



## **Liebert® PDX**

15-165 kW Indoor Room Cooling  
Units with Modulating Capacity  
A/W/F/D/H Version 50 Hz

Product Documentation  
English, Cod. 265200, rev. 17.05.2018



## Liebert® PDX

**Liebert® PDX** direct expansion cooling unit is equipped with the most advanced industry technology, guaranteeing precise cooling of data centers and server rooms.

It comes filled with R410A refrigerant which allows the unit to reach significant levels of efficiency.

This series offers units with gross rated cooling capacity from 15 to 120 kW.

**Liebert® PDX** range comes equipped with latest EC Fans technology thus ensuring top energy efficiency. The complete unit design has furthermore been optimized with enhanced heat exchangers, delivering a high level of overall efficiency and cooling capacity.

In addition, **Liebert® PDX** also includes as option unique Digital Scroll technology, making it the ideal, scalable cooling system able to expand with evolving business needs. The Digital Scroll modulating capability greatly contributes to the efficiency levels reached by **Liebert® PDX** with a 50 kW unit (inclusive of Digital Scroll) consuming as little as a 10 kW unit, thus delivering advantageous energy savings.

All **Liebert® PDX**'s components have been optimized to provide an extremely efficient solution both for conventional computer rooms and for infrastructures facing the challenges of modern IT applications.

In units from 15 to 33 kW the fan module is integrated in the unit frame, these units are available only as Standard Height (height 1970mm) and in three air discharge version: **Upflow**, **Downflow Frontal** and **Downflow Up**.

Units from 15 to 33 kW are available in Constant version (for high temperature and humidity).

Units from 40 kW to 120 kW are available in two versions: **Liebert® PDX** Standard Height (height 1970mm), and **Liebert® PDX** Extended Height (total height 2570mm). These units are composed of two sections:

- Coil section with heat exchanger coil, compressor, filter and control
- Fan module with high efficiency EC Fan.

**Liebert® PDX** Standard height Unit is supplied as a single unit with coil and fan section connected.

**Liebert® PDX** Extended height Unit is supplied in two modules (Coil section and Fan section) that should be connected on the field.

Standard and extended **Liebert® PDX** are available in four air discharge versions: **Upflow**, **Downflow Frontal** and **Downflow Up** with fans module installed above the raised floor, and version **Downflow Down** with fans module installed in the raised floor.

The new **Liebert® PDX** range is available across a full range of cooling modes: direct expansion, Indirect water Freecooling, Direct Air Freecooling and dual fluid redundancy cooling.

Units from 150 to 165 kW are available only in Extended version (total height 2570 mm); these units are available in two air discharge versions: Downflow Down and Downflow Up

**Liebert® PDX Standard Height**



**Liebert® PDX Extended Height**



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The product conforms to European Union directives 2006/42/EC; 2014/30/EU; 2014/35/EU; 2014/68/EU. Units are supplied complete with a Test Certificate Conformity Declaration and Component List.

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Liebert® PDX units are CE marked as they comply with the European directives concerning mechanical, electrical, electromagnetic and pressure equipment safety.



## The new Liebert® PDX

**Liebert® PDX** is Vertiv answer to the latest and the future Data Center needs.

Data Center environment is growing constantly in terms of cooling needs. It is asking and will continue to increase its demand for cooling solutions that provide exactly what the servers need without wasting energy overcooling as well as avoiding hot spots, **Liebert® PDX** thanks to usage of Stage Coils is designed to maximize the efficiency at part loads.

In fact as the outside conditions change all year long, as well as considering common cooling redundancy the units work most of the time in part load. **Liebert® PDX** provides atop efficient solution at full load, and maximizes its benefit at part load conditions.

The presence of Digital Scroll is then an additional step to further improve the part load efficiency.

**Liebert® PDX** has been designed to set new efficiency targets on Direct Expansion Data Center need applications.

Therefore all parts of common CRAC unit have been studied and optimized to provide a top efficient solution.

## Smart Aisle™ Solution – When Smart Means Efficient

**Liebert® PDX** as part of Smart Aisle™ cooling solution is the best answer to ensure the right cooling minimizing the cooling operating costs.

Vertiv's cold aisle containment solution, can achieve an energy saving of up to 65% higher than other manufacturers' cooling units with standard technology. The intelligent control of the Digital Scroll compressor's capacity together with accurate fan speed management, driven by cold aisle conditions, guarantees increased savings.

Smart mode is a control algorithm developed for Smart Aisle™ applications (Cold Aisle containment) meeting the cooling and airflow needs of the servers without wasting a single Watt on unnecessary cooling or air movement.

**Liebert® PDX** with DigitalScroll delivers the exact level of required air temperature while the ECFans manages the desired airflow. This ensures that only the necessary kilowatts of input power are used to cool the IT load. Units which include the Alco Electronic Expansion Valve are able to further increase overall system efficiency by reducing the condensing temperature during cooler seasons and at the same time preserving the Sensible Heat Ratio.



## Enhanced Freecooling

**Liebert® PDX** offers a full range of Freecooling solution that answers to all the different needs of the different sites application.

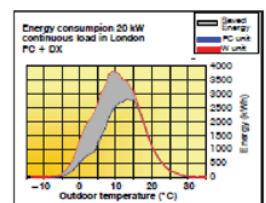
### Indirect Water based Freecooling – The right cooling with the minimum consumption

Whenever the Critical application needs a complete separation between indoor and outdoor or the Humidity control band requirements are tight **Liebert® PDX** offers the possibility to exploit water based indirect freecooling. Thanks to the double coil (Freecooling water and Direct Expansion) the unit provides the highest saving match with full availability of the DX solution. The usage of Stage Coil and Digital Scroll then allows maximizing the saving in mixed mode operation, so whenever the freecooling is not able to fully take the load the compressors can work just to complete the missing cooling needs.

Therefore **Liebert® PDX** Freecooling can provide extremely high energy saving granting the highest availability of the application.

### Liebert® Economizer – Direct Freecooling for Data Centers

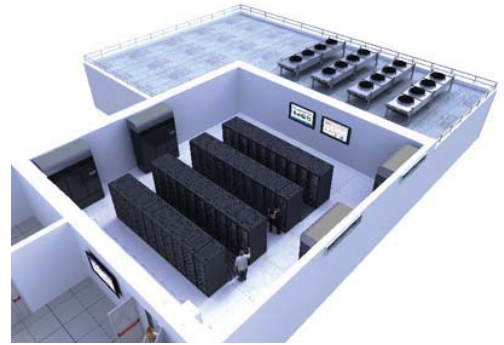
When the site allows for Direct freecooling application, and the Humidity control (still required as for most of Data Centers applications) band requirements can be enlarged to the limits of the ASHRAE (ASHRAE: 2011 Thermal Guidelines for Data Processing Environments) recommended zone, the **Liebert® PDX** offers the right solution for Data Centers.



# Liebert® PDX Top Efficiency

**Liebert® Economizer** allows checking not only if the external air has the right temperature to start giving some partial freecooling benefits, but also to check if the humidity is on the right conditions. In fact humidity control requires a relevant part of energy, therefore having an intelligent control, which allows using the external air only when it makes sense from all energy aspects, it is a key element for a Direct Freecooling for Data Center.

**Liebert® PDX** with Economizer solution allows maximizing direct freecooling benefits coupling the needed control of temperature and humidity, providing the full back up availability of the direct expansion solution.

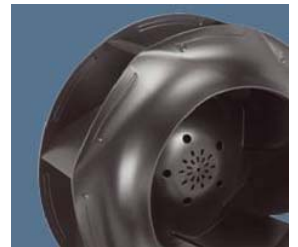


## Premium Fan Module – Technology for efficiency



The Premium Fan Module are the evolution of the EC fans technology. They are made of composite material. This new technology allows keeping the current high- strength of aluminum alloy adding the benefits of light weight and full flexibility on blade design of the new material. **Liebert® PDX** has been designed around these new fans in order to have the highest benefits from the new technology, translating the new Premium Fan Module into reduced noise levels as well as increased energy efficiency.

The high- level supervision of multiple units allows them to work together as a single system to optimize room temperature and humidity. This is of particular importance when the ECF an is considered. ECfan power consumption is exponential. Having five units running at 80% instead of four at 100%, means the energy used from the fans of the entire group is reduced by 36%. iCOM manages the reduction of fan speed whenever operation at full capacity is not required.



## Unit Aeraulic Design – A new way to look at aerodynamics



Aerodynamics is commonly associated with cars and motorbike racing or with flying aspects. With **Liebert® PDX** aerodynamics will be applied also high precision cooling design.

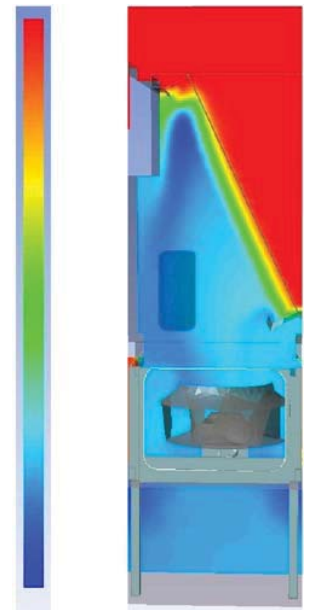
In fact, the internal design of **Liebert® PDX** has been deeply studied in order to optimize the aerodynamic impact of all the internal parts: coil shape, coil size, coil angle, electrical panel design, etc... This means a dramatically reduced internal air pressure drop that immediately becomes a benefit in terms of reduced unit power consumption.

## Heat Exchanger Section: Stage Coil Net Sensible Capacity matters

Efficiency is a fundamental requirement in all applications today. Even more for technological applications where the operational costs are by far the most significant consideration. Sensible Heat Ratio (SHR) values of greater than 0.90 are required to reduce to a minimum the energy spent controlling humidity during normal operating conditions.

Heat exchanger design and a correct air distribution within the unit are two of the most important factors required to achieve optimum performance.

**Liebert® PDX** units feature a very high coil heat exchanger surface respect to the exchanged power. Using the index [frontal Surface x Rows / refrigeration Power] values of over 100 mm<sup>2</sup>/W are obtained. In dual circuit units, the dual stage coil increases the evaporator temperature maximizing the SHR and increasing the unit efficiency. At partial load, the efficiency is strongly increased, due to the use of the total amount of airflow and frontal coil surface: with non- staged



# Liebert® PDX Top Efficiency

coil system, only half heat exchanger frontal surface was interested by the thermal exchange. Sophisticated design and development tools, such as Particle Image Velocimetry and Computational Fluid Dynamics are used by Vertiv to identify the best components layout in order to achieve an even and pressure- equalized airflow distribution within the unit which optimizes the entire coil surface area in the heat exchanging process.

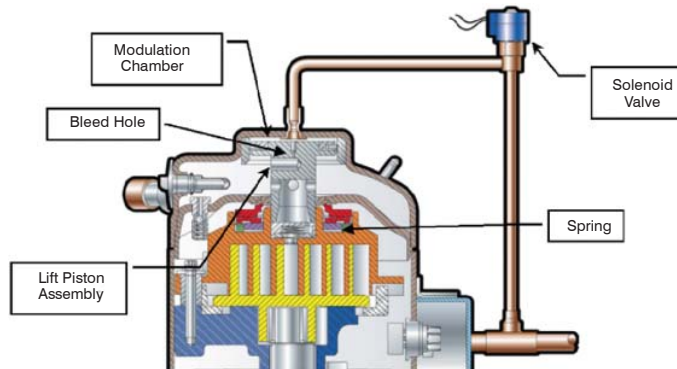
## Digital Scroll Compressor

Digital Scroll provides the necessary level of cooling by adjusting its delivery according to the heat load, thus ensuring constant, precise temperature levels.

The Digital Scroll operates in two stages - the "loaded state", when the solenoid valve is normally closed and "unloaded state", when the solenoid valve is open. During the loaded state the compressor operates like a Standard scroll and delivers full capacity and mass flow. However, during the unloaded state, there is no capacity and no mass flow through the compressor.

This allows having a number of benefits in terms of Efficiency:

- Perfect match between Cooling Capacity and Heat Load.
- Lower power input at partial load.
- Possibility to size cooling system to overcome future heat load growth.
- Improved SHR once the compressor is modulating (due to better evaporating temperature)



## Electronic Expansion Valve (EEV)

The valve is designed for modulating control of refrigerant circuits with highspeed and high precision. The EEV provides superior performance compared to a Thermostatic Expansion Valve (TXV), due to:

- Precise flow control
- Positioning time

EEV ensures a better control on super heating at the end of the evaporator, ensuring at the same time that compressor will never be filled by liquid from the 10% to 110% of its nominal capacity, instead a mechanical one cannot ensure it. It has to be calibrated and then it will work properly but only around the calibration point. This means that a TXV works better (i.e. better control, longer life) with a condensing pressure as much as possible constant. For such reason with TXV the condensing temperature is kept around 45°C as set point. But during the coldest period the condensing temperature can be lowered and the electronic expansion valve adapts to this new situation. This permits an increase of the cooling capacity of the unit, a decrease of the unit power input and so increase the energy efficiency of the entire Liebert® PDX unit.



Liebert® PDX allows having an option the EEV both on Standard Scroll and on Digital Scroll. The choice is driven by the application:

- Only temperature control - or wide range or Humidity band T→In this case the EEV gives a great efficiency effects both with Standard and Digital Scroll technology. To get the biggest advantage, a different pressure set point can be used for the fan speed controller of the Liebert remote condenser.
- Close Humidity control → Often, even the TXV valve allows to get good results, mainly thanks to the Digital Scroll modulation.

# Liebert® PDX Top Efficiency

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## Liebert® PDX serviceability

Attention to design detail means low operational costs including product maintenance through high levels of reliability and a service friendly design. As an example, all the crucial parts of the refrigeration circuit (i.e.: thermostatic valves, sight glasses and liquid line driers) are grouped together and accessible simply by opening the front door.

## Easy maintenance

All components are easily accessible from the front of the room unit. The service compartment facilitates checking and setting of refrigeration circuit, without changing aeraulic conditions. The access to the compressor is possible even when the unit is operating by removing the front panel.

The access to the fan is executed with the greatest care for easier interventions (maintenance and/or fan replacement).

One very important feature, for example, is the possibility to check the total pressure drop of the high pressure piping using the schrader connections available in the front part of the machine.

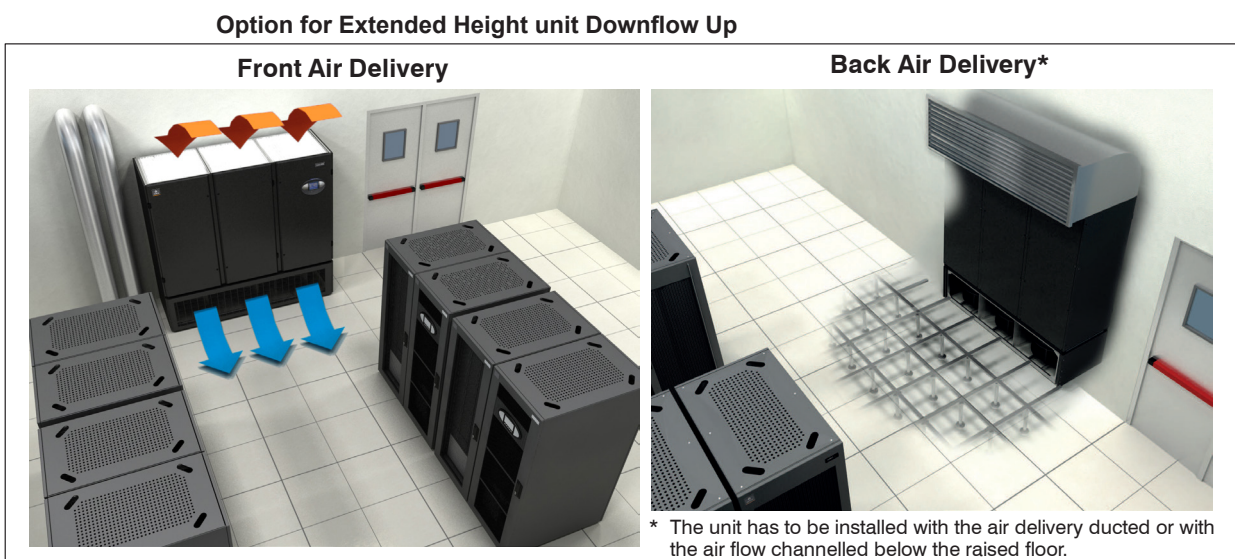
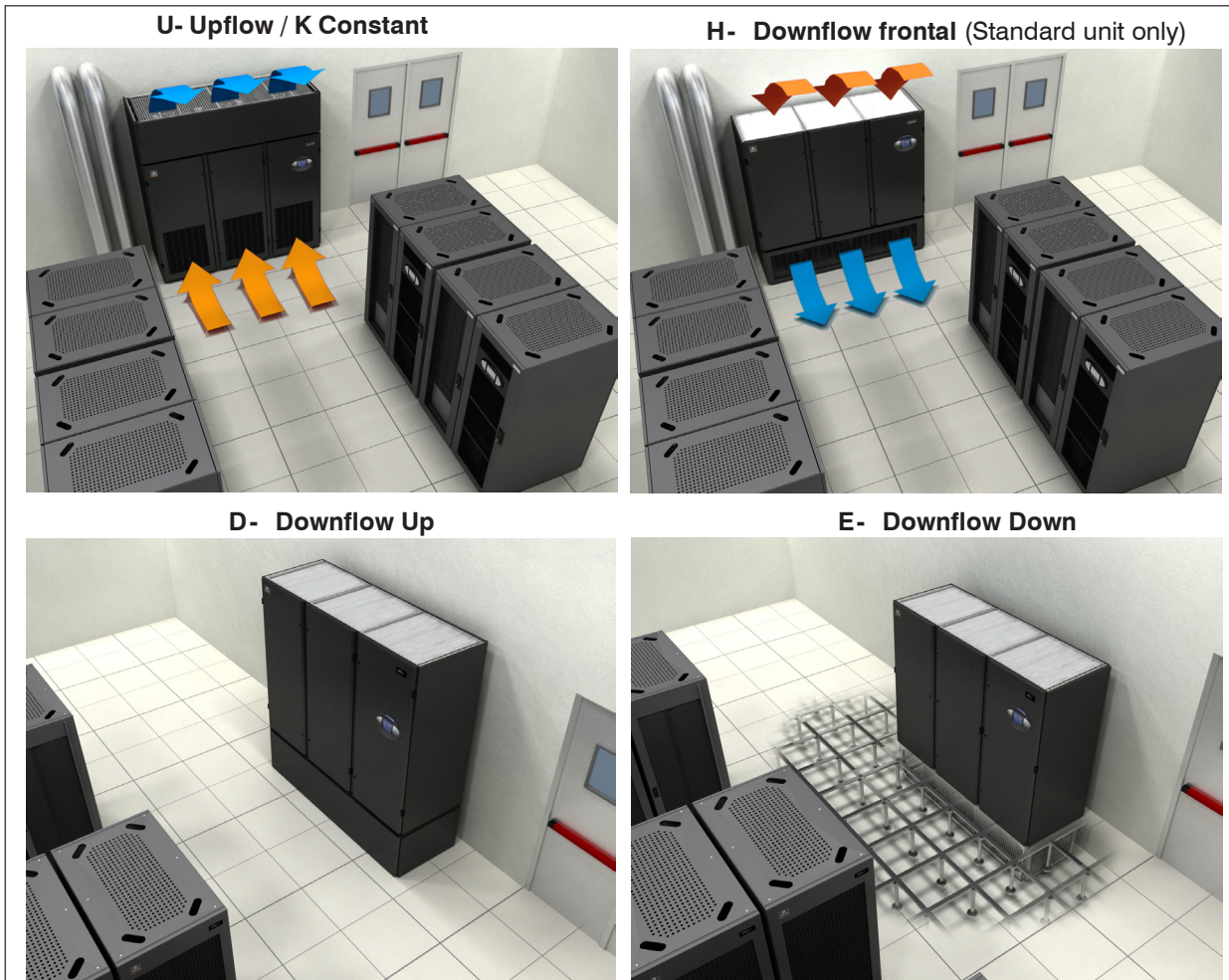




# 2

## Model Configuration

### Air discharge version



# Model Configuration

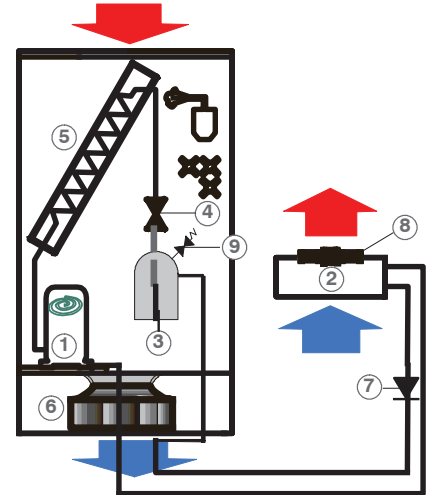
## Cooling Versions

### Version A

#### Direct expansion units with air - cooled condenser

Air cooled direct expansion units optimize condensing temperature in the simplest installation configurations and with minimized site impact.

The compressor (1) pumps the hot gaseous refrigerant into an outdoor air- cooled condenser(2). The liquefied refrigerant arrives to a liquid receiver (3) that ensures a constant and even refrigerant flow to the expansion valve (4) and then arrives to the evaporator (5). Here the refrigerant, thanks to the heat - exchanged with the room air moved by the fan (6) - evaporates and returns to the compressor (1); from this point, the refrigerant begins a new refrigeration cycle. To maintain the correct refrigerant discharge pressure, the speed of the motor fan (8) is controlled (proportional mode). Shut- off valves are provided as standard to assist with routine maintenance. The compressor (1) has a built- in non- return valve to avoid return of liquid refrigerant from the condenser in summertime, thus protecting the compressor from undesired refrigerant slugging during the start up. A second non- return valve (7) is necessary to avoid - in wintertime - refrigerant migration from the liquid pipes and the receiver (3) to the condenser (2), that should be responsible of low pressure intervention at the start- up of compressor.



For safety reason, a relief valve (9) is installed on the liquid receiver (3); this valve is equipped with flanged connections so that the refrigerant may be discharged to the outside.

#### External air- cooled condenser (2)

The units may be connected with a wide range of our condensers in standard or low noise version. For technical data and performance, refer to the relevant technical documentation. Chap. 5 gives the recommended matching condenser for **Liebert® PDX** units as a function of outdoor air temperature. To ensure correct operation, best performance, and longest life the units must be connected to remote condensers approved by Vertiv.

**Note 1:** Units and external condensers are supplied separately.

**Note 2:** The room unit refrigeration circuit is pressurized with helium at 3 bar and the condenser refrigeration circuit at 2 bar with dry air.

**Note 3:** The customer is responsible for making connections between the Unit and the external condenser and for charging with refrigerant (standard R410A) and oil, when request. Full instructions for these operations are given in the User Manual.

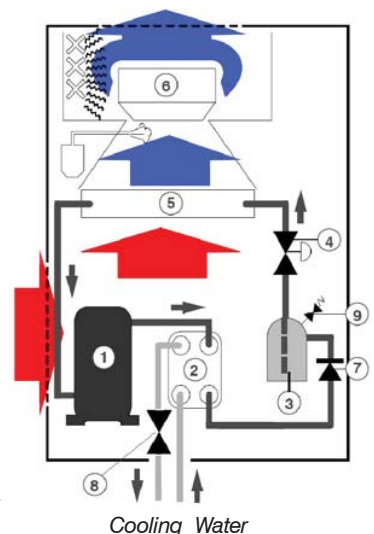
### Version W

#### Direct expansion units with water - cooled condenser

**Liebert® PDX WaterCooled** is the ideal configuration for leveraging all its efficiency benefits on applications with significant distances between internal and external units, or those with strong variations in geodetic height.

The compressor (1) pumps the hot gaseous refrigerant into a water-cooled condenser (2). The liquefied refrigerant arrives to a liquid receiver (3) that ensures a constant and even refrigerant flow to the expansion valve (4) and then arrives to the evaporator (5). Here the refrigerant, thanks to the heat - exchanged with the room air moved by the fan (6) - evaporates and returns to the compressor (1); from this point, the refrigerant begins a new refrigeration cycle.

The compressor (1) has a built- in non- return valve to avoid return of liquid refrigerant from the condenser, thus protecting the compressor from undesirable refrigerant slugging during the start up. A second non- return valve (7) is installed to avoid refrigerant migra-



# Model Configuration

tion from the liquid pipes and the receiver (3) to the condenser (2), that should be responsible of high pressure intervention at the start- up of compressor.

For safety reason, a relief valve (9) is installed on the liquid receiver (3); this valve is equipped with flanged connections so that the refrigerant may be discharged to the outside.

## Water - cooled condenser

These units are provided with one very efficient stainless steel brazed- plate water- cooled condenser (2). The condenser is fitted with a modulating valve (8) for the automatic control of condensing pressure. The units operate with mains water or closed circuit with an external Dry Cooler.

When operating in a closed circuit, to avoid undesired ice formation in wintertime, it is advisable to use water/glycol mixture: refer to Chap. 5 for the percentages to be used at minimum ambient temperatures. Dry Coolers are available as an option; water- glycol mixture and circulation pump(s) are normally supplied by others.

If mains water is used, a mechanical filter must be fitted in the water circuit to protect the plate condenser (2) (for other information see the User Manual).

Note. The water - cooled **Liebert® PDX** versions are filled with the complete charge of there requested refrigerant (standard R410A).

## Version F

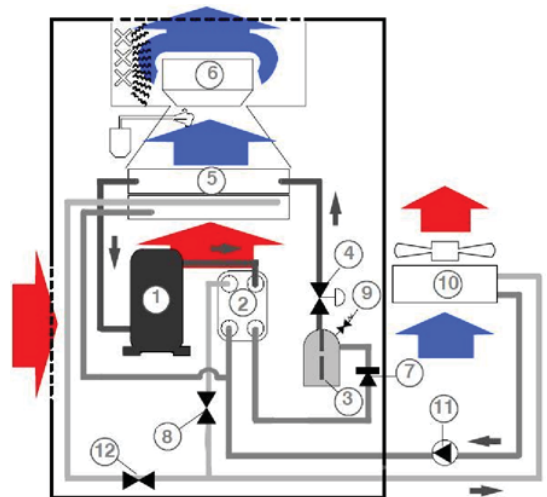
### Freecooler units

As seen in the previous chapter for all applications where efficiency is a prime objective, the **Liebert® PDX** offers the possibility of leveraging the Free-cooling effect for the longest period of time, as a result of its enhanced coil distribution.

The flexibility of the **Liebert® PDX** Freecooling configuration ensures the highest energy savings and efficiency in variable working conditions including DX mode.

### Freecooling mode

The Freecooler unit cools the air flow by means of the air refrigerant coil (5) in direct expansion rows [direct expansion mode] or, as an alternative, the air/water coil (5) in freecooling rows [freecooling mode]. Whenever the outdoor temperature is at least 5 degrees below the indoor return temperature, the water flow is cooled by an external Dry Cooler (10) and passes through the coil (5). When the external temperature is higher than ZET (Zero Energy Temperature), the water exchanges heat with the refrigerant in the water- cooled plate condenser (2). When the external temperature is below ZET, the water is cooled as much as to cool the room air directly in the air/water coil (5, freecooling rows).



### Refrigeration circuit

The compressor pumps the hot gaseous refrigerant into a water- cooled condenser (2). The liquefied refrigerant arrives to a liquid receiver (3) that ensures a constant and even refrigerant flow to the expansion valve (4) and then arrives to the direct expansion rows of the evaporator (5). Here the refrigerant, thanks to the heat - exchanged with the room air moved by the fan (6) - evaporates and returns to the compressor (1); from this point, the refrigerant begins a new refrigeration cycle.

The compressor (1) has a built- in non- return valve to avoid return of liquid refrigerant from the condenser, thus protecting the compressor from undesired refrigerant slugging during the start up. A second non- return valve (7) is installed to avoid refrigerant migration from the liquid pipes and the receiver (3) to the condenser (2), that should be responsible of high pressure intervention at the start- up of compressor.

For safety reason, a relief valve (9) is installed on the liquid receiver (3); this valve is equipped with flanged connections so that the refrigerant may be discharged to the outside.

Note. The **Liebert® PDX** Freecoolers are filled with the complete charge of the requested refrigerant (standard R410A).

# Model Configuration

## Water - cooled condenser

These units are provided with one very efficient stainless steel brazed- plate water- cooled condenser (2). The condenser is fitted with a modulating valve (8) for the automatic control of condensing pressure. To reduce water and energy consumption (pump), it's advisable to adopt a cooling water control valve (by the user), able to stop water feeding when unit is off.

## Water/ glycol circuit

The units operate with **water in closed circuit with an external Dry Cooler (10)**, cooled by the outside ambient air. To avoid undesired ice formation in winter time, it is advisable to use water/glycol mixture: refer to the User Manual for the percentages to be used at minimum ambient temperatures.

The circulation of the water- glycol mixture is forced (the pump (11) and the water- glycol mixture are not supplied).

The unit is provided with 2- way modulating valve (12) to control the glycoled- water flow passing through the water/glycol coil.

The opening or closing signals, generated by the electronic controller, manage the valve actuator movement in order to maintain the desired conditions in the conditioned room.

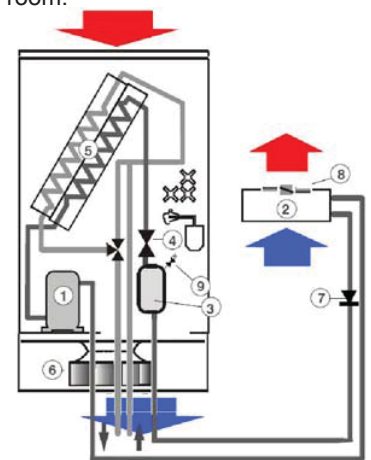
## Version D

### Air - cooled condenser dualfluid units

Dual Fluid can be translated as cooling redundancy. In fact the unit provides the Direct Expansion full back up cooling to a Chilled Water common working circuit.

Ideal for chilled water based applications with transition between Air Conditioning and Precision Cooling, the **Liebert® PDX** Dual Fluid Air Cooled configuration, offers efficient direct expansion cooling that works as redundant cooling for chilled water coils.

The Dual fluid unit cools the air flow by means of the air refrigerant coil (5) in direct expansion rows [direct expansion mode: see refrigeration circuit] or, as an alternative, the air/water coil (5) in the chilled water rows [chilled water mode].



### Refrigeration circuit

The compressor (1) pumps the hot gaseous refrigerant into an outdoor air- cooled condenser (2). The liquefied refrigerant arrives to a liquid receiver (3) that ensures a constant and even refrigerant flow to the expansion valve (4) and then arrives to the evaporator (5). Here the refrigerant, thanks to the heat - exchanged with the room air moved by the fan (6) - evaporates and returns to the compressor (1); from this point, the refrigerant begins a new refrigeration cycle. To maintain the correct refrigerant discharge pressure, the speed of the motor fan (8) is controlled (proportional mode).

Shut- off valves are provided as standard to assist with routine maintenance.

The compressor (1) has a built- in non- return valve to avoid return of liquid refrigerant from the condenser in summertime, thus protecting the compressor from undesired refrigerant slugging during the start up. A second non- return valve (7) is necessary to avoid - in wintertime - refrigerant migration from the liquid pipes and the receiver (3) to the condenser (2), that should be responsible of low pressure intervention at the start- up of compressor.

For safety reason, a relief valve (9) is installed on the liquid receiver (3); this valve is equipped with flanged connections so that the refrigerant may be discharged to the outside.

### External air - cooled condenser

The units may be connected with a wide range of our condensers in standard or low noise version.

For technical data and performance, refer to the relevant technical documentation. Chap. 5 gives the recommended matching condenser for **Liebert® PDX** units as a function of outdoor air temperature.

To ensure correct operation, best performance, and longest life the units must be connected to remote condensers approved by Vertiv .

**Note 1.** Units and external condensers are supplied separately.

**Note 2.** The room unit refrigeration circuit is pressurised with helium at 3 bar and the condenser refrigeration circuit at 2 bar with dry air.

**Note 3.** The customer is responsible for making connections between the Unit and the external condenser and for charging with refrigerant (standard R410A).

Full instructions for these operations are given in the User Manual.

# Model Configuration

## Version H

### Water - cooled condenser dualfluid units

Dual Fluid can be translated as cooling redundancy. In fact the unit provides the Direct

Expansion full back up cooling to a Chilled Water common working circuit.

This cooling configuration perfectly adapts to any installation layout, therefore chillers and dry coolers can be placed wherever necessary on the site.

### Dualfluid mode

The Dualfluid unit cools the air flow by means of the air- refrigerant coil (5) in direct expansion rows [direct expansion mode: see refrigeration circuit] or, as an alternative, the air/water coil (5) in the chilled water rows [chilled water mode].

### Refrigeration circuit

The compressor (1) pumps the hot gaseous refrigerant into a water- cooled condenser (2).

The liquefied refrigerant arrives to a liquid receiver (3) that ensures a constant and even refrigerant flow to the expansion valve (4) and then arrives to the evaporator (5). Here the refrigerant, thanks to the heat - exchanged with the room air moved by the fan (6) - evaporates and returns to the compressor (1); from this point, the refrigerant begins a new refrigeration cycle.

The compressor (1) has a built- in non- return valve to avoid return of liquid refrigerant from the condenser, thus protecting the compressor from undesirable refrigerant slugging during the start up.

The second non- return valve (7) avoids refrigerant migration from the liquid pipes and the receiver (3) to the condenser (2), that should be responsible of high pressure intervention at the start- up of compressor.

For safety reason, a relief valve (9) is installed on the liquid receiver (3); this valve is equipped with flanged connections so that the refrigerant may be discharged to the outside.

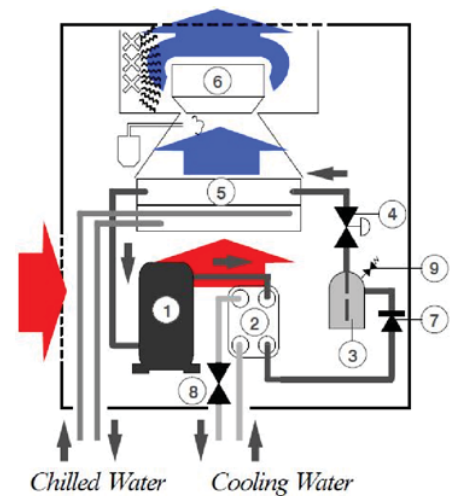
### Water - cooled condenser

These units are provided with one very efficient stainless steel brazed- plate water- cooled condenser (2). The condenser is fitted with a modulating valve (8) for the automatic control of condensing pressure. The units operate with mains water or open cooling tower water.

If mains water or open tower water are used, a mechanical filter must be fitted in the water circuit to protect the condenser (for other information see the User Manual).

**Note 1.** The water - cooled Dualfluid versions are filled with the complete charge of the requested refrigerant (standard R410A).

**Note 2.** To complete the Dualfluid system it is necessary to connect the chilled water coming from the external source to the air/water coil connections (5).



# Model Configuration

## Other Configurations

### CONSTANT

**Liebert® PDX** Constant is the solution for systems requiring extremely precise control of temperature and humidity for the most demanding installations and stringent standards. Typical installations are metrological rooms, laboratories, tobacco, paper and precision mechanical industries.

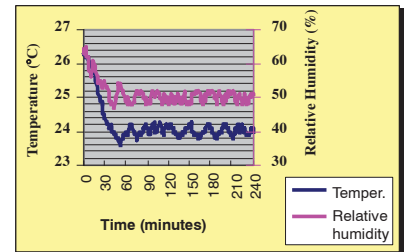
A special hot gas coil and a modulating valve enable the reduction of cooling capacity. **Liebert® PDX** Constant, with ducted air delivery, allows to maintain temperature and humidity tolerances of  $\pm 0.3^{\circ}\text{C}$  and  $\pm 2\% \text{R.H.}$  respect the set value. The possible offset ( $\pm 0.5^{\circ}\text{C}$ ) of the precise probes must be taken into consideration and it could be deleted with the relevant parameter control setting.

This important result is achieved through an accurate and continuous variation of both cooling capacity and steam production and fulfilling certain conditions:

1. Minimum thermal load not less than 30% of nominal unit capacity
2. Stable thermal load or with variations not bigger than 10% per hour.
3. Unit installed and ducted in proper way.
4. Environment with proper thermal insulation from external thermal load (take care of windows, doors, full-length windows etc.)
5. Unit return air conditions within the limits listed in the table below:

| Return air conditions | From   | To      |
|-----------------------|--------|---------|
| Air Temperature       | 20° C  | 25° C   |
| Air relative humidity | 40%    | 55%     |
| Air specific humidity | 7 g/kg | 10 g/kg |

The refrigeration diagram, the relevant description and the operating mode diagrams of iCom control describe very well how the **Liebert® PDX** Constant room units guarantee temperature and humidity within the requested tolerances.



# Model Configuration

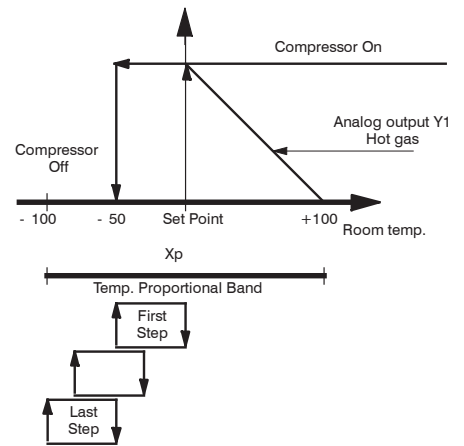
## iCom for Constant unit

The control of the unit for Metric Rooms is performed through the control iCom Medium Board with relevant software (see T/H diagrams).

### (T) Temperature control:

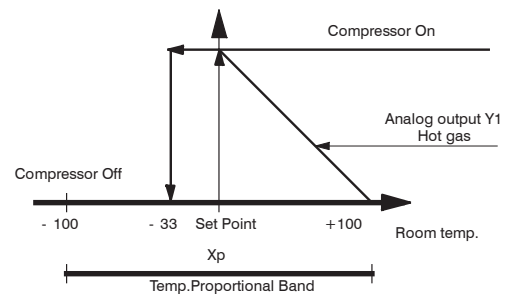
(Compressor + one, two or three electrical heating steps)

The compressor stops at - 50% of proportional band. In the left side of the proportional band the electrical heating steps switch on to reach the set point temperature.



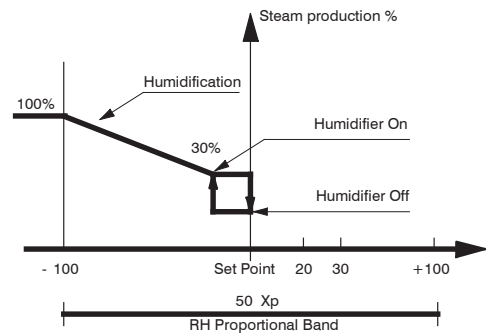
### (T) Temperature control:

(Only compressor)



### (H) Humidity control:

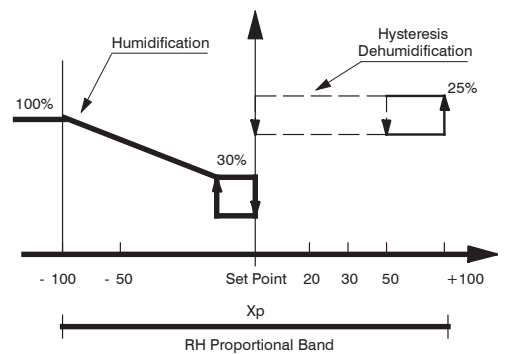
(Only humidification)



### (H & D) Control mode:

#### (Humidification- dehumidification)

The dehumidification hysteresis can be modified from 25 to 75% of the whole humidity proportional band. If a value higher than 45% of dehumidification hysteresis is programmed the overlapping of humidification- dehumidification mode will occur.



# Model Configuration

## Constant K, Version A

### Refrigeration circuit

All models are provided with a single refrigeration circuit. The compressor (1) pumps the hot gaseous refrigerant into an outdoor air- cooled condenser (2). The liquefied refrigerant arrives to a liquid receiver (3) that ensures a constant and even refrigerant flow to the thermostatic expansion valve (4) and then arrives to the evaporator (5). Here the refrigerant, thanks to the heat - exchanged with the room air moved by the fan (6) - evaporates and returns to the compressor (1); from this, the refrigerant begins a new refrigeration cycle. To maintain the correct refrigerant discharge pressure, the speed of the motor fan (8) is controlled (on- off or proportional mode).

When the cooling capacity of the room unit is higher than the room load and the room temperature tends to decrease, the hot gas valve (11) opens and the hot gas coil (10) heats the treated air, maintaining the room at the requested restricted temperature conditions.

Shut- off valves are provided as standard to assist with routine maintenance.

The compressor (1) has a built- in non- return valve to avoid return of liquid refrigerant from the condenser in summertime, thus protecting the compressor from undesired refrigerant slugging during the start up. A second non- return valve (7) is recommended to avoid - in wintertime - refrigerant migration from the liquid pipes and the receiver (3) to the condenser (2), that should be responsible of low pressure intervention at the start- up of compressor.

For safety reason, a relief valve (9) is installed on the liquid receiver (3); this valve is equipped with flanged connections so that the refrigerant may be discharged to the outside.

### External air- cooled condenser (2)

The units may be connected with a wide range of our condensers in standard or low noise version.

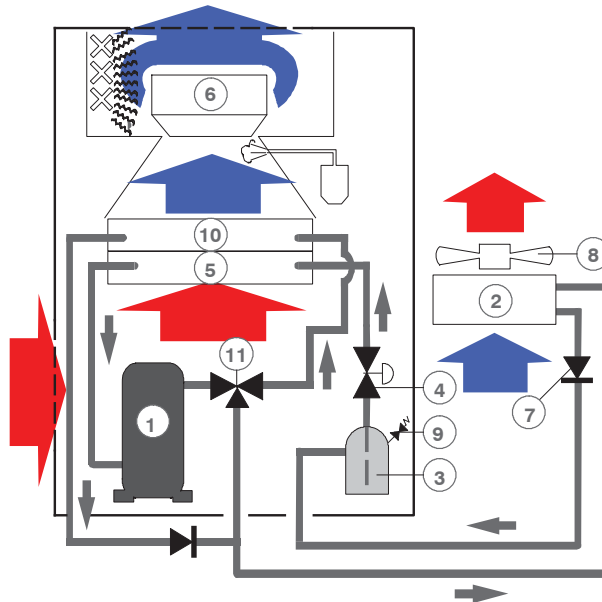
For technical data and performance, refer to the relevant technical documentation Chap 5 gives the recommended matching condenser for **Liebert® PDX** units as a function of outdoor air temperature.

**Note 1.** Units and external condensers are supplied separately.

**Note 2.** The room unit refrigeration circuit is pressurised with helium at 3 bar and the condenser refrigeration circuit at 2 bar with dry air.

**Note 3.** The customer is responsible for making connections between the Unit and the external condenser and for charging with refrigerant (standard R410A).

Full instructions for these operations are given in the Service Manual.





# Model Configuration

## Constant K, Version W

### Refrigeration circuit

All models are provided with a single refrigeration circuit. The compressor (1) pumps the hot gaseous refrigerant into a water- cooled condenser (2). The liquefied refrigerant arrives to a liquid receiver (3) that ensures a constant and even refrigerant flow to the thermostatic expansion valve (4) and then arrives to the evaporator (5). Here the refrigerant, thanks to the heat - exchanged with the room air moved by the fan (6) - evaporates and returns to the compressor (1); from this, the refrigerant begins a new refrigeration cycle.

When the cooling capacity of the room unit is higher than the room load and the room temperature tends to decrease, the hot gas valve (11) opens and the hot gas coil (10) heats the treated air, maintaining the room at the requested restricted temperature conditions.

Shut- off valves are provided as standard to assist with routine maintenance.

The compressor (1) has a built- in non- return valve to avoid return of liquid refrigerant from the condenser, thus protecting the compressor from undesirable refrigerant slugging during the start up. The second non- return valve (7) avoids refrigerant migration from the liquid pipes and the receiver (3) to the condenser (2), that should be responsible of high pressure intervention at the start- up of compressor. For safety reason, a relief valve (9) is installed on the liquid receiver (3); this valve is equipped with flanged connections so that the refrigerant may be discharged to the outside.

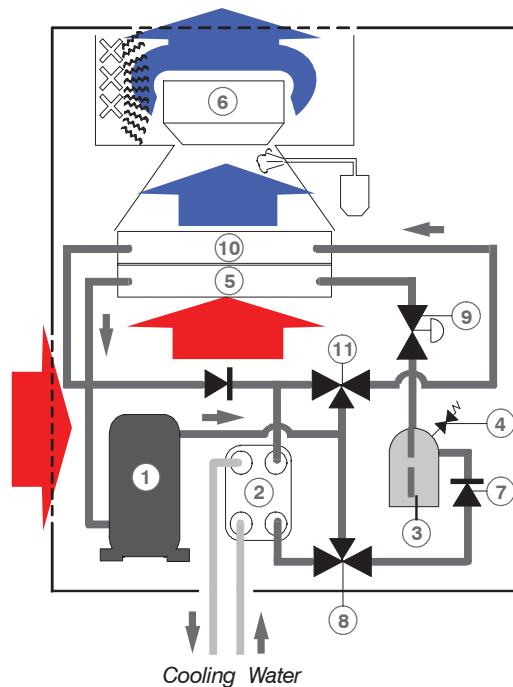
### Water- cooled condenser

These units are provided with one very efficient stainless steel brazed- plate water- cooled condenser (2). The condenser is fitted with an head- pressure regulating valve (8) for the automatic control of condensing pressure.

The units operate with **mains water or closed circuit with an external Dry Cooler**. When operating in a closed circuit, to avoid undesired ice formation in wintertime, it is advisable to use water/glycol mixture: refer to the Service Manual for the percentages to be used at minimum ambient temperatures. DryCoolers are available as an option; water- glycol mixture and circulation pump(s) are normally supplied by others.

If mains water is used, a mechanical filter must be fitted in the water circuit to protect the plate condenser (2) (for other information see the Service Manual).

**Note.** The water - cooled versions are filled with the complete charge of the requested refrigerant (standard R410A).



# Model Configuration

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## Airflow

### **L - Premium Fan Module**

The improvements of the EC Fan are connected with the benefits from a continuous speed control by iCOM. In fact with premium solution we can have a modulating fan speed based upon the load required, saving the power input of the fans.

EC fan power consumption is exponential. Having ten fans running at 70% instead of seven at 100%, means the energy used from the fans of the unit is reduced by more than 50%.

So as at any time the unit will run in partial load Liebert® PDX with premium fan module can allow to increase the saving of the stage coil thanks to saving on the fans side.

### **1 - Basic Fan Module**

The latest technology available: Plastic EC Fans.

They are made of composite material. This new technology allows keeping the current high-strength of aluminum alloy adding the benefits of light weight and full flexibility on blade design of the new material.

With a simple control logic that allows setting the unit for the specific site need and then have the unit running in that way. The EC Fan Fix speed can be set very easily at fixed fan speed, directly acting on the iCOM control without any need of cabling autotransformers voltages.

Liebert® PDX units are provided for operating with in the following working ranges (the limits concern new units on which correct installation have already been made):

### All versions\*\*\*)

|   |                         |   |
|---|-------------------------|---|
| Room air conditions   | Temperature: *)         | from 20 (26)°C to 35 (40)° C                  |
|   | Humidity ratio          | From 5.5 g/kg to 12g/kg                       |
|   | Relative humidity       | From 20% to 60%                               |
| Room air conditions **) (units for Smart Aisle application) | Temperature:            | from 26°C to 38° C                            |
|   | Humidity ratio          | From 5.5 g/kg to 12g/kg                       |
|   | Relative humidity       | From 20% to 60%                               |
| Hot water circuit   | inlet water temperature | max. 85°C                                     |
|   | water pressure          | max. 8.5 bar                                  |
| Storage conditions  | Temperature:            | from:- 20°C to: 50°C                          |
|   | Relative humidity:      | Max. 90% RH, preventing surface condensation. |
| Power supply tolerances                                     |                         | V ± 10%, Hz ± 2                               |

**Note:** Values in brackets correspond to PX150 and PX165

**Note:** The minimum condensing temperature for PX150 and PX165 is 40 °C

\*) for PX015 – basic fan version, temperature from 20 °C to 31 °C  
 – premium fan version, temperature from 20 °C to 27 °C

\*\*) Smart Aisle application not available for PX015

\*\*\*) Except EconoPhase, see relevant Literature

### For A and D units\*\*\*)

|  |                              |   |                              |
|--|------------------------------|---|------------------------------|
| <b>Outdoor temperature: lower limit</b>  |                              |   |                              |
| Exceeding the winter low temperature limits could stop the compressor(s) by Low Pressure transducer. Reset to normal operation can only be carried out manually through the unit control.  |                              |   |                              |
| down to -20°C  |                              | between -20°C and -30°C   |                              |
| Remote condenser fan speed control required  |                              | Remote condenser fan speed controller (VARIEX) inside the unit + Head pressure control valve (LOW-TEX) + increased liquid receiver required.<br>Hot gas not allowed |                              |
| <b>Outdoor temperature: higher limit</b>   |                              |   |                              |
| This limit is determined by coupled condenser model. Exceeding this limit (or a lack of maintenance), the compressor(s) could stop by High Pressure switch. Reset to normal operation can only be carried out manually.                      |                              |   |                              |
| <b>Approved Remote Air Condenser</b>   |                              |   |                              |
| To ensure correct operation, best performance, and longest life the units must be connected to remote condensers approved by Vertiv.<br>The warranty clauses are no longer valid if the unit is connected to an unapproved remote condenser. |                              |   |                              |
| Relative position room unit vs. remote condenser   |                              |   |                              |
| From unit to condenser max distance  | up to 60 m equivalent length | up to 100 m equivalent length   | up to 60 m equivalent length |
| From unit to condenser max geodetic height (1) (2)   | from 20 m to - 3 m           | from 30 m to - 8 m  | from - 8 m to - 15 m         |
| Requirements   |                              |   |                              |
| Pipe diameter  | see Tab 12f                  | see Tab 12f   | see Tab 12f                  |
| Oil traps on vertical upward line of refrigerant gas   | every 6 m, max               | every 6 m, max  | every 6 m, max               |
| Extra oil charge   | see User Manual              | see User Manual   | see User Manual              |
| Remote condenser fan speed control (VARIEX) installation   | mandatory                    | mandatory   | mandatory                    |
| Condenser  | design                       | oversized +20%  | oversized +30%               |
| Hot gas reheat   | allowed                      | NOT allowed   | NOT allowed                  |
| Additional non return valve on delivery line, at 2 m from compressor   | recommended                  | mandatory   | mandatory                    |

\*\*\*) Except EconoPhasa, see relevant Literature

# Operating Range

## For W, F and H units

|  |           |
|--|-----------|
| Water or mixture temperature to condenser, lower limit (other information User Manual) | min. 5° C |
|--|-----------|

## For F, D and H units

| Water condenser circuit and chilled water circuit                                     |                       |                       |
|---|-----------------------|-----------------------|
| inlet water temperature   | min. 5°C              |                       |
| water pressure  | max. 16 bar           |                       |
| Max. differential pressures on the modulating valve (2 or 3 ways)                     |                       |                       |
| - Max. differential pressure through the closed valve: $\Delta p_{cv}$                |                       |                       |
| - Max. differential pressure across the valve for modulating service: $\Delta p_{ms}$ |                       |                       |
| Models PDX  | $\Delta p_{cv}$ (kPa) | $\Delta p_{ms}$ (kPa) |
| PX...W/H (water condenser circuit)  | 175                   | 175                   |
| PX...F  | 175                   | 175                   |
| PX041 D/H (chilled water circuit)   | 300                   | 300                   |
| PX047 D/H   | 300                   | 200                   |
| PX051 D/H   | 300                   | 200                   |
| PX044 D/H   | 300                   | 200                   |
| PX054 D/H   | 300                   | 200                   |
| PX062 D/H   | 300                   | 200                   |
| PX068 D/H   | 210                   | 200                   |
| PX082 D/H   | 210                   | 200                   |
| PX094 D/H   | 210                   | 200                   |
| PX104 D/H   | 210                   | 200                   |
| Models PDX 1 bay  | $\Delta p_{cv}$ (kPa) | $\Delta p_{ms}$ (kPa) |
| PX015 W   | 300                   | 300                   |
| PX025 W   | 300                   | 300                   |
| PX0031 W  | 300                   | 300                   |
| PX033 W   | 175                   | 175                   |
| PX...W/H (water condenser circuit)  | 300                   | 300                   |
| PX ...F   | 300                   | 300                   |
| PX015 D/H (chilled water circuit)   | 300                   | 300                   |
| PX021 D   | 300                   | 300                   |
| PX025 D/H   | 300                   | 300                   |
| PX031 D/H   | 300                   | 300                   |

- (1) Positive difference in height: condenser above conditioner  
 (2) Negative difference in height: condenser below conditioner  
 Other information in User Manual.

**Liebert® PDX** performances are linked to room conditions, cooling system, airflow. The unit fitted with Digital Scroll Cooling System and Premium Fan Module can also modulate cooling capacity and airflow depending on the cooling needs. Therefore each single model can provide a wide range of capacity depending on the environment it is applied in. Below is a description of the most common conditions currently used in Data Center applications. This can help giving a picture on unit performances. **Liebert® PDX** is an extremely flexible unit able to adapt to different sites needs. Vertiv sales force has a selection tool able to provide the unit performances at the different conditions required.

### LEGACY

This kind of system works with room air condition 24° C, R.H. 50%. This system is often applied when the same direct expansion/chilled water system is used both for cooling the data centers as well as for air conditioning for people. In fact low air temperature allows a higher dehumidification required for air conditioning. In data centers dehumidification is not an advantage. The only heat load provided by the server is sensible heat load. Therefore **Liebert® PDX** is optimized to provide the highest net sensible capacity even at low air temperatures. You can find a reference of **Liebert® PDX** performances published in **Liebert® PDX** Brochure. Anyhow being currently this kind of working range mostly used in existing applications, and therefore, being required in different unit modulations to compare with the existing solutions, we suggest to contact our Sales representative that can offer you a detailed performance data sheet matching exactly your needs.

### SMART

This kind of system works with room air condition 35° C, R.H. 30%, convenient for cold aisle containment. Vertiv can offer a full solution: Smart Aisle™. Smart Aisle™ means a solution that goes from the rack to the power distribution, from the cooling to the AC power. It is a system optimized to offer the highest energy efficiency. Here is a description of the cooling part of this system. Due to the closure of the cold aisle the back air of the CRAC units can be relatively high. This maximizes the Freecooling period and makes this system suitable for all different climates; it offers the benefit to use the Freecooling even in hot countries. **Liebert® PDX** optimizes its cooling capacity and its airflow following the server requirements. On the following pages you can find tables with references for the unit performances with these working conditions. Due to the Smart Aisle Application system Optimization, the units can work with the precise airflow required by the servers, not being present in the data center airflow recirculation or bypass. Should you need more information on how the unit can run with different airflow, working temperatures, etc. our sales force can provide a full detailed data sheet that can match your requirements.

# Technical Data

Tab. 4a - Scroll Cooling System direct expansion unit @ 100% cooling capacity, Premium Fan Module

PXxxx A/W series

| MODELS   |                  | PX015   | PX021* | PX025   | PX031   | PX033   |      |      |
|--|------------------|---|--------|---------|---------|---------|------|------|
| Power supply voltage                               |                  | V/Ph/Hz 400V ±10% / 3Ph / 50Hz                                      |        |         |         |         |      |      |
| Refrigerant circuit                                |                  | single  | single | single  | single  | single  |      |      |
| PERFORMANCE LEGACY (1)(2)                          |                  | Air Condition: 24° C, R.H. 50%                                      |        |         |         |         |      |      |
| air flow   | m³/h             | 4462  | 5623   | 6828    | 7782    | 8164    |      |      |
| Refrigerant  |                  | R410A   |        |         |         |         |      |      |
| total gross cooling capacity                       | kW               | 13.9  | 19.3   | 25      | 30.1    | 34      |      |      |
| sensible gross cooling capacity                    | kW               | 13.9  | 19.3   | 24.6    | 28.3    | 30.8    |      |      |
| SHR (sensible/total ratio)                         | -                | 1   | 1      | 0.98    | 0.94    | 0.91    |      |      |
| compressor power input                             | kW               | 2.59  | 3.85   | 5.2     | 6.39    | 7.48    |      |      |
| compressor OA                                      | A                | 4.5   | 6.71   | 10.11   | 12.8    | 14.82   |      |      |
| Configuration                                      | Upflow           | Net Sensible cooling capacity                                       | kW     | 13.3    | 18.2    | 23.1    | 27.3 | 29.5 |
|  |                  | fan power input   | kW     | 0.53    | 0.88    | 1.44    | 2.02 | 2.29 |
|  |                  | unit power input  | kW     | 3.15    | 4.76    | 6.67    | 8.44 | 9.8  |
|  | Downflow Up      | Net Sensible cooling capacity                                       | kW     | 13.4    | 18.5    | 23.3    | 26.5 | 28.7 |
|  |                  | fan power input   | kW     | 0.45    | 0.81    | 1.33    | 1.88 | 2.13 |
|  |                  | unit power input  | kW     | 3.07    | 4.69    | 6.56    | 8.3  | 9.64 |
|  | Downflow Frontal | Net Sensible cooling capacity                                       | kW     | 13.4    | 18.5    | 23.3    | 26.5 | 28.7 |
|  |                  | fan power input   | kW     | 0.43    | 0.67    | 1.28    | 1.88 | 2.13 |
|  |                  | unit power input  | kW     | 3.05    | 4.63    | 6.51    | 8.3  | 9.64 |
| <b>Condensing section (W models only)</b>          |                  |   |        |         |         |         |      |      |
| water inlet temp: 30° C - condensation temp: 45° C |                  |   |        |         |         |         |      |      |
| water flow   | l/s              | 0.302   | -      | 0.573   | 0.698   | 0.771   |      |      |
| water side pressure drop                           | kPa              | 5   | -      | 12      | 11      | 8       |      |      |
| <b>FAN</b>   |                  |   |        |         |         |         |      |      |
| Quantity (Premium Fan Module)                      | no.              | 1   | 1      | 1       | 1       | 1       |      |      |
| FLA  | A                | 5.6   | 5.6    | 5.6     | 5.6     | 5.6     |      |      |
| LRA  | A                | 0.1   | 0.1    | 0.1     | 0.1     | 0.1     |      |      |
| Quantity (Basic Fan Module, Fix speed)             | no.              | 1   | 1      | 1       | 1       | 1       |      |      |
| FLA  | A                | 3.1   | 3.1    | 3.1     | 3.1     | 3.1     |      |      |
| LRA  | A                | 0.1   | 0.1    | 0.1     | 0.1     | 0.1     |      |      |
| <b>COMPRESSOR</b>                                  |                  |   |        |         |         |         |      |      |
| Quantity (Scroll Cooling System)                   | no.              | 1   | 1      | 1       | 1       | 1       |      |      |
| FLA  | A                | 8   | 11     | 15      | 18.2    | 21.6    |      |      |
| LRA  | A                | 43  | 67.1   | 101     | 128     | 139     |      |      |
| <b>EVAPORATING COIL</b>                            |                  |   |        |         |         |         |      |      |
| quantity / configuration                           | no.              | 1   | 1      | 1       | 1       | 1       |      |      |
| pipes/fins   |                  | Copper/treated aluminum   |        |         |         |         |      |      |
| pitch fins   | mm               | 1.8   | 1.8    | 1.8     | 1.8     | 1.8     |      |      |
| rows   | no.              | 6   | 6      | 6       | 6       | 6       |      |      |
| front surface                                      | m²               | 0.82  | 0.82   | 0.82    | 0.82    | 0.82    |      |      |
| <b>REFRIGERANT CONNECTIONS (A models only)</b>     |                  | <b>Refrigerant connecting pipe diameter: see Tab. 12f, Chap. 12</b> |        |         |         |         |      |      |
| gas line outlet (pipe to be welded, o.d.)          | mm               | 16  | 16     | 16      | 22      | 22      |      |      |
| liquid line inlet (pipe to be welded, o.d.)        | mm               | 12  | 12     | 12      | 16      | 16      |      |      |
| <b>WATER CIRCUIT (W models only)</b>               |                  |   |        |         |         |         |      |      |
| condenser type (W models only)                     |                  | Braze plate   |        |         |         |         |      |      |
| water connections ISO 7/1 (W models only)          | inch             | Rp 11/4   | -      | Rp 11/4 | Rp 11/4 | Rp 11/4 |      |      |
| Total water internal volume                        | l                | 1.58  | -      | 1.89    | 2.22    | 3.33    |      |      |
| <b>DIMENSIONS</b>                                  |                  |   |        |         |         |         |      |      |
| width  | mm               | 844   | 844    | 844     | 844     | 844     |      |      |
| depth  | mm               | 890   | 890    | 890     | 890     | 890     |      |      |
| height   | mm               | 1970  | 1970   | 1970    | 1970    | 1970    |      |      |
| footprint  | m²               | 0.75  | 0.75   | 0.75    | 0.75    | 0.75    |      |      |

Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.

Standard ESP: Upflow 50Pa; Downflow Up 20Pa; Downflow Frontal 0Pa

For Downflow Up and Down versions the data refers to the height of the raised floor= 600mm

Performance data refers to Downflow Units, if not specified otherwise.

(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17°C wb)

- Condensing temperature: 45°C

- Air flow of the units refers to the standard configuration with F5 class filter.

(2) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.

Technical data can be subject to change without notice.

\*PX021 unit is available only in A version

# Technical Data

| MODELS  |                         | PX041                          | PX045  | PX047  | PX051  | PX057  |        |        |
|---|-------------------------|--------------------------------|--------|--------|--------|--------|--------|--------|
| Power supply voltage  |                         | V/Ph/Hz 400V ±10% / 3Ph / 50Hz |        |        |        |        |        |        |
| Refrigerant circuit   |                         | single                         | single | single | single | single |        |        |
| PERFORMANCE LEGACY (1)(2)   |                         | Air Condition: 24° C, R.H. 50% |        |        |        |        |        |        |
| air flow  | m³/h                    | 10000                          | 10900  | 14500  | 15800  | 16300  |        |        |
| Refrigerant   |                         | R410A                          |        |        |        |        |        |        |
| total gross cooling capacity  | kW                      | 40.4                           | 44.6   | 46.3   | 53.1   | 58.9   |        |        |
| sensible gross cooling capacity   | kW                      | 37.7                           | 41.5   | 46.3   | 53.1   | 57.8   |        |        |
| SHR (sensible/total ratio)  | -                       | 0.93                           | 0.93   | 1      | 1      | 0.98   |        |        |
| compressor power input  | kW                      | 8.26                           | 9.31   | 9.34   | 11.27  | 12.77  |        |        |
| compressor OA   | A                       | 15.13                          | 17.43  | 17.47  | 22.27  | 25.6   |        |        |
| Configuration   | Upflow                  | Net Sensible cooling capacity  | kW     | 36.2   | 39.8   | 43.7   | 49.9   | 55     |
|   |                         | fan power input                | kW     | 1.47   | 2.39   | 2x1.28 | 2x1.6  | 2x1.71 |
|   |                         | unit power input               | kW     | 9.76   | 11.74  | 11.93  | 14.5   | 16.22  |
|   | Downflow Up             | Net Sensible cooling capacity  | kW     | 35.8   | 39.1   | 43.8   | 50     | 54.5   |
|   |                         | fan power input                | kW     | 1.9    | 2.39   | 2x1.23 | 2x1.55 | 2x1.66 |
|   |                         | unit power input               | kW     | 10.19  | 11.73  | 11.83  | 14.4   | 16.12  |
|   | Downflow Down           | Net Sensible cooling capacity  | kW     | 36     | 39.3   | 44.2   | 50.5   | 55     |
|   |                         | fan power input                | kW     | 1.72   | 2.13   | 2x1.05 | 2x1.29 | 2x1.39 |
|   |                         | unit power input               | kW     | 10.01  | 11.47  | 11.47  | 13.88  | 15.58  |
|   | Downflow Frontal        | Net Sensible cooling capacity  | kW     | 35.3   | 39.1   | 43.4   | 49.5   | 53.2   |
|   |                         | fan power input                | kW     | 1.41   | 2.33   | 2x1.19 | 2x1.49 | 2x1.61 |
|   |                         | unit power input               | kW     | 9.7    | 11.67  | 11.74  | 14.28  | 16.02  |
| <b>Condensing section (W models only)</b>   |                         |                                |        |        |        |        |        |        |
| <b>water inlet temp: 30° C - condensation temp: 45° C</b>                                   |                         |                                |        |        |        |        |        |        |
| water flow  | l/s                     | 0.918                          | 1.026  | 1.061  | 1.245  | 1.365  |        |        |
| water side pressure drop  | kPa                     | 11                             | 14     | 15     | 20     | 18     |        |        |
| <b>FAN</b>  |                         |                                |        |        |        |        |        |        |
| Quantity (Premium Fan Module)   | no.                     | 1                              | 1      | 2      | 2      | 2      |        |        |
| FLA   | A                       | 5                              | 5      | 10     | 10     | 10     |        |        |
| LRA   | A                       | 0.1                            | 0.1    | 0.2    | 0.2    | 0.2    |        |        |
| Quantity (Basic Fan Module)   | no.                     | 1                              | 1      | 1      | 1      | 2      |        |        |
| FLA   | A                       | 5                              | 5      | 5      | 5      | 10     |        |        |
| LRA   | A                       | 0.1                            | 0.1    | 0.1    | 0.1    | 0.2    |        |        |
| <b>COMPRESSOR</b>   |                         |                                |        |        |        |        |        |        |
| Quantity (Scroll Cooling System)  | no.                     | 1                              | 1      | 1      | 1      | 1      |        |        |
| FLA   | A                       | 25                             | 31     | 31     | 34     | 25.6   |        |        |
| LRA   | A                       | 118                            | 140    | 140    | 174    | 128    |        |        |
| <b>EVAPORATING COIL</b>   |                         |                                |        |        |        |        |        |        |
| quantity / configuration  | no.                     | 1                              | 1      | 1      | 1      | 1      |        |        |
| pipes/fins  | Copper/treated aluminum |                                |        |        |        |        |        |        |
| pitch fins  | mm                      | 1.8                            | 1.8    | 1.8    | 1.8    | 1.8    |        |        |
| rows  | no.                     | 6                              | 6      | 4      | 4      | 4      |        |        |
| front surface   | m²                      | 1.138                          | 1.138  | 1.825  | 1.825  | 1.825  |        |        |
| <b>REFRIGERANT CONNECTIONS</b> Refrigerant connecting pipe diameter: see Tab. 12f, Chap. 12 |                         |                                |        |        |        |        |        |        |
| (A models only)   |                         |                                |        |        |        |        |        |        |
| gas line outlet (pipe to be welded, o.d.)   | mm                      | 22                             | 22     | 22     | 22     | 22     |        |        |
| liquid line inlet (pipe to be welded, o.d.)   | mm                      | 18                             | 18     | 18     | 18     | 18     |        |        |
| <b>WATER CIRCUIT (W models only)</b>  |                         |                                |        |        |        |        |        |        |
| condenser type (W models only)  | Braze plate             |                                |        |        |        |        |        |        |
| water connections ISO 7/1 (W models only)   | inch                    | Rp1 1/4                        | Rp1 ¼  | Rp1 ¼  | Rp1 ¼  | Rp1 ¼  |        |        |
| Total water internal volume   | l                       | 4.54                           | 4.54   | 4.54   | 4.54   | 5.54   |        |        |
| <b>DIMENSIONS</b>   |                         |                                |        |        |        |        |        |        |
| width   | mm                      | 1200                           | 1200   | 1750   | 1750   | 1750   |        |        |
| depth   | mm                      | 890                            | 890    | 890    | 890    | 890    |        |        |
| height  | mm                      | 1970                           | 1970   | 1970   | 1970   | 1970   |        |        |
| footprint   | m²                      | 1.068                          | 1.068  | 1.558  | 1.558  | 1.558  |        |        |

Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.

Standard ESP: Upflow 50Pa; Downflow Up 20Pa; Downflow Frontal 0Pa

For Downflow Up and Down versions the data refers to the height of the raised floor= 600mm

Performance data refers to Downflow Units, if not specified otherwise.

**(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17°C wb)**

- Condensing temperature: 45°C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(2) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.**

Technical data can be subject to change without notice.

# Technical Data

| MODELS   |                  | PX044  | PX054       | PX062       | PX074       | PX068       | PX082       |        |        |
|--|------------------|--|-------------|-------------|-------------|-------------|-------------|--------|--------|
| Power supply voltage                               |                  | V/Ph/Hz 400V ±10% / 3Ph / 50Hz                               |             |             |             |             |             |        |        |
| Refrigerant circuit                                |                  | double   | double      | double      | double      | double      | double      |        |        |
| PERFORMANCE LEGACY (1)(2)                          |                  | Air Condition: 24° C, R.H. 50%                               |             |             |             |             |             |        |        |
| air flow   | m³/h             | 12500  | 15500       | 16300       | 17600       | 18500       | 24000       |        |        |
| Refrigerant  |                  | R410A  |             |             |             |             |             |        |        |
| total gross cooling capacity                       |                  | 44.8   | 55.2        | 62.5        | 74.1        | 66.2        | 85.7        |        |        |
| sensible gross cooling capacity                    | kW               | 44.3   | 54.6        | 59.1        | 67          | 64.5        | 83.6        |        |        |
| SHR (sensible/total ratio)                         | -                | 0.99   | 0.99        | 0.95        | 0.9         | 0.97        | 0.98        |        |        |
| compressor power input                             | kW               | 4.56+4.55  | 5.51+5.53   | 6.38+6.41   | 7.47+8.27   | 6.39+6.42   | 8.29+8.26   |        |        |
| compressor OA                                      | A                | 8.16+8.14  | 10.77+10.82 | 12.8+12.83  | 14.81+15.14 | 12.81+12.85 | 15.17+15.13 |        |        |
| Configurations                                     | Upflow           | Net Sensible cooling capacity                                | kW          | 41.9        | 50.7        | 54.8        | 62          | 62.4   | 79.5   |
|  |                  | fan power input  | kW          | 2x1.07      | 2x1.75      | 2x1.99      | 2x2.44      | 3x0.95 | 3x1.76 |
|  |                  | unit power input   | kW          | 11.28       | 14.57       | 16.8        | 20.65       | 15.7   | 21.87  |
|  | Downflow Up      | Net Sensible cooling capacity                                | kW          | 42.3        | 51.2        | 55.2        | 62.3        | 61.9   | 78.5   |
|  |                  | fan power input  | kW          | 2x0.99      | 2x1.70      | 2x1.94      | 2x2.38      | 3x0.88 | 3x1.71 |
|  |                  | unit power input   | kW          | 11.12       | 14.47       | 16.7        | 20.53       | 15.48  | 21.71  |
|  | Downflow Down    | Net Sensible cooling capacity                                | kW          | 42.6        | 51.6        | 55.8        | 63          | 62.1   | 79     |
|  |                  | fan power input  | kW          | 2x0.84      | 2x1.49      | 2x1.66      | 2x2.02      | 3x0.8  | 3x1.55 |
|  |                  | unit power input   | kW          | 10.82       | 14.05       | 16.14       | 19.81       | 15.24  | 21.23  |
|  | Downflow Frontal | Net Sensible cooling capacity                                | kW          | 41.6        | 50.2        | 54.2        | 61.3        | -      | -      |
|  |                  | fan power input  | kW          | 2x0.92      | 2x1.65      | 2x1.88      | 2x2.32      | -      | -      |
|  |                  | unit power input   | kW          | 10.98       | 14.38       | 16.58       | 20.4        | -      | -      |
| Condensing section (W models only)                 |                  |  |             |             |             |             |             |        |        |
| water inlet temp: 30° C - condensation temp: 45° C |                  |  |             |             |             |             |             |        |        |
| water flow   | l/s              | 0.554+0.487  | 0.678+0.598 | 0.676+0.766 | 0.751+0.934 | 0.684+0.781 | 1.031+0.907 |        |        |
| water side pressure drop                           | kPa              | 13+10  | 13+11       | 10+13       | 8+11        | 6+8         | 14+11       |        |        |
| FAN  |                  |  |             |             |             |             |             |        |        |
| Quantity (Premium Fan Module)                      |                  | 2  | 2           | 2           | 2           | 3           | 3           |        |        |
| FLA  |                  | 10   | 10          | 10          | 10          | 15          | 15          |        |        |
| LRA  |                  | 0.2  | 0.2         | 0.2         | 0.2         | 0.3         | 0.3         |        |        |
| Quantity (Basic Fan Module, Fix speed)             | no.              | 1  | 1           | 2           | 2           | 2           | 2           |        |        |
| FLA  | A                | 5  | 5           | 10          | 10          | 10          | 10          |        |        |
| LRA  | A                | 0.1  | 0.1         | 0.2         | 0.2         | 0.2         | 0.2         |        |        |
| COMPRESSOR   |                  |  |             |             |             |             |             |        |        |
| Quantity (Scroll Cooling System)                   | no.              | 2  | 2           | 2           | 2           | 2           | 2           |        |        |
| FLA  | A                | 2x15   | 2x16.2      | 2x18.2      | 21.6+25     | 2x18.2      | 2x25        |        |        |
| LRA  | A                | 2x75   | 2x101       | 2x128       | 139+118     | 2x128       | 2x118       |        |        |
| EVAPORATING COIL                                   |                  |  |             |             |             |             |             |        |        |
| quantity / configuration                           | no.              | 1  | 1           | 1           | 1           | 1           | 1           |        |        |
| pipes/fins   |                  | Copper/treated aluminum                                      |             |             |             |             |             |        |        |
| pitch fins   | mm               | 1.8  | 1.8         | 1.8         | 1.8         | 1.8         | 1.8         |        |        |
| rows   | no.              | 3+3  | 3+3         | 3+3         | 3+3         | 3+3         | 3+3         |        |        |
| front surface                                      | m²               | 1.675  | 1.675       | 1.675       | 1.675       | 2.675       | 2.675       |        |        |
| REFRIGERANT CONNECTIONS (A models only)            |                  | Refrigerant connecting pipe diameter: see Tab. 12f, Chap. 12 |             |             |             |             |             |        |        |
| gas line outlet (pipe to be welded, o.d.)          | mm               | 18/18  | 18/18       | 18/18       | 22/22       | 18/18       | 22/22       |        |        |
| liquid line inlet (pipe to be welded, o.d.)        | mm               | 18/18  | 18/18       | 18/18       | 18/18       | 18/18       | 18/18       |        |        |
| WATER CIRCUIT (W models only)                      |                  |  |             |             |             |             |             |        |        |
| condenser type (W models only)                     |                  | Brazed plate   |             |             |             |             |             |        |        |
| water connections ISO 7/1 (W models only)          | inch             | Rp1 ¼  | Rp1 ¼       | Rp1 ¼       | Rp1 ¼       | Rp1 ¼       | Rp1 ¼       |        |        |
| Total water internal volume                        | l                | 5.42   | 6.1         | 6.76        | 8.98        | 8.98        | 8.98        |        |        |
| DIMENSIONS   |                  |  |             |             |             |             |             |        |        |
| width  | mm               | 1750   | 1750        | 1750        | 1750        | 2550        | 2550        |        |        |
| depth  | mm               | 890  | 890         | 890         | 890         | 890         | 890         |        |        |
| height   | mm               | 1970   | 1970        | 1970        | 1970        | 1970        | 1970        |        |        |
| footprint  | m²               | 1.558  | 1.558       | 1.558       | 1.558       | 2.270       | 2.270       |        |        |

Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.

Standard ESP: Upflow 50Pa; Downflow Up 20Pa; Downflow Frontal 0Pa

For Downflow Up and Down versions the data refers to the height of the raised floor= 600mm

Performance data refers to Downflow Units, if not specified otherwise.

(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17°C wb)

- Condensing temperature: 45°C

- Air flow of the units refers to the standard configuration with F5 class filter.

(2) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.

Technical data can be subject to change without notice.



# Technical Data

| MODELS   |                  | PX094  | PX104       | PX120       | PX059 EXT     | PX092 EXT |             |        |
|--|------------------|--|-------------|-------------|---------------|-----------|-------------|--------|
| Power supply voltage                               |                  | V/Ph/Hz 400V ±10% / 3Ph / 50Hz                               |             |             |               |           |             |        |
| Refrigerant circuit                                |                  | double   | double      | double      | single        | double    |             |        |
| PERFORMANCE LEGACY (1)(2)                          |                  | Air Condition: 24° C, R.H. 50%                               |             |             |               |           |             |        |
| air flow   |                  | m³/h   | 26000       | 27000       | 27000         | 11200     | 17950       |        |
| Refrigerant  |                  | R410A  |             |             |               |           |             |        |
| total gross cooling capacity                       |                  | kW   | 94.4        | 106.5       | 122.8         | 57.3      | 92.5        |        |
| sensible gross cooling capacity                    |                  | kW   | 91.3        | 98.8        | 106.7         | 47.4      | 76.3        |        |
| SHR (sensible/total ratio)                         |                  | -  | 0.97        | 0.93        | 0.87          | 0.83      | 0.83        |        |
| compressor power input                             |                  | kW   | 9.42+9.31   | 11.29+11.24 | 12.75+14.97   | 12.76     | 11.26+9.27  |        |
| compressor OA                                      |                  | A  | 17.57+17.42 | 22.3+22.22  | 25.57+29.64   | 25.59     | 22.25+17.36 |        |
| Configuration                                      | Upflow           | Net Sensible cooling capacity                                | kW          | 86          | 92.9          | 101       | 45.3        | 72.8   |
|  |                  | fan power input  | kW          | 3x2.13      | 3x2.39        | 3x2.39    | 1.98        | 2x1.85 |
|  |                  | unit power input   | kW          | 25.17       | 29.73         | 34.93     | 14.77       | 24.24  |
|  | Downflow Up      | Net Sensible cooling capacity                                | kW          | 84.9        | 91.8          | 99.7      | 45.1        | 72.3   |
|  |                  | fan power input  | kW          | 3x2.13      | 3x2.33        | 3x2.33    | 2.32        | 2x2.02 |
|  |                  | unit power input   | kW          | 25.15       | 29.55         | 34.74     | 15.11       | 24.6   |
|  | Downflow Down    | Net Sensible cooling capacity                                | kW          | 85.6        | 92.5          | 100.5     | 45.4        | 72.4   |
|  |                  | fan power input  | kW          | 3x1.9       | 3x2.08        | 12.75     | 2.05        | 2x1.96 |
|  |                  | unit power input   | kW          | 24.46       | 28.8          | 19.02     | 14.84       | 24.48  |
|  | Downflow Frontal | Net Sensible cooling capacity                                | kW          | -           | -             | -         | -           | -      |
|  |                  | fan power input  | kW          | -           | -             | -         | -           | -      |
|  |                  | unit power input   | kW          | -           | -             | -         | -           | -      |
| Condensing section (W models only)                 |                  |  |             |             |               |           |             |        |
| water inlet temp: 30° C - condensation temp: 45° C |                  |  |             |             |               |           |             |        |
| water flow   |                  | l/s  | 1.152+1.012 | 1.326+1.173 | 1.269+1.616   | 1.331     | 1.223       |        |
| water side pressure drop                           |                  | kPa  | 18+13       | 23+18       | 16+25         | 18        | 20          |        |
| FAN  |                  |  |             |             |               |           |             |        |
| Quantity (Premium Fan Module)                      |                  | no.  | 3           | 3           | 3             | 1         | 2           |        |
| FLA  |                  | A  | 15          | 15          | 15            | 5         | 10          |        |
| LRA  |                  | A  | 0.3         | 0.3         | 0.3           | 0.1       | 0.2         |        |
| Quantity (Basic Fan Module, Fix speed)             |                  | no.  | 2           | 2           | -             | 1         | 2           |        |
| FLA  |                  | A  | 10          | 10          | -             | 5         | 10          |        |
| LRA  |                  | A  | 0.2         | 0.2         | -             | 0.1       | 0.2         |        |
| COMPRESSOR   |                  |  |             |             |               |           |             |        |
| Quantity (Scroll Cooling System)                   |                  | no.  | 2           | 2           | 4             | 2         | 2           |        |
| FLA  |                  | A  | 2x31        | 2x34        | 2x18.2+2x21.6 | 2x18.2    | 31 + 34     |        |
| LRA  |                  | A  | 2x140       | 2x174       | 2x128+2x139   | 2x128     | 140 + 174   |        |
| EVAPORATING COIL                                   |                  |  |             |             |               |           |             |        |
| quantity / configuration                           |                  | no.  | 1           | 1           | 1             | 1         | 1           |        |
| pipes/fins   |                  | Copper/treated aluminum                                      |             |             |               |           |             |        |
| pitch fins   |                  | mm   | 1.8         | 1.8         | 1.8           | 1.8       | 1.8         |        |
| rows   |                  | no.  | 3+3         | 3+3         | 3+3           | 6         | 3+3         |        |
| front surface                                      |                  | m²   | 2.675       | 2.675       | 2.675         | 1.53      | 2.412       |        |
| REFRIGERANT CONNECTIONS (A models only)            |                  | Refrigerant connecting pipe diameter: see Tab. 12f, Chap. 12 |             |             |               |           |             |        |
| gas line outlet (pipe to be welded, o.d.)          |                  | mm   | 22/22       | 22/22       | 22/22         | 22/22     | 22/28       |        |
| liquid line inlet (pipe to be welded, o.d.)        |                  | mm   | 18/18       | 18/18       | 18            | 18/18     | 18/18       |        |
| WATER CIRCUIT (W models only)                      |                  |  |             |             |               |           |             |        |
| condenser type (W models only)                     |                  | Braze plate  |             |             |               |           |             |        |
| water connections ISO 7/1 (W models only)          |                  | inch   | Rp1 ¼       | Rp1 ¼       | Rp1 ¼         | Rp1 ¼     | Rp1 ¼       |        |
| Total water internal volume                        |                  | l  | 8.98        | 8.98        | 11.08         | 5.34      | 7.98        |        |
| DIMENSIONS   |                  |  |             |             |               |           |             |        |
| width  |                  | mm   | 2550        | 2550        | 2550          | 1200      | 1750        |        |
| depth  |                  | mm   | 890         | 890         | 890           | 890       | 890         |        |
| height   |                  | mm   | 1970        | 1970        | 1970          | 2570      | 2570        |        |
| footprint  |                  | m2   | 2.270       | 2.270       | 2.270         | 1.068     | 1.558       |        |

Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.

Standard ESP: Upflow 50Pa; Downflow Up 20Pa; Downflow Frontal 0Pa

For Downflow Up and Down versions the data refers to the height of the raised floor= 600mm

Performance data refers to Downflow Units, if not specified otherwise.

(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17°C wb)

- Condensing temperature: 45°C

- Air flow of the units refers to the standard configuration with F5 class filter.

(2) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.

Technical data can be subject to change without notice.

# Technical Data

Tab. 4b - Digital Scroll Cooling System direct expansion unit @ 100% cooling capacity, Premium Fan Module  
PXxxx A/W series

| MODELS   |                  |                               | PX015   | PX021  | PX025  | PX031  | PX033  |       |
|--|------------------|-------------------------------|---|--------|--------|--------|--------|-------|
| Power supply voltage                               |                  | V/Ph/Hz                       | 400V ±10% / 3Ph / 50Hz  |        |        |        |        |       |
| Refrigerant circuit                                |                  |                               | single  | single | single | single | single |       |
| <b>PERFORMANCE LEGACY (1)(3)</b>                   |                  |                               | Air Condition: 24° C, R.H. 50%                                      |        |        |        |        |       |
| air flow   |                  | m³/h                          | 4462  | 5623   | 6828   | 7782   | 8164   |       |
| <b>Refrigerant</b>                                 |                  |                               | <b>R410A</b>  |        |        |        |        |       |
| total gross cooling capacity                       |                  | kW                            | 13.8  | 19.7   | 25     | 30     | 33.6   |       |
| sensible gross cooling capacity                    |                  | kW                            | 13.8  | 19.7   | 24.6   | 28.2   | 30.6   |       |
| SHR (sensible/total ratio)                         |                  | -                             | 1   | 1      | 0.98   | 0.94   | 0.91   |       |
| compressor power input                             |                  | kW                            | 2.64  | 4.1    | 5.46   | 6.71   | 7.73   |       |
| compressor OA                                      |                  | A                             | 1.53  | 7.39   | 4.85   | 12.88  | 14.74  |       |
| Configuration                                      | Upflow           | Net Sensible cooling capacity | kW  | 13.4   | 17.9   | 23     | 27.3   | 29.4  |
|  |                  | fan power input               | kW  | 0.53   | 0.88   | 1.44   | 2.02   | 2.99  |
|  |                  | unit power input              | kW  | 3.2    | 5      | 6.94   | 8.75   | 10.04 |
|  | Downflow Up      | Net Sensible cooling capacity | kW  | 13.3   | 18.4   | 23.3   | 26.4   | 28.5  |
|  |                  | fan power input               | kW  | 0.45   | 1.33   | 1.33   | 1.33   | 2.13  |
|  |                  | unit power input              | kW  | 3.12   | 5.46   | 6.82   | 8.62   | 9.89  |
|  | Downflow Frontal | Net Sensible cooling capacity | kW  | 13.5   | 18.5   | 23.3   | 26.4   | 28.5  |
|  |                  | fan power input               | kW  | 0.43   | 1.28   | 1.28   | 1.81   | 2.13  |
|  |                  | unit power input              | kW  | 3.1    | 5.42   | 6.77   | 8.62   | 9.89  |
| <b>Condensing section (W models only)</b>          |                  |                               |   |        |        |        |        |       |
| water inlet temp: 30° C - condensation temp: 45° C |                  |                               |   |        |        |        |        |       |
| water flow   |                  | l/s                           | 0.304   | 0.427  | 0.577  | 0.701  | 0.768  |       |
| water side pressure drop                           |                  | kPa                           | 5   | 7      | 12     | 11     | 8      |       |
| <b>PERFORMANCE SMART (2)(3)</b>                    |                  |                               | Air Condition: 35° C, R.H. 30%                                      |        |        |        |        |       |
| air flow (4)                                       |                  | m³/h                          | 4462  | 5623   | 6828   | 7782   | 8164   |       |
| <b>Refrigerant</b>                                 |                  |                               | <b>R410A</b>  |        |        |        |        |       |
| total gross cooling capacity                       |                  | kW                            |   | 23.9   | 31.2   | 36.5   | 40.2   |       |
| sensible gross cooling capacity                    |                  | kW                            |   | 23.9   | 31.2   | 36.5   | 40.2   |       |
| SHR (sensible/total ratio)                         |                  | -                             |   | 1      | 1      | 1      | 1      |       |
| compressor power input                             |                  | kW                            |   | 4.18   | 5.4    | 6.86   | 7.82   |       |
| compressor OA                                      |                  | A                             |   | 7.43   | 4.79   | 13.05  | 14.88  |       |
| Configuration                                      | Upflow           | Net Sensible cooling capacity | kW  | 22.9   | 29     | 34.2   | 37.7   |       |
|  |                  | fan power input               | kW  | 0.88   | 1.44   | 1.95   | 2.21   |       |
|  |                  | unit power input              | kW  | 5.08   | 6.88   | 8.83   | 10.6   |       |
|  | Downflow Up      | Net Sensible cooling capacity | kW  | 23.1   | 29.9   | 34.7   | 38.1   |       |
|  |                  | fan power input               | kW  | 0.81   | 1.33   | 1.81   | 2.06   |       |
|  |                  | unit power input              | kW  | 5.02   | 6.76   | 8.7    | 9.91   |       |
|  | Downflow Frontal | Net Sensible cooling capacity | kW  | 23.8   | 29.9   | 34.7   | 38.2   |       |
|  |                  | fan power input               | kW  | 1.28   | 1.28   | 1.81   | 2.06   |       |
|  |                  | unit power input              | kW  | 5.51   | 6.71   | 8.7    | 9.91   |       |
| <b>Condensing section (W models only)</b>          |                  |                               |   |        |        |        |        |       |
| water inlet temp: 30° C - condensation temp: 45° C |                  |                               |   |        |        |        |        |       |
| water flow   |                  | l/s                           | 0.315   | 0.528  | 0.706  | 0.841  | 0.905  |       |
| water side pressure drop                           |                  | kPa                           | 4   | 11     | 18     | 16     | 11     |       |
| <b>FAN</b>   |                  |                               |   |        |        |        |        |       |
| Quantity (Premium Fan Module)                      |                  | no.                           | 1   | 1      | 1      | 1      | 1      |       |
| FLA  |                  | A                             | 5.6   | 5.6    | 5.6    | 5.6    | 5.6    |       |
| LRA  |                  | A                             | 0.1   | 0.1    | 0.1    | 0.1    | 0.1    |       |
| Quantity (Basic Fan Module, Fix speed)             |                  | no.                           | 1   | 1      | 1      | 1      | 1      |       |
| FLA  |                  | A                             | 3.1   | 3.1    | 3.1    | 3.1    | 3.1    |       |
| LRA  |                  | A                             | 0.1   | 0.1    | 0.1    | 0.1    | 0.1    |       |
| <b>COMPRESSOR</b>                                  |                  |                               |   |        |        |        |        |       |
| Quantity (Digital Scroll Cooling System)           |                  | no.                           | 1   | 1      | 1      | 1      | 1      |       |
| FLA  |                  | A                             | 6.9   | 11.8   | 16.5   | 18.2   | 21.6   |       |
| LRA  |                  | A                             | 46  | 64     | 101    | 128    | 139    |       |
| <b>EVAPORATING COIL</b>                            |                  |                               |   |        |        |        |        |       |
| quantity / configuration                           |                  | no.                           | 1   | 1      | 1      | 1      | 1      |       |
| pipes/fins   |                  |                               | Copper/treated aluminum   |        |        |        |        |       |
| pitch fins   |                  | mm                            | 1.8   | 1.8    | 1.8    | 1.8    | 1.8    |       |
| rows   |                  | no.                           | 6   | 6      | 6      | 6      | 6      |       |
| front surface                                      |                  | m²                            | 0.82  | 0.82   | 0.82   | 0.82   | 0.82   |       |
| <b>REFRIGERANT CONNECTIONS</b>                     |                  |                               | <b>Refrigerant connecting pipe diameter: see Tab. 12f, Chap. 12</b> |        |        |        |        |       |
| (A models only)                                    |                  |                               |   |        |        |        |        |       |
| gas line outlet (pipe to be welded, o.d.)          |                  | mm                            | 16  | 16     | 16     | 22     | 22     |       |
| liquid line inlet (pipe to be welded, o.d.)        |                  | mm                            | 12  | 12     | 12     | 16     | 16     |       |

# Technical Data

| MODELS                                    |                | PX015        | PX021   | PX025   | PX031   | PX033   |
|---|----------------|--------------|---------|---------|---------|---------|
| <b>WATER CIRCUIT (W models only)</b>      |                |              |         |         |         |         |
| condenser type (W models only)            |                | Brazed plate |         |         |         |         |
| water connections ISO 7/1 (W models only) | inch           | Rp1 1/4      | Rp1 1/4 | Rp1 1/4 | Rp1 1/4 | Rp1 1/4 |
| Total water internal volume               | l              | 1.58         | 1.89    | 1.89    | 2.22    | 3.33    |
| <b>DIMENSIONS</b>                         |                |              |         |         |         |         |
| width                                     | mm             | 844          | 844     | 844     | 844     | 844     |
| depth                                     | mm             | 890          | 890     | 890     | 890     | 890     |
| height                                    | mm             | 1970         | 1970    | 1970    | 1970    | 1970    |
| footprint                                 | m <sup>2</sup> | 0.75         | 0.75    | 0.75    | 0.75    | 0.75    |

Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.

Standard ESP: Upflow 50Pa; Downflow Up 20Pa; Downflow Frontal 0Pa

For Downflow Up version the data refers to the height of the raised floor= 600mm

Performance data refers to Downflow Units, if not specified otherwise.

**(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17° C wb)**

- Condensing temperature: 45° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(2) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 35°C bs; 30% R.H. (21.4° C wb)**

- Condensing temperature: 45° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(3) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.**

**(4) The Airflow indicated in the Smart Performance is the unit nominal airflow.**

Technical data can be subject to change without notice.

# Technical Data

| MODELS   |                  | PX041                          | PX045  | PX047  | PX051  | PX057  |        |        |
|--|------------------|--------------------------------|--------|--------|--------|--------|--------|--------|
| Power supply voltage                               |                  | V/Ph/Hz 400V ±10% / 3Ph / 50Hz |        |        |        |        |        |        |
| Refrigerant circuit                                |                  | single                         | single | single | single | single |        |        |
| PERFORMANCE LEGACY (1)(3)                          |                  | Air Condition: 24° C, R.H. 50% |        |        |        |        |        |        |
| air flow   | m³/h             | 10000                          | 10900  | 14500  | 15800  | 16300  |        |        |
| Refrigerant  |                  | R410A                          |        |        |        |        |        |        |
| total gross cooling capacity                       | kW               | 39.7                           | 43.8   | 48.2   | 51.9   | 58.7   |        |        |
| sensible gross cooling capacity                    | kW               | 37.4                           | 41.1   | 48.2   | 51.9   | 57.7   |        |        |
| SHR (sensible/total ratio)                         | -                | 0.94                           | 0.94   | 1      | 1      | 0.98   |        |        |
| compressor power input                             | kW               | 8.47                           | 9.59   | 10.66  | 11.22  | 13.08  |        |        |
| compressor OA                                      | A                | 15.6                           | 18.2   | 14.94  | 21.82  | 25.66  |        |        |
| Configuration                                      | Upflow           | Net Sensible cooling capacity  | kW     | 36.3   | 39.5   | 45.6   | 48.5   | 54.9   |
|  |                  | fan power input                | kW     | 1.9    | 2.39   | 2x1.28 | 2x1.6  | 2x1.71 |
|  |                  | unit power input               | kW     | 10.41  | 12.02  | 13.25  | 14.45  | 16.53  |
|  | Downflow Up      | Net Sensible cooling capacity  | kW     | 35.5   | 38.7   | 45.7   | 48.8   | 54.4   |
|  |                  | fan power input                | kW     | 1.9    | 2.33   | 2x1.23 | 2x1.55 | 2x1.66 |
|  |                  | unit power input               | kW     | 10.4   | 11.95  | 13.15  | 14.35  | 16.43  |
|  | Downflow Down    | Net Sensible cooling capacity  | kW     | 35.7   | 38.9   | 46.1   | 49.3   | 54.9   |
|  |                  | fan power input                | kW     | 1.72   | 2.13   | 2x1.05 | 2x1.29 | 2x1.39 |
|  |                  | unit power input               | kW     | 10.22  | 11.75  | 12.79  | 13.83  | 15.89  |
|  | Downflow Frontal | Net Sensible cooling capacity  | kW     | 35.6   | 38.7   | 45.3   | 48.3   | 53.1   |
|  |                  | fan power input                | kW     | 1.84   | 2.33   | 2x1.19 | 2x1.49 | 2x1.61 |
|  |                  | unit power input               | kW     | 10.34  | 11.95  | 13.07  | 14.23  | 16.32  |
| Condensing section (W models only)                 |                  |                                |        |        |        |        |        |        |
| water inlet temp: 30° C - condensation temp: 45° C |                  |                                |        |        |        |        |        |        |
| water flow   | l/s              | 0.907                          | 1.015  | 1.130  | 1.219  | 1.368  |        |        |
| water side pressure drop                           | kPa              | 11                             | 13     | 16     | 19     | 18     |        |        |
| PERFORMANCE SMART (2)(3)                           |                  | Air Condition: 35° C, R.H. 30% |        |        |        |        |        |        |
| air flow (4)                                       | m³/h             | 10000                          | 10900  | 14500  | 15800  | 16300  |        |        |
| Refrigerant  |                  | R410A                          |        |        |        |        |        |        |
| total gross cooling capacity                       | kW               | 48.4                           | 53.3   | 60.5   | 64.8   | 71.8   |        |        |
| sensible gross cooling capacity                    | kW               | 48.4                           | 53.3   | 60.5   | 64.8   | 71.8   |        |        |
| SHR (sensible/total ratio)                         | -                | 1                              | 1      | 1      | 1      | 1      |        |        |
| compressor power input                             | kW               | 8.55                           | 9.73   | 10.71  | 11.11  | 13.27  |        |        |
| compressor OA                                      | A                | 15.64                          | 18.44  | 15.06  | 21.53  | 25.89  |        |        |
| Configuration                                      | Upflow           | Net Sensible cooling capacity  | kW     | 47     | 51.5   | 57.9   | 61.6   | 68.4   |
|  |                  | fan power input                | kW     | 1.9    | 2.39   | 2x1.28 | 2x1.6  | 2x1.71 |
|  |                  | unit power input               | kW     | 10.49  | 12.16  | 13.3   | 14.34  | 16.72  |
|  | Downflow Up      | Net Sensible cooling capacity  | kW     | 46.5   | 50.9   | 58     | 61.7   | 68.5   |
|  |                  | fan power input                | kW     | 1.9    | 2.39   | 2x1.23 | 2x1.55 | 2x1.66 |
|  |                  | unit power input               | kW     | 10.48  | 12.15  | 13.2   | 14.24  | 16.62  |
|  | Downflow Down    | Net Sensible cooling capacity  | kW     | 46.7   | 51.1   | 58.4   | 62.2   | 69     |
|  |                  | fan power input                | kW     | 1.72   | 2.13   | 2x1.05 | 2x1.29 | 2x1.39 |
|  |                  | unit power input               | kW     | 10.3   | 11.89  | 12.84  | 13.72  | 16.08  |
|  | Downflow Frontal | Net Sensible cooling capacity  | kW     | 46.6   | 50.9   | 57.3   | 60.9   | 67.4   |
|  |                  | fan power input                | kW     | 1.84   | 2.33   | 2x1.19 | 2x1.49 | 2x1.61 |
|  |                  | unit power input               | kW     | 10.42  | 12.09  | 13.12  | 14.13  | 16.5   |
| Condensing section (W models only)                 |                  |                                |        |        |        |        |        |        |
| water inlet temp: 30° C - condensation temp: 45° C |                  |                                |        |        |        |        |        |        |
| water flow   | l/s              | 1.089                          | 1.216  | 1.391  | 1.493  | 1.645  |        |        |
| water side pressure drop                           | kPa              | 16                             | 19     | 25     | 28     | 27     |        |        |
| FAN  |                  |                                |        |        |        |        |        |        |
| Quantity (Premium Fan Module)                      | no.              | 1                              | 1      | 2      | 2      | 2      |        |        |
| FLA  | A                | 5                              | 5      | 10     | 10     | 10     |        |        |
| LRA  | A                | 0.1                            | 0.1    | 0.2    | 0.2    | 0.2    |        |        |
| Quantity (Basic Fan Module, Fix speed)             | no.              | 1                              | 1      | 1      | 1      | 2      |        |        |
| FLA  | A                | 5                              | 5      | 5      | 5      | 10     |        |        |
| LRA  | A                | 0.1                            | 0.1    | 0.1    | 0.1    | 0.2    |        |        |
| COMPRESSOR   |                  |                                |        |        |        |        |        |        |
| Quantity (Digital Scroll Cooling System)           | no.              | 1                              | 1      | 2      | 2      | 2      |        |        |
| FLA  | A                | 25                             | 27     | 2x16.5 | 2x16.2 | 2x18.2 |        |        |
| LRA  | A                | 118                            | 140    | 2x101  | 2x101  | 2x128  |        |        |
| EVAPORATING COIL                                   |                  |                                |        |        |        |        |        |        |
| quantity / configuration                           | no.              |                                | 1      | 1      | 1      | 1      |        |        |
| pipes/fins   |                  | Copper/treated aluminum        |        |        |        |        |        |        |
| pitch fins   | mm               | 1.8                            | 1.8    | 1.8    | 1.8    | 1.8    |        |        |
| rows   | no.              | 6                              | 6      | 4      | 4      | 4      |        |        |
| front surface                                      | m²               | 1.138                          | 1.138  | 1.825  | 1.825  | 1.825  |        |        |

# Technical Data

| MODELS   |                | PX041  | PX045 | PX047 | PX051 | PX057 |
|--|----------------|--|-------|-------|-------|-------|
| <b>REFRIGERANT CONNECTIONS (A models only)</b> |                | Refrigerant connecting pipe diameter: see Tab. 12f, Chap. 12 |       |       |       |       |
| gas line outlet (pipe to be welded, o.d.)      | mm             | 22   | 22    | 22    | 22    | 22    |
| liquid line inlet (pipe to be welded, o.d.)    | mm             | 18   | 18    | 18    | 18    | 18    |
| <b>WATER CIRCUIT (W models only)</b>           |                |  |       |       |       |       |
| condenser type (W models only)                 |                | Braze plate  |       |       |       |       |
| water connections ISO 7/1 (W models only)      | inch           | Rp1 ¼  | Rp1 ¼ | Rp1 ¼ | Rp1 ¼ | Rp1 ¼ |
| Total water internal volume                    | l              | 4.54   | 4.54  | 4.54  | 4.54  | 5.54  |
| <b>DIMENSIONS</b>                              |                |  |       |       |       |       |
| width  | mm             | 1200   | 1200  | 1750  | 1750  | 1750  |
| depth  | mm             | 890  | 890   | 890   | 890   | 890   |
| height   | mm             | 1970   | 1970  | 1970  | 1970  | 1970  |
| footprint                                      | m <sup>2</sup> | 1.068  | 1.068 | 1.558 | 1.558 | 1.558 |

Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.

Standard ESP: Upflow 50 Pa; Downflow Up 20 Pa; Downflow Frontal 0 Pa

For Downflow Up version the data refers to the height of the raised floor= 600mm

Performance data refers to Downflow Units, if not specified otherwise.

**(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17° C wb)**

- Condensing temperature: 45° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(2) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 35°C bs; 30% R.H. (21.4° C wb)**

- Condensing temperature: 45° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(3) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.**

**(4) The Airflow indicated in the Smart Performance is the unit nominal airflow.**

Technical data can be subject to change without notice.

# Technical Data

| MODELS                                   |                         | PX044  | PX054       | PX062       | PX074       | PX068       | PX082       |        |        |
|--|-------------------------|--|-------------|-------------|-------------|-------------|-------------|--------|--------|
| Power supply voltage                     |                         | V/Ph/Hz 400V ±10% / 3Ph / 50Hz                     |             |             |             |             |             |        |        |
| Refrigerant circuit                      |                         | double   | double      | double      | double      | double      | double      |        |        |
| PERFORMANCE LEGACY (1)(3)                |                         | Air Condition: 24° C, R.H. 50%                     |             |             |             |             |             |        |        |
| air flow                                 | m³/h                    | 12500  | 15500       | 16300       | 17600       | 18499       | 24000       |        |        |
| Refrigerant                              |                         | R410A  |             |             |             |             |             |        |        |
| total gross cooling capacity             | kW                      | 44.6   | 55          | 62.3        | 73.7        | 66          | 86.2        |        |        |
| sensible gross cooling capacity          | kW                      | 44.2   | 54.5        | 59          | 66.8        | 64.4        | 83.8        |        |        |
| SHR (sensible/total ratio)               | -                       | 0.99   | 0.99        | 0.95        | 0.91        | 0.98        | 0.97        |        |        |
| compressor power input                   | kW                      | 4.76+4.56  | 5.69+5.51   | 6.69+6.41   | 7.71+8.27   | 6.72+6.42   | 9.29+9.35   |        |        |
| compressor OA                            | A                       | 8.38+8.16  | 11.01+10.77 | 12.85+12.83 | 14.72+15.14 | 12.9+12.85  | 16.5+16.56  |        |        |
| Configuration                            | Upflow                  | Net Sensible cooling capacity                      | kW          | 41.8        | 50.7        | 54.7        | 61.8        | 62.3   | 79.7   |
|  |                         | fan power input                                    | kW          | 2x1.07      | 2x1.75      | 2x1.99      | 2x2.44      | 3x0.95 | 3x1.76 |
|  |                         | unit power input                                   | kW          | 11.48       | 14.73       | 17.1        | 20.88       | 16.03  | 23.96  |
|  | Downflow Up             | Net Sensible cooling capacity                      | kW          | 42.2        | 51.1        | 55.1        | 62.1        | 61.8   | 78.7   |
|  |                         | fan power input                                    | kW          | 2x0.99      | 2x1.71      | 2x1.94      | 2x2.38      | 3x0.88 | 3x1.71 |
|  |                         | unit power input                                   | kW          | 11.33       | 14.63       | 17.01       | 20.77       | 15.81  | 23.8   |
|  | Downflow Down           | Net Sensible cooling capacity                      | kW          | 42.5        | 51.5        | 55.6        | 62.6        | 62     | 79.2   |
|  |                         | fan power input                                    | kW          | 2x0.84      | 2x1.49      | 2x1.66      | 2x2.02      | 3x0.8  | 3x1.55 |
|  |                         | unit power input                                   | kW          | 11.03       | 14.21       | 16.45       | 20.05       | 15.57  | 23.32  |
|  | Downflow Frontal        | Net Sensible cooling capacity                      | kW          | 41.5        | 50.1        | 54.1        | 61.1        | -      | -      |
|  |                         | fan power input                                    | kW          | 2x0.92      | 2x1.65      | 2x1.88      | 2x2.32      | -      | -      |
|  |                         | unit power input                                   | kW          | 11.18       | 14.54       | 16.88       | 20.63       | -      | -      |
| Condensing section (W models only)       |                         | water inlet temp: 30° C - condensation temp: 45° C |             |             |             |             |             |        |        |
| water flow                               | l/s                     | 0.487+0.553  | 0.599+0.677 | 0.680+0.766 | 0.747+0.934 | 0.687+0.781 | 0.933+1.059 |        |        |
| water side pressure drop                 | kPa                     | 10+13  | 11+13       | 10+13       | 8+11        | 6+8         | 11+15       |        |        |
| PERFORMANCE SMART (2)(3)                 |                         | Air Condition: 35° C, R.H. 30%                     |             |             |             |             |             |        |        |
| air flow (4)                             | m³/h                    | 12500  | 15500       | 16300       | 17600       | 18500       | 24000       |        |        |
| Refrigerant                              |                         | R410A  |             |             |             |             |             |        |        |
| total gross cooling capacity             | kW                      | 59.9   | 71.4        | 77.3        | 89.9        | 82.9        | 109.6       |        |        |
| sensible gross cooling capacity          | kW                      | 59.9   | 71.4        | 77.3        | 89.9        | 82.9        | 109.6       |        |        |
| SHR (sensible/total ratio)               | -                       | 1  | 1           | 1           | 1           | 1           | 1           |        |        |
| compressor power input                   | kW                      | 4.83+4.56  | 5.65+5.43   | 6.81+6.49   | 7.8+8.36    | 6.87+6.53   | 9.37+9.46   |        |        |
| compressor OA                            | A                       | 8.41+8.21  | 10.87+10.6  | 13+12.95    | 14.84+15.27 | 13.06+13.01 | 16.57+16.61 |        |        |
| Configuration                            | Upflow                  | Net Sensible cooling capacity                      | kW          | 53.8        | 68.5        | 73.1        | 84.9        | 80.8   | 107.7  |
|  |                         | fan power input                                    | kW          | 2x1.07      | 2x1.75      | 2x1.94      | 2x2.38      | 3x0.91 | 3x1.76 |
|  |                         | unit power input                                   | kW          | 11.57       | 14.62       | 17.2        | 20.94       | 16.17  | 24.14  |
|  | Downflow Up             | Net Sensible cooling capacity                      | kW          | 57.9        | 67.9        | 73.5        | 85.2        | 80.4   | 104.4  |
|  |                         | fan power input                                    | kW          | 2x0.99      | 2x1.70      | 2x1.88      | 2x2.38      | 3x0.84 | 3x1.71 |
|  |                         | unit power input                                   | kW          | 11.4        | 14.51       | 17.9        | 20.83       | 15.95  | 23.99  |
|  | Downflow Down           | Net Sensible cooling capacity                      | kW          | 58.2        | 68.3        | 74          | 86          | 80.6   | 104.9  |
|  |                         | fan power input                                    | kW          | 2x0.84      | 2x1.49      | 2x1.61      | 2x1.91      | 3x0.77 | 3x1.55 |
|  |                         | unit power input                                   | kW          | 11.1        | 14.09       | 16.55       | 20.11       | 15.74  | 23.51  |
|  | Downflow Frontal        | Net Sensible cooling capacity                      | kW          | 56.8        | 66.4        | 72.6        | 84.1        | -      | -      |
|  |                         | fan power input                                    | kW          | 2x0.92      | 2x1.65      | 2x1.82      | 2x2.26      | -      | -      |
|  |                         | unit power input                                   | kW          | 11.25       | 14.41       | 16.96       | 20.69       | -      | -      |
| Condensing section (W models only)       |                         | water inlet temp: 30° C - condensation temp: 45° C |             |             |             |             |             |        |        |
| water flow                               | l/s                     | 0.571+0.669  | 0.71+0.832  | 0.798+0.969 | 0.854+1.163 | 0.820+0.993 | 1.096+1.311 |        |        |
| water side pressure drop                 | kPa                     | 13+17  | 15+19       | 14+21       | 10+18       | 9+13        | 16+22       |        |        |
| FAN                                      |                         |  |             |             |             |             |             |        |        |
| Quantity (Premium Fan Module)            | no.                     | 2  | 2           | 2           | 2           | 3           | 3           |        |        |
| FLA                                      | A                       | 10   | 10          | 10          | 10          | 15          | 15          |        |        |
| LRA                                      | A                       | 0.2  | 0.2         | 0.2         | 0.2         | 0.3         | 0.3         |        |        |
| Quantity (Basic Fan Module, Fix speed)   | no.                     | 1  | 1           | 2           | 2           | 2           | 2           |        |        |
| FLA                                      | A                       | 5  | 5           | 10          | 10          | 10          | 10          |        |        |
| LRA                                      | A                       | 0.1  | 0.1         | 0.2         | 0.2         | 0.2         | 0.2         |        |        |
| COMPRESSOR                               |                         |  |             |             |             |             |             |        |        |
| Quantity (Digital Scroll Cooling System) | no.                     | 2  | 2           | 2           | 2           | 2           | 4           |        |        |
| FLA                                      | A                       | 2x15   | 2x16.2      | 2x18.2      | 21.6+25     | 2x18.2      | 4x15        |        |        |
| LRA                                      | A                       | 2x75   | 2x101       | 2x128       | 139+118     | 2x128       | 4x75        |        |        |
| EVAPORATING COIL                         |                         |  |             |             |             |             |             |        |        |
| quantity / configuration                 | no.                     | 1  | 1           | 1           | 1           | 1           | 1           |        |        |
| pipes/fins                               | Copper/treated aluminum |  |             |             |             |             |             |        |        |
| pitch fins                               | mm                      | 1.8  | 1.8         | 1.8         | 1.8         | 1.8         | 1.8         |        |        |
| rows                                     | no.                     | 3+3  | 3+3         | 3+3         | 3+3         | 3+3         | 3+3         |        |        |
| front surface                            | m²                      | 1.675  | 1.675       | 1.675       | 1.675       | 2.675       | 2.675       |        |        |

# Technical Data

| MODELS   |   | PX044       | PX054 | PX062 | PX074 | PX068 | PX082 |
|--|---|-------------|-------|-------|-------|-------|-------|
| <b>REFRIGERANT CONNECTIONS (A models only)</b> | <b>Refrigerant connecting pipe diameter: see Tab. 12f, Chap. 12</b> |             |       |       |       |       |       |
| gas line outlet (pipe to be welded, o.d.)      | mm  | 18/18       | 18/18 | 18/18 | 22/22 | 18/18 | 22/22 |
| liquid line inlet (pipe to be welded, o.d.)    | mm  | 18/18       | 18/18 | 18/18 | 18/18 | 18/18 | 18/18 |
| <b>WATER CIRCUIT (W models only)</b>           |   |             |       |       |       |       |       |
| condenser type (W models only)                 |   | Braze plate |       |       |       |       |       |
| water connections ISO 7/1 (W models only)      | inch  | Rp1 ¼       | Rp1 ¼ | Rp1 ¼ | Rp1 ¼ | Rp1 ¼ | Rp1 ¼ |
| Total water internal volume                    | l   | 5.42        | 6.1   | 6.76  | 8.98  | 8.98  | 8.98  |
| <b>DIMENSIONS</b>                              |   |             |       |       |       |       |       |
| width  | mm  | 1750        | 1750  | 1750  | 1750  | 2550  | 2550  |
| depth  | mm  | 890         | 890   | 890   | 890   | 890   | 890   |
| height   | mm  | 1970        | 1970  | 1970  | 1970  | 1970  | 1970  |
| footprint                                      | m <sup>2</sup>  | 1.558       | 1.558 | 1.558 | 1.558 | 2.270 | 2.270 |

Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.

Standard ESP: Upflow 50Pa; Downflow Up 20Pa; Downflow Down 20 Pa Downflow Frontal 0Pa

For Downflow Up and Down versions the data refers to the height of the raised floor= 600mm

Performance data refers to Downflow Units, if not specified otherwise.

**(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17° C wb)**

- Condensing temperature: 45° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(2) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 35°C bs; 30% R.H. (21.4° C wb)**

- Condensing temperature: 45° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(3) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.**

**(4) The Airflow indicated in the Smart Performance is the unit nominal airflow.**

Technical data can be subject to change without notice.

# Technical Data

| MODELS  |                  | PX094                          | PX104       | PX120       | PX059 EXT     | PX092 EXT |             |        |
|---|------------------|--------------------------------|-------------|-------------|---------------|-----------|-------------|--------|
| <b>Power supply voltage</b>                               |                  | V/Ph/Hz 400V ±10% / 3Ph / 50Hz |             |             |               |           |             |        |
| <b>Refrigerant circuit</b>                                |                  | double                         | double      | double      | single        | double    |             |        |
| <b>PERFORMANCE LEGACY (1)(3)</b>                          |                  | Air Condition: 24° C, R.H. 50% |             |             |               |           |             |        |
| air flow  |                  | m³/h                           | 26000       | 27000       | 27000         | 11200     | 17950       |        |
| <b>Refrigerant</b>  |                  | <b>R410A</b>                   |             |             |               |           |             |        |
| total gross cooling capacity                              |                  | kW                             | 97.7        | 104.2       | 122.5         | 57.1      | 91.8        |        |
| sensible gross cooling capacity                           |                  | kW                             | 92.8        | 97.8        | 106.6         | 47.3      | 76          |        |
| SHR (sensible/total ratio)                                |                  | -                              | 0.95        | 0.94        | 0.87          | 0.83      | 0.83        |        |
| compressor power input                                    |                  | kW                             | 10.64+10.68 | 11.22+11.2  | 13.02+15.22   | 13.06     | 9.52+11.26  |        |
| compressor OA   |                  | A                              | 14.9+15     | 21.85+21.76 | 25.58+29.57   | 25.63     | 18.11+22.25 |        |
| Configuration   | Upflow           | Net Sensible cooling capacity  | kW          | 87.6        | 91.9          | 100.7     | 45.2        | 72.4   |
|   |                  | fan power input                | kW          | 3x2.13      | 3x2.39        | 3x2.39    | 1.98        | 2x1.85 |
|   |                  | unit power input               | kW          | 27.75       | 29.61         | 35.46     | 54          | 24.5   |
|   | Downflow Up      | Net Sensible cooling capacity  | kW          | 86.4        | 90.8          | 99.6      | 45          | 72     |
|   |                  | fan power input                | kW          | 3x2.13      | 3x2.33        | 3x2.33    | 2.45        | 2x2.02 |
|   |                  | unit power input               | kW          | 27.74       | 29.44         | 35.26     | 15.41       | 24.85  |
|   | Downflow Down    | Net Sensible cooling capacity  | kW          | 87.1        | 91.5          | 100.3     | 45.2        | 72.7   |
|   |                  | fan power input                | kW          | 3x1.9       | 3x2.08        | 3x2.08    | 2.18        | 2x1.67 |
|   |                  | unit power input               | kW          | 27.05       | 28.69         | 34.51     | 15.14       | 24.15  |
|   | Downflow Frontal | Net Sensible cooling capacity  | kW          | -           | -             | -         | -           | -      |
|   |                  | fan power input                | kW          | -           | -             | -         | -           | -      |
|   |                  | unit power input               | kW          | -           | -             | -         | -           | -      |
| <b>Condensing section (W models only)</b>                 |                  |                                |             |             |               |           |             |        |
| <b>water inlet temp: 30° C - condensation temp: 45° C</b> |                  |                                |             |             |               |           |             |        |
| water flow  |                  | l/s                            | 1.071+1.217 | 1.149+1.299 | 1.275+1.614   | 1.335     | 0.934+1.221 |        |
| water side pressure drop                                  |                  | kPa                            | 15+19       | 18+21       | 16+25         | 18        | 11+20       |        |
| <b>PERFORMANCE SMART (2)(3)</b>                           |                  | Air Condition: 35° C, R.H. 30% |             |             |               |           |             |        |
| air flow (4)  |                  | m³/h                           | 26000       | 27000       | 27000         | 11200     | 17950       |        |
| <b>Refrigerant</b>  |                  | <b>R410A</b>                   |             |             |               |           |             |        |
| total gross cooling capacity                              |                  | kW                             | 121.4       | 128.4       | 146.7         | 66.4      | 111         |        |
| sensible gross cooling capacity                           |                  | kW                             | 121.4       | 128.3       | 146.7         | 66.4      | 110.5       |        |
| SHR (sensible/total ratio)                                |                  | -                              | 1           | 1           | 1             | 1         | 1           |        |
| compressor power input                                    |                  | kW                             | 10.69+10.73 | 11.19+11.02 | 13.11+15.44   | 13.18     | 9.62+11.27  |        |
| compressor OA   |                  | A                              | 15.01+15.05 | 21.73+21.3  | 25.7+29.83    | 25.8      | 18.25+22.31 |        |
| Configuration   | Upflow           | Net Sensible cooling capacity  | kW          | 116.4       | 122.4         | 141.8     | 62.9        | 104.1  |
|   |                  | fan power input                | kW          | 3x2.13      | 3x2.39        | 3x2.26    | 1.98        | 2x1.85 |
|   |                  | unit power input               | kW          | 27.84       | 29.38         | 35.37     | 15.17       | 24.62  |
|   | Downflow Up      | Net Sensible cooling capacity  | kW          | 115         | 121.4         | 140       | 64.1        | 106.5  |
|   |                  | fan power input                | kW          | 3x2.13      | 3x2.33        | 3x2.26    | 2.25        | 2x2.09 |
|   |                  | unit power input               | kW          | 27.84       | 29.23         | 35.36     | 15.46       | 24.96  |
|   | Downflow Down    | Net Sensible cooling capacity  | kW          | 115.7       | 122.1         | 140.7     | 64.4        | 107.2  |
|   |                  | fan power input                | kW          | 3x1.9       | 3x2.08        | 3x2.02    | 1.98        | 2x1.67 |
|   |                  | unit power input               | kW          | 27.15       | 28.48         | 34.64     | 15.19       | 24.26  |
|   | Downflow Frontal | Net Sensible cooling capacity  | kW          | -           | -             | -         | -           | -      |
|   |                  | fan power input                | kW          | -           | -             | -         | -           | -      |
|   |                  | unit power input               | kW          | -           | -             | -         | -           | -      |
| <b>Condensing section (W models only)</b>                 |                  |                                |             |             |               |           |             |        |
| <b>water inlet temp: 30° C - condensation temp: 45° C</b> |                  |                                |             |             |               |           |             |        |
| water flow  |                  | l/s                            | 1.254+1.537 | 1.333+1.626 | 1.414+1.995   | 1.530     | 1.056+1.506 |        |
| water side pressure drop                                  |                  | kPa                            | 20+30       | 23+33       | 20+38         | 23        | 15+28       |        |
| <b>FAN</b>  |                  |                                |             |             |               |           |             |        |
| Quantity (Premium Fan Module)                             |                  | no.                            | 3           | 3           | 3             | 1         | 2           |        |
| FLA   |                  | A                              | 15          | 15          | 15            | 5         | 10          |        |
| LRA   |                  | A                              | 0.3         | 0.3         | 0.3           | 0.1       | 0.2         |        |
| Quantity (Basic Fan Module, Fix speed)                    |                  | no.                            | 2           | 2           | -             | 1         | 2           |        |
| FLA   |                  | A                              | 10          | 10          | -             | 5         | 10          |        |
| LRA   |                  | A                              | 0.2         | 0.2         | -             | 0.1       | 0.2         |        |
| <b>COMPRESSOR</b>   |                  |                                |             |             |               |           |             |        |
| Quantity (Digital Scroll Cooling System)                  |                  | no.                            | 4           | 4           | 4             | 2         | 2           |        |
| FLA   |                  | A                              | 4x16.5      | 4x16.2      | 2x18.2+2x21.6 | 2x18.2    | 2x34        |        |
| LRA   |                  | A                              | 4x101       | 4x101       | 2x128+2x139   | 2x128     | 2x174       |        |
| <b>EVAPORATING COIL</b>                                   |                  |                                |             |             |               |           |             |        |
| quantity / configuration                                  |                  | no.                            | 1           | 1           | 1             | 1         | 1           |        |
| pipes/fins  |                  | Copper/treated aluminum        |             |             |               |           |             |        |
| pitch fins  |                  | mm                             | 1.8         | 1.8         | 1.8           | 1.8       | 1.8         |        |
| rows  |                  | no.                            | 3+3         | 3+3         | 3+3           | 6         | 3+3         |        |
| front surface   |                  | m²                             | 2.675       | 2.675       | 2.675         | 1.53      | 2.412       |        |



# Technical Data

| MODELS   |   | PX094 | PX104 | PX120 | PX059 EXT | PX092 EXT |
|--|---|-------|-------|-------|-----------|-----------|
| <b>REFRIGERANT CONNECTIONS (A models only)</b> | <b>Refrigerant connecting pipe diameter: see Tab. 12f, Chap. 12</b> |       |       |       |           |           |
| gas line outlet (pipe to be welded, o.d.)      | mm  | 22/22 | 22/22 | 22/22 | 22/22     | 22/22     |
| liquid line inlet (pipe to be welded, o.d.)    | mm  | 18/18 | 18/18 | 18    | 18/18     | 18/18     |
| <b>WATER CIRCUIT (W models only)</b>           |   |       |       |       |           |           |
| condenser type (W models only)                 | Brazed plate  |       |       |       |           |           |
| water connections ISO 7/1 (W models only)      | inch  | Rp1 ¼ | Rp1 ¼ | Rp1 ¼ | Rp1 ¼     | Rp1 ¼     |
| Total water internal volume                    | l   | 8.98  | 8.98  | 11.08 | 5.34      | 7.98      |
| <b>DIMENSIONS</b>                              |   |       |       |       |           |           |
| width  | mm  | 2550  | 2550  | 2550  | 1200      | 1750      |
| depth  | mm  | 890   | 890   | 890   | 890       | 890       |
| height   | mm  | 1970  | 1970  | 1970  | 2570      | 2570      |
| footprint                                      | m <sup>2</sup>  | 2.270 | 2.270 | 2.270 | 1.068     | 1.558     |

Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.  
 Standard ESP: Upflow 50Pa; Downflow Up 20Pa; Downflow Down 20 Pa Downflow Frontal 0Pa  
 For Downflow Up and Down versions the data refers to the height of the raised floor= 600mm  
 Performance data refers to Downflow Units, if not specified otherwise.

**(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17° C wb)**

- Condensing temperature: 45° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(2) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 35°C bs; 30% R.H. (21.4° C wb)**

- Condensing temperature: 45° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(3) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.**

**(4) The Airflow indicated in the Smart Performance is the unit nominal airflow.**

Technical data can be subject to change without notice.

# Technical Data

| MODELS                                      |               |                               | PX150  | PX165         |       |
|---|---------------|-------------------------------|--|---------------|-------|
| Power supply voltage                        |               | V/Ph/Hz                       | 400V ±10% / 3Ph / 50Hz                                       |               |       |
| Refrigerant circuit                         |               |                               | double   | double        |       |
| PERFORMANCE LEGACY (1)(3)                   |               |                               | Air Condition: 24° C, R.H. 50%                               |               |       |
| air flow                                    |               | m³/h                          | 34585  | 42500         |       |
| Refrigerant                                 |               |                               | R410A  |               |       |
| total gross cooling capacity                |               | kW                            | 156,6  | 177,9         |       |
| sensible gross cooling capacity             |               | kW                            | 131,5  | 156,2         |       |
| SHR (sensible/total ratio)                  |               | -                             | 0,84   | 0,88          |       |
| compressor power input                      |               | kW                            | 16,73+19,00  | 18,85+22,78   |       |
| compressor OA                               |               | A                             | 30,72+35,76  | 35,55+45,18   |       |
| Configuration                               | Downflow Up   | Net Sensible cooling capacity | kW   | 122,9         | 141,8 |
|   |               | fan power input               | kW   | 8,52          | 14,44 |
|   |               | unit power input              | kW   | 44,33         | 56,1  |
|   | Downflow Down | Net Sensible cooling capacity | kW   | 124           | 143,7 |
|   |               | fan power input               | kW   | 7,48          | 12,56 |
|   |               | unit power input              | kW   | 43,24         | 54,22 |
| PERFORMANCE SMART (2)(3)                    |               |                               | Air Condition: 37° C, R.H. 24%                               |               |       |
| air flow                                    |               | m³/h                          | 34585  | 42500         |       |
| Refrigerant                                 |               |                               | R410A  |               |       |
| total gross cooling capacity                |               | kW                            | 199,1  | 228,1         |       |
| sensible gross cooling capacity             |               | kW                            | 199  | 228,1         |       |
| SHR (sensible/total ratio)                  |               | -                             | 1,00   | 1,00          |       |
| compressor power input                      |               | kW                            | 16,78+19,59  | 19,11+22,89   |       |
| compressor OA                               |               | A                             | 30,77+36,73  | 35,93+45,38   |       |
| Configuration                               | Downflow Up   | Net Sensible cooling capacity | kW   | 190,8         | 215,2 |
|   |               | fan power input               | kW   | 8,24          | 14,44 |
|   |               | unit power input              | kW   | 44,69         | 56,15 |
|   | Downflow Down | Net Sensible cooling capacity | kW   | 191,8         | 215,9 |
|   |               | fan power input               | kW   | 7,24          | 12,2  |
|   |               | unit power input              | kW   | 43,64         | 54,28 |
| <b>FAN</b>                                  |               |                               |  |               |       |
| Quantity (Premium Fan Module)               |               | no.                           | 4  | 4             |       |
| FLA   |               | A                             | 4x7,4  | 4x7,4         |       |
| LRA   |               | A                             | 4x0,1  | 4x0,1         |       |
| <b>COMPRESSOR</b>                           |               |                               |  |               |       |
| Quantity (Digital Scroll Cooling System)    |               | no.                           | 4  | 4             |       |
| FLA   |               | A                             | 2x25 + 2x31  | 2x31+ 2x34    |       |
| LRA   |               | A                             | 2x118 + 2x140  | 2x140 + 2x174 |       |
| <b>EVAPORATING COIL</b>                     |               |                               |  |               |       |
| quantity / configuration                    |               | no.                           | 1  | 1             |       |
| pipes/fins                                  |               |                               | Copper/treated aluminum                                      |               |       |
| pitch fins                                  |               | mm                            | 1,8  | 1,8           |       |
| rows  |               | no.                           | 3+3  | 3+3           |       |
| front surface                               |               | m²                            | 4,338  | 4,338         |       |
| REFRIGERANT CONNECTIONS (A models only)     |               |                               | Refrigerant connecting pipe diameter: see Tab. 12f, Chap. 12 |               |       |
| gas line outlet (pipe to be welded, o.d.)   |               | mm                            | 28   | 28            |       |
| liquid line inlet (pipe to be welded, o.d.) |               | mm                            | 18   | 18            |       |
| <b>DIMENSIONS</b>                           |               |                               |  |               |       |
| width                                       |               | mm                            | 3350   | 3350          |       |
| depth                                       |               | mm                            | 890  | 890           |       |
| height                                      |               | mm                            | 2570   | 2570          |       |
| footprint                                   |               | m²                            | 2,98   | 2,98          |       |

Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.

Standard ESP: Downflow Up 50Pa; Downflow Down 50 Pa

For Downflow Up and Down versions the data refers to the height of the raised floor= 600mm

Performance data refers to Downflow Units, if not specified otherwise.

(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17° C wb)

- Condensing temperature: 45° C

- Air flow of the units refers to the standard configuration with F5 class filter.

(2) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 37°C bs; 24% R.H. (21.21° C wb)

- Condensing temperature: 45° C

- Air flow of the units refers to the standard configuration with F5 class filter.

(3) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.

Technical data can be subject to change without notice.

# Technical Data

Tab. 4c - Scroll Cooling System freecooling direct expansion unit @ 100% cooling capacity, Premium Fan Module  
PXxxx F series

| MODELS  |                  | PX015                          | PX025  | PX031  |       |       |
|---|------------------|--------------------------------|--------|--------|-------|-------|
| Power supply voltage  |                  | V/Ph/Hz 400V ±10% / 3Ph / 50Hz |        |        |       |       |
| Refrigerant circuit   |                  | single                         | single | single |       |       |
| PERFORMANCE LEGACY (1)(2)   |                  | Air Condition: 24° C, R.H. 50% |        |        |       |       |
| air flow  | m³/h             | 4984                           | 6484   | 7202   |       |       |
| ethylene glycol   | %                | 30                             | 30     | 30     |       |       |
| proposed Dry Cooler   |                  | DYS013                         | DYL028 | DYL028 |       |       |
| <b>MECHANICAL COOLING PERFORMANCE (@ 35.0° C outdoor air temperature)</b> |                  |                                |        |        |       |       |
| Refrigerant   |                  | R410A                          |        |        |       |       |
| total gross cooling capacity  |                  | kW                             | 13.4   | 22.8   | 24.6  |       |
| sensible gross cooling capacity   |                  | kW                             | 13.4   | 22.4   | 24.6  |       |
| SHR (sensible/total ratio)  |                  | -                              | 1      | 0.98   | 1     |       |
| compressor power input  |                  | kW                             | 2.59   | 5.18   | 5.53  |       |
| compressor OA   |                  | A                              | 4.5    | 10.08  | 10.82 |       |
| Configuration   | Upflow           | Net Sensible cooling capacity  | kW     | 12.3   | 20.2  | 21.5  |
|   |                  | fan power input                | kW     | 1      | 1.91  | 2.32  |
|   |                  | unit power input               | kW     | 3.62   | 7.12  | 7.88  |
|   | Downflow Up      | Net Sensible cooling capacity  | kW     | 12.5   | 20.7  | 22.2  |
|   |                  | fan power input                | kW     | 0.89   | 1.73  | 2.32  |
|   |                  | unit power input               | kW     | 3.51   | 6.94  | 7.88  |
|   | Downflow Frontal | Net Sensible cooling capacity  | kW     | 12.6   | 20.7  | 22.3  |
|   |                  | fan power input                | kW     | 0.85   | 1.67  | 2.25  |
|   |                  | unit power input               | kW     | 3.47   | 6.88  | 7.81  |
| mixture flow  |                  | l/s                            | 0.336  | 0.611  | 0.633 |       |
| mixture condenser pressure drop   |                  | kPa                            | 5      | 11     | 9     |       |
| unit total pressure drop  |                  | kPa                            | 7      | 16     | 15    |       |
| <b>FREECOOLING PERFORMANCE (@ 5.0° C outdoor air temperature)</b>         |                  |                                |        |        |       |       |
| total gross cooling capacity  |                  | kW                             | 11.3   | 16.2   | 16.9  |       |
| sensible gross cooling capacity   |                  | kW                             | 11.3   | 16.2   | 16.9  |       |
| SHR (sensible/total ratio)  |                  | -                              | 1      | 1      | 1     |       |
| Configuration   | Upflow           | Net Sensible cooling capacity  | kW     | 10.3   | 14.29 | 14.58 |
|   |                  | fan power input                | kW     | 1      | 1.91  | 2.32  |
|   |                  | unit power input               | kW     | 1      | 1.91  | 2.32  |
|   | Downflow Up      | Net Sensible cooling capacity  | kW     | 10.41  | 14.47 | 14.58 |
|   |                  | fan power input                | kW     | 0.89   | 1.73  | 2.32  |
|   |                  | unit power input               | kW     | 0.89   | 1.73  | 2.32  |
|   | Downflow Frontal | Net Sensible cooling capacity  | kW     | 10.45  | 14.53 | 14.65 |
|   |                  | fan power input                | kW     | 0.85   | 1.67  | 2.25  |
|   |                  | unit power input               | kW     | 0.85   | 1.67  | 2.25  |
| mixture flow  |                  | l/s                            | 0.72   | 1.08   | 1.19  |       |
| unit total pressure drop  |                  | kPa                            | 36     | 63     | 74    |       |
| dry - cooler pressure drop  |                  | kPa                            | 29     | 47     | 55    |       |
| <b>FAN</b>  |                  |                                |        |        |       |       |
| Quantity (Premium Fan Module)   |                  | no.                            | 1      | 1      | 1     |       |
| FLA   |                  | A                              | 5.6    | 5.6    | 5.6   |       |
| LRA   |                  | A                              | 0.1    | 0.1    | 0.1   |       |
| Quantity (Basic Fan Module, Fix speed)                                    |                  | no.                            | 1      | 1      | 1     |       |
| FLA   |                  | A                              | 3.1    | 3.1    | 3.1   |       |
| LRA   |                  | A                              | 0.1    | 0.1    | 0.1   |       |
| <b>COMPRESSOR</b>   |                  |                                |        |        |       |       |
| Quantity (Scroll Cooling System)  |                  | no.                            | 1      | 1      | 1     |       |
| FLA   |                  | A                              | 8      | 15     | 16.2  |       |
| LRA   |                  | A                              | 43     | 101    | 101   |       |
| <b>EVAPORATING COIL</b>   |                  |                                |        |        |       |       |
| quantity / configuration  |                  | no.                            | 1      | 1      | 1     |       |
| pipes/fins  |                  | Copper/treated aluminum        |        |        |       |       |
| pitch fins  |                  | mm                             | 1.8    | 1.8    | 1.8   |       |
| rows  |                  | no.                            | 5      | 5      | 5     |       |
| front surface   |                  | m²                             | 0.70   | 0.70   | 0.70  |       |
| <b>CHILLED WATER COIL</b>   |                  |                                |        |        |       |       |
| quantity / configuration  |                  | no.                            | 1      | 1      | 1     |       |
| pipes/fins  |                  | Copper/treated aluminum        |        |        |       |       |
| pitch fins  |                  | mm                             | 1.6    | 1.6    | 1.6   |       |
| rows  |                  | no.                            | 5      | 5      | 5     |       |
| front surface   |                  | m²                             | 0.70   | 0.70   | 0.70  |       |

# Technical Data

| MODELS                      | PX015          | PX025 | PX031 |       |
|-----------------------------|----------------|-------|-------|-------|
| <b>WATER CIRCUIT</b>        |                |       |       |       |
| condenser type              | Brazed plate   |       |       |       |
| water connections ISO 7/1   | inch           | Rp1 ¼ | Rp1 ¼ | Rp1 ¼ |
| Total water internal volume | l              | 1.58  | 1.89  | 2.22  |
| <b>DIMENSIONS</b>           |                |       |       |       |
| width                       | mm             | 844   | 844   | 844   |
| depth                       | mm             | 890   | 890   | 890   |
| height                      | mm             | 1970  | 1970  | 1970  |
| footprint                   | m <sup>2</sup> | 0.75  | 0.75  | 0.75  |

Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.

Standard ESP: Upflow 50Pa; Downflow Up 20Pa; Downflow Frontal 0Pa

For Downflow Up version the data refers to the height of the raised floor= 600mm

Performance data refers to Downflow Units, if not specified otherwise.

**(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17° C wb)**

- Condensing temperature: 45° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(2) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.**

Technical data can be subject to change without notice.

\* VICTAULIC® Connection.

\*\* Optional. Threaded union on request

# Technical Data

| MODELS  |                  | PX041                                 | PX047  | PX051  | PX044       | PX054      |        |        |
|---|------------------|---------------------------------------|--------|--------|-------------|------------|--------|--------|
| Power supply voltage  | V/Ph/Hz          | 400V ±10% / 3Ph / 50Hz                |        |        |             |            |        |        |
| Refrigerant circuit   |                  | single                                | single | single | double      | double     |        |        |
| <b>PERFORMANCE LEGACY (1)(2)</b>  |                  | <b>Air Condition: 24° C, R.H. 50%</b> |        |        |             |            |        |        |
| air flow  | m³/h             | 10000                                 | 13200  | 15200  | 12500       | 15300      |        |        |
| ethylene glycol   | %                | 30                                    | 30     | 30     | 30          | 30         |        |        |
| proposed Dry Cooler   |                  | DYS035                                | DYS035 | DYS044 | DYS035      | DYS044     |        |        |
| <b>MECHANICAL COOLING PERFORMANCE (@ 35.0° C outdoor air temperature)</b> |                  |                                       |        |        |             |            |        |        |
| <b>Refrigerant</b>  |                  | <b>R410A</b>                          |        |        |             |            |        |        |
| total gross cooling capacity  | kW               | 35.4                                  | 42     | 49.5   | 38.8        | 47.8       |        |        |
| sensible gross cooling capacity   | kW               | 35                                    | 42     | 49.5   | 38.8        | 47.8       |        |        |
| SHR (sensible/total ratio)  | -                | 0.99                                  | 1      | 1      | 1           | 1          |        |        |
| compressor power input  | kW               | 9.94                                  | 10.67  | 12.46  | 5.67+5.57   | 6.75+6.65  |        |        |
| compressor OA   | A                | 17.57                                 | 3.99   | 4.02   | 9.75+5.59   | 12.3+12.18 |        |        |
| Configuration   | Upflow           | Net Sensible cooling capacity         | kW     | 35.7   | 42          | 44.8       | 36     | 43.3   |
|   |                  | fan power input                       | kW     | 2.41   | 2x1.35      | 2x1.91     | 2x1.33 | 2x2.19 |
|   |                  | unit power input                      | kW     | 12.4   | 13.4        | 16.3       | 13.92  | 17.8   |
|   | Downflow Up      | Net Sensible cooling capacity         | kW     | 32.9   | 39.4        | 45.8       | 36.2   | 43.5   |
|   |                  | fan power input                       | kW     | 2.41   | 2x1.3       | 2x1.85     | 2x1.28 | 2x2.14 |
|   |                  | unit power input                      | kW     | 12.38  | 13.3        | 16.19      | 13.83  | 17.65  |
|   | Downflow Down    | Net Sensible cooling capacity         | kW     | 35     | 39.8        | 46.3       | 36.5   | 44.1   |
|   |                  | fan power input                       | kW     | 2.15   | 2x1.13      | 2x1.59     | 2x1.11 | 2x1.86 |
|   |                  | unit power input                      | kW     | 12.12  | 12.96       | 15.67      | 13.49  | 17.15  |
|   | Downflow Frontal | Net Sensible cooling capacity         | kW     | 32.7   | 39          | 45.5       | 35.9   | 43.2   |
|   |                  | fan power input                       | kW     | 2.28   | 2.42        | 3.5        | 2.4    | 4.04   |
|   |                  | unit power input                      | kW     | 12.25  | 13.09       | 15.96      | 13.63  | 17.43  |
| mixture flow  | l/s              | 1.397                                 | 1.943  | 1.987  | 0.708+0.708 | 0.78+0.78  |        |        |
| mixture condenser pressure drop   | kPa              | 18                                    | 32     | 34     | 20+20       | 17+17      |        |        |
| unit total pressure drop  | kPa              | 28                                    | 52     | 55     | 23+23       | 20+20      |        |        |
| <b>FREECOOLING PERFORMANCE (@ 5.0° C outdoor air temperature)</b>         |                  |                                       |        |        |             |            |        |        |
| total gross cooling capacity  | kW               | 25.3                                  | 33.8   | 40.5   | 28.7        | 35.7       |        |        |
| sensible gross cooling capacity   | kW               | 25.3                                  | 33.8   | 40.5   | 28.7        | 35.7       |        |        |
| SHR (sensible/total ratio)  | -                | 1                                     | 1      | 1      | 1           | 1          |        |        |
| Configuration   | Upflow           | Net Sensible cooling capacity         | kW     | 23     | 31.3        | 36.9       | 26     | 31.3   |
|   |                  | fan power input                       | kW     | 2.41   | 2x1.35      | 2x1.91     | 2x1.33 | 2x2.19 |
|   |                  | unit power input                      | kW     | 2.44   | 2.73        | 3.85       | 2.69   | 4.41   |
|   | Downflow Up      | Net Sensible cooling capacity         | kW     | 22.9   | 31.2        | 36.7       | 26.1   | 31.4   |
|   |                  | fan power input                       | kW     | 2.41   | 2x1.3       | 2x1.85     | 2x1.28 | 2x2.14 |
|   |                  | unit power input                      | kW     | 2.44   | 2.63        | 3.73       | 2.59   | 4.31   |
|   | Downflow Down    | Net Sensible cooling capacity         | kW     | 23.2   | 31.7        | 37.5       | 26.4   | 31.9   |
|   |                  | fan power input                       | kW     | 2.15   | 2x1.13      | 2x1.59     | 2x1.11 | 2x1.86 |
|   |                  | unit power input                      | kW     | 2.18   | 2.29        | 3.21       | 2.25   | 3.75   |
|   | Downflow Frontal | Net Sensible cooling capacity         | kW     | 23.1   | 31.6        | 37.3       | 26.3   | 31.6   |
|   |                  | fan power input                       | kW     | 2.28   | 2.42        | 3.5        | 2.4    | 4.04   |
|   |                  | unit power input                      | kW     | 2.31   | 2.45        | 3.53       | 2.43   | 4.07   |
| mixture flow  | l/s              | 1.4                                   | 1.94   | 1.99   | 1.42        | 1.56       |        |        |
| unit total pressure drop  | kPa              | 73                                    | 51     | 53     | 24          | 28         |        |        |
| dry - cooler pressure drop  | kPa              | 75                                    | 75     | 69     | 75          | 69         |        |        |
| <b>FAN</b>  |                  |                                       |        |        |             |            |        |        |
| Quantity (Premium Fan Module)   | no.              | 1                                     | 1      | 1      | 2           | 2          |        |        |
| FLA   | A                | 5                                     | 5      | 5      | 10          | 10         |        |        |
| LRA   | A                | 0.1                                   | 0.1    | 0.1    | 0.2         | 0.2        |        |        |
| Quantity (Basic Fan Module, Fix speed)                                    | no.              | 1                                     | 1      | 1      | 1           | 1          |        |        |
| FLA   | A                | 5                                     | 5      | 5      | 5           | 5          |        |        |
| LRA   | A                | 0.1                                   | 0.1    | 0.1    | 0.1         | 0.1        |        |        |
| <b>COMPRESSOR</b>   |                  |                                       |        |        |             |            |        |        |
| Quantity (Scroll Cooling System)  | no.              | 1                                     | 1      | 1      | 2           | 2          |        |        |
| FLA   | A                | 25                                    | 31     | 34     | 2x15        | 2x16.2     |        |        |
| LRA   | A                | 118                                   | 140    | 174    | 2x75        | 2x101      |        |        |
| <b>EVAPORATING COIL</b>   |                  |                                       |        |        |             |            |        |        |
| quantity / configuration  | no.              | 1                                     | 1      | 1      | 1           | 1          |        |        |
| pipes/fins  |                  | Copper/treated aluminum               |        |        |             |            |        |        |
| pitch fins  | mm               | 1.8                                   | 1.8    | 1.8    | 1.8         | 1.8        |        |        |
| rows  | no.              | 5                                     | 4      | 4      | 2+3         | 2+3        |        |        |
| front surface   | m²               | 0.978                                 | 1.626  | 1.626  | 1.482       | 1.482      |        |        |
| <b>CHILLED WATER COIL</b>   |                  |                                       |        |        |             |            |        |        |
| quantity / configuration  |                  |                                       |        |        |             |            |        |        |

# Technical Data

| MODELS                      |                | PX041                   | PX047  | PX051  | PX044  | PX054  |
|-----------------------------|----------------|-------------------------|--------|--------|--------|--------|
| quantity / configuration    | no.            | 1                       | 1      | 1      | 1      | 1      |
| pipes/fins                  |                | Copper/treated aluminum |        |        |        |        |
| pitch fins                  | mm             | 1.6                     | 1.6    | 1.6    | 1.6    | 1.6    |
| rows                        | no.            | 5                       | 5      | 5      | 5      | 5      |
| front surface               | m <sup>2</sup> | 0.978                   | 1.626  | 1.626  | 1.482  | 1.482  |
| <b>WATER CIRCUIT</b>        |                |                         |        |        |        |        |
| condenser type              |                | Brazed plate            |        |        |        |        |
| water connections ISO 7/1   | inch           | Rp 1 ¼                  | Rp 1 ½ | Rp 1 ½ | Rp 1 ½ | Rp 1 ½ |
| Total water internal volume | l              | 21.44                   | 32.04  | 32.04  | 31.92  | 32.6   |
| <b>DIMENSIONS</b>           |                |                         |        |        |        |        |
| width                       | mm             | 1200                    | 1750   | 1750   | 1750   | 1750   |
| depth                       | mm             | 890                     | 890    | 890    | 890    | 890    |
| height                      | mm             | 1970                    | 1970   | 1970   | 1970   | 1970   |
| footprint                   | m <sup>2</sup> | 1.068                   | 1.558  | 1.558  | 1.558  | 1.558  |

Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.

Standard ESP: Upflow 50Pa; Downflow Up 20Pa; Downflow Frontal 0Pa

For Downflow Up version the data refers to the height of the raised floor= 600mm

Performance data refers to Downflow Units, if not specified otherwise.

**(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17° C wb)**

- Condensing temperature: 45° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(2) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.**

Technical data can be subject to change without notice.

\* VICTAULIC® Connection.

\*\* Optional. Threaded union on request

# Technical Data

| MODELS  |                  | PX041                          | PX047  | PX051  | PX044       | PX054      |        |        |
|---|------------------|--------------------------------|--------|--------|-------------|------------|--------|--------|
| Power supply voltage  |                  | V/Ph/Hz 400V ±10% / 3Ph / 50Hz |        |        |             |            |        |        |
| Refrigerant circuit   |                  | single                         | single | single | double      | double     |        |        |
| PERFORMANCE LEGACY (1)(2)   |                  | Air Condition: 24° C, R.H. 50% |        |        |             |            |        |        |
| air flow  | m³/h             | 10000                          | 13200  | 15200  | 12500       | 15300      |        |        |
| ethylene glycol   | %                | 30                             | 30     | 30     | 30          | 30         |        |        |
| proposed Dry Cooler   |                  | DYS035                         | DYS035 | DYS044 | DYS035      | DYS044     |        |        |
| <b>MECHANICAL COOLING PERFORMANCE (@ 35.0° C outdoor air temperature)</b> |                  |                                |        |        |             |            |        |        |
| Refrigerant   |                  | R410A                          |        |        |             |            |        |        |
| total gross cooling capacity  | kW               | 35.4                           | 42     | 49.5   | 38.8        | 47.8       |        |        |
| sensible gross cooling capacity   | kW               | 35                             | 42     | 49.5   | 38.8        | 47.8       |        |        |
| SHR (sensible/total ratio)  | -                | 0.99                           | 1      | 1      | 1           | 1          |        |        |
| compressor power input  | kW               | 9.94                           | 10.67  | 12.46  | 5.67+5.57   | 6.75+6.65  |        |        |
| compressor OA   | A                | 17.57                          | 3.99   | 4.02   | 9.75+5.59   | 12.3+12.18 |        |        |
| Configuration   | Upflow           | Net Sensible cooling capacity  | kW     | 35.7   | 42          | 44.8       | 36     | 43.3   |
|   |                  | fan power input                | kW     | 2.41   | 2x1.35      | 2x1.91     | 2x1.33 | 2x2.19 |
|   |                  | unit power input               | kW     | 12.4   | 13.4        | 16.3       | 13.92  | 17.8   |
|   | Downflow Up      | Net Sensible cooling capacity  | kW     | 32.9   | 39.4        | 45.8       | 36.2   | 43.5   |
|   |                  | fan power input                | kW     | 2.41   | 2x1.3       | 2x1.85     | 2x1.28 | 2x2.14 |
|   |                  | unit power input               | kW     | 12.38  | 13.3        | 16.19      | 13.83  | 17.65  |
|   | Downflow Down    | Net Sensible cooling capacity  | kW     | 35     | 39.8        | 46.3       | 36.5   | 44.1   |
|   |                  | fan power input                | kW     | 2.15   | 2x1.13      | 2x1.59     | 2x1.11 | 2x1.86 |
|   |                  | unit power input               | kW     | 12.12  | 12.96       | 15.67      | 13.49  | 17.15  |
|   | Downflow Frontal | Net Sensible cooling capacity  | kW     | 32.7   | 39          | 45.5       | 35.9   | 43.2   |
|   |                  | fan power input                | kW     | 2.28   | 2.42        | 3.5        | 2.4    | 4.04   |
|   |                  | unit power input               | kW     | 12.25  | 13.09       | 15.96      | 13.63  | 17.43  |
| mixture flow  | l/s              | 1.397                          | 1.943  | 1.987  | 0.708+0.708 | 0.78+0.78  |        |        |
| mixture condenser pressure drop   | kPa              | 18                             | 32     | 34     | 20+20       | 17+17      |        |        |
| unit total pressure drop  | kPa              | 28                             | 52     | 55     | 23+23       | 20+20      |        |        |
| <b>FREECOOLING PERFORMANCE (@ 5.0° C outdoor air temperature)</b>         |                  |                                |        |        |             |            |        |        |
| total gross cooling capacity  | kW               | 25.3                           | 33.8   | 40.5   | 28.7        | 35.7       |        |        |
| sensible gross cooling capacity   | kW               | 25.3                           | 33.8   | 40.5   | 28.7        | 35.7       |        |        |
| SHR (sensible/total ratio)  | -                | 1                              | 1      | 1      | 1           | 1          |        |        |
| Configuration   | Upflow           | Net Sensible cooling capacity  | kW     | 23     | 31.3        | 36.9       | 26     | 31.3   |
|   |                  | fan power input                | kW     | 2.41   | 2x1.35      | 2x1.91     | 2x1.33 | 2x2.19 |
|   |                  | unit power input               | kW     | 2.44   | 2.73        | 3.85       | 2.69   | 4.41   |
|   | Downflow Up      | Net Sensible cooling capacity  | kW     | 22.9   | 31.2        | 36.7       | 26.1   | 31.4   |
|   |                  | fan power input                | kW     | 2.41   | 2x1.3       | 2x1.85     | 2x1.28 | 2x2.14 |
|   |                  | unit power input               | kW     | 2.44   | 2.63        | 3.73       | 2.59   | 4.31   |
|   | Downflow Down    | Net Sensible cooling capacity  | kW     | 23.2   | 31.7        | 37.5       | 26.4   | 31.9   |
|   |                  | fan power input                | kW     | 2.15   | 2x1.13      | 2x1.59     | 2x1.11 | 2x1.86 |
|   |                  | unit power input               | kW     | 2.18   | 2.29        | 3.21       | 2.25   | 3.75   |
|   | Downflow Frontal | Net Sensible cooling capacity  | kW     | 23.1   | 31.6        | 37.3       | 26.3   | 31.6   |
|   |                  | fan power input                | kW     | 2.28   | 2.42        | 3.5        | 2.4    | 4.04   |
|   |                  | unit power input               | kW     | 2.31   | 2.45        | 3.53       | 2.43   | 4.07   |
| mixture flow  | l/s              | 1.4                            | 1.94   | 1.99   | 1.42        | 1.56       |        |        |
| unit total pressure drop  | kPa              | 73                             | 51     | 53     | 24          | 28         |        |        |
| dry - cooler pressure drop  | kPa              | 75                             | 75     | 69     | 75          | 69         |        |        |
| <b>FAN</b>  |                  |                                |        |        |             |            |        |        |
| Quantity (Premium Fan Module)   | no.              | 1                              | 1      | 1      | 2           | 2          |        |        |
| FLA   | A                | 5                              | 5      | 5      | 10          | 10         |        |        |
| LRA   | A                | 0.1                            | 0.1    | 0.1    | 0.2         | 0.2        |        |        |
| Quantity (Basic Fan Module, Fix speed)                                    | no.              | 1                              | 1      | 1      | 1           | 1          |        |        |
| FLA   | A                | 5                              | 5      | 5      | 5           | 5          |        |        |
| LRA   | A                | 0.1                            | 0.1    | 0.1    | 0.1         | 0.1        |        |        |
| <b>COMPRESSOR</b>   |                  |                                |        |        |             |            |        |        |
| Quantity (Scroll Cooling System)  | no.              | 1                              | 1      | 1      | 2           | 2          |        |        |
| FLA   | A                | 25                             | 31     | 34     | 2x15        | 2x16.2     |        |        |
| LRA   | A                | 118                            | 140    | 174    | 2x75        | 2x101      |        |        |
| <b>EVAPORATING COIL</b>   |                  |                                |        |        |             |            |        |        |
| quantity / configuration  | no.              | 1                              | 1      | 1      | 1           | 1          |        |        |
| pipes/fins  |                  | Copper/treated aluminum        |        |        |             |            |        |        |
| pitch fins  | mm               | 1.8                            | 1.8    | 1.8    | 1.8         | 1.8        |        |        |
| rows  | no.              | 5                              | 4      | 4      | 2+3         | 2+3        |        |        |
| front surface   | m²               | 0.978                          | 1.626  | 1.626  | 1.482       | 1.482      |        |        |
| <b>CHILLED WATER COIL</b>   |                  |                                |        |        |             |            |        |        |
| quantity / configuration  | no.              | 1                              | 1      | 1      | 1           | 1          |        |        |
| pipes/fins  |                  | Copper/treated aluminum        |        |        |             |            |        |        |

# Technical Data

| MODELS                      |                | PX041  | PX047  | PX051  | PX044  | PX054  |
|-----------------------------|----------------|--------|--------|--------|--------|--------|
| pitch fins                  | mm             | 1.6    | 1.6    | 1.6    | 1.6    | 1.6    |
| rows                        | no.            | 5      | 5      | 5      | 5      | 5      |
| front surface               | m <sup>2</sup> | 0.978  | 1.626  | 1.626  | 1.482  | 1.482  |
| <b>WATER CIRCUIT</b>        |                |        |        |        |        |        |
| condenser type              | Braze plate    |        |        |        |        |        |
| water connections ISO 7/1   | inch           | Rp 1 ¼ | Rp 1 ½ | Rp 1 ½ | Rp 1 ½ | Rp 1 ½ |
| Total water internal volume | l              | 21.44  | 32.04  | 32.04  | 31.92  | 32.6   |
| <b>DIMENSIONS</b>           |                |        |        |        |        |        |
| width                       | mm             | 1200   | 1750   | 1750   | 1750   | 1750   |
| depth                       | mm             | 890    | 890    | 890    | 890    | 890    |
| height                      | mm             | 1970   | 1970   | 1970   | 1970   | 1970   |
| footprint                   | m <sup>2</sup> | 1.068  | 1.558  | 1.558  | 1.558  | 1.558  |

Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.

Standard ESP: Upflow 50Pa; Downflow Up 20Pa; Downflow Frontal 0Pa

For Downflow Up version the data refers to the height of the raised floor= 600mm

Performance data refers to Downflow Units, if not specified otherwise.

**(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17° C wb)**

- Condensing temperature: 45° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(2) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.**

Technical data can be subject to change without notice.

\* VICTAULIC® Connection.

\*\* Optional. Threaded union on request



# Technical Data

| MODELS   |                         | PX062                          | PX068       | PX082       | PX094       | PX104       |        |        |
|--|-------------------------|--------------------------------|-------------|-------------|-------------|-------------|--------|--------|
| Power supply voltage   |                         | 400V ±10% / 3Ph / 50Hz         |             |             |             |             |        |        |
| Refrigerant circuit  |                         | double                         | double      | double      | double      | double      |        |        |
| PERFORMANCE LEGACY (1)(2)  |                         | Air Condition: 24° C, R.H. 50% |             |             |             |             |        |        |
| air flow   | m³/h                    | 15900                          | 18500       | 24000       | 25000       | 25000       |        |        |
| ethylene glycol  | %                       | 30                             | 30          | 30          | 30          | 30          |        |        |
| proposed Dry Cooler  |                         | DYS050                         | DYS050      | DYS065      | DYS084      | DYS084      |        |        |
| MECHANICAL COOLING PERFORMANCE (@ 35.0° C outdoor air temperature) |                         |                                |             |             |             |             |        |        |
| Refrigerant  |                         | R410A                          |             |             |             |             |        |        |
| total gross cooling capacity                                       | kW                      | 54.5                           | 58.4        | 73          | 80.9        | 89.5        |        |        |
| sensible gross cooling capacity                                    | kW                      | 54.4                           | 58.4        | 73          | 78.7        | 86.5        |        |        |
| SHR (sensible/total ratio)   | -                       | 1                              | 1           | 1           | 0.97        | 0.97        |        |        |
| compressor power input   | kW                      | 7.56+7.98                      | 7.5+7.65    | 10.48+10.28 | 11.31+11.13 | 14.03+13.85 |        |        |
| compressor OA  | A                       | 14.16+14.66                    | 14.08+14.27 | 18.37+18.09 | 20.36+20.09 | 26.16+25.89 |        |        |
| Configuration  | Upflow                  | Net Sensible cooling capacity  | kW          | 49.3        | 55.5        | 67.2        | 72.6   | 80.5   |
|  |                         | fan power input                | kW          | 2x2.39      | 3x1.15      | 3x2.16      | 3x2.41 | 3x2.42 |
|  |                         | unit power input               | kW          | 20.02       | 18.66       | 27.32       | 29.77  | 35.25  |
|  | Downflow Up             | Net Sensible cooling capacity  | kW          | 49.8        | 55.1        | 66.5        | 71.6   | 79.4   |
|  |                         | fan power input                | kW          | 2x2.33      | 3x1.11      | 3x2.16      | 3x2.35 | 3x2.35 |
|  |                         | unit power input               | kW          | 19.89       | 18.51       | 27.27       | 29.52  | 34.96  |
|  | Downflow Down           | Net Sensible cooling capacity  | kW          | 50.4        | 55.4        | 67.2        | 72.3   | 80.1   |
|  |                         | fan power input                | kW          | 2x2.04      | 3x0.99      | 3x1.93      | 3x2.12 | 3x2.12 |
|  |                         | unit power input               | kW          | 19.31       | 18.15       | 26.58       | 28.83  | 34.27  |
|  | Downflow Frontal        | Net Sensible cooling capacity  | kW          | 49.6        | -           | -           | -      | -      |
|  |                         | fan power input                | kW          | 2x2.21      | -           | -           | -      | -      |
|  |                         | unit power input               | kW          | 19.62       | -           | -           | -      | -      |
| mixture flow   | l/s                     | 0.892+0.892                    | 0.987+0.987 | 1.08+1.08   | 1.27+1.27   | 1.27+1.27   |        |        |
| mixture condenser pressure drop                                    | kPa                     | 16+16                          | 9+10        | 11+11       | 15+15       | 15+15       |        |        |
| unit total pressure drop   | kPa                     | 20+20                          | 14+15       | 17+17       | 23+23       | 23+23       |        |        |
| FREECOOLING PERFORMANCE (@ 5.0° C outdoor air temperature)         |                         |                                |             |             |             |             |        |        |
| total gross cooling capacity                                       | kW                      | 38.9                           | 45.2        | 51.1        | 56.7        | 56.3        |        |        |
| sensible gross cooling capacity                                    | kW                      | 38.9                           | 45.2        | 51.1        | 56.7        | 56.3        |        |        |
| SHR (sensible/total ratio)   | -                       | 1                              | 1           | 1           | 1           | 1           |        |        |
| Configuration  | Upflow                  | Net Sensible cooling capacity  | kW          | 34.1        | 41.5        | 45.1        | 50     | 49.6   |
|  |                         | fan power input                | kW          | 2x2.39      | 3x1.15      | 3x2.16      | 3x2.41 | 3x2.42 |
|  |                         | unit power input               | kW          | 4.81        | 3.48        | 6.51        | 7.26   | 7.29   |
|  | Downflow Up             | Net Sensible cooling capacity  | kW          | 34.3        | 41.8        | 44.6        | 49.7   | 49.3   |
|  |                         | fan power input                | kW          | 2x2.33      | 3x1.11      | 3x2.16      | 3x2.35 | 3x2.35 |
|  |                         | unit power input               | kW          | 4.69        | 3.36        | 6.51        | 7.18   | 7.18   |
|  | Downflow Down           | Net Sensible cooling capacity  | kW          | 34.8        | 42          | 45.8        | 50.9   | 50.5   |
|  |                         | fan power input                | kW          | 2x2.04      | 3x0.99      | 3x1.93      | 3x2.12 | 3x2.12 |
|  |                         | unit power input               | kW          | 4.11        | 3           | 5.82        | 6.39   | 6.39   |
|  | Downflow Frontal        | Net Sensible cooling capacity  | kW          | 34.5        | -           | -           | -      | -      |
|  |                         | fan power input                | kW          | 2x2.21      | -           | -           | -      | -      |
|  |                         | unit power input               | kW          | 4.45        | -           | -           | -      | -      |
| mixture flow   | l/s                     | 1.78                           | 1.98        | 2.16        | 2.54        | 2.54        |        |        |
| unit total pressure drop   | kPa                     | 36                             | 22          | 43          | 34          | 34          |        |        |
| dry - cooler pressure drop   | kPa                     | 27                             | 18          | 25          | 27          | 27          |        |        |
| <b>FAN</b>   |                         |                                |             |             |             |             |        |        |
| Quantity (Premium Fan Module)                                      | no.                     | 2                              | 3           | 3           | 3           | 3           |        |        |
| FLA  | A                       | 10                             | 15          | 15          | 15          | 15          |        |        |
| LRA  | A                       | 0.2                            | 0.3         | 0.3         | 0.3         | 0.3         |        |        |
| Quantity (Basic Fan Module, Fix speed)                             | no.                     | 2                              | 2           | 2           | 2           | 2           |        |        |
| FLA  | A                       | 10                             | 10          | 10          | 10          | 10          |        |        |
| LRA  | A                       | 0.2                            | 0.2         | 0.2         | 0.2         | 0.2         |        |        |
| <b>COMPRESSOR</b>  |                         |                                |             |             |             |             |        |        |
| Quantity (Scroll Cooling System)                                   | no.                     | 2                              | 2           | 2           | 2           | 2           |        |        |
| FLA  | A                       | 2x18.2                         | 2x18.2      | 2x25        | 2x31        | 2x34        |        |        |
| LRA  | A                       | 2x128                          | 2x128       | 2x118       | 2x140       | 2x174       |        |        |
| <b>EVAPORATING COIL</b>  |                         |                                |             |             |             |             |        |        |
| quantity / configuration   | no.                     | 1                              | 1           | 1           | 1           | 1           |        |        |
| pipes/fins   | Copper/treated aluminum |                                |             |             |             |             |        |        |
| pitch fins   | mm                      | 1.8                            | 1.8         | 1.8         | 1.8         | 1.8         |        |        |
| rows   | no.                     | 2+3                            | 2+3         | 2+3         | 2+3         | 2+3         |        |        |
| front surface  | m²                      | 1.482                          | 2.442       | 2.442       | 2.442       | 2.442       |        |        |
| <b>CHILLED WATER COIL</b>  |                         |                                |             |             |             |             |        |        |
| quantity / configuration   | no.                     | 1                              | 1           | 1           | 1           | 1           |        |        |
| pipes/fins   | Copper/treated aluminum |                                |             |             |             |             |        |        |

# Technical Data

| MODELS                      |                | PX062  | PX068              | PX082 | PX094 | PX104 |
|-----------------------------|----------------|--------|--------------------|-------|-------|-------|
| pitch fins                  | mm             | 1.6    | 1.6                | 1.6   | 1.6   | 1.6   |
| rows                        | no.            | 5      | 5                  | 5     | 5     | 5     |
| front surface               | m <sup>2</sup> | 1.482  | 2.442              | 2.442 | 2.442 | 2.442 |
| <b>WATER CIRCUIT</b>        |                |        |                    |       |       |       |
| condenser type              | Braze plate    |        |                    |       |       |       |
| water connections ISO 7/1   | inch           | Rp 1 ½ | O. D. 54 mm* R 2** |       |       |       |
| Total water internal volume | l              | 33.26  | 53.08              | 53.08 | 53.08 | 53.08 |
| <b>DIMENSIONS</b>           |                |        |                    |       |       |       |
| width                       | mm             | 1750   | 2550               | 2550  | 2550  | 2550  |
| depth                       | mm             | 890    | 890                | 890   | 890   | 890   |
| height                      | mm             | 1970   | 1970               | 1970  | 1970  | 1970  |
| footprint                   | m <sup>2</sup> | 1.558  | 2.270              | 2.270 | 2.270 | 2.270 |

Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.

Standard ESP: Upflow 50Pa; Downflow Up 20Pa; Downflow Frontal 0Pa

For Downflow Up version the data refers to the height of the raised floor= 600mm

Performance data refers to Downflow Units, if not specified otherwise.

**(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17° C wb)**

- Condensing temperature: 45° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(2) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.**

Technical data can be subject to change without notice.

\* VICTAULIC® Connection.

\*\* Optional. Threaded union on request

# Technical Data

Tab. 4d - Digital Scroll Cooling System freecooling direct expansion unit @ 100% cooling capacity, Premium Fan Module PXxxx F series

| MODELS   |                  |                               | PX015                          | PX021  | PX025  | PX031  |       |
|--|------------------|-------------------------------|--------------------------------|--------|--------|--------|-------|
| Power supply voltage   |                  | V/Ph/Hz                       | 400V ±10% / 3Ph / 50Hz         |        |        |        |       |
| Refrigerant circuit  |                  |                               | single                         | single | single | single |       |
| PERFORMANCE LEGACY (1)(3)  |                  |                               | Air Condition: 24° C, R.H. 50% |        |        |        |       |
| air flow   |                  | m³/h                          | 4984                           | 5397   | 6484   | 7202   |       |
| ethylene glycol  |                  | %                             | 30                             | 30     | 30     | 30     |       |
| proposed Dry Cooler  |                  |                               | DYS013                         | DYS017 | DYS028 | DYS028 |       |
| MECHANICAL COOLING PERFORMANCE (@ 35.0° C outdoor air temperature) |                  |                               |                                |        |        |        |       |
| Refrigerant  |                  |                               | R410A                          |        |        |        |       |
| total gross cooling capacity                                       |                  | kW                            | 13.5                           | 17.7   | 22.7   | 24.5   |       |
| sensible gross cooling capacity                                    |                  | kW                            | 13.5                           | 17.7   | 22.3   | 24.5   |       |
| SHR (sensible/total ratio)   |                  | -                             | 1                              | 1      | 0.98   | 1      |       |
| compressor power input   |                  | kW                            | 2.64                           | 4.08   | 5.47   | 5.69   |       |
| compressor OA  |                  | A                             | 4.65                           | 7.37   | 10.02  | 11.02  |       |
| Configuration  | Upflow           | Net Sensible cooling capacity | kW                             | 12.3   | 16.3   | 20.2   | 21.4  |
|  |                  | fan power input               | kW                             | 1      | 1.21   | 1.91   | 2.32  |
|  |                  | unit power input              | kW                             | 3.68   | 5.31   | 7.41   | 8.04  |
|  | Downflow Up      | Net Sensible cooling capacity | kW                             | 12.6   | 16.6   | 20.6   | 22.2  |
|  |                  | fan power input               | kW                             | 0.89   | 1.08   | 1.73   | 2.25  |
|  |                  | unit power input              | kW                             | 3.56   | 5.19   | 7.23   | 7.97  |
|  | Downflow Frontal | Net Sensible cooling capacity | kW                             | 12.7   | 16.7   | 20.7   | 22.2  |
|  |                  | fan power input               | kW                             | 0.85   | 1.04   | 1.67   | 2.25  |
|  |                  | unit power input              | kW                             | 3.52   | 5.15   | 7.17   | 7.97  |
| mixture flow   |                  | l/s                           | 0.339                          | 0.463  | 0.616  | 0.65   |       |
| mixture condenser pressure drop                                    |                  | kPa                           | 5                              | 7      | 11     | 9      |       |
| unit total pressure drop   |                  | kPa                           | 7                              | 10     | 16     | 15     |       |
| FREECOOLING PERFORMANCE (@ 5.0° C outdoor air temperature)         |                  |                               |                                |        |        |        |       |
| total gross cooling capacity                                       |                  | kW                            | 14.8                           | 15.6   | 19.2   | 20.6   |       |
| sensible gross cooling capacity                                    |                  | kW                            | 14.3                           | 15.3   | 18.5   | 19.8   |       |
| SHR (sensible/total ratio)   |                  | -                             | 0.97                           | 0.98   | 0.96   | 0.96   |       |
| Configuration  | Upflow           | Net Sensible cooling capacity | kW                             | 13.3   | 14.09  | 16.59  | 17.48 |
|  |                  | fan power input               | kW                             | 1      | 1.21   | 1.91   | 2.32  |
|  |                  | unit power input              | kW                             | 1      | 1.21   | 1.91   | 2.32  |
|  | Downflow Up      | Net Sensible cooling capacity | kW                             | 13.41  | 14.22  | 16.77  | 17.55 |
|  |                  | fan power input               | kW                             | 0.89   | 1.08   | 1.73   | 2.25  |
|  |                  | unit power input              | kW                             | 0.89   | 1.08   | 1.73   | 2.25  |
|  | Downflow Frontal | Net Sensible cooling capacity | kW                             | 13.45  | 14.26  | 16.83  | 17.55 |
|  |                  | fan power input               | kW                             | 0.85   | 1.04   | 1.67   | 2.25  |
|  |                  | unit power input              | kW                             | 0.85   | 1.04   | 1.67   | 2.25  |
| mixture flow   |                  | l/s                           | 0.81                           | 0.86   | 1.08   | 1.19   |       |
| unit total pressure drop   |                  | kPa                           | 37                             | 42     | 63     | 74     |       |
| dry - cooler pressure drop   |                  | kPa                           | 28                             | 32     | 47     | 55     |       |
| PERFORMANCE SMART (2)(3)   |                  |                               | Air Condition: 35° C, R.H. 30% |        |        |        |       |
| air flow(4)  |                  | m³/h                          | 4984                           | 5397   | 6484   | 7202   |       |
| ethylene glycol  |                  | %                             | 30                             | 30     | 30     | 30     |       |
| proposed Dry Cooler  |                  |                               | DYS013                         | DYS017 | DYS028 | DYS028 |       |
| MECHANICAL COOLING PERFORMANCE (@ 35.0° C outdoor air temperature) |                  |                               |                                |        |        |        |       |
| Refrigerant  |                  |                               | R410A                          |        |        |        |       |
| total gross cooling capacity                                       |                  | kW                            | 14.1                           | 22.2   | 28     | 30.2   |       |
| sensible gross cooling capacity                                    |                  | kW                            | 14.1                           | 22.2   | 28     | 30.2   |       |
| SHR (sensible/total ratio)   |                  | -                             | 1                              | 1      | 1      | 1      |       |
| compressor power input   |                  | kW                            | 2.61                           | 4.16   | 5.43   | 5.65   |       |
| compressor OA  |                  | A                             | 4.65                           | 7.42   | 10.02  | 10.88  |       |
| Configuration  | Upflow           | Net Sensible cooling capacity | kW                             | 13.1   | 20.6   | 25.5   | 27    |
|  |                  | fan power input               | A                              | 1      | 1.21   | 1.91   | 2.32  |
|  |                  | unit power input              | kW                             | 3.64   | 5.39   | 7.38   | 8.01  |
|  | Downflow Up      | Net Sensible cooling capacity | kW                             | 13.2   | 21.1   | 26.3   | 27.9  |
|  |                  | fan power input               | A                              | 0.89   | 1.08   | 1.73   | 2.25  |
|  |                  | unit power input              | kW                             | 3.53   | 5.27   | 7.19   | 7.93  |
|  | Downflow Frontal | Net Sensible cooling capacity | kW                             | 13.3   | 21.2   | 26.4   | 27.9  |
|  |                  | fan power input               | A                              | 0.85   | 1.04   | 1.67   | 2.25  |
|  |                  | unit power input              | kW                             | 6.56   | 5.23   | 7.13   | 7.93  |
| mixture flow   |                  | l/s                           | 0.352                          | 0.569  | 0.741  | 0.783  |       |
| mixture condenser pressure drop                                    |                  | kPa                           | 6                              | 10     | 16     | 21     |       |
| unit total pressure drop   |                  | kPa                           | 8                              | 14     | 23     | 13     |       |

# Technical Data

| MODELS  |                  | PX015                         | PX021 | PX025 | PX031 |       |       |
|---|------------------|-------------------------------|-------|-------|-------|-------|-------|
| <b>FREECOOLING PERFORMANCE (@ 5.0° C outdoor air temperature)</b> |                  |                               |       |       |       |       |       |
| total gross cooling capacity                                      |                  | kW                            | 34.9  | 37.1  | 42.7  | 46.1  |       |
| sensible gross cooling capacity                                   |                  | kW                            | 30.7  | 32.9  | 38.4  | 41.9  |       |
| SHR (sensible/total ratio)  |                  | -                             | 0.88  | 0.89  | 0.9   | 0.91  |       |
| Configuration   | Upflow           | Net Sensible cooling capacity | kW    | 29.7  | 31.69 | 36.49 | 39.58 |
|   |                  | fan power input               | kW    | 1     | 1.21  | 1.91  | 2.32  |
|   |                  | unit power input              | kW    | 1     | 1.21  | 1.91  | 2.32  |
|   | Downflow Up      | Net Sensible cooling capacity | kW    | 29.81 | 31.82 | 36.67 | 39.65 |
|   |                  | fan power input               | kW    | 0.89  | 1.08  | 1.73  | 2.25  |
|   |                  | unit power input              | kW    | 0.89  | 1.08  | 1.73  | 2.25  |
|   | Downflow Frontal | Net Sensible cooling capacity | kW    | 29.85 | 31.86 | 36.73 | 39.65 |
|   |                  | fan power input               | kW    | 0.85  | 1.04  | 1.67  | 2.25  |
|   |                  | unit power input              | kW    | 0.85  | 1.04  | 1.67  | 2.25  |
| mixture flow  |                  | l/s                           | 1.83  | 2.06  | 2.37  | 2.56  |       |
| unit total pressure drop  |                  | kPa                           | 181   | 203   | 263   | 304   |       |
| dry - cooler pressure drop  |                  | kPa                           | 131   | 146   | 187   | 215   |       |
| <b>FAN</b>  |                  |                               |       |       |       |       |       |
| Quantity (Premium Fan Module)                                     |                  | no.                           | 1     | 1     | 1     | 1     |       |
| FLA   |                  | A                             | 5.6   | 5.6   | 5.6   | 5.6   |       |
| LRA   |                  | A                             | 0.1   | 0.1   | 0.1   | 0.1   |       |
| Quantity (Basic Fan Module, Fix speed)                            |                  | no.                           | 1     | 1     | 1     | 1     |       |
| FLA   |                  | A                             | 3.1   | 3.1   | 3.1   | 3.1   |       |
| LRA   |                  | A                             | 0.1   | 0.1   | 0.1   | 0.1   |       |
| <b>COMPRESSOR</b>   |                  |                               |       |       |       |       |       |
| Quantity (Digital Scroll Cooling System)                          |                  | no.                           | 1     | 1     | 1     | 1     |       |
| FLA   |                  | A                             | 6.9   | 11.8  | 16.5  | 16.2  |       |
| LRA   |                  | A                             | 46    | 64    | 101   | 101   |       |
| <b>EVAPORATING COIL</b>   |                  |                               |       |       |       |       |       |
| quantity / configuration  |                  | no.                           | 1     | 1     | 1     | 1     |       |
| pipes/fins  |                  | Copper/treated aluminum       |       |       |       |       |       |
| pitch fins  |                  | mm                            | 1.8   | 1.8   | 1.8   | 1.8   |       |
| rows  |                  | no.                           | 5     | 5     | 5     | 5     |       |
| front surface   |                  | m <sup>2</sup>                | 0.70  | 0.70  | 0.70  | 0.70  |       |
| <b>CHILLED WATER COIL</b>   |                  |                               |       |       |       |       |       |
| quantity / configuration  |                  | no.                           | 1     | 1     | 1     | 1     |       |
| pipes/fins  |                  | Copper/treated aluminum       |       |       |       |       |       |
| pitch fins  |                  | mm                            | 1.6   | 1.6   | 1.6   | 1.6   |       |
| rows  |                  | no.                           | 5     | 5     | 5     | 5     |       |
| front surface   |                  | m <sup>2</sup>                | 0.70  | 0.70  | 0.70  | 0.70  |       |
| <b>WATER CIRCUIT</b>  |                  |                               |       |       |       |       |       |
| condenser type  |                  | Braze plate                   |       |       |       |       |       |
| water connections ISO 7/1   |                  | inch                          |       |       |       |       |       |
| Total water internal volume                                       |                  | l                             |       |       |       |       |       |
| <b>DIMENSIONS</b>   |                  |                               |       |       |       |       |       |
| width   |                  | mm                            | 844   | 844   | 844   | 844   |       |
| depth   |                  | mm                            | 890   | 890   | 890   | 890   |       |
| height  |                  | mm                            | 1970  | 1970  | 1970  | 1970  |       |
| footprint   |                  | m <sup>2</sup>                | 0.75  | 0.75  | 0.75  | 0.75  |       |

Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.

Standard ESP: Upflow 50Pa; Downflow Up 20Pa; Downflow Frontal 0Pa

For Downflow Up version the data refers to the height of the raised floor= 600mm

Performance data refers to Downflow Units, if not specified otherwise.

**(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17° C wb)**

- Condensing temperature: 45° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(2) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 35°C bs; 30% R.H. (21.4° C wb)**

- Condensing temperature: 45° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(3) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.**

**(4) The Airflow indicated in the Smart Performance is the unit nominal airflow.**

Technical data can be subject to change without notice.

# Technical Data

| MODELS  |                  |                               | PX041                          | PX047  | PX051  | PX044       | PX054       |        |
|---|------------------|-------------------------------|--------------------------------|--------|--------|-------------|-------------|--------|
| Power supply voltage  |                  | V/Ph/Hz                       | 400V ±10% / 3Ph / 50Hz         |        |        |             |             |        |
| Refrigerant circuit   |                  |                               | single                         | single | single | double      | double      |        |
| PERFORMANCE LEGACY (1)(3)   |                  |                               | Air Condition: 24° C, R.H. 50% |        |        |             |             |        |
| air flow  | m³/h             |                               | 10000                          | 13200  | 15200  | 12500       | 15300       |        |
| ethylene glycol   | %                |                               | 30                             | 30     | 30     | 30          | 30          |        |
| proposed Dry Cooler   |                  |                               | DYS035                         | DYS035 | DYS044 | DYS035      | DYS044      |        |
| <b>MECHANICAL COOLING PERFORMANCE (@ 35.0° C outdoor air temperature)</b> |                  |                               |                                |        |        |             |             |        |
| Refrigerant   |                  |                               | R410A                          |        |        |             |             |        |
| total gross cooling capacity  |                  | kW                            | 34.9                           | 43.6   | 48.2   | 38.6        | 47.7        |        |
| sensible gross cooling capacity   |                  | kW                            | 34.7                           | 43.6   | 48.2   | 38.6        | 47.7        |        |
| SHR (sensible/total ratio)  |                  | -                             | 1                              | 1      | 1      | 1           | 1           |        |
| compressor power input  |                  | kW                            | 10.17                          | 12.51  | 12.48  | 5.77+5.67   | 6.84+6.75   |        |
| compressor OA   |                  | A                             | 17.87                          | 16.62  | 23.37  | 9.8+9.75    | 12.45+12.3  |        |
| Configuration   | Upflow           | Net Sensible cooling capacity | kW                             | 32.8   | 40.9   | 44.4        | 35.8        | 43.1   |
|   |                  | fan power input               | kW                             | 2.41   | 2X1.35 | 2X1.91      | 2X1.33      | 2X1.19 |
|   |                  | unit power input              | kW                             | 12.63  | 15.23  | 16.33       | 14.12       | 17.99  |
|   | Downflow Up      | Net Sensible cooling capacity | kW                             | 32.3   | 41     | 44.5        | 36          | 43.4   |
|   |                  | fan power input               | kW                             | 2.41   | 2X1.3  | 2X1.85      | 2X1.28      | 2.14   |
|   |                  | unit power input              | kW                             | 12.61  | 15.14  | 16.21       | 14.03       | 17.9   |
|   | Downflow Down    | Net Sensible cooling capacity | kW                             | 32.6   | 41.4   | 45          | 36.4        | 43.9   |
|   |                  | fan power input               | kW                             | 2.15   | 2X1.13 | 2X1.59      | 2X1.11      | 2X1.86 |
|   |                  | unit power input              | kW                             | 12.35  | 14.8   | 3.21        | 13.69       | 17.34  |
|   | Downflow Frontal | Net Sensible cooling capacity | kW                             | 32.4   | 40.8   | 43.3        | 35.8        | 43     |
|   |                  | fan power input               | kW                             | 2.28   | 2X1.21 | 2X1.75      | 2X1.2       | 2X2.02 |
|   |                  | unit power input              | kW                             | 12.48  | 14.92  | 3.53        | 13.83       | 17.62  |
| mixture flow  |                  | l/s                           | 1.397                          | 1.943  | 1.987  | 0.708+0.708 | 0.78+0.78   |        |
| mixture condenser pressure drop   |                  | kPa                           | 18                             | 32     | 34     | 20+20       | 17+17       |        |
| unit total pressure drop  |                  | kPa                           | 28                             | 52     | 55     | 23+23       | 20+20       |        |
| <b>FREECOOLING PERFORMANCE (@ 5.0° C outdoor air temperature)</b>         |                  |                               |                                |        |        |             |             |        |
| total gross cooling capacity  |                  | kW                            | 25.4                           | 33.9   | 39     | 28          | 35.6        |        |
| sensible gross cooling capacity   |                  | kW                            | 25.4                           | 33.9   | 39     | 28          | 35.6        |        |
| SHR (sensible/total ratio)  |                  | -                             | 1                              | 1      | 1      | 1           | 1           |        |
| Configuration   | Upflow           | Net Sensible cooling capacity | kW                             | 23     | 30.4   | 35.2        | 26.1        | 31.3   |
|   |                  | fan power input               | kW                             | 2.41   | 2X1.35 | 2X1.91      | 2X1.33      | 2X2.19 |
|   |                  | unit power input              | kW                             | 2.44   | 2.73   | 3.85        | 2.69        | 4.41   |
|   | Downflow Up      | Net Sensible cooling capacity | kW                             | 23     | 30.5   | 35.3        | 25.4        | 31.4   |
|   |                  | fan power input               | kW                             | 2.41   | 2X1.3  | 2X1.85      | 2X1.28      | 2X2.14 |
|   |                  | unit power input              | kW                             | 2.44   | 2.63   | 3.73        | 2.59        | 4.31   |
|   | Downflow Down    | Net Sensible cooling capacity | kW                             | 23.2   | 30.8   | 35.8        | 26.4        | 31.9   |
|   |                  | fan power input               | kW                             | 2.15   | 2X1.13 | 2X1.59      | 2X1.11      | 2X1.86 |
|   |                  | unit power input              | kW                             | 2.18   | 2.29   | 3.21        | 2.25        | 3.75   |
|   | Downflow Frontal | Net Sensible cooling capacity | kW                             | 23.1   | 30.6   | 35.5        | 26.3        | 31.7   |
|   |                  | fan power input               | kW                             | 2.28   | 2X1.21 | 2X1.75      | 2X1.2       | 2X2.02 |
|   |                  | unit power input              | kW                             | 2.31   | 2.45   | 3.53        | 2.43        | 4.07   |
| mixture flow  |                  | l/s                           | 1.4                            | 1.94   | 1.99   | 1.42        | 1.56        |        |
| unit total pressure drop  |                  | kPa                           | 73                             | 51     | 53     | 24          | 28          |        |
| dry - cooler pressure drop  |                  | kPa                           | 32                             | 32     | 29     | 32          | 29          |        |
| PERFORMANCE SMART (2)(3)  |                  |                               | Air Condition: 35° C, R.H. 30% |        |        |             |             |        |
| air flow(4)   | m3/h             |                               | 10000                          | 13200  | 15200  | 12500       | 15300       |        |
| ethylene glycol   | %                |                               | 30                             | 30     | 30     | 30          | 30          |        |
| proposed Dry Cooler   |                  |                               | DYS035                         | DYS035 | DYS044 | DYS035      | DYS044      |        |
| <b>MECHANICAL COOLING PERFORMANCE (@ 35.0° C outdoor air temperature)</b> |                  |                               |                                |        |        |             |             |        |
| Refrigerant   |                  |                               | R410A                          |        |        |             |             |        |
| total gross cooling capacity  |                  | kW                            | 42.5                           | 53.9   | 59.7   | 47.9        | 59          |        |
| sensible gross cooling capacity   |                  | kW                            | 42.5                           | 53.9   | 59.7   | 47.9        | 59          |        |
| SHR (sensible/total ratio)  |                  | -                             | 1                              | 1      | 1      | 1           | 1           |        |
| compressor power input  |                  | kW                            | 10.66                          | 13.26  | 13.01  | 6.18+6.09   | 7.2+7.18    |        |
| compressor OA   |                  | A                             | 18.53                          | 17.42  | 23.91  | 10.31+10.44 | 12.85+12.82 |        |

# Technical Data

| MODELS  |                  |                               |                | PX041                   | PX047  | PX051  | PX044       | PX054     |
|---|------------------|-------------------------------|----------------|-------------------------|--------|--------|-------------|-----------|
| Configuration   | Upflow           | Net Sensible cooling capacity | kW             | 40.6                    | 51.2   | 55.9   | 45.2        | 54.4      |
|   |                  | fan power input               | A              | 2.41                    | 2x1.35 | 2x1.91 | 2x1.37      | 2x2.19    |
|   |                  | unit power input              | kW             | 13.13                   | 15.99  | 16.86  | 15.01       | 18.78     |
|   | Downflow Up      | Net Sensible cooling capacity | kW             | 40.1                    | 51.3   | 56     | 45.4        | 54.8      |
|   |                  | fan power input               | A              | 2.41                    | 2x1.3  | 2x1.85 | 2x1.28      | 2x2.14    |
|   |                  | unit power input              | kW             | 13.1                    | 15.89  | 16.74  | 14.86       | 18.69     |
|   | Downflow Down    | Net Sensible cooling capacity | kW             | 40.3                    | 51.7   | 56.6   | 45.6        | 55.3      |
|   |                  | fan power input               | A              | 2.15                    | 2x1.13 | 2x1.59 | 2x1.16      | 2x1.86    |
|   |                  | unit power input              | kW             | 12.84                   | 15.55  | 16.22  | 14.62       | 18.13     |
|   | Downflow Frontal | Net Sensible cooling capacity | kW             | 40.2                    | 50.9   | 55.4   | 45          | 54.2      |
|   |                  | fan power input               | A              | 2.28                    | 2x1.21 | 2x1.75 | 2x1.20      | 2x2.02    |
|   |                  | unit power input              | kW             | 12.97                   | 15.67  | 16.51  | 14.68       | 18.4      |
| mixture flow  |                  |                               | l/s            | 1.397                   | 1.943  | 1.987  | 0.708+0.708 | 0.78+0.78 |
| mixture condenser pressure drop                                   |                  |                               | kPa            | 18                      | 32     | 34     | 20+20       | 17+17     |
| unit total pressure drop  |                  |                               | kPa            | 28                      | 52     | 55     | 23+23       | 20+20     |
| <b>FREECOOLING PERFORMANCE (@ 5.0° C outdoor air temperature)</b> |                  |                               |                |                         |        |        |             |           |
| total gross cooling capacity                                      |                  |                               | kW             | 40.9                    | 54.8   | 65.7   | 47.2        | 58.7      |
| sensible gross cooling capacity                                   |                  |                               | kW             | 40.9                    | 54.8   | 65.7   | 47.2        | 58.7      |
| SHR (sensible/total ratio)  |                  |                               | -              | 1                       | 1      | 1      | 1           | 1         |
| Configuration   | Upflow           | Net Sensible cooling capacity | kW             | 38.4                    | 52.1   | 61.8   | 44.5        | 53.3      |
|   |                  | fan power input               | kW             | 2.41                    | 2x1.35 | 2x1.91 | 2x1.37      | 2x1.19    |
|   |                  | unit power input              | kW             | 2.44                    | 2.73   | 3.85   | 2.77        | 4.41      |
|   | Downflow Up      | Net Sensible cooling capacity | kW             | 38.5                    | 52.2   | 62     | 44.7        | 54.4      |
|   |                  | fan power input               | kW             | 2.41                    | 2x1.3  | 2x1.85 | 2x1.28      | 2x2.14    |
|   |                  | unit power input              | kW             | 2.44                    | 2.63   | 3.73   | 2.59        | 4.31      |
|   | Downflow Down    | Net Sensible cooling capacity | kW             | 38.7                    | 52.5   | 62.5   | 44.9        | 53.9      |
|   |                  | fan power input               | kW             | 2.15                    | 2x2.13 | 2x1.59 | 2x1.16      | 2x1.86    |
|   |                  | unit power input              | kW             | 2.18                    | 2.29   | 3.21   | 2.35        | 3.75      |
|   | Downflow Frontal | Net Sensible cooling capacity | kW             | 38.6                    | 52.4   | 62.2   | 44.8        | 53.6      |
|   |                  | fan power input               | kW             | 2.28                    | 2x1.21 | 2x1.75 | 2x1.20      | 2x2.02    |
|   |                  | unit power input              | kW             | 2.31                    | 2.45   | 3.53   | 2.43        | 4.07      |
| mixture flow  |                  |                               | l/s            | 1.4                     | 1.94   | 1.99   | 1.42        | 1.56      |
| unit total pressure drop  |                  |                               | kPa            | 72                      | 49     | 52     | 23          | 27        |
| dry - cooler pressure drop  |                  |                               | kPa            | 30                      | 30     | 28     | 30          | 28        |
| <b>FAN</b>  |                  |                               |                |                         |        |        |             |           |
| Quantity (Premium Fan Module)                                     |                  |                               | no.            | 1                       | 2      | 2      | 2           | 2         |
| FLA   |                  |                               | A              | 5                       | 10     | 10     | 10          | 10        |
| LRA   |                  |                               | A              | 0.1                     | 0.2    | 0.2    | 0.2         | 0.2       |
| Quantity (Basic Fan Module, Fix speed)                            |                  |                               | no.            | 1                       | 1      | 1      | 1           | 1         |
| FLA   |                  |                               | A              | 5                       | 5      | 5      | 5           | 5         |
| LRA   |                  |                               | A              | 0.1                     | 0.1    | 0.1    | 0.1         | 0.1       |
| <b>COMPRESSOR</b>   |                  |                               |                |                         |        |        |             |           |
| Quantity (Digital Scroll Cooling System)                          |                  |                               | no.            | 1                       | 2      | 2      | 2           | 2         |
| FLA   |                  |                               | A              | 25                      | 2x16.5 | 2x16.2 | 2x15        | 2x16.2    |
| LRA   |                  |                               | A              | 118                     | 2x101  | 2x101  | 2x75        | 2x101     |
| <b>EVAPORATING COIL</b>   |                  |                               |                |                         |        |        |             |           |
| quantity / configuration  |                  |                               | no.            | 1                       | 1      | 1      | 1           | 1         |
| pipes/fins  |                  |                               |                | Copper/treated aluminum |        |        |             |           |
| pitch fins  |                  |                               | mm             | 1.8                     | 1.8    | 1.8    | 1.8         | 1.8       |
| rows  |                  |                               | no.            | 5                       | 4      | 4      | 2+3         | 2+3       |
| front surface   |                  |                               | m <sup>2</sup> | 0.978                   | 1.626  | 1.626  | 1.482       | 1.482     |
| <b>CHILLED WATER COIL</b>   |                  |                               |                |                         |        |        |             |           |
| quantity / configuration  |                  |                               | no.            | 1                       | 1      | 1      | 1           | 1         |
| pipes/fins  |                  |                               |                | Copper/treated aluminum |        |        |             |           |
| pitch fins  |                  |                               | mm             | 1.6                     | 1.6    | 1.6    | 1.6         | 1.6       |
| rows  |                  |                               | no.            | 5                       | 5      | 5      | 5           | 5         |
| front surface   |                  |                               | m <sup>2</sup> | 0.978                   | 1.626  | 1.626  | 1.482       | 1.482     |
| <b>WATER CIRCUIT</b>  |                  |                               |                |                         |        |        |             |           |
| condenser type  |                  |                               |                | Braze plate             |        |        |             |           |
| water connections ISO 7/1   |                  |                               | inch           | Rp 1 ¼                  | Rp 1 ½ | Rp 1 ½ | Rp 1 ½      | Rp 1 ½    |
| Total water internal volume                                       |                  |                               | l              | 21.44                   | 32.04  | 32.04  | 31.92       | 32.6      |
| <b>DIMENSIONS</b>   |                  |                               |                |                         |        |        |             |           |
| width   |                  |                               | mm             | 1200                    | 1750   | 1750   | 1750        | 1750      |
| depth   |                  |                               | mm             | 890                     | 890    | 890    | 890         | 890       |
| height  |                  |                               | mm             | 1970                    | 1970   | 1970   | 1970        | 1970      |
| footprint   |                  |                               | m <sup>2</sup> | 1.068                   | 1.558  | 1.558  | 1.558       | 1.558     |

## Technical Data

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Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.  
Standard ESP: Upflow 50Pa; Downflow Up 20Pa; Downflow Down 20 Pa Downflow Frontal 0Pa  
For Downflow Up and Down versions the data refers to the height of the raised floor= 600mm  
Performance data refers to Downflow Units, if not specified otherwise.

**(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17° C wb)**

- Condensing temperature: 45° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(2) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 35°C bs; 30% R.H. (21.4° C wb)**

- Condensing temperature:45° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(3) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.**

**(4) The Airflow indicated in the Smart Performance is the unit nominal airflow.**

Technical data can be subject to change without notice.

\* VICTAULIC® Connection.

\*\* Optional. Threaded union on request

# Technical Data

| MODELS  |                  | PX062                          | PX068       | PX082       | PX094       | PX104       |        |        |
|---|------------------|--------------------------------|-------------|-------------|-------------|-------------|--------|--------|
| Power supply voltage  |                  | V/Ph/Hz 400V ±10% / 3Ph / 50Hz |             |             |             |             |        |        |
| Refrigerant circuit   |                  | double                         | double      | double      | double      | double      |        |        |
| PERFORMANCE LEGACY (1)(3)   |                  | Air Condition: 24° C, R.H. 50% |             |             |             |             |        |        |
| air flow  | m³/h             | 15900                          | 18500       | 24000       | 25000       | 25000       |        |        |
| ethylene glycol   | %                | 30                             | 30          | 30          | 30          | 30          |        |        |
| proposed Dry Cooler   |                  | DYS050                         | DYS050      | DYS065      | DYS084      | DYS084      |        |        |
| <b>MECHANICAL COOLING PERFORMANCE (@ 35.0° C outdoor air temperature)</b> |                  |                                |             |             |             |             |        |        |
| Refrigerant   |                  | R410A                          |             |             |             |             |        |        |
| total gross cooling capacity  | kW               | 54.4                           | 58.2        | 73.3        | 84          | 87.8        |        |        |
| sensible gross cooling capacity   | kW               | 54.4                           | 58.2        | 73.3        | 83.8        | 85.6        |        |        |
| SHR (sensible/total ratio)  | -                | 1                              | 1           | 1           | 1           | 0.98        |        |        |
| compressor power input  | kW               | 7.76+7.64                      | 7.73+7.65   | 11.56+11.82 | 13.08+13.28 | 14.03+14.2  |        |        |
| compressor OA   | A                | 14.31+14.26                    | 14.27+14.27 | 19.71+20.08 | 1719+17.4   | 25.32+25.53 |        |        |
| Configuration   | Upflow           | Net Sensible cooling capacity  | kW          | 49.3        | 55.3        | 67.6        | 77.5   | 79.9   |
|   |                  | fan power input                | kW          | 2x2.39      | 3x1.15      | 3x2.16      | 3x2.41 | 3x2.41 |
|   |                  | unit power input               | kW          | 20.21       | 18.9        | 29.91       | 33.75  | 35.58  |
|   | Downflow Up      | Net Sensible cooling capacity  | kW          | 49.7        | 54.9        | 66.8        | 77     | 78.6   |
|   |                  | fan power input                | kW          | 2x2.33      | 3x1.11      | 3x2.16      | 3x2.35 | 3x2.35 |
|   |                  | unit power input               | kW          | 20.09       | 18.74       | 29.89       | 33.44  | 35.31  |
|   | Downflow Down    | Net Sensible cooling capacity  | kW          | 50.3        | 55.2        | 67.6        | 77.5   | 79.3   |
|   |                  | fan power input                | kW          | 2x2.04      | 3x0.99      | 3x1.93      | 3x2.12 | 3x2.12 |
|   |                  | unit power input               | kW          | 19.51       | 18.38       | 29.5        | 32.81  | 34.62  |
|   | Downflow Frontal | Net Sensible cooling capacity  | kW          | 48.8        | -           | -           | -      | -      |
|   |                  | fan power input                | kW          | 2x2.21      | -           | -           | -      | -      |
|   |                  | unit power input               | kW          | 19.81       | -           | -           | -      | -      |
| mixture flow  | l/s              | 0.892+0.892                    | 0.987+0.987 | 1.08+1.08   | 1.267+1.267 | 1.267+1.267 |        |        |
| mixture condenser pressure drop   | kPa              | 16+16                          | 9+10        | 11+11       | 15+15       | 15+15       |        |        |
| unit total pressure drop  | kPa              | 20+20                          | 14+15       | 17+17       | 23+23       | 23+23       |        |        |
| <b>FREECOOLING PERFORMANCE (@ 5.0° C outdoor air temperature)</b>         |                  |                                |             |             |             |             |        |        |
| total gross cooling capacity  | kW               | 38.9                           | 45.2        | 52.1        | 59.3        | 59.3        |        |        |
| sensible gross cooling capacity   | kW               | 38.9                           | 45.2        | 52.1        | 59.3        | 59.3        |        |        |
| SHR (sensible/total ratio)  | -                | 1                              | 1           | 1           | 1           | 1           |        |        |
| Configuration   | Upflow           | Net Sensible cooling capacity  | kW          | 34.1        | 41.6        | 46.8        | 52.1   | 52     |
|   |                  | fan power input                | kW          | 2x2.39      | 3x1.15      | 3x2.16      | 3x2.41 | 3x2.41 |
|   |                  | unit power input               | kW          | 4.81        | 3.48        | 6.51        | 7.25   | 7.25   |
|   | Downflow Up      | Net Sensible cooling capacity  | kW          | 34.3        | 41.9        | 45.6        | 52.3   | 52.2   |
|   |                  | fan power input                | kW          | 2x2.33      | 3x1.11      | 3x2.16      | 3x2.35 | 3x2.35 |
|   |                  | unit power input               | kW          | 4.69        | 3.36        | 6.51        | 7.08   | 7.08   |
|   | Downflow Down    | Net Sensible cooling capacity  | kW          | 34.8        | 42.1        | 46.8        | 53     | 52.8   |
|   |                  | fan power input                | kW          | 2x2.04      | 3x0.99      | 3x1.93      | 3x2.12 | 3x2.12 |
|   |                  | unit power input               | kW          | 4.11        | 3           | 5.82        | 6.39   | 6.39   |
|   | Downflow Frontal | Net Sensible cooling capacity  | kW          | 34.5        | -           | -           | -      | -      |
|   |                  | fan power input                | kW          | 2x2.21      | -           | -           | -      | -      |
|   |                  | unit power input               | kW          | 4.45        | -           | -           | -      | -      |
| mixture flow  | l/s              | 1.78                           | 1.98        | 2.16        | 2.54        | 2.54        |        |        |
| unit total pressure drop  | kPa              | 36                             | 21          | 25          | 33          | 34          |        |        |
| dry - cooler pressure drop  | kPa              | 27                             | 18          | 18          | 12          | 12          |        |        |
| <b>PERFORMANCE SMART (2)(3)</b>   |                  |                                |             |             |             |             |        |        |
| Air Condition: 35° C, R.H. 30%  |                  |                                |             |             |             |             |        |        |
| air flow(4)   | m³/h             | 15900                          | 18500       | 24000       | 25000       | 25000       |        |        |
| ethylene glycol   | %                | 30                             | 30          | 30          | 30          | 30          |        |        |
| proposed Dry Cooler   |                  | DYS050                         | DYS050      | DYS065      | DYS084      | DYS084      |        |        |
| <b>MECHANICAL COOLING PERFORMANCE (@ 35.0° C outdoor air temperature)</b> |                  |                                |             |             |             |             |        |        |
| Refrigerant   |                  | R410A                          |             |             |             |             |        |        |
| total gross cooling capacity  | kW               | 66.3                           | 72.2        | 90.6        | 102.9       | 106.3       |        |        |
| sensible gross cooling capacity   | kW               | 66.3                           | 72.2        | 90.6        | 102.9       | 106.3       |        |        |
| SHR (sensible/total ratio)  | -                | 1                              | 1           | 1           | 1           | 1           |        |        |
| compressor power input  | kW               | 8.26+8.18                      | 8.33+8.22   | 12.44+12.76 | 13.91+14.29 | 14.79+15.13 |        |        |
| compressor OA   | A                | 14.96+14.91                    | 15.03+14.96 | 20.96+21.42 | 18.1+18.53  | 26.26+26.67 |        |        |



# Technical Data

| MODELS  |                  |                               |                | PX062                   | PX068              | PX082     | PX094       | PX104       |
|---|------------------|-------------------------------|----------------|-------------------------|--------------------|-----------|-------------|-------------|
| Configuration   | Upflow           | Net Sensible cooling capacity | kW             | 61.4                    | 69.4               | 85        | 96.7        | 100.2       |
|   |                  | fan power input               | A              | 2x2.39                  | 3x1.15             | 3x2.16    | 3x2.41      | 3x2.41      |
|   |                  | unit power input              | kW             | 21.23                   | 20.09              | 31.78     | 35.56       | 37.25       |
|   | Downflow Up      | Net Sensible cooling capacity | kW             | 61.7                    | 68.9               | 84.1      | 95.8        | 99.2        |
|   |                  | fan power input               | A              | 2x2.33                  | 3x1.07             | 3x2.16    | 3x2.35      | 3x2.35      |
|   |                  | unit power input              | kW             | 21.13                   | 19.79              | 31.71     | 35.28       | 37          |
|   | Downflow Down    | Net Sensible cooling capacity | kW             | 62.3                    | 69.2               | 84.8      | 96.5        | 102.7       |
|   |                  | fan power input               | A              | 2x2.04                  | 3x0.99             | 3x1.93    | 3x2.12      | 3x1.2       |
|   |                  | unit power input              | kW             | 20.55                   | 19.55              | 31.02     | 34.59       | 33.55       |
|   | Downflow Frontal | Net Sensible cooling capacity | kW             | 61                      | -                  | -         | -           | -           |
|   |                  | fan power input               | A              | 2x2.21                  | -                  | -         | -           | -           |
|   |                  | unit power input              | kW             | 20.8                    | -                  | -         | -           | -           |
| mixture flow  |                  |                               | l/s            | 0.892+0.892             | 0.987+0.987        | 1.08+1.08 | 1.267+1.267 | 1.267+1.267 |
| mixture condenser pressure drop                                   |                  |                               | kPa            | 16+16                   | 9+10               | 11+11     | 15+15       | 15+15       |
| unit total pressure drop  |                  |                               | kPa            | 20+20                   | 14+15              | 17+17     | 23+23       | 23+23       |
| <b>FREECOOLING PERFORMANCE (@ 5.0° C outdoor air temperature)</b> |                  |                               |                |                         |                    |           |             |             |
| total gross cooling capacity                                      |                  |                               | kW             | 62.9                    | 74.5               | 86.8      | 97.9        | 96.8        |
| sensible gross cooling capacity                                   |                  |                               | kW             | 62.9                    | 74.5               | 86.8      | 97.9        | 96.8        |
| SHR (sensible/total ratio)  |                  |                               | -              | 1                       | 1                  | 1         | 1           | 1           |
| Configuration   | Upflow           | Net Sensible cooling capacity | kW             | 58.2                    | 71                 | 80.6      | 89.7        | 89.5        |
|   |                  | fan power input               | kW             | 2x2.39                  | 3x1.15             | 3x2.16    | 3x2.41      | 3x2.41      |
|   |                  | unit power input              | kW             | 4.81                    | 3.48               | 6.51      | 7.25        | 7.25        |
|   | Downflow Up      | Net Sensible cooling capacity | kW             | 58.3                    | 71.3               | 80.3      | 90.8        | 89.8        |
|   |                  | fan power input               | kW             | 2x2.33                  | 3x1.07             | 3x2.16    | 3x2.35      | 3x2.35      |
|   |                  | unit power input              | kW             | 4.69                    | 3.24               | 6.51      | 7.08        | 7.08        |
|   | Downflow Down    | Net Sensible cooling capacity | kW             | 58.8                    | 71.5               | 81.3      | 90.6        | 90.4        |
|   |                  | fan power input               | kW             | 2x2.04                  | 3x0.99             | 3x1.93    | 3x2.12      | 3x2.12      |
|   |                  | unit power input              | kW             | 4.11                    | 3                  | 5.82      | 6.39        | 6.39        |
|   | Downflow Frontal | Net Sensible cooling capacity | kW             | 58.5                    | -                  | -         | -           | -           |
|   |                  | fan power input               | kW             | 2x2.21                  | -                  | -         | -           | -           |
|   |                  | unit power input              | kW             | 4.45                    | -                  | -         | -           | -           |
| mixture flow  |                  |                               | l/s            | 1.78                    | 1.98               | 2.16      | 2.54        | 2.54        |
| unit total pressure drop  |                  |                               | kPa            | 35                      | 21                 | 24        | 33          | 33          |
| dry - cooler pressure drop  |                  |                               | kPa            | 26                      | 17                 | 18        | 11          | 11          |
| <b>FAN</b>  |                  |                               |                |                         |                    |           |             |             |
| Quantity (Premium Fan Module)                                     |                  |                               | no.            | 2                       | 3                  | 3         | 3           | 3           |
| FLA   |                  |                               | A              | 10                      | 15                 | 15        | 15          | 15          |
| LRA   |                  |                               | A              | 0.2                     | 0.3                | 0.3       | 0.3         | 0.3         |
| Quantity (Basic Fan Module, Fix speed)                            |                  |                               | no.            | 2                       | 2                  | 2         | 2           | 2           |
| FLA   |                  |                               | A              | 10                      | 10                 | 10        | 10          | 10          |
| LRA   |                  |                               | A              | 0.2                     | 0.2                | 0.2       | 0.2         | 0.2         |
| <b>COMPRESSOR</b>   |                  |                               |                |                         |                    |           |             |             |
| Quantity (Digital Scroll Cooling System)                          |                  |                               | no.            | 2                       | 2                  | 4         | 4           | 4           |
| FLA   |                  |                               | A              | 2x18.2                  | 2x18.2             | 4x15      | 4x15.5      | 4x16.2      |
| LRA   |                  |                               | A              | 2x128                   | 2x128              | 4x75      | 4x101       | 4x101       |
| <b>EVAPORATING COIL</b>   |                  |                               |                |                         |                    |           |             |             |
| quantity / configuration  |                  |                               | no.            | 1                       | 1                  | 1         | 1           | 1           |
| pipes/fins  |                  |                               |                | Copper/treated aluminum |                    |           |             |             |
| pitch fins  |                  |                               | mm             | 1.8                     | 1.8                | 1.8       | 1.8         | 1.8         |
| rows  |                  |                               | no.            | 2+3                     | 2+3                | 2+3       | 2+3         | 2+3         |
| front surface   |                  |                               | m <sup>2</sup> | 1.482                   | 2.442              | 2.442     | 2.442       | 2.442       |
| <b>CHILLED WATER COIL</b>   |                  |                               |                |                         |                    |           |             |             |
| quantity / configuration  |                  |                               | no.            | 1                       | 1                  | 1         | 1           | 1           |
| pipes/fins  |                  |                               |                | Copper/treated aluminum |                    |           |             |             |
| pitch fins  |                  |                               | mm             | 1.6                     | 1.6                | 1.6       | 1.6         | 1.6         |
| rows  |                  |                               | no.            | 5                       | 5                  | 5         | 5           | 5           |
| front surface   |                  |                               | m <sup>2</sup> | 1.482                   | 2.442              | 2.442     | 2.442       | 2.442       |
| <b>WATER CIRCUIT</b>  |                  |                               |                |                         |                    |           |             |             |
| condenser type  |                  |                               |                | Braze plate             |                    |           |             |             |
| water connections ISO 7/1   |                  |                               | inch           | Rp 1 ½                  | O. D. 54 mm* R 2** |           |             |             |
| Total water internal volume                                       |                  |                               | l              | 33.26                   | 53.08              | 53.08     | 53.08       | 53.08       |
| <b>DIMENSIONS</b>   |                  |                               |                |                         |                    |           |             |             |
| width   |                  |                               | mm             | 1750                    | 2550               | 2550      | 2550        | 2550        |
| depth   |                  |                               | mm             | 890                     | 890                | 890       | 890         | 890         |
| height  |                  |                               | mm             | 1970                    | 1970               | 1970      | 1970        | 1970        |
| footprint   |                  |                               | m <sup>2</sup> | 1.558                   | 2.270              | 2.270     | 2.270       | 2.270       |

## Technical Data

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Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.  
Standard ESP: Upflow 50Pa; Downflow Up 20Pa; Downflow Down 20 Pa Downflow Frontal 0Pa  
For Downflow Up and Down versions the data refers to the height of the raised floor= 600mm  
Performance data refers to Downflow Units, if not specified otherwise.

**(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17° C wb)**

- Condensing temperature: 45° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(2) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 35°C bs; 30% R.H. (21.4° C wb)**

- Condensing temperature: 45° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(3) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.**

**(4) The Airflow indicated in the Smart Performance is the unit nominal airflow.**

Technical data can be subject to change without notice.

\* VICTAULIC® Connection.

\*\* Optional. Threaded union on request

# Technical Data

Tab. 4e - Scroll Cooling System dualfluid direct expansion unit @ 100% cooling capacity, Premium Fan Module

PXxxx D/H series

| MODELS   |                  | PX015                          | PX021* | PX025  | PX031  |       |       |
|--|------------------|--------------------------------|--------|--------|--------|-------|-------|
| Power supply voltage                               |                  | V/Ph/Hz                        |        |        |        |       |       |
|  |                  | 400V ±10% / 3Ph / 50Hz         |        |        |        |       |       |
| Refrigerant circuit                                |                  | single                         | single | single | single |       |       |
| PERFORMANCE LEGACY (1)(2)                          |                  | Air Condition: 24° C, R.H. 50% |        |        |        |       |       |
| air flow   | m³/h             | 4984                           | 5397   | 6484   | 7202   |       |       |
| ethylene glycol                                    | %                | 0                              | 0      | 0      | 0      |       |       |
| <b>MECHANICAL COOLING PERFORMANCE (1)</b>          |                  |                                |        |        |        |       |       |
| Refrigerant  |                  | R410A                          |        |        |        |       |       |
| total gross cooling capacity                       | kW               | 13.4                           | 18     | 22.8   | 24.6   |       |       |
| sensible gross cooling capacity                    | kW               | 13.4                           | 18     | 22.4   | 24.6   |       |       |
| SHR (sensible/total ratio)                         | -                | 1                              | 1      | 0.98   | 1      |       |       |
| compressor power input                             | kW               | 2.59                           | 3.86   | 5.18   | 5.53   |       |       |
| compressor OA                                      | A                | 4.5                            | 6.72   | 10.08  | 10.82  |       |       |
| Configuration                                      | Upflow           | Net Sensible cooling capacity  | kW     | 12.3   | 16.6   | 20.2  | 21.6  |
|  |                  | fan power input                | kW     | 1      | 1.25   | 1.91  | 2.54  |
|  |                  | unit power input               | kW     | 3.62   | 5.14   | 7.12  | 8.1   |
|  | Downflow Up      | Net Sensible cooling capacity  | kW     | 12.5   | 16.9   | 20.7  | 22.2  |
|  |                  | fan power input                | kW     | 0.92   | 1.13   | 1.73  | 2.32  |
|  |                  | unit power input               | kW     | 3.51   | 5.02   | 6.94  | 7.88  |
|  | Downflow Frontal | Net Sensible cooling capacity  | kW     | 12.6   | 16.9   | 20.7  | 22.3  |
|  |                  | fan power input                | kW     | 0.85   | 1.13   | 1.67  | 2.25  |
|  |                  | unit power input               | kW     | 3.47   | 5.02   | 6.88  | 7.81  |
| Condensing section (H models only)                 |                  |                                |        |        |        |       |       |
| water inlet temp: 30° C - condensation temp: 45° C |                  |                                |        |        |        |       |       |
| water flow   | l/s              | 0.336                          | 0.409  | 0.542  | 0.578  |       |       |
| water side pressure drop                           | kPa              | 5                              | 6      | 11     | 10     |       |       |
| <b>CHILLED WATER PERFORMANCE (1)</b>               |                  |                                |        |        |        |       |       |
| total gross cooling capacity                       | kW               | 20.9                           | 22.2   | 25.3   | 27.3   |       |       |
| sensible gross cooling capacity                    | kW               | 17.6                           | 18.8   | 21.9   | 23.8   |       |       |
| SHR (sensible/total ratio)                         | -                | 0.84                           | 0.85   | 0.87   | 0.87   |       |       |
| Configuration                                      | Upflow           | Net Sensible cooling capacity  | kW     | 16.57  | 17.56  | 19.96 | 21.3  |
|  |                  | fan power input                | kW     | 1.03   | 1.24   | 1.94  | 2.57  |
|  |                  | unit power input               | kW     | 1.03   | 1.24   | 1.94  | 2.57  |
|  | Downflow Up      | Net Sensible cooling capacity  | kW     | 16.7   | 17.69  | 20.14 | 21.45 |
|  |                  | fan power input                | kW     | 0.95   | 1.11   | 1.76  | 2.35  |
|  |                  | unit power input               | kW     | 0.95   | 1.11   | 1.76  | 2.35  |
|  | Downflow Frontal | Net Sensible cooling capacity  | kW     | 16.8   | 17.73  | 20.2  | 21.52 |
|  |                  | fan power input                | kW     | 0.88   | 1.07   | 1.7   | 2.28  |
|  |                  | unit power input               | kW     | 0.88   | 1.07   | 1.7   | 2.28  |
| mixture flow                                       | l/s              | 0.99                           | 1.06   | 1.08   | 1.3    |       |       |
| unit total pressure drop                           | kPa              | 50                             | 56     | 63     | 81     |       |       |
| <b>FAN</b>   |                  |                                |        |        |        |       |       |
| Quantity (Premium Fan Module)                      | no.              | 1                              | 1      | 1      | 1      |       |       |
| FLA  | A                | 5.6                            | 5.6    | 5.6    | 5.6    |       |       |
| LRA  | A                | 0.1                            | 0.1    | 0.1    | 0.1    |       |       |
| Quantity (Basic Fan Module, Fix speed)             | no.              | 1                              | 1      | 1      | 1      |       |       |
| FLA  | A                | 3.1                            | 3.1    | 3.1    | 3.1    |       |       |
| LRA  | A                | 0.1                            | 0.1    | 0.1    | 0.1    |       |       |
| <b>COMPRESSOR</b>                                  |                  |                                |        |        |        |       |       |
| Quantity (Scroll Cooling System)                   | no.              | 1                              | 1      | 1      | 1      |       |       |
| FLA  | A                | 8                              | 11     | 15     | 16.2   |       |       |
| LRA  | A                | 43                             | 67.1   | 101    | 101    |       |       |
| <b>EVAPORATING COIL</b>                            |                  |                                |        |        |        |       |       |
| quantity / configuration                           | no.              | 1                              | 1      | 1      | 1      |       |       |
| pipes/fins   |                  | Copper/treated aluminum        |        |        |        |       |       |
| pitch fins   | mm               | 1.8                            | 1.8    | 1.8    | 1.8    |       |       |
| rows   | no.              | 5                              | 5      | 5      | 5      |       |       |
| front surface                                      | m²               | 0.70                           | 0.7    | 0.7    | 0.70   |       |       |
| <b>CHILLED WATER COIL</b>                          |                  |                                |        |        |        |       |       |
| quantity / configuration                           | no.              | 1                              | 1      | 1      | 1      |       |       |
| pipes/fins   |                  | Copper/treated aluminum        |        |        |        |       |       |
| pitch fins   | mm               | 1.6                            | 1.6    | 1.6    | 1.6    |       |       |
| rows   | no.              | 5                              | 5      | 5      | 5      |       |       |
| front surface                                      | m²               | 0.70                           | 0.7    | 0.7    | 0.70   |       |       |

\*PX021 unit is available only in D version

# Technical Data

| MODELS   |                | PX015   | PX021*   | PX025    | PX031    |
|--|----------------|---|----------|----------|----------|
| <b>REFRIGERANT CONNECTIONS (D models only)</b> |                | <b>Refrigerant connecting pipe diameter: see Tab. 12f, Chap. 12</b> |          |          |          |
| gas line outlet (pipe to be welded, o.d.)      | mm             | 16  | 16       | 16       | 22       |
| liquid line inlet (pipe to be welded, o.d.)    | mm             | 12  | 12       | 12       | 16       |
| <b>WATER CIRCUIT CONDENSER (H models only)</b> |                |   |          |          |          |
| condenser type                                 |                | Braze plate   |          |          |          |
| water connections ISO 7/1                      | inch           | Rp 1 1/4  | Rp 1 1/4 | Rp 1 1/4 | Rp 1 1/4 |
| Total water internal volume                    | l              | 1.58  | 1.89     | 1.89     | 2.22     |
| <b>CHILLED WATER CONTENT ISO 7/1</b>           |                |   |          |          |          |
| Total water internal volume                    | l              | 12.4  | 12.4     | 12.4     | 12.4     |
| <b>DIMENSIONS</b>                              |                |   |          |          |          |
| width  | mm             | 844   | 844      | 844      | 844      |
| depth  | mm             | 890   | 890      | 890      | 890      |
| height   | mm             | 1970  | 1970     | 1970     | 1970     |
| footprint                                      | m <sup>2</sup> | 0.75  | 0.75     | 0.75     | 0.75     |

Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.

Standard ESP: Upflow 50Pa; Downflow Up 20Pa; Downflow Frontal 0Pa

For Downflow Up version the data refers to the height of the raised floor= 600mm

Performance data refers to Downflow Units, if not specified otherwise.

**(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17° C wb)**

- Condensing temperature: 45° C

- CW mode water temperature inlet/outlet 7/12 ° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(2) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.**

Technical data can be subject to change without notice.

\* VICTAULIC® Connection.

\*\* Optional. Threaded union on request

# Technical Data

| MODELS  |                  | PX041                          | PX047  | PX051  | PX044       | PX054       |        |        |
|---|------------------|--------------------------------|--------|--------|-------------|-------------|--------|--------|
| Power supply voltage                                      |                  | V/Ph/Hz 400V ±10% / 3Ph / 50Hz |        |        |             |             |        |        |
| Refrigerant circuit                                       |                  | single                         | single | single | double      | double      |        |        |
| PERFORMANCE LEGACY (1)(2)                                 |                  | Air Condition: 24° C, R.H. 50% |        |        |             |             |        |        |
| air flow  | m³/h             | 10000                          | 13200  | 15200  | 12500       | 15300       |        |        |
| ethylene glycol   | %                | 0                              | 0      | 0      | 0           | 0           |        |        |
| <b>MECHANICAL COOLING PERFORMANCE (1)</b>                 |                  |                                |        |        |             |             |        |        |
| Refrigerant   |                  | R410A                          |        |        |             |             |        |        |
| total gross cooling capacity                              | kW               | 38.7                           | 45.3   | 52     | 42.8        | 52.3        |        |        |
| sensible gross cooling capacity                           | kW               | 36.5                           | 45.3   | 52     | 42.7        | 52.2        |        |        |
| SHR (sensible/total ratio)                                | -                | 0.94                           | 1      | 1      | 1           | 1           |        |        |
| compressor power input                                    | kW               | 8.26                           | 9.32   | 11.26  | 4.55+4.55   | 5.53+5.53   |        |        |
| compressor OA   | A                | 15.13                          | 17.44  | 22.25  | 8.15+8.14   | 10.81+10.82 |        |        |
| Configuration   | Upflow           | Net Sensible cooling capacity  | kW     | 34.7   | 42.6        | 48.2        | 39.9   |        |
|   |                  | fan power input                | kW     | 1.78   | 2x1.35      | 2x1.91      | 2x1.37 | 47.8   |
|   |                  | unit power input               | kW     | 10.07  | 12.05       | 15.11       | 11.87  | 2x2.25 |
|   | Downflow Up      | Net Sensible cooling capacity  | kW     | 34.1   | 42.7        | 48.3        | 40.1   | 47.8   |
|   |                  | fan power input                | kW     | 2.47   | 2x1.3       | 2x1.85      | 2x1.33 | 2x2.19 |
|   |                  | unit power input               | kW     | 10.76  | 11.95       | 14.99       | 2x1.33 | 15.47  |
|   | Downflow Down    | Net Sensible cooling capacity  | kW     | 34.3   | 43          | 48.7        | 2x1.33 | 48.4   |
|   |                  | fan power input                | kW     | 2.22   | 2x1.13      | 2x1.64      | 2x1.61 | 2x1.91 |
|   |                  | unit power input               | kW     | 10.51  | 11.63       | 14.57       | 11.45  | 14.91  |
|   | Downflow Frontal | Net Sensible cooling capacity  | kW     | 34.8   | 42.4        | 47.9        | 39.8   | 47.5   |
|   |                  | fan power input                | kW     | 1.53   | 2x1.21      | 2x1.75      | 2x1.24 | 2x2.08 |
|   |                  | unit power input               | kW     | 9.82   | 11.77       | 14.79       | 11.61  | 15.25  |
| <b>Condensing section (H models only)</b>                 |                  |                                |        |        |             |             |        |        |
| <b>water inlet temp: 30° C - condensation temp: 45° C</b> |                  |                                |        |        |             |             |        |        |
| water flow  | l/s              | 0.882                          | 1.041  | 1.223  | 0.513+0.484 | 0.621+0.594 |        |        |
| water side pressure drop                                  | kPa              | 17                             | 12     | 16     | 10+10       | 11+10       |        |        |
| <b>CHILLED WATER PERFORMANCE (1)</b>                      |                  |                                |        |        |             |             |        |        |
| total gross cooling capacity                              | kW               | 37.6                           | 53.9   | 59.5   | 49.2        | 56.7        |        |        |
| sensible gross cooling capacity                           | kW               | 35.3                           | 48.8   | 54.9   | 45.3        | 53.7        |        |        |
| SHR (sensible/total ratio)                                | -                | 0.94                           | 0.91   | 0.92   | 0.92        | 0.94        |        |        |
| Configuration   | Upflow           | Net Sensible cooling capacity  | kW     | 33.6   | 46.1        | 51.1        | 42.6   | 49.1   |
|   |                  | fan power input                | kW     | 1.78   | 2x1.35      | 2x1.91      | 2x1.37 | 2x2.25 |
|   |                  | unit power input               | kW     | 1.81   | 2.73        | 3.85        | 2.77   | 4.53   |
|   | Downflow Up      | Net Sensible cooling capacity  | kW     | 32.9   | 46.2        | 51.2        | 42.6   | 49.3   |
|   |                  | fan power input                | kW     | 2.47   | 2x1.3       | 2x1.85      | 2x1.33 | 2x2.19 |
|   |                  | unit power input               | kW     | 2.5    | 2.63        | 3.73        | 2.69   | 4.41   |
|   | Downflow Down    | Net Sensible cooling capacity  | kW     | 33.1   | 46.5        | 51.6        | 43     | 49.8   |
|   |                  | fan power input                | kW     | 2.22   | 2x1.13      | 2x1.64      | 2x1.61 | 2x1.91 |
|   |                  | unit power input               | kW     | 2.25   | 2.29        | 3.31        | 2.35   | 3.85   |
|   | Downflow Frontal | Net Sensible cooling capacity  | kW     | 33.8   | 46.4        | 51.4        | 42.8   | 49.5   |
|   |                  | fan power input                | kW     | 1.53   | 2x1.21      | 2x1.75      | 2x1.24 | 2x2.08 |
|   |                  | unit power input               | kW     | 1.56   | 2.45        | 3.53        | 2.51   | 4.19   |
| mixture flow  | l/s              | 1.79                           | 2.57   | 2.84   | 2.35        | 2.7         |        |        |
| unit total pressure drop                                  | kPa              | 100                            | 71     | 85     | 50          | 65          |        |        |
| <b>FAN</b>  |                  |                                |        |        |             |             |        |        |
| Quantity (Premium Fan Module)                             | no.              | 1                              | 1      | 1      | 2           | 2           |        |        |
| FLA   | A                | 5                              | 5      | 5      | 10          | 10          |        |        |
| LRA   | A                | 0.1                            | 0.1    | 0.1    | 0.2         | 0.2         |        |        |
| Quantity (Basic Fan Module, Fix speed)                    | no.              | 1                              | 1      | 1      | 1           | 1           |        |        |
| FLA   | A                | 5                              | 5      | 5      | 5           | 5           |        |        |
| LRA   | A                | 0.1                            | 0.1    | 0.1    | 0.1         | 0.1         |        |        |
| <b>COMPRESSOR</b>   |                  |                                |        |        |             |             |        |        |
| Quantity (Scroll Cooling System)                          | no.              | 1                              | 1      | 1      | 2           | 2           |        |        |
| FLA   | A                | 25                             | 31     | 34     | 2x15        | 2x16.2      |        |        |
| LRA   | A                | 118                            | 140    | 174    | 2x75        | 2x101       |        |        |
| <b>EVAPORATING COIL</b>                                   |                  |                                |        |        |             |             |        |        |
| quantity / configuration                                  | no.              | 1                              | 1      | 1      | 1           | 1           |        |        |
| pipes/fins  |                  | Copper/treated aluminum        |        |        |             |             |        |        |
| pitch fins  | mm               | 1.8                            | 1.8    | 1.8    | 1.8         | 1.8         |        |        |
| rows  | no.              | 5                              | 4      | 4      | 2+2         | 2+3         |        |        |
| front surface   | m²               | 0.978                          | 1.626  | 1.626  | 1.482       | 1.482       |        |        |
| <b>CHILLED WATER COIL</b>                                 |                  |                                |        |        |             |             |        |        |
| quantity / configuration                                  | no.              | 1                              | 1      | 1      | 1           | 1           |        |        |
| pipes/fins  |                  | Copper/treated aluminum        |        |        |             |             |        |        |
| pitch fins  | mm               | 1.6                            | 1.6    | 1.6    | 1.6         | 1.6         |        |        |

# Technical Data

| MODELS   |                | PX041   | PX047  | PX051  | PX044  | PX054  |
|--|----------------|---|--------|--------|--------|--------|
| rows   | no.            | 5   | 5      | 5      | 5      | 5      |
| front surface                                  | m <sup>2</sup> | 0.978   | 1.626  | 1.626  | 1.482  | 1.482  |
| <b>REFRIGERANT CONNECTIONS (D models only)</b> |                | <b>Refrigerant connecting pipe diameter: see Tab. 12f, Chap. 12</b> |        |        |        |        |
| gas line outlet (pipe to be welded, o.d.)      | mm             | 22  | 22     | 22     | 18/18  | 18/18  |
| liquid line inlet (pipe to be welded, o.d.)    | mm             | 18  | 18     | 18     | 18/18  | 18/18  |
| <b>WATER CIRCUIT CONDENSER (H models only)</b> |                |   |        |        |        |        |
| condenser type                                 |                | Braze plate   |        |        |        |        |
| water connections ISO 7/1                      | inch           | Rp 1 ¼  | Rp 1 ¼ | Rp 1 ¼ | Rp 1 ¼ | Rp 1 ¼ |
| Total water internal volume                    | l              | 4.14  | 4.14   | 4.14   | 5.12   | 5.8    |
| <b>CHILLED WATER CONTENT ISO 7/1</b>           |                |   |        |        |        |        |
| Total water internal volume                    | l              | 17.6  | 27.9   | 27.9   | 25.9   | 25.9   |
| <b>DIMENSIONS</b>                              |                |   |        |        |        |        |
| width  | mm             | 1200  | 1750   | 1750   | 1750   | 1750   |
| depth  | mm             | 890   | 890    | 890    | 890    | 890    |
| height   | mm             | 1970  | 1970   | 1970   | 1970   | 1970   |
| footprint                                      | m <sup>2</sup> | 1.07  | 1.56   | 1.56   | 1.56   | 1.56   |

Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.

Standard ESP: Upflow 50Pa; Downflow Up 20Pa; Downflow Down 20 Pa Downflow Frontal 0Pa

For Downflow Up and Down versions the data refers to the height of the raised floor= 600mm

Performance data refers to Downflow Units, if not specified otherwise.

**(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17° C wb)**

- Condensing temperature: 45° C

- CW mode water temperature inlet/outlet 7/12 ° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(2) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.**

Technical data can be subject to change without notice.

\* VICTAULIC® Connection.

\*\* Optional. Threaded union on request

# Technical Data

| MODELS  |                  | PX062                          | PX068       | PX082       | PX094       | PX104       |        |        |
|---|------------------|--------------------------------|-------------|-------------|-------------|-------------|--------|--------|
| Power supply voltage                                      |                  | V/Ph/Hz 400V ±10% / 3Ph / 50Hz |             |             |             |             |        |        |
| Refrigerant circuit                                       |                  | double                         | double      | double      | double      | double      |        |        |
| PERFORMANCE LEGACY (1)(2)                                 |                  | Air Condition: 24° C, R.H. 50% |             |             |             |             |        |        |
| air flow  | m³/h             | 15900                          | 18500       | 24000       | 25000       | 25000       |        |        |
| ethylene glycol   | %                | 0                              | 0           | 0           | 0           | 0           |        |        |
| <b>MECHANICAL COOLING PERFORMANCE (1)</b>                 |                  |                                |             |             |             |             |        |        |
| Refrigerant   |                  | R410A                          |             |             |             |             |        |        |
| total gross cooling capacity                              | kW               | 58.8                           | 63.3        | 81.5        | 88.8        | 99.4        |        |        |
| sensible gross cooling capacity                           | kW               | 56.6                           | 62.8        | 81.1        | 86.3        | 91.5        |        |        |
| SHR (sensible/total ratio)                                | -                | 0.96                           | 0.99        | 1           | 0.97        | 0.92        |        |        |
| compressor power input                                    | kW               | 6.38+6.39                      | 6.39+6.4    | 8.27+8.26   | 9.33+9.3    | 11.25+11.23 |        |        |
| compressor OA   | A                | 12.8+12.8                      | 12.81+12.82 | 15.14+15.13 | 17.45+17.41 | 22.23+22.20 |        |        |
| Configuration   | Upflow           | Net Sensible cooling capacity  | kW          | 51.3        | 60.1        | 75.6        | 80.4   | 85.5   |
|   |                  | fan power input                | kW          | 2x2.45      | 3x1.19      | 3x2.22      | 3x2.47 | 3x2.48 |
|   |                  | unit power input               | kW          | 17.7        | 16.4        | 23.22       | 26.08  | 29.93  |
|   | Downflow Up      | Net Sensible cooling capacity  | kW          | 51.8        | 59.4        | 74.5        | 79.1   | 84.2   |
|   |                  | fan power input                | kW          | 2x2.39      | 3x1.15      | 3x2.22      | 3x2.41 | 3x2.41 |
|   |                  | unit power input               | kW          | 17.58       | 16.27       | 23.22       | 25.89  | 29.74  |
|   | Downflow Down    | Net Sensible cooling capacity  | kW          | 52.4        | 59.7        | 75.2        | 79.8   | 84.9   |
|   |                  | fan power input                | kW          | 2x2.1       | 3x1.03      | 3x1.99      | 3x2.2  | 3x2.18 |
|   |                  | unit power input               | kW          | 17          | 15.91       | 22.53       | 25.2   | 29.05  |
|   | Downflow Frontal | Net Sensible cooling capacity  | kW          | 50.7        | -           | -           | -      | -      |
|   |                  | fan power input                | kW          | 2x2.33      | -           | -           | -      | -      |
|   |                  | unit power input               | kW          | 17.46       | -           | -           | -      | -      |
| <b>Condensing section (H models only)</b>                 |                  |                                |             |             |             |             |        |        |
| <b>water inlet temp: 30° C - condensation temp: 45° C</b> |                  |                                |             |             |             |             |        |        |
| water flow  | l/s              | 0.672+0.694                    | 0.683+0.723 | 0.946+0.903 | 1.044+1.001 | 1.189+1.158 |        |        |
| water side pressure drop                                  | kPa              | 10+11                          | 6+8         | 8+8         | 10+9        | 12+12       |        |        |
| <b>CHILLED WATER PERFORMANCE (1)</b>                      |                  |                                |             |             |             |             |        |        |
| total gross cooling capacity                              | kW               | 58.2                           | 76.9        | 92.1        | 94.8        | 94.8        |        |        |
| sensible gross cooling capacity                           | kW               | 55.4                           | 69          | 85.8        | 88.8        | 88.8        |        |        |
| SHR (sensible/total ratio)                                | -                | 0.95                           | 0.9         | 0.93        | 0.94        | 0.94        |        |        |
| Configuration   | Upflow           | Net Sensible cooling capacity  | kW          | 50.5        | 65.4        | 79.1        | 81.3   | 81.3   |
|   |                  | fan power input                | kW          | 2x2.45      | 3x1.19      | 3x2.22      | 3x2.47 | 3x2.48 |
|   |                  | unit power input               | kW          | 4.93        | 3.6         | 6.69        | 7.44   | 7.44   |
|   | Downflow Up      | Net Sensible cooling capacity  | kW          | 53.4        | 65.5        | 79.1        | 81.5   | 81.5   |
|   |                  | fan power input                | kW          | 2x2.39      | 3x1.15      | 3x2.22      | 3x2.41 | 3x2.41 |
|   |                  | unit power input               | kW          | 4.81        | 3.48        | 6.69        | 7.26   | 7.26   |
|   | Downflow Down    | Net Sensible cooling capacity  | kW          | 51.2        | 65.9        | 79.8        | 82.2   | 82.2   |
|   |                  | fan power input                | kW          | 2x2.1       | 3x1.03      | 3x1.99      | 3x2.2  | 3x2.18 |
|   |                  | unit power input               | kW          | 4.23        | 3.12        | 6           | 6.57   | 6.57   |
|   | Downflow Frontal | Net Sensible cooling capacity  | kW          | 50.7        | -           | -           | -      | -      |
|   |                  | fan power input                | kW          | 2x2.33      | -           | -           | -      | -      |
|   |                  | unit power input               | kW          | 4.69        | -           | -           | -      | -      |
| mixture flow  | l/s              | 2.78                           | 3.66        | 4.39        | 4.52        | 4.52        |        |        |
| unit total pressure drop                                  | kPa              | 68                             | 54          | 75          | 79          | 79          |        |        |
| <b>FAN</b>  |                  |                                |             |             |             |             |        |        |
| Quantity (Premium Fan Module)                             | no.              | 2                              | 3           | 3           | 3           | 3           |        |        |
| FLA   | A                | 10                             | 15          | 15          | 15          | 15          |        |        |
| LRA   | A                | 0.2                            | 0.3         | 0.3         | 0.3         | 0.3         |        |        |
| Quantity (Basic Fan Module, Fix speed)                    | no.              | 2                              | 2           | 2           | 2           | 2           |        |        |
| FLA   | A                | 10                             | 10          | 10          | 10          | 10          |        |        |
| LRA   | A                | 0.2                            | 0.2         | 0.2         | 0.2         | 0.2         |        |        |
| <b>COMPRESSOR</b>   |                  |                                |             |             |             |             |        |        |
| Quantity (Scroll Cooling System)                          | no.              | 2                              | 2           | 2           | 2           | 2           |        |        |
| FLA   | A                | 2x18.2                         | 2x18.2      | 2x25        | 2x31        | 2x34        |        |        |
| LRA   | A                | 2x128                          | 2x128       | 2x118       | 2x140       | 2x174       |        |        |
| <b>EVAPORATING COIL</b>                                   |                  |                                |             |             |             |             |        |        |
| quantity / configuration                                  | no.              | 1                              | 1           | 1           | 1           | 1           |        |        |
| pipes/fins  |                  | Copper/treated aluminum        |             |             |             |             |        |        |
| pitch fins  | mm               | 1.8                            | 1.8         | 1.8         | 1.8         | 1.8         |        |        |
| rows  | no.              | 2+3                            | 2+3         | 2+3         | 2+3         | 2+3         |        |        |
| front surface   | m²               | 1.482                          | 2.442       | 2.442       | 2.442       | 2.442       |        |        |
| <b>CHILLED WATER COIL</b>                                 |                  |                                |             |             |             |             |        |        |
| quantity / configuration                                  | no.              | 1                              | 1           | 1           | 1           | 1           |        |        |
| pipes/fins  |                  | Copper/treated aluminum        |             |             |             |             |        |        |
| pitch fins  | mm               | 1.6                            | 1.6         | 1.6         | 1.6         | 1.6         |        |        |

# Technical Data

| MODELS   |                | PX062   | PX068  | PX082  | PX094  | PX104  |
|--|----------------|---|--------|--------|--------|--------|
| rows   | no.            | 5   | 5      | 5      | 5      | 5      |
| front surface                                  | m <sup>2</sup> | 1.482   | 2.442  | 2.442  | 2.442  | 2.442  |
| <b>REFRIGERANT CONNECTIONS (D models only)</b> |                | <b>Refrigerant connecting pipe diameter: see Tab. 12f, Chap. 12</b> |        |        |        |        |
| gas line outlet (pipe to be welded, o.d.)      | mm             | 18/18   | 18/18  | 18/18  | 18/18  | 18/18  |
| liquid line inlet (pipe to be welded, o.d.)    | mm             | 18/18   | 18/18  | 22/22  | 22/22  | 22/22  |
| <b>WATER CIRCUIT CONDENSER (H models only)</b> |                |   |        |        |        |        |
| condenser type                                 |                | Braze plate   |        |        |        |        |
| water connections ISO 7/1                      | inch           | Rp 1 ¼  | Rp 1 ¼ | Rp 1 ¼ | Rp 1 ¼ | Rp 1 ¼ |
| Total water internal volume                    | l              | 6.46  | 8.68   | 8.68   | 8.68   | 8.68   |
| <b>CHILLED WATER CONTENT ISO 7/1</b>           |                | <b>O. D. 54 mm* R 2**</b>   |        |        |        |        |
| Total water internal volume                    | l              | 25.9  | 42.6   | 42.6   | 42.6   | 42.6   |
| <b>DIMENSIONS</b>                              |                |   |        |        |        |        |
| width  | mm             | 1750  | 2550   | 2550   | 2550   | 2550   |
| depth  | mm             | 890   | 890    | 890    | 890    | 890    |
| height   | mm             | 1970  | 1970   | 1970   | 1970   | 1970   |
| footprint                                      | m <sup>2</sup> | 1.56  | 2.27   | 2.27   | 2.27   | 2.27   |

Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.

Standard ESP: Upflow 50Pa; Downflow Up 20Pa; Downflow Down 20 Pa Downflow Frontal 0Pa

For Downflow Up and Down versions the data refers to the height of the raised floor= 600mm

Performance data refers to Downflow Units, if not specified otherwise.

(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17° C wb)

- Condensing temperature: 45° C

- CW mode water temperature inlet/outlet 7/12 ° C

- Air flow of the units refers to the standard configuration with F5 class filter.

(2) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.

Technical data can be subject to change without notice.

\* VICTAULIC® Connection.

\*\* Optional. Threaded union on request



# Technical Data

Tab. 4f - Digital Scroll Cooling System dualfluid direct expansion unit @ 100% cooling capacity, Premium Fan Module  
PXxxx D/H series

| MODELS   |                  |                               |    | PX015                          | PX021  | PX025  | PX031  |
|--|------------------|-------------------------------|----|--------------------------------|--------|--------|--------|
| Power supply voltage                               |                  | V/Ph/Hz                       |    | 400V ±10% / 3Ph / 50Hz         |        |        |        |
| Refrigerant circuit                                |                  |                               |    | single                         | single | single | single |
| PERFORMANCE LEGACY (1)(2)                          |                  |                               |    | Air Condition: 24° C, R.H. 50% |        |        |        |
| air flow   |                  | m³/h                          |    | 4984                           | 5397   | 6484   | 7202   |
| ethylene glycol                                    |                  | %                             |    | 0                              | 0      | 0      | 0      |
| MECHANICAL COOLING PERFORMANCE (1)                 |                  |                               |    |                                |        |        |        |
| Refrigerant  |                  |                               |    | R410A                          |        |        |        |
| total gross cooling capacity                       |                  | kW                            |    | 13.5                           | 17.7   | 22.7   | 24.5   |
| sensible gross cooling capacity                    |                  | kW                            |    | 13.5                           | 17.7   | 22.3   | 24.5   |
| SHR (sensible/total ratio)                         |                  | -                             |    | 1                              | 1      | 0.98   | 1      |
| compressor power input                             |                  | kW                            |    | 2.64                           | 4.08   | 5.47   | 5.69   |
| compressor OA                                      |                  | A                             |    | 4.66                           | 7.37   | 9.87   | 11.02  |
| Configuration                                      | Upflow           | Net Sensible cooling capacity | kW | 12.3                           | 16.3   | 20.2   | 21.5   |
|  |                  | fan power input               | kW | 1                              | 1.21   | 1.91   | 2.54   |
|  |                  | unit power input              | kW | 3.62                           | 5.31   | 7.41   | 8.26   |
|  | Downflow Up      | Net Sensible cooling capacity | kW | 12.6                           | 16.6   | 20.6   | 22.1   |
|  |                  | fan power input               | kW | 0.89                           | 1.08   | 1.73   | 2.32   |
|  |                  | unit power input              | kW | 3.68                           | 5.19   | 7.23   | 8.04   |
|  | Downflow Frontal | Net Sensible cooling capacity | kW | 12.7                           | 16.7   | 20.7   | 22.2   |
|  |                  | fan power input               | kW | 0.85                           | 1.04   | 1.67   | 2.25   |
|  |                  | unit power input              | kW | 3.52                           | 5.15   | 7.17   | 7.97   |
| Condensing section (H models only)                 |                  |                               |    |                                |        |        |        |
| water inlet temp: 30° C - condensation temp: 45° C |                  |                               |    |                                |        |        |        |
| water flow   |                  | l/s                           |    | 0.304                          | 0.414  | 0.547  | 0.579  |
| water side pressure drop                           |                  | kPa                           |    | 5                              | 7      | 12     | 10     |
| CHILLED WATER PERFORMANCE (1)                      |                  |                               |    |                                |        |        |        |
| total gross cooling capacity                       |                  | kW                            |    | 20.9                           | 22.2   | 25.3   | 27.3   |
| sensible gross cooling capacity                    |                  | kW                            |    | 17.6                           | 18.8   | 21.9   | 23.8   |
| SHR (sensible/total ratio)                         |                  | -                             |    | 0.84                           | 0.85   | 0.87   | 0.87   |
| Configuration                                      | Upflow           | Net Sensible cooling capacity | kW | 16.57                          | 17.56  | 19.96  | 21.3   |
|  |                  | fan power input               | kW | 1.03                           | 1.24   | 1.94   | 2.57   |
|  |                  | unit power input              | kW | 1.03                           | 1.24   | 1.94   | 2.57   |
|  | Downflow Up      | Net Sensible cooling capacity | kW | 16.7                           | 17.69  | 20.14  | 21.45  |
|  |                  | fan power input               | kW | 0.92                           | 1.11   | 1.76   | 2.35   |
|  |                  | unit power input              | kW | 0.92                           | 1.11   | 1.76   | 2.35   |
|  | Downflow Frontal | Net Sensible cooling capacity | kW | 16.8                           | 17.73  | 20.2   | 21.6   |
|  |                  | fan power input               | kW | 0.88                           | 1.07   | 1.7    | 2.28   |
|  |                  | unit power input              | kW | 0.88                           | 1.07   | 1.7    | 2.28   |
| mixture flow                                       |                  | l/s                           |    | 0.99                           | 1.06   | 1.21   | 1.3    |
| unit total pressure drop                           |                  | kPa                           |    | 50                             | 56     | 71     | 81     |
| PERFORMANCE SMART (2)(3)                           |                  |                               |    | Air Condition: 35° C, R.H. 30% |        |        |        |
| air flow(4)  |                  | m³/h                          |    | 4984                           | 5397   | 6484   | 7202   |
| ethylene glycol                                    |                  | %                             |    | 0                              | 0      | 0      | 0      |
| MECHANICAL COOLING PERFORMANCE (2)                 |                  |                               |    |                                |        |        |        |
| Refrigerant  |                  |                               |    | R410A                          |        |        |        |
| total gross cooling capacity                       |                  | kW                            |    | -                              | 21.8   | 27.5   | 29.3   |
| sensible gross cooling capacity                    |                  | kW                            |    | -                              | 21.8   | 27.5   | 29.3   |
| SHR (sensible/total ratio)                         |                  | -                             |    | -                              | 1      | 1      | 1      |
| compressor power input                             |                  | kW                            |    | -                              | 4.15   | 5.44   | 5.66   |
| compressor OA                                      |                  | A                             |    | -                              | 11.8   | 9.87   | 10.91  |
| Configuration                                      | Upflow           | Net Sensible cooling capacity | kW | -                              | 20.6   | 25.5   | 27     |
|  |                  | fan power input               | kW | -                              | 1.21   | 1.91   | 2.32   |
|  |                  | unit power input              | kW | -                              | 5.39   | 7.38   | 8.01   |
|  | Downflow Up      | Net Sensible cooling capacity | kW | -                              | 21.1   | 26.3   | 27.8   |
|  |                  | fan power input               | kW | -                              | 1.08   | 1.73   | 2.32   |
|  |                  | unit power input              | kW | -                              | 5.27   | 7.19   | 8      |
|  | Downflow Frontal | Net Sensible cooling capacity | kW | -                              | 21.1   | 26.4   | 27.8   |
|  |                  | fan power input               | kW | -                              | 1.08   | 1.67   | 2.32   |
|  |                  | unit power input              | kW | -                              | 5.27   | 7.13   | 8      |
| Condensing section                                 |                  |                               |    |                                |        |        |        |
| water inlet temp: 30° C - condensation temp: 45° C |                  |                               |    |                                |        |        |        |
| water flow   |                  | l/s                           |    | -                              | 0.507  | 0.657  | 0.695  |
| water side pressure drop                           |                  | kPa                           |    | -                              | 10     | 17     | 15     |
| CHILLED WATER PERFORMANCE (2)                      |                  |                               |    |                                |        |        |        |

# Technical Data

| MODELS  |                  | PX015                         | PX021    | PX025    | PX031    |          |      |
|---|------------------|-------------------------------|----------|----------|----------|----------|------|
| total gross cooling capacity                                |                  | kW                            | 13.5     | 22.2     | 31.1     | 27.3     |      |
| sensible gross cooling capacity                             |                  | kW                            | 13.5     | 18.8     | 31.1     | 23.8     |      |
| SHR (sensible/total ratio)                                  |                  | -                             | 1        | 0.85     | 1        | 0.87     |      |
| Configuration   | Upflow           | Net Sensible cooling capacity | kW       | 12.3     | 25.7     | 29.2     | 31.4 |
|   |                  | fan power input               | kW       | 1.04     | 1.24     | 1.94     | 2.35 |
|   |                  | unit power input              | kW       | 3.66     | 1.24     | 1.94     | 2.35 |
|   | Downflow Up      | Net Sensible cooling capacity | kW       | 12.6     | 25.9     | 29.34    | 31.4 |
|   |                  | fan power input               | kW       | 0.92     | 1.11     | 1.76     | 2.35 |
|   |                  | unit power input              | kW       | 3.54     | 1.11     | 1.76     | 2.35 |
|   | Downflow Frontal | Net Sensible cooling capacity | kW       | 12.6     | 25.9     | 29.5     | 31.4 |
|   |                  | fan power input               | kW       | 0.85     | 1.11     | 1.7      | 2.35 |
|   |                  | unit power input              | kW       | 3.47     | 1.11     | 1.7      | 2.35 |
| mixture flow  |                  | l/s                           |          | 1.08     | 1.24     | 1.34     |      |
| unit total pressure drop                                    |                  | kPa                           |          | 56       | 73       | 84       |      |
| <b>FAN</b>  |                  |                               |          |          |          |          |      |
| Quantity (Premium Fan Module)                               |                  | no.                           | 1        | 1        | 1        | 1        |      |
| FLA   |                  | A                             | 5.6      | 5.6      | 5.6      | 5.6      |      |
| LRA   |                  | A                             | 0.1      | 0.1      | 0.1      | 0.1      |      |
| Quantity (Basic Fan Module, Fix speed)                      |                  | no.                           | 1        | 1        | 1        | 1        |      |
| FLA   |                  | A                             | 3.1      | 3.1      | 3.1      | 3.1      |      |
| LRA   |                  | A                             | 0.1      | 0.1      | 0.1      | 0.1      |      |
| <b>COMPRESSOR</b>   |                  |                               |          |          |          |          |      |
| Quantity (Digital Scroll Cooling System)                    |                  | no.                           | 1        | 1        | 1        | 1        |      |
| FLA   |                  | A                             | 8        | 11.8     | 15       | 16.2     |      |
| LRA   |                  | A                             | 43       | 64       | 101      | 101      |      |
| <b>EVAPORATING COIL</b>                                     |                  |                               |          |          |          |          |      |
| quantity / configuration                                    |                  | no.                           | 1        | 1        | 1        | 1        |      |
| pipes/fins  |                  | Copper/treated aluminum       |          |          |          |          |      |
| pitch fins  |                  | mm                            | 1.8      | 1.8      | 1.8      | 1.8      |      |
| rows  |                  | no.                           | 5        | 5        | 5        | 5        |      |
| front surface   |                  | m <sup>2</sup>                | 0.70     | 0.70     | 0.70     | 0.70     |      |
| <b>CHILLED WATER COIL</b>                                   |                  |                               |          |          |          |          |      |
| quantity / configuration                                    |                  | no.                           | 1        | 1        | 1        | 1        |      |
| pipes/fins  |                  | Copper/treated aluminum       |          |          |          |          |      |
| pitch fins  |                  | mm                            | 1.6      | 1.6      | 1.6      | 1.6      |      |
| rows  |                  | no.                           | 5        | 5        | 5        | 5        |      |
| front surface   |                  | m <sup>2</sup>                | 0.70     | 0.70     | 0.70     | 0.70     |      |
| <b>REFRIGERANT CONNECTIONS (D models only)</b>              |                  |                               |          |          |          |          |      |
| Refrigerant connecting pipe diameter: see Tab. 12f, Chap.12 |                  |                               |          |          |          |          |      |
| gas line outlet (pipe to be welded, o.d.)                   |                  | mm                            | 16       | 16       | 16       | 22       |      |
| liquid line inlet (pipe to be welded, o.d.)                 |                  | mm                            | 12       | 12       | 12       | 16       |      |
| <b>WATER CIRCUIT CONDENSER (H models only)</b>              |                  |                               |          |          |          |          |      |
| condenser type  |                  | Braze plate                   |          |          |          |          |      |
| water connections ISO 7/1                                   |                  | inch                          | Rp 1 1/4 | Rp 1 1/4 | Rp 1 1/4 | Rp 1 1/4 |      |
| Total water internal volume                                 |                  | l                             | 1.58     | 1.89     | 1.89     | 2.22     |      |
| <b>CHILLED WATER CONTENT ISO 7/1</b>                        |                  |                               |          |          |          |          |      |
| Total water internal volume                                 |                  | l                             | 12.4     | 12.4     | 12.4     | 12.4     |      |
| <b>DIMENSIONS</b>   |                  |                               |          |          |          |          |      |
| width   |                  | mm                            | 844      | 844      | 844      | 844      |      |
| depth   |                  | mm                            | 890      | 890      | 890      | 890      |      |
| height  |                  | mm                            | 1970     | 1970     | 1970     | 1970     |      |
| footprint   |                  | m <sup>2</sup>                | 0.75     | 0.75     | 0.75     | 0.75     |      |

Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.

Standard ESP: Upflow 50Pa; Downflow Up 20Pa; Downflow Frontal 0Pa

For Downflow Up version the data refers to the height of the raised floor = 600mm

Performance data refers to Downflow Units, if not specified otherwise.

**(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17° C wb)**

- Condensing temperature: 45° C

- CW mode water temperature inlet/outlet 7/12 ° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(2) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 35°C bs; 30% R.H. (21.4° C wb)**

- Condensing temperature: 45° C

- CW mode water temperature inlet/outlet 12/18 ° C

- Air flow of the units refers to the standard configuration with F5 class filter.

**(3) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.**

**(4) The Airflow indicated in the Smart Performance is the unit nominal airflow.**

Technical data can be subject to change without notice.

\* VICTAULIC® Connection.

\*\* Optional. Threaded union on request

# Technical Data

| MODELS   |                  |                               | PX041                          | PX047  | PX051  | PX044      | PX054       |        |
|--|------------------|-------------------------------|--------------------------------|--------|--------|------------|-------------|--------|
| Power supply voltage                               |                  | V/Ph/Hz                       | 400V ±10% / 3Ph / 50Hz         |        |        |            |             |        |
| Refrigerant circuit                                |                  |                               | single                         | single | single | double     | double      |        |
| PERFORMANCE LEGACY (1)(2)                          |                  |                               | Air Condition: 24° C, R.H. 50% |        |        |            |             |        |
| air flow   |                  | m³/h                          | 10000                          | 13200  | 15200  | 12500      | 15300       |        |
| ethylene glycol                                    |                  | %                             | 0                              | 0      | 0      | 0          | 0           |        |
| <b>MECHANICAL COOLING PERFORMANCE (1)</b>          |                  |                               |                                |        |        |            |             |        |
| Refrigerant  |                  |                               | R410A                          |        |        |            |             |        |
| total gross cooling capacity                       |                  | kW                            | 38                             | 47     | 50.9   | 42.6       | 52.2        |        |
| sensible gross cooling capacity                    |                  | kW                            | 36.2                           | 46.6   | 50.9   | 42.6       | 52.1        |        |
| SHR (sensible/total ratio)                         |                  | -                             | 0.95                           | 0.99   | 1      | 1          | 1           |        |
| compressor power input                             |                  | kW                            | 8.47                           | 10.65  | 11.22  | 4.76+4.55  | 5.69+5.53   |        |
| compressor OA                                      |                  | A                             | 15.59                          | 14.93  | 21.83  | 8.38+8.15  | 11.01+10.81 |        |
| Configuration                                      | Upflow           | Net Sensible cooling capacity | kW                             | 34.7   | 44.2   | 47         | 39.8        | 47.7   |
|  |                  | fan power input               | kW                             | 2.47   | 2x1.35 | 2x1.91     | 2x1.37      | 2x2.25 |
|  |                  | unit power input              | kW                             | 10.97  | 13.38  | 15.07      | 12.07       | 15.75  |
|  | Downflow Up      | Net Sensible cooling capacity | kW                             | 33.7   | 44     | 47.2       | 39.9        | 47.7   |
|  |                  | fan power input               | kW                             | 2.47   | 2x1.3  | 2x1.85     | 2x1.33      | 2x2.19 |
|  |                  | unit power input              | kW                             | 10.97  | 13.28  | 14.95      | 12          | 15.63  |
|  | Downflow Down    | Net Sensible cooling capacity | kW                             | 34     | 44.3   | 47.6       | 40.2        | 48.3   |
|  |                  | fan power input               | kW                             | 2.22   | 2x1.13 | 2x1.64     | 2x1.16      | 2x1.91 |
|  |                  | unit power input              | kW                             | 10.72  | 12.94  | 14.53      | 11.66       | 15.07  |
|  | Downflow Frontal | Net Sensible cooling capacity | kW                             | 33.9   | 43.2   | 46.8       | 39.6        | 47.4   |
|  |                  | fan power input               | kW                             | 2.34   | 2x1.21 | 2x1.75     | 2x1.24      | 2x2.08 |
|  |                  | unit power input              | kW                             | 10.84  | 13.1   | 14.75      | 11.81       | 15.41  |
| water inlet temp: 30° C - condensation temp: 45° C |                  |                               |                                |        |        |            |             |        |
| water flow   |                  | l/s                           | 0.873                          | 1.104  | 1.197  | 0.486+0.51 | 0.595+0.62  |        |
| water side pressure drop                           |                  | kPa                           | 10                             | 16     | 18     | 10+10      | 11+12       |        |
| <b>CHILLED WATER PERFORMANCE (1)</b>               |                  |                               |                                |        |        |            |             |        |
| total gross cooling capacity                       |                  | kW                            | 37.6                           | 53.9   | 59.5   | 49.2       | 56.7        |        |
| sensible gross cooling capacity                    |                  | kW                            | 35.3                           | 48.8   | 54.9   | 45.3       | 53.7        |        |
| SHR (sensible/total ratio)                         |                  | -                             | 0.94                           | 0.9    | 0.92   | 0.92       | 0.95        |        |
| Configuration                                      | Upflow           | Net Sensible cooling capacity | kW                             | 32.9   | 46.1   | 51.1       | 42.6        | 49.1   |
|  |                  | fan power input               | kW                             | 2.47   | 2x1.35 | 2x1.91     | 2x1.37      | 2x2.25 |
|  |                  | unit power input              | kW                             | 2.5    | 2.73   | 3.85       | 2.77        | 4.53   |
|  | Downflow Up      | Net Sensible cooling capacity | kW                             | 32.9   | 46.2   | 51.2       | 42.6        | 49.3   |
|  |                  | fan power input               | kW                             | 2.47   | 2x1.3  | 2x1.85     | 2x1.33      | 2x2.19 |
|  |                  | unit power input              | kW                             | 2.5    | 2.63   | 3.73       | 2.69        | 4.41   |
|  | Downflow Down    | Net Sensible cooling capacity | kW                             | 33.1   | 46.5   | 51.6       | 43          | 49.8   |
|  |                  | fan power input               | kW                             | 2.22   | 2x1.13 | 2x1.64     | 2x1.16      | 2x1.91 |
|  |                  | unit power input              | kW                             | 2.25   | 2.29   | 3.31       | 2.35        | 3.85   |
|  | Downflow Frontal | Net Sensible cooling capacity | kW                             | 33     | 46.4   | 51.4       | 42.8        | 49.5   |
|  |                  | fan power input               | kW                             | 2.34   | 2x1.21 | 2x1.75     | 2x1.24      | 2x2.08 |
|  |                  | unit power input              | kW                             | 2.37   | 2.45   | 3.53       | 2.51        | 4.19   |
| mixture flow                                       |                  | l/s                           | 1.79                           | 2.57   | 2.84   | 2.35       | 2.7         |        |
| unit total pressure drop                           |                  | kPa                           | 100                            | 71     | 85     | 50         | 65          |        |
| PERFORMANCE SMART (2)(3)                           |                  |                               | Air Condition: 35° C, R.H. 30% |        |        |            |             |        |
| air flow(4)  |                  | m³/h                          | 10000                          | 13200  | 15200  | 12500      | 15300       |        |
| ethylene glycol                                    |                  | %                             | 0                              | 0      | 0      | 0          | 0           |        |
| <b>MECHANICAL COOLING PERFORMANCE (2)</b>          |                  |                               |                                |        |        |            |             |        |
| Refrigerant  |                  |                               | R410A                          |        |        |            |             |        |
| total gross cooling capacity                       |                  | kW                            | 46.2                           | 58.1   | 63.2   | 53.5       | 65.3        |        |
| sensible gross cooling capacity                    |                  | kW                            | 46.2                           | 58.1   | 63.2   | 53.5       | 65.2        |        |
| SHR (sensible/total ratio)                         |                  | -                             | 1                              | 1      | 1      | 1          | 1           |        |
| compressor power input                             |                  | kW                            | 8.52                           | 10.71  | 11.13  | 4.84+4.56  | 5.64+5.47   |        |
| compressor OA                                      |                  | A                             | 15.63                          | 15.04  | 21.58  | 8.41+8.2   | 10.86+10.68 |        |
| Configuration                                      | Upflow           | Net Sensible cooling capacity | kW                             | 44.3   | 55.4   | 59.3       | 50.6        | 60.6   |
|  |                  | fan power input               | kW                             | 2.47   | 2x1.35 | 2x1.91     | 2x1.37      | 2x2.25 |
|  |                  | unit power input              | kW                             | 11.03  | 13.45  | 14.98      | 12.16       | 15.64  |
|  | Downflow Up      | Net Sensible cooling capacity | kW                             | 43.7   | 55.5   | 59.5       | 50.8        | 60.8   |
|  |                  | fan power input               | kW                             | 2.47   | 2x1.3  | 2x1.85     | 2x1.33      | 2x2.19 |
|  |                  | unit power input              | kW                             | 11.02  | 13.34  | 14.86      | 12.09       | 15.52  |
|  | Downflow Down    | Net Sensible cooling capacity | kW                             | 44     | 55.8   | 59.9       | 51.1        | 61.4   |
|  |                  | fan power input               | kW                             | 2.22   | 2x1.13 | 2x1.62     | 2x1.16      | 2x1.91 |
|  |                  | unit power input              | kW                             | 10.77  | 13     | 14.4       | 11.75       | 14.96  |
|  | Downflow Frontal | Net Sensible cooling capacity | kW                             | 43.9   | 54.8   | 58.6       | 50.3        | 60.1   |
|  |                  | fan power input               | kW                             | 2.34   | 2x1.21 | 2x1.8      | 2x1.24      | 2x2.08 |
|  |                  | unit power input              | kW                             | 10.89  | 13.15  | 14.77      | 11.9        | 15.31  |

# Technical Data

| MODELS  |                  | PX041                         | PX047   | PX051  | PX044      | PX054      |        |        |
|---|------------------|-------------------------------|---------|--------|------------|------------|--------|--------|
| <b>Condensing section</b>   |                  |                               |         |        |            |            |        |        |
| <b>water inlet temp: 30° C - condensation temp: 45° C</b>           |                  |                               |         |        |            |            |        |        |
| water flow  | l/s              | 1.043                         | 1.339   | 1.457  | 0.587+0.64 | 0.716+0.77 |        |        |
| water side pressure drop  | kPa              | 14                            | 23      | 27     | 14+16      | 15+17      |        |        |
| <b>CHILLED WATER PERFORMANCE (2)</b>                                |                  |                               |         |        |            |            |        |        |
| total gross cooling capacity  | kW               | 39.5                          | 55.4    | 61.7   | 51.5       | 60         |        |        |
| sensible gross cooling capacity                                     | kW               | 39.5                          | 55.4    | 61.7   | 51.5       | 60         |        |        |
| SHR (sensible/total ratio)  | -                | 1                             | 1       | 1      | 1          | 1          |        |        |
| Configuration   | Upflow           | Net Sensible cooling capacity | kW      | 37     | 52.7       | 57.9       | 48.8   | 55.5   |
|   |                  | fan power input               | kW      | 2.47   | 2x1.35     | 2x1.91     | 2x1.37 | 2x2.25 |
|   |                  | unit power input              | kW      | 2.5    | 2.73       | 3.85       | 2.77   | 4.53   |
|   | Downflow Up      | Net Sensible cooling capacity | kW      | 37     | 52.8       | 58         | 48.8   | 55.6   |
|   |                  | fan power input               | kW      | 2.47   | 2x1.3      | 2x1.85     | 2x1.33 | 2x2.19 |
|   |                  | unit power input              | kW      | 2.5    | 2.63       | 3.73       | 2.69   | 4.41   |
|   | Downflow Down    | Net Sensible cooling capacity | kW      | 37.3   | 53.2       | 58.4       | 49.2   | 56.2   |
|   |                  | fan power input               | kW      | 2.22   | 2x1.13     | 2x1.64     | 2x1.16 | 2x1.91 |
|   |                  | unit power input              | kW      | 2.25   | 2.29       | 3.31       | 2.35   | 3.85   |
|   | Downflow Frontal | Net Sensible cooling capacity | kW      | 37.1   | 53         | 58.1       | 49     | 55.8   |
|   |                  | fan power input               | kW      | 2.34   | 2x1.21     | 2x1.8      | 2x1.24 | 2x2.08 |
|   |                  | unit power input              | kW      | 2.37   | 2.45       | 3.63       | 2.51   | 4.19   |
| mixture flow  | l/s              | 1.58                          | 2.21    | 2.46   | 2.05       | 2.39       |        |        |
| unit total pressure drop  | kPa              | 76                            | 52      | 63     | 38         | 50         |        |        |
| <b>FAN</b>  |                  |                               |         |        |            |            |        |        |
| Quantity (Premium Fan Module)                                       | no.              | 1                             | 2       | 2      | 2          | 2          |        |        |
| FLA   | A                | 5                             | 10      | 10     | 10         | 10         |        |        |
| LRA   | A                | 0.1                           | 0.2     | 0.2    | 0.2        | 0.2        |        |        |
| Quantity (Basic Fan Module, Fix speed)                              | no.              | 1                             | 1       | 1      | 1          | 1          |        |        |
| FLA   | A                | 5                             | 5       | 5      | 5          | 5          |        |        |
| LRA   | A                | 0.1                           | 0.1     | 0.1    | 0.1        | 0.1        |        |        |
| <b>COMPRESSOR</b>   |                  |                               |         |        |            |            |        |        |
| Quantity (Digital Scroll Cooling System)                            | no.              | 1                             | 2       | 2      | 2          | 2          |        |        |
| FLA   | A                | 25                            | 16.5+15 | 2x16.2 | 2x15       | 2x16.2     |        |        |
| LRA   | A                | 118                           | 2x101   | 2x101  | 2x75       | 2x101      |        |        |
| <b>EVAPORATING COIL</b>   |                  |                               |         |        |            |            |        |        |
| quantity / configuration  | no.              | 1                             | 1       | 1      | 1          | 1          |        |        |
| pipes/fins  |                  | Copper/treated aluminum       |         |        |            |            |        |        |
| pitch fins  | mm               | 1.8                           | 1.8     | 1.8    | 1.8        | 1.8        |        |        |
| rows  | no.              | 5                             | 4       | 4      | 2+2        | 2+2        |        |        |
| front surface   | m <sup>2</sup>   | 0.978                         | 1.626   | 1.626  | 1.482      | 1.482      |        |        |
| <b>CHILLED WATER COIL</b>   |                  |                               |         |        |            |            |        |        |
| quantity / configuration  | no.              | 1                             | 1       | 1      | 1          | 1          |        |        |
| pipes/fins  |                  | Copper/treated aluminum       |         |        |            |            |        |        |
| pitch fins  | mm               | 1.6                           | 1.6     | 1.6    | 1.6        | 1.6        |        |        |
| rows  | no.              | 5                             | 5       | 5      | 5          | 5          |        |        |
| front surface   | m <sup>2</sup>   | 0.978                         | 1.626   | 1.626  | 1.482      | 1.482      |        |        |
| <b>REFRIGERANT CONNECTIONS (D models only)</b>                      |                  |                               |         |        |            |            |        |        |
| <b>Refrigerant connecting pipe diameter: see Tab. 12f, Chap. 12</b> |                  |                               |         |        |            |            |        |        |
| gas line outlet (pipe to be welded, o.d.)                           | mm               | 22                            | 22      | 22     | 18/18      | 18/18      |        |        |
| liquid line inlet (pipe to be welded, o.d.)                         | mm               | 18                            | 18      | 18     | 18/18      | 18/18      |        |        |
| <b>WATER CIRCUIT CONDENSER (H models only)</b>                      |                  |                               |         |        |            |            |        |        |
| condenser type  |                  | Braze plate                   |         |        |            |            |        |        |
| water connections ISO 7/1   | inch             | Rp 1 ¼                        | Rp 1 ¼  | Rp 1 ¼ | Rp 1 ¼     | Rp 1 ¼     |        |        |
| Total water internal volume   | l                | 4.14                          | 4.14    | 4.14   | 5.12       | 5.8        |        |        |
| <b>CHILLED WATER CONTENT ISO 7/1</b>                                |                  |                               |         |        |            |            |        |        |
| Total water internal volume   | l                | 17.6                          | 27.9    | 27.9   | 25.9       | 25.9       |        |        |
| <b>DIMENSIONS</b>   |                  |                               |         |        |            |            |        |        |
| width   | mm               | 1200                          | 1750    | 1750   | 1750       | 1750       |        |        |
| depth   | mm               | 890                           | 890     | 890    | 890        | 890        |        |        |
| height  | mm               | 1970                          | 1970    | 1970   | 1970       | 1970       |        |        |
| footprint   | m <sup>2</sup>   | 1.068                         | 1.558   | 1.558  | 1.558      | 1.558      |        |        |

Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.

Standard ESP: Upflow 50Pa; Downflow Up 20Pa; Downflow Down 20 Pa Downflow Frontal 0Pa

For Downflow Up and Down versions the data refers to the height of the raised floor= 600 mm

Performance data refers to Downflow Units, if not specified otherwise.

**(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17° C wb)**

- Condensing temperature: 45° C

- CW mode water temperature inlet/outlet 7/12 ° C

- Air flow of the units refers to the standard configuration with F5 class filter.

## Technical Data

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(2) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 35°C bs; 30% R.H. (21.4° C wb)

- Condensing temperature: 45° C

- CW mode water temperature inlet/outlet 12/18 ° C

- Air flow of the units refers to the standard configuration with F5 class filter.

(3) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.

(4) The Airflow indicated in the Smart Performance is the unit nominal airflow.

Technical data can be subject to change without notice.

\* VICTAULIC® Connection.

\*\* Optional. Threaded union on request

# Technical Data

| MODELS   |                  |                               | PX062                          | PX068       | PX082      | PX094       | PX104       |        |
|--|------------------|-------------------------------|--------------------------------|-------------|------------|-------------|-------------|--------|
| Power supply voltage                               |                  | V/Ph/Hz                       | 400V ±10% / 3Ph / 50Hz         |             |            |             |             |        |
| Refrigerant circuit                                |                  |                               | double                         | double      | double     | double      | double      |        |
| PERFORMANCE LEGACY (1)(2)                          |                  |                               | Air Condition: 24° C, R.H. 50% |             |            |             |             |        |
| air flow   | m³/h             |                               | 15900                          | 18500       | 24000      | 25000       | 25000       |        |
| ethylene glycol                                    | %                |                               | 0                              | 0           | 0          | 0           | 0           |        |
| MECHANICAL COOLING PERFORMANCE (1)                 |                  |                               |                                |             |            |             |             |        |
| Refrigerant  |                  |                               | R410A                          |             |            |             |             |        |
| total gross cooling capacity                       | kW               |                               | 58.6                           | 63.1        | 81.9       | 92          | 97.1        |        |
| sensible gross cooling capacity                    | kW               |                               | 56.5                           | 62.7        | 81.3       | 87.9        | 90.4        |        |
| SHR (sensible/total ratio)                         | -                |                               | 0.96                           | 0.99        | 0.99       | 0.96        | 0.93        |        |
| compressor power input                             | kW               |                               | 6.68+6.39                      | 6.72+6.4    | 9.29+9.31  | 10.64+10.65 | 11.22+11.22 |        |
| compressor OA                                      | A                |                               | 12.85+12.8                     | 12.9+12.82  | 16.5+16.52 | 14.9+14.93  | 21.85+21.84 |        |
| Configuration                                      | Upflow           | Net Sensible cooling capacity | kW                             | 51.3        | 60.1       | 76          | 81.8        | 84.4   |
|  |                  | fan power input               | kW                             | 2x2.45      | 3x1.19     | 3x2.22      | 3x2.47      | 3x2.47 |
|  |                  | unit power input              | kW                             | 17.99       | 16.73      | 25.3        | 28.74       | 29.88  |
|  | Downflow Up      | Net Sensible cooling capacity | kW                             | 51.7        | 59.2       | 74.7        | 80.7        | 83.1   |
|  |                  | fan power input               | kW                             | 2x2.39      | 3x1.15     | 3x2.22      | 3x2.41      | 3x2.41 |
|  |                  | unit power input              | kW                             | 17.88       | 16.6       | 25.29       | 28.55       | 29.7   |
|  | Downflow Down    | Net Sensible cooling capacity | kW                             | 52.3        | 59.6       | 75.4        | 81.3        | 83.8   |
|  |                  | fan power input               | kW                             | 2x2.10      | 3x1.03     | 3x1.99      | 3x2.2       | 2x2.18 |
|  |                  | unit power input              | kW                             | 17.3        | 16.24      | 24.6        | 27.92       | 29.01  |
|  | Downflow Frontal | Net Sensible cooling capacity | kW                             | 50.6        | -          | -           | -           | -      |
|  |                  | fan power input               | kW                             | 2x2.33      | -          | -           | -           | -      |
|  |                  | unit power input              | kW                             | 17.75       | -          | -           | -           | -      |
| Condensing section                                 |                  |                               |                                |             |            |             |             |        |
| water inlet temp: 30° C - condensation temp: 45° C |                  |                               |                                |             |            |             |             |        |
| water flow   | l/s              |                               | 0.675+0.694                    | 0.686+0.723 | 0.929+0.97 | 1.061+1.10  | 1.132+1.17  |        |
| water side pressure drop                           | kPa              |                               | 10+11                          | 6+8         | 11+13      | 15+16       | 16+18       |        |
| CHILLED WATER PERFORMANCE (1)                      |                  |                               |                                |             |            |             |             |        |
| total gross cooling capacity                       | kW               |                               | 58.2                           | 76.7        | 92.1       | 94.8        | 94.8        |        |
| sensible gross cooling capacity                    | kW               |                               | 55.4                           | 69          | 85.8       | 88.8        | 88.8        |        |
| SHR (sensible/total ratio)                         | -                |                               | 0.95                           | 0.9         | 0.93       | 0.94        | 0.94        |        |
| Configuration                                      | Upflow           | Net Sensible cooling capacity | kW                             | 50.5        | 65.4       | 79.1        | 81.3        | 81.3   |
|  |                  | fan power input               | kW                             | 2x2.45      | 3x1.19     | 3x2.22      | 3x2.47      | 3x2.47 |
|  |                  | unit power input              | kW                             | 4.93        | 3.60       | 6.69        | 7.44        | 7.44   |
|  | Downflow Up      | Net Sensible cooling capacity | kW                             | 50.6        | 65.5       | 79.1        | 81.5        | 81.5   |
|  |                  | fan power input               | kW                             | 2x2.39      | 3x1.15     | 3x2.22      | 3x2.41      | 3x2.41 |
|  |                  | unit power input              | kW                             | 4.81        | 3.48       | 6.69        | 7.26        | 7.26   |
|  | Downflow Down    | Net Sensible cooling capacity | kW                             | 51.2        | 65.9       | 79.8        | 82.2        | 82.2   |
|  |                  | fan power input               | kW                             | 2x2.10      | 3x1.03     | 3x1.99      | 3x2.18      | 3x2.18 |
|  |                  | unit power input              | kW                             | 4.23        | 3.12       | 6           | 6.57        | 6.57   |
|  | Downflow Frontal | Net Sensible cooling capacity | kW                             | 50.7        | -          | -           | -           | -      |
|  |                  | fan power input               | kW                             | 2x2.33      | -          | -           | -           | -      |
|  |                  | unit power input              | kW                             | 4.69        | -          | -           | -           | -      |
| mixture flow                                       | l/s              |                               | 2.78                           | 3.66        | 4.39       | 4.52        | 4.52        |        |
| unit total pressure drop                           | kPa              |                               | 68                             | 54          | 75         | 79          | 79          |        |
| PERFORMANCE SMART (2)(3)                           |                  |                               | Air Condition: 35° C, R.H. 30% |             |            |             |             |        |
| air flow(4)  | m³/h             |                               | 15900                          | 18500       | 24000      | 25000       | 25000       |        |
| ethylene glycol                                    | %                |                               | 0                              | 0           | 0          | 0           | 0           |        |
| MECHANICAL COOLING PERFORMANCE (2)                 |                  |                               |                                |             |            |             |             |        |
| Refrigerant  |                  |                               | R410A                          |             |            |             |             |        |
| total gross cooling capacity                       | kW               |                               | 72.3                           | 79          | 101.9      | 113.5       | 118.6       |        |
| sensible gross cooling capacity                    | kW               |                               | 72.2                           | 78.9        | 101.9      | 113.4       | 118.6       |        |
| SHR (sensible/total ratio)                         | -                |                               | 1                              | 1           | 1          | 1           | 1           |        |
| compressor power input                             | kW               |                               | 6.81+6.44                      | 6.88+6.48   | 9.38+9.42  | 10.69+10.71 | 11.19+11.14 |        |
| compressor OA                                      | A                |                               | 13+12.88                       | 13.07+12.93 | 16.58+16.6 | 15.01+15.05 | 21.75+21.61 |        |
| Configuration                                      | Upflow           | Net Sensible cooling capacity | kW                             | 67.3        | 76.4       | 96.5        | 107.6       | 112.8  |
|  |                  | fan power input               | kW                             | 2x2.39      | 3x1.15     | 3x2.22      | 3x2.47      | 3x2.47 |
|  |                  | unit power input              | kW                             | 18.05       | 16.85      | 25.49       | 28.84       | 29.76  |
|  | Downflow Up      | Net Sensible cooling capacity | kW                             | 67.6        | 75.7       | 95.4        | 106.2       | 111.3  |
|  |                  | fan power input               | kW                             | 2x2.33      | 3x1.07     | 3x2.16      | 3x2.41      | 3x2.41 |
|  |                  | unit power input              | kW                             | 17.94       | 16.6       | 25.31       | 28.66       | 29.59  |
|  | Downflow Down    | Net Sensible cooling capacity | kW                             | 68.2        | 75.9       | 95.9        | 106.9       | 112    |
|  |                  | fan power input               | kW                             | 2x2.04      | 3x0.99     | 3x1.99      | 3x2.18      | 3x2.18 |
|  |                  | unit power input              | kW                             | 17.36       | 16.36      | 16.07       | 27.97       | 28.9   |
|  | Downflow Frontal | Net Sensible cooling capacity | kW                             | 66.7        | -          | -           | -           | -      |
|  |                  | fan power input               | kW                             | 2x2.21      | -          | -           | -           | -      |
|  |                  | unit power input              | kW                             | 17.68       | -          | -           | -           | -      |

# Technical Data

| MODELS   |                  | PX062                         | PX068       | PX082        | PX094       | PX104      |        |        |
|--|------------------|-------------------------------|-------------|--------------|-------------|------------|--------|--------|
| <b>Condensing section (H models only)</b>                    |                  |                               |             |              |             |            |        |        |
| <b>water inlet temp: 30° C - condensation temp: 45° C</b>    |                  |                               |             |              |             |            |        |        |
| water flow   | l/s              | 0.795+0.864                   | 0.824+0.907 | 1.110+1.21   | 1.251+1.37  | 1.312+1.44 |        |        |
| water side pressure drop                                     | kPa              | 14+17                         | 9+11        | 16+19        | 20+24       | 22+26      |        |        |
| <b>CHILLED WATER PERFORMANCE (2)</b>                         |                  |                               |             |              |             |            |        |        |
| total gross cooling capacity                                 |                  |                               |             |              |             |            |        |        |
| total gross cooling capacity                                 | kW               | 68.7                          | 87.5        | 96           | 99          | 99         |        |        |
| sensible gross cooling capacity                              | kW               | 68.7                          | 87.5        | 96           | 99          | 99         |        |        |
| SHR (sensible/total ratio)                                   | -                | 1                             | 1           | 1            | 1           | 1          |        |        |
| Configuration  | Upflow           | Net Sensible cooling capacity | kW          | 63.9         | 84.1        | 89.4       | 91.6   | 91.6   |
|  |                  | fan power input               | kW          | 2x2.39       | 3x1.15      | 3x2.22     | 3x2.47 | 2.47   |
|  |                  | unit power input              | kW          | 4.81         | 3.48        | 6.69       | 7.44   | 7.44   |
|  | Downflow Up      | Net Sensible cooling capacity | kW          | 64           | 84.3        | 89.6       | 91.8   | 91.8   |
|  |                  | fan power input               | kW          | 2x2.33       | 3x1.07      | 3x2.16     | 3x2.41 | 2x2.41 |
|  |                  | unit power input              | kW          | 4.69         | 3.24        | 6.51       | 7.26   | 7.26   |
|  | Downflow Down    | Net Sensible cooling capacity | kW          | 64.6         | 84.5        | 90.1       | 92.5   | 92.5   |
|  |                  | fan power input               | kW          | 2x2.04       | 3x0.99      | 3x1.99     | 3x2.18 | 3x2.18 |
|  |                  | unit power input              | kW          | 4.11         | 3           | 6          | 6.57   | 6.57   |
|  | Downflow Frontal | Net Sensible cooling capacity | kW          | 64.3         | -           | -          | -      | -      |
|  |                  | fan power input               | kW          | 2x2.21       | -           | -          | -      | -      |
|  |                  | unit power input              | kW          | 4.45         | -           | -          | -      | -      |
| mixture flow   | l/s              | 2.74                          | 3.49        | 3.83         | 3.95        | 3.95       |        |        |
| unit total pressure drop                                     | kPa              | 65                            | 48          | 56           | 60          | 60         |        |        |
| <b>FAN</b>   |                  |                               |             |              |             |            |        |        |
| Quantity (Premium Fan Module)                                | no.              | 2                             | 3           | 3            | 3           | 3          |        |        |
| FLA  | A                | 10                            | 15          | 15           | 15          | 15         |        |        |
| LRA  | A                | 0.2                           | 0.3         | 0.3          | 0.3         | 0.3        |        |        |
| Quantity (Basic Fan Module, Fix speed)                       | no.              | 2                             | 2           | 2            | 2           | 2          |        |        |
| FLA  | A                | 10                            | 10          | 10           | 10          | 10         |        |        |
| LRA  | A                | 0.2                           | 0.2         | 0.2          | 0.2         | 0.2        |        |        |
| <b>COMPRESSOR</b>  |                  |                               |             |              |             |            |        |        |
| Quantity (Digital Scroll Cooling System)                     | no.              | 2                             | 2           | 4            | 4           | 4          |        |        |
| FLA  | A                | 2x18.2                        | 2x18.2      | 4x15         | 2x(16.5+15) | 4x16.2     |        |        |
| LRA  | A                | 2x128                         | 2x128       | 4x75         | 4x101       | 4x101      |        |        |
| <b>EVAPORATING COIL</b>                                      |                  |                               |             |              |             |            |        |        |
| quantity / configuration                                     | no.              | 1                             | 1           | 1            | 1           | 1          |        |        |
| pipes/fins   |                  | Copper/treated aluminum       |             |              |             |            |        |        |
| pitch fins   | mm               | 1.8                           | 1.8         | 1.8          | 1.8         | 1.8        |        |        |
| rows   | no.              | 2+2                           | 2+2         | 2+2          | 2+2         | 2+2        |        |        |
| front surface  | m <sup>2</sup>   | 1.482                         | 2.442       | 2.442        | 2.442       | 2.442      |        |        |
| <b>CHILLED WATER COIL</b>                                    |                  |                               |             |              |             |            |        |        |
| quantity / configuration                                     | no.              | 1                             | 1           | 1            | 1           | 1          |        |        |
| pipes/fins   |                  | Copper/treated aluminum       |             |              |             |            |        |        |
| pitch fins   | mm               | 1.6                           | 1.6         | 1.6          | 1.6         | 1.6        |        |        |
| rows   | no.              | 5                             | 5           | 5            | 5           | 5          |        |        |
| front surface  | m <sup>2</sup>   | 1.482                         | 2.442       | 2.442        | 2.442       | 2.442      |        |        |
| <b>REFRIGERANT CONNECTIONS (D models only)</b>               |                  |                               |             |              |             |            |        |        |
| Refrigerant connecting pipe diameter: see Tab. 12f, Chap. 12 |                  |                               |             |              |             |            |        |        |
| gas line outlet (pipe to be welded, o.d.)                    | mm               | 18/18                         | 18/18       | 22/22        | 22/22       | 22/22      |        |        |
| liquid line inlet (pipe to be welded, o.d.)                  | mm               | 18/18                         | 18/18       | 18/18        | 18/18       | 18/18      |        |        |
| <b>WATER CIRCUIT CONDENSER (H models only)</b>               |                  |                               |             |              |             |            |        |        |
| condenser type   |                  |                               |             | Brazed plate |             |            |        |        |
| water connections ISO 7/1                                    | inch             | Rp 1 ¼                        | Rp 1 ¼      | Rp 1 ¼       | Rp 1 ¼      | Rp 1 ¼     |        |        |
| Total water internal volume                                  | l                | 6.46                          | 8.68        | 8.68         | 8.68        | 8.68       |        |        |
| <b>CHILLED WATER CONTENT ISO 7/1</b>                         |                  |                               |             |              |             |            |        |        |
| Total water internal volume                                  | l                | 25.9                          | 42.6        | 42.6         | 42.6        | 42.6       |        |        |
| <b>DIMENSIONS</b>  |                  |                               |             |              |             |            |        |        |
| width  | mm               | 1750                          | 2550        | 2550         | 2550        | 2550       |        |        |
| depth  | mm               | 890                           | 890         | 890          | 890         | 890        |        |        |
| height   | mm               | 1970                          | 1970        | 1970         | 1970        | 1970       |        |        |
| footprint  | m <sup>2</sup>   | 1.558                         | 2.270       | 2.270        | 2.270       | 2.270      |        |        |

Data refers to Standard Units without options, Premium Fan Module with clean F5 filters.

Standard ESP: Upflow 50Pa; Downflow Up 20Pa; Downflow Frontal 0Pa

For Downflow Up and Down versions the data refers to the height of the raised floor= 600 mm

Performance data refers to Downflow Units, if not specified otherwise.

**(1) IN THE FOLLOWING STANDARD CONDITIONS: Room conditions 24°C bs; 50% R.H. (17°C wb) - Condensing temperature: 45° C**

**- Air flow of the units refers to the standard configuration with F5 class filter.**

**(2) Liebert PDX is able to adapt to the different site needs and working conditions. Performances in different working conditions, different airflows can be provided by Vertiv representatives.**

Technical data can be subject to change without notice.

# Technical Data

Tab. 4g - Scroll Cooling System direct expansion unit @ 100% cooling capacity, Basic Fan Module

Pxxx KA/W series

| MODELS                                      |        | PX015  | PX021   | PX025   | PX031   |                        |      |     |     |     |
|---|--------|--|---------|---------|---------|------------------------|------|-----|-----|-----|
| Power supply voltage                        |        | V/Ph/Hz  |         |         |         | 400V ±10% / 3Ph / 50Hz |      |     |     |     |
| Refrigerant circuit                         |        | single   | single  | single  | single  |                        |      |     |     |     |
| PERFORMANCE LEGACY (1)(2)                   |        | Air Condition: 24° C, R.H. 50%                               |         |         |         |                        |      |     |     |     |
| air flow                                    |        | m <sup>3</sup> /h  | 3854    | 5580    | 5978    | 6661                   |      |     |     |     |
| Refrigerant                                 |        | R410A  |         |         |         |                        |      |     |     |     |
| total gross cooling capacity                |        | kW   | 12.6    | 18      | 22.4    | 26.9                   |      |     |     |     |
| sensible gross cooling capacity             |        | kW   | 12.6    | 18      | 22.2    | 25.7                   |      |     |     |     |
| SHR (sensible/total ratio)                  |        | -  | 1       | 1       | 0.99    | 0.95                   |      |     |     |     |
| compressor power input                      |        | kW   | 2.6     | 3.85    | 5.17    | 6.37                   |      |     |     |     |
| compressor OA                               |        | A  | 4.53    | 6.71    | 10.06   | 12.79                  |      |     |     |     |
| Configuration                               | Upflow | Net Sensible cooling capacity                                | kW      | 12.2    | 16.5    | 20.9                   | 23.9 |     |     |     |
|   |        | fan power input  | kW      | 0.45    | 1.17    | 1.29                   | 1.73 |     |     |     |
|   |        | unit power input   | kW      | 3.08    | 5.05    | 6.49                   | 8.13 |     |     |     |
| Condensing section (W models only)          |        | water inlet temp: 30° C - condensation temp: 45° C           |         |         |         |                        |      |     |     |     |
| water flow                                  |        | l/s  | 0.277   | 0.393   | 0.518   | 0.627                  |      |     |     |     |
| water side pressure drop                    |        | kPa  | 4       | 6       | 10      | 9                      |      |     |     |     |
| FAN   |        | Quantity (Basic Fan Module, Fix speed)                       |         |         |         | no.                    | 1    | 1   | 1   | 1   |
| FLA   |        | A  | 3.1     | 3.1     | 3.1     | 3.1                    |      |     |     |     |
| LRA   |        | A  | 0.1     | 0.1     | 0.1     | 0.1                    |      |     |     |     |
| COMPRESSOR                                  |        | Quantity (Scroll Cooling System)                             |         |         |         | no.                    | 1    | 1   | 1   | 1   |
| FLA   |        | A  | 8       | 11.8    | 15      | 18.2                   |      |     |     |     |
| LRA   |        | A  | 43      | 64      | 101     | 128                    |      |     |     |     |
| EVAPORATING COIL                            |        | quantity / configuration                                     |         |         |         | no.                    | 1    | 1   | 1   | 1   |
| pipes/fins                                  |        | Copper/treated aluminum                                      |         |         |         |                        |      |     |     |     |
| pitch fins                                  |        | mm   | 1.8     | 1.8     | 1.8     | 1.8                    |      |     |     |     |
| rows  |        | no.  | 6       | 6       | 6       | 6                      |      |     |     |     |
| front surface                               |        | m <sup>2</sup>   | 0.82    | 0.82    | 0.82    | 0.82                   |      |     |     |     |
| REFRIGERANT CONNECTIONS (A models only)     |        | Refrigerant connecting pipe diameter: see Tab. 12f, Chap. 12 |         |         |         |                        |      |     |     |     |
| gas line outlet (pipe to be welded, o.d.)   |        | mm   | 16      | 16      | 16      | 22                     |      |     |     |     |
| liquid line inlet (pipe to be welded, o.d.) |        | mm   | 12      | 12      | 12      | 16                     |      |     |     |     |
| WATER CIRCUIT (W models only)               |        | condenser type (W models only)                               |         |         |         | Brazed plate           |      |     |     |     |
| water connections ISO 7/1 (W models only)   |        | inch   | Rp1 1/4 | Rp1 1/4 | Rp1 1/4 | Rp1 1/4                |      |     |     |     |
| Total water internal volume                 |        | l  | 1.58    | 1.89    | 1.89    | 2.22                   |      |     |     |     |
| DIMENSIONS                                  |        | width  |         |         |         | mm                     | 844  | 844 | 844 | 844 |
| depth                                       |        | mm   | 890     | 890     | 890     | 890                    |      |     |     |     |
| height                                      |        | mm   | 1970    | 1970    | 1970    | 1970                   |      |     |     |     |
| footprint                                   |        | m <sup>2</sup>   | 0.75    | 0.75    | 0.75    | 0.75                   |      |     |     |     |

\*PX021 unit is available only in KA version



# 5

## Heat Rejections (A - D versions)

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### Coupling of room units with remote air- cooled condensers

The units should be connected to Liebert HCR or Liebert® MC™ Microchannel Coil Condenser.

The following paragraphs describe the suggested coupling of Liebert® PDX units. The data given below are approximate and must always be verified on the basis of the other specific operating conditions.

Liebert® PDX units, Dual Circuit Scroll Cooling System, can be connected to Liebert HCR (single circuit), Liebert® HBR (dual circuit) or Liebert® MC™ Microchannel Coil Condenser single or dual circuit. Liebert® PDX units, Dual Circuit Digital Scroll Cooling System, can be connected to Liebert HCR (single circuit) or Liebert® MC™ Microchannel Coil Condenser single or dual circuit.

To ensure correct operation, best performance, and longest life the units must be connected to remote condensers approved by Vertiv.

The warranty clauses are no longer valid if the unit is connected to an unapproved remote condenser. Connecting a too large capacity condenser (50% higher than the nominal capacity indicated in Tab.5.a) to the PDX unit can cause malfunctioning and incorrect condenser regulation at low ambient temperature (e.g. in cold season).

All HCR condensers (refrigerant R410A) with Variex have the possibility to change the condenser set point from default set point 1 (condensing temperature 39°C) to set point 2 (condensing temperature 34°C). This set point 2 increases the system efficiency despite of a little increase of the external unit noise. For more details see the HCR manuals.

**Note:** This option is possible only when indoor units have the EEV (electronic expansion valve).



# Heat Rejections (A - D versions)

Tab. 5a - Coupling of Liebert HCR Condensers with Liebert® PDX A- D

| MODEL     | External temperature up to 35°C | External temperature up to 40°C | External temperature up to 46°C | External temperature up to 48°C |
|-----------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| PX015xA/D | 1x HCR24                        | 1x HCR24                        | 1x HCR33                        | 1x HCR51                        |
| PX021xA/D | 1x HCR33                        | 1x HCR33                        | 1x HCR43                        | 1x HCR51                        |
| PX025xA/D | 1x HCR33                        | 1x HCR43                        | 1x HCR51                        | 1x HCR59                        |
| PX031xA/D | 1x HCR43                        | 1x HCR43                        | 1x HCR59                        | 1x HCR76                        |
| PX033xA/D | 1x HCR43                        | 1x HCR59                        | 1x HCR76                        | 1x HCR88                        |
| PX041xA/D | 1x HCR51                        | 1x HCR59                        | 1x HCR76                        | 1x HCR88                        |
| PX045xA   | 1x HCR59                        | 1x HCR59                        | 1x HCR76                        | 1x HCR88                        |
| PX047xA/D | 1x HCR59                        | 1x HCR59                        | 1x HCR76                        | 1x HCR88                        |
| PX051xA/D | 1x HCR59                        | 1x HCR76                        | 1x HCR88                        | 1x HCR99                        |
| PX057xA   | 1x HCR76                        | 1x HCR88                        | 1x HCR88                        | 1x HCR99                        |
| PX044xA/D | 2x HCR33                        | 2x HCR33                        | 2x HCR43                        | 2x HCR51                        |
| PX054xA/D | 2x HCR33                        | 2x HCR43                        | 2x HCR43                        | 2x HCR59                        |
| PX062xA/D | 2x HCR43                        | 2x HCR43                        | 2x HCR59                        | 2x HCR76                        |
| PX074xA   | 2x HCR43                        | 2x HCR59                        | 2x HCR76                        | 2x HCR88                        |
| PX068xA/D | 2x HCR43                        | 2x HCR43                        | 2x HCR59                        | 2x HCR76                        |
| PX082xA/D | 2x HCR51                        | 2x HCR59                        | 2x HCR76                        | 2x HCR88                        |
| PX094xA/D | 2x HCR59                        | 2x HCR76                        | 2x HCR88                        | 2x HCR99                        |
| PX104xA/D | 2x HCR59                        | 2x HCR76                        | 2x HCR88                        | 2x HCR99                        |
| PX120xA   | 2x HCR76                        | 2x HCR88                        | 2x HCR99                        | 2x HCR99                        |
| PX059xA   | 1x HCR76                        | 1x HCR88                        | 1x HCR88                        | 1x HCR99                        |
| PX092xA   | 2x HCR59                        | 2x HCR76                        | 2x HCR88                        | 2x HCR99                        |
| PX150xA   | 2 x HCR99                       | 2 x HCR99                       | 2 x HCR99                       | -                               |
| PX165xA   | 2 x HCR99                       | 2 x HCR99                       | -                               | -                               |

Tab. 5b - Coupling of Liebert® MC Condensers with Liebert® PDX A- D

| MODEL     | External temperature up to 35°C | External temperature up to 40°C | External temperature up to 46°C |
|-----------|---------------------------------|---------------------------------|---------------------------------|
| PX015xA/D | 1 x MCS028                      | 1 x MCS028                      | 1 x MCM040                      |
| PX021xA/D | 1 x MCS028                      | 1 x MCM040                      | 1 x MCM040                      |
| PX025xA/D | 1 x MCM040                      | 1 x MCM040                      | 1x MCL55                        |
| PX031xA/D | 1 x MCM040                      | 1 x MCM040                      | 1x MCL55                        |
| PX033xA/D | 1x MCL55                        | 1x MCL55                        | 1 x MCM080                      |
| PX041xA/D | 1 x MCL055                      | 1 x MCL055                      | 1 x MCM080                      |
| PX045xA   | 1 x MCL055                      | 1 x MCM080                      | 1 x MCM080                      |
| PX047xA/D | 1 x MCL055                      | 1 x MCM080                      | 1 x MCM080                      |
| PX051xA/D | 1 x MCM080                      | 1 x MCM080                      | 1 x MCL110                      |
| PX057xA   | 1 x MCM080                      | 1 x MCM080                      | 1 x MCL110                      |
| PX044xA/D | 2 x MCS028                      | 2 x MCM040                      | 2 x MCM040                      |
| PX054xA/D | 2 x MCM040                      | 2 x MCM040                      | 2 x MCL055                      |
| PX062xA/D | 2 x MCM040                      | 2 x MCL055                      | 2 x MCL055                      |
| PX074xA   | 2 x MCL055                      | 2 x MCL055                      | 2 x MCM080                      |
| PX068xA/D | 2 x MCM040                      | 2 x MCL055                      | 2 x MCL055                      |
| PX082xA/D | 2 x MCL055                      | 2 x MCL055                      | 2 x MCM080                      |
| PX094xA/D | 2 x MCL055                      | 2 x MCM080                      | 2 x MCM080                      |
| PX104xA/D | 2 x MCM080                      | 2 x MCM080                      | 2 x MCL110                      |
| PX120xA   | 2 x MCM080                      | 2 x MCL110                      | 2 x MCL110                      |
| PX059xA   | 1 x MCM080                      | 1 x MCM080                      | 1 x MCL110                      |
| PX092xA   | 2 x MCL055                      | 2 x MCM080                      | 2 x MCM080                      |
| PX150xA   | 2 x MCL110                      | 2 x MCL165                      | 2 x MCL165                      |
| PX165xA   | 2 x MCL165                      | 2 x MCL165                      | 2 x MCL165                      |

# Heat Rejections (A - D versions)

Tab. 5c - Technical data and performance of Liebert HCR condenser

| Model  | Power supply [V/Ph/Hz] | Total Heat Rejection (THR)* R410A [kW] | Air Volume [m3/h] | Noise Level ** [dB(A)] @ 5 m | Input Power [kW] | Current Absorption [A] | FLA [A] | Refrigerant connections [mm] |                  | Unit with packing         |             |
|--------|------------------------|--|-------------------|------------------------------|------------------|------------------------|---------|------------------------------|------------------|---------------------------|-------------|
|        |                        |  |                   |                              |                  |                        |         | Gas line [mm]                | Liquid line [mm] | Dimensions [mm]           | Weight [kg] |
| HCR 24 | 230/1/50               | 24.0                                   | 8600              | 51.0                         | 0.55             | 2.5                    | 2.5     | 16                           | 16               | L 1112<br>W 1340<br>H 907 | 60          |
| HCR 33 | 230/1/50               | 32.2                                   | 7400              | 51.0                         | 0.55             | 2.5                    | 2.5     | 16                           | 16               | L 1112<br>W 1340<br>H 907 | 75          |
| HCR 43 | 230/1/50               | 46.0                                   | 17000             | 54.0                         | 1.10             | 5.0                    | 5.0     | 16                           | 16               | L 1112<br>W 2340<br>H 907 | 92          |
| HCR 51 | 230/1/50               | 52.0                                   | 17000             | 54.0                         | 1.10             | 5.0                    | 5.0     | 22                           | 16               | L 1112<br>W 2340<br>H 907 | 93          |
| HCR 59 | 230/1/50               | 62.0                                   | 15600             | 54.0                         | 1.10             | 5.0                    | 5.0     | 22                           | 16               | L 1112<br>W 2340<br>H 907 | 102         |
| HCR 76 | 230/1/50               | 78.0                                   | 25500             | 56.0                         | 1.65             | 7.5                    | 7.5     | 22                           | 16               | L 1112<br>W 3340<br>H 907 | 136         |
| HCR 88 | 230/1/50               | 92.0                                   | 23400             | 56.0                         | 1.65             | 7.5                    | 7.5     | 22                           | 16               | L 1112<br>W 3340<br>H 907 | 165         |
| HCR 99 | 230/1/50               | 130.0                                  | 32000             | 57.0                         | 2.20             | 10.0                   | 10.0    | 28                           | 22               | L 1112<br>W 4338<br>H 907 | 220         |

Tab. 5d - Technical data and performance of Liebert® MC Condenser

| Model  | Power supply [V/Ph/Hz] | Total Heat Rejection (THR)* R410A[kW] | Air Volume [m3/h] | Noise Level ** [dB(A)] 5 m | Input Power [kW] | Current Absorption [A] | FLA [A] | Refrigerant connections [mm] |                  | Unit with packing          |             |
|--------|------------------------|---------------------------------------|-------------------|----------------------------|------------------|------------------------|---------|------------------------------|------------------|----------------------------|-------------|
|        |                        |                                       |                   |                            |                  |                        |         | Gas line [mm]                | Liquid line [mm] | Dimensions [mm]            | Weight [kg] |
| MCS028 | 230/1/50               | 32.96                                 | 8831              | 49.8                       | 0.473            | 0.99                   | 4.3     | 22                           | 16               | L 1400<br>W 1100<br>H 1000 | 70          |
| MCM040 | 400/3/50               | 41.97                                 | 11264             | 54                         | 0.636            | 1.23                   | 1.5     | 22                           | 16               | L 1453<br>W 1175<br>H 1007 | 105         |
| MCL055 | 400/3/50               | 59.55                                 | 15451             | 62                         | 0.92             | 1.72                   | 3.5     | 28                           | 22               | L 1730<br>W 1420<br>H 1100 | 156         |
| MCM080 | 400/3/50               | 83.94                                 | 22528             | 57                         | 1.272            | 2.46                   | 3       | 28                           | 22               | L 2674<br>W 1175<br>H 1007 | 200         |
| MCL110 | 400/3/50               | 112.0                                 | 30902             | 65                         | 2.11             | 3.96                   | 7       | 35                           | 28               | L 3160<br>W 1420<br>H 1100 | 273         |

(\*) The nominal capacities refer to the following operative conditions:

- refrigerant as indicated (R410A).
- temperature differences: 15 K (T condensation – T outdoor).
- height of the installation = 0m, above the sea level. For different altitudes, see Hirating program.
- clean exchange surfaces.

(\*\*) The levels of sound pressure here included are measured in the same operative conditions, and are referred to 5 m far from the unit, at 1.5 m in height in free field conditions.

# Heat Rejections (W - F - H versions)

## Coupling of water cooled units with remote Dry Coolers

The water- condensed units are provided with a water/refrigerant exchanger with braze- welded plates made of stainless steel; this advanced exchanger type gives the highest efficiency in heat exchange. In addition, a certain over-sizing of the exchanger has been provided so as to reduce pressure drops (and energy consumption of the water pump) as much as possible and thus to allow the unit to operate with the external chiller in closed circuit, even at high outdoor temperatures.



The units type W/H are designed for operating with mains water or water in closed circuit with an external chiller. The units type F are designed for operating with water in closed circuit with a remote Dry Cooler (or other suitable external device).

When operating in a closed circuit, the water is cooled by the outdoor air in a heat exchanger; in this case, to avoid unwanted ice formation during winter, it is advisable to use a water/glycol mixture.

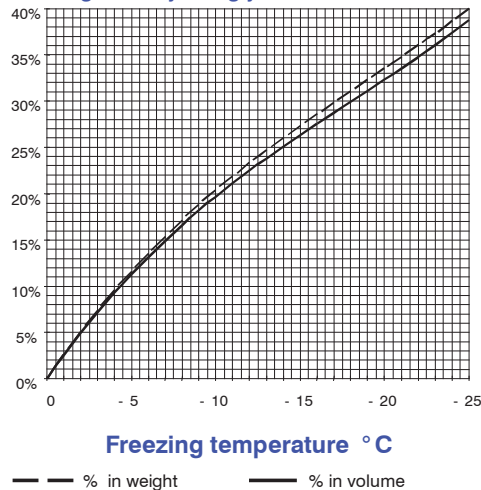
The circulation of the water- glycol mixture is forced (the pump is not supplied). If mains water or tower water is used, when installing the unit fit a mechanical filter on the water line to protect the condenser against possible impurities contained in the water (for condenser cleaning see the User Manual).

## Dry Coolers

Our Dry Coolers are built with a copper/ aluminium cooling coil and axial fan(s).

The main data on Dry Coolers is shown in the following table:

Percentage of ethylene glycol mixed with water



### Note:

In the closed circuits to avoid water freezing in the cold seasons, it is strictly recommended to mix water with ethylene glycol. The suggested percentage is given in the Diagram.

For safety reason, calculate the percentage at least at 5°C below the minimum ambient temperature.

It is also recommended to check periodically the mixture: in case of leakage of the circuit, the sanitary water, used at compensation, reduces progressively the glycol percentage and increases the freezing point of the mixture!

## Features and benefits

Liebert HPD Dry Coolers are the new range of liquid coolers, able to cover rated heat exchange capacities from 8 to 400 kW.

They excel above all for their efficiency, versatility and reliability, thanks to the following features:

- Possibility of installation with horizontal or vertical air flow with simple operations on site, with the same model of Dry Cooler, without needing any wiring or re- wiring inside the unit.
- Modulating fan speed regulator with phase (optional), for a continuous modulation of the fan speed, installed on the machine, wired and factory- set, thus making the connection steps on site and the unit start- up extremely easy; the fan speed regulator with phase cutoff can be selected to control up to two set- point values for the water delivery temperature of the Dry Cooler.

Do not use fan speed regulator other than the approved one supplied by the manufacturer. When the Dry Cooler is ordered without temperature control, an outer on/off type control (to be arranged by the customer) is anyway allowed and must be connected on site with the suitable terminals available in the electric board Q of the unit (see wiring diagram enclosed to the unit).

- The axial fans are equipped with protection grid and are statically and dynamically balanced; they can guarantee high efficiency and a low emitted noise level (above all in the low noise version); further, they are equipped with motors able to operate within a wide range of outdoor working temperatures. Protection degree IP 54. Single- phase fans feature an electric condenser incorporated in the terminal board.
- Heat exchanger with oval- geometry tubes ensuring the best air flow and thus an increase in the efficiency of the heat exchange, for a lower emitted noise level.

Tubes are in copper and fins in aluminum, with wide heat exchange surface.

## Heat Rejections (W - F - H versions)

Upon request (optional), the unit can be ordered with fins in epoxy- coated aluminum, with a better protection. The coil manifolds are in copper, with flanged connections in AISI 304 stainless steel for the models with three- phase power supply and male gas threaded connections for the single- phase models.

- the power supply is:
  - 230 V single phase 50 Hz in the DYS models (standard noise level) and DYL models (low noise level).
  - 400 V three- phase 50 Hz in the DYS models (standard noise level) and DYL models (low noise level).
- Electrical boxes and accessories are water proof IP55.
- The frame is made up of a sturdy structure in galvanized steel, totally painted.
- The units are equipped with protection electric board Q, with main disconnect and safety device for fan motors.
- The most important technical data are gathered in Tab. 5f.
- Tests on thermal performance have been carried out at IMQ laboratories, according to the norm UNI EN 1048:2000, at the following special operating conditions:
  - Air inlet T = 35°C
  - Water inlet T = 45°C
  - Water outlet T = 40°C
- Sound pressure levels have been evaluated according to the norm EN13487, at a 10- m distance, with free field.
- The working pressure depends on the circuit where the Dry Cooler is connected. Dry Cooler max working pressure = 16 bar.

### All Dry Coolers are CE marking.

Dry Cooler units are conform to the following directives:

- MD: 2006/42/EC;
- EMC: 2014/30/EU;
- LVD: 2014/35/EU;
- PED: 2014/68/EU;

Tab. 5e - Coupling of Dry Coolers

| Model       | External temperature up to 30°C |            | External temperature up to 35°C |            | External temperature up to 40°C |            |
|-------------|---------------------------------|------------|---------------------------------|------------|---------------------------------|------------|
|             | Standard                        | Low noise  | Standard                        | Low noise  | Standard                        | Low noise  |
| PX015xW/F/H | 1 x DYS011                      | 1 x DYL011 | 1 x DYS013                      | 1 x DYL015 | 1 x DYS022                      | 1 x DYL017 |
| PX025xW/F/H | 1 x DYS028                      | 1 x DYL027 | 1 x DYS028                      | 1 x DYL027 | 1 x DYS044                      | 1 x DYL047 |
| PX031xW/F/H | 1 x DYS028                      | 1 x DYL027 | 1 x DYS028                      | 1 x DYL027 | 1 x DYS044                      | 1 x DYL047 |
| PX033xW     | 1 x DYS028                      | 1 x DYL027 | 1 x DYS028                      | 1 x DYL027 | 1 x DYS050                      | 1 x DYL047 |
| PX041xW/F/H | 1 x DYS028                      | 1 x DYL027 | 1 x DYS035                      | 1 x DYL040 | 1 x DYS050                      | 1 x DYL055 |
| PX045xW     | 1 x DYS028                      | 1 x DYL027 | 1 x DYS035                      | 1 x DYL040 | 1 x DYS050                      | 1 x DYL065 |
| PX047xW/F/H | 1 x DYS028                      | 1 x DYL027 | 1 x DYS035                      | 1 x DYL047 | 1 x DYS050                      | 1 x DYL065 |
| PX051xW/F/H | 1 x DYS035                      | 1 x DYL040 | 1 x DYS044                      | 1 x DYL047 | 1 x DYS084                      | 1 x DYL085 |
| PX057xW     | 1 x DYS035                      | 1 x DYL040 | 1 x DYS050                      | 1 x DYL055 | 1 x DYS084                      | 1 x DYL085 |
| PX044xW/F/H | 1 x DYS028                      | 1 x DYL027 | 1 x DYS035                      | 1 x DYL040 | 1 x DYS050                      | 1 x DYL065 |
| PX054xW/F/H | 1 x DYS035                      | 1 x DYL040 | 1 x DYS044                      | 1 x DYL047 | 1 x DYS084                      | 1 x DYL085 |
| PX062xW/F/H | 1 x DYS044                      | 1 x DYL047 | 1 x DYS050                      | 1 x DYL055 | 1 x DYS084                      | 1 x DYL085 |
| PX074xW     | 1 x DYS044                      | 1 x DYL047 | 1 x DYS050                      | 1 x DYL065 | 1 x DYS122                      | 1 x DYL130 |
| PX068xW/F/H | 1 x DYS044                      | 1 x DYL047 | 1 x DYS050                      | 1 x DYL055 | 1 x DYS084                      | 1 x DYL100 |
| PX082xW/F/H | 1 x DYS050                      | 1 x DYL055 | 1 x DYS065                      | 1 x DYL065 | 1 x DYS122                      | 1 x DYL130 |
| PX094xW/F/H | 1 x DYS050                      | 1 x DYL055 | 1 x DYS084                      | 1 x DYL085 | 1 x DYS122                      | 1 x DYL130 |
| PX104xW/F/H | 1 x DYS065                      | 1 x DYL065 | 1 x DYS084                      | 1 x DYL100 | 1 x DYS175                      | 1 x DYL160 |
| PX120xW     | 1 x DYS084                      | 1 x DYL085 | 1 x DYS122                      | 1 x DYL100 | 1 x DYS220                      | 1 x DYL210 |
| PX059xW     | 1 x DYS035                      | 1 x DYL040 | 1 x DYS044                      | 1 x DYL055 | 1 x DYS084                      | 1 x DYL085 |
| PX092xW     | 1 x DYS050                      | 1 x DYL065 | 1 x DYS084                      | 1 x DYL085 | 1 x DYS122                      | 1 x DYL130 |

The table shows the recommended combinations of the Dry Coolers Liebert HPD with the air conditioners Liebert® PDX, according to the external air temperature.

The combinations have been evaluated considering a mixture of water and ethylene glycol up to 30% as thermal exchange fluid.

The above indications are approximate and must be checked on the basis of other specific operating conditions.

For operating conditions other than those indicated in the table, refer to the New Hirting calculation software and to the Dry Coolers User Manual.

# Heat Rejections (W - F - H versions)

Tab. 5f - Technical data and performance of Dry Coolers

| Standard Model | Performances |                          |                             | Electrical Data |      |                          |                          | Overall Dimensions      |
|----------------|--------------|--------------------------|-----------------------------|-----------------|------|--------------------------|--------------------------|-------------------------|
|                | Capacity     | Max. water pressure drop | Max. sound pressure level © | Power supply    | Fans | Total absorbed power(AC) | Total absorbed power(EC) | Widthx DepthxHeight (b) |
|                | kW           | kPa                      | db(A) 10m free field        | V/Ph/Hz         | no   | kW                       | kW                       | mm                      |
| DYS011         | 11,2         | 48                       | 23.5                        | 230/1/50        | 1    | 0,68                     | 0,75                     | 767 x 954 x 1240        |
| DYS013         | 12,6         | 48                       | 19.0                        | 230/1/50        | 1    | 0,68                     | 0,75                     | 767 x 954 x 1240        |
| DYS017         | 17,1         | 51                       | 44.7                        | 230/1/50        | 2    | 1,36                     | 1,50                     | 767 x 954 x 2120        |
| DYS022         | 22,1         | 51                       | 66.0                        | 230/1/50        | 2    | 1,36                     | 1,50                     | 767 x 954 x 2120        |
| DYS028         | 28,7         | 46                       | 40.2                        | 400/3/50        | 2    | 1,26                     | 1,24                     | 1067 x 1080 x 2360      |
| DYS035         | 35,7         | 46                       | 70.0                        | 400/3/50        | 2    | 1,26                     | 1,24                     | 1067 x 1080 x 2360      |
| DYS044         | 44,5         | 48                       | 62.0                        | 400/3/50        | 2    | 1,68                     | 1,86                     | 1067 x 1150 x 2960      |
| DYS050         | 50,4         | 50                       | 54.0                        | 400/3/50        | 3    | 3,88                     | 4,00                     | 1067 x 1150 x 4260      |
| DYS065         | 65,7         | 51                       | 32.0                        | 400/3/50        | 3    | 3,88                     | 4,00                     | 1245 x 1386 x 3340      |
| DYS084         | 84,5         | 51                       | 65.0                        | 400/3/50        | 4    | 3,88                     | 4,00                     | 1245 x 1386 x 3340      |
| DYS122         | 122,8        | 53                       | 40.0                        | 400/3/50        | 3    | 5,82                     | 6,00                     | 1245 x 1386 x 4815      |
| DYS175         | 175,5        | 54                       | 64.0                        | 400/3/50        | 4    | 7,76                     | 8,00                     | 1245 x 1386 x 6290      |
| DYS220         | 2,200        | 56                       | 70.0                        | 400/3/50        | 6    | 11,64                    | 12,00                    | 2295 x 1386 x 4815      |
| DYS267         | 266,8        | 56                       | 50.0                        | 400/3/50        | 6    | 11,64                    | 12,00                    | 2295 x 1386 x 4815      |
| DYS330         | 3,300        | 57                       | 26.0                        | 400/3/50        | 8    | 15,52                    | 16,00                    | 2295 x 1386 x 6290      |
| DYS400         | 405,0        | 58                       | 45,0                        | 400/3/50        | 10   | 19,4                     | 20,00                    | 2295 x 1386 x 7765      |

| Low Noise Model | Performances |                          |                             | Electrical Data |      |                          |                          | Overall Dimensions      |
|-----------------|--------------|--------------------------|-----------------------------|-----------------|------|--------------------------|--------------------------|-------------------------|
|                 | Capacity     | Max. water pressure drop | Max. sound pressure level © | Power supply    | Fans | Total absorbed power(AC) | Total absorbed power(EC) | Widthx DepthxHeight (b) |
|                 | kW           | kPa                      | db(A) 10m free field        | V/Ph/Hz         | no   | kW                       | kW                       | mm                      |
| DYL008          | 6,6          | 37                       | 20                          | 230/1/50        | 1    | 0,22                     | 0,22                     | 767 x 954 x 1240        |
| DYL011          | 10,2         | 37                       | 13                          | 230/1/50        | 1    | 0,22                     | 0,22                     | 767 x 954 x 1240        |
| DYL015          | 13,7         | 40                       | 26                          | 230/1/50        | 2    | 0,44                     | 0,44                     | 767 x 954 x 2120        |
| DYL017          | 17,0         | 40                       | 41                          | 230/1/50        | 2    | 0,44                     | 0,44                     | 767 x 954 x 2120        |
| DYL027          | 25,0         | 42                       | 28                          | 400/3/50        | 3    | 0,66                     | 0,66                     | 1067 x 1080 x 2360      |
| DYL040          | 35,1         | 42                       | 45                          | 400/3/50        | 2    | 1,06                     | 0,92                     | 1067 x 1080 x 2360      |
| DYL047          | 45,0         | 43                       | 57                          | 400/3/50        | 3    | 1,59                     | 1,38                     | 1067 x 1150 x 2960      |
| DYL055          | 54,7         | 43                       | 41                          | 400/3/50        | 3    | 1,59                     | 1,38                     | 1067 x 1150 x 4260      |
| DYL065          | 64,6         | 44                       | 18                          | 400/3/50        | 4    | 2,12                     | 1,84                     | 1245 x 1386 x 3340      |
| DYL085          | 85,1         | 44                       | 29                          | 400/3/50        | 4    | 2,49                     | 3,00                     | 1245 x 1386 x 3340      |
| DYL100          | 103,5        | 44                       | 53                          | 400/3/50        | 3    | 2,49                     | 3,00                     | 1245 x 1386 x 4815      |
| DYL130          | 130,8        | 45                       | 57                          | 400/3/50        | 4    | 3,32                     | 4,00                     | 1245 x 1386 x 6290      |
| DYL160          | 162,1        | 46                       | 29                          | 400/3/50        | 4    | 4,15                     | 5,00                     | 2295 x 1386 x 4815      |
| DYL210          | 211,0        | 47                       | 50                          | 400/3/50        | 6    | 4,98                     | 6,00                     | 2295 x 1386 x 4815      |
| DYL270          | 271,0        | 48                       | 62                          | 400/3/50        | 8    | 6,64                     | 8,00                     | 2295 x 1386 x 6290      |
| DYL350          | 349,8        | 49                       | 27                          | 400/3/50        | 10   | 8,30                     | 10,00                    | 2295 x 1386 x 7765      |

(a): at the following operative conditions:

- outdoor temperature = 35°C,
- inlet/outlet water temperature = 45°C/40°C,
- fluid is pure water, slm zero meters.

For different conditions refer to NewHirating program and to the Dry Coolers User Manual.

(b): vertical flow installation.

(c): sound pressure level, free field, at 10 m distance, according to EN13487.

# 6

## Airflow characteristics

### Useful available heads

The tables give the available and allowed external static pressure against airflow at different EC Fan modulation. All units are considered in standard configuration with clean F5 air filters.

The Liebert® PDX units are supplied with electric fans sized for 20 Pa Available External Static Pressure (ESP) for the models Downflow Up and Down, 50 Pa for the models Upflow and 0 Pa for Downflow Frontal.

The nominal airflow of all units can be changed via iCOM control.

**Note:** The EC Fan modulation could slightly differ from the EC Fan voltage signal.

**Tab. 6a - PXxxx A/W series, basic fan module**

| MODELS               |                                    | PX015                     | PX021 | PX025 | PX031 | PX033 |      |
|----------------------|------------------------------------|---------------------------|-------|-------|-------|-------|------|
| Power supply voltage |                                    | V/Ph/Hz 400 ±10% / 3 / 50 |       |       |       |       |      |
| Upflow               | Nominal air flow                   | m³/h                      | 3854  | 5580  | 5978  | 6620  | 6620 |
|                      | ESP @ nominal airflow              | Pa                        | 50    | 50    | 50    | 50    | 50   |
|                      | EC fan modulation                  | %                         | 61    | 83    | 90    | 97    | 97   |
|                      | Max ESP available@ nominal airflow | Pa                        | 250   | 250   | 226   | 100   | 100  |
|                      | EC fan modulation                  | %                         | 77    | 95    | 100   | 100   | 100  |
|                      | Max. airflow (@ 100%, nominal ESP) | m³/h                      | 6886  | 6886  | 6724  | 6724  | 6724 |
| Downflow Up          | Nominal air flow                   | m³/h                      | 3854  | 5580  | 5978  | 6620  | 6620 |
|                      | ESP @ nominal airflow              | Pa                        | 20    | 20    | 20    | 20    | 20   |
|                      | EC fan modulation                  | %                         | 57    | 80    | 87    | 96    | 96   |
|                      | Max ESP available@ nominal airflow | Pa                        | 250   | 250   | 246   | 100   | 100  |
|                      | EC fan modulation                  | %                         | 76    | 94    | 100   | 100   | 100  |
|                      | Max. airflow (@ 100%, nominal ESP) | m³/h                      | 7124  | 7124  | 6945  | 6945  | 6945 |
| Downflow Frontal     | Nominal air flow                   | m³/h                      | 3854  | 5580  | 5978  | 6620  | 6620 |
|                      | ESP @ nominal airflow              | Pa                        | 0     | 0     | 0     | 0     | 0    |
|                      | EC fan modulation                  | %                         | 56    | 79    | 86    | 95    | 95   |
|                      | Max ESP available@ nominal airflow | Pa                        | 250   | 250   | 246   | 100   | 100  |
|                      | EC fan modulation                  | %                         | 76    | 94    | 100   | 100   | 100  |
|                      | Max. airflow (@ 100%, nominal ESP) | m³/h                      | 7204  | 7204  | 7204  | 7204  | 7204 |

| MODELS   |                                    | PX041                     | PX045 | PX047 | PX051 | PX057 | PX044 | PX054 | PX062 |       |
|--|------------------------------------|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Power supply voltage                                   |                                    | V/Ph/Hz 400 ±10% / 3 / 50 |       |       |       |       |       |       |       |       |
| Upflow   | Nominal air flow                   | m³/h                      | 10000 | 10500 | 12200 | 12200 | 16300 | 11900 | 12400 | 16300 |
|  | ESP @ nominal airflow              | Pa                        | 50    | 50    | 50    | 50    | 50    | 50    | 50    | 50    |
|  | EC fan modulation                  | %                         | 91    | 95    | 91    | 91    | 89    | 91    | 96    | 93    |
|  | Max ESP available@ nominal airflow | Pa                        | 197   | 135   | 187   | 187   | 226   | 181   | 115   | 155   |
|  | EC fan modulation                  | %                         | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h                      | 11140 | 11140 | 13212 | 13212 | 18787 | 12867 | 12867 | 17682 |
| Downflow Up  | Nominal air flow                   | m³/h                      | 10000 | 10500 | 12200 | 12200 | 16301 | 11900 | 12400 | 16300 |
|  | ESP @ nominal airflow              | Pa                        | 20    | 20    | 20    | 20    | 20    | 20    | 20    | 20    |
|  | EC fan modulation                  | %                         | 91    | 95    | 90    | 90    | 89    | 90    | 95    | 93    |
|  | Max ESP available@ nominal airflow | Pa                        | 166   | 102   | 170   | 170   | 196   | 167   | 100   | 127   |
|  | EC fan modulation                  | %                         | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h                      | 11092 | 11092 | 13290 | 13290 | 18668 | 12958 | 12958 | 17653 |
| Downflow Frontal                                       | Nominal air flow                   | m³/h                      | 10000 | 10500 | 12200 | 12200 | 16300 | 11900 | 12400 | 16300 |
|  | ESP @ nominal airflow              | Pa                        | 20    | 20    | 20    | 20    | 20    | 20    | 20    | 20    |
|  | EC fan modulation                  | %                         | 87    | 90    | 88    | 88    | 81    | 88    | 92    | 86    |
|  | Max ESP available@ nominal airflow | Pa                        | 238   | 180   | 211   | 211   | 300   | 206   | 142   | 231   |
|  | EC fan modulation                  | %                         | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h                      | 11749 | 11749 | 13626 | 13626 | 20573 | 13276 | 13276 | 19309 |
| Downflow Frontal/<br>Downflow Up<br>Front Air Delivery | Nominal air flow                   | m³/h                      | 10000 | 10500 | 12200 | 12200 | 16300 | 11900 | 12400 | 16300 |
|  | ESP @ nominal airflow              | Pa                        | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
|  | EC fan modulation                  | %                         | 90    | 94    | 93    | 93    | 87    | 93    | 98    | 92    |
|  | Max ESP available@ nominal airflow | Pa                        | 166   | 102   | 101   | 101   | 197   | 100   | 28    | 128   |
|  | EC fan modulation                  | %                         | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h                      | 11230 | 11230 | 12890 | 12890 | 18930 | 12584 | 12584 | 17901 |

# Airflow characteristics

| MODELS   |                                    | PX074   | PX068             | PX082 | PX094 | PX104 | PX120 | PX059<br>EXT | PX092<br>EXT |
|--|------------------------------------|---------|-------------------|-------|-------|-------|-------|--------------|--------------|
| Power supply voltage                                   |                                    | V/Ph/Hz | 400 ±10% / 3 / 50 |       |       |       |       |              |              |
| Upflow   | Nominal air flow                   | m³/h    | 16650             | 18500 | 22350 |       |       | -            |              |
|  | ESP @ nominal airflow              | Pa      | 50                | 50    | 50    | 50    | 50    | -            | 50           |
|  | EC fan modulation                  | %       | 95                | 79    | 95    |       |       | -            |              |
|  | Max ESP available@ nominal airflow | Pa      | 129               | 349   | 117   |       |       | -            |              |
|  | EC fan modulation                  | %       | 100               | 100   | 100   | 100   | 100   | -            | 100          |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h    | 17682             | 23285 | 23285 | 23285 | 23285 | -            |              |
| Downflow Up  | Nominal air flow                   | m³/h    | 16650             | 18500 | 22350 | 22350 | 22350 | -            |              |
|  | ESP @ nominal airflow              | Pa      | 20                | 20    | 20    | 20    | 20    | -            | 20           |
|  | EC fan modulation                  | %       | 95                | 78    | 94    | 94    | 94    | -            | 95           |
|  | Max ESP available@ nominal airflow | Pa      | 100               | 338   | 102   | 102   | 102   | -            | 101          |
|  | EC fan modulation                  | %       | 100               | 100   | 100   | 100   | 100   | -            | 100          |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h    | 17653             | 23459 | 23459 | 23459 | 23459 | -            | 11336        |
| Downflow Frontal                                       | Nominal air flow                   | m³/h    | 16650             | 18500 | 22350 | 22350 | 22350 | -            | 10750        |
|  | ESP @ nominal airflow              | Pa      | 20                | 20    | 20    | 20    | 20    | -            | 20           |
|  | EC fan modulation                  | %       | 88                | 75    | 90    | 90    | 90    | -            | 91           |
|  | Max ESP available@ nominal airflow | Pa      | 209               | 390   | 176   | 176   | 176   | -            | 180          |
|  | EC fan modulation                  | %       | 100               | 100   | 100   | 100   | 100   | -            | 100          |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h    | 19309             | 24580 | 24580 | 24580 | 24580 | -            | 11994        |
| Downflow Frontal/<br>Downflow Up<br>Front Air Delivery | Nominal air flow                   | m³/h    | 16650             |       |       |       |       | -            | 10750        |
|  | ESP @ nominal airflow              | Pa      | 0                 |       |       |       |       | -            | 0            |
|  | EC fan modulation                  | %       | 94                |       |       |       |       | -            | 94           |
|  | Max ESP available@ nominal airflow | Pa      | 101               |       |       |       |       | -            | 101          |
|  | EC fan modulation                  | %       | 100               |       |       |       |       | -            | 100          |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h    | 17901             |       |       |       |       | -            | 11475        |

Tab. 6b - PXxxx A/W series, premium fan module

| MODELS               |                                    | PX015   | PX021*            | PX025 | PX031 | PX033 |
|----------------------|------------------------------------|---------|-------------------|-------|-------|-------|
| Power supply voltage |                                    | V/Ph/Hz | 400 ±10% / 3 / 50 |       |       |       |
| Upflow               | Nominal air flow                   | m³/h    | 4462              | 5623  | 6828  | 7782  |
|                      | ESP @ nominal airflow              | Pa      | 50                | 50    | 50    | 50    |
|                      | EC fan modulation                  | %       | 58                | 70    | 83    | 93    |
|                      | Max ESP available@ nominal airflow | Pa      | 250               | 250   | 250   | 210   |
|                      | EC fan modulation                  | %       | 73                | 82    | 93    | 100   |
|                      | Max. airflow (@ 100%, nominal ESP) | m³/h    | 8493              | 8493  | 8491  | 8491  |
| Downflow Up          | Nominal air flow                   | m³/h    | 4462              | 5623  | 6828  | 7782  |
|                      | ESP @ nominal airflow              | Pa      | 20                | 20    | 20    | 20    |
|                      | EC fan modulation                  | %       | 55                | 68    | 81    | 91    |
|                      | Max ESP available@ nominal airflow | Pa      | 250               | 250   | 250   | 217   |
|                      | EC fan modulation                  | %       | 73                | 82    | 93    | 100   |
|                      | Max. airflow (@ 100%, nominal ESP) | m³/h    | 8652              | 8652  | 8643  | 8643  |
| Downflow Frontal     | Nominal air flow                   | m³/h    | 4462              | 5623  | 6828  | 7782  |
|                      | ESP @ nominal airflow              | Pa      | 0                 | 0     | 0     | 0     |
|                      | EC fan modulation                  | %       | 54                | 67    | 80    | 90    |
|                      | Max ESP available@ nominal airflow | Pa      | 250               | 250   | 250   | 217   |
|                      | EC fan modulation                  | %       | 73                | 82    | 93    | 100   |
|                      | Max. airflow (@ 100%, nominal ESP) | m³/h    | 8732              | 8732  | 8724  | 8724  |

\*PX021 unit is available only in A version



# Airflow characteristics

| MODELS   |                                    |         | PX041             | PX045 | PX047 | PX051 | PX057 | PX044 | PX054 | PX062 |
|--|------------------------------------|---------|-------------------|-------|-------|-------|-------|-------|-------|-------|
| Power supply voltage                                   |                                    | V/Ph/Hz | 400 ±10% / 3 / 50 |       |       |       |       |       |       |       |
| Upflow   | Nominal air flow                   | m³/h    | 10000             | 10900 | 14500 | 15800 | 16300 | 12500 | 15500 | 16300 |
|  | ESP @ nominal airflow              | Pa      | 50                | 50    | 50    | 50    | 50    | 50    | 50    | 50    |
|  | EC fan modulation                  | %       | 86                | 94    | 75    | 81    | 83    | 71    | 84    | 88    |
|  | Max ESP available@ nominal airflow | Pa      | 252               | 138   | 381   | 311   | 282   | 425   | 262   | 211   |
|  | EC fan modulation                  | %       | 100               | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h    | 11518             | 11518 | 19671 | 19671 | 19671 | 18505 | 18505 | 18505 |
| Downflow Up  | Nominal air flow                   | m³/h    | 10000             | 10900 | 14500 | 15800 | 16300 | 12500 | 15500 | 16300 |
|  | ESP @ nominal airflow              | Pa      | 20                | 20    | 20    | 20    | 20    | 20    | 20    | 20    |
|  | EC fan modulation                  | %       | 86                | 94    | 74    | 80    | 82    | 69    | 83    | 87    |
|  | Max ESP available@ nominal airflow | Pa      | 224               | 319   | 366   | 293   | 263   | 415   | 247   | 194   |
|  | EC fan modulation                  | %       | 100               | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h    | 11481             | 11481 | 19712 | 19712 | 19712 | 18605 | 18605 | 18605 |
| Downflow Frontal                                       | Nominal air flow                   | m³/h    | 10000             | 10900 | 14500 | 15800 | 16300 | 12500 | 15500 | 16300 |
|  | ESP @ nominal airflow              | Pa      | 20                | 20    | 20    | 20    | 20    | 20    | 20    | 20    |
|  | EC fan modulation                  | %       | 83                | 90    | 70    | 75    | 77    | 65    | 79    | 82    |
|  | Max ESP available@ nominal airflow | Pa      | 275               | 164   | 423   | 360   | 335   | 458   | 311   | 265   |
|  | EC fan modulation                  | %       | 100               | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h    | 11928             | 11928 | 21058 | 21058 | 21058 | 19806 | 19806 | 19806 |
| Downflow Frontal/<br>Downflow Up<br>Front Air Delivery | Nominal air flow                   | m³/h    | 10000             | 10900 | 14500 | 15800 | 16300 | 12500 | 15500 | 16300 |
|  | ESP @ nominal airflow              | Pa      | 0                 | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
|  | EC fan modulation                  | %       | 85                | 93    | 73    | 79    | 81    | 67    | 82    | 86    |
|  | Max ESP available@ nominal airflow | Pa      | 224               | 105   | 366   | 294   | 264   | 415   | 247   | 194   |
|  | EC fan modulation                  | %       | 100               | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h    | 11161             | 11611 | 19954 | 19954 | 19954 | 18854 | 18854 | 18854 |

| MODELS   |                                    |         | PX074             | PX068 | PX082 | PX094 | PX104 | PX120 | PX059<br>EXT | PX092<br>EXT | PX150 | PX165 |
|--|------------------------------------|---------|-------------------|-------|-------|-------|-------|-------|--------------|--------------|-------|-------|
| Power supply voltage                                   |                                    | V/Ph/Hz | 400 ±10% / 3 / 50 |       |       |       |       |       |              |              |       |       |
| Upflow   | Nominal air flow                   | m³/h    | 17600             | 18500 | 24000 | 26000 | 27000 | 27000 | 11200        | 17950        |       |       |
|  | ESP @ nominal airflow              | Pa      | 50                | 50    | 50    | 50    | 50    | 50    | 50           | 50           |       |       |
|  | EC fan modulation                  | %       | 95                | 68    | 84    | 90    | 94    | 94    | 88           | 85           |       |       |
|  | Max ESP available@ nominal airflow | Pa      | 119               | 457   | 269   | 184   | 137   | 137   | 225          | 258          |       |       |
|  | EC fan modulation                  | %       | 100               | 100   | 100   | 100   | 100   | 100   | 100          | 100          |       |       |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h    | 18505             | 28739 | 28739 | 28739 | 28739 | 28739 | 12516        | 21009        |       |       |
| Downflow Up  | Nominal air flow                   | m³/h    | 17600             | 18500 | 24000 | 26000 | 27000 | 27000 | 11200        | 17950        | 34585 | 42500 |
|  | ESP @ nominal airflow              | Pa      | 20                | 20    | 20    | 20    | 20    | 20    | 20           | 20           | 50    | 50    |
|  | EC fan modulation                  | %       | 94                | 66    | 83    | 90    | 93    | 93    | 95           | 88           | 79    | 94    |
|  | Max ESP available@ nominal airflow | Pa      | 100               | 444   | 248   | 159   | 110   | 110   | 100          | 185          | 377   | 163   |
|  | EC fan modulation                  | %       | 100               | 100   | 100   | 100   | 100   | 100   | 100          | 100          | 100   | 100   |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h    | 18605             | 28738 | 28738 | 28738 | 28738 | 28738 | 11738        | 20166        | 45959 | 45959 |
| Downflow Frontal<br>(*Downflow Down<br>for PX150-165)  | Nominal air flow                   | m³/h    | 17600             | 18500 | 24000 | 26000 | 27000 | 27000 | 11200        | 17950        | 34585 | 42500 |
|  | ESP @ nominal airflow              | Pa      | 20                | 20    | 20    | 20    | 20    | 20    | 20           | 20           | 50    | 50    |
|  | EC fan modulation                  | %       | 88                | 64    | 80    | 86    | 89    | 89    | 91           | 87           | 75    | 89    |
|  | Max ESP available@ nominal airflow | Pa      | 182               | 474   | 297   | 216   | 172   | 172   | 156          | 199          | 436   | 250   |
|  | EC fan modulation                  | %       | 100               | 100   | 100   | 100   | 100   | 100   | 100          | 100          | 100   | 100   |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h    | 19806             | 30090 | 30090 | 30090 | 30090 | 30090 | 12156        | 20399        | 49161 | 49161 |
| Downflow Frontal/<br>Downflow Up Front<br>Air Delivery | Nominal air flow                   | m³/h    | 17600             |       |       |       |       |       | 11200        | 17950        |       |       |
|  | ESP @ nominal airflow              | Pa      | 0                 |       |       |       |       |       | 0            | 0            |       |       |
|  | EC fan modulation                  | %       | 93                |       |       |       |       |       | 93           | 87           |       |       |
|  | Max ESP available@ nominal airflow | Pa      | 100               |       |       |       |       |       | 98           | 185          |       |       |
|  | EC fan modulation                  | %       | 100               |       |       |       |       |       | 100          | 100          |       |       |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h    | 18854             |       |       |       |       |       | 11868        | 20412        |       |       |

# Airflow characteristics

Tab. 6c - PXxxx F/D/H series, basic fan module

| MODELS               |                                    | PX015   | PX021*            | PX025 | PX031 | PX033 |   |
|----------------------|------------------------------------|---------|-------------------|-------|-------|-------|---|
| Power supply voltage |                                    | V/Ph/Hz | 400 ±10% / 3 / 50 |       |       |       |   |
| Upflow               | Nominal air flow                   | m³/h    | 4300              | 4700  | 5235  | 5510  | - |
|                      | ESP @ nominal airflow              | Pa      | 50                | 50    | 50    | 50    | - |
|                      | EC fan modulation                  | %       | 78                | 84    | 91    | 97    | - |
|                      | Max ESP available@ nominal airflow | Pa      | 250               | 250   | 184   | 110   | - |
|                      | EC fan modulation                  | %       | 91                | 96    | 100   | 100   | - |
|                      | Max. airflow (@ 100%, nominal ESP) | m³/h    | 5723              | 5723  | 5723  | 5723  | - |
| Downflow Up          | Nominal air flow                   | m³/h    | 4300              | 4700  | 5235  | 5766  | - |
|                      | ESP @ nominal airflow              | Pa      | 20                | 20    | 20    | 20    | - |
|                      | EC fan modulation                  | %       | 74                | 80    | 88    | 96    | - |
|                      | Max ESP available@ nominal airflow | Pa      | 250               | 250   | 221   | 85    | - |
|                      | EC fan modulation                  | %       | 90                | 95    | 100   | 100   | - |
|                      | Max. airflow (@ 100%, nominal ESP) | m³/h    | 6011              | 6011  | 6011  | 6011  | - |
| Downflow Frontal     | Nominal air flow                   | m³/h    | 4300              | 4700  | 5235  | 5766  | - |
|                      | ESP @ nominal airflow              | Pa      | 0                 | 0     | 0     | 0     | - |
|                      | EC fan modulation                  | %       | 73                | 79    | 87    | 95    | - |
|                      | Max ESP available@ nominal airflow | Pa      | 250               | 250   | 221   | 85    | - |
|                      | EC fan modulation                  | %       | 90                | 95    | 100   | 100   | - |
|                      | Max. airflow (@ 100%, nominal ESP) | m³/h    | 6082              | 6082  | 6082  | 6082  | - |

| MODELS   |                                    | PX041   | PX047             | PX051 | PX044 | PX054 | PX062 | PX068 | PX082 | PX094 | PX104 |       |
|--|------------------------------------|---------|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Power supply voltage                                   |                                    | V/Ph/Hz | 400 ±10% / 3 / 50 |       |       |       |       |       |       |       |       |       |
| Upflow   | Nominal air flow                   | m³/h    | 9500              | 11650 | 11650 | 11350 | 11350 | 15200 | 18500 | 21200 | 21200 | 21200 |
|  | ESP @ nominal airflow              | Pa      | 50                | 50    | 50    | 50    | 50    | 50    | 50    | 50    | 50    | 50    |
|  | EC fan modulation                  | %       | 94                | 91    | 91    | 92    | 92    | 96    | 84    | 96    | 96    | 96    |
|  | Max ESP available@ nominal airflow | Pa      | 149               | 182   | 182   | 176   | 176   | 118   | 281   | 110   | 110   | 110   |
|  | EC fan modulation                  | %       | 100               | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h    | 10213             | 12612 | 12612 | 12338 | 12338 | 16097 | 22163 | 22163 | 22163 | 22163 |
| Downflow Up  | Nominal air flow                   | m³/h    | 9500              | 11650 | 11650 | 11350 | 11350 | 15200 | 18500 | 21200 | 21200 | 21200 |
|  | ESP @ nominal airflow              | Pa      | 20                | 20    | 20    | 20    | 20    | 20    | 20    | 20    | 20    | 20    |
|  | EC fan modulation                  | %       | 94                | 90    | 90    | 90    | 90    | 95    | 83    | 95    | 95    | 95    |
|  | Max ESP available@ nominal airflow | Pa      | 121               | 167   | 167   | 164   | 164   | 95    | 272   | 98    | 98    | 98    |
|  | EC fan modulation                  | %       | 100               | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h    | 10199             | 12701 | 12701 | 12430 | 12430 | 16114 | 22336 | 22336 | 22336 | 22336 |
| Downflow Frontal                                       | Nominal air flow                   | m³/h    | 9500              | 11650 | 11650 | 11350 | 11350 | 15200 | 18500 | 21200 | 21200 | 21200 |
|  | ESP @ nominal airflow              | Pa      | 20                | 20    | 20    | 20    | 20    | 20    | 20    | 20    | 20    | 20    |
|  | EC fan modulation                  | %       | 90                | 88    | 88    | 88    | 88    | 89    | 79    | 90    | 90    | 90    |
|  | Max ESP available@ nominal airflow | Pa      | 186               | 204   | 204   | 199   | 199   | 187   | 323   | 165   | 165   | 165   |
|  | EC fan modulation                  | %       | 100               | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h    | 10729             | 13004 | 13004 | 12719 | 12719 | 17389 | 23336 | 23336 | 23336 | 23336 |
| Downflow Frontal/<br>Downflow Up Front<br>Air Delivery | Nominal air flow                   | m³/h    | 9500              | 11650 | 11650 | 11350 | 11350 | 15200 |       |       |       |       |
|  | ESP @ nominal airflow              | Pa      | 0                 | 0     | 0     | 0     | 0     | 0     |       |       |       |       |
|  | EC fan modulation                  | %       | 93                | 93    | 93    | 93    | 93    | 94    |       |       |       |       |
|  | Max ESP available@ nominal airflow | Pa      | 121               | 103   | 103   | 103   | 103   | 99    |       |       |       |       |
|  | EC fan modulation                  | %       | 100               | 100   | 100   | 100   | 100   | 100   |       |       |       |       |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h    | 10331             | 12347 | 12347 | 12097 | 12097 | 16338 |       |       |       |       |

\*PX021 unit is available only in D version

# Airflow characteristics

Tab. 6d - PXxxx F/D/H series, premium fan module

| MODELS               |                                    | PX015                     | PX021* | PX025 | PX031 | PX033 |   |
|----------------------|------------------------------------|---------------------------|--------|-------|-------|-------|---|
| Power supply voltage |                                    | V/Ph/Hz 400 ±10% / 3 / 50 |        |       |       |       |   |
| Upflow               | Nominal air flow                   | m³/h                      | 4984   | 5397  | 6484  | 6997  | - |
|                      | ESP @ nominal airflow              | Pa                        | 50     | 50    | 50    | 50    | - |
|                      | EC fan modulation                  | %                         | 73     | 78    | 91    | 97    | - |
|                      | Max ESP available@ nominal airflow | Pa                        | 250    | 250   | 230   | 100   | - |
|                      | EC fan modulation                  | %                         | 85     | 90    | 100   | 100   | - |
|                      | Max. airflow (@ 100%, nominal ESP) | m³/h                      | 7220   | 7220  | 7220  | 7220  | - |
| Downflow Up          | Nominal air flow                   | m³/h                      | 4984   | 5397  | 6484  | 7202  | - |
|                      | ESP @ nominal airflow              | Pa                        | 20     | 20    | 20    | 20    | - |
|                      | EC fan modulation                  | %                         | 71     | 76    | 89    | 97    | - |
|                      | Max ESP available@ nominal airflow | Pa                        | 250    | 250   | 247   | 80    | - |
|                      | EC fan modulation                  | %                         | 85     | 89    | 100   | 100   | - |
|                      | Max. airflow (@ 100%, nominal ESP) | m³/h                      | 7488   | 7488  | 7488  | 7488  | - |
| Downflow Frontal     | Nominal air flow                   | m³/h                      | 4984   | 5397  | 6484  | 7202  | - |
|                      | ESP @ nominal airflow              | Pa                        | 0      | 0     | 0     | 0     | - |
|                      | EC fan modulation                  | %                         | 69     | 74    | 88    | 96    | - |
|                      | Max ESP available@ nominal airflow | Pa                        | 250    | 250   | 247   | 80    | - |
|                      | EC fan modulation                  | %                         | 85     | 89    | 100   | 100   | - |
|                      | Max. airflow (@ 100%, nominal ESP) | m³/h                      | 7563   | 7563  | 7563  | 7563  | - |

| MODELS   |                                    | PX041                     | PX047 | PX051 | PX044 | PX054 | PX062 | PX068 | PX082 | PX094 | PX104 |       |
|--|------------------------------------|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Power supply voltage                                   |                                    | V/Ph/Hz 400 ±10% / 3 / 50 |       |       |       |       |       |       |       |       |       |       |
| Upflow   | Nominal air flow                   | m³/h                      | 10000 | 13200 | 15200 | 12500 | 15300 | 15900 | 18500 | 24000 | 25000 | 25000 |
|  | ESP @ nominal airflow              | Pa                        | 50    | 50    | 50    | 50    | 50    | 50    | 50    | 50    | 50    | 50    |
|  | EC fan modulation                  | %                         | 94    | 77    | 87    | 77    | 92    | 95    | 73    | 91    | 95    | 95    |
|  | Max ESP available@ nominal airflow | Pa                        | 136   | 361   | 226   | 341   | 160   | 115   | 389   | 168   | 120   | 120   |
|  | EC fan modulation                  | %                         | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h                      | 10588 | 17604 | 17604 | 16772 | 16772 | 16772 | 26488 | 26488 | 26488 | 26488 |
| Downflow Up  | Nominal air flow                   | m³/h                      | 10000 | 13200 | 15200 | 12500 | 15300 | 15900 | 18500 | 24000 | 25000 | 25000 |
|  | ESP @ nominal airflow              | Pa                        | 20    | 20    | 20    | 20    | 20    | 20    | 20    | 20    | 20    | 20    |
|  | EC fan modulation                  | %                         | 94    | 76    | 86    | 76    | 91    | 94    | 72    | 91    | 94    | 94    |
|  | Max ESP available@ nominal airflow | Pa                        | 107   | 348   | 208   | 331   | 146   | 102   | 377   | 149   | 99    | 99    |
|  | EC fan modulation                  | %                         | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h                      | 10580 | 17704 | 17704 | 16892 | 16892 | 16892 | 26528 | 26528 | 26528 | 26528 |
| Downflow Frontal                                       | Nominal air flow                   | m³/h                      | 10000 | 13200 | 15200 | 12500 | 15300 | 15900 | 18500 | 24000 | 25000 | 25000 |
|  | ESP @ nominal airflow              | Pa                        | 20    | 20    | 20    | 20    | 20    | 20    | 20    | 20    | 20    | 20    |
|  | EC fan modulation                  | %                         | 90    | 72    | 81    | 72    | 86    | 89    | 70    | 87    | 90    | 90    |
|  | Max ESP available@ nominal airflow | Pa                        | 158   | 396   | 275   | 374   | 209   | 170   | 407   | 198   | 152   | 152   |
|  | EC fan modulation                  | %                         | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h                      | 10950 | 18758 | 18758 | 17837 | 17837 | 17837 | 27640 | 27640 | 27640 | 27640 |
| Downflow Frontal/<br>Downflow Up Front<br>Air Delivery | Nominal air flow                   | m³/h                      | 10000 | 13200 | 15200 | 12500 | 15300 | 15900 |       |       |       |       |
|  | ESP @ nominal airflow              | Pa                        | 0     | 0     | 0     | 0     | 0     | 0     |       |       |       |       |
|  | EC fan modulation                  | %                         | 92    | 74    | 84    | 74    | 89    | 92    |       |       |       |       |
|  | Max ESP available@ nominal airflow | Pa                        | 107   | 348   | 213   | 332   | 149   | 102   |       |       |       |       |
|  | EC fan modulation                  | %                         | 100   | 100   | 100   | 100   | 100   | 100   |       |       |       |       |
|  | Max. airflow (@ 100%, nominal ESP) | m³/h                      | 10706 | 17937 | 17937 | 17122 | 17122 | 17122 |       |       |       |       |

\*PX021 unit is available only in D version

## Airflow characteristics

Tab. 6e - PXxxx A/W series and Constant configuration, basic fan module

| MODELS               |                                    | PX015                     | PX021 | PX025 | PX031 |      |
|----------------------|------------------------------------|---------------------------|-------|-------|-------|------|
| Power supply voltage |                                    | V/Ph/Hz 400 ±10% / 3 / 50 |       |       |       |      |
| Upflow               | Nominal air flow                   | m <sup>3</sup> /h         | 3854  | 5580  | 5978  | 6620 |
|                      | ESP @ nominal airflow              | Pa                        | 50    | 50    | 50    | 50   |
|                      | EC fan modulation                  | %                         | 61    | 83    | 90    | 97   |
|                      | Max ESP available@ nominal airflow | Pa                        | 250   | 250   | 226   | 100  |
|                      | EC fan modulation                  | %                         | 77    | 95    | 100   | 100  |
|                      | Max. airflow (@ 100%, nominal ESP) | m <sup>3</sup> /h         | 6886  | 6886  | 6724  | 6724 |

\*PX021 unit is available only in KA version

# 7

## Sound Pressure Level

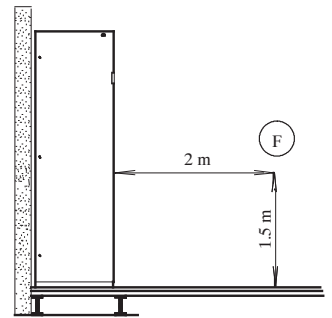
Liebert® PDX units have been designed with particular care for sound and vibration problems. The complete mechanical insulation of the ventilating section, combined with the special study of the aer-audic circuit as a consequence of accurate researches made in our thermodynamic laboratories and the oversizing of the components crossed by air offer the highest ventilation efficiency with the lowest sound emission.

### Sound emission spectra

All tests are performed in our laboratories under the described conditions. The instrument is placed in (F) point, at 1.5 m from the ground in front of the machine at 2 m distance. Test conditions: Downflow unit with underflow air discharge and 20 Pa available external static pressure; Upflow unit with ducted air discharge and 50 Pa available external static pressure. Nominal air flow with clean F5 filters. Premium Fan Module, Digital Scroll Cooling system @100% cooling capacity. Ambient temperature 24° C and relative humidity 50%. Condensing temperature 45° C.

**The noise levels refer to free field conditions.**

The following tables show sound levels for every octave band frequency. The data are referred to the main used configurations; for different configurations consult Hirating software



# Sound Pressure Level

## Sound emission spectra

The following tables show sound levels for every octave band frequency.

**Tab. 7a - A/W versions and Upflow configuration, Standard Height, Digital Scroll Cooling System @ 100% cooling capacity, Premium Fan Module, nominal airflow**

| MODEL     | Mode | Level | Octave band frequency (Hz) |       |      |      |      |      |      |      |      | Sound Level [dB(A)] |
|-----------|------|-------|----------------------------|-------|------|------|------|------|------|------|------|---------------------|
|           |      |       | 31.5                       | 63    | 125  | 250  | 500  | 1000 | 2000 | 4000 | 8000 |                     |
| PX015UA/W | (1)  | SPL   | 44.7                       | 44.7  | 31.3 | 40.3 | 45.7 | 44.6 | 44.2 | 38.6 | 26.5 | 49.7                |
|           | (2)  | SPL   | 44.7                       | 44.7  | 31.3 | 40.3 | 46.4 | 44.9 | 45.2 | 42.1 | 30.4 | 50.7                |
|           | (3)  | PWL   | 84.9                       | 84.9  | 80.4 | 72.4 | 70.2 | 70   | 68.5 | 63.3 | 51.9 | 75.2                |
| PX021UA   | (1)  | SPL   | 49.7                       | 49.7  | 36.3 | 45.3 | 50.7 | 49.6 | 49.2 | 43.6 | 31.5 | 54.7                |
|           | (2)  | SPL   | 49.7                       | 49.7  | 36.3 | 45.3 | 51.4 | 49.9 | 50.2 | 47.1 | 35.4 | 55.7                |
|           | (3)  | PWL   | 89.9                       | 89.9  | 85.4 | 77.4 | 75.2 | 75   | 73.5 | 68.3 | 56.9 | 80.2                |
| PX025UA/W | (1)  | SPL   | 54.7                       | 54.7  | 41.3 | 50.3 | 55.7 | 54.6 | 54.2 | 48.6 | 36.5 | 59.7                |
|           | (2)  | SPL   | 54.7                       | 54.7  | 41.3 | 50.3 | 56.4 | 54.9 | 55.2 | 52.1 | 40.4 | 60.7                |
|           | (3)  | PWL   | 94.9                       | 94.9  | 90.4 | 82.4 | 80.2 | 80   | 78.5 | 73.3 | 61.9 | 85.2                |
| PX031UA/W | (1)  | SPL   | 58.7                       | 58.7  | 45.3 | 54.3 | 59.7 | 58.6 | 58.2 | 52.6 | 40.5 | 63.7                |
|           | (2)  | SPL   | 58.7                       | 58.7  | 45.3 | 54.3 | 60.4 | 58.9 | 59.2 | 56.1 | 44.4 | 64.7                |
|           | (3)  | PWL   | 98.9                       | 98.9  | 94.4 | 86.4 | 84.2 | 84   | 82.5 | 77.3 | 65.9 | 89.2                |
| PX033UA/W | (1)  | SPL   | 60.3                       | 60.3  | 46.9 | 55.9 | 61.3 | 60.2 | 59.8 | 54.2 | 42.1 | 65.3                |
|           | (2)  | SPL   | 60.3                       | 60.3  | 46.9 | 55.9 | 62   | 60.5 | 60.8 | 57.7 | 46   | 66.3                |
|           | (3)  | PWL   | 100.5                      | 100.5 | 96   | 88   | 85.8 | 85.6 | 84.1 | 78.9 | 67.5 | 90.8                |
| PX041xA/W | (1)  | SPL   | 62.6                       | 62.6  | 64.4 | 61.4 | 57.3 | 54.3 | 50.4 | 43.8 | 34.7 | 59.8                |
|           | (2)  | SPL   | 68.8                       | 68.8  | 65.2 | 62.9 | 61.7 | 60.1 | 59.8 | 50   | 41   | 65.4                |
|           | (3)  | PWL   | 101.1                      | 101.1 | 92.1 | 90.5 | 92.2 | 92   | 95.3 | 82.3 | 73.4 | 98.6                |
| PX045xA/W | (1)  | SPL   | 65.2                       | 65.2  | 67   | 64   | 59.9 | 56.9 | 53   | 46.4 | 37.3 | 62.4                |
|           | (2)  | SPL   | 71.4                       | 71.4  | 67.8 | 65.5 | 64.3 | 62.7 | 62.4 | 52.6 | 43.6 | 68                  |
|           | (3)  | PWL   | 103.7                      | 103.7 | 94.7 | 93.1 | 94.8 | 94.6 | 97.9 | 84.9 | 76   | 101.2               |
| PX047xA/W | (1)  | SPL   | 53.2                       | 53.2  | 67.6 | 55.2 | 54.2 | 52.1 | 49.6 | 41.9 | 31.8 | 57.9                |
|           | (2)  | SPL   | 53.4                       | 53.4  | 67.6 | 55.4 | 54.5 | 52.8 | 50.6 | 44.3 | 36.1 | 58.5                |
|           | (3)  | PWL   | 80.2                       | 80.2  | 92.4 | 82.2 | 81.4 | 80.1 | 78.2 | 73.3 | 67   | 85.5                |
| PX051xA/W | (1)  | SPL   | 55.5                       | 55.5  | 69.9 | 57.5 | 56.5 | 54.4 | 51.9 | 44.2 | 34.1 | 60.2                |
|           | (2)  | SPL   | 55.7                       | 55.7  | 69.9 | 57.7 | 56.8 | 55.1 | 52.9 | 46.6 | 38.4 | 60.8                |
|           | (3)  | PWL   | 82.5                       | 82.5  | 94.7 | 84.5 | 83.7 | 82.4 | 80.5 | 75.6 | 69.3 | 87.8                |
| PX057xA/W | (1)  | SPL   | 56.5                       | 56.5  | 70.9 | 58.5 | 57.5 | 55.4 | 52.9 | 45.2 | 35.1 | 61.2                |
|           | (2)  | SPL   | 56.7                       | 56.7  | 70.9 | 58.7 | 57.8 | 56.1 | 53.9 | 47.6 | 39.4 | 61.8                |
|           | (3)  | PWL   | 83.5                       | 83.5  | 95.7 | 85.5 | 84.7 | 83.4 | 81.5 | 76.6 | 70.3 | 88.8                |
| PX044xA/W | (1)  | SPL   | 51.8                       | 51.8  | 66.2 | 53.8 | 52.8 | 50.7 | 48.2 | 40.5 | 30.4 | 56.5                |
|           | (2)  | SPL   | 52                         | 52    | 66.2 | 54   | 53.1 | 51.4 | 49.2 | 42.9 | 34.7 | 57.1                |
|           | (3)  | PWL   | 78.8                       | 78.8  | 91   | 80.8 | 80   | 78.7 | 76.8 | 71.9 | 65.6 | 84.1                |
| PX054xA/W | (1)  | SPL   | 57.3                       | 57.3  | 71.7 | 59.3 | 58.3 | 56.2 | 53.7 | 46   | 35.9 | 62                  |
|           | (2)  | SPL   | 57.5                       | 57.5  | 71.7 | 59.5 | 58.6 | 56.9 | 54.7 | 48.4 | 40.2 | 62.6                |
|           | (3)  | PWL   | 84.3                       | 84.3  | 96.5 | 86.3 | 85.5 | 84.2 | 82.3 | 77.4 | 71.1 | 89.6                |
| PX062xA/W | (1)  | SPL   | 58.8                       | 58.8  | 73.2 | 60.8 | 59.8 | 57.7 | 55.2 | 47.5 | 37.4 | 63.5                |
|           | (2)  | SPL   | 59                         | 59    | 73.2 | 61   | 60.1 | 58.4 | 56.2 | 49.9 | 41.7 | 64.1                |
|           | (3)  | PWL   | 85.8                       | 85.8  | 98   | 87.8 | 87   | 85.7 | 83.8 | 78.9 | 72.6 | 91.1                |
| PX074xA/W | (1)  | SPL   | 60.8                       | 60.8  | 75.2 | 62.8 | 61.8 | 59.7 | 57.2 | 49.5 | 39.4 | 65.5                |
|           | (2)  | SPL   | 61                         | 61    | 75.2 | 63   | 62.1 | 60.4 | 58.2 | 51.9 | 43.7 | 66.1                |
|           | (3)  | PWL   | 87.8                       | 87.8  | 100  | 89.8 | 89   | 87.7 | 85.8 | 80.9 | 74.6 | 93.1                |

# Sound Pressure Level

| MODEL     | Mode | Level | Octave band frequency (Hz) |      |       |      |       |      |      |      |      | Sound Level [dB(A)] |
|-----------|------|-------|----------------------------|------|-------|------|-------|------|------|------|------|---------------------|
|           |      |       | 31.5                       | 63   | 125   | 250  | 500   | 1000 | 2000 | 4000 | 8000 |                     |
| PX068xA/W | (1)  | SPL   | 60.5                       | 60.5 | 64.6  | 58.5 | 54.7  | 52.8 | 49.4 | 42.2 | 32.3 | 58.1                |
|           | (2)  | SPL   | 60.8                       | 60.8 | 65.3  | 59.7 | 59.5  | 56.9 | 55   | 49.7 | 40.5 | 62.2                |
|           | (3)  | PWL   | 87.7                       | 87.7 | 92.6  | 87.5 | 90.9  | 87.6 | 87.2 | 83.8 | 75.3 | 93.6                |
| PX082xA/W | (1)  | SPL   | 66.8                       | 66.8 | 70.9  | 64.8 | 61    | 59.1 | 55.7 | 48.5 | 38.6 | 64.4                |
|           | (2)  | SPL   | 67.1                       | 67.1 | 71.6  | 66   | 65.8  | 63.2 | 61.3 | 56   | 46.8 | 68.5                |
|           | (3)  | PWL   | 94                         | 94   | 98.9  | 93.8 | 97.2  | 93.9 | 93.5 | 90.1 | 81.6 | 99.9                |
| PX094xA/W | (1)  | SPL   | 69.2                       | 69.2 | 73.3  | 67.2 | 63.4  | 61.5 | 58.1 | 50.9 | 41   | 66.8                |
|           | (2)  | SPL   | 69.5                       | 69.5 | 74    | 68.4 | 68.2  | 65.6 | 63.7 | 58.4 | 49.2 | 70.9                |
|           | (3)  | PWL   | 96.4                       | 96.4 | 101.3 | 96.2 | 99.6  | 96.3 | 95.9 | 92.5 | 84   | 102.3               |
| PX104xA/W | (1)  | SPL   | 70.3                       | 70.3 | 74.4  | 68.3 | 64.5  | 62.6 | 59.2 | 52   | 42.1 | 67.9                |
|           | (2)  | SPL   | 70.6                       | 70.6 | 75.1  | 69.5 | 69.3  | 66.7 | 64.8 | 59.5 | 50.3 | 72                  |
|           | (3)  | PWL   | 97.5                       | 97.5 | 102.4 | 97.3 | 100.7 | 97.4 | 97   | 93.6 | 85.1 | 103.4               |
| PX120xA/W | (1)  | SPL   | 70.3                       | 70.3 | 74.4  | 68.3 | 64.5  | 62.6 | 59.2 | 52   | 42.1 | 67.9                |
|           | (2)  | SPL   | 70.6                       | 70.6 | 75.1  | 69.5 | 69.3  | 66.7 | 64.8 | 59.5 | 50.3 | 72                  |
|           | (3)  | PWL   | 97.5                       | 97.5 | 102.4 | 97.3 | 100.7 | 97.4 | 97   | 93.6 | 85.1 | 103.4               |

## LEGEND

The sound levels global and for each octave band are expressed in dB with a tolerance of (- 0/+2) dB.

(1) Only ventilation (50 Pa available external static pressure), 2 m in front of the unit and 1.5 m height, in free field conditions.

(2) Working compressor (50 Pa available external static pressure), 2 m in front of the unit and 1.5 m height, in free field conditions.

(3) Working compressor, on discharge side.

Level

**SPL** sound pressure level

**PWL** sound power level

**Tab. 7b - A/W versions and Upflow configuration, Extended Height, Digital Scroll Cooling System @ 100% cooling capacity, Premium Fan Module, nominal airflow**

| MODEL     | Mode | Level | Octave band frequency (Hz) |       |       |       |      |      |      |      |      | Sound Level [dB(A)] |
|-----------|------|-------|----------------------------|-------|-------|-------|------|------|------|------|------|---------------------|
|           |      |       | 31.5                       | 63    | 125   | 250   | 500  | 1000 | 2000 | 4000 | 8000 |                     |
| PX059xA/W | (1)  | SPL   | 64.3                       | 64.3  | 66.1  | 63.1  | 59   | 56   | 52.1 | 45.5 | 36.4 | 61.5                |
|           | (2)  | SPL   | 70.5                       | 70.5  | 66.9  | 64.6  | 63.4 | 61.8 | 61.5 | 51.7 | 42.7 | 67.1                |
|           | (3)  | PWL   | 102.8                      | 102.8 | 93.8  | 92.2  | 93.9 | 93.7 | 97   | 84   | 75.1 | 100.3               |
| PX092xA/W | (1)  | SPL   | 57.2                       | 57.2  | 71.6  | 59.2  | 58.2 | 56.1 | 53.6 | 45.9 | 35.8 | 61.9                |
|           | (2)  | SPL   | 57.4                       | 57.4  | 71.6  | 59.4  | 58.5 | 56.8 | 54.6 | 48.3 | 40.1 | 62.5                |
|           | (3)  | PWL   | 84.2                       | 84.2  | 96.4  | 86.2  | 85.4 | 84.1 | 82.2 | 77.3 | 71   | 89.5                |
| PX150AD   | (1)  | SPL   | 70,1                       | 70,1  | 76,8  | 70,5  | 66   | 65,1 | 62,5 | 55,2 | 46,7 | 70.8                |
|           | (2)  | SPL   | 72,7                       | 72,7  | 77,2  | 70,8  | 67,5 | 67,3 | 64,9 | 58   | 49,5 | 72.5                |
|           | (3)  | PWL   | 101,9                      | 101,9 | 104,2 | 97,7  | 95,6 | 96,1 | 93,9 | 87,4 | 78,9 | 101                 |
| PX165AD   | (1)  | SPL   | 73,8                       | 73,8  | 80,5  | 74,2  | 69,7 | 68,8 | 66,2 | 58,9 | 50,4 | 74,0                |
|           | (2)  | SPL   | 76,4                       | 76,4  | 80,9  | 74,5  | 71,2 | 71,0 | 68,6 | 61,7 | 53,2 | 75,7                |
|           | (3)  | PWL   | 105,6                      | 105,6 | 107,9 | 101,4 | 99,3 | 99,8 | 97,6 | 91,1 | 82,6 | 104,2               |

## LEGEND

The sound levels global and for each octave band are expressed in dB with a tolerance of (- 0/+2) dB.

(1) Only ventilation (50 Pa available external static pressure), 2 m in front of the unit and 1.5 m height, in free field conditions.

(2) Working compressor (50 Pa available external static pressure), 2 m in front of the unit and 1.5 m height, in free field conditions.

(3) Working compressor, on discharge side.

Level

**SPL** sound pressure level

**PWL** sound power level

# Sound Pressure Level

Tab. 7c - F/D/H versions and Upflow configuration, Standard Height, Digital Scroll Cooling System @ 100% cooling capacity, Premium Fan Module, nominal airflow

| MODEL            | Mode | Level | Octave band frequency (Hz) |       |       |      |       |      |      |      |      | Sound Level [dB(A)] |
|------------------|------|-------|----------------------------|-------|-------|------|-------|------|------|------|------|---------------------|
|                  |      |       | 31.5                       | 63    | 125   | 250  | 500   | 1000 | 2000 | 4000 | 8000 |                     |
| PX015U<br>F/D/H  | (1)  | SPL   | 50.1                       | 50.1  | 36.7  | 45.7 | 51.1  | 50   | 49.6 | 44   | 31.9 | 55.1                |
|                  | (2)  | SPL   | 50.1                       | 50.1  | 36.7  | 45.7 | 51.8  | 50.3 | 50.6 | 47.5 | 35.8 | 56.1                |
|                  | (3)  | PWL   | 90.3                       | 90.3  | 85.8  | 77.8 | 75.6  | 75.4 | 73.9 | 68.7 | 57.3 | 80.6                |
| PX021UD          | (1)  | SPL   | 52.1                       | 52.1  | 38.7  | 47.7 | 53.1  | 52   | 51.6 | 46   | 33.9 | 57.1                |
|                  | (2)  | SPL   | 52.1                       | 52.1  | 38.7  | 47.7 | 53.8  | 52.3 | 52.6 | 49.5 | 37.8 | 58.1                |
|                  | (3)  | PWL   | 92.3                       | 92.3  | 87.8  | 79.8 | 77.6  | 77.4 | 75.9 | 70.7 | 59.3 | 82.6                |
| PX025U<br>F/D/H  | (1)  | SPL   | 57.3                       | 57.3  | 62.4  | 55.8 | 53.3  | 52.1 | 49.6 | 44.2 | 33.3 | 57.1                |
|                  | (2)  | SPL   | 61.6                       | 61.6  | 63.9  | 56.6 | 55.4  | 55.2 | 53.7 | 48.5 | 37.1 | 60.1                |
|                  | (3)  | PWL   | 92.5                       | 92.5  | 92    | 84   | 84.1  | 84.9 | 84.4 | 79.4 | 67.5 | 89.9                |
| PX031U<br>F/D/H  | (1)  | SPL   | 59.5                       | 59.5  | 64.6  | 58   | 55.5  | 54.3 | 51.8 | 46.4 | 35.5 | 59.3                |
|                  | (2)  | SPL   | 63.8                       | 63.8  | 66.1  | 58.8 | 57.6  | 57.4 | 55.9 | 50.7 | 39.3 | 62.3                |
|                  | (3)  | PWL   | 94.7                       | 94.7  | 94.2  | 86.2 | 86.3  | 87.1 | 86.6 | 81.6 | 69.7 | 92.1                |
| PX041x-<br>F/D/H | (1)  | SPL   | 65.3                       | 65.3  | 67.1  | 64.1 | 60    | 57   | 53.1 | 46.5 | 37.4 | 62.5                |
|                  | (2)  | SPL   | 71.5                       | 71.5  | 67.9  | 65.6 | 64.4  | 62.8 | 62.5 | 52.7 | 43.7 | 68.1                |
|                  | (3)  | PWL   | 103.8                      | 103.8 | 94.8  | 93.2 | 94.9  | 94.7 | 98   | 85   | 76.1 | 101.3               |
| PX047x-<br>F/D/H | (1)  | SPL   | 54.6                       | 54.6  | 69    | 56.6 | 55.6  | 53.5 | 51   | 43.3 | 33.2 | 59.3                |
|                  | (2)  | SPL   | 54.8                       | 54.8  | 69    | 56.8 | 55.9  | 54.2 | 52   | 45.7 | 37.5 | 59.9                |
|                  | (3)  | PWL   | 81.6                       | 81.6  | 93.8  | 83.6 | 82.8  | 81.5 | 79.6 | 74.7 | 68.4 | 86.9                |
| PX051x-<br>F/D/H | (1)  | SPL   | 58.5                       | 58.5  | 72.9  | 60.5 | 59.5  | 57.4 | 54.9 | 47.2 | 37.1 | 63.2                |
|                  | (2)  | SPL   | 58.7                       | 58.7  | 72.9  | 60.7 | 59.8  | 58.1 | 55.9 | 49.6 | 41.4 | 63.8                |
|                  | (3)  | PWL   | 85.5                       | 85.5  | 97.7  | 87.5 | 86.7  | 85.4 | 83.5 | 78.6 | 72.3 | 90.8                |
| PX044x-<br>F/D/H | (1)  | SPL   | 55.4                       | 55.4  | 69.8  | 57.4 | 56.4  | 54.3 | 51.8 | 44.1 | 34   | 60.1                |
|                  | (2)  | SPL   | 55.6                       | 55.6  | 69.8  | 57.6 | 56.7  | 55   | 52.8 | 46.5 | 38.3 | 60.7                |
|                  | (3)  | PWL   | 82.4                       | 82.4  | 94.6  | 84.4 | 83.6  | 82.3 | 80.4 | 75.5 | 69.2 | 87.7                |
| PX054x-<br>F/D/H | (1)  | SPL   | 60.7                       | 60.7  | 75.1  | 62.7 | 61.7  | 59.6 | 57.1 | 49.4 | 39.3 | 65.4                |
|                  | (2)  | SPL   | 60.9                       | 60.9  | 75.1  | 62.9 | 62    | 60.3 | 58.1 | 51.8 | 43.6 | 66                  |
|                  | (3)  | PWL   | 87.7                       | 87.7  | 99.9  | 89.7 | 88.9  | 87.6 | 85.7 | 80.8 | 74.5 | 93                  |
| PX062x-<br>F/D/H | (1)  | SPL   | 60.9                       | 60.9  | 75.3  | 62.9 | 61.9  | 59.8 | 57.3 | 49.6 | 39.5 | 65.6                |
|                  | (2)  | SPL   | 61.1                       | 61.1  | 75.3  | 63.1 | 62.2  | 60.5 | 58.3 | 52   | 43.8 | 66.2                |
|                  | (3)  | PWL   | 87.9                       | 87.9  | 100.1 | 89.9 | 89.1  | 87.8 | 85.9 | 81   | 74.7 | 93.2                |
| PX068x-<br>F/D/H | (1)  | SPL   | 63.3                       | 63.3  | 67.4  | 61.3 | 57.5  | 55.6 | 52.2 | 45   | 35.1 | 60.9                |
|                  | (2)  | SPL   | 63.6                       | 63.6  | 68.1  | 62.5 | 62.3  | 59.7 | 57.8 | 52.5 | 43.3 | 65                  |
|                  | (3)  | PWL   | 90.5                       | 90.5  | 95.4  | 90.3 | 93.7  | 90.4 | 90   | 86.6 | 78.1 | 96.4                |
| PX082x-<br>F/D/H | (1)  | SPL   | 70.1                       | 70.1  | 74.2  | 68.1 | 64.3  | 62.4 | 59   | 51.8 | 41.9 | 67.7                |
|                  | (2)  | SPL   | 70.4                       | 70.4  | 74.9  | 69.3 | 69.1  | 66.5 | 64.6 | 59.3 | 50.1 | 71.8                |
|                  | (3)  | PWL   | 97.3                       | 97.3  | 102.2 | 97.1 | 100.5 | 97.2 | 96.8 | 93.4 | 84.9 | 103.2               |
| PX094x-<br>F/D/H | (1)  | SPL   | 71                         | 71    | 75.1  | 69   | 65.2  | 63.3 | 59.9 | 52.7 | 42.8 | 68.6                |
|                  | (2)  | SPL   | 71.3                       | 71.3  | 75.8  | 70.2 | 70    | 67.4 | 65.5 | 60.2 | 51   | 72.7                |
|                  | (3)  | PWL   | 98.2                       | 98.2  | 103.1 | 98   | 101.4 | 98.1 | 97.7 | 94.3 | 85.8 | 104.1               |
| PX104x-<br>F/D/H | (1)  | SPL   | 69.6                       | 69.6  | 73.7  | 67.6 | 63.8  | 61.9 | 58.5 | 51.3 | 41.4 | 67.2                |
|                  | (2)  | SPL   | 69.9                       | 69.9  | 74.4  | 68.8 | 68.6  | 66   | 64.1 | 58.8 | 49.6 | 71.3                |
|                  | (3)  | PWL   | 96.8                       | 96.8  | 101.7 | 96.6 | 100   | 96.7 | 96.3 | 92.9 | 84.4 | 102.7               |

## LEGEND

The sound levels global and for each octave band are expressed in dB with a tolerance of (-0/+2) dB.

(1) Only ventilation (50 Pa available external static pressure), 2 m in front of the unit and 1.5 m height, in free field conditions.

(2) Working compressor (50 Pa available external static pressure), 2 m in front of the unit and 1.5 m height, in free field conditions.

(3) Working compressor, on discharge side.

Level **SPL** sound pressure level **PWL** sound power level



# Sound Pressure Level

Tab. 7d - A/W versions and Downflow Up configuration, Standard Height, Digital Scroll Cooling System @ 100% cooling capacity, Premium Fan Module, nominal airflow

| MODEL     | Mode | Level | Octave band frequency (Hz) |      |      |      |      |      |      |      |      | Sound Level [dB(A)] |
|-----------|------|-------|----------------------------|------|------|------|------|------|------|------|------|---------------------|
|           |      |       | 31.5                       | 63   | 125  | 250  | 500  | 1000 | 2000 | 4000 | 8000 |                     |
| PX015DA/W | (1)  | SPL   | 43.5                       | 43.5 | 48.6 | 42   | 39.5 | 38.3 | 35.8 | 30.4 | 19.5 | 43.3                |
|           | (2)  | SPL   | 47.8                       | 47.8 | 50.1 | 42.8 | 41.6 | 41.4 | 39.9 | 34.7 | 23.3 | 46.3                |
|           | (3)  | PWL   | 78.7                       | 78.7 | 78.2 | 70.2 | 70.3 | 71.1 | 70.6 | 65.6 | 53.7 | 76.1                |
| PX021DA   | (1)  | SPL   | 48.9                       | 48.9 | 54   | 47.4 | 44.9 | 43.7 | 41.2 | 35.8 | 24.9 | 48.7                |
|           | (2)  | SPL   | 53.2                       | 53.2 | 55.5 | 48.2 | 47   | 46.8 | 45.3 | 40.1 | 28.7 | 51.7                |
|           | (3)  | PWL   | 84.1                       | 84.1 | 83.6 | 75.6 | 75.7 | 76.5 | 76   | 71   | 59.1 | 81.5                |
| PX025DA/W | (1)  | SPL   | 54                         | 54   | 59.1 | 52.5 | 50   | 48.8 | 46.3 | 40.9 | 30   | 53.8                |
|           | (2)  | SPL   | 58.3                       | 58.3 | 60.6 | 53.3 | 52.1 | 51.9 | 50.4 | 45.2 | 33.8 | 56.8                |
|           | (3)  | PWL   | 89.2                       | 89.2 | 88.7 | 80.7 | 80.8 | 81.6 | 81.1 | 76.1 | 64.2 | 86.6                |
| PX031DA/W | (1)  | SPL   | 58                         | 58   | 63.1 | 56.5 | 54   | 52.8 | 50.3 | 44.9 | 34   | 57.8                |
|           | (2)  | SPL   | 62.3                       | 62.3 | 64.6 | 57.3 | 56.1 | 55.9 | 54.4 | 49.2 | 37.8 | 60.8                |
|           | (3)  | PWL   | 93.2                       | 93.2 | 92.7 | 84.7 | 84.8 | 85.6 | 85.1 | 80.1 | 68.2 | 90.6                |
| PX033DA/W | (1)  | SPL   | 57.8                       | 57.8 | 62.9 | 56.3 | 53.8 | 52.6 | 50.1 | 44.7 | 33.8 | 57.6                |
|           | (2)  | SPL   | 62.1                       | 62.1 | 64.4 | 57.1 | 55.9 | 55.7 | 54.2 | 49   | 37.6 | 60.6                |
|           | (3)  | PWL   | 93                         | 93   | 92.5 | 84.5 | 84.6 | 85.4 | 84.9 | 79.9 | 68   | 90.4                |
| PX041xA/W | (1)  | SPL   | 59.7                       | 59.7 | 64.8 | 58.2 | 55.7 | 54.5 | 52   | 46.6 | 35.7 | 59.5                |
|           | (2)  | SPL   | 64                         | 64   | 66.3 | 59   | 57.8 | 57.6 | 56.1 | 50.9 | 39.5 | 62.5                |
|           | (3)  | PWL   | 94.9                       | 94.9 | 94.4 | 86.4 | 86.5 | 87.3 | 86.8 | 81.8 | 69.9 | 92.3                |
| PX045xA/W | (1)  | SPL   | 62.4                       | 62.4 | 67.5 | 60.9 | 58.4 | 57.2 | 54.7 | 49.3 | 38.4 | 62.2                |
|           | (2)  | SPL   | 66.7                       | 66.7 | 69   | 61.7 | 60.5 | 60.3 | 58.8 | 53.6 | 42.2 | 65.2                |
|           | (3)  | PWL   | 97.6                       | 97.6 | 97.1 | 89.1 | 89.2 | 90   | 89.5 | 84.5 | 72.6 | 95                  |
| PX047xA/W | (1)  | SPL   | 57                         | 57   | 62.3 | 58.8 | 53.9 | 51.5 | 46.5 | 38.6 | 29.8 | 56.8                |
|           | (2)  | SPL   | 57.9                       | 57.9 | 63.5 | 59.5 | 55.5 | 55.4 | 48.9 | 42.2 | 33.5 | 59.1                |
|           | (3)  | PWL   | 85.4                       | 85.4 | 91.3 | 86.8 | 83.7 | 85.9 | 77.9 | 72.4 | 63.8 | 88.5                |
| PX051xA/W | (1)  | SPL   | 59.4                       | 59.4 | 64.7 | 61.2 | 56.3 | 53.9 | 48.9 | 41   | 32.2 | 59.2                |
|           | (2)  | SPL   | 60.3                       | 60.3 | 65.9 | 61.9 | 57.9 | 57.8 | 51.3 | 44.6 | 35.9 | 61.5                |
|           | (3)  | PWL   | 87.8                       | 87.8 | 93.7 | 89.2 | 86.1 | 88.3 | 80.3 | 74.8 | 66.2 | 90.9                |
| PX057xA/W | (1)  | SPL   | 60.4                       | 60.4 | 65.7 | 62.2 | 57.3 | 54.9 | 49.9 | 42   | 33.2 | 60.2                |
|           | (2)  | SPL   | 61.3                       | 61.3 | 66.9 | 62.9 | 58.9 | 58.8 | 52.3 | 45.6 | 36.9 | 62.5                |
|           | (3)  | PWL   | 88.8                       | 88.8 | 94.7 | 90.2 | 87.1 | 89.3 | 81.3 | 75.8 | 67.2 | 91.9                |
| PX044xA/W | (1)  | SPL   | 55.3                       | 55.3 | 60.6 | 57.1 | 52.2 | 49.8 | 44.8 | 36.9 | 28.1 | 55.1                |
|           | (2)  | SPL   | 56.2                       | 56.2 | 61.8 | 57.8 | 53.8 | 53.7 | 47.2 | 40.5 | 31.8 | 57.4                |
|           | (3)  | PWL   | 83.7                       | 83.7 | 89.6 | 85.1 | 82   | 84.2 | 76.2 | 70.7 | 62.1 | 86.8                |
| PX054xA/W | (1)  | SPL   | 61.1                       | 61.1 | 66.4 | 62.9 | 58   | 55.6 | 50.6 | 42.7 | 33.9 | 60.9                |
|           | (2)  | SPL   | 62                         | 62   | 67.6 | 63.6 | 59.6 | 59.5 | 53   | 46.3 | 37.6 | 63.2                |
|           | (3)  | PWL   | 89.5                       | 89.5 | 95.4 | 90.9 | 87.8 | 90   | 82   | 76.5 | 67.9 | 92.6                |
| PX062xA/W | (1)  | SPL   | 62.7                       | 62.7 | 68   | 64.5 | 59.6 | 57.2 | 52.2 | 44.3 | 35.5 | 62.5                |
|           | (2)  | SPL   | 63.6                       | 63.6 | 69.2 | 65.2 | 61.2 | 61.1 | 54.6 | 47.9 | 39.2 | 64.8                |
|           | (3)  | PWL   | 91.1                       | 91.1 | 97   | 92.5 | 89.4 | 91.6 | 83.6 | 78.1 | 69.5 | 94.2                |
| PX074xA/W | (1)  | SPL   | 64.9                       | 64.9 | 70.2 | 66.7 | 61.8 | 59.4 | 54.4 | 46.5 | 37.7 | 64.7                |
|           | (2)  | SPL   | 65.8                       | 65.8 | 71.4 | 67.4 | 63.4 | 63.3 | 56.8 | 50.1 | 41.4 | 67                  |
|           | (3)  | PWL   | 93.3                       | 93.3 | 99.2 | 94.7 | 91.6 | 93.8 | 85.8 | 80.3 | 71.7 | 96.4                |
| PX068xA/W | (1)  | SPL   | 59.2                       | 59.2 | 65.9 | 59.6 | 55.1 | 54.2 | 51.6 | 44.3 | 35.8 | 59.4                |
|           | (2)  | SPL   | 61.8                       | 61.8 | 66.3 | 59.9 | 56.6 | 56.4 | 54   | 47.1 | 38.6 | 61.1                |
|           | (3)  | PWL   | 91                         | 91   | 93.3 | 86.8 | 84.7 | 85.2 | 83   | 76.5 | 68   | 89.6                |

# Sound Pressure Level

| MODEL     | Mode | Level | Octave band frequency (Hz) |       |       |      |      |      |      |      |      | Sound Level [dB(A)] |
|-----------|------|-------|----------------------------|-------|-------|------|------|------|------|------|------|---------------------|
|           |      |       | 31.5                       | 63    | 125   | 250  | 500  | 1000 | 2000 | 4000 | 8000 |                     |
| PX082xA/W | (1)  | SPL   | 66                         | 66    | 72.7  | 66.4 | 61.9 | 61   | 58.4 | 51.1 | 42.6 | 66.2                |
|           | (2)  | SPL   | 68.6                       | 68.6  | 73.1  | 66.7 | 63.4 | 63.2 | 60.8 | 53.9 | 45.4 | 67.9                |
|           | (3)  | PWL   | 97.8                       | 97.8  | 100.1 | 93.6 | 91.5 | 92   | 89.8 | 83.3 | 74.8 | 96.4                |
| PX094xA/W | (1)  | SPL   | 68.5                       | 68.5  | 75.2  | 68.9 | 64.4 | 63.5 | 60.9 | 53.6 | 45.1 | 68.7                |
|           | (2)  | SPL   | 71.1                       | 71.1  | 75.6  | 69.2 | 65.9 | 65.7 | 63.3 | 56.4 | 47.9 | 70.4                |
|           | (3)  | PWL   | 100.3                      | 100.3 | 102.6 | 96.1 | 94   | 94.5 | 92.3 | 85.8 | 77.3 | 98.9                |
| PX104xA/W | (1)  | SPL   | 69.6                       | 69.6  | 76.3  | 70   | 65.5 | 64.6 | 62   | 54.7 | 46.2 | 69.8                |
|           | (2)  | SPL   | 72.2                       | 72.2  | 76.7  | 70.3 | 67   | 66.8 | 64.4 | 57.5 | 49   | 71.5                |
|           | (3)  | PWL   | 101.4                      | 101.4 | 103.7 | 97.2 | 95.1 | 95.6 | 93.4 | 86.9 | 78.4 | 100                 |
| PX120xA/W | (1)  | SPL   | 69.6                       | 69.6  | 76.3  | 70   | 65.5 | 64.6 | 62   | 54.7 | 46.2 | 69.8                |
|           | (2)  | SPL   | 72.2                       | 72.2  | 76.7  | 70.3 | 67   | 66.8 | 64.4 | 57.5 | 49   | 71.5                |
|           | (3)  | PWL   | 101.4                      | 101.4 | 103.7 | 97.2 | 95.1 | 95.6 | 93.4 | 86.9 | 78.4 | 100                 |

## LEGEND

The sound levels global and for each octave band are expressed in dB with a tolerance of (- 0/+2) dB.

(1) Only ventilation (50 Pa available external static pressure), 2 m in front of the unit and 1.5 m height, in free field conditions.

(2) Working compressor (50 Pa available external static pressure), 2 m in front of the unit and 1.5 m height, in free field conditions.

(3) Working compressor, on discharge side.

Level

**SPL** sound pressure level

**PWL** sound power level

**Tab. 7e - A/W versions and Downflow Down configuration, Extended Height, Digital Scroll Cooling System @ 100% cooling capacity, Premium Fan Module, nominal airflow**

| MODEL     | Mode | Level | Octave band frequency (Hz) |       |       |      |      |      |      |      |      | Sound Level [dB(A)] |
|-----------|------|-------|----------------------------|-------|-------|------|------|------|------|------|------|---------------------|
|           |      |       | 31.5                       | 63    | 125   | 250  | 500  | 1000 | 2000 | 4000 | 8000 |                     |
| PX059xA/W | (1)  | SPL   | 60.6                       | 60.6  | 65.7  | 59.1 | 56.6 | 55.4 | 52.9 | 47.5 | 36.6 | 60.4                |
|           | (2)  | SPL   | 64.9                       | 64.9  | 67.2  | 59.9 | 58.7 | 58.5 | 57   | 51.8 | 40.4 | 63.4                |
|           | (3)  | PWL   | 95.8                       | 95.8  | 95.3  | 87.3 | 87.4 | 88.2 | 87.7 | 82.7 | 70.8 | 93.2                |
| PX092xA/W | (1)  | SPL   | 60.8                       | 60.8  | 66.1  | 62.6 | 57.7 | 55.3 | 50.3 | 42.4 | 33.6 | 60.6                |
|           | (2)  | SPL   | 61.7                       | 61.7  | 67.3  | 63.3 | 59.3 | 59.2 | 52.7 | 46   | 37.3 | 62.9                |
|           | (3)  | PWL   | 89.2                       | 89.2  | 95.1  | 90.6 | 87.5 | 89.7 | 81.7 | 76.2 | 67.6 | 92.3                |
| PX150EA   | (1)  | SPL   | 66,6                       | 66,6  | 73,3  | 67   | 62,5 | 61,6 | 59   | 51,7 | 43,2 | 66,8                |
|           | (2)  | SPL   | 69,2                       | 69,2  | 73,7  | 67,3 | 64   | 63,8 | 61,4 | 54,5 | 46   | 68,5                |
|           | (3)  | PWL   | 98,4                       | 98,4  | 100,7 | 94,2 | 92,1 | 92,6 | 90,4 | 83,9 | 75,4 | 97                  |
| PX165EA   | (1)  | SPL   | 70,3                       | 70,3  | 77    | 70,7 | 66,2 | 65,3 | 62,7 | 55,4 | 46,9 | 70,5                |
|           | (2)  | SPL   | 72,9                       | 72,9  | 77,4  | 71   | 67,7 | 67,5 | 65,1 | 58,2 | 49,7 | 72,2                |
|           | (3)  | PWL   | 102,1                      | 102,1 | 104,4 | 97,9 | 95,8 | 96,3 | 94,1 | 87,6 | 79,1 | 100,7               |

## LEGEND

The sound levels global and for each octave band are expressed in dB with a tolerance of (- 0/+2) dB.

(1) Only ventilation (50 Pa available external static pressure), 2 m in front of the unit and 1.5 m height, in free field conditions.

(2) Working compressor (50 Pa available external static pressure), 2 m in front of the unit and 1.5 m height, in free field conditions.

(3) Working compressor, on discharge side.

Level

**SPL** sound pressure level

**PWL** sound power level

# Sound Pressure Level

Tab. 7f - F/D/H versions and Downflow Up configuration, Standard Height, Digital Scroll Cooling System @ 100% cooling capacity, Premium Fan Module, nominal airflow

| MODEL        | Mode | Level | Octave band frequency (Hz) |      |       |      |      |      |      |      |      | Sound Level<br>[dB(A)] |
|--------------|------|-------|----------------------------|------|-------|------|------|------|------|------|------|------------------------|
|              |      |       | 31.5                       | 63   | 125   | 250  | 500  | 1000 | 2000 | 4000 | 8000 |                        |
| PX015D-F/D/H | (1)  | SPL   | 49.2                       | 49.2 | 54.3  | 47.7 | 45.2 | 44   | 41.5 | 36.1 | 25.2 | 49                     |
|              | (2)  | SPL   | 53.5                       | 53.5 | 55.8  | 48.5 | 47.3 | 47.1 | 45.6 | 40.4 | 29   | 52                     |
|              | (3)  | PWL   | 84.4                       | 84.4 | 83.9  | 75.9 | 76   | 76.8 | 76.3 | 71.3 | 59.4 | 81.8                   |
| PX021DD      | (1)  | SPL   | 51.1                       | 51.1 | 56.2  | 49.6 | 47.1 | 45.9 | 43.4 | 38   | 27.1 | 50.9                   |
|              | (2)  | SPL   | 55.4                       | 55.4 | 57.7  | 50.4 | 49.2 | 49   | 47.5 | 42.3 | 30.9 | 53.9                   |
|              | (3)  | PWL   | 86.3                       | 86.3 | 85.8  | 77.8 | 77.9 | 78.7 | 78.2 | 73.2 | 61.3 | 83.7                   |
| PX025D-F/D/H | (1)  | SPL   | 55.7                       | 55.7 | 60.8  | 54.2 | 51.7 | 50.5 | 48   | 42.6 | 31.7 | 55.5                   |
|              | (2)  | SPL   | 60                         | 60   | 62.3  | 55   | 53.8 | 53.6 | 52.1 | 46.9 | 35.5 | 58.5                   |
|              | (3)  | PWL   | 90.9                       | 90.9 | 90.4  | 82.4 | 82.5 | 83.3 | 82.8 | 77.8 | 65.9 | 88.3                   |
| PX031D-F/D/H | (1)  | SPL   | 58.8                       | 58.8 | 63.9  | 57.3 | 54.8 | 53.6 | 51.1 | 45.7 | 34.8 | 58.6                   |
|              | (2)  | SPL   | 63.1                       | 63.1 | 65.4  | 58.1 | 56.9 | 56.7 | 55.2 | 50   | 38.6 | 61.6                   |
|              | (3)  | PWL   | 94                         | 94   | 93.5  | 85.5 | 85.6 | 86.4 | 85.9 | 80.9 | 69   | 91.4                   |
| PX041x-F/D/H | (1)  | SPL   | 62.1                       | 62.1 | 67.2  | 60.6 | 58.1 | 56.9 | 54.4 | 49   | 38.1 | 61.9                   |
|              | (2)  | SPL   | 66.4                       | 66.4 | 68.7  | 61.4 | 60.2 | 60   | 58.5 | 53.3 | 41.9 | 64.9                   |
|              | (3)  | PWL   | 97.3                       | 97.3 | 96.8  | 88.8 | 88.9 | 89.7 | 89.2 | 84.2 | 72.3 | 94.7                   |
| PX047x-F/D/H | (1)  | SPL   | 58.2                       | 58.2 | 63.5  | 60   | 55.1 | 52.7 | 47.7 | 39.8 | 31   | 58                     |
|              | (2)  | SPL   | 59.1                       | 59.1 | 64.7  | 60.7 | 56.7 | 56.6 | 50.1 | 43.4 | 34.7 | 60.3                   |
|              | (3)  | PWL   | 86.6                       | 86.6 | 92.5  | 88   | 84.9 | 87.1 | 79.1 | 73.6 | 65   | 89.7                   |
| PX051x-F/D/H | (1)  | SPL   | 62.4                       | 62.4 | 67.7  | 64.2 | 59.3 | 56.9 | 51.9 | 44   | 35.2 | 62.2                   |
|              | (2)  | SPL   | 63.3                       | 63.3 | 68.9  | 64.9 | 60.9 | 60.8 | 54.3 | 47.6 | 38.9 | 64.5                   |
|              | (3)  | PWL   | 90.8                       | 90.8 | 96.7  | 92.2 | 89.1 | 91.3 | 83.3 | 77.8 | 69.2 | 93.9                   |
| PX044x-F/D/H | (1)  | SPL   | 58.8                       | 58.8 | 64.1  | 60.6 | 55.7 | 53.3 | 48.3 | 40.4 | 31.6 | 58.6                   |
|              | (2)  | SPL   | 59.7                       | 59.7 | 65.3  | 61.3 | 57.3 | 57.2 | 50.7 | 44   | 35.3 | 60.9                   |
|              | (3)  | PWL   | 87.2                       | 87.2 | 93.1  | 88.6 | 85.5 | 87.7 | 79.7 | 74.2 | 65.6 | 90.3                   |
| PX054x-F/D/H | (1)  | SPL   | 64.5                       | 64.5 | 69.8  | 66.3 | 61.4 | 59   | 54   | 46.1 | 37.3 | 64.3                   |
|              | (2)  | SPL   | 65.4                       | 65.4 | 71    | 67   | 63   | 62.9 | 56.4 | 49.7 | 41   | 66.6                   |
|              | (3)  | PWL   | 92.9                       | 92.9 | 98.8  | 94.3 | 91.2 | 93.4 | 85.4 | 79.9 | 71.3 | 96                     |
| PX062x-F/D/H | (1)  | SPL   | 65.5                       | 65.5 | 70.8  | 67.3 | 62.4 | 60   | 55   | 47.1 | 38.3 | 65.3                   |
|              | (2)  | SPL   | 66.4                       | 66.4 | 72    | 68   | 64   | 63.9 | 57.4 | 50.7 | 42   | 67.6                   |
|              | (3)  | PWL   | 93.9                       | 93.9 | 99.8  | 95.3 | 92.2 | 94.4 | 86.4 | 80.9 | 72.3 | 97                     |
| PX068x-F/D/H | (1)  | SPL   | 61.9                       | 61.9 | 68.6  | 62.3 | 57.8 | 56.9 | 54.3 | 47   | 38.5 | 62.1                   |
|              | (2)  | SPL   | 64.5                       | 64.5 | 69    | 62.6 | 59.3 | 59.1 | 56.7 | 49.8 | 41.3 | 63.8                   |
|              | (3)  | PWL   | 93.7                       | 93.7 | 96    | 89.5 | 87.4 | 87.9 | 85.7 | 79.2 | 70.7 | 92.3                   |
| PX082x-F/D/H | (1)  | SPL   | 69.2                       | 69.2 | 75.9  | 69.6 | 65.1 | 64.2 | 61.6 | 54.3 | 45.8 | 69.4                   |
|              | (2)  | SPL   | 71.8                       | 71.8 | 76.3  | 69.9 | 66.6 | 66.4 | 64   | 57.1 | 48.6 | 71.1                   |
|              | (3)  | PWL   | 101                        | 101  | 103.3 | 96.8 | 94.7 | 95.2 | 93   | 86.5 | 78   | 99.6                   |
| PX094x-F/D/H | (1)  | SPL   | 70.2                       | 70.2 | 76.9  | 70.6 | 66.1 | 65.2 | 62.6 | 55.3 | 46.8 | 70.4                   |
|              | (2)  | SPL   | 72.8                       | 72.8 | 77.3  | 70.9 | 67.6 | 67.4 | 65   | 58.1 | 49.6 | 72.1                   |
|              | (3)  | PWL   | 102                        | 102  | 104.3 | 97.8 | 95.7 | 96.2 | 94   | 87.5 | 79   | 100.6                  |
| PX104x-F/D/H | (1)  | SPL   | 70.2                       | 70.2 | 76.9  | 70.6 | 66.1 | 65.2 | 62.6 | 55.3 | 46.8 | 70.4                   |
|              | (2)  | SPL   | 72.8                       | 72.8 | 77.3  | 70.9 | 67.6 | 67.4 | 65   | 58.1 | 49.6 | 72.1                   |
|              | (3)  | PWL   | 102                        | 102  | 104.3 | 97.8 | 95.7 | 96.2 | 94   | 87.5 | 79   | 100.6                  |

**LEGEND**

The sound levels global and for each octave band are expressed in dB with a tolerance of (- 0/+2) dB.

(1) Only ventilation (50 Pa available external static pressure), 2 m in front of the unit and 1.5 m height, in free field conditions.

(2) Working compressor (50 Pa available external static pressure), 2 m in front of the unit and 1.5 m height, in free field conditions.

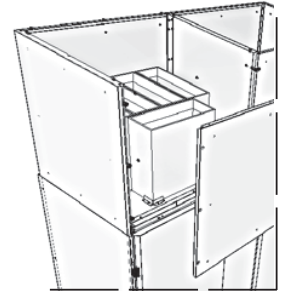
(3) Working compressor, on discharge side.

Level **SPL** sound pressure level **PWL** sound power level

# Sound Pressure Level

## Plenum with silencing cartridges (accessory)

These are special cartridges made of self-extinguishing material with a high noise attenuation capacity. They are guaranteed against disintegration and release of particles due to friction of the air. It is possible to install the supplied plenum 600 mm height with one row of cartridges over the unit. Despite a small additional pressure drop, these cartridges provide a remarkable sound power level reduction.



**Tab. 7g - Features of silencing cartridges**

| Models  | Dimensions      | Free Section | Cartridge Number |
|---|-----------------|--------------|------------------|
|   | [mm]            | [mm]         |                  |
| PX015 - 21 - 25 - 31 - 33                                   | 500 x 195 x 500 | 400 x 100    | 4                |
| PX041 - PX045 - PX059                                       | 500 x 195 x 500 | 400 x 100    | 7                |
| PX047 - PX051 - PX057 - PX044 PX054 - PX062 - PX074 - PX092 | 500 x 195 x 500 | 400 x 100    | 11               |
| PX068 - PX082 - PX094 PX104 - PX120                         | 500 x 195 x 500 | 400 x 100    | 16               |

**Tab. 7h - Attenuation in dB silencing cartridges**

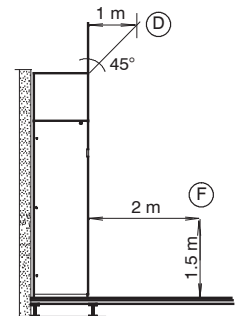
| row no. | Attenuation in dB at different frequency values (Hz) |     |     |     |      |      |      |      |
|---------|--|-----|-----|-----|------|------|------|------|
|         | 63   | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
| 1       | 1  | 4   | 7   | 15  | 26   | 28   | 27   | 14   |

**Tab. 7i - Pressure drops silencing cartridges**

| row no. | Pressure drops (Pa) for each module at different air flows (m <sup>3</sup> /s) |     |     |     |     |
|---------|--|-----|-----|-----|-----|
|         | 0.2  | 0.3 | 0.4 | 0.5 | 0.6 |
| 1       | 1  | 2   | 4   | 7   | 9   |

**Tab. 7j - Approximate variations of Sound Pressure Level**

Variations compared to values measured without noise reduction duct: free discharge (for Upflow units) or free suction (Downflow units).  
 Position F: 2 meters from the front, 1.5 meter from the ground  
 Position D: 1 meter from the front, 45° from the top



| Unit Configuration | Plenum Height | Cartridge Rows Number | Position |           |
|--------------------|---------------|-----------------------|----------|-----------|
|                    |               |                       | F        | D         |
| Downflow Up        | 600 mm        | 1                     | - 4.0 dB | - 7.0 dB  |
| Upflow             | 600 mm        | 1                     | - 7.5 dB | - 12.0 dB |

### Fans (CRAC unit)

The units install innovating EC fans incorporating an impeller with curved blades corrosion resistant made of fibreglass plastic. This new technology allows keeping the current high- strength of aluminium alloy adding the benefits of light weight and full flexibility on blade design of the new material. The good dampening behaviour of the plastic also helps to reduce noise emissions.

The optimised aerodynamic design permits achieving high energy efficiency and a reduced noise level.

Other benefits came from the EC motors, it is comparable to the DC brush- less motor, except that the magnetic field is produced by permanent magnets in the rotor; the commutation is done electronically and therefore without wear.

The EC Fans are controlled via a linear interface, 0- 10Vdc, through iCOM.

The motor is three- phase with IP54 protection; provided with internal thermal protection.

The fan wheel is statically and dynamically balanced; the bearings are self - lubricating.



### Compressor

#### Scroll compressors.

The scroll is a simple compression concept first patented in 1905. A scroll is an involute spiral which, when matched with a mating scroll form, generates a series of crescent shaped gas pockets between the two members. During compression, one scroll remains stationary (fixed scroll) while the other form (orbiting scroll) is allowed to orbit (but not rotate) around the first form. As this motion occurs, the pockets between the two forms are slowly pushed to the center of the two scrolls while simultaneously being reduced in volume. When the pocket reaches the center of the scroll form, the gas, which is now at a high pressure, is discharged out of a port located at the center. During compression, several pockets are being compressed simultaneously, resulting in a very smooth process. Both the suction process (outer portion of the scroll members) and the discharge process (inner portion) are continuous.

High COP (Coefficient Of Performance)

High MTBF (Mean Time Between Failure)

Low sound level

Vibration- damped

Provided with internal thermal protection

Low pickup current (equalization of the internal pressures).

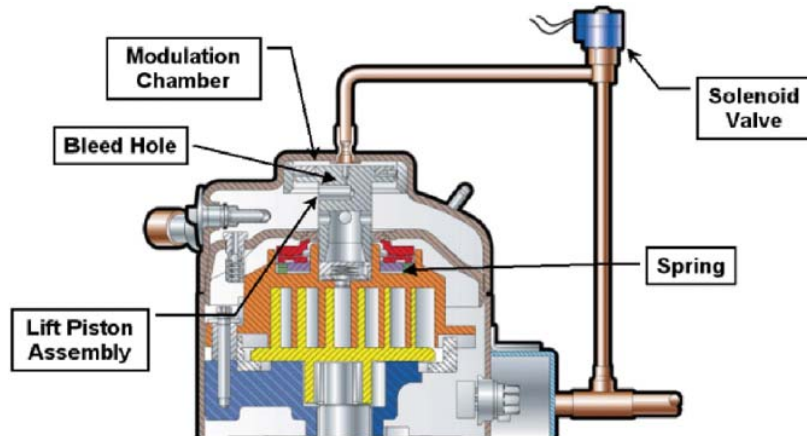


#### Digital Scroll compressor

When it is mandatory to have a precise and continuous equivalence between the load and the cooling capacity. We get this through the innovative compressor: the Copeland Digital Scroll. It uses a simple and effective method to modulate the capacity, giving unparalleled performance in the modulation field. The controlled separation of the scrolls is achieved using a solenoid valve and a bypass connection between the discharge chamber and the gas intake (See Fig.8.a). The scrolls are designed so that the upper scroll can separate from the bottom scroll by 1 mm vertically. A piston is attached on top of the upper scroll and will lift up the upper scroll when it moves up. When the solenoid valve is closed, the Digital Scroll operates as a normal scroll compressor and the compressed gas is discharged at high pressure through the normal piping. When the solenoid valve is opened, the discharge chamber and intake gas pressure becomes connected, thereby releasing some of the discharge pressure. This leads to less pressure holding the piston down thereby causing the piston to shift upwards, which in turn lifts the upper scroll. Once the scrolls separate, any gas passing through is no longer compressed.

The Digital Scroll operates in two stages - the "Loaded state", when the solenoid valve is normally closed and "Unloaded state", when the solenoid valve is open. During the loaded state the compressor operates like a standard scroll and delivers full capacity and mass flow. However, during the unloaded state, there is no capacity and no mass flow through the compressor.

# Technical Specifications



At this stage, let us introduce the concept of a cycle time. A cycle time consists of a "Loaded State" time and "Unloaded State" time. The duration of these 2- time segments determine the capacity modulation of the compressor. Example: In a 20 seconds cycle time, if the loaded state time is 10 seconds and the unloaded state time is 10 seconds, the compressor modulation is 50%. If for the same cycle time, the loaded state time is 15 seconds and the unloaded state time is 5 seconds, the compressor modulation is 75%. The capacity is a time averaged summation of the loaded state and unloaded state. By varying the loaded state time and unloaded state time, any capacity between 10% and 100% can be delivered by the compressor. Hence, the Copeland Digital Scroll can achieve a continuous modulation of AC capacity to suit the system's needs precisely.

We could vary the cycle time and still achieve the same effective capacity, but Copeland and Liebert have done extensive testing to optimize the cycle time in this application.

## Electronic Expansion Valve

The valve is designed for modulating control of refrigerant circuits with high speed and high precision. The EEV provides superior performance compared to a Thermostatic Expansion Valve (TXV), due to:

- Precise flow control
- Positioning time

EEV ensures a better control on super heating at the end of the evaporator, ensuring at the same time that compressor will never be filled by liquid from the 10% to 110% of its nominal capacity, instead a mechanical one cannot ensure it. It has to be calibrated and then it will work properly but only around the calibration point.

This means that a TXV works better (i.e. better control, longer life) with a condensing pressure as much as possible constant. For such reason with TXV the condensing temperature is kept around 45°C as set point. But during the coldest period the condensing temperature can be lowered and the electronic expansion valve adapts to this new situation. This permits an increase of the cooling capacity of the unit, a decrease of the unit power input and so increase the energy efficiency of the entire Liebert® PDX unit. Liebert® PDX allows having an option the EEV both on Standard Scroll and on Digital Scroll. The choice is driven by the application:

- Only temperature control - or wide range or Humidity band T→In this case the EEV gives a great efficiency effects both with Standard and Digital Scroll technology. To get the biggest advantage, a different pressure set point can be used for the fan speed controller of the Liebert remote condenser.
- Close Humidity control → Often, even the TXV valve allows to get good results, mainly thanks to the Digital Scroll modulation.

## Digital range - Major Benefits

Vertiv is proud to offer a new possibility to have the best technologic evolutions in your cooling unit, adding to an already optimum product a wide range of benefits:

Modulation (as explained in Digital Scroll Chapter):

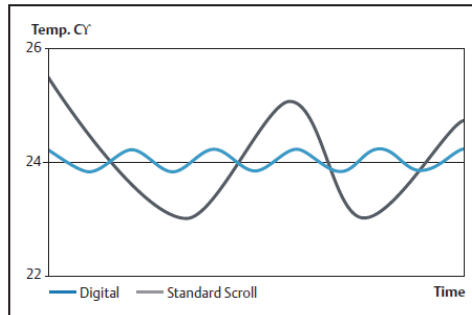
- Perfect match between Cooling Capacity and Heat Load.
- Lower power input at partial load.
- Quick adaptation to changing heat load.
- Possibility to size cooling system to overcome future heat load growth

# Technical Specifications

## Precision Control:

- More precise room temperature control.  
Once you make a direct comparisons between standard units using standard scroll compressors and Liebert® PDX, is necessary to notice that Liebert® PDX has a very high precision in control room temperature; so all the advantages exponentially increase comparing Liebert® PDX to a standard unit with the same tolerances on controlling the temperature.

Fig. 8.b



In fact to guarantee the same precision, standard scroll technology has to use additional technologies, like hot gas by pass or hot gas injection, and others, to avoid the compressor shut off and to avoid loosing temperature control. All these techniques are very energy expensive and for this reason we can say that Liebert® PDX offers more requiring less.

## Availability & Reliability:

- Less number of start/stop cycling means longer unit life.  
As described previously, at partial load, a Digital Scroll does not work with ON -OFF configuration. This avoids peaks in adsorbed power and reduces stress on components. This increases the life of the unit, greatly reducing failure due to fatigue.
- Wide operational limits for higher availability.  
To maximise the possible advantages coming from the thermodynamic functioning of Liebert® PDX, Vertiv has developed a special software; with an additional pressure transducer the control, when external air temperature increases over standard functioning limits, commands the compressor to modulate his capacity. Forcing the condensing temperature to decrease under the limit, even when at partial load, the unit guarantees refrigeration; standard units in the same condition would fail. So when you size your requested unit you consider the worst external conditions; it can happen that occasionally during the year it will be hotter than your design ambient temperature. In this case a standard unit will shut down due to high condensing temperatures, leaving your Data Center without cooling when the requirement is at its highest, however your Lieber® PDX will guarantee a partial cooling capacity.  
So System availability is guaranteed even during extreme operating conditions.

## Increased Efficiency due to:

- COP and SHR Effect.  
At partial load alternation between loaded and unloaded states involves a reduction on nominal mass flow both on the evaporator and on the condenser. This gives digital technology two important thermodynamic advantages: higher evaporating temperatures and lower condensing temperatures. These are both important characteristics, the evaporating temperature is directly related to cooling capacity, and a higher evaporating temperature means a higher cooling capacity. Condensing temperature is directly related to power input, and lower it is the lower the power consumption of the compressor. Consequently the Digital scroll increases its COP at partial load (higher then 75%) in fact the higher evaporating temperature and lower condensing temperature gives higher cooling capacity and lower power input.
- EEV Effect (as explained in the relevant chapter).
- EC Fan Effect (as explained in the relevant chapter).

Thanks to all these effects we can have a reduction up to 50% on the yearly energy consumption and a return of investment lower then half a year (considering a comparison versus a standard Room Cooling Unit with standard Scroll, standard AC Fan and standard Thermostatic Expansion Valve, placed in a city in the Central Europe).

# Technical Specifications

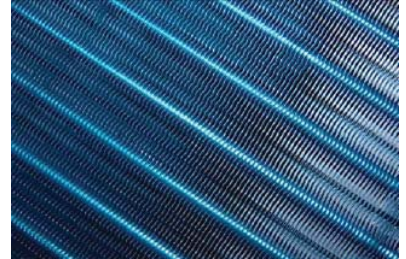
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## Refrigerant

The units are designed for being used with refrigerant R410A.

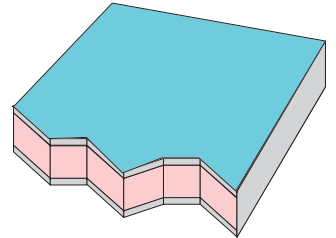
## Coils

DX refrigerant / Chilled water/room air High frontal surface.  
Made of copper pipes and aluminium fins.  
Fins treated with hydrofile styrol acrylic paints to withstand corrosive atmospheres.  
Low pressure drop.  
High SHR (Sensible Heat Ratio).  
In dual circuit units, the dual stage coil increases the SHR, at partial load the efficiency is strongly increased due to the use of the total amount of airflow and frontal coil surface.



## Frame and panels

The sheet steel structure, painted with epoxy- polyester powders, is assembled by stainless steel rivets; the paneling system ensures higher stiffness; there will also be some pluggings for guaranteeing both safety and high acoustic absorption.  
The frontal panel is assembled on hinges to make the access easier; this can be opened by the fast closing lock.  
The rear and side panels are screwed to the supports. The rear panel is screwed directly to the frame.  
The panels are lined with thermoacoustic insulating material - class 0 (ISO 1182.2) with thermal conductivity 0.04 W/mK and density from 20 to 50 kg/m<sup>3</sup>.  
The internal sheet metal parts are made of hot- dip galvanized steel in order to provide corrosion protection and avoid zinc whiskers growing.



## Electric panel

The electric panel is housed in the frontal part of the unit, behind the right door. It is insulated against the air flow and protected by a cover, so as to avoid tampering by non- authorized personnel and to protect the electric panel parts supplied with a voltage higher than 24 V.  
Once open the electrical panel could be rotate on the right to make the installation procedure and maintenance easier.  
The electric panel complies with the norm 204- 1 IEC.  
The air conditioners have been provided for operating at 400 V~ /3/50 Hz+N+G (as alternative execution, the version with 230~V/3/50Hz + G can be supplied in the majority of cases).  
Magnetothermal switches are supplied as protection of every electric component.  
A single- phase transformer has been provided for supplying power to the secondary circuit at 24V.  
There will be an automatic start- up after a possible stop due to power supply lack.  
Additional terminals for remote start- up and carry of some operating conditions (fans and compressors) or connection of additional devices (Liquistat, Firestat, Smokestat, clogged filters) are set in series on the terminal panel of the electric panel. On the terminal panel there is also a clean contact for the remote signalling of the general alarm.  
The panels are lined with thermo acoustic insulating material - class 0 (ISO 1182.2).

## Wye vs. Delta Connection Power Supply for PDX

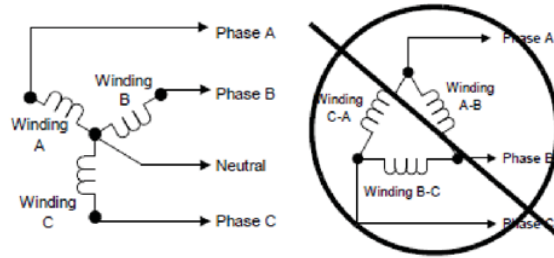
The Liebert PDX EC Fan Model is designed to operate with Wye- connected power. It will not operate properly with Delta connected power.  
A field- supplied isolation transformer or other power solutions will be needed for proper function.  
The electronically commutated motors included in the Liebert PDX are suitable for connection to power supplies with a solidly grounded neutral.



# Technical Specifications

Fig. 8.c Wye vs. Delta power supply connection diagram

Wye Power Supply Connection    Delta Power Supply Connection



### Acceptable Power Supplies -380V to 460V Nominal Units

(TT System, TN-S System or TN-C System)

- 380V wye with solidly grounded neutral and 220V line- to- ground
- 460V wye with solidly grounded neutral and 277V line- to- ground.

### Unacceptable Power Supplies—380V to 460V Nominal Units (IT System)

- Wye with high- resistance (or impedance) ground
- Delta without ground or with floating ground
- Delta with corner ground
- Delta with grounded center tap.

If the unit must be installed in the IT System, contact Vertiv Technical department prior to installation.

## Humidification

Liebert® PDX offers the possibility to choose between Electrode, Ultrasonic and Infrared Humidifiers. Depending on which is the priority between the water characteristics and the efficiency Liebert® PDX is able to give the right solution:

- Ultrasonic Humidifier: Top Efficient solution to manage the humidification process. The Ultrasonic Humidifier needs a correct water treatment to allow the system work properly.
- Infrared Humidifier: this is the perfect solution whenever there is not the possibility to have a high quality of water. In fact Infrared Humidifier does not suffer any performance decade based on water conductivity (as happens for common electrode solution); additionally it does not require a specific water treatment.
- Electrode Humidifier: this is the most common solution in European Data Center, providing efficiency level once it works with the correct water conductivity.

For complete details about humidifiers solution see Chapter 11.

## Electrical Heaters

for Heating Mode and reheating in dehumidification mode.

A stage of electrical heater is available for each Liebert® PDX. If necessary for units with 2 or 3 fans it is possible install as well a second stage of electrical heater to increase significantly the heating power.

Each stage of heaters are made of finned armored stainless steel AISI 304. to maintain a low surfaces power density. Ionization effects are eliminated owing to the low heater surface temperature.

There an ON- OFF type electronic temperature controller, a safety thermostat with manual reset, a circuit breaker for short- circuit protection and harness protection from possible accidental contact.

The electrical heating can work as well the dehumidification system is activated; in this way humidity sensor and indicator are necessary and provided on request.

Electrical heating can be installed combined with hot gas or hot water heating.



# Technical Specifications

Tab. 8a - Features of Electrical heating system at nominal airflow

| Model               | ELECTRICAL HEATING |                    |                    |                    |        |      |
|---------------------|--------------------|--------------------|--------------------|--------------------|--------|------|
|                     | Std. Capacity      |                    | Opt. High Capacity |                    |        |      |
|                     | FLA [A]            | nominal power [kW] | FLA [A]            | nominal power [kW] |        |      |
| (400V / 3Ph / 50Hz) |                    |                    |                    |                    |        |      |
| PX015               | 10.8               | 7.5                | -                  | -                  |        |      |
| PX021               |                    |                    |                    |                    |        |      |
| PX025               |                    |                    |                    |                    |        |      |
| PX031               |                    |                    |                    |                    |        |      |
| PX033               |                    |                    |                    |                    |        |      |
| PX041               |                    |                    |                    |                    |        |      |
| PX045               |                    |                    |                    |                    |        |      |
| PX059               |                    |                    |                    |                    |        |      |
| PX047               |                    |                    |                    |                    | 21.6 * | 15 * |
| PX051               |                    |                    |                    |                    | 21.6 * | 15 * |
| PX057               |                    |                    | 21.6               | 15                 |        |      |
| PX044               |                    |                    | 21.6 *             | 15 *               |        |      |
| PX054               |                    |                    | 21.6 *             | 15 *               |        |      |
| PX062               |                    |                    | 21.6               | 15                 |        |      |
| PX074               |                    |                    | 21.6               | 15                 |        |      |
| PX092               |                    |                    | 21.6               | 15                 |        |      |
| PX068               |                    |                    | 21.6 ** / 32.5 *** | 15 ** / 22.5 ***   |        |      |
| PX082               |                    |                    | 21.6 ** / 32.5 *** | 15 ** / 22.5 ***   |        |      |
| PX094               |                    |                    | 21.6 ** / 32.5 *** | 15 ** / 22.5 ***   |        |      |
| PX104               |                    |                    | 21.6 ** / 32.5 *** | 15 ** / 22.5 ***   |        |      |
| PX120               | 32.5               | 22.5               |                    |                    |        |      |
| PX150               | 32.5               | 22.5               |                    |                    |        |      |
| PX165               | 32.5               | 22.5               |                    |                    |        |      |

\* Not available with Basic Fan Module.

\*\* With Basic Fan Module.

\*\*\* With Premium Fan Module.

## Hot Water Coil

for heating and reheating mode and dehumidification system

The hot water heating is a copper pipes and aluminium fins coil, with one row, test pressure 30 bar and includes an exhaust valve. A three- way on- off valve directly driven by the microprocessor controller is supplied as standard. A hot water thermostat (provided by the customer) is installed to indicate the presence of hot water at the correct temperature. The heating system can work even if the dehumidification system is activated; in this case humidity sensor and an indicator are necessary and are provided on request.

**Note:** Hot water power in F, D, H units could slightly differ from hot water power in A, W units.

Tab. 8b - Features of hot water reheat system at nominal airflow, Premium Fan Module

| MODELS   |                | PX015 | PX021 | PX025 | PX031 | PX033 | PX041 | PX045 | PX047 | PX051 | PX057 | PX044 |
|--|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| rows   | no.            | 1     | 1     | 1     | 1     | 1     | 1     | 2     | 2     | 2     | 2     | 2     |
| surface  | m <sup>2</sup> | 0.384 | 0.384 | 0.384 | 0.384 | 0.384 | 0.324 | 0.324 | 0.549 | 0.549 | 0.549 | 0.549 |
| <b>indoor temp. 24°C, 50% R.H.; water inlet/outlet temperature 80/65°C</b> |                |       |       |       |       |       |       |       |       |       |       |       |
| Power (re - heating)   | kW             | 11.3  | 13.2  | 14.9  | 16.1  | 16.7  | 25.4  | 26.8  | 41.6  | 44.7  | 45.9  | 40.7  |
| water flow   | l/s            | 0.185 | 0.215 | 0.243 | 0.263 | 0.272 | 0.413 | 0.437 | 0.679 | 0.729 | 0.748 | 0.664 |
| coil side pressure drops   | kPa            | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     |
| total pressure drops   | kPa            | 3     | 3     | 4     | 4     | 5     | 10    | 11    | 24    | 28    | 29    | 23    |

# Technical Specifications

| MODELS   |                | PX054 | PX062 | PX074 | PX068 | PX082 | PX094 | PX104 | PX120 | PX059 EXT | PX092 EXT |
|--|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-----------|-----------|
| rows   | no.            | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2         | 2         |
| surface  | m <sup>2</sup> | 0.549 | 0.549 | 0.549 | 0.909 | 0.909 | 0.909 | 0.909 | 0.909 | 0.324     | 0.549     |
| <b>indoor temp. 24°C, 50% R.H.; water inlet/outlet temperature 80/65°C</b> |                |       |       |       |       |       |       |       |       |           |           |
| Power (re - heating)   | kW             | 46.7  | 48.6  | 51.6  | 66.6  | 78.8  | 83    | 85.8  | 87.5  | 23.2      | 42.3      |
| water flow   | l/s            | 0.762 | 0.793 | 0.842 | 1.085 | 1.285 | 1.353 | 1.399 | 1.427 | 0.377     | 0.69      |
| coil side pressure drops   | kPa            | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1         | 1         |
| total pressure drops   | kPa            | 30    | 33    | 37    | 61    | 85    | 94    | 100   | 104   | 8         | 25        |

## Hot Gas Coil DX units for Reheating Mode only

Liebert® PDX can be supplied with a reheating system that uses the heat which is normally transferred to the condenser, thus saving energy.

This system is activated during the dehumidification phase, when the temperature is below its setpoint. A control valve prevents the refrigerant from flowing into the reheat coil when not required.

Hot gas reheat is available as an alternative to hot water reheat.

**Note:** Reheating capacity in F, D, H units could slightly differ from reheating capacity in A, W units.

**Tab. 8c - Features of hot gas reheat system at nominal airflow, Premium Fan Module**

| MODELS   |                | PX015 | PX025 | PX031 | PX033 | PX041 | PX045 | PX047 | PX051 | PX057 | PX044 |
|--|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| rows   | no.            | 1     | 1     | 1     | 1     | 2     | 2     | 2     | 2     | 2     | 2     |
| surface  | m <sup>2</sup> | 0.384 | 0.384 | 0.384 | 0.384 | 0.324 | 0.324 | 0.549 | 0.549 | 0.549 | 0.549 |
| Reheating capacity (Scroll Cooling System) (at 24°C, 50%, condensing temperature 45°C)         | kW             | 9.1   | 16.6  | 20.1  | 22.9  | 26.8  | 29.6  | 30.6  | 35.4  | 39.4  | 13.9  |
| Reheating capacity (Digital Scroll Cooling System) (at 24°C, 50%, condensing temperature 45°C) | kW             | 9.1   | 16.7  | 19.9  | 22.9  | 26.5  | 29.4  | 32.4  | 34.7  | 39.3  | 14    |

| MODELS   |                | PX054 | PX062 | PX074 | PX068 | PX082 | PX094 | PX104 | PX059 EXT | PX092 EXT |
|--|----------------|-------|-------|-------|-------|-------|-------|-------|-----------|-----------|
| rows   | no.            | 2     | 2     | 2     | 2     | 2     | 2     | 26    | 2         | 2         |
| surface  | m <sup>2</sup> | 0.549 | 0.549 | 0.549 | 0.909 | 0.909 | 0.909 | 0.909 | 0.324     | 0.549     |
| Reheating capacity (Scroll Cooling System) (at 24°C, 50%, condensing temperature 45°C)         | kW             | 17.2  | 19.5  | 22.3  | 20.4  | 26.5  | 29.3  | 33.5  | 38.5      | 27.4      |
| Reheating capacity (Digital Scroll Cooling System) (at 24°C, 50%, condensing temperature 45°C) | kW             | 17.2  | 19.4  | 22.2  | 20.2  | 27.2  | 30.8  | 32.9  | 38.4      | 27.2      |

**Tab. 8d - Reheating mode during the dehumidification**

|             |                                     |
|-------------|-------------------------------------|
| First step  | Hot gas reheat                      |
| Second step | Hot gas reheat + Heaters first step |
| Third step  | Hot gas reheat + Heaters total      |

## Air filters

Removable filters are installed inside the unit before heat exchanger and fans. The F5 standard filters made by paper material and are completely recyclable. Additional high efficiency filters F6, F7 are available as optional. For complete details about filter sections see chapter 9.



# Technical Specifications

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## Dual Power Supply

Liebert® PDX offers as option the possibility to have dual power supplies in order to have the units up and running once the main power supply fails.

Liebert® PDX allows choosing between 3 different solutions:

- **Dual Power Supply Parallel**  
2 separate power supplies: during normal working mode both are present, during emergency situation only the main one. This means that during emergency mode ventilation redundancy is granted disabling heating, humidifying and compressor power input. This last option allows during emergency mode to reduce unit power absorption and therefore Genset or UPS sizes.
- **Dual Power Supply Alternate**  
2 separate power supplies: each power supply is able to completely feed the unit. (ATS) Alternate Transfer Switch makes the switch in case of main line failure. In case of failure of the main supply the unit automatically switches to the second power supply. This allows to have a complete power supply redundancy or in case needed to have during emergency mode full cooling redundancy disabling heating and humidifying. This last option allows during emergency mode to reduce unit power absorption and therefore Genset or UPS sizes.

The solution allows having the following benefits:

- possibility to have together Automatic or Manual changeover.
- transfer switching time between power A and power B 1,2-1,5sec.
- **Dual Power Supply Alternate Premium Version with UPS for iCOM board**  
The switch between one power supply and the other makes the units restarting as it pass through the off position. The solution with iCOM Control kept alive under UPS allows the control of the unit to stay powered. This means that the unit is not rebooting and so immediately ready again to cool the room.  
The solution with integrated UPS for the iCOM Control keeps iCOM alive for five minutes, so even if both power supplies are missing this allows a unit to be ready to continue working once one of the two will come back.

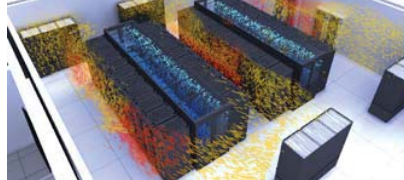
## Smart Aisle TM Solution

To drastically reduce the energy consumption and thus truly optimize the investment in the installation, Vertiv offers the solution that will exactly adjust the cooling capacity to the needs of the servers. This solution includes the separation of the cold and hot zone through a cold aisle, or hot aisle, containment. This allows the cooling units to operate with higher air temperature therefore increasing both capacity and efficiency.

The solution is designed to have the latest cooling unit (compressor modulating technology with digital scroll, EC fan, Electronic Expansion Valve) with the best control for the Data Center application and well optimized distribution of the air and of the temperatures.

The proposal consists of precision control of temperature, humidity and air flow rate at the server level to ensure exactly the airflow required by the server at the conditions they need to produce maximum life and highest reliability.

**The solution is Smart Aisle™** control for the cold aisle containment, Digital modulating compressor in a unit with EC Fan to have all the best technologies in the market controlled in the most efficient way.



Liebert® PDX as part of Smart Aisle™ cooling solution is the best answer to ensure the right cooling minimizing the cooling operating costs.

The Liebert® PDX SmartAisle™ comes with return and supply sensors, remote sensors as well as ready to drive a damper to aerally insulate the units not working and a button to force the unit on full cooling for emergency situations.

Vertiv's cold aisle containment solution can achieve an energy saving of up to 65% higher than other manufacturers' cooling units with standard technology.

# Technical Specifications

The unit will drive the compressor(s) based on the supply temperature, while the airflow will be driven based upon the patented control method on the remote temperature and humidity sensors installed on the calibrated holes of the Smart Aisle™.

This allows equalizing the pressures within inside and outside the closed aisle and therefore matching exactly the airflow required by the servers. This means higher availability for the servers' equipment that will be working with the right airflow and the right temperature and minimum power consumption as the unit will not waste any single watt on not needed cooling.

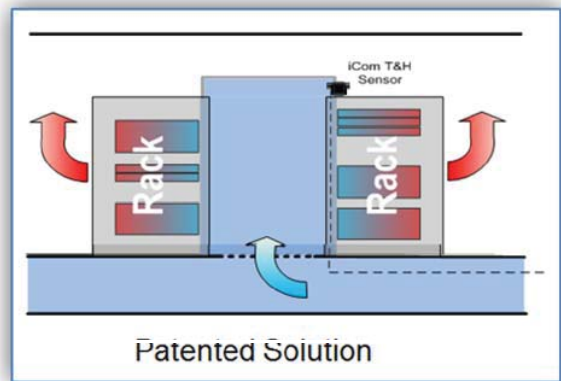
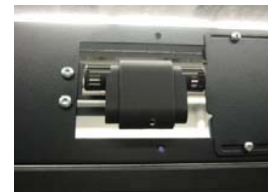


Fig. 8.d Remote temperature and humidity sensor)



## Liebert® ECONOMIZER Solution

The usage of direct freecooling is more and more common on Data Center applications. Compared to other applications the Data Center application still marks a difference on the usage of the Direct Freecooling. The discriminating factor is the humidity control.

In fact, the solution with the direct Freecooling can be limited not only by the temperatures outside but in particular by the humidity levels. Dry Air can absorb different quantities of vapor depending on its temperature. At a given temperature there is a maximum quantity of grams of vapour by each kilogram that can be taken by the air. More vapour would become solid as liquid water. Given a specific condition the air will have a temperature and a quantity of humidity (this is defined as absolute humidity). If we compare this level of humidity with the maximum level that the air at that temperature can absorb we have the relative humidity. (This from a logic point of view on the physics:

Relative humidity is the ratio of the partial pressure of water vapor in an air- water mixture to the saturated vapor pressure of water at a prescribed temperature – wikipedia).

As example: at 18° C the maximum level of humidity is 12,89 g/kg. In case of 18° C 50% the absolute humidity is 6.38 g/kg.

The hotter is the air the more humidity it can absorb.

These rules are clearly represented on the physics using the psychrometric chart that is presenting the different conditions of temperature and humidity at the pressure of sea level.

The behaviour of fresh air freecooling is strongly linked to these physic rules. In fact during winter time the air is cold and when is cold it can have a maximum humidity which is extremely low. (As example at 5°C the maximum level of humidity is already below the ASHRAE recommended limit and as matter of comparison it corresponds to same absolute humidity that you have at 24°C 28%).

Therefore in such times you enter in the Data Center very dry air thus requiring the use of the humidifier (element with high energy consumption) in compensation.

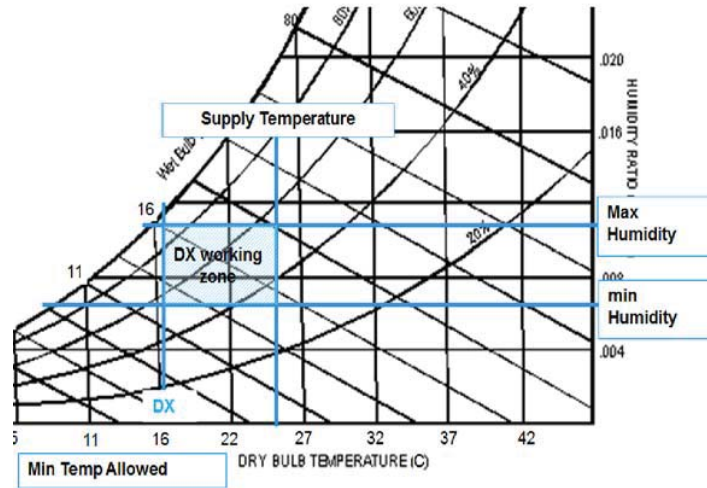
Similarly, in wet periods in the spring / autumn, the risk is opposite, that you enter in the data center air that requires dehumidification. (As example air condition of 15°C 100% typical foggy condition corresponds to the absolute humidity level that you have at 24°C 80%).

An efficient control for data centers is then what gives you the possibility to set limits that allow you to choose whether or not to use the outside air to avoid using it when energy is not convenient.

This is **Liebert® Economizer**. It allows setting limits in terms of both temperature and humidity and use the air only when it makes sense from all energy points of view.

# Technical Specifications

Fig. 8.e Sample of settable Economizer working range



So Vertiv proposes a complete solution of direct freecooling specifically thought and developed to address data center needs.

The solution includes in the unit Return and Supply temperature sensors, an external temperature and humidity sensor to check external absolute humidity and solution to correctly drive the dampers installed in a plenum above the unit for the mixing of the external and return air. iCOM control therefore if external temperature and humidity are within the correct range allows the direct freecooling and complete the required acting the compressors. For digital scroll there is the great opportunity to exploit the modulation capacity to always provide exactly what is needed in terms of modulation.

Whenever the cooling from outside is enough to fully cool the room, the unit will work on pure freecooling mode.

The solution is therefore optimizing to provide the highest saving and the biggest availability thanks to the full Direct Expansion back up provided by the compressor(s).

### Standard filters

Removable filters are installed inside the unit before fan and heat exchanger.

The standard filtration grade is F5 (CEN EN779 - respectively corresponding to EU5 according to Eurovent EU4/5).

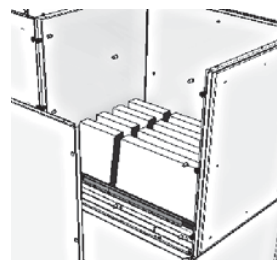
The filter pleated structure gives high filtration efficiency, low pressure drop and permit to use the filter without metallic or cardboard frame. The filter media is composed by fibre and latex.



### High efficiency filters (accessory)

An optional extension hood with high efficiency filters is available, filtration class F6, F7 and F9 in accordance with the CEN EN 779 standard, are made of fibreglass filter media. The filters are placed in "V" sections with a solid external frame in polypropylene, and can withstand remarkable pressure and flow variations. These filters will be installed within an additional duct on the unit top.

The additional pressure drop in comparison with F5 sdt filters are indicated in the following graphs (Tab 9c- e). For dimensions see Fig. 12.a.

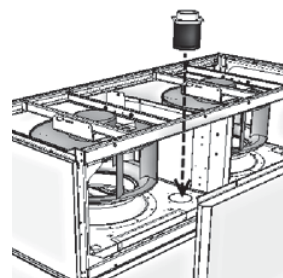


### Clogged filter alarm

A differential static pressure gauge after and before the filter gives a signal when the filter is dirty.

### Fresh air kit (accessory)

The fresh air kit, optional, has aG3 class filter installed on the intake side of the fan and is connected to the unit with a 100mmdiameter plastic duct. As the fresh air intake is positioned close to the fan suction, it will easily mix the fresh air with the recirculation air.



### Air Filters general information

Recently new test methods and configuration systems have been developed for all type of filters. In Europe,CEN is working to establish common standards, in the United States ASHRAE Standards has been in use since 1968 and replaced by ANSI/ASHRAE 52.1- 1992. So, in order to have a reference about different standards, see Tab. 9a and Tab 9b. There is no perfect correspondence between different standards, due to the different test methods, but the tables can be used as general guide.

# Filter section

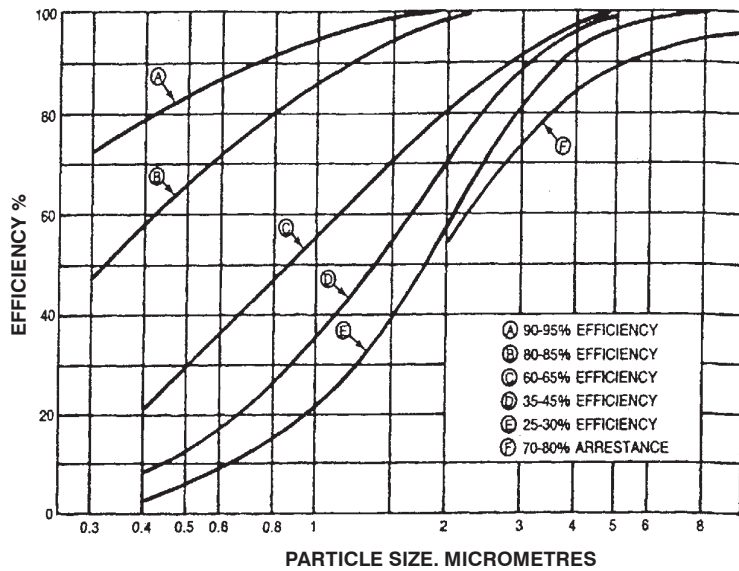
Tab. 9a - Comparison between air filter tests

| Eurovent 4/9 | EN 779<br>EN 1882 | Average Arrestance *<br>[ASHRAE Standard 52.1 - 1992] |             | Average Dust Spot Efficiency **<br>[ASHRAE Standard 52.1 - 1992] |             | Minimum Efficiency Reporting Value [ASHRAE 52.2- 1999] |
|--------------|-------------------|---|-------------|--|-------------|--|
|              |                   | [greater then or equal to]                            | [less than] | [greater than or equal to]                                       | [less than] |  |
| EU1          | G1                | 60%   | 65%         |  | 20%         | 1- 4   |
| EU2          | G2                | 65%   | 80%         | 20%  |             | 4  |
| EU3          | G3                | 80%   | 90%         | 20%  |             | 5  |
| EU4          | G4                | 90%   | 95%         | 20%  | 30%         | 6- 7- 8  |
| EU5          | F5                | 95%   | 98%         | 40%  | 60%         | 8- 9- 10   |
| EU6          | F6                | 99%   |             | 60%  | 80%         | 10- 11- 12- 13   |
| EU7          | F7                | 99%   |             | 80%  | 90%         | 13- 14   |
| EU8          | F8                | 99%   |             | 90%  | 95%         | 14- 15   |
| EU9          | F9                | 99%   |             | 95%  |             | 15   |

\* Achieved filtering performance in accordance to gravimetric test method on a specific sample of dust.

\*\* Achieved filtering performance in accordance to a light transmission test methods, with natural atmospheric dust.

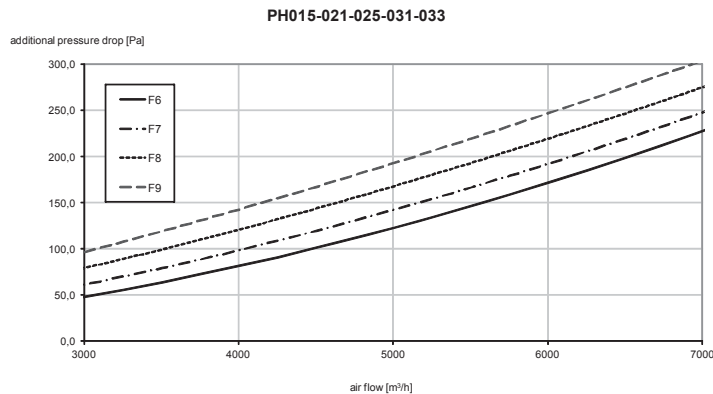
Tab. 9b - Approximate efficiency versus particle size for typical air filters



Curves are approximation for general guidance only. Efficiency and arrestance per ASHRAE Std 52.1 test method [From ASHRAE Handbook, HVAC Systems and Equipment].

## High efficiency filters additional pressure drop

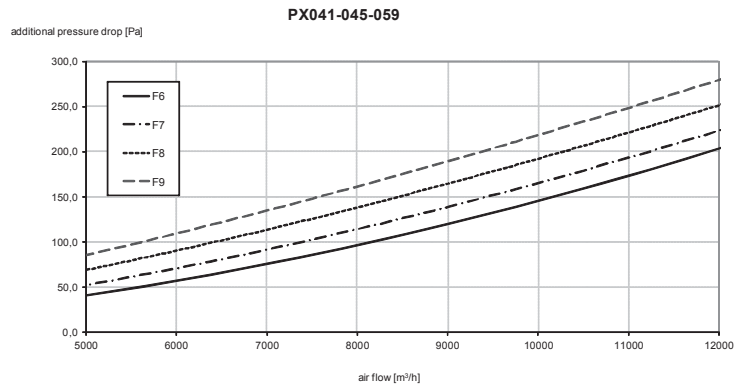
Tab. 9c - Units PX015 - 021 - 025 - 031 - 033: additional pressure drop high efficiency filter



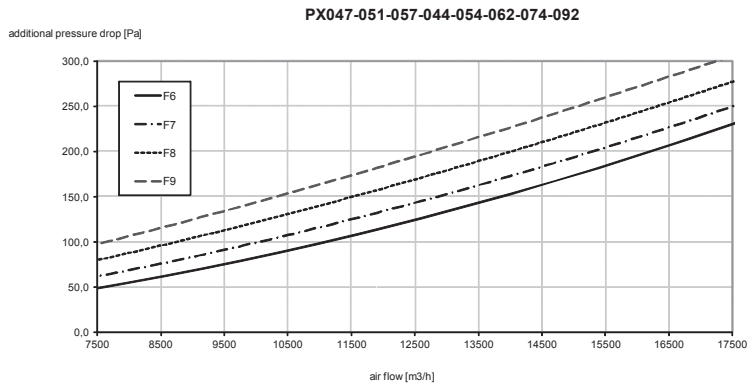


# Filter section

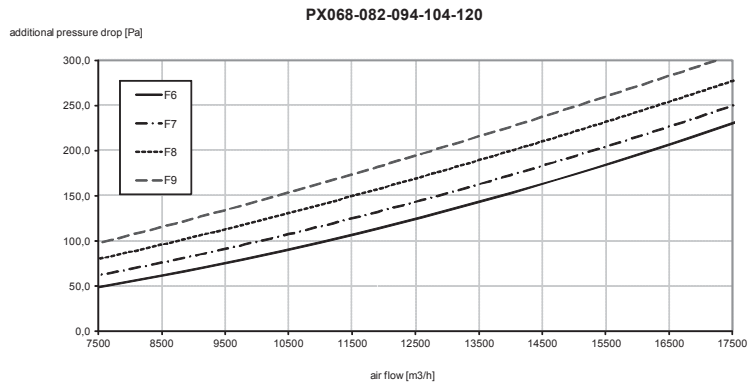
**Tab. 9d - Units PX041 - 045 - 059: additional pressure drop high efficiency filter.**



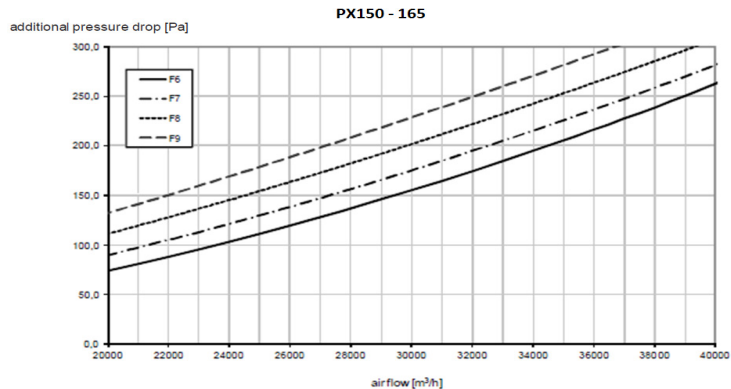
**Tab. 9e - Units PX047 - 051 - 057 - 044 - 054 - 062 - 074 - 092: additional pressure drop high efficiency filter.**



**Tab. 9f - Units PX068 - 082 - 094 - 104 - 120: additional pressure drop high efficiency filter.**



**Tab. 9g - Units PX150 - 165: additional pressure drop high efficiency filter.**



### iCOM Control

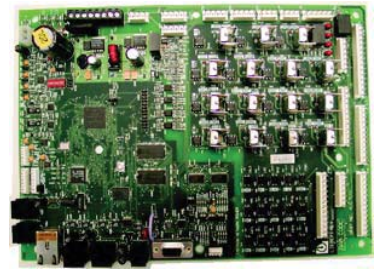
Liebert® PDX models are controlled by iCOM Large board. The control handles the operation of the Liebert® PDX units with a special control algorithm, ensuring top reliability and maximum efficiency.

The iCOM Large board (main board) is housed in the electrical panel and it could be connected to a remote display (supplied on request), to be installed in the container/room.

- The 3 digit user interface is an inner display that permits an easy access to the unit parameters. Writing access is protected by a password. It features navigation push-buttons and status leds.

As optional is possible to have a large display that allows more functions and a more accurate monitoring (see paragraph CDL Graphic Display). Warnings and alarms activate a visual indicator and buzzer. All settings are protected through a 3-Level password system.

- Input for Remote unit On- Off and free contacts for simple remote monitoring of warnings and alarms are available.
- LAN management: functions provided as standard include stand-by (in case of failure or overload of the unit in operation, the second one starts automatically), automatic rotation, and cascade (division of the load among several units, through split of the proportional band).
- Automatic restart is provided after a power failure.



**Tab. 10a - Technical Data iCOM**

|                             |   |
|-----------------------------|---|
| Technical Data              | iCOM Large  |
| E2prom                      | 4 Mbit + 512 kbit   |
| Flash memory                | 32 Mbit   |
| RAM memory                  | 128 Mbit  |
| Microcontroller             | Coldfire 32 Mbit  |
| Analogue Input              | 4 x 0- 10V,0- 5V,4..20 mA (selectable) + 2 PTC/NTC + 2 NTC            |
| Digital Input               | 15 x opto- coupled  |
| Analogue Output             | 4 x 0- 10V  |
| Digital Output              | 15 triacs output and 2 relay output                                   |
| Time and date               | Buffered by an LI-battery   |
| Hirobus Lan connectors      | 2 RJ45 sockets (for unit in LAN, remote display)                      |
| Ethernet network connectors | 1 RJ45 socket   |
| CAN bus connectors          | 2 RJ12 sockets  |
| Hironet connectors          | 1 RJ9 socket for RS485 (direct connection to proprietary supervision) |
| RS232 service port          | 1 db9 socket  |

# Microprocessor Controls

## CDL Graphic Display (option)

Featuring up to 16 days record of controlled parameters as well as the last 400 events occurred.

- Large graphic display (320 x 240 pixel).
- System Window: system operation status at a glance.
- Self - explanatory Icons: they are used for the Menu- Layout of the CDL iCOM. There are 3 iCOM menus: user, service and advanced.
- Online Help: Every single parameter has its own multi- page explanation.
- Status Report of the latest 400 event- messages of the unit/system.
- Four different Graphic Data Records.
- Semi or Full Manual Mode software management including all safety devices.
- 3- Level Passwords system to protect all the settings.
- Ergonomic design for use also as portable device (start- up and "flying connections" by service personnel).
- Multi- language menu with on- the- fly language selection.















### Technical Data CDL Graphic Display

- Microcontroller: . . . . . Coldfire 32bit
- Time and date function buffered by LI - battery
- Ethernet network connectors . . . . . 1 RJ45 sockets (for unit in LAN, remote display)
- CAN bus connectors . . . . . 2 RJ12 sockets
- Power supply: . . . . . via CAN bus or external 12Vdc supply



# Microprocessor Controls

|   |   |
|---|---|
|    | <p>Return air temperature. If on the top- right SYSTEM is indicated, it is the average of all units with system on. If UNIT x is indicated, it is the return air temperature of the specific unit. This is valid for all indications in the display. The small number represents the actual set point. If the “Cold Aisle” function is enabled the remote THB sensor temperature value is shown in place of the standard share return temperature. Specific Cold Aisle icons are shown.</p> |
|    | <p>Return air humidity of the system / the unit and the set point. If the “Cold Aisle” function is enabled the remote THB sensor humidity value is shown in place of the standard share return humidity. Specific Cold Aisle icons are shown.</p>   |
|    | <p>Supply air temperature of the system / the unit and the supply limit set point. SET means set point ACT means actual reading</p>   |
|    | <p>This bargraph gives information about the actual Fan speed. In units w/o Fan speed control the graph will show 100% if the fan is on, and 0% if the fan is off.</p>  |
|    | <p>This bargraph gives information about the actual used cooling resources in operation, either for the system or for a specific unit.</p>  |
|    | <p>This bargraph gives information about the actual used Freecooling resources in operation, either for the system or for a specific unit.</p>  |
|   | <p>This bargraph gives information about the actual used heating resources (Hot Water) in operation, either for the system or for a specific unit.</p>  |
|  | <p>This bargraph gives information about the actual used heating resources (Electrical Heaters) in operation, either for the system or for a specific unit.</p>   |
|  | <p>This bargraph gives information about the actual used dehumidification resources in operation, either for the system or for a specific unit.</p>   |
|  | <p>This bargraph gives information about the actual used humidification resources in operation, either for the system or for a specific unit.</p>   |
|  | <p>This bargraph gives information about the next maintenance time (mm-yyyy).</p>   |
|  | <p>This field of the window informs about time, date, the status of the system/unit. It also contains an event log holding the 2 latest events occurred to the system / unit. (Large CF Display only).</p>  |

## Liebert IntelliSlot® Web, 485, SiteLink- E, IPBML cards

Liebert IntelliSlot® Web, 485, SiteLink- E, IPBML cards enable monitoring through Liebert Supervising SW tools (SiteScan, Nform) or a Building Management System.

Plug and play solution cards that allow live data management, remote alarm notification and offer multiple connection options. Moreover provide for ease of integration with industry standard “open” protocol.

## Alarm Board (accessory)

The Alarm Board converts Alarms (high priority) or Warnings (lower priority) from iCOM into Volt- free contacts. In this way, following Warnings/Alarms are separated: Humidifier Failure (if installed), High/Low room Temperature, High/Low room Humidity, Fan Failure, Clogged Filter alarm (if device installed), Water Leakage (if sensor installed). Alarm board is included for free in case Electronic Expansion Valve (selected on unit digit) and standard software. In fact iCOM can use the same board as double function for this application.

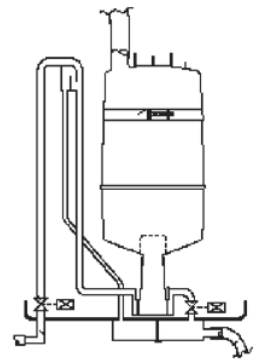
The **humidification system** is provided by an electronic controlled humidifier. The **dehumidification** function, which is supplied as standard when the humidifier option is installed, acts by reducing the fan speed with consequent reduction of the air flow and at the same time switching on the compressor(s).

### Electronic humidity control

The software of the iCOM Control microprocessor control includes an algorithm which manages the humidifier modulating and also provides the dehumidification function. There is also a special function which automatically prevents dehumidification if the return air temperature is below the required value. When the temperature reaches the correct value, the dehumidification function is automatically reactivated. Dehumidification control may be either of the proportional or of the on- off type, depending on the installation requirements: on- off is set as standard at the factory.

### Electrode steam humidifier

The Electrode humidifier is a replaceable plastic water cylinder with immersed electrodes. When an electrical current passes between the electrodes, the water is converted into the required quantity of steam. It is suitable for a large range of water qualities (with varying degrees of hardness) with the exception of demineralized water. It almost instantaneously produces clean, particle- free steam and avoids energy losses which are typical of other systems. The humidifier is provided with the steam cylinder, water inlet and outlet valves and a maximum level sensor. The steam output can be adjusted within a range of values which can be chosen manually and is factory- set at 50% of the maximum capacity (see the relevant data in Tab. 11a).



### Electrode humidifier features

The steam is mixed with the delivery air of the evaporating coil by means of a suitable distributor. The iCOM Control controller can determine when the cylinder has to be changed. Replacing the cylinder is extremely easy and quick. A self - adaptive flow control system is fitted as standard and controls the current passing through the cylinder water.

**Tab. 11a - Humidair specifications**

| MAIN POWER SUPPLIES | SETTING    | ABSORBED CURRENT | POWER | MAX. CYLINDER WATER VOLUME | MAX. SUPPLY WATER QUANTITY | MAX. DRAIN WATER QUANTITY |
|---------------------|------------|------------------|-------|----------------------------|----------------------------|---------------------------|
| (V ± 10%)           | [kg/h] *   | [A]              | [kW]  | [l]                        | [l/min.]                   | [l/min.]                  |
| 400V / 3ph / 50Hz   | 2.7...13.0 | 13.0             | 9.0   | 5.5                        | 0.6                        | 10.0                      |

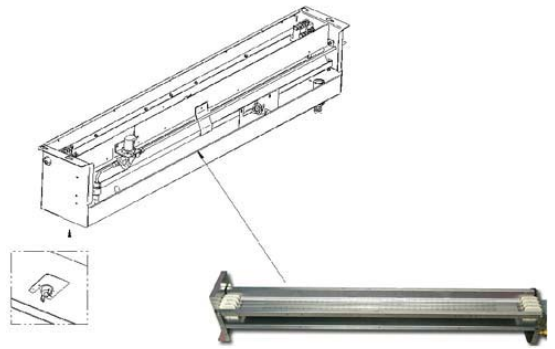
For humidifier current (FLA) and rated power refer to electrical features in air conditioner manual.

(\*) Unit is factory - set to produce about 50% of the maximum value (see iCOM Control manual).

# Humidification

## Infrared humidifier

The infrared humidifier design consists of quartz lamps mounted above a stainless steel water reservoir. The lamps never come in contact with the water. When humidification of room air is required, infrared rays generate water vapor—without impurities or odor, within seconds.



### Infrared humidifier features

The steam is mixed with the delivery air of the cooling coil by means of a suitable distributor. During normal humidifier operation, deposits of mineral solids will collect in the humidifier pan and on the float switch. These must be cleaned periodically to ensure proper operation. Frequency of cleaning must be locally established because it depends on humidifier usage and local water quality. A spare pan is recommended to reduce maintenance time at unit. The Liebert autoflush system can greatly increase the time between cleanings, but does not eliminate the need for periodic checks and maintenance.

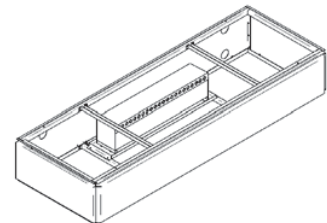
Tab. 11b - Infrared Humidifier specificatio

| Humidifier Model            | PAN             | MAIN POWER SUPPLIES | NOMINAL CAPACITY | ABSORBED CURRENT | POWER INPUT |
|-----------------------------|-----------------|---------------------|------------------|------------------|-------------|
|                             |                 | (V ± 10%)           | [kg/h]           | [A]              | [kW]        |
| PX015- 021<br>025- 031- 033 | Stainless steel | 400V / 3ph / 50Hz   | 5                | 6.4              | 4.8         |
| PX041- 045- 059             | Stainless steel | 400V / 3ph / 50Hz   | 5                | 6.4              | 4.8         |
| PX044...165                 | Stainless steel | 400V / 3ph / 50Hz   | 10               | 13.9             | 9.6         |

## Ultrasonic humidifier

Ultrasonic humidifier operates on the principle of ultrasonic nebulization.

The mist generated in the water tank by means of the transducer is blown into the room by the built-in fan. Ultrasonic Humidifier can work only with demineralized water with conductivity < 5 µS/cm (up to 20 µS/cm for a short time).



### Ultrasonic humidifier features

The Ultrasonic humidifier is supplied mounted within one base module 400 mm high stand alone, to connect on the field with the air conditioner.

The module can be installed on the raised floor or in the raised floor. This option is not available for PDX from 15 to 33kW. The humidifier consists of nebulization modules, solenoid valve for the control of the supply water, float switch and a case that houses the fan.

Tab. 11c - Ultrasonic Humidifier specifications

| Humidifier Model | POWER SUPPLIES | NOMINAL CAPACITY | NUMBER OF TRANSDUCERS | POWER |
|------------------|----------------|------------------|-----------------------|-------|
|                  | (Vac)          | [kg/h]           |                       | [W]   |
| HSU08RM000       | 48             | 0...6.0          | 16                    | 670   |

### Liebert® PDX EconoPhase System

Liebert® PDX EconoPhase System is designed to provide precision air conditioning to computer racks in a data center or computer room as efficiently and effectively as possible.

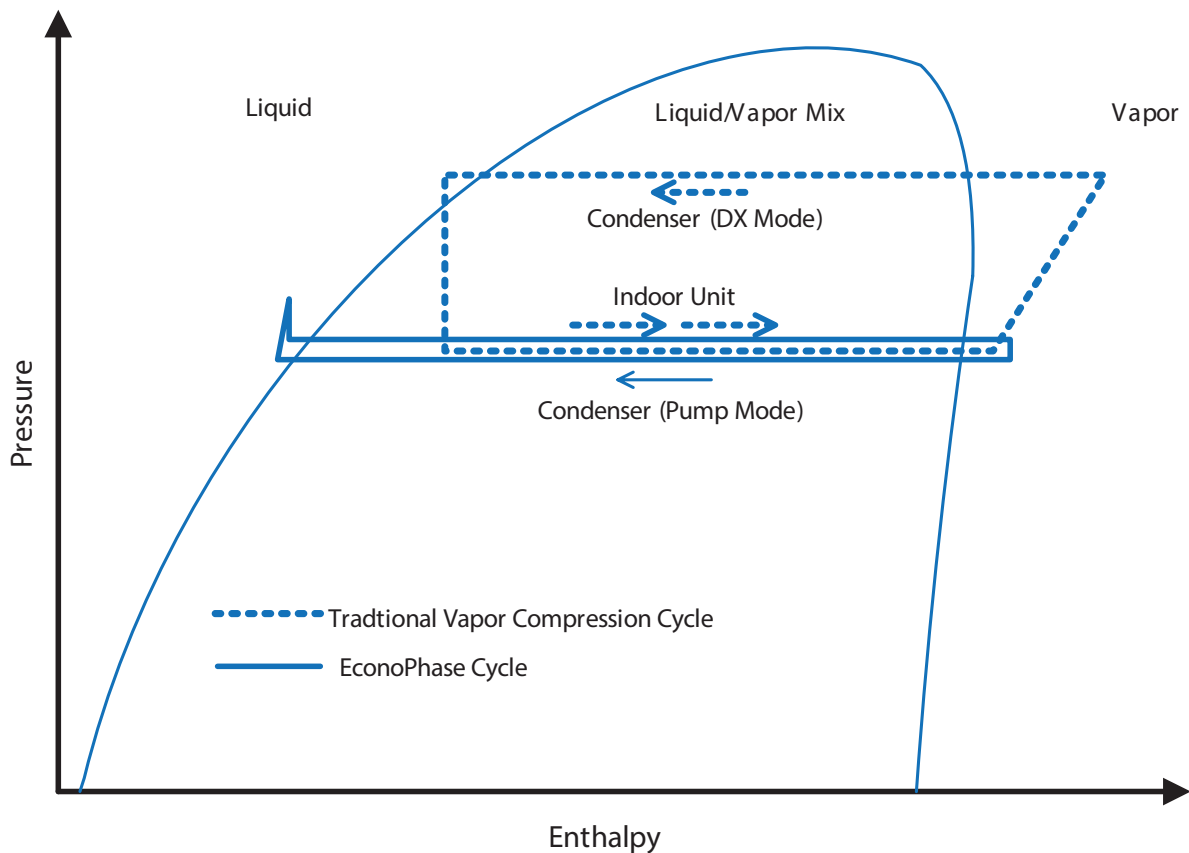
A Liebert PDX Liebert EconoPhase system is composed of:

- Liebert® PDX EconoPhase version - High efficiency, Digital Scroll, floor-mounted indoor unit
- Liebert® MC™ Condenser EconoPhase version - Air-cooled microchannel condenser, premium version
- Liebert® EconoPhase - Liebert EconoPhase pump refrigerant module

The Liebert® EconoPhase is an add-on module for use with an air-cooled Liebert® PDX system. The Liebert® EconoPhase will allow the system to switch to Liebert® EconoPhase operation when the outdoor temperature is low enough to provide the required temperature difference between the inside air and the outside air, providing significant energy savings because there is no need to operate the compressor. At lower temperatures, the system switches one or both circuits from Compressor Mode to Pump Mode. The pump consumes roughly 1/10th of the power consumed by the compressor.

The Liebert® EconoPhase system maintains this energy efficiency by employing the heat absorption properties of a liquid (pumped refrigerant) through a phase change. Refrigerant is pumped as a liquid, becomes a gas within the Liebert® PDX evaporator and then is returned to the Liebert® MC where it condenses to a liquid. The subcooled liquid refrigerant from the condenser is then run directly into the Liebert® EconoPhase pumps and is circulated back to the Liebert® PDX unit (see Figure 1). The system will operate as a typical air-cooled direct expansion system when outdoor ambient conditions are unfavorable to EconoPhase operation. The pumps in the Liebert® EconoPhase pump module are turned off and bypassed during compressor operation.

Fig. 12.1 - Pressure enthalpy diagram, pumped refrigerant Liebert® EconoPhase



# EconoPhase System

Fig. 12.2 - Compressorized operation flow path

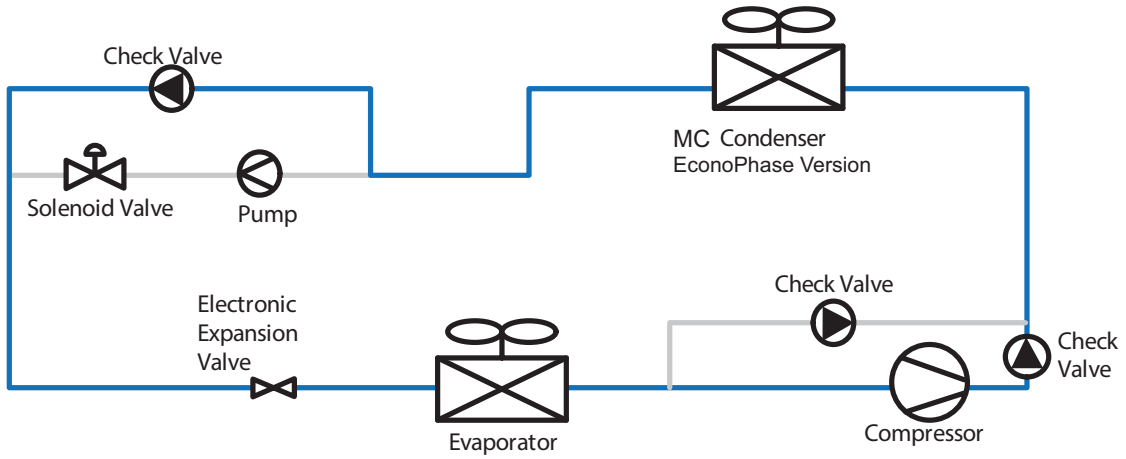
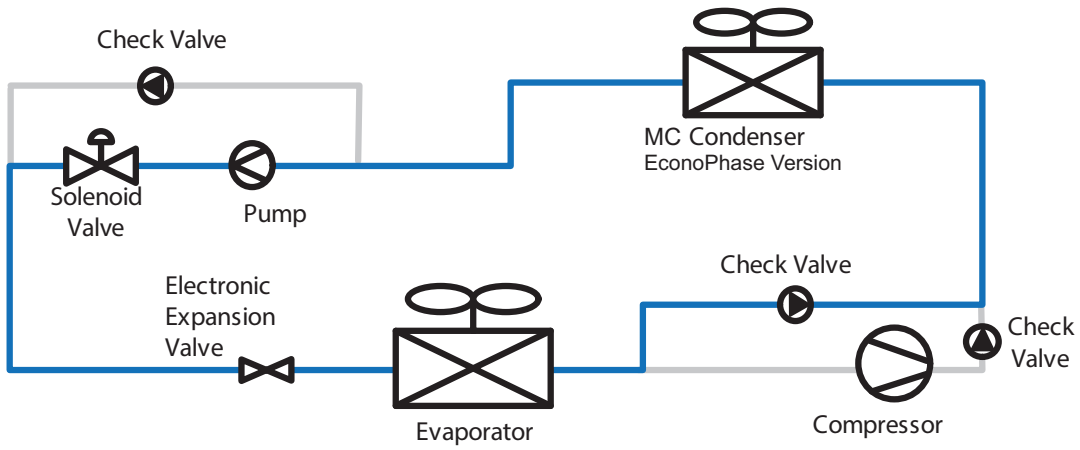


Fig. 12.3 - Pump operation flow path





# EconoPhase System

## Description of Liebert® EconoPhase Operation

The Liebert® EconoPhase unit enables the Liebert® PDX system to operate in any of three modes to control temperature, depending on the outdoor temperature and the load.

- Compressor Mode
- Pump Mode
- Mixed Mode

When the outdoor temperature becomes low enough to provide the required temperature difference between the inside air and the outside air, there is no need to compress the refrigerant to a higher pressure/temperature. When the outdoor temperature is low enough, the system switches from Compressor Mode to Pump Mode or to Mixed Mode.

- Compressor Mode: All available compressors may be used to maintain the control temperature. All the available Liebert® EconoPhase pumps are Off. The control will typically run in this mode when the load and temperatures are such that full or partial Liebert® EconoPhase operation is not possible, or because certain pumps have experienced alarms.
- Pump Mode: All of the available pumps may be used to maintain the Control Temperature. All the compressors in the system are Off. The control will typically run in this mode when load and temperatures permit.
- Mixed Mode: The pump in Circuit 1 is On and the compressor(s) in Circuit 2 is On. Some systems may not have Mixed Mode capability, depending on the manufacture date. Contact the factory to inquire about a software upgrade.

### EconoPhase Control

EconoPhase operation has three main controlled parameters:

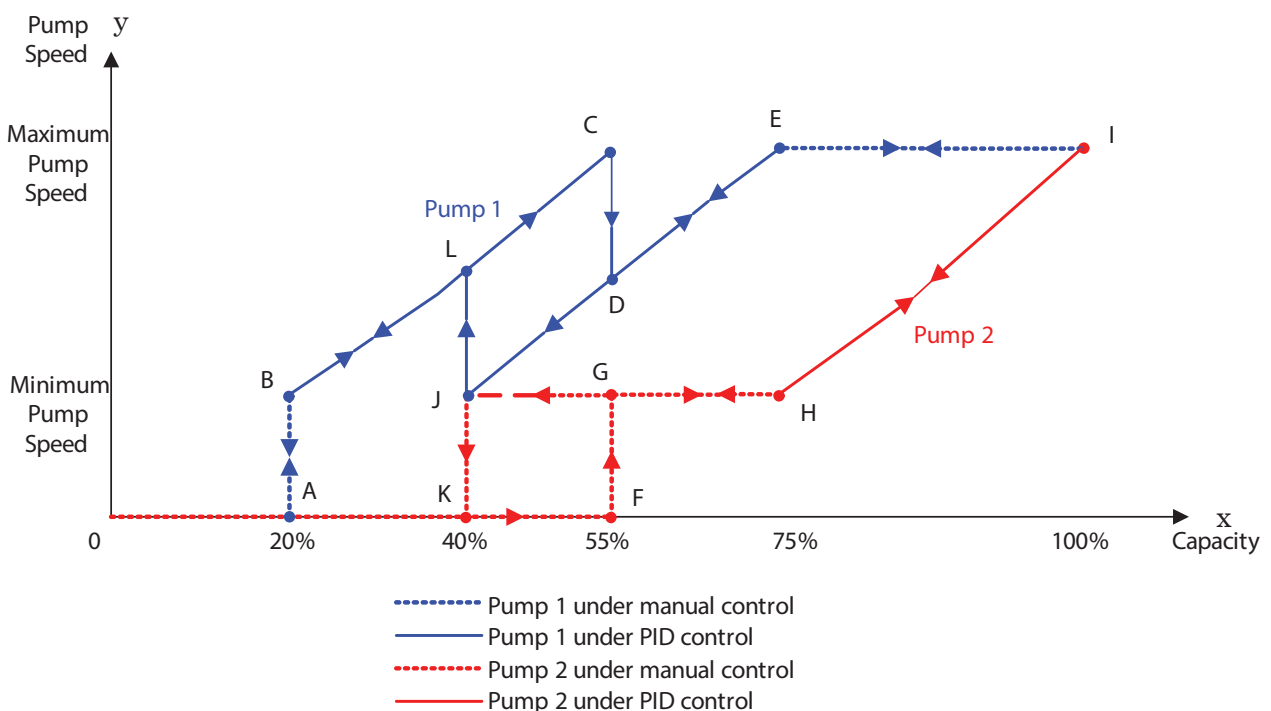
- return or supply air temperature control
- refrigerant temperature
- pump pressure differential (outlet pressure - inlet pressure)

### Room Temperature

When the system is in Pump Mode, the room temperature is controlled by modulating the pump speed with a variable frequency drive. The load requirement will determine if one pump or two are needed. Figure 8 shows the sequence of operation in terms of pump speed. Minimum speed is 45% and maximum speed is 100 %. See Table 2 for more detail on the events shown in Figure 8 and the conditions that trigger action.

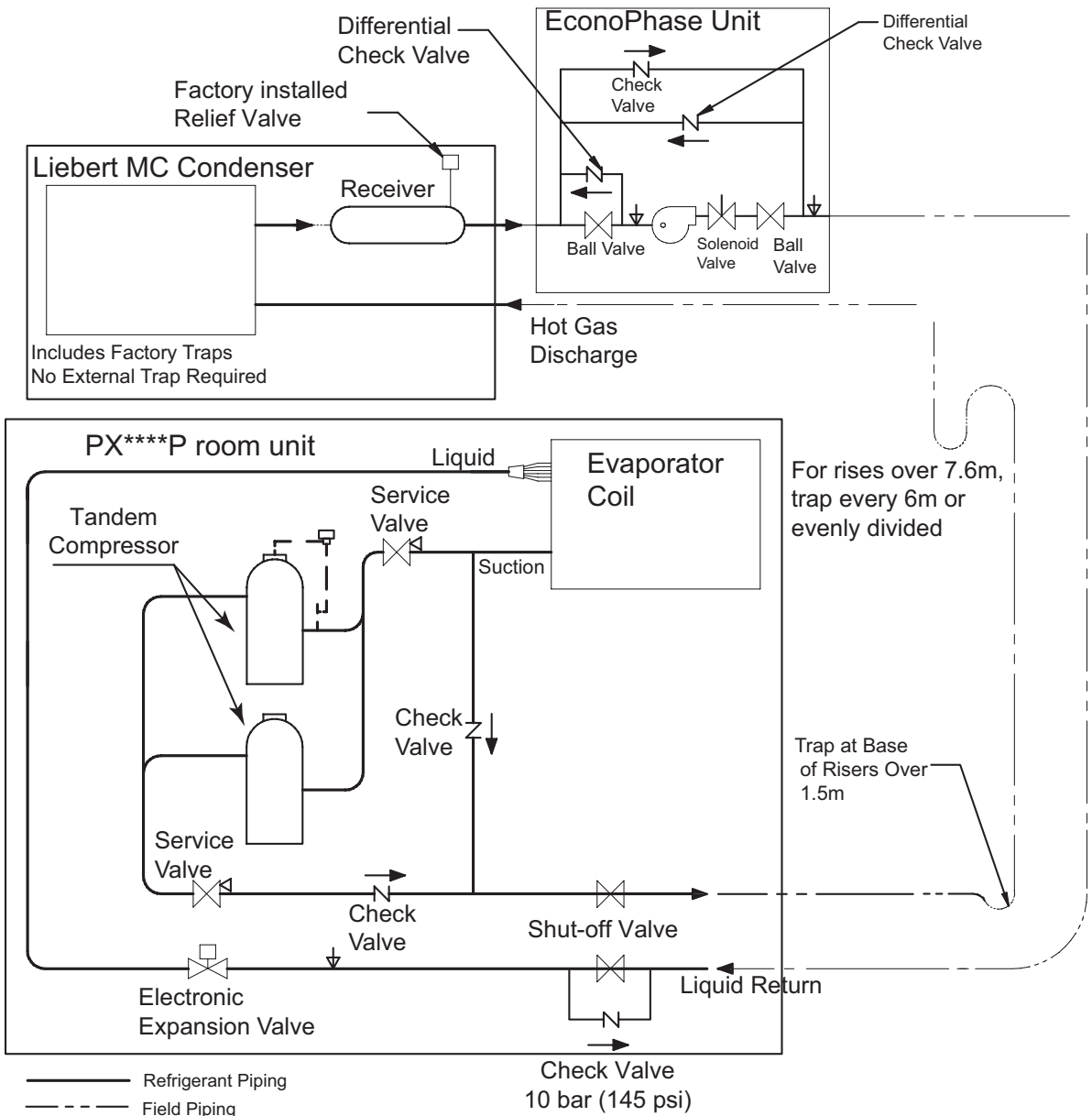
The pump startup routine calls for a start speed of 80%. The pump will run for up to 60 seconds at 80% with the EEV at 60 % while waiting on the pump pressure differential to reach at least 0.83 bar to indicate that flow has been established. If the pump establishes flow, the speed will change from 80% to the required control speed as shown on the curves in Figure 6.

Fig. 12.4 - Two-circuit pump control



# EconoPhase System

Fig. 12.5 - Piping schematic



1. Two refrigeration circuits provided. Single refrigeration circuit shown for clarity.
2. Schematic representation shown. Do not use for specific connection locations.
3. Vertical height of condenser above indoor unit shall be no greater than 18.0m.
4. All indoor and outdoor field refrigerant piping must be insulated, 12mm minimum thickness. All outdoor insulation must be UV- and ozone-resistant

# EconoPhase System

## Operating limits

The units are designed to operate within working ranges (see Tab. 1). These limits are referred to new machines or to those that have been correctly installed and serviced. The warranty clauses are no longer valid for any possible damage or malfunction that may occur during or due to operation outside the application values.

**Tab. 1 - Operating limits**

|   |                    |   |
|---|--------------------|---|
| Room air conditions                                     | Temperature:       | From 20°C to 35° C                            |
|   | Humidity ratio     | From 5.5 g/kg to 12 g/kg                      |
|   | Relative humidity  | From 20% to 60%                               |
| Room air conditions (units for Smart Aisle application) | Temperature:       | From 26°C to 38° C                            |
|   | Humidity ratio     | From 5.5 g/kg to 12 g/kg                      |
|   | Relative humidity  | From 20% to 60%                               |
| Storage conditions                                      | Temperature:       | from:- 20°C to: 50°C                          |
|   | Relative humidity: | Max. 90% RH, preventing surface condensation. |
| Power supply tolerances                                 |                    | V ± 10% Hz ± 2                                |

### Note:

The allowed thermal load shall not be lower than 20% of nominal air conditioner cooling capacity. Lower thermal load will drive to imprecise temperature and humidity control and frequent compressor(s) switch on/off.

|   |
|---|
| <b>Outdoor temperature: lower limit</b>   |
| Exceeding the winter low temperature limits could drive to issues at the microprocessor control, at the electric devices and at the fan operation. Normally with these low temperatures the compressor is stopped and the EconoPhase is active. In case of compressor running, exceeding these temperatures could stop the compressor(s) by Low Pressure transducer. Reset to normal operation can only be carried out manually through the unit control. |
| <b>down to - 35° C</b>  |
| Remote condenser Vertiv fan speed control (VARIEX) required. It is standard available on the MC Condenser EconoPhase version  |
| <b>Outdoor temperature: higher limit</b>  |
| This limit is determined by coupled condenser model. Exceeding this limit (or a lack of maintenance), the compressor(s) could stop by High Pressure switch. Reset to normal operation can only be carried out manually.   |
| <b>Approved Remote Air Condenser</b>  |
| To ensure safe and correct operation, best performance, and longest life the units must be connected only to remote condensers approved by Vertiv.<br>The warranty clauses are no longer valid if the unit is connected to an unapproved remote condenser.  |

| Relative position room unit vs. remote condenser         |                              |                               |
|--|------------------------------|-------------------------------|
| From unit to condenser, max distance                     | up to 60 m equivalent length | up to 100 m equivalent length |
| From unit to con- denser, max geodetic height (1)        | from 0 m to 18 m             | from 0 m to 18 m              |
| <b>Requirements</b>                                      |                              |                               |
| Pipe diameter  | see Tab. d                   | see Tab. d                    |
| Oil traps on vertical line of gas refrigerant            | every 6 m, max               | every 6 m, max                |
| Extra oil charge   | see Tab. 7                   | see Tab. 7                    |
| Remote condenser fan speed control (VARIEX) installation | mandatory                    | mandatory                     |
| Condenser  | design                       | oversized +20%                |
| Hot Gas Reheat   | not allowed                  | not allowed                   |
| Insulation external liquid pipe line                     | mandatory                    | mandatory                     |

(1) Remote condenser below room unit : not allowed.

# EconoPhase System

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## Liebert MC™ EconoPhase Version

The Liebert MC air-cooled microchannel condenser is a low-profile, direct-drive propeller fan-type air-cooled unit suitable for mounting outdoors. It provides heat rejection, matches the heat rejection capacity corresponding with the outdoor ambient temperature and with each corresponding compressor heat rejection requirements.

Constructed with an aluminum cabinet, galvanized steel frame microchannel coil and a liquid receiver with safety valve, the unit is quiet and corrosion resistant. The condenser is quickly and easily installed because all internal wiring is completed at the factory with only electrical connections and communications connections to be made at the job site.

The Liebert® EconoPhase pumped refrigerant system will always use the premium version condenser. In EconoPhase operation, the premium control board uses inputs from the indoor unit, condenser refrigerant temperatures and ambient temperatures to modulate the EC fan motor speed from 0 to 100% RPM, maintaining the refrigerant temperature setpoint. The control system provides temperature control for outdoor ambient as low as -35°C in pumped refrigerant Liebert® EconoPhase operation.

## Liebert® EconoPhase Pump Refrigerant Module

The Liebert® EconoPhase is an option for a Liebert® PDX EconoPhase Version air-cooled system. The Liebert® EconoPhase allows an air-cooled direct expansion system to switch from vapor compression operation to pumped refrigerant operation when the outdoor temperature is low enough to provide the required temperature difference between the inside air and the outside air.

**Fig. 12.6 - Liebert EconoPhase module**



## Standard Air-Cooled System vs. Liebert® PDX EconoPhase System

There are differences between the standard air-cooled system and a system designed with the Liebert® PDX EconoPhase. The user must be aware of these differences to achieve the best operation. This section summarizes the differences; more detailed explanations are found throughout this manual and the manual of Liebert EconoPhase Pump Refrigerant Module.

- **Liebert EconoPhase Operation** - Liebert® EconoPhase operation is possible when the outdoor temperature is low enough to provide the required temperature difference between the indoor air and the outside air. This mode turns the compressors Off and turns the Liebert® EconoPhase pumps On.
- **Refrigerant Pumping** - During Liebert® EconoPhase operation, the refrigerant is pumped around the air-cooled loop instead of going through the vapor compression cycle. System pressures will vary significantly depending on whether the system is operating in standard aircooled mode or in Liebert® EconoPhase operation.

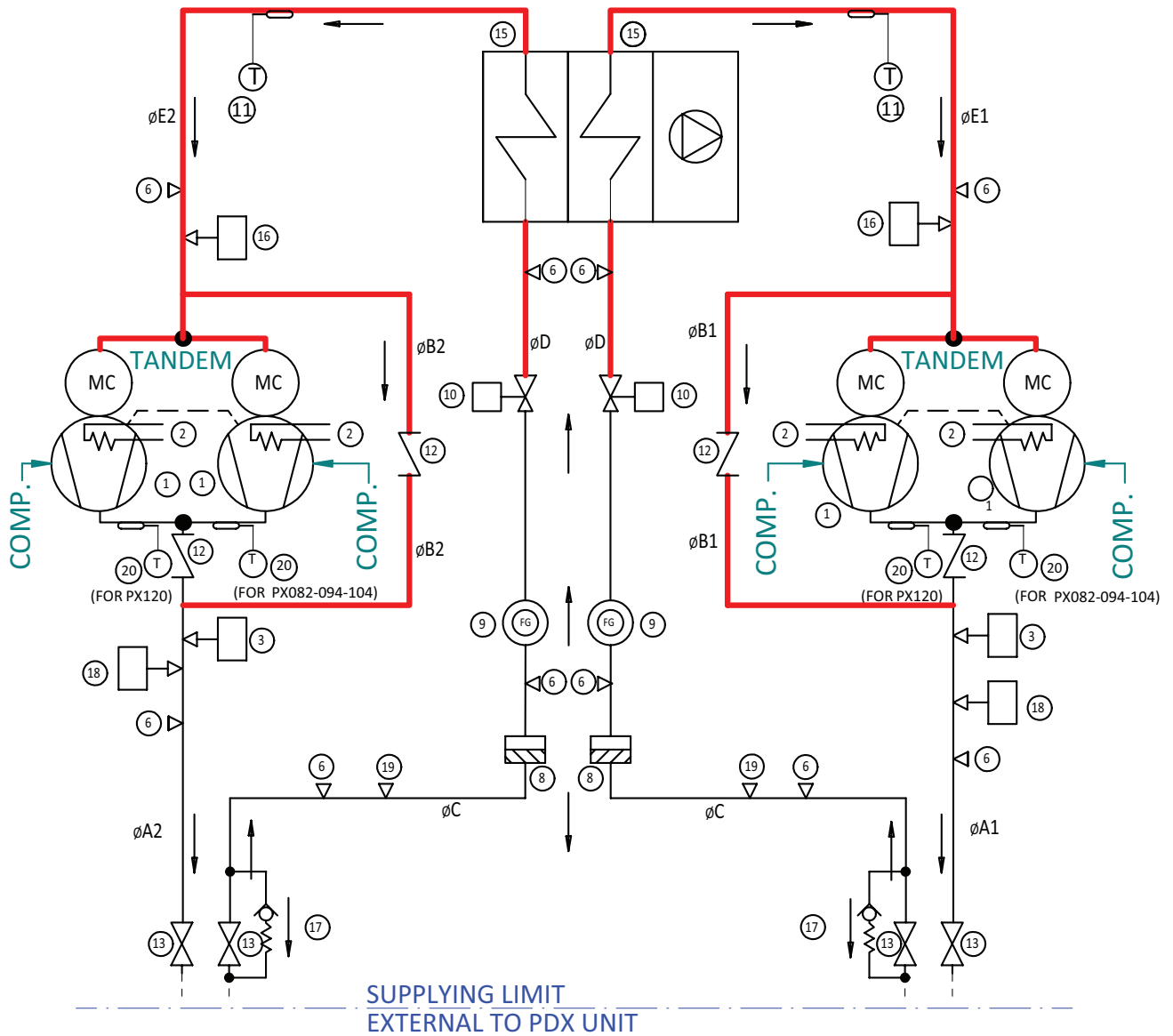
## EconoPhase System

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- **Energy Savings** - The coefficient of performance of the system increases significantly during the EconoPhase operation which results in significant energy savings for the user.
- **EEV** - The system uses an electronic expansion valve during both direct expansion and EconoPhase operation. The EEV results in energy savings and helps the pump maintain proper differential during EconoPhase operation.
- **Piping** - The condenser piping is larger than what is typically specified for Liebert® air-cooled Precision Cooling systems. The pipe sizing still allows oil return to the compressor and also allows for efficient operation in both modes of operation. All field piped lines must be insulated because the fluid temperatures can be well below the dew point during EconoPhase operation. All outdoor insulation must be UV rated and rated for outdoor use.
- **Unit/Module Communications** - A CANbus connection links the Liebert PDX and the air-cooled condenser to achieve the most efficient operation as well as the condenser and the Liebert® EconoPhase module.

# EconoPhase System

Fig. 12.7 - Refrigerant circuit EconoPhase version - Dual circuits - Tandem DIGITAL SCROLL compressors - EEV



| Nr. | DESCRIPTION                              |
|-----|--|
| 20  | NTC TEMPERATURE SENSOR FOR DIGITAL COMP. |
| 19  | ACCESS VALVE 1/4                         |
| 18  | HIGH PRESSURE TRANSDUCER                 |
| 17  | CHECK VALVE 10 BAR (145 psi)             |
| 16  | LOW PRESSURE TRANSDUCER EEV              |
| 15  | EVAPORATOR                               |
| 13  | SHUT-OFF VALVE                           |
| 12  | CHECK VALVE                              |
| 11  | TEMPERATURE SENSOR FOR EEV               |
| 10  | ELECTRONIC EXPANSION VALVE EEV           |
| 9   | SIGHT GLASS                              |
| 8   | FILTER DRYER                             |
| 6   | ACCESS VALVE 5/16                        |
| 3   | HIGH PRESSURE SWITCH                     |
| 2   | CRANKCASE HEATER                         |
| 1   | COMPRESSOR                               |

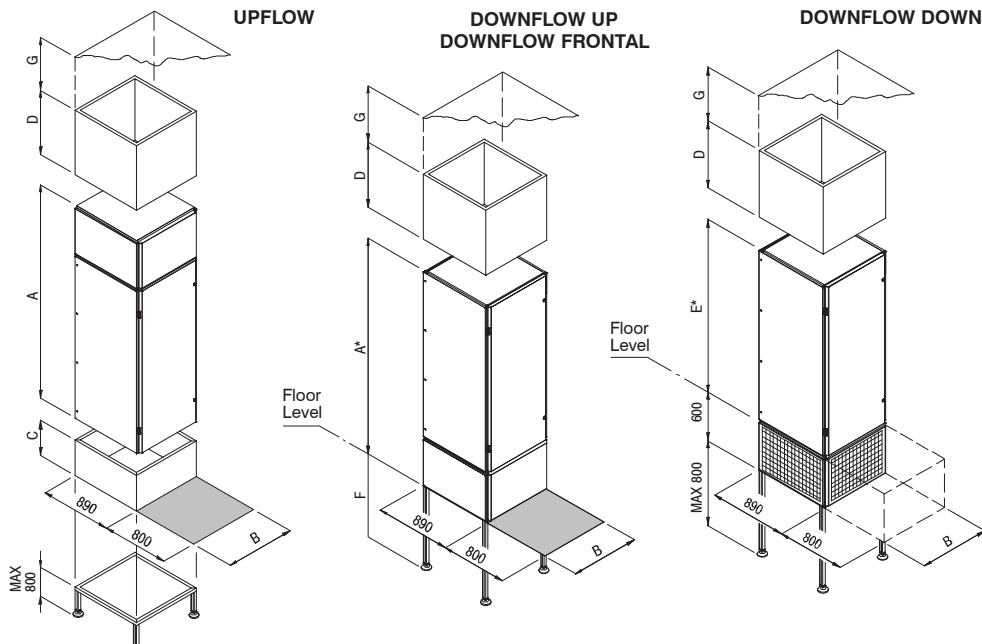
| Model  | ø A1 | ø A2 | ø B1 | ø B2 | ø C | ø D | ø E1 | ø E2 |
|--------|------|------|------|------|-----|-----|------|------|
| PX082A | 22   | 22   | 22   | 22   | 18  | 18  | 28   | 28   |
| PX094A | 22   | 22   | 22   | 22   | 18  | 22  | 28   | 28   |
| PX104A | 22   | 22   | 22   | 22   | 18  | 22  | 28   | 28   |
| PX120A | 22   | 28   | 22   | 28   | 18  | 22  | 28   | 35   |

# 13

## Dimensional Data / Connections

### Overall dimensions and service area

Fig. 13.a



Tab. 13a - Overall dimensions - Service area (referring to Fig. 13.a)

| Models | Unit   |  |                       | Options                          |                                    |                                      |                |                     |
|--------|--------|--|-----------------------|----------------------------------|------------------------------------|--------------------------------------|----------------|---------------------|
|        | B [mm] | Upflow<br>Downflow Up<br>Downflow Frontal<br>A* [mm] | Downflow Down E* [mm] | AVAILABLE PLENUM HEIGHTS: D [mm] |                                    |                                      |                | Base Modules C [mm] |
|        |        |  | Plenum                | Ple-num for silencing cartridges | Plenum for high efficiency filters | Plenum with frontal airflow (Upflow) | Air Economizer |                     |
| PX015  | 844    | 1970*  | -                     | 500 - 600 - 700 - 800 - 900      | 600 - 900                          | 600 - 900                            | 600            | 850                 |
| PX021  |        |  |                       |                                  |                                    |                                      |                |                     |
| PX025  |        |  |                       |                                  |                                    |                                      |                |                     |
| PX031  |        |  |                       |                                  |                                    |                                      |                |                     |
| PX033  |        |  |                       |                                  |                                    |                                      |                |                     |
| PX041  | 1200   | 1970*  | 1370*                 | 500 - 600 - 700 - 800 - 900      | 600 - 900                          | 600 - 900                            | 600            | 850                 |
| PX045  |        |  |                       |                                  |                                    |                                      |                |                     |
| PX047  |        |  |                       |                                  |                                    |                                      |                |                     |
| PX051  |        |  |                       |                                  |                                    |                                      |                |                     |
| PX057  |        |  |                       |                                  |                                    |                                      |                |                     |
| PX044  | 1750   | 1970*  | 1370*                 | 500 - 600 - 700 - 800 - 900      | 600 - 900                          | 600 - 900                            | 600            | 850                 |
| PX054  |        |  |                       |                                  |                                    |                                      |                |                     |
| PX062  |        |  |                       |                                  |                                    |                                      |                |                     |
| PX074  |        |  |                       |                                  |                                    |                                      |                |                     |
| PX068  |        |  |                       |                                  |                                    |                                      |                |                     |
| PX082  | 2550   | 1970*  | 1370*                 | 500 - 600 - 700 - 800 - 900      | 600 - 900                          | 600 - 900                            | 600            | 850                 |
| PX094  |        |  |                       |                                  |                                    |                                      |                |                     |
| PX104  |        |  |                       |                                  |                                    |                                      |                |                     |
| PX120  | 1200   | 1970*  | 1370*                 | 500 - 600 - 700 - 800 - 900      | 600 - 900                          | 600 - 900                            | 600            | 850                 |
| PX059  |        |  |                       |                                  |                                    |                                      |                |                     |
| PX092  |        |  |                       |                                  |                                    |                                      |                |                     |
| PX150  | 3350   | 1970*  | 1370*                 | 500 - 600 - 700 - 800 - 900      | 600 - 900                          | 600 - 900                            | 600            | 850                 |
| PX165  |        |  |                       |                                  |                                    |                                      |                |                     |

F (free space between unit bottom and basement): max. 800 mm (base frame/legs kit availability)  
 min. 600mm (to get declared performances)  
 min. 300mm (minimum working conditions)

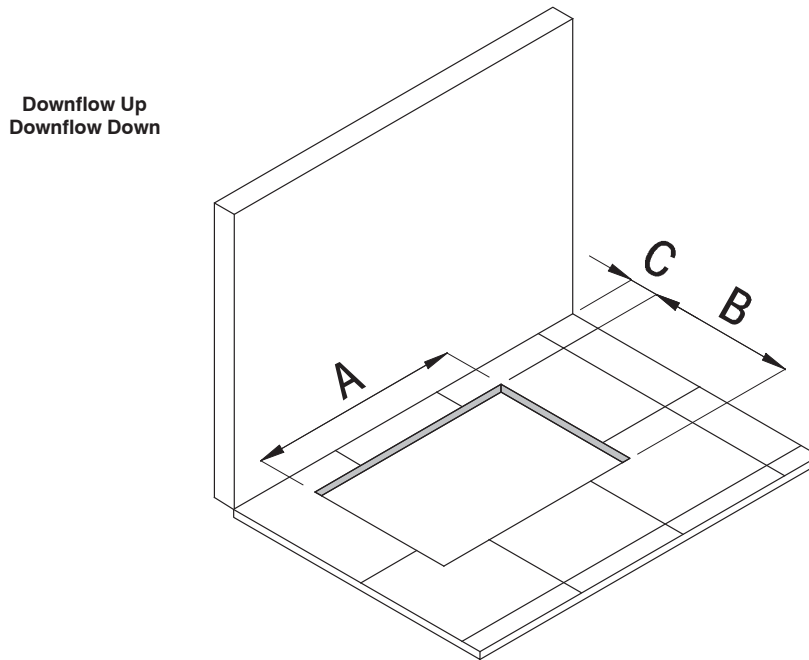
G (free space between ceiling and unit top or plenum top if installed): min. 600mm (to get declared performances)  
 min. 300mm (minimum working conditions)

\* In Downflow Up, Downflow Frontal, Downflow Down units with predisposition for damper, economizer and plenum installation the unit is shipped with a connecting flange 50 mm high fixed on the unit top, so the unit is 50 mm higher. If required, the flange can be removed by unscrewing the fixing screws (removing the side panel to access the screws head) and repositioned later (see Chap. 14).

# Dimensional Data / Connections

Hole in the floor for Downflow versions.

Fig. 13.b



Tab. 13b - Hole in the floor for Downflow units, dimensions in mm

| Configuration | Unit                            | PX015<br>PX021<br>PX025<br>PX031<br>PX033 | PX041<br>PX045<br>PX059 | PX047 PX051<br>PX057 PX044<br>PX054 PX062<br>PX074 PX092 | PX068<br>PX082 PX094<br>PX104 PX120 | PX150<br>PX165 |      |
|---------------|---------------------------------|---|-------------------------|--|-------------------------------------|----------------|------|
| Downflow Up   |                                 | A   | 740                     | 1100   | 1650                                | 2450           | 3250 |
|               |                                 | B   | 760                     | 760  | 760                                 | 760            | 760  |
|               |                                 | C*  | 70                      | 70   | 70                                  | 70             | 70   |
|               | With Base Frame **              | A   | 804                     | 1176   | 1726                                | 2526           | 3326 |
|               |                                 | B   | 830                     | 840  | 840                                 | 840            | 840  |
|               |                                 | C*  | 30                      | 30   | 30                                  | 30             | 30   |
|               | With Legs kit **                | A   |                         | 1156   | 1706                                | 2506           | 3306 |
|               |                                 | B   |                         | 820  | 820                                 | 820            | 820  |
|               |                                 | C*  |                         | 30   | 30                                  | 30             | 30   |
| Downflow Down |                                 | A   |                         | 1182   | 1732                                | 2532           | 3332 |
|               |                                 | B   |                         | 846  | 846                                 | 846            | 846  |
|               |                                 | C*  |                         | 20   | 20                                  | 20             | 20   |
|               | With floor tiles support kit ** | A   |                         | 1220   | 1770                                | 2570           | 3370 |
|               |                                 | B   |                         | 885  | 885                                 | 885            | 885  |
|               |                                 | C*  |                         | 50   | 50                                  | 50             | 50   |

\* Minimal distance of the working unit from the back wall. Caution: In order to assemble and/ or install accessories, a larger distance might be required. In that case, the unit can be moved in the working position after installation / assembly procedures.

\*\* Optional accessories - see details in Chap. 14



# Dimensional Data / Connections

## Units Weight

Tab. 13c - Units weight

| MODELS  | A [kg]    | W [kg]    | F [kg]      | D [kg]     | H [kg]      | Packaging (kg) |
|---|-----------|-----------|-------------|------------|-------------|----------------|
| Standard Height unit  |           |           |             |            |             |                |
| PX015   | 290       | 300       | 316         | 318        | 323         | 19             |
| PX021   | 300       | 310       | 328         | 328        | 333         | 19             |
| PX025   | 320       | 330       | 348         | 348        | 353         | 19             |
| PX031   | 340       | 352       | 368         | 368        | 373         | 19             |
| PX033   | 340       | 359       | -           | -          | -           | 19             |
| PX041   | 452       | 466       | 521         | 507        | 521         | 23             |
| PX045   | 456       | 470       |             |            |             | 23             |
| PX047   | 620 (635) | 635 (650) | 727 (742)   | 712 (727)  | 727 (742)   | 28             |
| PX051   | 621 (637) | 636 (652) | 728 (744)   | 713 (697)  | 728 (744)   | 28             |
| PX057   | 675       | 692       |             |            |             | 28             |
| PX044   | 638       | 657       | 747         | 725        | 744         | 28             |
| PX054   | 642       | 663       | 751         | 727        | 748         | 28             |
| PX062   | 680       | 703       | 790         | 764        | 787         | 28             |
| PX074   | 680       | 706       |             |            |             | 28             |
| PX068   | 887       | 910       | 1006        | 971        | 1001        | 42             |
| PX082   | 891 (931) | 920 (960) | 1010 (1050) | 975 (1015) | 1005 (1045) | 42             |
| PX094   | 899 (929) | 928 (958) | 1022 (1052) | 987 (1017) | 1017 (1047) | 42             |
| PX104   | 901 (931) | 930 (963) | 1024 (1057) | 989 (1022) | 1019 (1052) | 42             |
| PX120   | 954       | 989       |             |            |             | 42             |
| Extended Height unit [Coil Module] (1)                      |           |           |             |            |             |                |
| PX059   | 461       | 478       |             |            |             | 23             |
| PX092   | 576       | 605       |             |            |             | 28             |
| PX150   | 1080      |           |             |            |             | 58             |
| PX165   | 1080      |           |             |            |             | 58             |
| Extended Height unit [Fan Base Frame] (1)                   |           |           |             |            |             |                |
| BF121   |           |           | 91          |            |             | 26             |
| BF176   |           |           | 150         |            |             | 35             |
| BF336   |           |           | 325         |            |             | 78             |
| Extended Height unit [Fan Base Module / Fan Top Plenum] (1) |           |           |             |            |             |                |
| BM/ TP 121  |           |           | 132         |            |             | 26             |
| BM/ TP 176  |           |           | 200         |            |             | 35             |
| BM336   |           |           | 405         |            |             | 78             |

Note:

Data above refer to standard units without any option. Data in brackets refer to Digital Scroll Compressor Cooling System, when the data differs.  
 (1) For Extended Height total unit weight must be calculated summing the Coil Module weight and Fan Section weight.

# Dimensional Data / Connections

## Packing

The air conditioners are packed on a wooden pallet (1), with shockproof angle pieces from pressed cardboard (2, 3, 4, 5), panels in cardboard (6, 7) and flexible polythene film (8).

Base frames are packed on a wooden pallet (1), with a panel in cardboard (6) and a protective\ wooden structure (9).

## Special packing (options)

Special packing for sea transport, consisting of a wooden box or crate, can be supplied on request.

Fig. 13.c Packing of unit

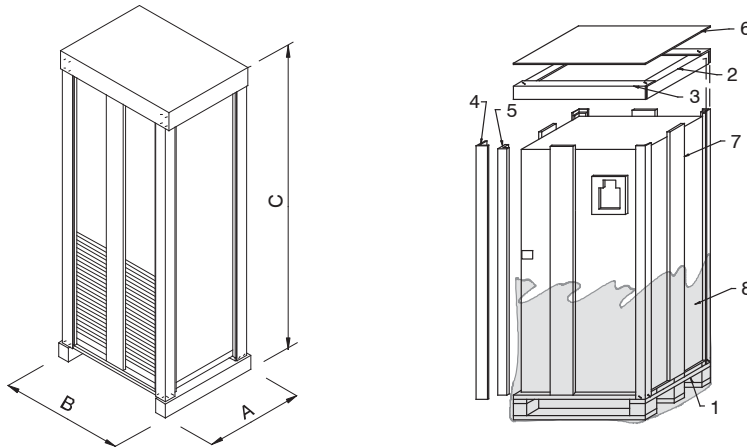
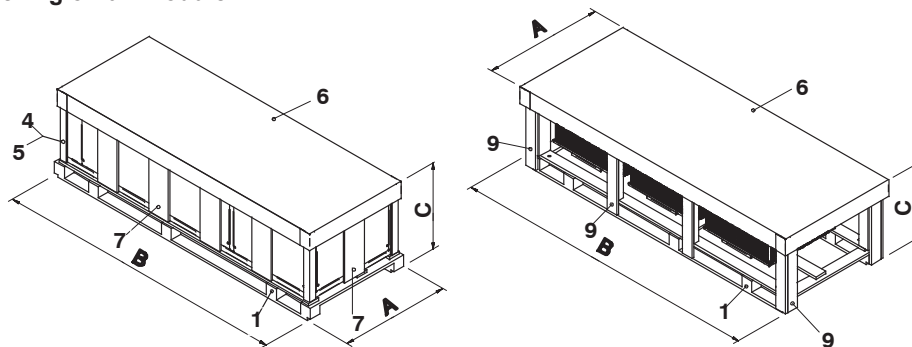


Fig. 13.d Packing of fan module



Tab. 13d - Packing dimensions

| Standard Height Unit                            | Extended Height Unit [Coil Module] | A [mm] | B [mm] | C [mm] |
|---|------------------------------------|--------|--------|--------|
| PX015 PX021 PX025<br>PX031 PX033                | -                                  | 960    | 924    | 2170   |
| PX041 PX045                                     | PX059                              | 960    | 1280   | 2170   |
| PX047 PX051 PX057<br>PX044 PX054 PX062<br>PX074 | PX092                              | 960    | 1830   | 2170   |
| PX068 PX082 PX094<br>PX104 PX120                | -                                  | 960    | 2630   | 2170   |
| -   | PX150 PX165                        | 960    | 3430   | 2170   |
|   | Extended Height Unit [Fan Module]  | A [mm] | B[mm]  | C[mm]  |
|   | BM/ TP/BF121                       | 960    | 1280   | 800    |
|   | BM/ TP/BF176                       | 960    | 1830   | 800    |
|   | BM/BF336                           | 960    | 3430   | 800    |

# Dimensional Data / Connections

## Refrigerant, hydraulic and electrical connections – Downflow version

Tab. 13e - Refrigerant , hydraulic and electrical connections

| Models<br>Unit Connections |   | PX015 - 021 - 025   |                |                |             |                | PX031       |                |                |             |   | PX033          |                |
|----------------------------|---|---|----------------|----------------|-------------|----------------|-------------|----------------|----------------|-------------|---|----------------|----------------|
|                            |   | A   | W              | F              | D           | H              | A           | W              | F              | D           | H | A              | W              |
| IL1                        | Refrigerant liquid line inlet 1*          | O.D. Ø12 mm   |                |                | O.D. Ø12 mm |                | O.D. Ø16 mm |                |                | O.D. Ø16 mm |   | O.D. Ø16 mm    |                |
| IL2                        | Refrigerant liquid line inlet 2*          |   |                |                |             |                |             |                |                |             |   |                |                |
| OG1                        | Refrigerant gas line outlet 1*            | O.D. Ø16 mm   |                |                | O.D. Ø16 mm |                | O.D. Ø22 mm |                |                | O.D. Ø22 mm |   | O.D. Ø22 mm    |                |
| OG2                        | Refrigerant gas line outlet 2*            |   |                |                |             |                |             |                |                |             |   |                |                |
| IWC1                       | Water to condenser 1 inlet                |   | Rp 1 ¼ ISO 7/1 |                |             | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |                |             |   | Rp 1 ¼ ISO 7/1 | Rp 1 ¼ ISO 7/1 |
| IWC2                       | Water to condenser 2 inlet                |   |                |                |             |                |             |                |                |             |   |                |                |
| OWC1                       | Water to condenser1 outlet                |   | Rp 1 ¼ ISO 7/1 |                |             | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |                |             |   | Rp 1 ¼ ISO 7/1 | Rp 1 ¼ ISO 7/1 |
| OWC2                       | Water to condenser2 outlet                |   |                |                |             |                |             |                |                |             |   |                |                |
| IHW                        | Hot water inlet                           | OD 22 mm  |                |                |             |                |             |                |                |             |   |                |                |
| OHW                        | Hot water outlet                          | OD 22 mm  |                |                |             |                |             |                |                |             |   |                |                |
| IFC                        | Water inlet (Freecooling and dual fluid)  |   |                | Rp 1 ¼ ISO 7/1 |             |                |             |                | Rp 1 ¼ ISO 7/1 |             |   |                |                |
| OFC                        | Water outlet (Freecooling and dual fluid) |   |                | Rp 1 ¼ ISO 7/1 |             |                |             |                | Rp 1 ¼ ISO 7/1 |             |   |                |                |
| CD                         | Condensate drain                          | I.D. Ø20 [mm]   |                |                |             |                |             |                |                |             |   |                |                |
| HF                         | Humidifier feed                           | R ½ - ISO 7/1 (Electrode Humidifier); O.D. 6 [mm] (Infrared Humidifier)   |                |                |             |                |             |                |                |             |   |                |                |
| HD                         | Humidifier drain                          | I.D. Ø32 [mm] (Electrode Humidifier); I.D. Ø22 [mm] (Infrared Humidifier) |                |                |             |                |             |                |                |             |   |                |                |
| EC                         | Electrical power supply                   | Ø 48 [mm]   |                |                |             |                |             |                |                |             |   |                |                |
| EC aux                     | Low voltage cables                        | Ø 40 - Ø 36 [mm]  |                |                |             |                |             |                |                |             |   |                |                |

# Dimensional Data / Connections

| Model<br>Unit Connection |   | PX041                                |                |                |             |                | PX045       |                | PX059       |                |
|--------------------------|---|--------------------------------------|----------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|
|                          |   | A                                    | W              | F              | D           | H              | A           | W              | A           | W              |
| IL1                      | Refrigerant liquid line inlet 1*          | O.D. Ø18 mm                          |                |                | O.D. Ø18 mm |                | O.D. Ø18 mm |                | O.D. Ø18 mm |                |
| IL2                      | Refrigerant liquid line inlet 2*          |                                      |                |                |             |                |             |                |             |                |
| OG1                      | Refrigerant gas line outlet 1*            | O.D. Ø22 mm                          |                |                | O.D. Ø22 mm |                | O.D. Ø22 mm |                | O.D. Ø22 mm |                |
| OG2                      | Refrigerant gas line outlet 2*            |                                      |                |                |             |                |             |                |             |                |
| IWC1                     | Water to condenser 1 inlet                |                                      | Rp 1 ¼ ISO 7/1 |                |             | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |
| IWC2                     | Water to condenser 2 inlet                |                                      |                |                |             |                |             |                |             |                |
| OWC1                     | Water to condenser 1 outlet               |                                      | Rp 1 ¼ ISO 7/1 |                |             | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |
| OWC2                     | Water to condenser 2 outlet               |                                      |                |                |             |                |             |                |             |                |
| IHW                      | Hot water inlet                           | OD 22 mm                             |                |                |             |                |             |                |             |                |
| OHW                      | Hot water outlet                          | OD 22 mm                             |                |                |             |                |             |                |             |                |
| IFC                      | Water inlet (Freecooling and dual fluid)  |                                      |                | Rp 1 ¼ ISO 7/1 |             |                |             |                |             |                |
| OFC                      | Water outlet (Freecooling and dual fluid) |                                      |                | Rp 1 ¼ ISO 7/1 |             |                |             |                |             |                |
| CD                       | Condensate drain                          | I.D. Ø 20 [mm]                       |                |                |             |                |             |                |             |                |
| HF1                      | Humidifier feed                           | R ½ - ISO 7/1 (Electrode Humidifier) |                |                |             |                |             |                |             |                |
| HF2                      | Humidifier feed                           | O.D. 6 [mm] (Infrared Humidifier)    |                |                |             |                |             |                |             |                |
| HD1                      | Humidifier drain                          | I.D. Ø32 [mm] (Electrode Humidifier) |                |                |             |                |             |                |             |                |
| HD2                      | Humidifier drain                          | I.D. Ø22 [mm] (Infrared Humidifier)  |                |                |             |                |             |                |             |                |
| EC                       | Electrical power supply                   | Ø 48 [mm]                            |                |                |             |                |             |                |             |                |
| EC aux                   | Low voltage cables                        | Ø 40 - Ø 36 [mm]                     |                |                |             |                |             |                |             |                |

\* Connection size only. The connecting pipe diameter depends on unit model, see Tab.d in par. 5.1.2 (User Manual)

\*\* VICTAULIC® Connection.

\*\*\* Optional. Threaded union on request

## Dimensional Data / Connections

| Model<br>Unit Connection |   | PX047   |                |               |             |                | PX051       |                |               |             |                | PX057       |                |
|--------------------------|---|---|----------------|---------------|-------------|----------------|-------------|----------------|---------------|-------------|----------------|-------------|----------------|
|                          |   | A   | W              | F             | D           | H              | A           | W              | F             | D           | H              | A           | W              |
| IL1                      | Refrigerant liquid line inlet 1*          | O.D. Ø18 mm   |                |               | O.D. Ø18 mm |                | O.D. Ø18 mm |                |               | O.D. Ø18 mm |                | O.D. Ø18 mm |                |
| IL2                      | Refrigerant liquid line inlet 2*          |   |                |               |             |                |             |                |               |             |                |             |                |
| OG1                      | Refrigerant gas line outlet 1*            | O.D. Ø22 mm   |                |               | O.D. Ø22 mm |                | O.D. Ø22 mm |                |               | O.D. Ø22 mm |                | O.D. Ø22 mm |                |
| OG2                      | Refrigerant gas line outlet 2*            |   |                |               |             |                |             |                |               |             |                |             |                |
| IWC1                     | Water to condenser 1 inlet                |   | Rp 1 ¼ ISO 7/1 |               |             | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |               |             | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |
| IWC2                     | Water to condenser 2 inlet                |   |                |               |             |                |             |                |               |             |                |             |                |
| OWC1                     | Water to condenser 1 outlet               |   | Rp 1 ¼ ISO 7/1 |               |             | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |               |             | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |
| OWC2                     | Water to condenser 2 outlet               |   |                |               |             |                |             |                |               |             |                |             |                |
| IHW                      | Hot water inlet                           | OD 22 mm  |                |               |             |                |             |                |               |             |                |             |                |
| OHW                      | Hot water outlet                          | OD 22 mm  |                |               |             |                |             |                |               |             |                |             |                |
| IFC                      | Water inlet (Freecooling and dual fluid)  |   |                | Rp 1½ ISO 7/1 |             |                |             |                | Rp 1½ ISO 7/1 |             |                |             |                |
| OFC                      | Water outlet (Freecooling and dual fluid) |   |                | Rp 1½ ISO 7/1 |             |                |             |                | Rp 1½ ISO 7/1 |             |                |             |                |
| CD                       | Condensate drain                          | I.D. Ø 20 [mm]  |                |               |             |                |             |                |               |             |                |             |                |
| HF                       | Humidifier feed                           | R ½ - ISO 7/1 (Electrode Humidifier), O.D. 6 [mm] (Infrared Humidifier)   |                |               |             |                |             |                |               |             |                |             |                |
| HD                       | Humidifier drain                          | I.D. Ø32 [mm] (Electrode Humidifier), I.D. Ø22 [mm] (Infrared Humidifier) |                |               |             |                |             |                |               |             |                |             |                |
| EC                       | Electrical power supply                   | Ø 48 [mm]   |                |               |             |                |             |                |               |             |                |             |                |
| EC aux                   | Low voltage cables                        | Ø 40 - Ø 36 [mm]  |                |               |             |                |             |                |               |             |                |             |                |

# Dimensional Data / Connections

| Model<br>Unit Connection |   | PX044   |                |                |                |   | PX054          |   |                |                |   | PX062          |   |                |                |   |
|--------------------------|---|---|----------------|----------------|----------------|---|----------------|---|----------------|----------------|---|----------------|---|----------------|----------------|---|
|                          |   | A   | W              | F              | D              | H | A              | W | F              | D              | H | A              | W | F              | D              | H |
| IL1                      | Refrigerant liquid line inlet 1*            | O.D. Ø18 mm   |                |                | O.D. Ø18 mm    |   | O.D. Ø18 mm    |   |                | O.D. Ø18 mm    |   | O.D. Ø18 mm    |   |                | O.D. Ø18 mm    |   |
| IL2                      | Refrigerant liquid line inlet 2*            | O.D. Ø18 mm   |                |                | O.D. Ø18 mm    |   | O.D. Ø18 mm    |   |                | O.D. Ø18 mm    |   | O.D. Ø18 mm    |   |                | O.D. Ø18 mm    |   |
| OG1                      | Refrigerant gas line outlet 1*              | O.D. Ø18 mm   |                |                | O.D. Ø18 mm    |   | O.D. Ø18 mm    |   |                | O.D. Ø18 mm    |   | O.D. Ø18 mm    |   |                | O.D. Ø18 mm    |   |
| OG2                      | Refrigerant gas line outlet 2*              | O.D. Ø18 mm   |                |                | O.D. Ø18 mm    |   | O.D. Ø18 mm    |   |                | O.D. Ø18 mm    |   | O.D. Ø18 mm    |   |                | O.D. Ø18 mm    |   |
| IWC1                     | Water to condenser 1 inlet                  |   | Rp 1 ¼ ISO 7/1 |                | Rp 1 ¼ ISO 7/1 |   | Rp 1 ¼ ISO 7/1 |   |                | Rp 1 ¼ ISO 7/1 |   | Rp 1 ¼ ISO 7/1 |   |                | Rp 1 ¼ ISO 7/1 |   |
| IWC2                     | Water to condenser 2 inlet                  |   | Rp 1 ¼ ISO 7/1 |                | Rp 1 ¼ ISO 7/1 |   | Rp 1 ¼ ISO 7/1 |   |                | Rp 1 ¼ ISO 7/1 |   | Rp 1 ¼ ISO 7/1 |   |                | Rp 1 ¼ ISO 7/1 |   |
| OWC1                     | Water to condenser 1 outlet                 |   | Rp 1 ¼ ISO 7/1 |                | Rp 1 ¼ ISO 7/1 |   | Rp 1 ¼ ISO 7/1 |   |                | Rp 1 ¼ ISO 7/1 |   | Rp 1 ¼ ISO 7/1 |   |                | Rp 1 ¼ ISO 7/1 |   |
| OWC2                     | Water to condenser 2 outlet                 |   | Rp 1 ¼ ISO 7/1 |                | Rp 1 ¼ ISO 7/1 |   | Rp 1 ¼ ISO 7/1 |   |                | Rp 1 ¼ ISO 7/1 |   | Rp 1 ¼ ISO 7/1 |   |                | Rp 1 ¼ ISO 7/1 |   |
| IHW                      | Hot water inlet                             | OD 22 mm  |                |                |                |   |                |   |                |                |   |                |   |                |                |   |
| OHW                      | Hot water outlet                            | OD 22 mm  |                |                |                |   |                |   |                |                |   |                |   |                |                |   |
| IFC                      | Water inlet (Freecooling and dual fluid)    |   |                | Rp 1 ½ ISO 7/1 |                |   |                |   | Rp 1 ½ ISO 7/1 |                |   |                |   | Rp 1 ½ ISO 7/1 |                |   |
| OFC                      | Water outlet (Free- cooling and dual fluid) |   |                | Rp 1 ½ ISO 7/1 |                |   |                |   | Rp 1 ½ ISO 7/1 |                |   |                |   | Rp 1 ½ ISO 7/1 |                |   |
| CD                       | Condensate drain                            | I.D. Ø 20 [mm]  |                |                |                |   |                |   |                |                |   |                |   |                |                |   |
| HF                       | Humidifier feed                             | R ½ - ISO 7/1 (Electrode Humidifier), O.D. 6 [mm] (Infrared Humidifier)   |                |                |                |   |                |   |                |                |   |                |   |                |                |   |
| HD                       | Humidifier drain                            | I.D. Ø32 [mm] (Electrode Humidifier), I.D. Ø22 [mm] (Infrared Humidifier) |                |                |                |   |                |   |                |                |   |                |   |                |                |   |
| EC                       | Electrical power supply                     | Ø 48 [mm]   |                |                |                |   |                |   |                |                |   |                |   |                |                |   |
| EC aux                   | Low voltage cables                          | Ø 40 - Ø 36 [mm]  |                |                |                |   |                |   |                |                |   |                |   |                |                |   |

\* Connection size only. The connecting pipe diameter depends on unit model, see Tab.d in par. 5.1.2 (User Manual)

\*\* VICTAULIC® Connection.

\*\*\* Optional. Threaded union on request

# Dimensional Data / Connections

| Model<br>Unit Connection |   | PX074   |                | PX092       |                | PX068       |                |   |   |                                  | PX082          |             |                |   |                                  |                |
|--------------------------|---|---|----------------|-------------|----------------|-------------|----------------|---|---|----------------------------------|----------------|-------------|----------------|---|----------------------------------|----------------|
|                          |   | A   | W              | A           | W              | A           | W              | F | D | H                                | A              | W           | F              | D | H                                |                |
| IL1                      | Refrigerant liquid line inlet 1*          | O.D. Ø18 mm   |                | O.D. Ø18 mm |                | O.D. Ø18 mm |                |   |   | O.D. Ø18 mm                      |                | O.D. Ø18 mm |                |   | O.D. Ø18 mm                      |                |
| IL2                      | Refrigerant liquid line inlet 2*          | O.D. Ø18 mm   |                | O.D. Ø18 mm |                | O.D. Ø18 mm |                |   |   | O.D. Ø18 mm                      |                | O.D. Ø18 mm |                |   | O.D. Ø18 mm                      |                |
| OG1                      | Refrigerant gas line outlet 1*            | O.D. Ø22 mm   |                | O.D. Ø22 mm |                | O.D. Ø18 mm |                |   |   | O.D. Ø18 mm                      |                | O.D. Ø22 mm |                |   | O.D. Ø22 mm                      |                |
| OG2                      | Refrigerant gas line outlet 2*            | O.D. Ø22 mm   |                | O.D. Ø22 mm |                | O.D. Ø18 mm |                |   |   | O.D. Ø18 mm                      |                | O.D. Ø22 mm |                |   | O.D. Ø22 mm                      |                |
| IWC1                     | Water to condenser 1 inlet                |   | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |   |   |                                  | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |   |                                  | Rp 1 ¼ ISO 7/1 |
| IWC2                     | Water to condenser 2 inlet                |   | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |   |   |                                  | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |   |                                  | Rp 1 ¼ ISO 7/1 |
| OWC1                     | Water to condenser 1 outlet               |   | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |   |   |                                  | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |   |                                  | Rp 1 ¼ ISO 7/1 |
| OWC2                     | Water to condenser 2 outlet               |   | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |   |   |                                  | Rp 1 ¼ ISO 7/1 |             | Rp 1 ¼ ISO 7/1 |   |                                  | Rp 1 ¼ ISO 7/1 |
| IHW                      | Hot water inlet                           | OD 22 mm  |                |             |                |             |                |   |   |                                  |                |             |                |   |                                  |                |
| OHW                      | Hot water outlet                          | OD 22 mm  |                |             |                |             |                |   |   |                                  |                |             |                |   |                                  |                |
| IFC                      | Water inlet (Freecooling and dual fluid)  |   |                |             |                |             |                |   |   | O.D. 54 mm**<br>R 2 - ISO 7/1*** |                |             |                |   | O.D. 54 mm**<br>R 2 - ISO 7/1*** |                |
| OFC                      | Water outlet (Freecooling and dual fluid) |   |                |             |                |             |                |   |   | O.D. 54 mm**<br>R 2 - ISO 7/1*** |                |             |                |   | O.D. 54 mm**<br>R 2 - ISO 7/1*** |                |
| CD                       | Condensate drain                          | I.D. Ø 20 [mm]  |                |             |                |             |                |   |   |                                  |                |             |                |   |                                  |                |
| HF                       | Humidifier feed                           | R ½ - ISO 7/1 (Electrode Humidifier), O.D. 6 [mm] (Infrared Humidifier)   |                |             |                |             |                |   |   |                                  |                |             |                |   |                                  |                |
| HD                       | Humidifier drain                          | I.D. Ø32 [mm] (Electrode Humidifier), I.D. Ø22 [mm] (Infrared Humidifier) |                |             |                |             |                |   |   |                                  |                |             |                |   |                                  |                |
| EC                       | Electrical power supply                   | Ø 48 [mm]   |                |             |                |             |                |   |   |                                  |                |             |                |   |                                  |                |
| EC aux                   | Low voltage cables                        | Ø 40 - Ø 36 [mm]  |                |             |                |             |                |   |   |                                  |                |             |                |   |                                  |                |

# Dimensional Data / Connections

| Model<br>Unit Connection |   | PX094   |               |                               |               |   | PX104         |   |                               |               |   | PX120         |   | PX150-<br>165 |
|--------------------------|---|---|---------------|-------------------------------|---------------|---|---------------|---|-------------------------------|---------------|---|---------------|---|---------------|
|                          |   | A   | W             | F                             | D             | H | A             | W | F                             | D             | H | A             | W | A             |
| IL1                      | Refrigerant liquid line inlet 1*          | O.D. Ø18 mm   |               |                               | O.D. Ø18 mm   |   | O.D. Ø18 mm   |   |                               | O.D. Ø18 mm   |   | O.D. Ø18 mm   |   | O.D. Ø18 mm   |
| IL2                      | Refrigerant liquid line inlet 2*          | O.D. Ø18 mm   |               |                               | O.D. Ø18 mm   |   | O.D. Ø18 mm   |   |                               | O.D. Ø18 mm   |   | O.D. Ø18 mm   |   | O.D. Ø18 mm   |
| OG1                      | Refrigerant gas line outlet 1*            | O.D. Ø22 mm   |               |                               | O.D. Ø22 mm   |   | O.D. Ø22 mm   |   |                               | O.D. Ø22 mm   |   | O.D. Ø22 mm   |   | O.D. Ø28 mm   |
| OG2                      | Refrigerant gas line outlet 2*            | O.D. Ø22 mm   |               |                               | O.D. Ø22 mm   |   | O.D. Ø22 mm   |   |                               | O.D. Ø22 mm   |   | O.D. Ø28 mm   |   | O.D. Ø28 mm   |
| IWC1                     | Water to condenser 1 inlet                |   | Rp 1¼ ISO 7/1 |                               | Rp 1¼ ISO 7/1 |   | Rp 1¼ ISO 7/1 |   |                               | Rp 1¼ ISO 7/1 |   | Rp 1¼ ISO 7/1 |   | Rp 1¼ ISO 7/1 |
| IWC2                     | Water to condenser 2 inlet                |   | Rp 1¼ ISO 7/1 |                               | Rp 1¼ ISO 7/1 |   | Rp 1¼ ISO 7/1 |   |                               | Rp 1¼ ISO 7/1 |   | Rp 1¼ ISO 7/1 |   | Rp 1¼ ISO 7/1 |
| OWC1                     | Water to condenser 1 outlet               |   | Rp 1¼ ISO 7/1 |                               | Rp 1¼ ISO 7/1 |   | Rp 1¼ ISO 7/1 |   |                               | Rp 1¼ ISO 7/1 |   | Rp 1¼ ISO 7/1 |   | Rp 1¼ ISO 7/1 |
| OWC2                     | Water to condenser 2 outlet               |   | Rp 1¼ ISO 7/1 |                               | Rp 1¼ ISO 7/1 |   | Rp 1¼ ISO 7/1 |   |                               | Rp 1¼ ISO 7/1 |   | Rp 1¼ ISO 7/1 |   | Rp 1¼ ISO 7/1 |
| IHW                      | Hot water inlet                           | OD 22 mm  |               |                               |               |   |               |   |                               |               |   |               |   |               |
| OHW                      | Hot water outlet                          | OD 22 mm  |               |                               |               |   |               |   |                               |               |   |               |   |               |
| IFC                      | Water inlet (Freecooling and dual fluid)  |   |               | O.D. 54 mm** R 2 - ISO 7/1*** |               |   |               |   | O.D. 54 mm** R 2 - ISO 7/1*** |               |   |               |   |               |
| OFC                      | Water outlet (Freecooling and dual fluid) |   |               | O.D. 54 mm** R 2 - ISO 7/1*** |               |   |               |   | O.D. 54 mm** R 2 - ISO 7/1*** |               |   |               |   |               |
| CD                       | Condensate drain                          | I.D. Ø 20 [mm]  |               |                               |               |   |               |   |                               |               |   |               |   |               |
| HF                       | Humidifier feed                           | R ½ - ISO 7/1 (Electrode Humidifier), O.D. 6 [mm] (Infrared Humidifier)   |               |                               |               |   |               |   |                               |               |   |               |   |               |
| HD                       | Humidifier drain                          | I.D. Ø32 [mm] (Electrode Humidifier), I.D. Ø22 [mm] (Infrared Humidifier) |               |                               |               |   |               |   |                               |               |   |               |   |               |
| EC                       | Electrical power supply                   | Ø 48 [mm]   |               |                               |               |   |               |   |                               |               |   |               |   |               |
| EC aux                   | Low voltage cables                        | Ø 40 - Ø 36 [mm]  |               |                               |               |   |               |   |                               |               |   |               |   |               |

\* Connection size only. The connecting pipe diameter depends on unit model, see Tab.d in par. 5.1.2 (User Manual)

\*\* VICTAULIC® Connection.

\*\*\* Optional. Threaded union on request



# Dimensional Data / Connections

Fig. 13.e Refrigerant, water and electrical connections PX015 - 021 - 025 - 031 - 033 A-W Downflow, top view

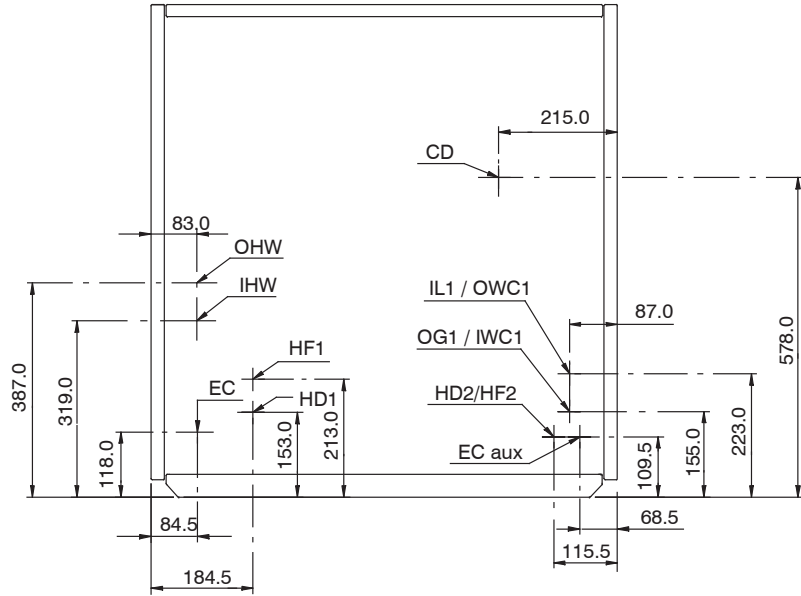
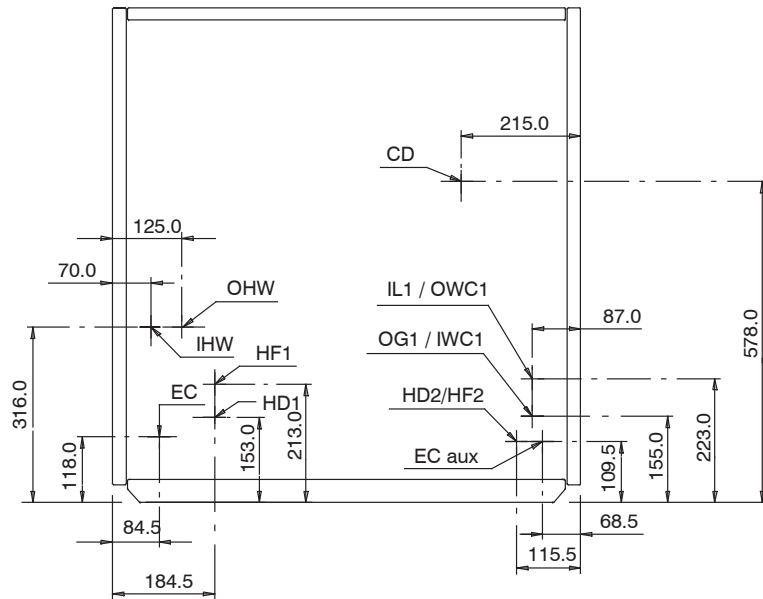


Fig. 13.f Refrigerant, water and electrical connections PX015 - 021 - 025 - 031 - 033 A-W Upflow, top view



# Dimensional Data / Connections

Fig. 13.g Refrigerant, water and electrical connections PX015 - 021 - 025 - 031 F - D - H Downflow, top view

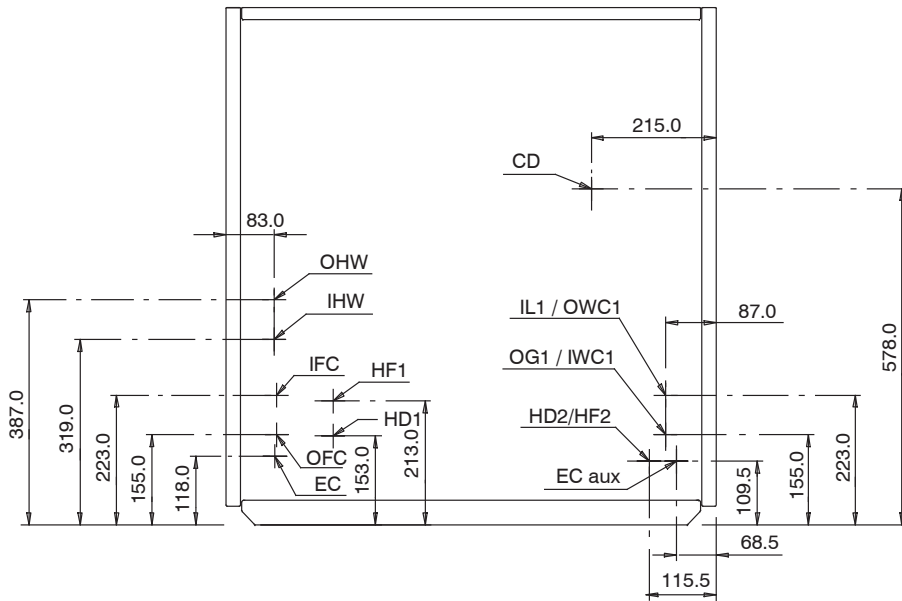
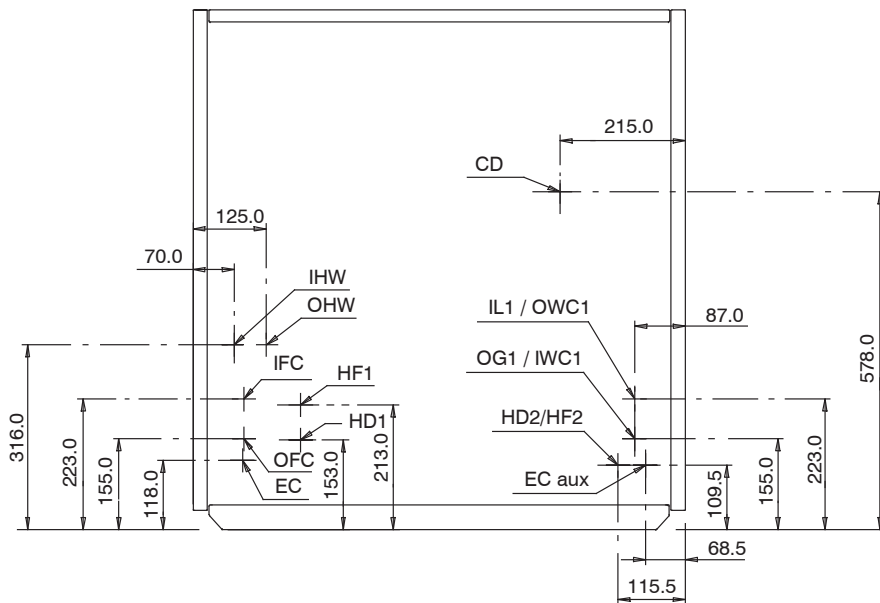


Fig. 13.h Refrigerant, water and electrical connections PX015 - 021 - 025 - 031 F - D - H Upflow, top view



# Dimensional Data / Connections

Fig. 13.i Refrigerant, water and electrical connections PX041-045-059 A-W, top view

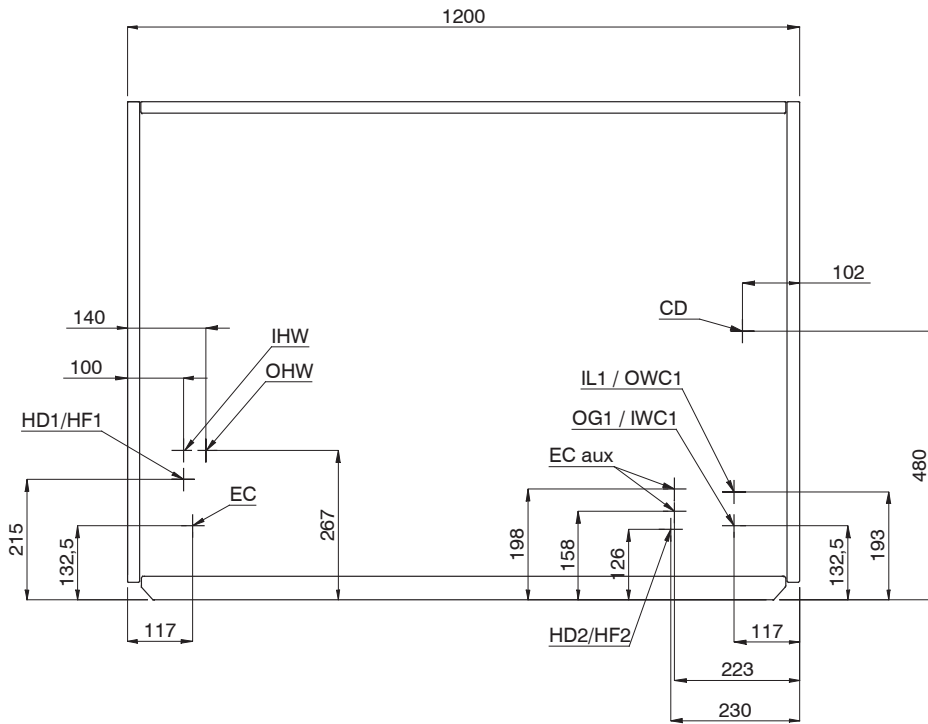
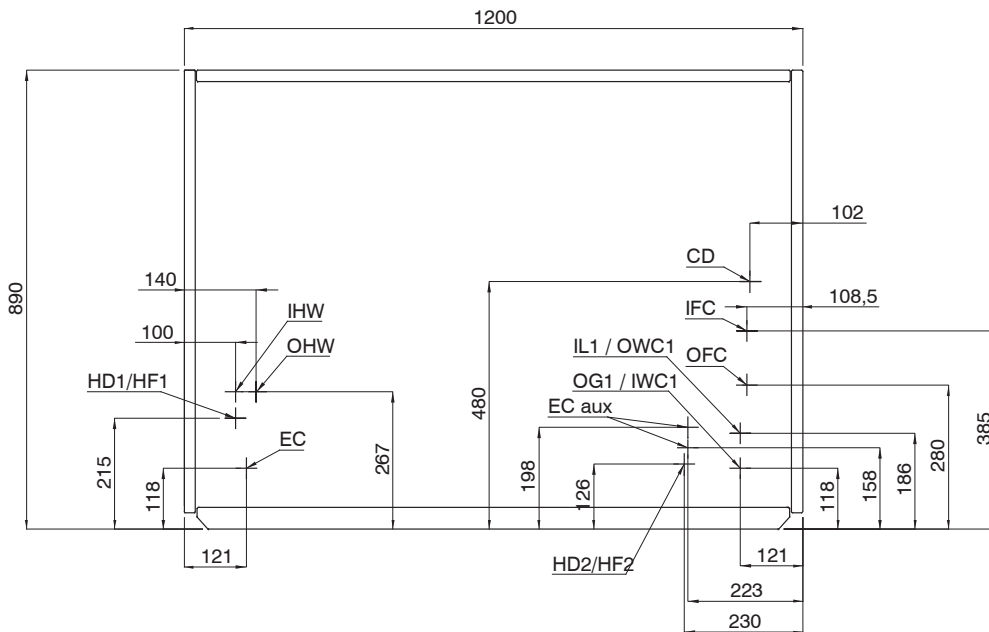


Fig. 13.j Refrigerant, water and electrical connections PX 041 F-H-D, top view



# Dimensional Data / Connections

Fig. 13.k Refrigerant, water and electrical connections PX 047-051-057-044-054-062-074-092 A-D, top view

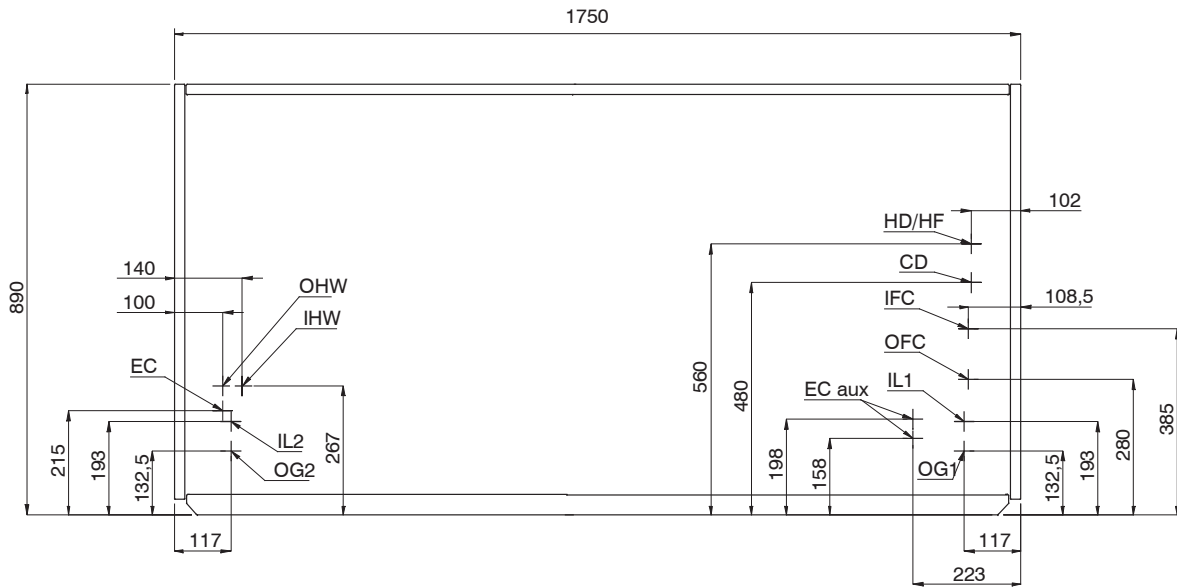
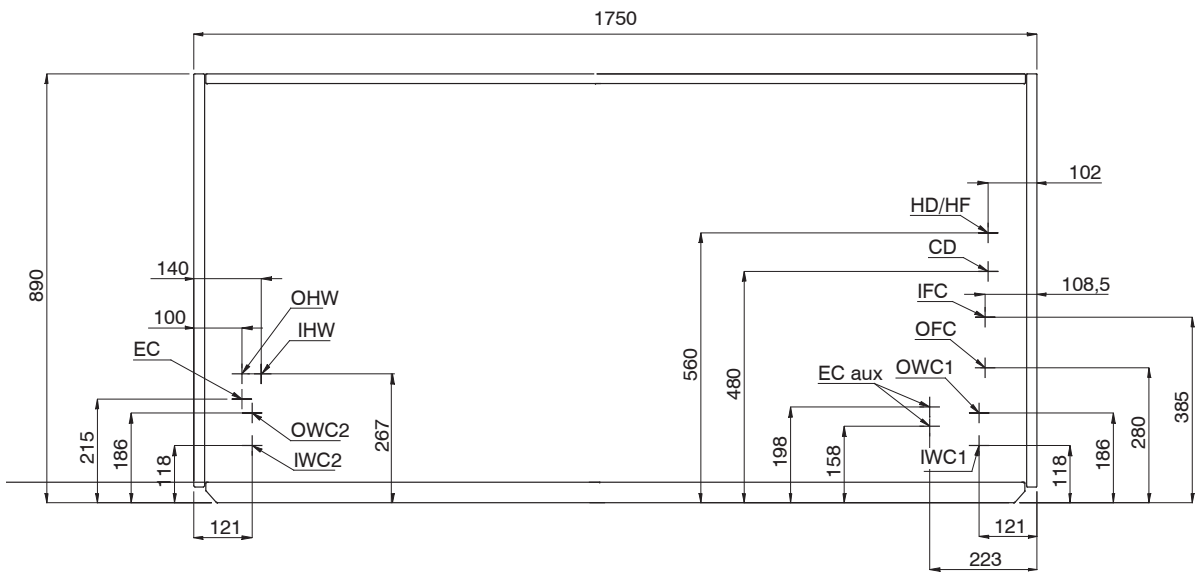


Fig. 13.l Refrigerant, water and electrical connections PX047-051-057-044-054-062-074-092 W-F-H, top view



# Dimensional Data / Connections

Fig. 13.m Refrigerant, water and electrical connections PX 068-082-094-104-120 A-D, top view

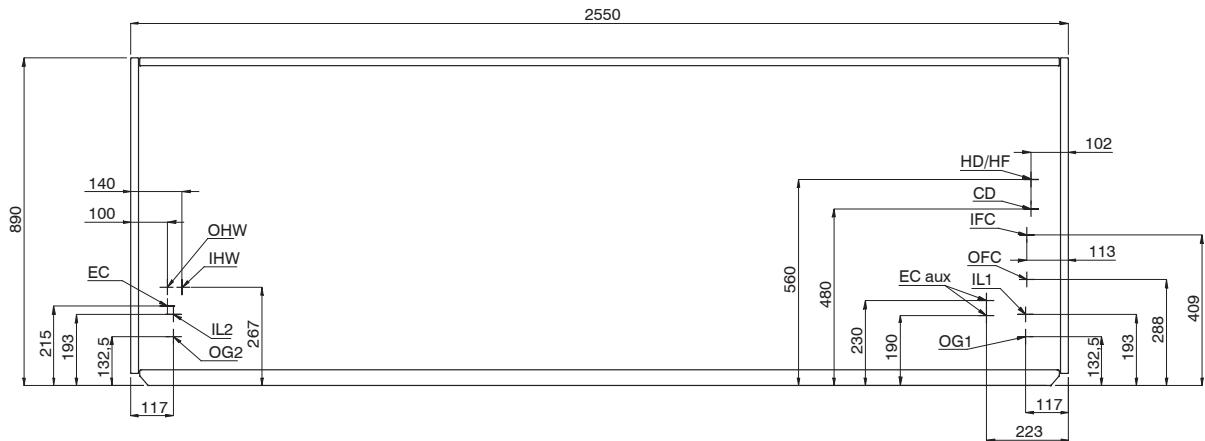


Fig. 13.n Refrigerant, water and electrical connections PX 068-082-094-104-120 W-F-H, top view

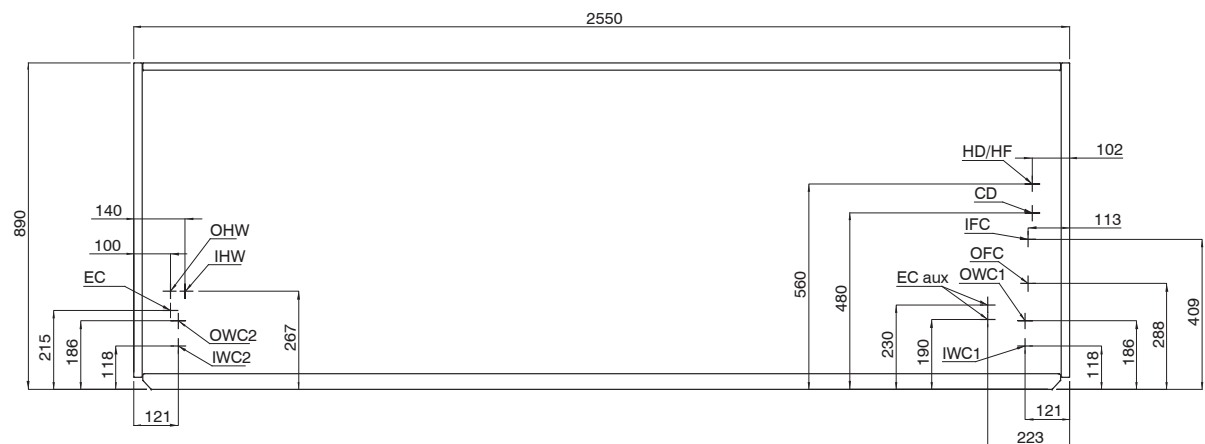
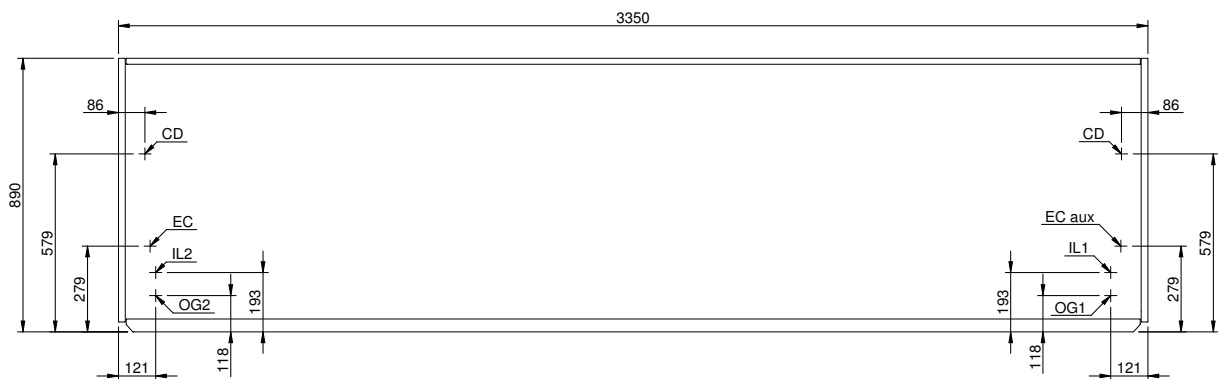


Fig. 13.o Refrigerant, water and electrical connections PX 150-165 A, top view



# Dimensional Data / Connections

Fig. 13.p Refrigerant and water connections PX015- 021- 025- 031- 033 A/W/F/D/H Upflow, side view

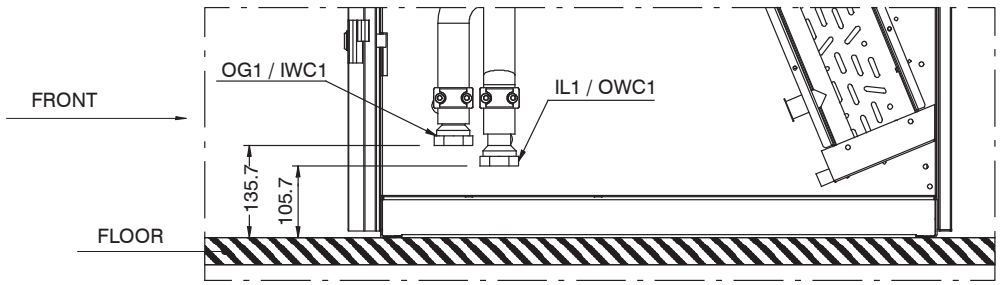
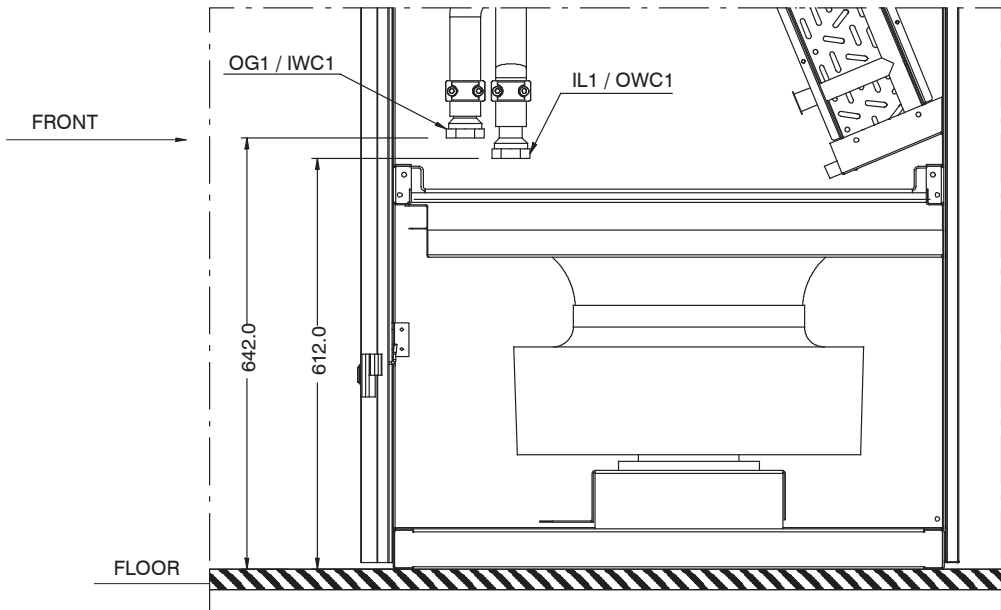


Fig. 13.q Refrigerant and water connections PX015- 021- 025- 031- 033 A/W/F/D/H Downflow,, side view



# Dimensional Data / Connections

Fig. 13.r Refrigerant and water connections PX015 - 021 - 025 - 031 F/D/H Upflow, side view

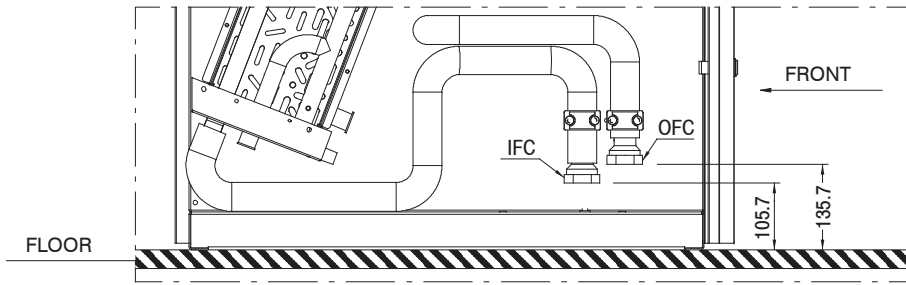
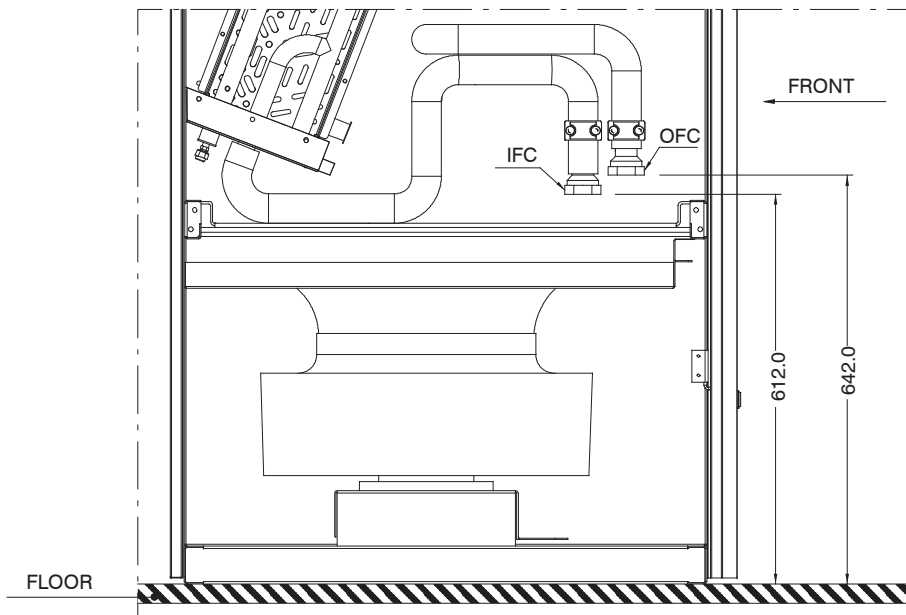


Fig. 13.s Refrigerant and water connections PX015 - 021 - 025 - 031 F/D/H Downflow, side view



# Dimensional Data / Connections

Fig. 13.t Refrigerant and water connections PX041-165 Downflow, side view

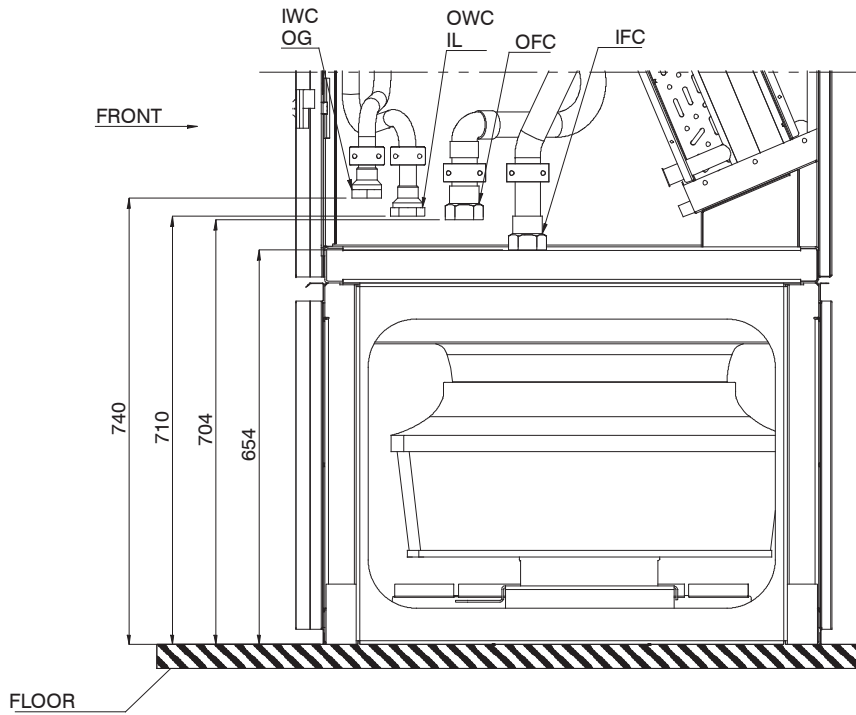
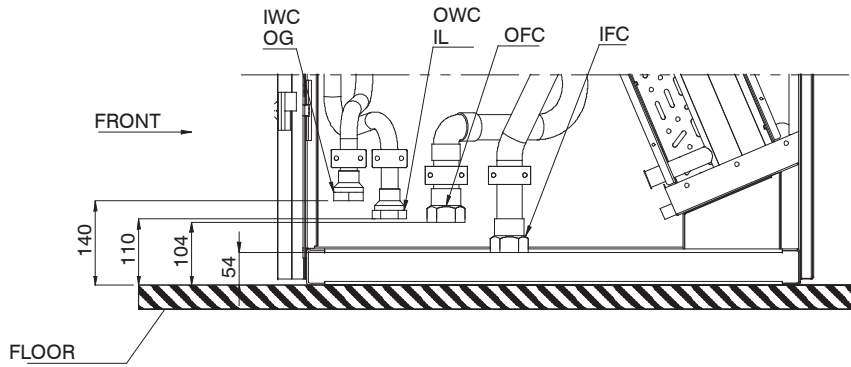


Fig. 13.u Refrigerant and water connections PX 041-120 Upflow, side view





## Dimensional Data / Connections

Tab. 13f - Pipe diameters (room unit - remote condenser). Except EconoPhasa Version, see relevant Literature

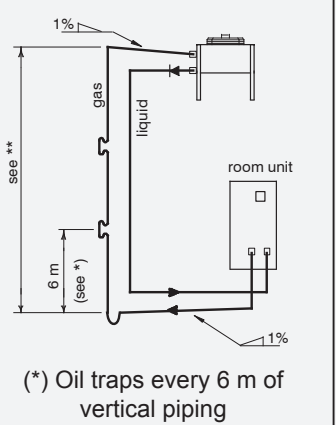
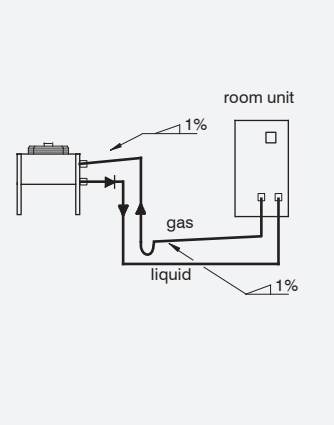
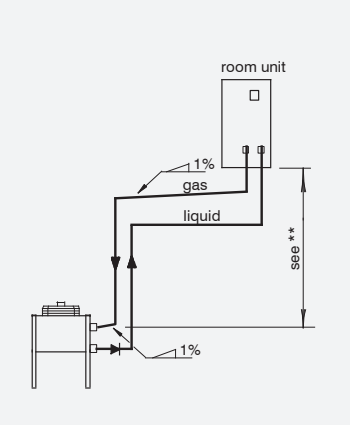
|       |          |          |
|-------|----------|----------|
| PX015 | 16 x 1.0 | 12 x 1.0 |
| PX021 | 18 x 1.0 | 16 x 1.0 |
| PX025 | 22 x 1.5 | 18 x 1.0 |
| PX031 | 22 x 1.5 | 22 x 1.5 |
| PX033 | 22 x 1.5 | 22 x 1.5 |
| PX041 | 22 x 1.5 | 22 x 1.5 |
| PX045 | 28 x 1.5 | 22 x 1.5 |
| PX059 | 28 x 1.5 | 22 x 1.5 |
| PX047 | 28 x 1.5 | 22 x 1.5 |
| PX051 | 28 x 1.5 | 22 x 1.5 |
| PX057 | 28 x 1.5 | 22 x 1.5 |
| PX044 | 18 x 1   | 16 x 1   |
| PX054 | 22 x 1.5 | 18 x 1   |
| PX062 | 22 x 1.5 | 18 x 1   |
| PX074 | 22 x 1.5 | 18 x 1   |
| PX092 | 28 x 1.5 | 22 x 1.5 |
| PX068 | 22 x 1.5 | 18 x 1   |
| PX082 | 22 x 1.5 | 18 x 1   |
| PX094 | 28 x 1.5 | 22 x 1.5 |
| PX104 | 28 x 1.5 | 22 x 1.5 |
| PX120 | 28 x 1.5 | 22 x 1.5 |
| PX150 | 35 x 1.5 | 28 x 1.5 |
| PX165 | 35 x 1.5 | 28 x 1.5 |

Tab. 13g - Equivalent lengths (m) of: curves, shut - off and non - return valves

| Nominal diameter (mm) |  90° |  45° |  180° |  90° |  |
|-----------------------|---|---|--|---|---|
| 12                    | 0.50  | 0.25  | 0.75   | 2.10  | 1.90  |
| 14                    | 0.53  | 0.26  | 0.80   | 2.20  | 2.00  |
| 16                    | 0.55  | 0.27  | 0.85   | 2.40  | 2.10  |
| 18                    | 0.60  | 0.30  | 0.95   | 2.70  | 2.40  |
| 22                    | 0.70  | 0.35  | 1.10   | 3.20  | 2.80  |
| 28                    | 0.80  | 0.45  | 1.30   | 4.00  | 3.30  |

# Dimensional Data / Connections

Tab. 13h - Condenser positioning. Except EconoPhasa Version, see relevant Literature

| CONDENSER POSITION |      | CONDENSER ABOVE CONDITIONER  | CONDENSER AND CONDITIONER AT SAME LEVEL   | CONDENSER BELOW CONDITIONER (not recommended)  |
|--------------------|------|--|---|--|
| INSULATION         | gas  | int.   | necessary   | necessary  |
|                    |      | ext.   | only for aesthetic reasons  | only for aesthetic reasons   |
|                    | liq. | int.   | absolutely not  | no (expose to cold underfloor air)   |
|                    |      | ext.   | only for aesthetic reasons  | only if exposed to sun   |
| LAYOUT             |      |  <p>(*) Oil traps every 6 m of vertical piping</p> |  |  |

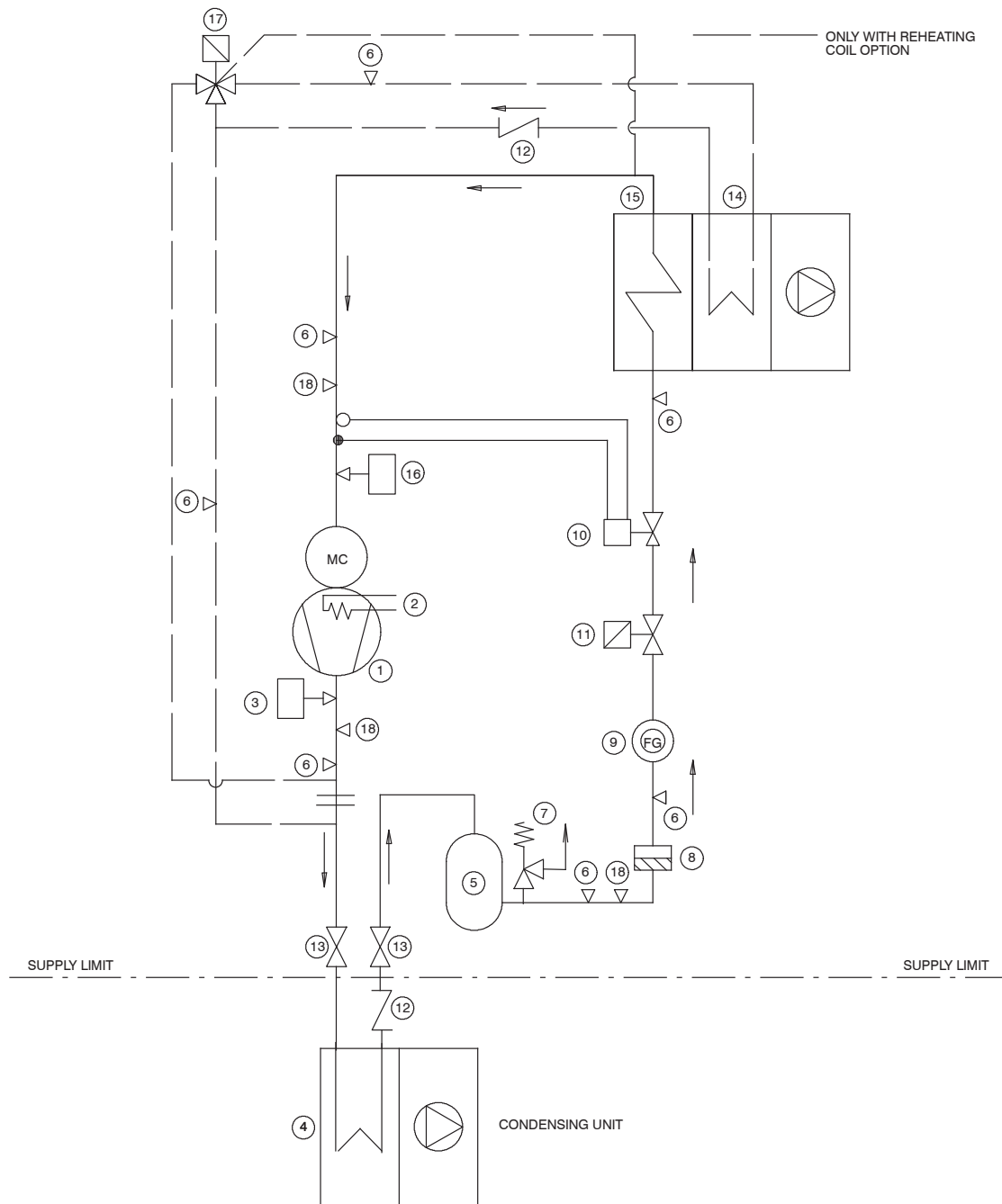
(\*\*) see Chap. 3

Note: Create an oil trap on the horizontal discharge line before each lift.  
 Check the manufacturer's indication for the non-return valve orientation and position.

# 14

## Refrigerant and Hydraulic Circuits

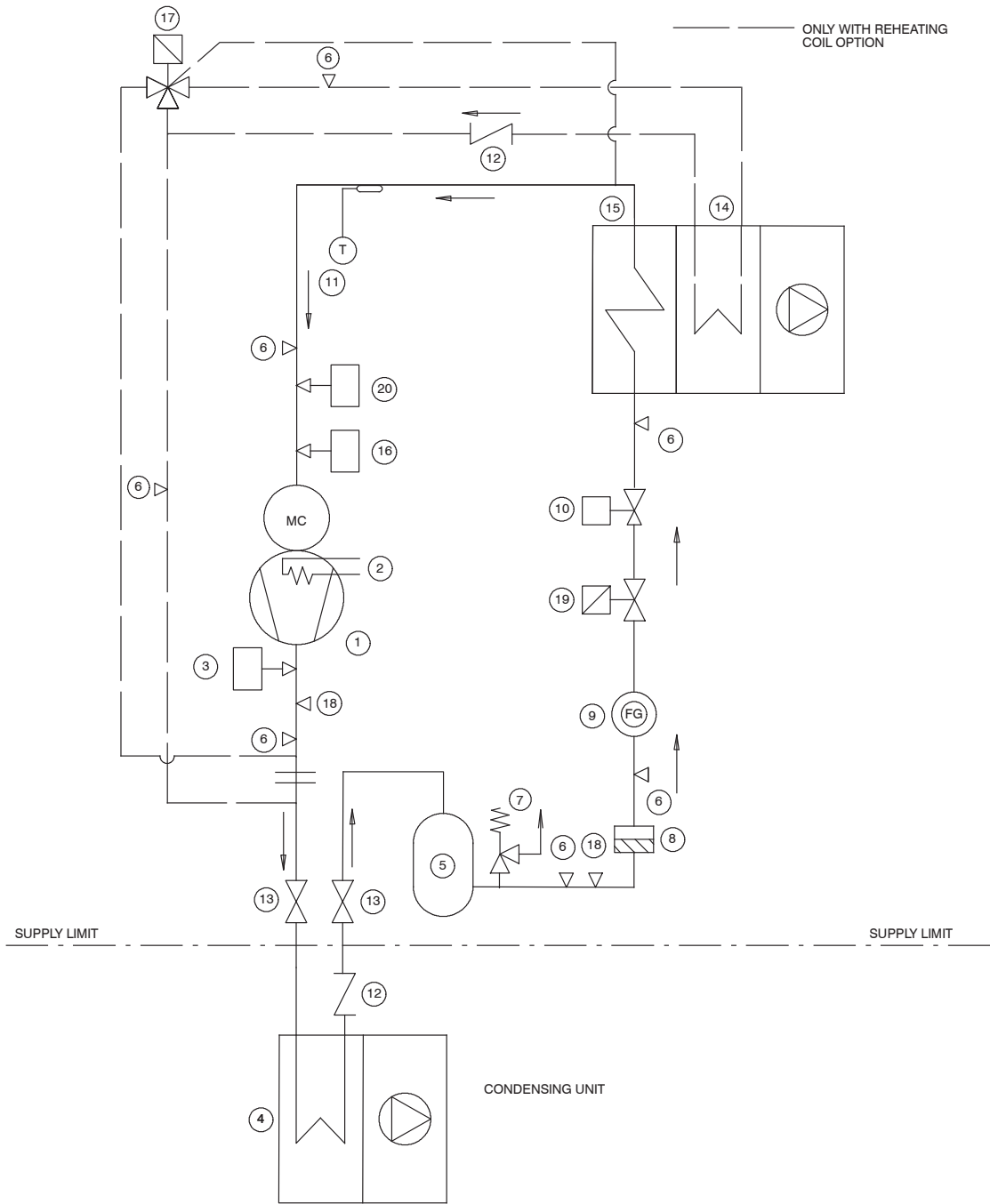
Fig. 14.1 - Refrigerant circuit A version - Single circuit - Single SCROLL compressor - TXV



| POS. | DESCRIPTION               | POS. | DESCRIPTION                         |
|------|---------------------------|------|-------------------------------------|
| 1    | Compressor                | 10   | Thermostatic expansion valve        |
| 2    | Crankcase heater          | 11   | Shut-off solenoid valve             |
| 3    | High pressure switch (HP) | 12   | Check valve                         |
| 4    | Air cooled condenser      | 13   | Shut-off valve                      |
| 5    | Liquid receiver           | 14   | Reheating coil (optional)           |
| 6    | Access valve 5/16"        | 15   | Evaporator                          |
| 7    | Safety valve              | 16   | Low pressure transducer             |
| 8    | Filter dryer              | 17   | Reheating solenoid valve (optional) |
| 9    | Sight glass               | 18   | Access valve 1/4"                   |

# Refrigerant and Hydraulic Circuits

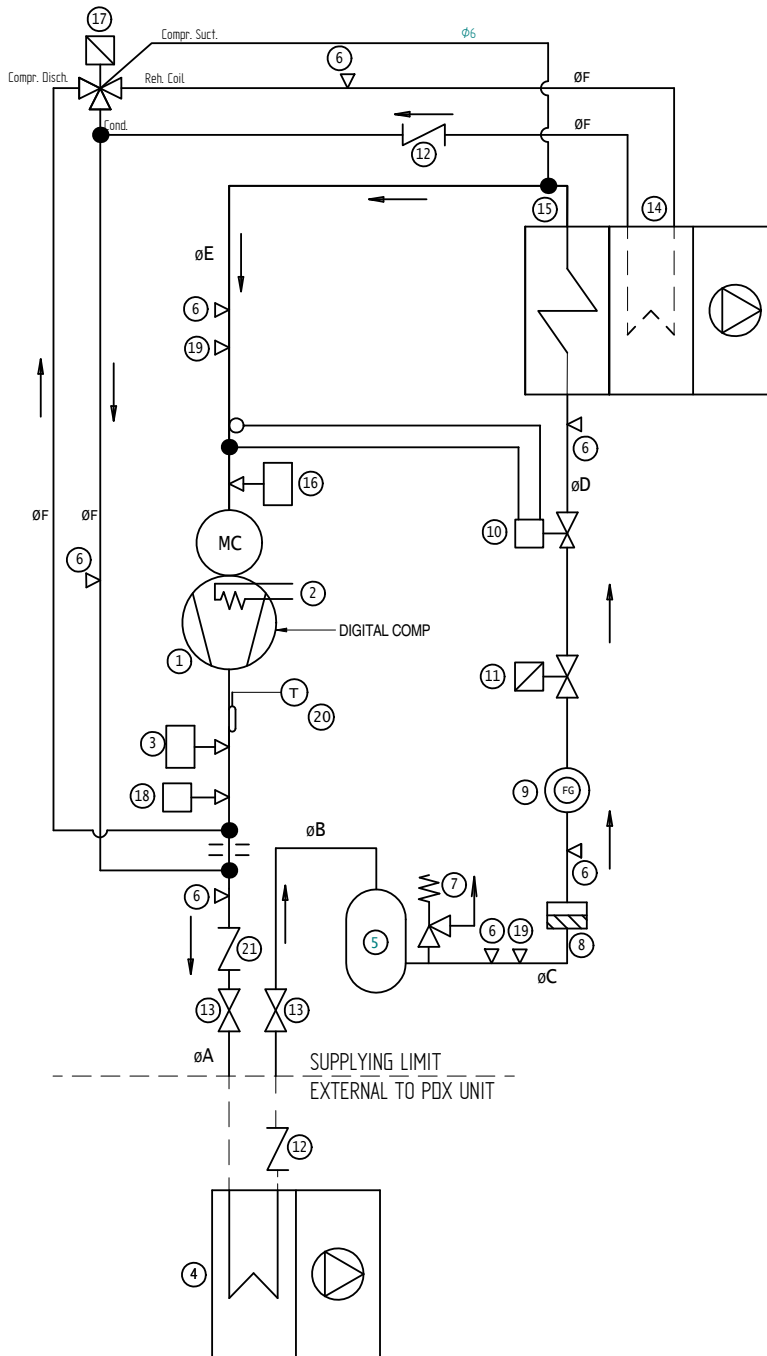
Fig. 14.2 - Refrigerant circuit A version - Single circuit - Single SCROLL compressor - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION                         |
|------|----------------------------------|------|-------------------------------------|
| 1    | Compressor                       | 11   | Temperature sensor for EEV          |
| 2    | Crankcase heater                 | 12   | Check valve                         |
| 3    | High pressure switch (HP)        | 13   | Shut-off valve                      |
| 4    | Air cooled condenser             | 14   | Reheating coil (optional)           |
| 5    | Liquid receiver                  | 15   | Evaporator                          |
| 6    | Access valve 5/16"               | 16   | Low pressure transducer EEV         |
| 7    | Safety valve                     | 17   | Reheating solenoid valve (optional) |
| 8    | Filter dryer                     | 18   | Access valve 1/4"                   |
| 9    | Sight glass                      | 19   | Shut-off solenoid valve             |
| 10   | Electronic expansion valve (EEV) | 20   | Low pressure transducer EEV         |

# Refrigerant and Hydraulic Circuits

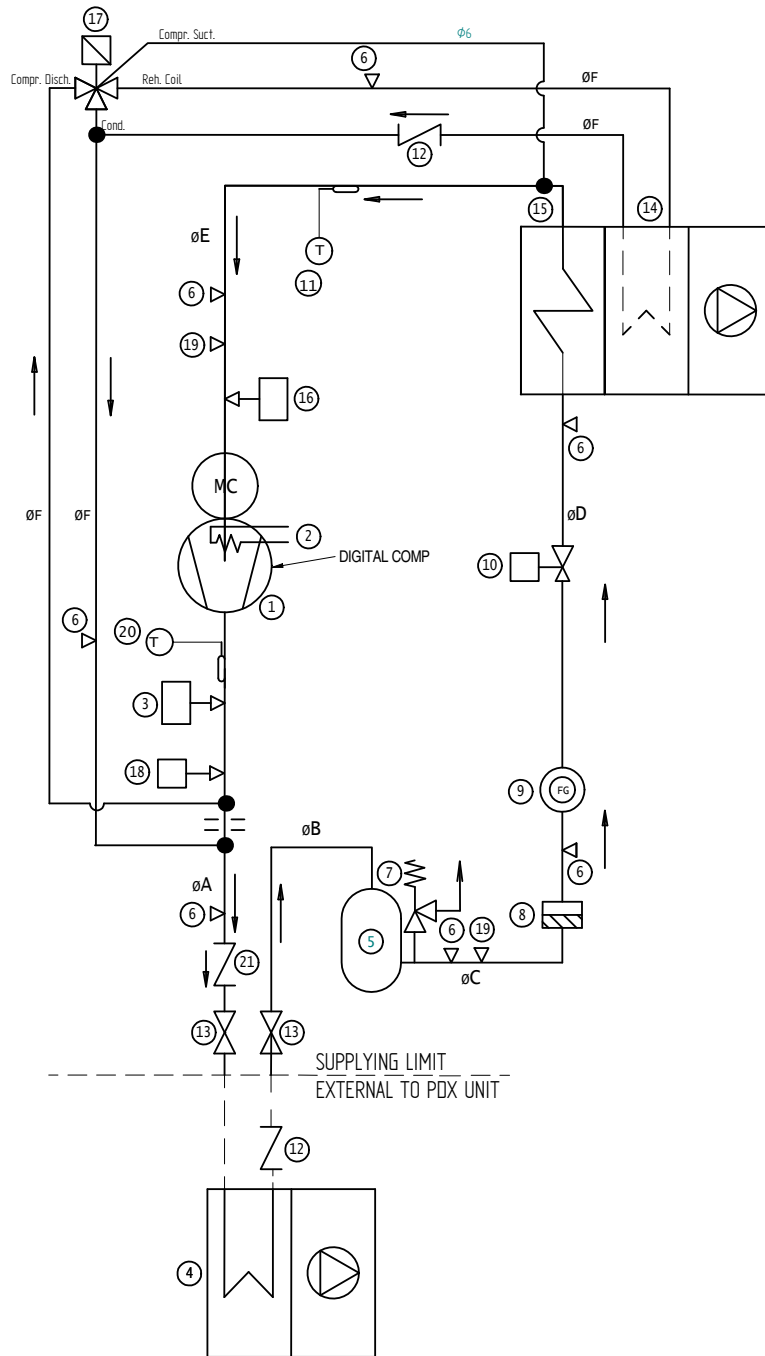
Fig. 14.3 - Refrigerant circuit A version - Single circuit - Single DIGITAL SCROLL compressor - TXV



| POS. | DESCRIPTION                  | POS. | DESCRIPTION  |
|------|------------------------------|------|--|
| 1    | Compressor                   | 11   | Shut-off solenoid valve                              |
| 2    | Crankcase heater             | 12   | Check valve  |
| 3    | High pressure switch (HP)    | 13   | Shut-off valve                                       |
| 4    | Air cooled condenser         | 14   | Reheating coil (optional)                            |
| 5    | Liquid receiver              | 15   | Evaporator   |
| 6    | Access valve 5/16"           | 16   | Low pressure transducer                              |
| 7    | Safety valve                 | 17   | Reheating solenoid valve (optional)                  |
| 8    | Filter dryer                 | 18   | High pressure transducer                             |
| 9    | Sight glass                  | 19   | Access valve 1/4"                                    |
| 10   | Thermostatic expansion valve | 20   | NTC Temperature sensor for DIGITAL SCROLL compressor |
|      |                              | 21   | CHECK VALVE(ONLY FOR PX015,021,025)                  |

# Refrigerant and Hydraulic Circuits

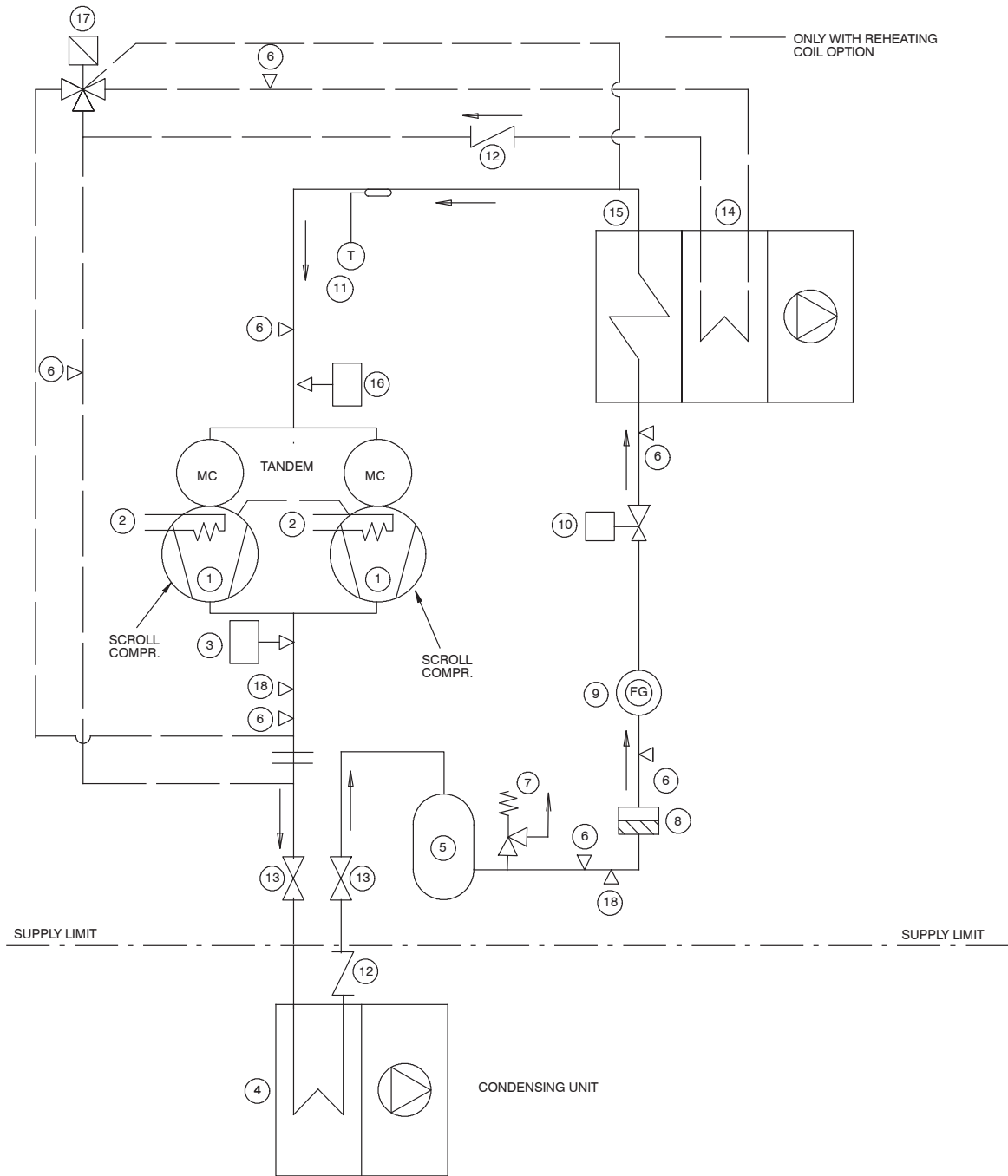
Fig. 14.4 - Refrigerant circuit A version - Single circuit - Single DIGITAL SCROLL compressor - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 11   | Temperature sensor for EEV                           |
| 2    | Crankcase heater                 | 12   | Check valve  |
| 3    | High pressure switch (HP)        | 13   | Shut-off valve                                       |
| 4    | Air cooled condenser             | 14   | Reheating coil (optional)                            |
| 5    | Liquid receiver                  | 15   | Evaporator   |
| 6    | Access valve 5/16"               | 16   | Low pressure transducer EEV                          |
| 7    | Safety valve                     | 17   | Reheating solenoid valve (optional)                  |
| 8    | Filter dryer                     | 18   | High pressure transducer                             |
| 9    | Sight glass                      | 19   | Access valve 1/4"                                    |
| 10   | Electronic expansion valve (EEV) | 20   | NTC Temperature sensor for DIGITAL SCROLL compressor |
|      |                                  | 21   | CHECK VALVE(ONLY FOR PX015,021,025)                  |

# Refrigerant and Hydraulic Circuits

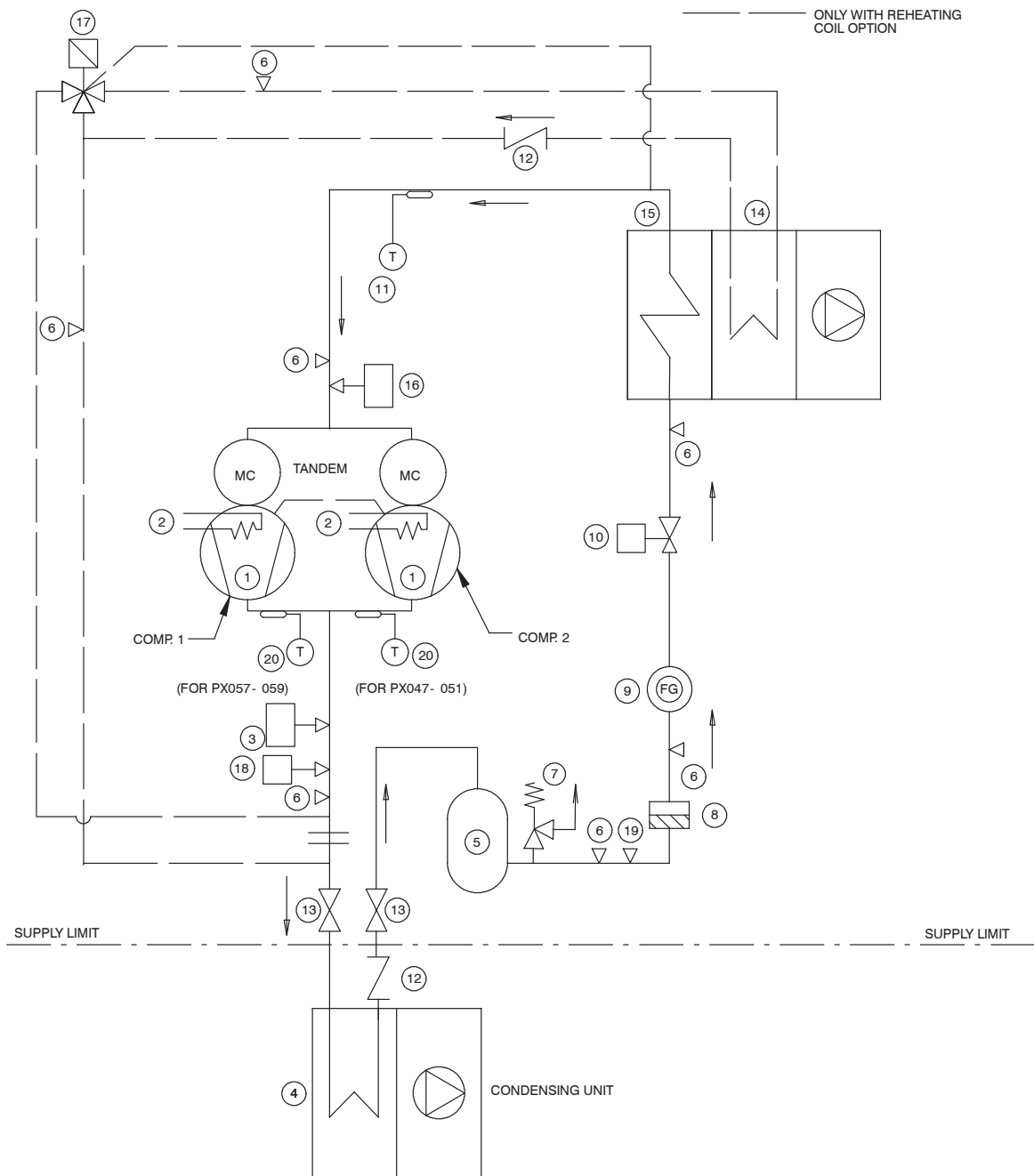
Fig. 14.5 - Refrigerant circuit A version - Single circuit - Tandem SCROLL compressors - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION                         |
|------|----------------------------------|------|-------------------------------------|
| 1    | Compressor                       | 11   | Temperature sensor for EEV          |
| 2    | Crankcase heater                 | 12   | Check valve                         |
| 3    | High pressure switch (HP)        | 13   | Shut-off valve                      |
| 4    | Air cooled condenser             | 14   | Reheating coil (optional)           |
| 5    | Liquid receiver                  | 15   | Evaporator                          |
| 6    | Access valve 5/16"               | 16   | Low pressure transducer EEV         |
| 7    | Safety valve                     | 17   | Reheating solenoid valve (optional) |
| 8    | Filter dryer                     | 18   | Access valve 1/4"                   |
| 9    | Sight glass                      | 19   | High pressure transducer            |
| 10   | Electronic expansion valve (EEV) |      |                                     |

# Refrigerant and Hydraulic Circuits

Fig. 14.6 - Refrigerant circuit A version - Single circuit - Tandem DIGITAL SCROLL compressors - EEV

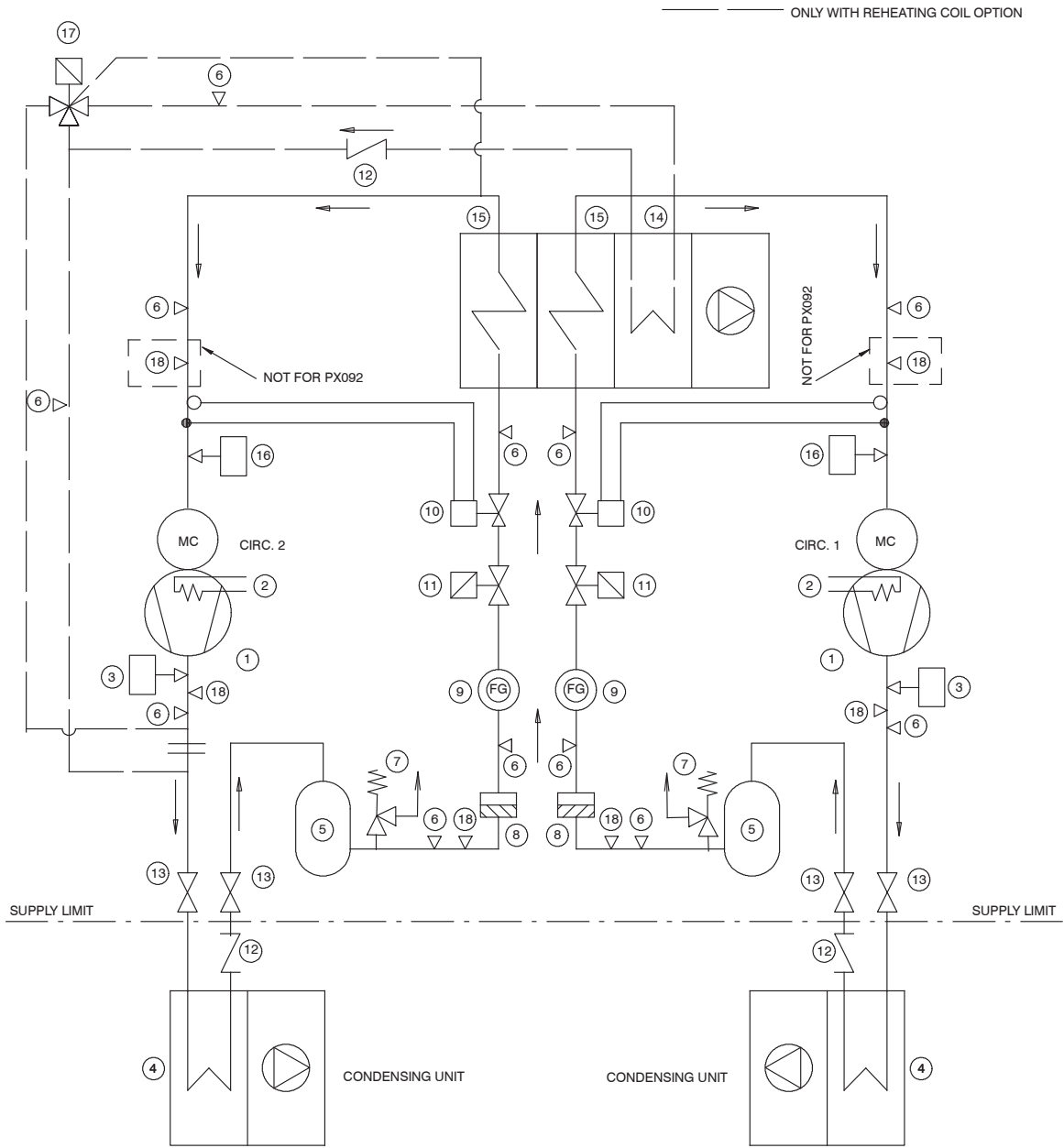


| POS. | DESCRIPTION                      | POS. | DESCRIPTION  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 11   | Temperature sensor for EEV                           |
| 2    | Crankcase heater                 | 12   | Check valve  |
| 3    | High pressure switch (HP)        | 13   | Shut-off valve                                       |
| 4    | Air cooled condenser             | 14   | Reheating coil (optional)                            |
| 5    | Liquid receiver                  | 15   | Evaporator   |
| 6    | Access valve 5/16"               | 16   | Low pressure transducer EEV                          |
| 7    | Safety valve                     | 17   | Reheating solenoid valve (optional)                  |
| 8    | Filter dryer                     | 18   | High pressure transducer                             |
| 9    | Sight glass                      | 19   | Access valve 1/4"                                    |
| 10   | Electronic expansion valve (EEV) | 20   | NTC Temperature sensor for DIGITAL SCROLL compressor |



# Refrigerant and Hydraulic Circuits

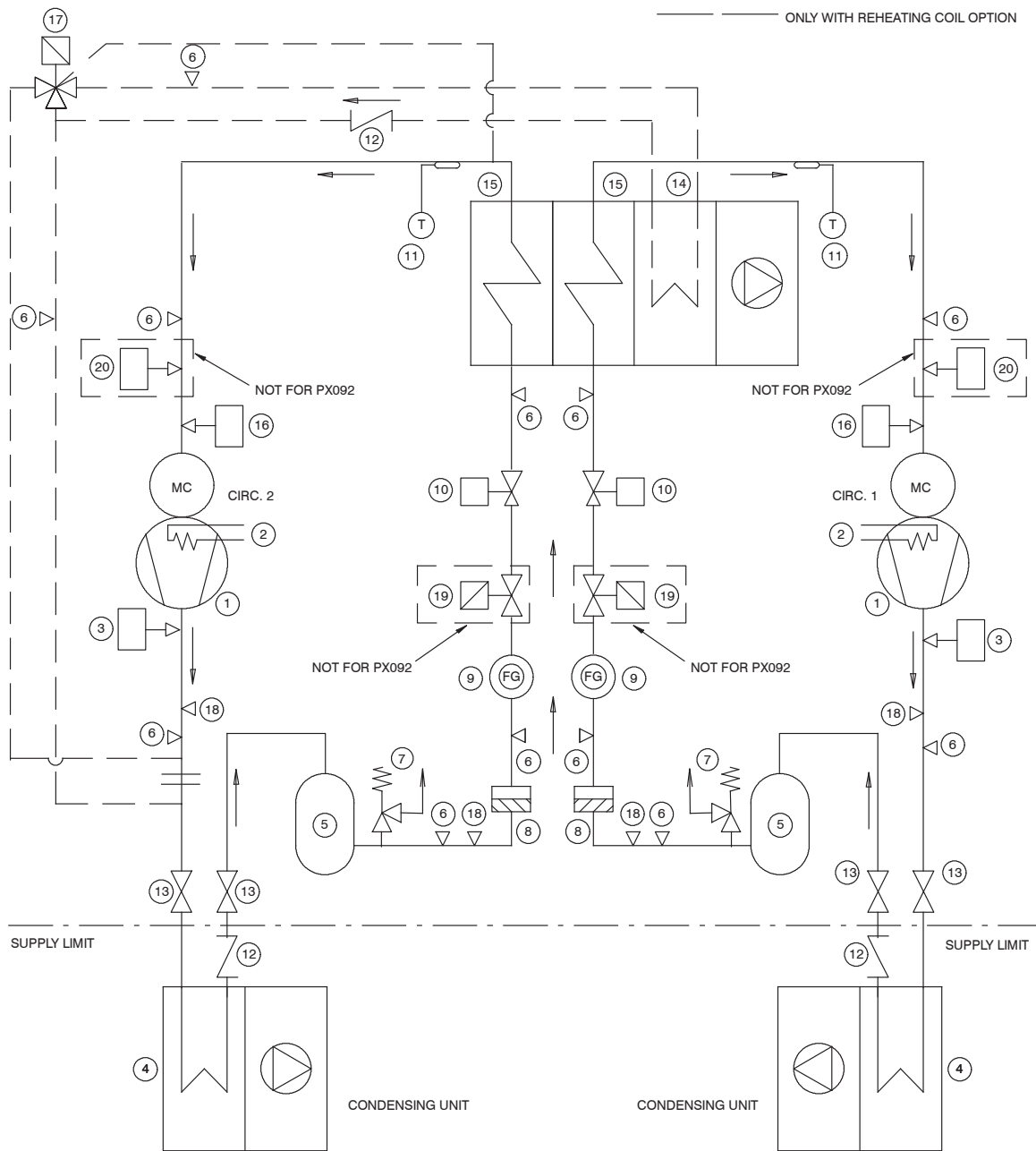
Fig. 14.7 - Refrigerant circuit A version - Dual circuits - Single SCROLL compressor - TXV



| POS. | DESCRIPTION               | POS. | DESCRIPTION                         |
|------|---------------------------|------|-------------------------------------|
| 1    | Compressor                | 10   | Thermostatic expansion valve        |
| 2    | Crankcase heater          | 11   | Shut-off solenoid valve             |
| 3    | High pressure switch (HP) | 12   | Check valve                         |
| 4    | Air cooled condenser      | 13   | Shut-off valve                      |
| 5    | Liquid receiver           | 14   | Reheating coil (optional)           |
| 6    | Access valve 5/16"        | 15   | Evaporator                          |
| 7    | Safety valve              | 16   | Low pressure transducer             |
| 8    | Filter dryer              | 17   | Reheating solenoid valve (optional) |
| 9    | Sight glass               | 18   | Access valve 1/4"                   |

# Refrigerant and Hydraulic Circuits

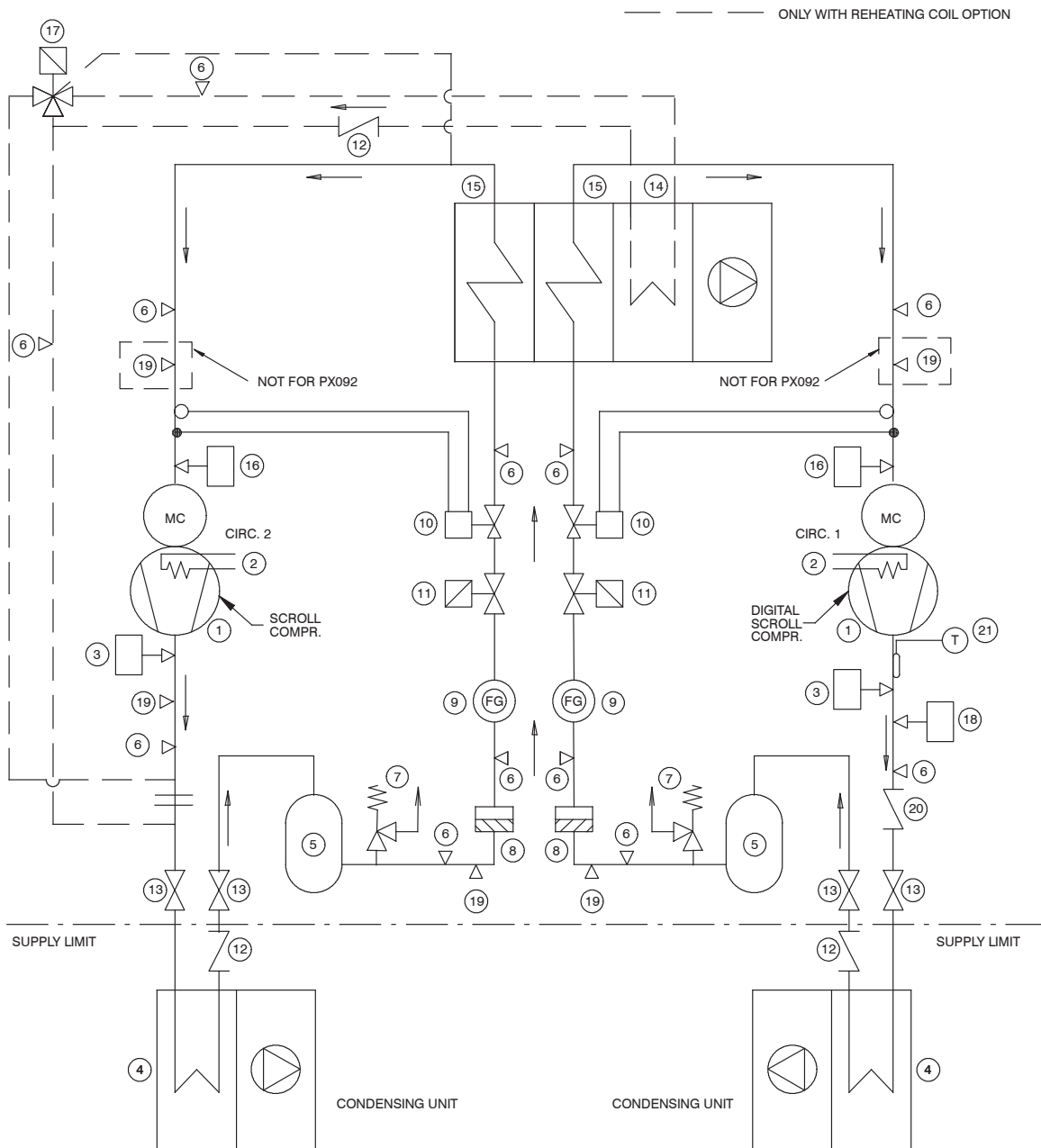
Fig. 14.8 - Refrigerant circuit A version - Dual circuits - Single SCROLL compressor - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION                         |
|------|----------------------------------|------|-------------------------------------|
| 1    | Compressor                       | 11   | Temperature sensor for EEV          |
| 2    | Crankcase heater                 | 12   | Check valve                         |
| 3    | High pressure switch (HP)        | 13   | Shut-off valve                      |
| 4    | Air cooled condenser             | 14   | Reheating coil (optional)           |
| 5    | Liquid receiver                  | 15   | Evaporator                          |
| 6    | Access valve 5/16"               | 16   | Low pressure transducer EEV         |
| 7    | Safety valve                     | 17   | Reheating solenoid valve (optional) |
| 8    | Filter dryer                     | 18   | Access valve 1/4"                   |
| 9    | Sight glass                      | 19   | Shut-off solenoid valve (EEV)       |
| 10   | Electronic expansion valve (EEV) | 20   | Low pressure transducer EEV         |

# Refrigerant and Hydraulic Circuits

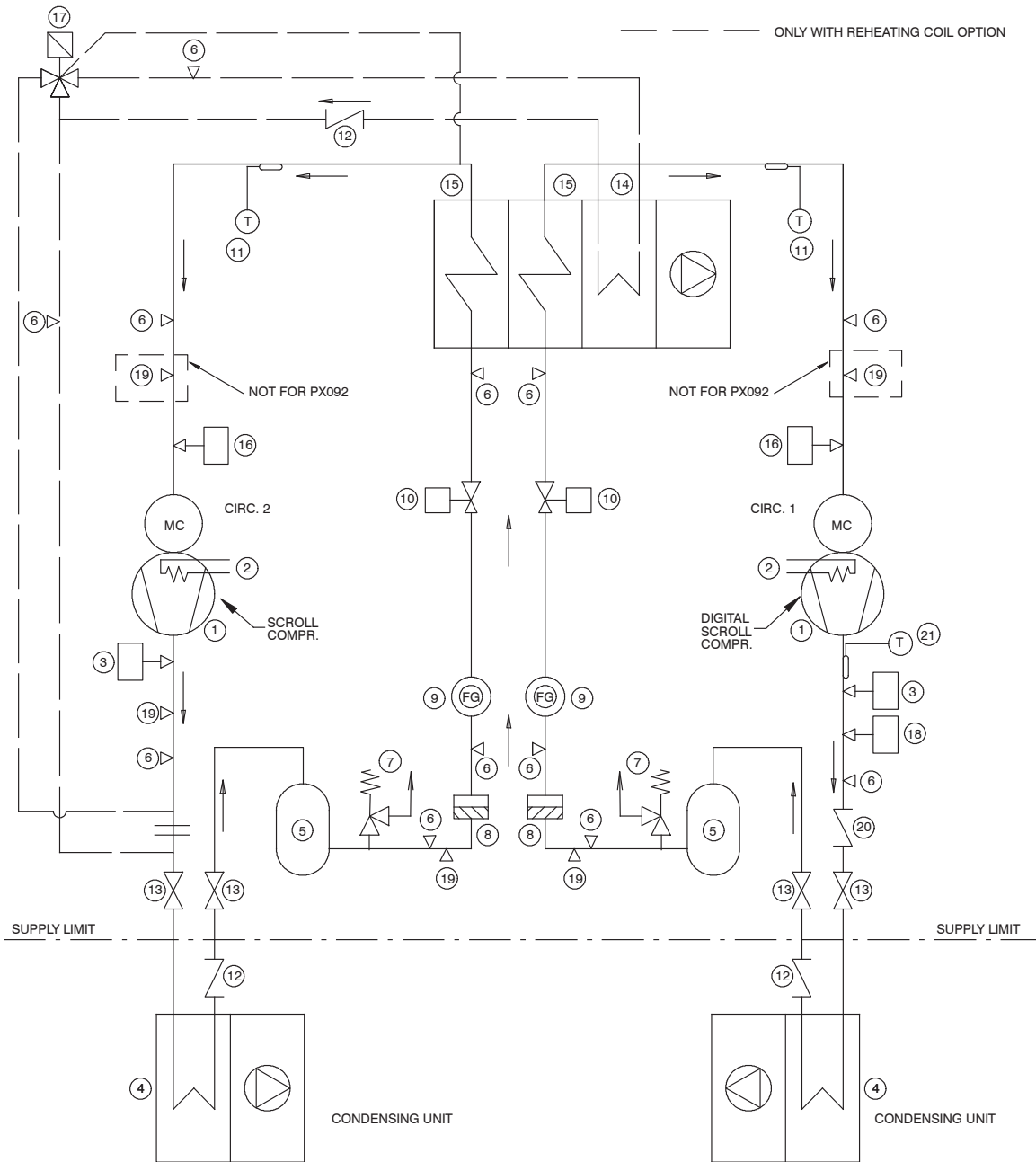
Fig. 14.9 - Refrigerant circuit A version - Dual circuits - Single SCROLL+DIGITAL SCROLL compressor - TXV



| POS. | DESCRIPTION                  | POS. | DESCRIPTION  |
|------|------------------------------|------|--|
| 1    | Compressor                   | 12   | Check valve  |
| 2    | Crankcase heater             | 13   | Shut-off valve                                       |
| 3    | High pressure switch (HP)    | 14   | Reheating coil (optional)                            |
| 4    | Air cooled condenser         | 15   | Evaporator   |
| 5    | Liquid receiver              | 16   | Low pressure transducer                              |
| 6    | Access valve 5/16"           | 17   | Reheating solenoid valve (optional)                  |
| 7    | Safety valve                 | 18   | High pressure transducer                             |
| 8    | Filter dryer                 | 19   | Access valve 1/4"                                    |
| 9    | Sight glass                  | 20   | Check valve (only for PX044-054)                     |
| 10   | Thermostatic expansion valve | 21   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 11   | Shut-off solenoid valve      |      |  |

# Refrigerant and Hydraulic Circuits

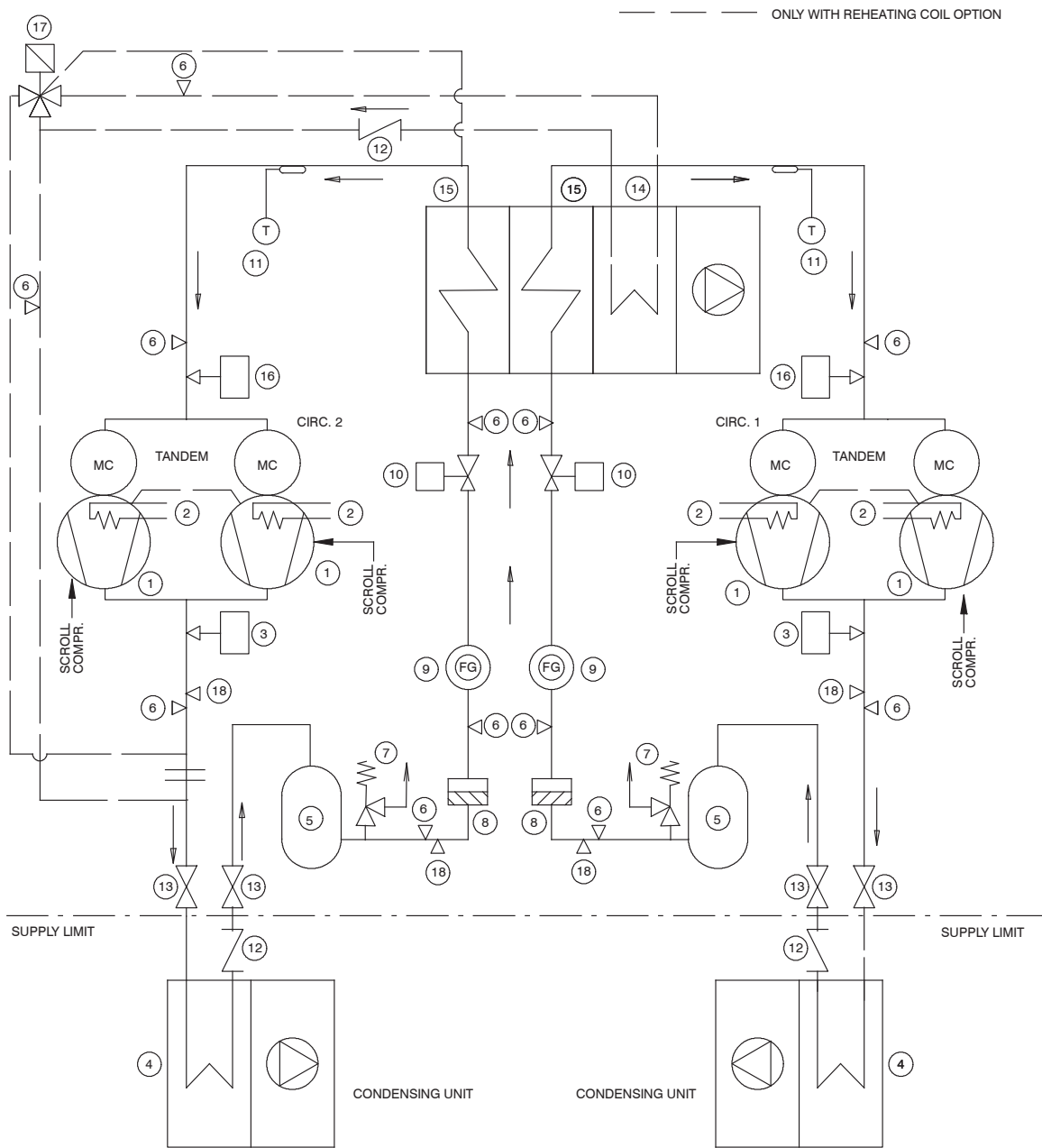
Fig. 14.10 - Refrigerant circuit A version - Dual circuits - Single SCROLL+DIGITAL SCROLL compressor - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 12   | Check valve  |
| 2    | Crankcase heater                 | 13   | Shut-off valve                                       |
| 3    | High pressure switch (HP)        | 14   | Reheating coil (optional)                            |
| 4    | Air cooled condenser             | 15   | Evaporator   |
| 5    | Liquid receiver                  | 16   | Low pressure transducer                              |
| 6    | Access valve 5/16"               | 17   | Reheating solenoid valve (optional)                  |
| 7    | Safety valve                     | 18   | High pressure transducer                             |
| 8    | Filter dryer                     | 19   | Access valve 1/4"                                    |
| 9    | Sight glass                      | 20   | Check valve (only for PX044-054)                     |
| 10   | Electronic expansion valve (EEV) | 21   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 11   | Temperature sensor for EEV       |      |  |

# Refrigerant and Hydraulic Circuits

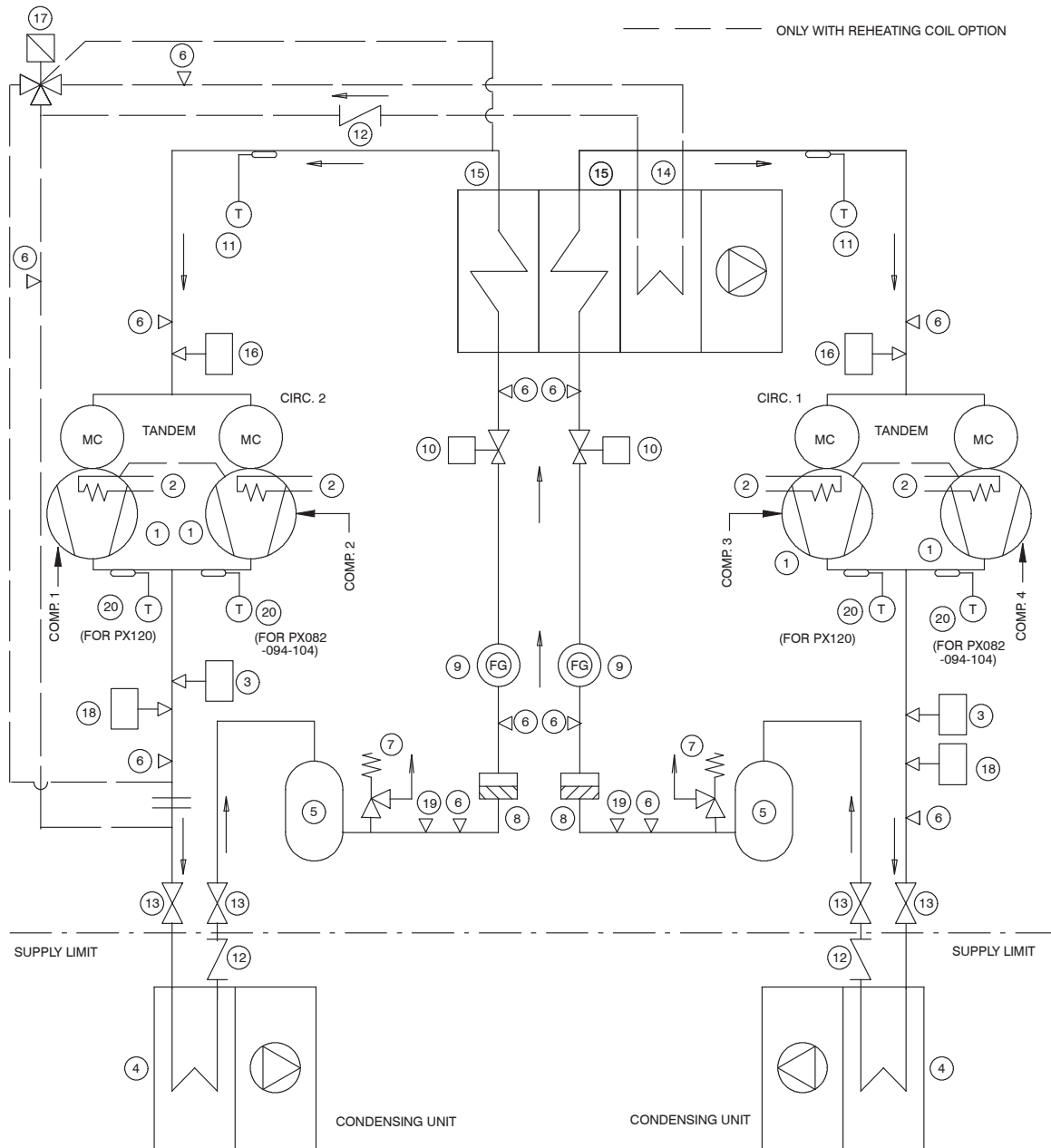
Fig. 14.11 - Refrigerant circuit A version - Dual circuits - Tandem SCROLL compressors - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION                         |
|------|----------------------------------|------|-------------------------------------|
| 1    | Compressor                       | 11   | Temperature sensor for EEV          |
| 2    | Crankcase heater                 | 12   | Check valve                         |
| 3    | High pressure switch (HP)        | 13   | Shut-off valve                      |
| 4    | Air cooled condenser             | 14   | Reheating coil (optional)           |
| 5    | Liquid receiver                  | 15   | Evaporator                          |
| 6    | Access valve 5/16"               | 16   | Low pressure transducer             |
| 7    | Safety valve                     | 17   | Reheating solenoid valve (optional) |
| 8    | Filter dryer                     | 18   | Access valve 1/4"                   |
| 9    | Sight glass                      | 19   | High pressure transducer            |
| 10   | Electronic expansion valve (EEV) |      |                                     |

# Refrigerant and Hydraulic Circuits

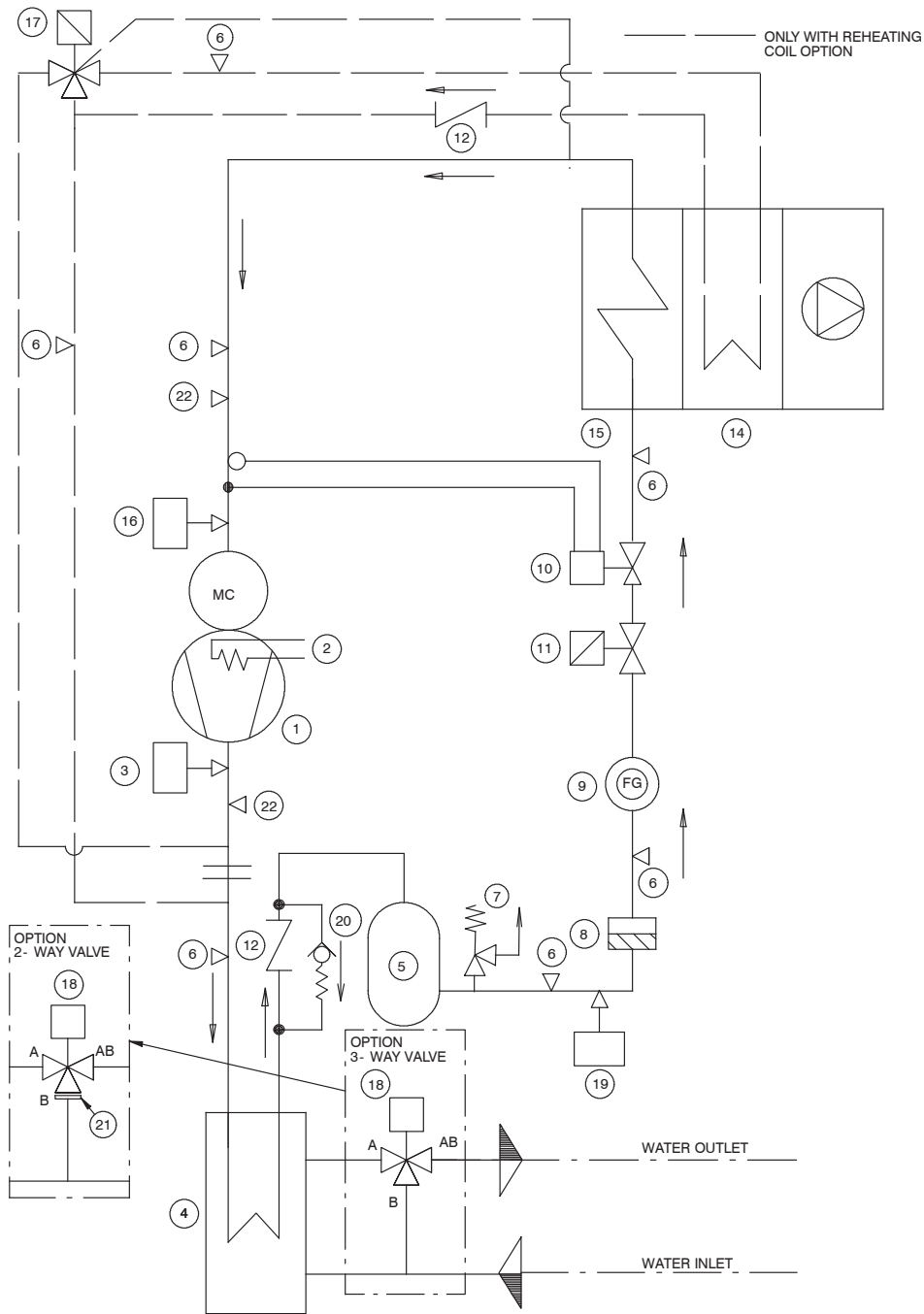
Fig. 14.12 - Refrigerant circuit A version - Dual circuits - Tandem DIGITAL SCROLL compressors - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 11   | Temperature sensor for EEV                           |
| 2    | Crankcase heater                 | 12   | Check valve  |
| 3    | High pressure switch (HP)        | 13   | Shut-off valve                                       |
| 4    | Air cooled condenser             | 14   | Reheating coil (optional)                            |
| 5    | Liquid receiver                  | 15   | Evaporator   |
| 6    | Access valve 5/16"               | 16   | Low pressure transducer                              |
| 7    | Safety valve                     | 17   | Reheating solenoid valve (optional)                  |
| 8    | Filter dryer                     | 18   | High pressure transducer                             |
| 9    | Sight glass                      | 19   | Access valve 1/4"                                    |
| 10   | Electronic expansion valve (EEV) | 20   | NTC Temperature sensor for DIGITAL SCROLL compressor |

# Refrigerant and Hydraulic Circuits

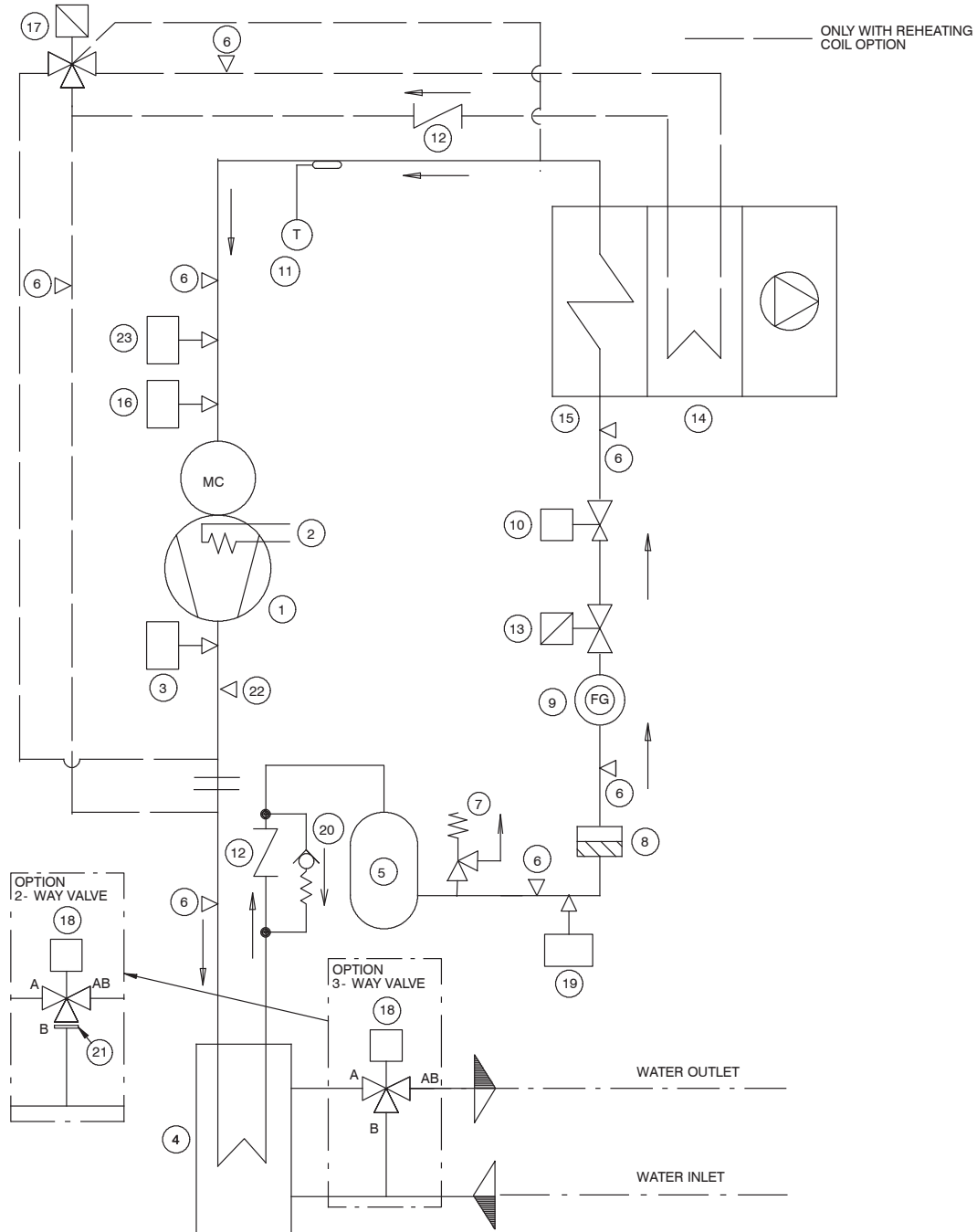
Fig. 14.13 - Refrigerant circuit W version - Single circuit - Single SCROLL compressor - TXV



| POS. | DESCRIPTION                  | POS. | DESCRIPTION                                  |
|------|------------------------------|------|--|
| 1    | Compressor                   | 12   | Check valve                                  |
| 2    | Crankcase heater             | 14   | Reheating coil (optional)                    |
| 3    | High pressure switch (HP)    | 15   | Evaporator                                   |
| 4    | Water cooled condenser       | 16   | Low pressure transducer                      |
| 5    | Liquid receiver              | 17   | Reheating solenoid valve (optional)          |
| 6    | Access valve 5/16"           | 18   | Condensing regulation water valve            |
| 7    | Safety valve                 | 19   | Pressure transducer condensing regulation    |
| 8    | Filter dryer                 | 20   | Check valve 10 bar (145 psi)                 |
| 9    | Sight glass                  | 21   | Blind disk - only with optional 2- way valve |
| 10   | Thermostatic expansion valve | 22   | Access valve 1/4"                            |
| 11   | Shut-off solenoid valve      |      |  |

# Refrigerant and Hydraulic Circuits

Fig. 14.14 - Refrigerant circuit W version - Single circuit - Single SCROLL compressor - EEV

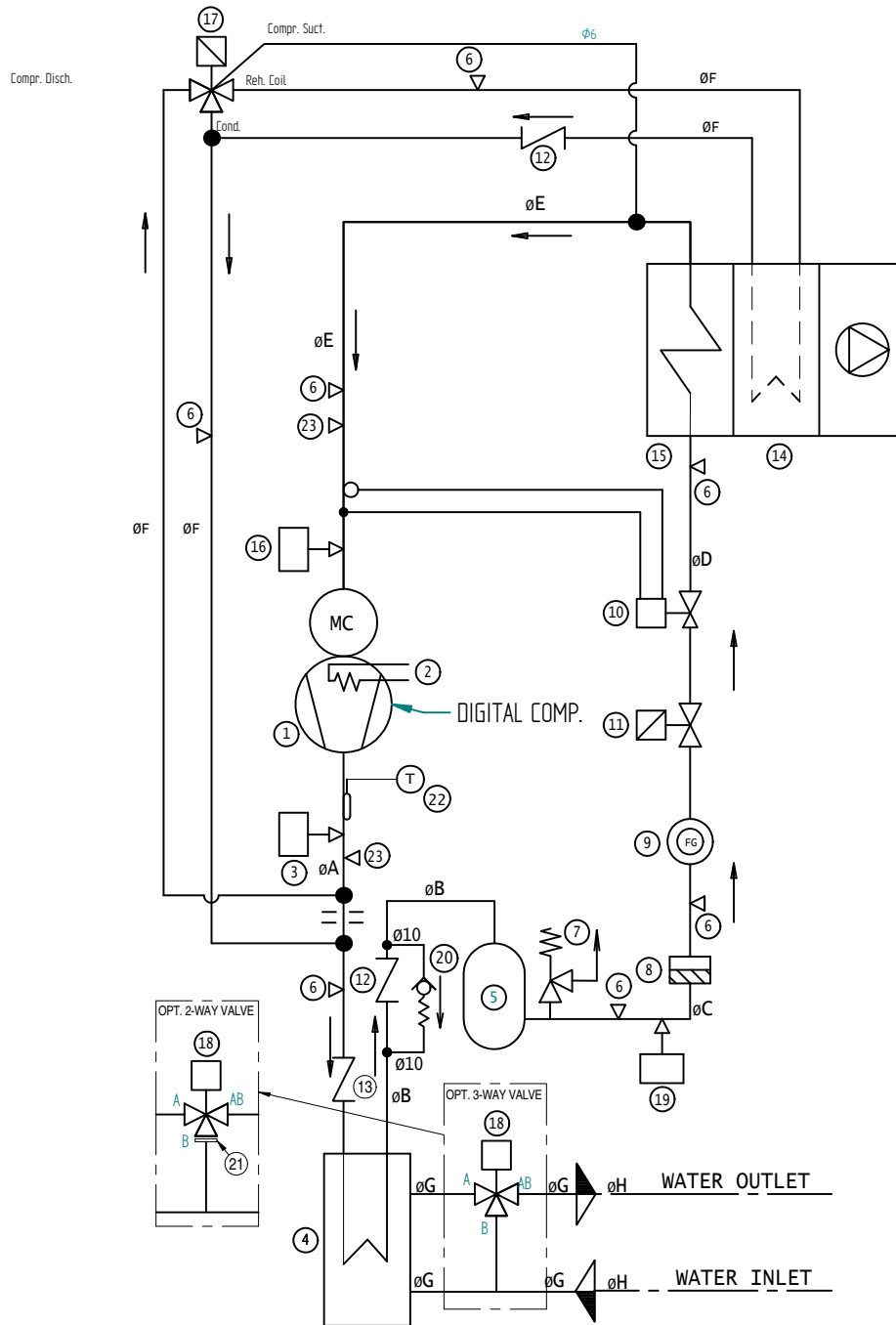


| POS. | DESCRIPTION                      | POS. | DESCRIPTION                                  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 13   | Shut-off solenoid valve (EEV)                |
| 2    | Crankcase heater                 | 14   | Reheating coil (optional)                    |
| 3    | High pressure switch (HP)        | 15   | Evaporator                                   |
| 4    | Water cooled condenser           | 16   | Low pressure transducer                      |
| 5    | Liquid receiver                  | 17   | Reheating solenoid valve (optional)          |
| 6    | Access valve 5/16"               | 18   | Condensing regulation water valve            |
| 7    | Safety valve                     | 19   | Pressure transducer condensing regulation    |
| 8    | Filter dryer                     | 20   | Check valve 10 bar (145 psi)                 |
| 9    | Sight glass                      | 21   | Blind disk - only with optional 2- way valve |
| 10   | Electronic expansion valve (EEV) | 22   | Access valve 1/4"                            |
| 11   | Temperature sensor for EEV       | 23   | Shut-off solenoid valve                      |
| 12   | Check valve                      |      |  |



# Refrigerant and Hydraulic Circuits

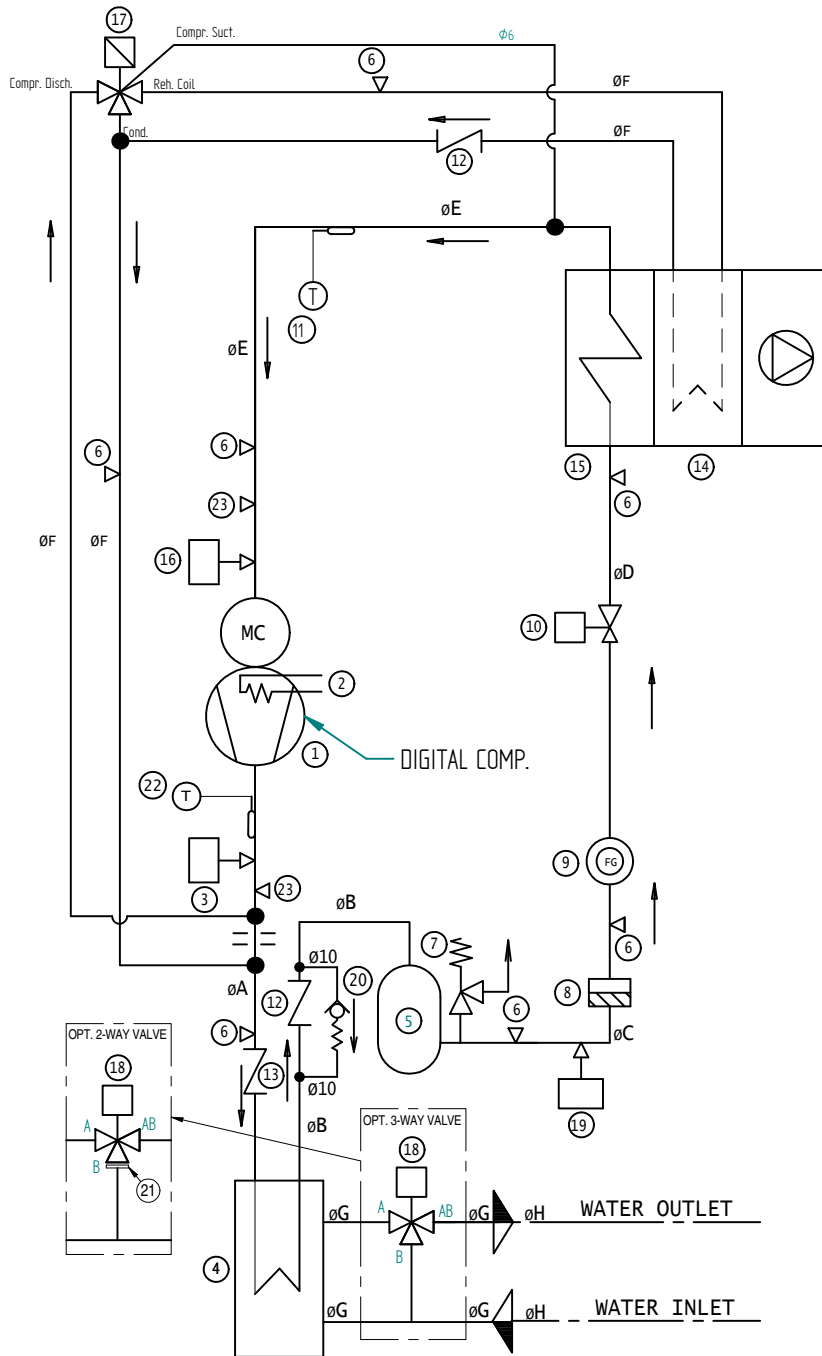
Fig. 14.15 - Refrigerant circuit W version - Single circuit - Single DIGITAL SCROLL compressor - TXV



| POS. | DESCRIPTION                  | POS. | DESCRIPTION  |
|------|------------------------------|------|--|
| 1    | Compressor                   | 12   | Check valve  |
| 2    | Crankcase heater             | 13   | CHECK VALVE(OPTIONAL FOR PX015,PX021,PX025)          |
| 3    | High pressure switch (HP)    | 14   | Reheating coil (optional)                            |
| 4    | Water cooled condenser       | 15   | Evaporator   |
| 5    | Liquid receiver              | 16   | Low pressure transducer                              |
| 6    | Access valve 5/16"           | 17   | Reheating solenoid valve (optional)                  |
| 7    | Safety valve                 | 18   | Condensing regulation water valve                    |
| 8    | Filter dryer                 | 19   | Pressure transducer condensing regulation            |
| 9    | Sight glass                  | 20   | Check valve 10 bar (145 psi)                         |
| 10   | Thermostatic expansion valve | 21   | Blind disk - only with optional 2- way valve         |
| 11   | Shut- off solenoid valve     | 22   | NTC Temperature sensor for DIGITAL SCROLL compressor |
|      |                              | 23   | Access valve 1/4"                                    |

# Refrigerant and Hydraulic Circuits

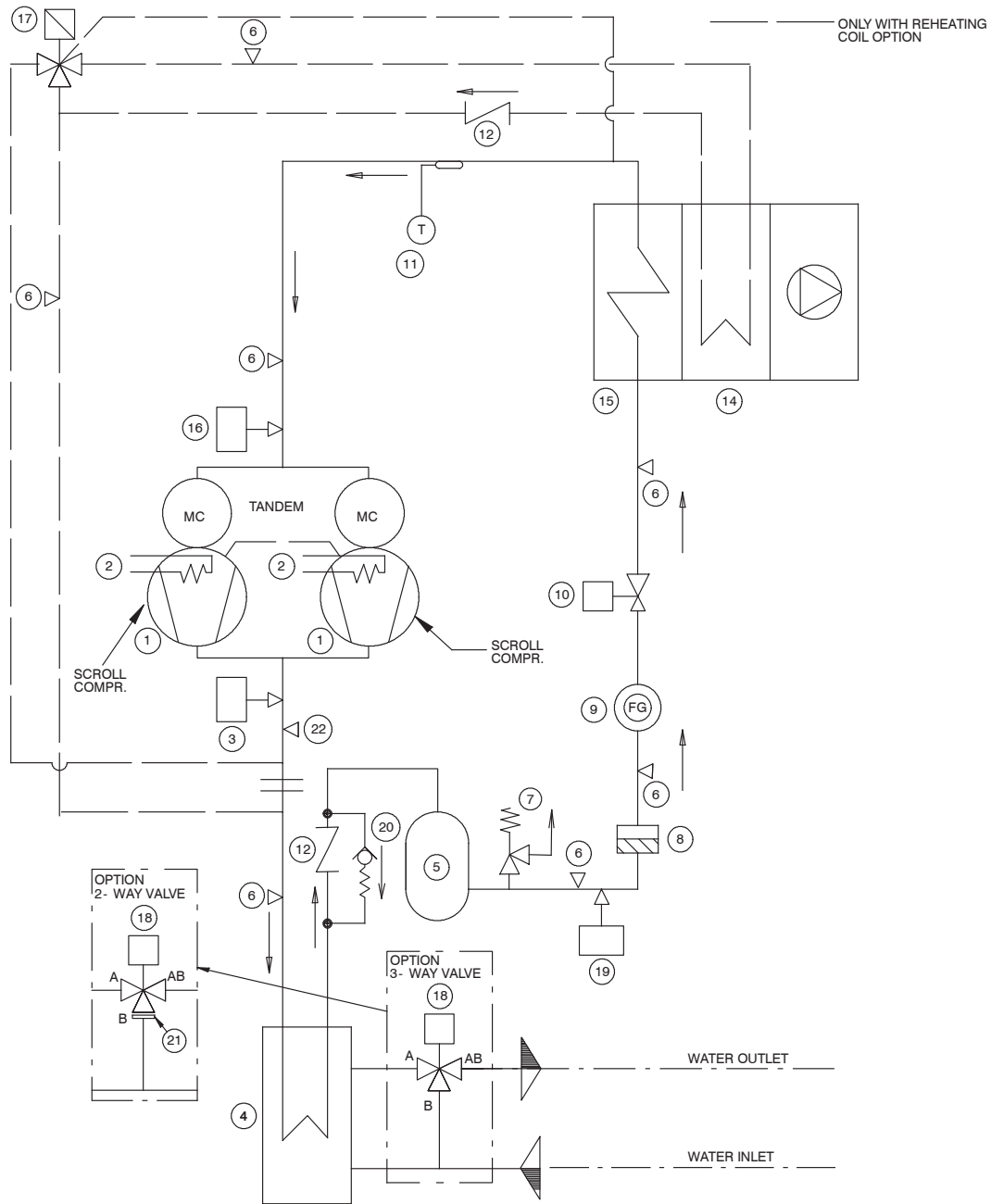
Fig. 14.16 - Refrigerant circuit W version - Single circuit - Single DIGITAL SCROLL compressor - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 12   | Check valve  |
| 2    | Crankcase heater                 | 13   | CHECK VALVE(OPTIONAL FOR PX015,PX021,PX025)          |
| 3    | High pressure switch (HP)        | 14   | Reheating coil (optional)                            |
| 4    | Water cooled condenser           | 15   | Evaporator   |
| 5    | Liquid receiver                  | 16   | Low pressure transducer                              |
| 6    | Access valve 5/16"               | 17   | Reheating solenoid valve (optional)                  |
| 7    | Safety valve                     | 18   | Condensing regulation water valve                    |
| 8    | Filter dryer                     | 19   | Pressure transducer condensing regulation            |
| 9    | Sight glass                      | 20   | Check valve 10 bar (145 psi)                         |
| 10   | Electronic expansion valve (EEV) | 21   | Blind disk - only with optional 2- way valve         |
| 11   | Temperature sensor for EEV       | 22   | NTC Temperature sensor for DIGITAL SCROLL compressor |
|      |                                  | 23   | Access valve 1/4"                                    |

# Refrigerant and Hydraulic Circuits

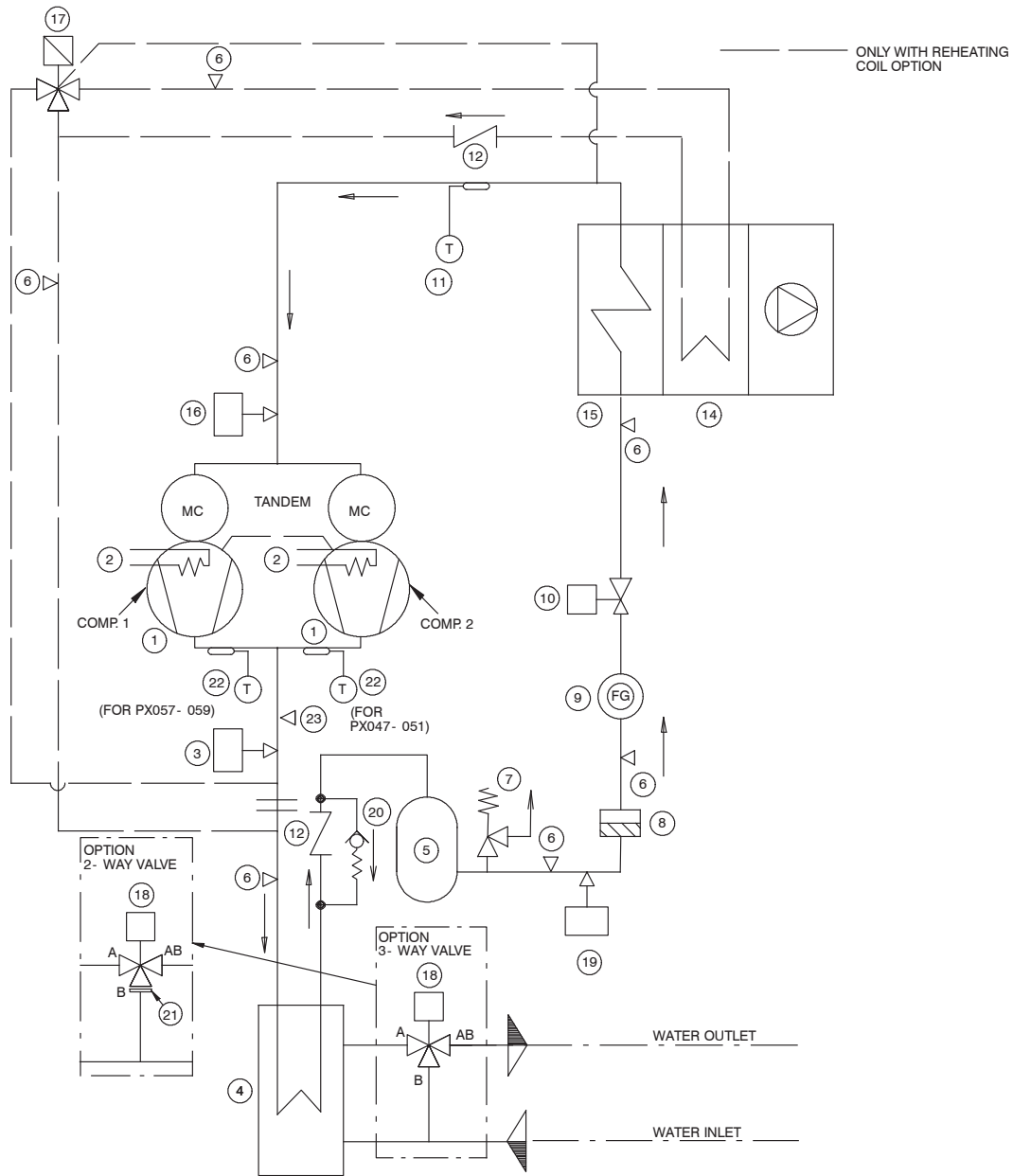
Fig. 14.17 - Refrigerant circuit W version - Single circuit - Tandem SCROLL compressors - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION                                  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 12   | Check valve                                  |
| 2    | Crankcase heater                 | 14   | Reheating coil (optional)                    |
| 3    | High pressure switch (HP)        | 15   | Evaporator                                   |
| 4    | Water cooled condenser           | 16   | Low pressure transducer                      |
| 5    | Liquid receiver                  | 17   | Reheating solenoid valve (optional)          |
| 6    | Access valve 5/16"               | 18   | Condensing regulation water valve            |
| 7    | Safety valve                     | 19   | Pressure transducer condensing regulation    |
| 8    | Filter dryer                     | 20   | Check valve 10 bar (145 psi)                 |
| 9    | Sight glass                      | 21   | Blind disk - only with optional 2- way valve |
| 10   | Electronic expansion valve (EEV) | 22   | Access valve 1/4"                            |
| 11   | Temperature sensor for EEV       |      |  |

# Refrigerant and Hydraulic Circuits

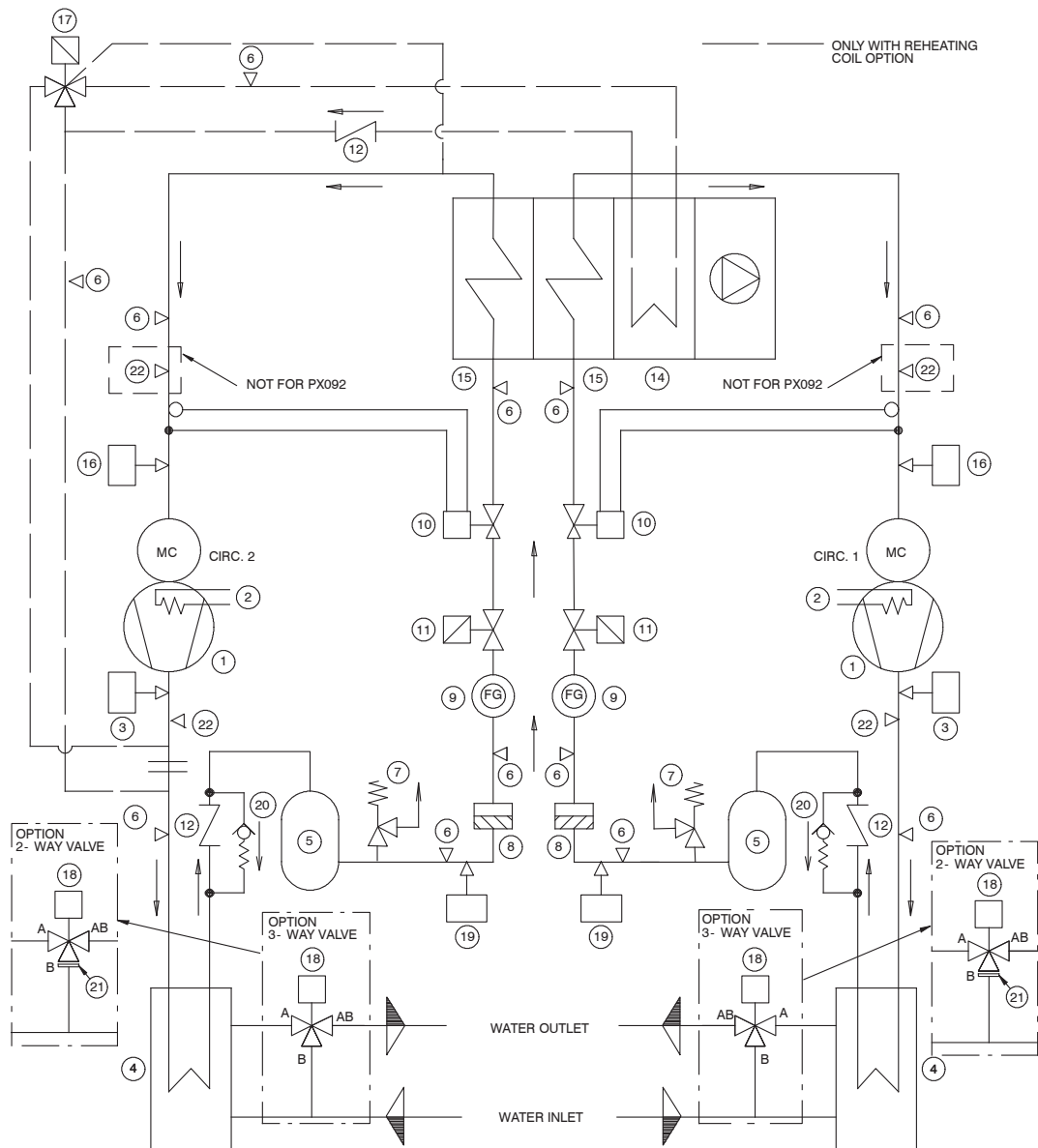
Fig. 14.18 - Refrigerant circuit W version - Single circuit - Tandem DIGITAL SCROLL compressors - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 13   | Pressure transducer for electronic expansion valve   |
| 2    | Crankcase heater                 | 14   | Reheating coil (optional)                            |
| 3    | High pressure switch (HP)        | 15   | Evaporator   |
| 4    | Water cooled condenser           | 16   | Low pressure transducer                              |
| 5    | Liquid receiver                  | 17   | Reheating solenoid valve (optional)                  |
| 6    | Access valve 5/16"               | 18   | Condensing regulation water valve                    |
| 7    | Safety valve                     | 19   | Pressure transducer condensing regulation            |
| 8    | Filter dryer                     | 20   | Check valve 10 bar (145 psi)                         |
| 9    | Sight glass                      | 21   | Blind disk - only with optional 2- way valve         |
| 10   | Electronic expansion valve (EEV) | 22   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 11   | Temperature sensor for EEV       | 23   | Access valve 1/4"                                    |
| 12   | Check valve                      |      |  |

# Refrigerant and Hydraulic Circuits

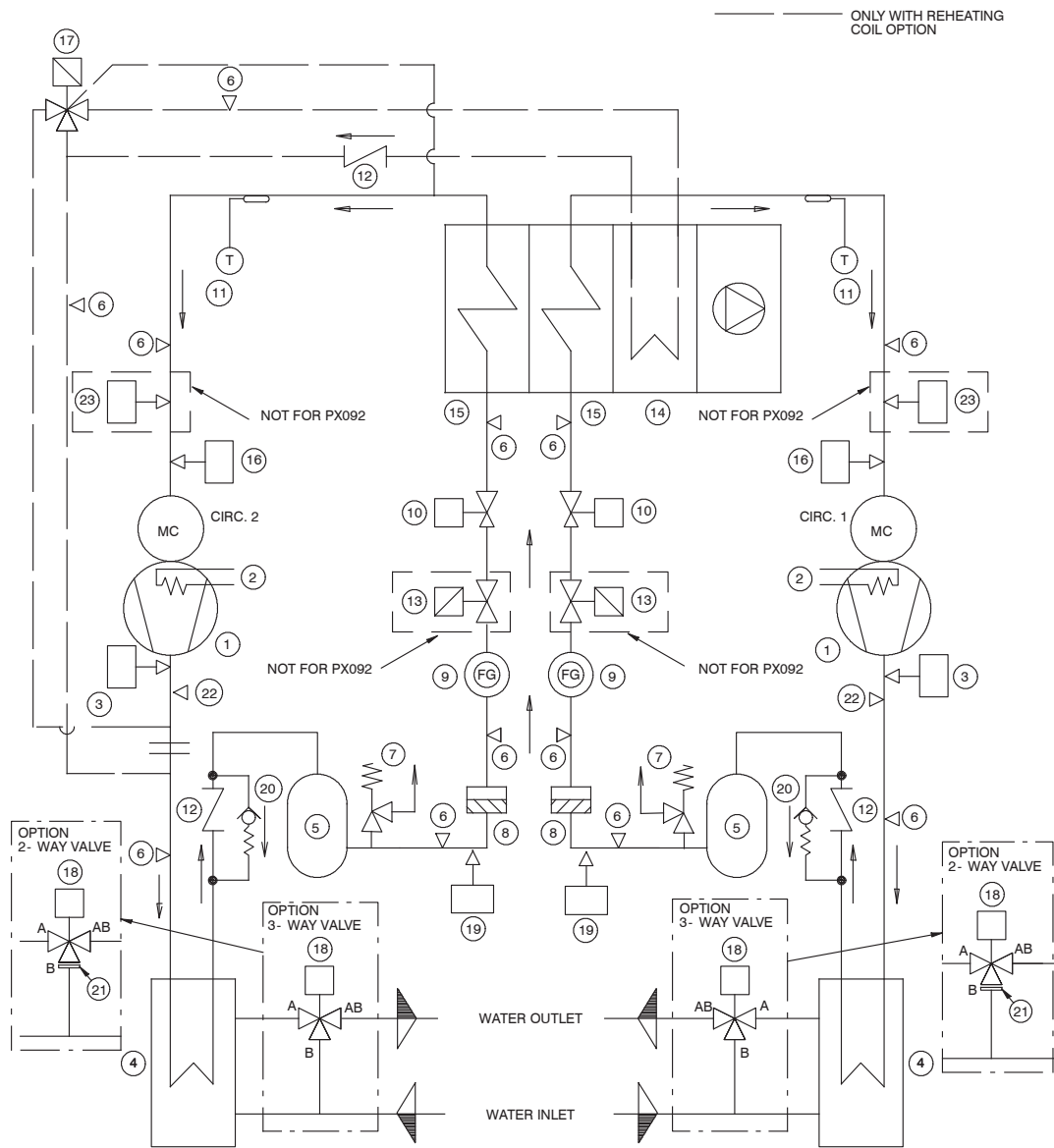
Fig. 14.19 - Refrigerant circuit W version - Dual circuits - Single SCROLL compressor - TXV



| POS. | DESCRIPTION                  | POS. | DESCRIPTION                                  |
|------|------------------------------|------|--|
| 1    | Compressor                   | 12   | Check valve                                  |
| 2    | Crankcase heater             | 14   | Reheating coil (optional)                    |
| 3    | High pressure switch (HP)    | 15   | Evaporator                                   |
| 4    | Water cooled condenser       | 16   | Low pressure transducer                      |
| 5    | Liquid receiver              | 17   | Reheating solenoid valve (optional)          |
| 6    | Access valve 5/16"           | 18   | Condensing regulation water valve            |
| 7    | Safety valve                 | 19   | Pressure transducer condensing regulation    |
| 8    | Filter dryer                 | 20   | Check valve 10 bar (145 psi)                 |
| 9    | Sight glass                  | 21   | Blind disk - only with optional 2- way valve |
| 10   | Thermostatic expansion valve | 22   | Access valve 1/4"                            |
| 11   | Shut- off solenoid valve     |      |  |

# Refrigerant and Hydraulic Circuits

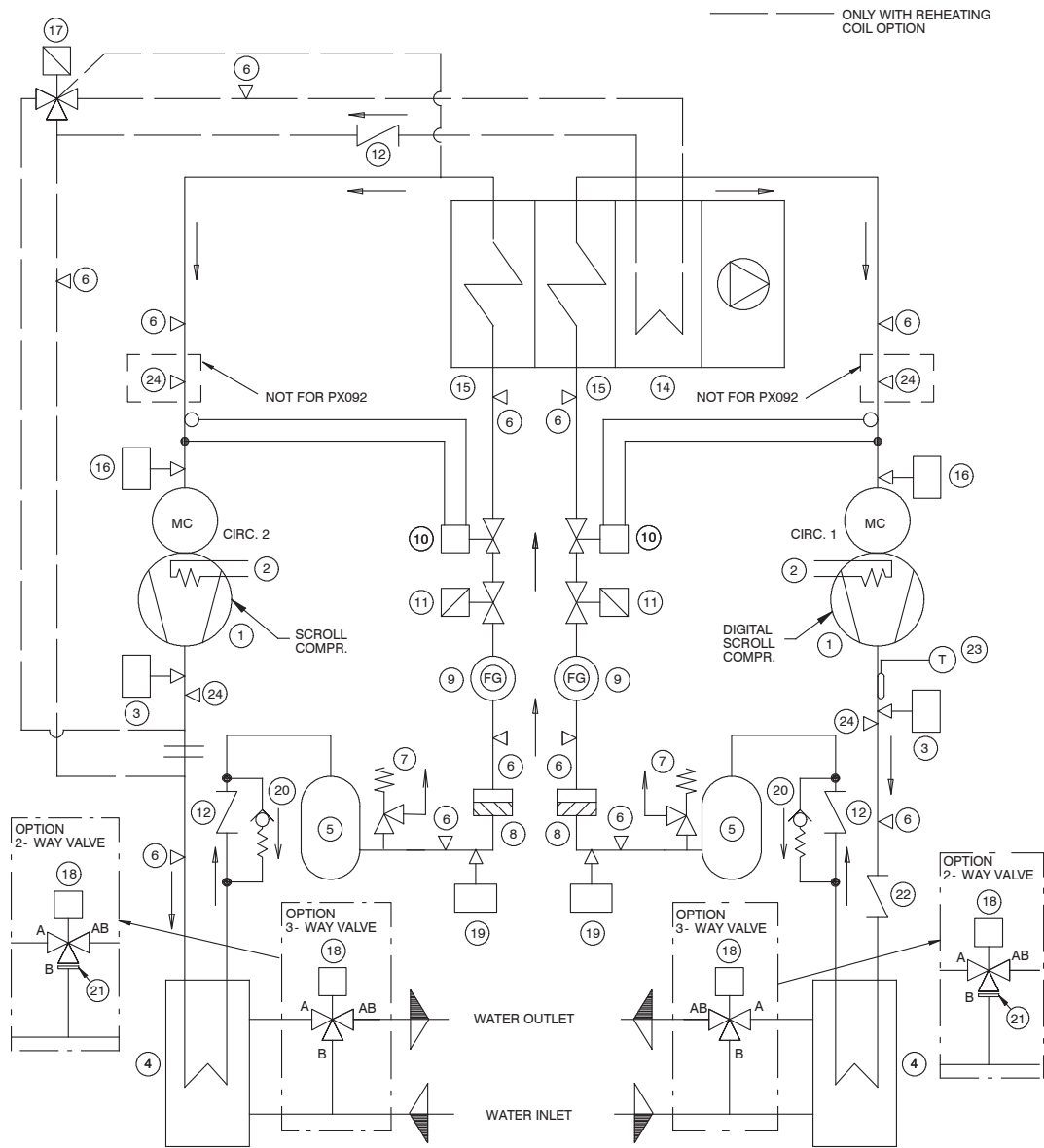
Fig. 14.20 - Refrigerant circuit W version - Dual circuits - Single SCROLL compressor - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION                                  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 13   | Shut-off solenoid valve (EEV)                |
| 2    | Crankcase heater                 | 14   | Reheating coil (optional)                    |
| 3    | High pressure switch (HP)        | 15   | Evaporator                                   |
| 4    | Water cooled condenser           | 16   | Low pressure transducer                      |
| 5    | Liquid receiver                  | 17   | Reheating solenoid valve (optional)          |
| 6    | Access valve 5/16"               | 18   | Condensing regulation water valve            |
| 7    | Safety valve                     | 19   | Pressure transducer condensing regulation    |
| 8    | Filter dryer                     | 20   | Check valve 10 bar (145 psi)                 |
| 9    | Sight glass                      | 21   | Blind disk - only with optional 2- way valve |
| 10   | Electronic expansion valve (EEV) | 22   | Access valve 1/4"                            |
| 11   | Temperature sensor for EEV       | 23   | Low pressure transducer EEV                  |
| 12   | Check valve                      |      |  |

# Refrigerant and Hydraulic Circuits

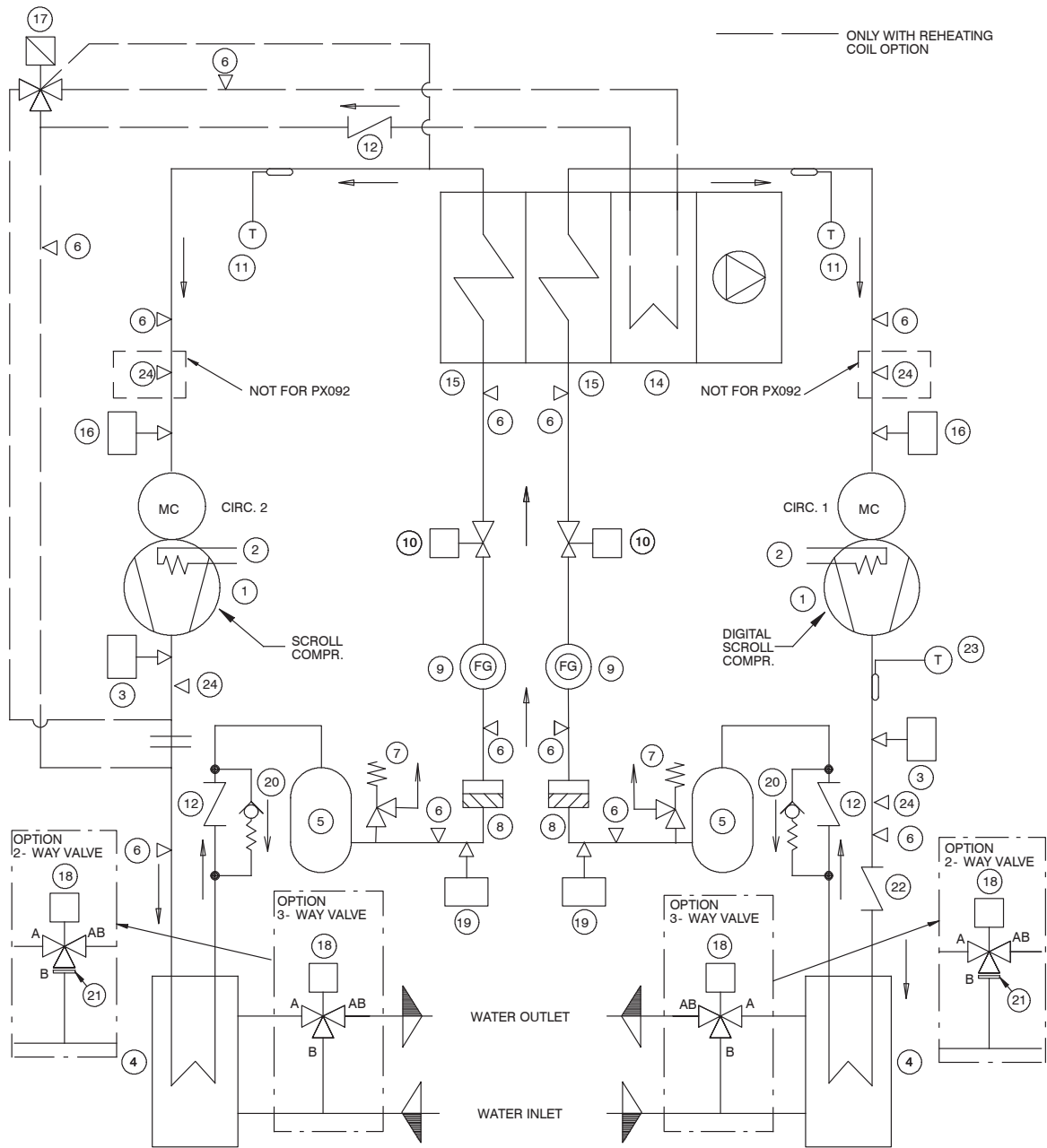
Fig. 14.21 - Refrigerant circuit W version - Dual circuits - Single SCROLL+DIGITAL SCROLL compressor - TXV



| POS. | DESCRIPTION                  | POS. | DESCRIPTION  |
|------|------------------------------|------|--|
| 1    | Compressor                   | 14   | Reheating coil (optional)                            |
| 2    | Crankcase heater             | 15   | Evaporator   |
| 3    | High pressure switch (HP)    | 16   | Low pressure transducer                              |
| 4    | Water cooled condenser       | 17   | Reheating solenoid valve (optional)                  |
| 5    | Liquid receiver              | 18   | Condensing regulation water valve                    |
| 6    | Access valve 5/16"           | 19   | Pressure transducer condensing regulation            |
| 7    | Safety valve                 | 20   | Check valve 10 bar (145 psi)                         |
| 8    | Filter dryer                 | 21   | Blind disk - only with optional 2- way valve         |
| 9    | Sight glass                  | 22   | Check valve for PX044 - 054                          |
| 10   | Thermostatic expansion valve | 23   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 11   | Shut- off solenoid valve     | 24   | Access valve 1/4"                                    |
| 12   | Check valve                  |      |  |

# Refrigerant and Hydraulic Circuits

Fig. 14.22 - Refrigerant circuit W version - Dual circuits - Single SCROLL+DIGITAL SCROLL compressor - EEV

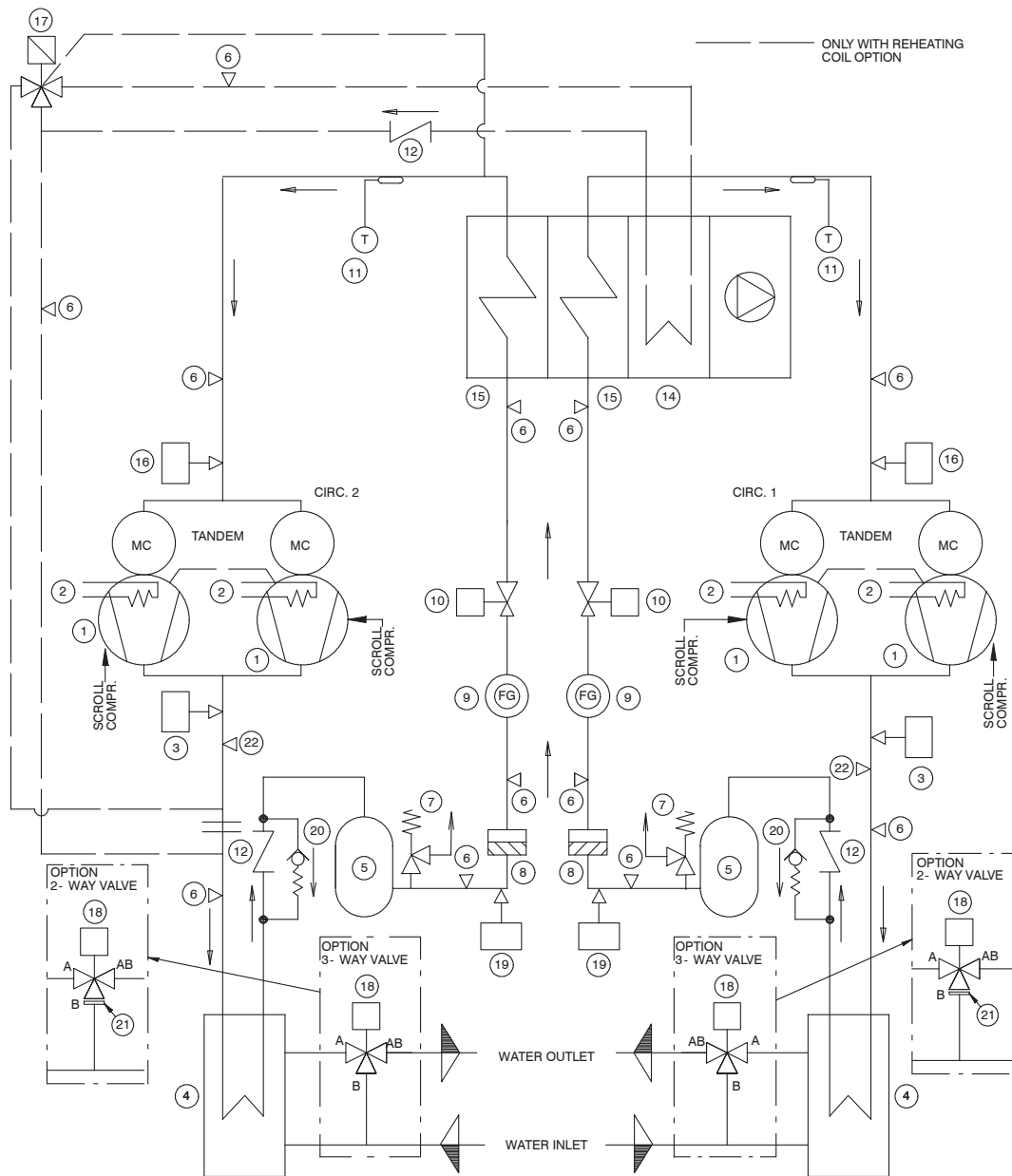


| POS. | DESCRIPTION                      | POS. | DESCRIPTION  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 14   | Reheating coil (optional)                            |
| 2    | Crankcase heater                 | 15   | Evaporator   |
| 3    | High pressure switch (HP)        | 16   | Low pressure transducer                              |
| 4    | Water cooled condenser           | 17   | Reheating solenoid valve (optional)                  |
| 5    | Liquid receiver                  | 18   | Condensing regulation water valve                    |
| 6    | Access valve 5/16"               | 19   | Pressure transducer condensing regulation            |
| 7    | Safety valve                     | 20   | Check valve 10 bar (145 psi)                         |
| 8    | Filter dryer                     | 21   | Blind disk - only with optional 2- way valve         |
| 9    | Sight glass                      | 22   | Check valve for PX044 - 054                          |
| 10   | Electronic expansion valve (EEV) | 23   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 11   | Temperature sensor for EEV       | 24   | Access valve 1/4"                                    |
| 12   | Check valve                      |      |  |



# Refrigerant and Hydraulic Circuits

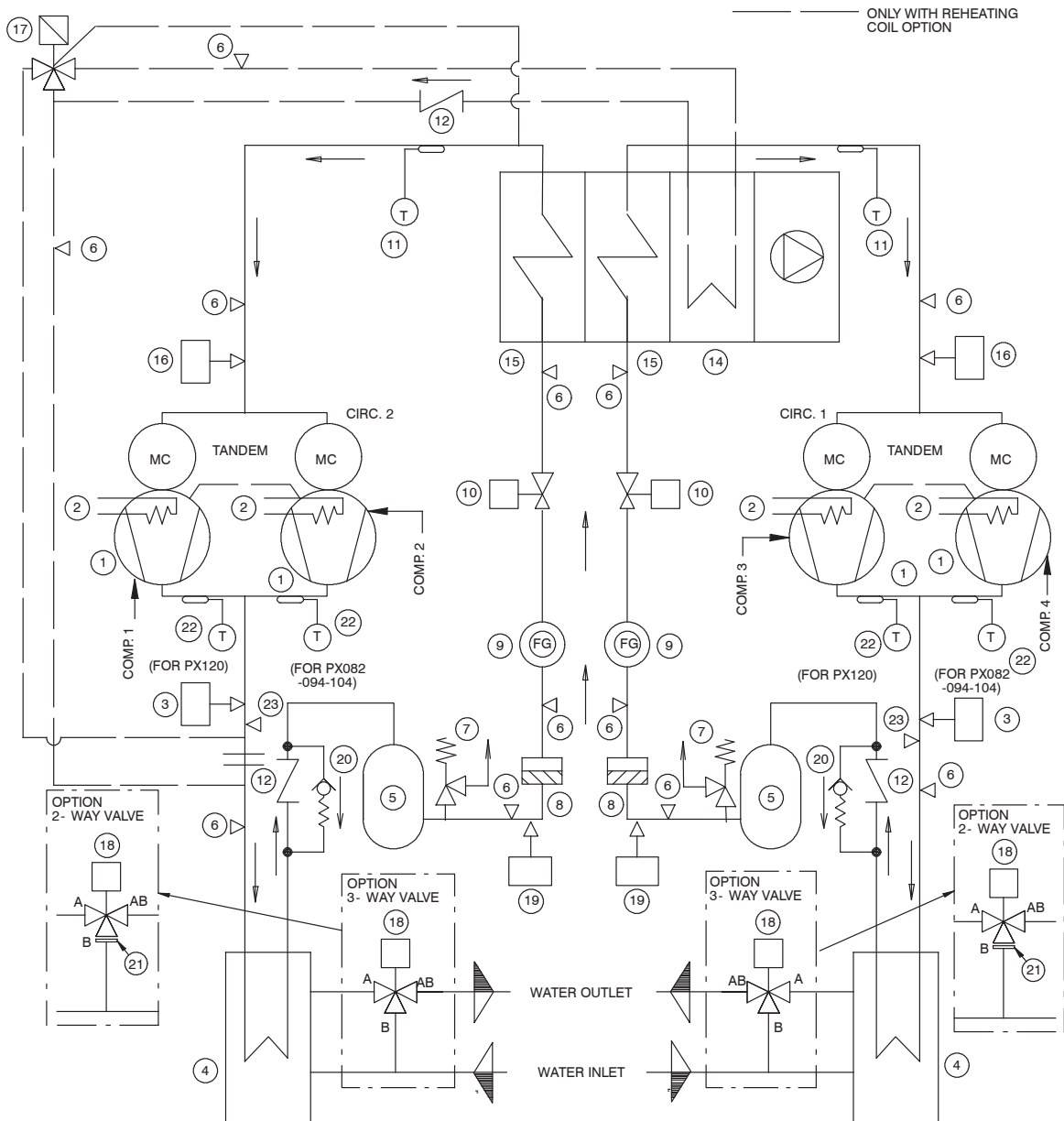
Fig. 14.23 - Refrigerant circuit W version - Dual circuits - Tandem SCROLL compressors - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION                                  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 12   | Check valve                                  |
| 2    | Crankcase heater                 | 14   | Reheating coil (optional)                    |
| 3    | High pressure switch (HP)        | 15   | Evaporator                                   |
| 4    | Water cooled condenser           | 16   | Low pressure transducer                      |
| 5    | Liquid receiver                  | 17   | Reheating solenoid valve (optional)          |
| 6    | Access valve 5/16"               | 18   | Condensing regulation water valve            |
| 7    | Safety valve                     | 19   | Pressure transducer condensing regulation    |
| 8    | Filter dryer                     | 20   | Check valve 10 bar (145 psi)                 |
| 9    | Sight glass                      | 21   | Blind disk - only with optional 2- way valve |
| 10   | Electronic expansion valve (EEV) | 22   | Access valve 1/4"                            |
| 11   | Temperature sensor for EEV       |      |  |

# Refrigerant and Hydraulic Circuits

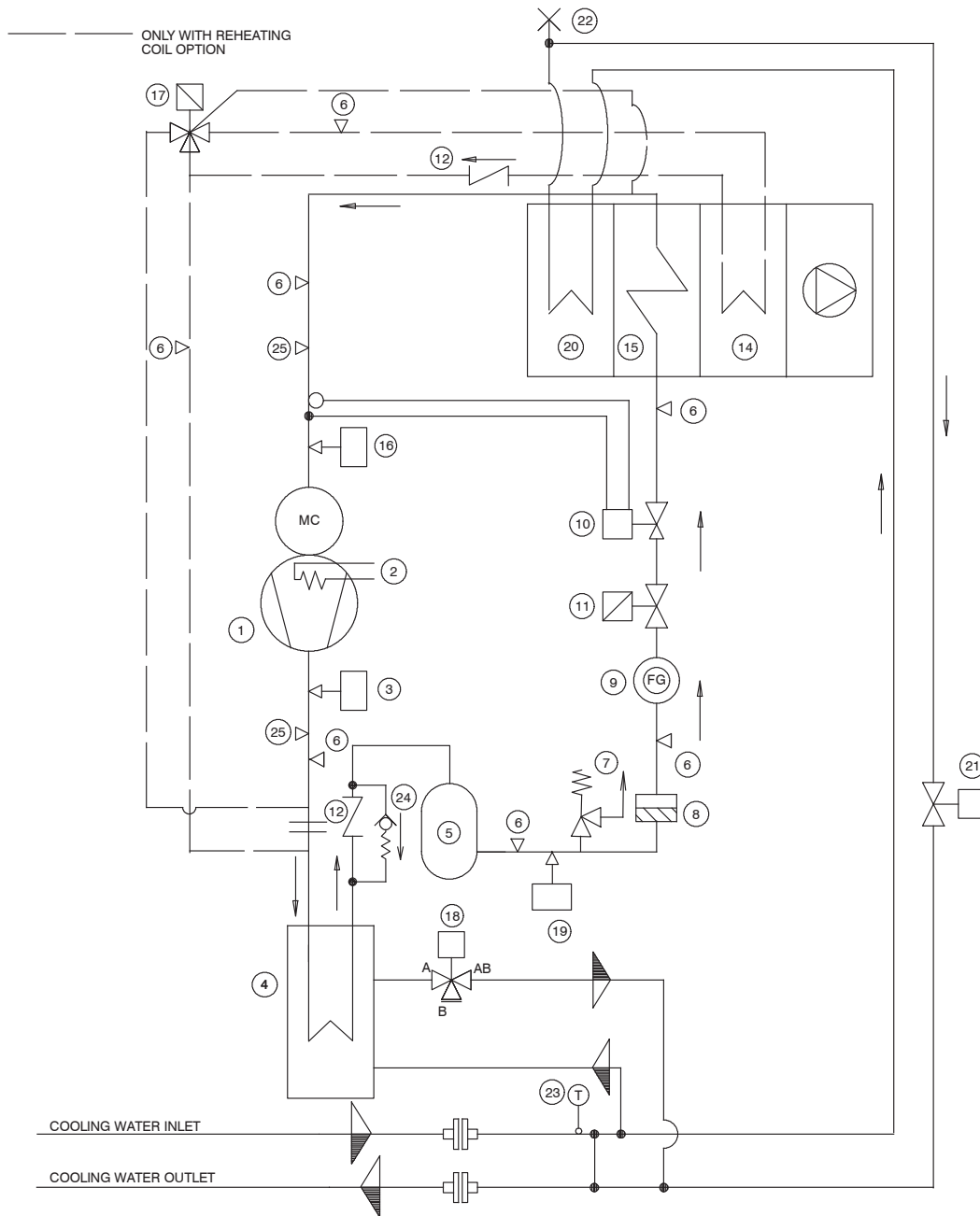
Fig. 14.24 - Refrigerant circuit W version - Dual circuits - Tandem DIGITAL SCROLL compressors - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 12   | Check valve  |
| 2    | Crankcase heater                 | 14   | Reheating coil (optional)                            |
| 3    | High pressure switch (HP)        | 15   | Evaporator   |
| 4    | Water cooled condenser           | 16   | Low pressure transducer                              |
| 5    | Liquid receiver                  | 17   | Reheating solenoid valve (optional)                  |
| 6    | Access valve 5/16"               | 18   | Condensing regulation water valve                    |
| 7    | Safety valve                     | 19   | Pressure transducer condensing regulation            |
| 8    | Filter dryer                     | 20   | Check valve 10 bar (145 psi)                         |
| 9    | Sight glass                      | 21   | Blind disk - only with optional 2- way valve         |
| 10   | Electronic expansion valve (EEV) | 22   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 11   | Temperature sensor for EEV       | 23   | Access valve 1/4"                                    |

# Refrigerant and Hydraulic Circuits

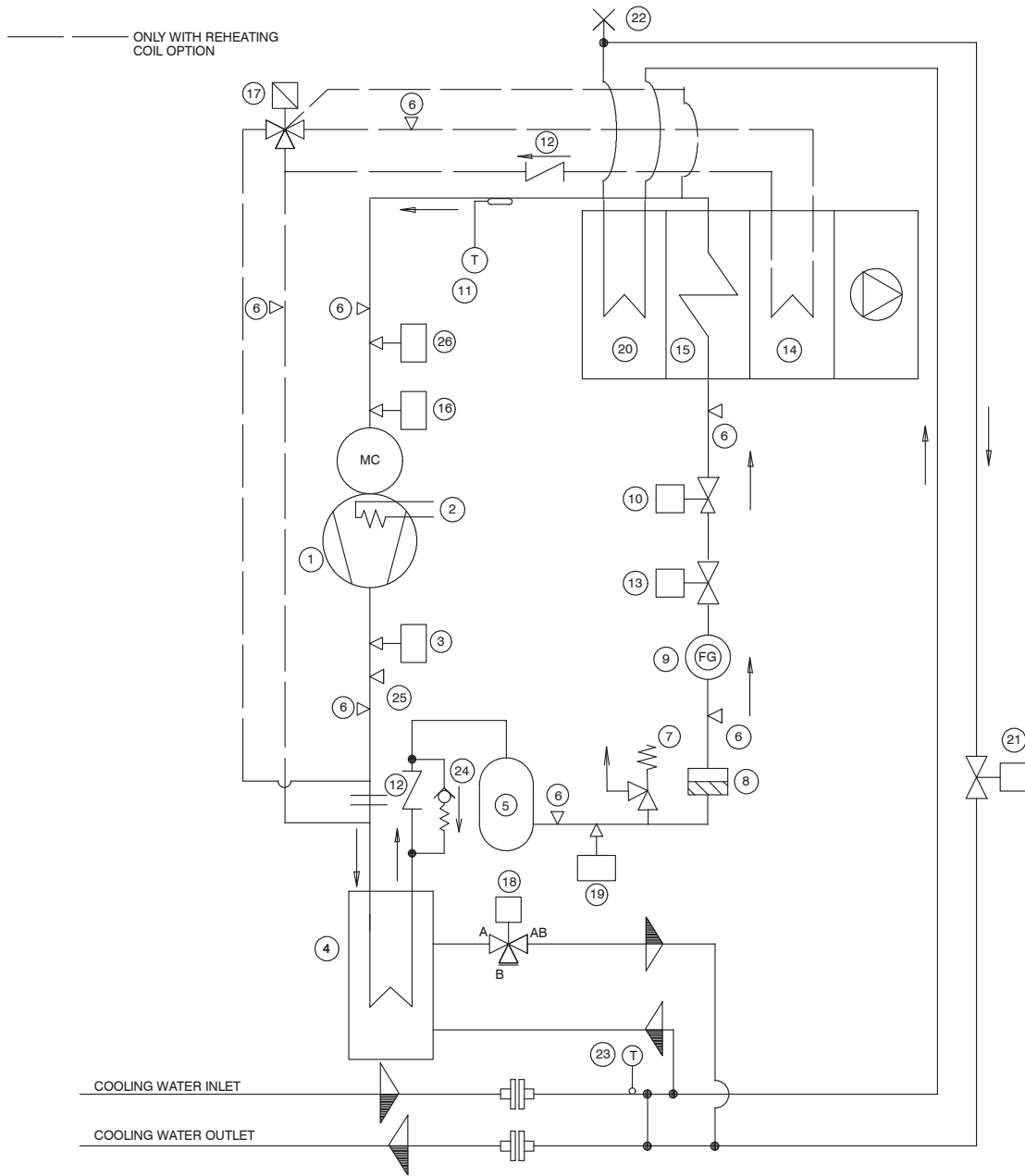
Fig. 14.25 - Refrigerant circuit F version - Single circuit - Single SCROLL compressor - TXV



| POS. | DESCRIPTION                  | POS. | DESCRIPTION                               |
|------|------------------------------|------|---|
| 1    | Compressor                   | 14   | Reheating coil (optional)                 |
| 2    | Crankcase heater             | 15   | Evaporator                                |
| 3    | High pressure switch (HP)    | 16   | Low pressure transducer                   |
| 4    | Water cooled condenser       | 17   | Reheating solenoid valve (optional)       |
| 5    | Liquid receiver              | 18   | Condensing regulation water valve         |
| 6    | Access valve 5/16"           | 19   | Pressure transducer condensing regulation |
| 7    | Safety valve                 | 20   | Chilled water coil                        |
| 8    | Filter dryer                 | 21   | Chilled water 2- way valve                |
| 9    | Sight glass                  | 22   | Manual bleed valve                        |
| 10   | Thermostatic expansion valve | 23   | Inlet water sensor                        |
| 11   | Shut- off solenoid valve     | 24   | Check valve 10 bar (145 psi)              |
| 12   | Check valve                  | 25   | Access valve 1/4"                         |

# Refrigerant and Hydraulic Circuits

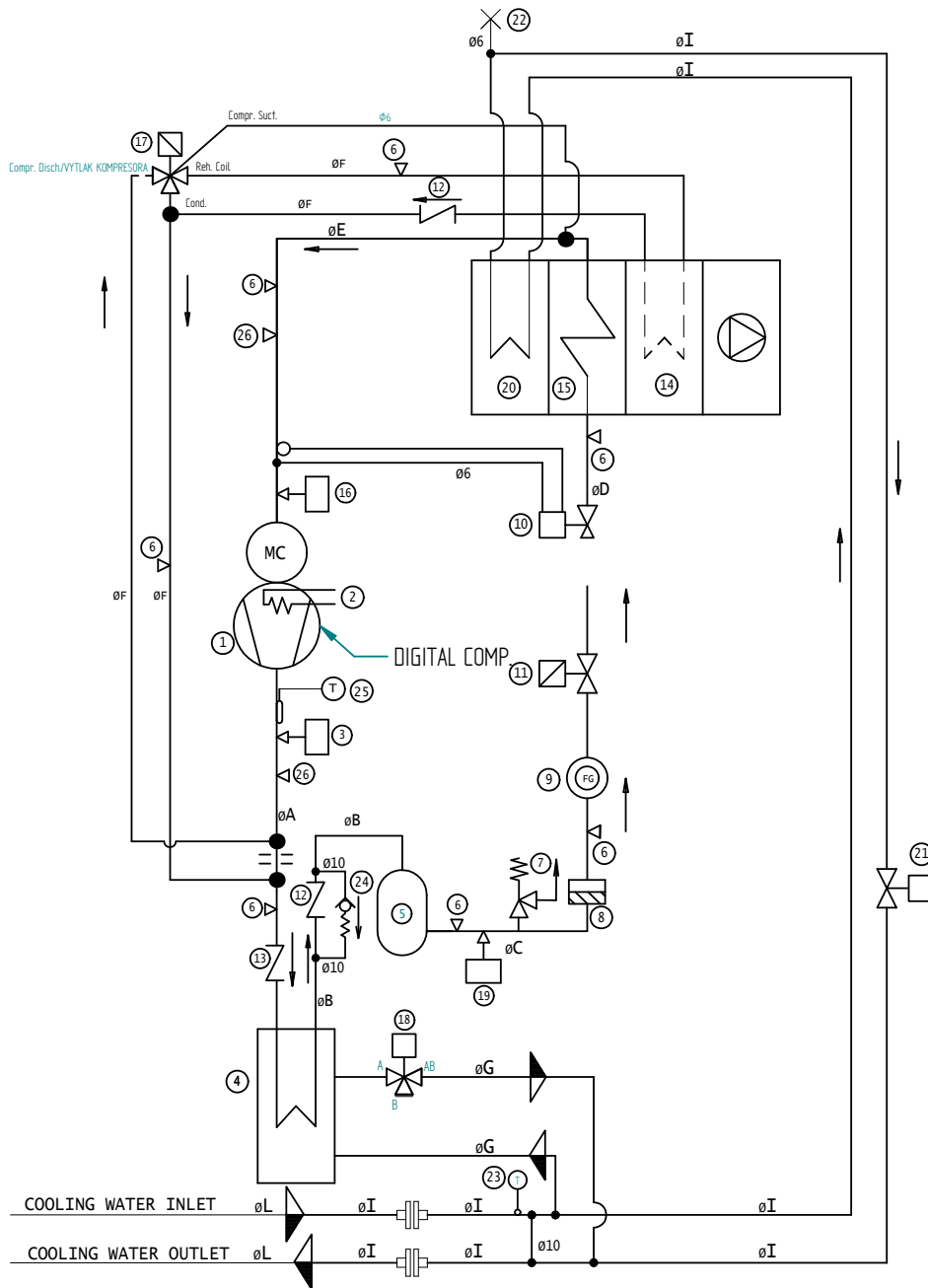
Fig. 14.26 - Refrigerant circuit F version - Single circuit - Single SCROLL compressor - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION                               |
|------|----------------------------------|------|---|
| 1    | Compressor                       | 14   | Reheating coil (optional)                 |
| 2    | Crankcase heater                 | 15   | Evaporator                                |
| 3    | High pressure switch (HP)        | 16   | Low pressure transducer                   |
| 4    | Water cooled condenser           | 17   | Reheating solenoid valve (optional)       |
| 5    | Liquid receiver                  | 18   | Condensing regulation water valve         |
| 6    | Access valve 5/16"               | 19   | Pressure transducer condensing regulation |
| 7    | Safety valve                     | 20   | Chilled water coil                        |
| 8    | Filter dryer                     | 21   | Chilled water 2- way valve                |
| 9    | Sight glass                      | 22   | Manual bleed valve                        |
| 10   | Electronic expansion valve (EEV) | 23   | Inlet water sensor                        |
| 11   | Temperature sensor for EEV       | 24   | Check valve 10 bar (145 psi)              |
| 12   | Check valve                      | 25   | Access valve 1/4"                         |
| 13   | Shut-off solenoid valve (EEV)    | 26   | Shut-off solenoid valve                   |

# Refrigerant and Hydraulic Circuits

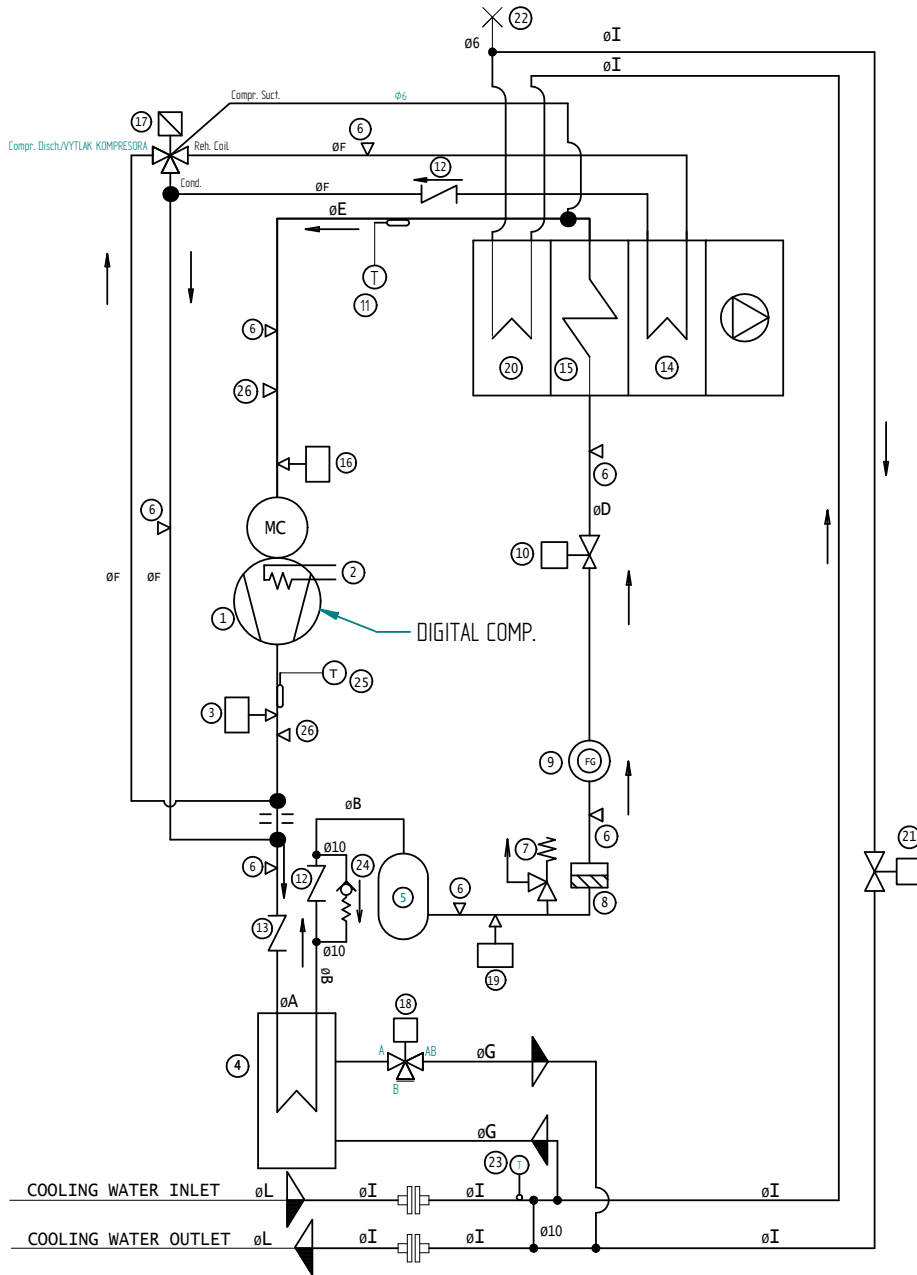
Fig. 14.27 - Refrigerant circuit F version - Single circuit - Single DIGITAL SCROLL compressor - TXV



| POS. | DESCRIPTION                              | POS. | DESCRIPTION  |
|------|--|------|--|
| 1    | Compressor                               | 14   | Reheating coil (optional)                            |
| 2    | Crankcase heater                         | 15   | Evaporator   |
| 3    | High pressure switch (HP)                | 16   | Low pressure transducer                              |
| 4    | Water cooled condenser                   | 17   | Reheating solenoid valve (optional)                  |
| 5    | Liquid receiver                          | 18   | Condensing regulation water valve                    |
| 6    | Access valve 5/16"                       | 19   | Pressure transducer condensing regulation            |
| 7    | Safety valve                             | 20   | Chilled water coil                                   |
| 8    | Filter dryer                             | 21   | Chilled water 2- way valve                           |
| 9    | Sight glass                              | 22   | Manual bleed valve                                   |
| 10   | Thermostatic expansion valve             | 23   | Inlet water sensor                                   |
| 11   | Shut- off solenoid valve                 | 24   | Check valve 10 bar (145 psi)                         |
| 12   | Check valve                              | 25   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 13   | CHECK VALVE (ONLY FOR PX015,021,025,031) | 26   | Access valve 1/4"                                    |

# Refrigerant and Hydraulic Circuits

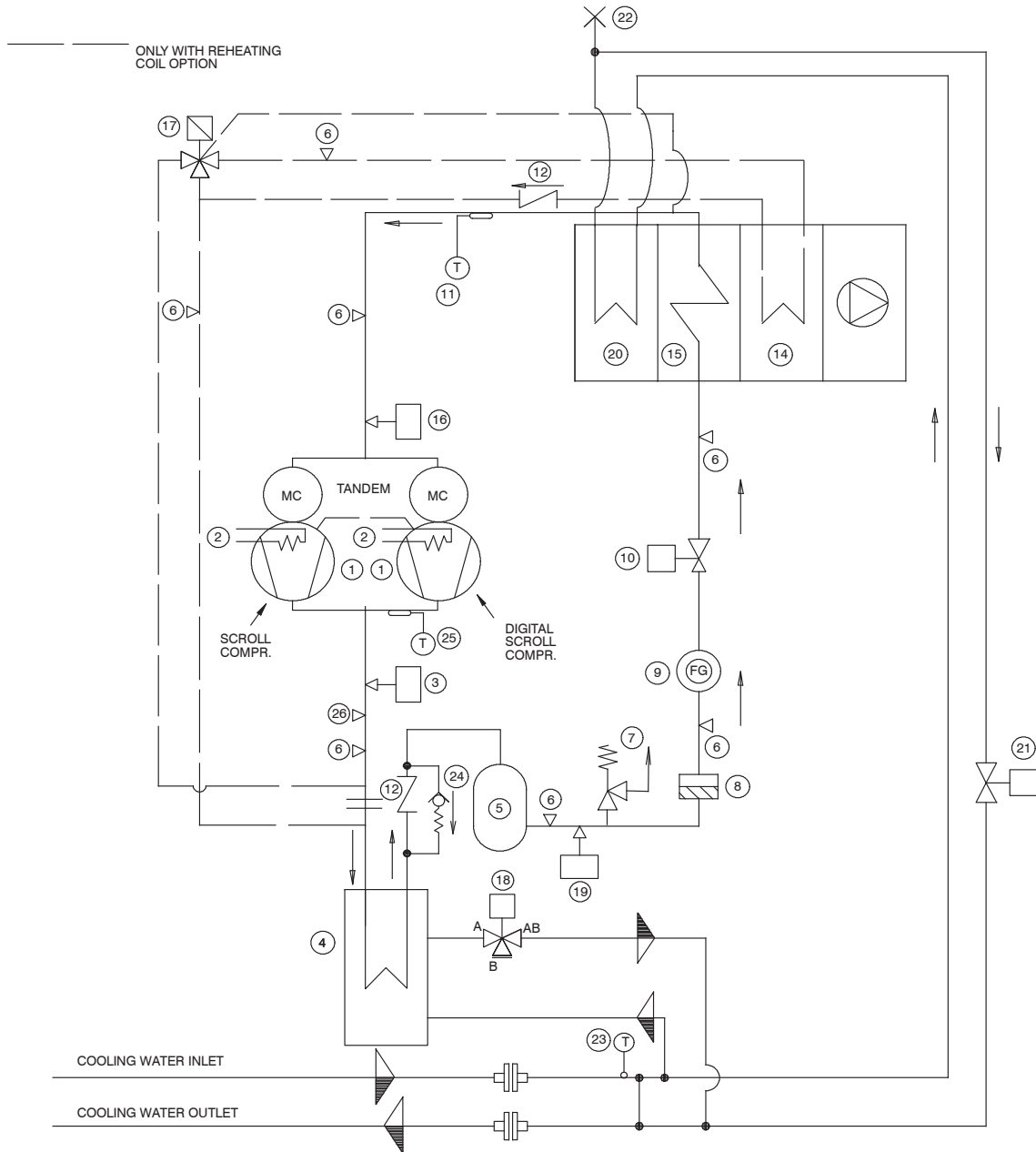
Fig. 14.28 - Refrigerant circuit F version - Single circuit - Single DIGITAL SCROLL compressor - EEV



| POS. | DESCRIPTION                             | POS. | DESCRIPTION  |
|------|---|------|--|
| 1    | Compressor                              | 14   | Reheating coil (optional)                            |
| 2    | Crankcase heater                        | 15   | Evaporator   |
| 3    | High pressure switch (HP)               | 16   | Low pressure transducer                              |
| 4    | Water cooled condenser                  | 17   | Reheating solenoid valve (optional)                  |
| 5    | Liquid receiver                         | 18   | Condensing regulation water valve                    |
| 6    | Access valve 5/16"                      | 19   | Pressure transducer condensing regulation            |
| 7    | Safety valve                            | 20   | Chilled water coil                                   |
| 8    | Filter dryer                            | 21   | Chilled water 2- way valve                           |
| 9    | Sight glass                             | 22   | Manual bleed valve                                   |
| 10   | Electronic expansion valve (EEV)        | 23   | Inlet water sensor                                   |
| 11   | Temperature sensor for EEV              | 24   | Check valve 10 bar (145 psi)                         |
| 12   | Check valve                             | 25   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 13   | CHECK VALVE(ONLY FOR PX015,021,025,031) | 26   | Access valve 1/4"                                    |

# Refrigerant and Hydraulic Circuits

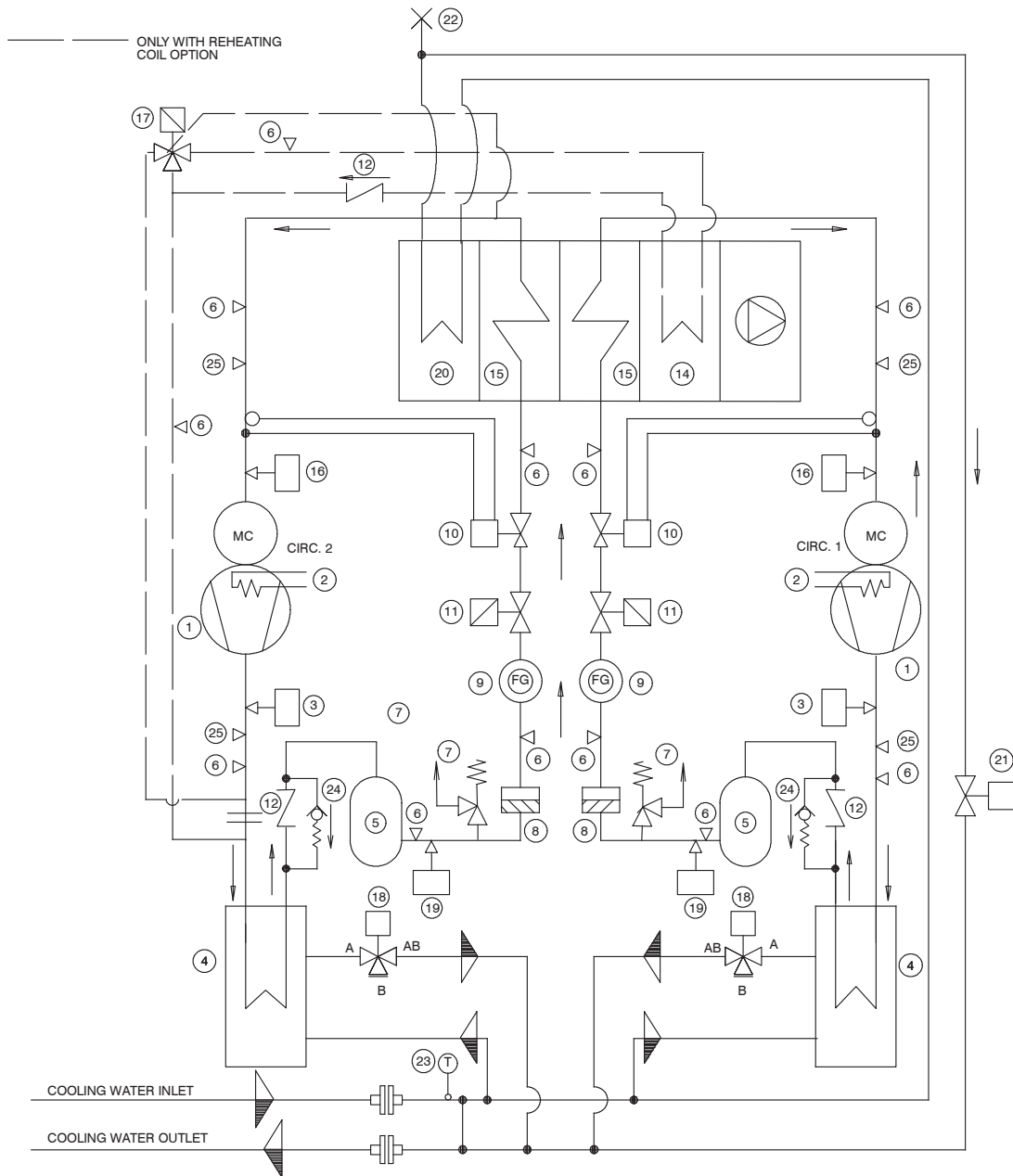
Fig. 14.29 - Refrigerant circuit F version - Single circuit - Tandem DIGITAL SCROLL compressors - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 15   | Evaporator   |
| 2    | Crankcase heater                 | 16   | Low pressure transducer                              |
| 3    | High pressure switch (HP)        | 17   | Reheating solenoid valve (optional)                  |
| 4    | Water cooled condenser           | 18   | Condensing regulation water valve                    |
| 5    | Liquid receiver                  | 19   | Pressure transducer condensing regulation            |
| 6    | Access valve 5/16"               | 20   | Chilled water coil                                   |
| 7    | Safety valve                     | 21   | Chilled water 2- way valve                           |
| 8    | Filter dryer                     | 22   | Manual bleed valve                                   |
| 9    | Sight glass                      | 23   | Inlet water sensor                                   |
| 10   | Electronic expansion valve (EEV) | 24   | Check valve 10 bar (145 psi)                         |
| 11   | Temperature sensor for EEV       | 25   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 12   | Check valve                      | 26   | Access valve 1/4"                                    |
| 14   | Reheating coil (optional)        |      |  |

# Refrigerant and Hydraulic Circuits

Fig. 14.30 - Refrigerant circuit F version - Dual circuits - Single SCROLL compressor - TXV

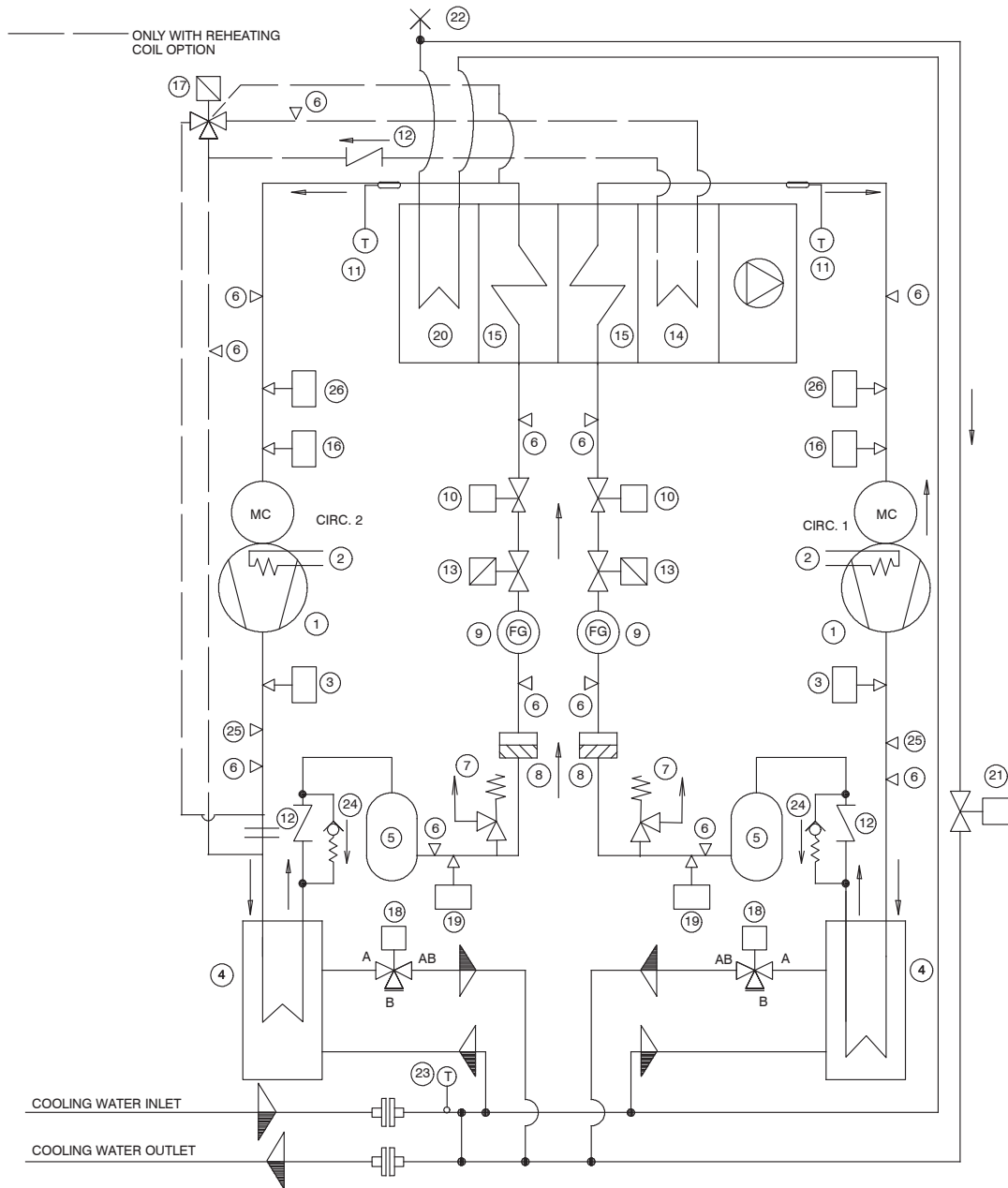


| POS. | DESCRIPTION                  | POS. | DESCRIPTION                               |
|------|------------------------------|------|---|
| 1    | Compressor                   | 14   | Reheating coil (optional)                 |
| 2    | Crankcase heater             | 15   | Evaporator                                |
| 3    | High pressure switch (HP)    | 16   | Low pressure transducer                   |
| 4    | Water cooled condenser       | 17   | Reheating solenoid valve (optional)       |
| 5    | Liquid receiver              | 18   | Condensing regulation water valve         |
| 6    | Access valve 5/16"           | 19   | Pressure transducer condensing regulation |
| 7    | Safety valve                 | 20   | Chilled water coil                        |
| 8    | Filter dryer                 | 21   | Chilled water 2- way valve                |
| 9    | Sight glass                  | 22   | Manual bleed valve                        |
| 10   | Thermostatic expansion valve | 23   | Inlet water sensor                        |
| 11   | Shut- off solenoid valve     | 24   | Check valve 10 bar (145 psi)              |
| 12   | Check valve                  | 25   | Access valve 1/4"                         |



# Refrigerant and Hydraulic Circuits

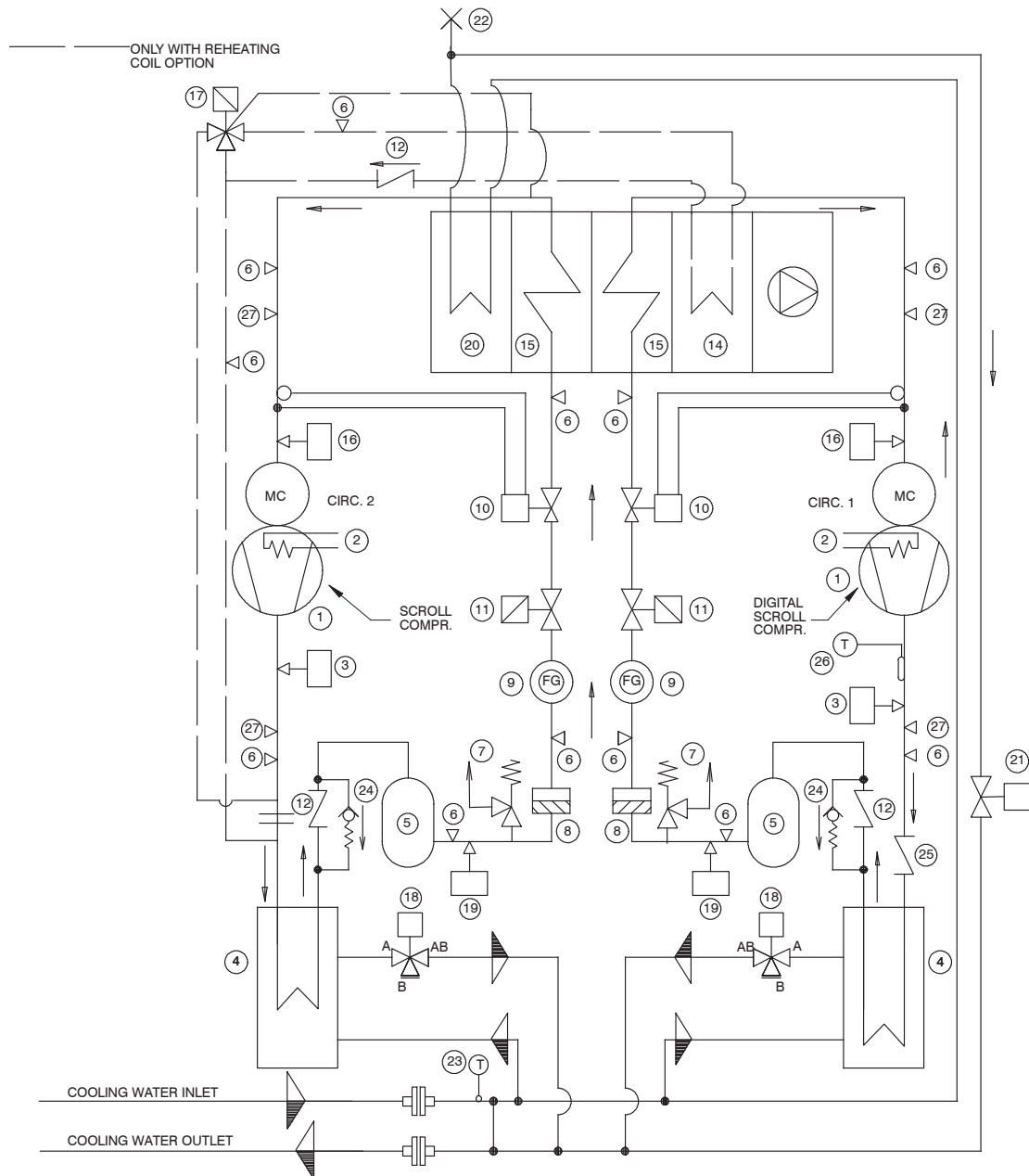
Fig. 14.31 - Refrigerant circuit F version - Dual circuits - Single SCROLL compressor - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION                               |
|------|----------------------------------|------|---|
| 1    | Compressor                       | 14   | Reheating coil (optional)                 |
| 2    | Crankcase heater                 | 15   | Evaporator                                |
| 3    | High pressure switch (HP)        | 16   | Low pressure transducer                   |
| 4    | Water cooled condenser           | 17   | Reheating solenoid valve (optional)       |
| 5    | Liquid receiver                  | 18   | Condensing regulation water valve         |
| 6    | Access valve 5/16"               | 19   | Pressure transducer condensing regulation |
| 7    | Safety valve                     | 20   | Chilled water coil                        |
| 8    | Filter dryer                     | 21   | Chilled water 2- way valve                |
| 9    | Sight glass                      | 22   | Manual bleed valve                        |
| 10   | Electronic expansion valve (EEV) | 23   | Inlet water sensor                        |
| 11   | Temperature sensor for EEV       | 24   | Check valve 10 bar (145 psi)              |
| 12   | Check valve                      | 25   | Access valve 1/4"                         |
| 13   | Shut- off solenoid valve         | 26   | Low pressure transducer EEV               |

# Refrigerant and Hydraulic Circuits

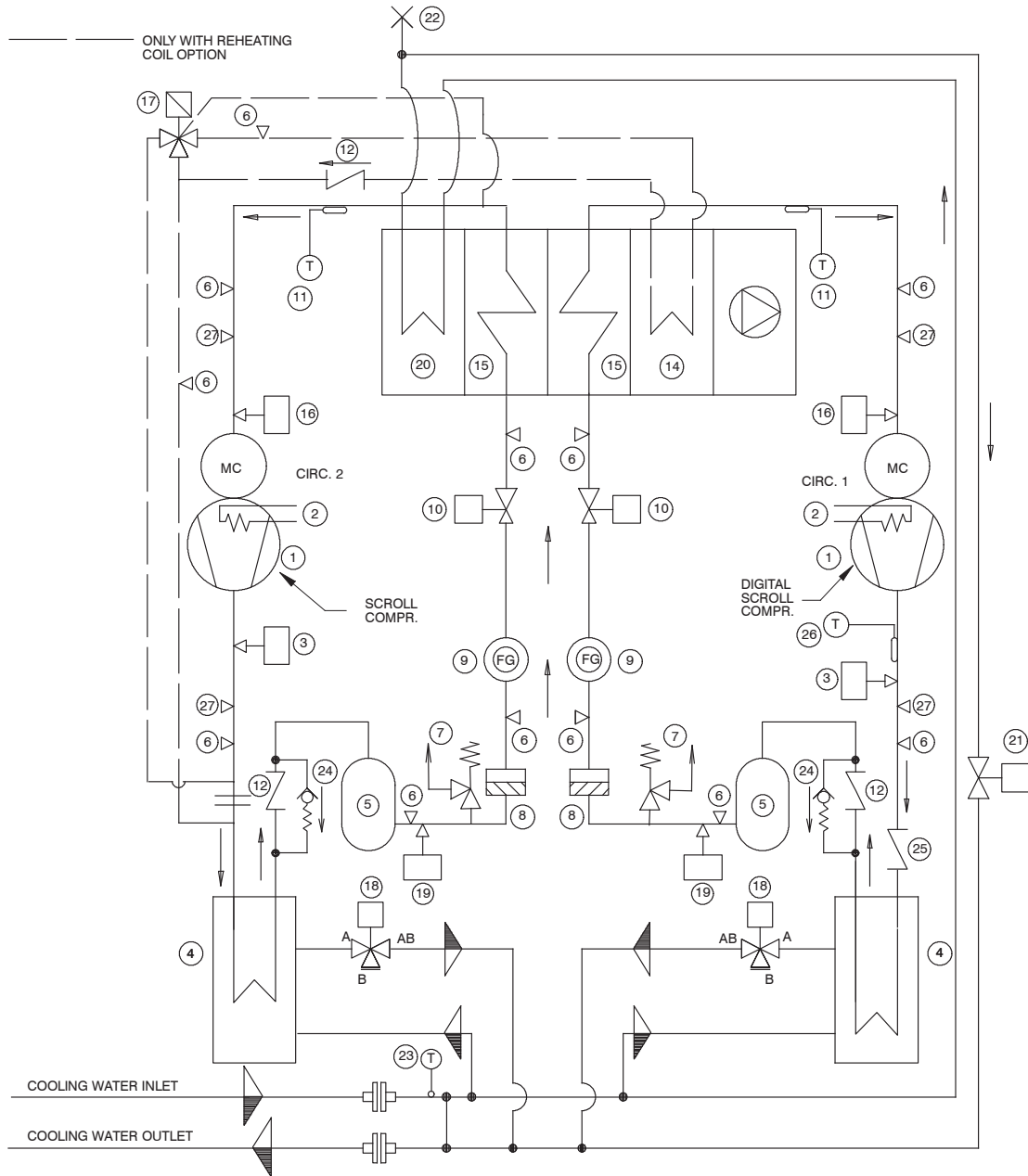
Fig. 14.32 - Refrigerant circuit F version - Dual circuits - Single SCROLL+DIGITAL SCROLL compressor - TXV



| POS. | DESCRIPTION                  | POS. | DESCRIPTION  |
|------|------------------------------|------|--|
| 1    | Compressor                   | 15   | Evaporator   |
| 2    | Crankcase heater             | 16   | Low pressure transducer                              |
| 3    | High pressure switch (HP)    | 17   | Reheating solenoid valve (optional)                  |
| 4    | Water cooled condenser       | 18   | Condensing regulation water valve                    |
| 5    | Liquid receiver              | 19   | Pressure transducer condensing regulation            |
| 6    | Access valve 5/16"           | 20   | Chilled water coil                                   |
| 7    | Safety valve                 | 21   | Chilled water 2- way valve                           |
| 8    | Filter dryer                 | 22   | Manual bleed valve                                   |
| 9    | Sight glass                  | 23   | Inlet water sensor                                   |
| 10   | Thermostatic expansion valve | 24   | Check valve 10 bar (145 psi)                         |
| 11   | Shut- off solenoid valve     | 25   | Check valve for PX044 - 054                          |
| 12   | Check valve                  | 26   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 14   | Reheating coil (optional)    | 27   | Access valve 1/4"                                    |

# Refrigerant and Hydraulic Circuits

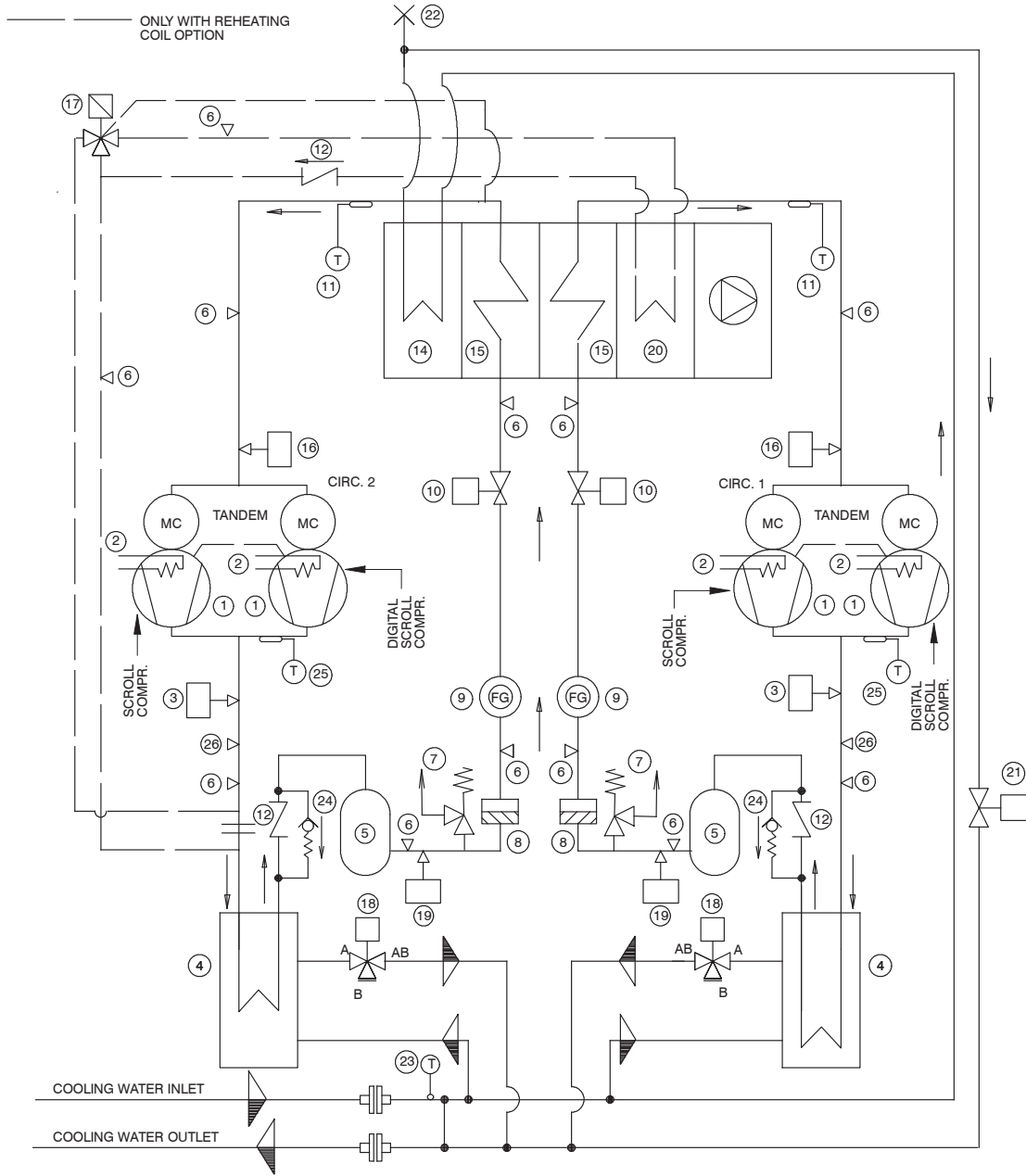
Fig. 14.33 - Refrigerant circuit F version - Dual circuits - Single SCROLL+DIGITAL SCROLL compressor - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 15   | Evaporator   |
| 2    | Crankcase heater                 | 16   | Low pressure transducer                              |
| 3    | High pressure switch (HP)        | 17   | Reheating solenoid valve (optional)                  |
| 4    | Water cooled condenser           | 18   | Condensing regulation water valve                    |
| 5    | Liquid receiver                  | 19   | Pressure transducer condensing regulation            |
| 6    | Access valve 5/16"               | 20   | Chilled water coil                                   |
| 7    | Safety valve                     | 21   | Chilled water 2- way valve                           |
| 8    | Filter dryer                     | 22   | Manual bleed valve                                   |
| 9    | Sight glass                      | 23   | Inlet water sensor                                   |
| 10   | Electronic expansion valve (EEV) | 24   | Check valve 10 bar (145 psi)                         |
| 11   | Temperature sensor for EEV       | 25   | Check valve for PX044 - 054                          |
| 12   | Check valve                      | 26   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 14   | Reheating coil (optional)        | 27   | Access valve 1/4"                                    |

# Refrigerant and Hydraulic Circuits

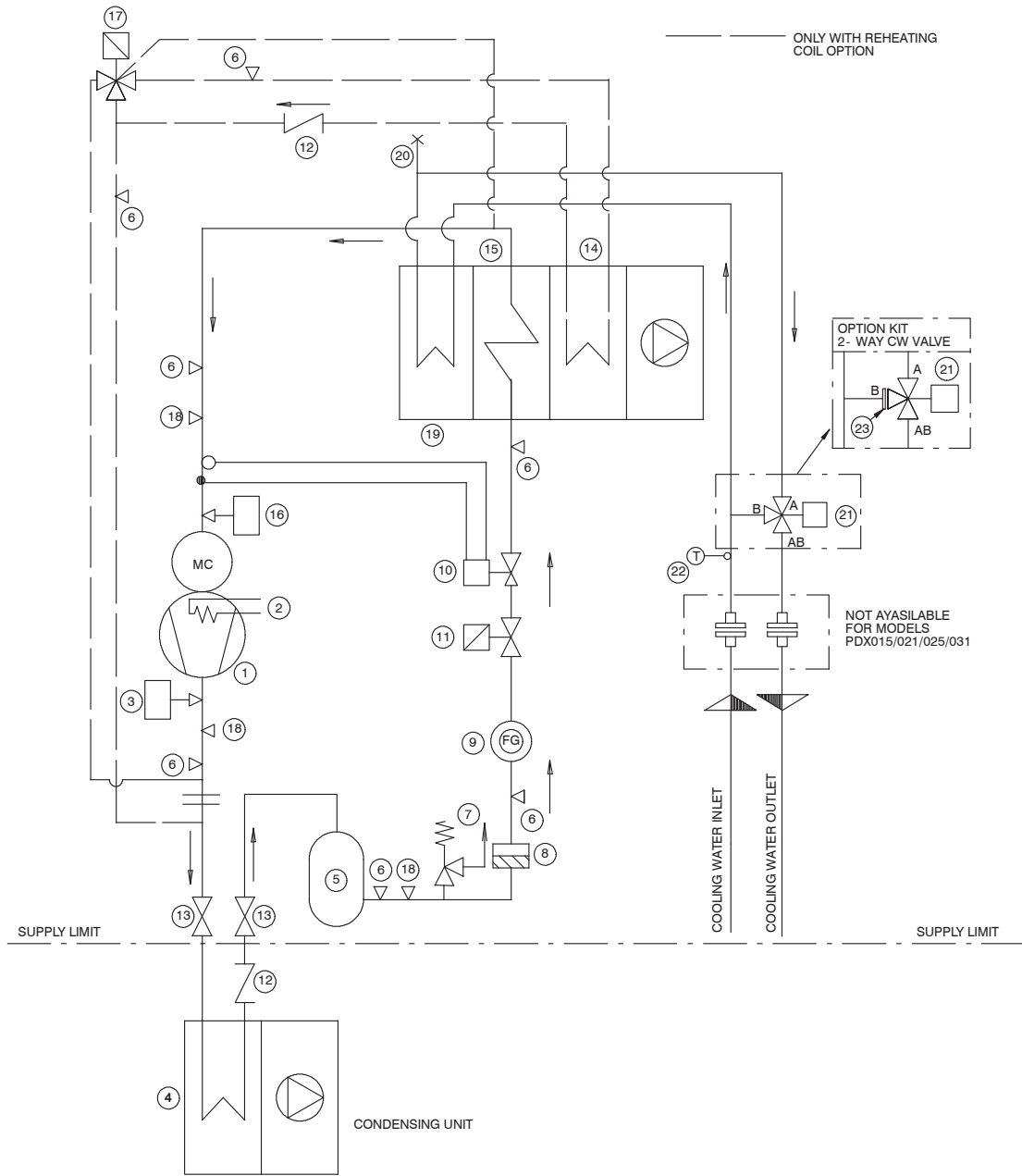
Fig. 14.34 - Refrigerant circuit F version - Dual circuits - Tandem DIGITAL SCROLL compressors - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 15   | Evaporator   |
| 2    | Crankcase heater                 | 16   | Low pressure transducer                              |
| 3    | High pressure switch (HP)        | 17   | Reheating solenoid valve (optional)                  |
| 4    | Water cooled condenser           | 18   | Condensing regulation water valve                    |
| 5    | Liquid receiver                  | 19   | Pressure transducer condensing regulation            |
| 6    | Access valve 5/16"               | 20   | Chilled water coil                                   |
| 7    | Safety valve                     | 21   | Chilled water 2- way valve                           |
| 8    | Filter dryer                     | 22   | Manual bleed valve                                   |
| 9    | Sight glass                      | 23   | Inlet water sensor                                   |
| 10   | Electronic expansion valve (EEV) | 24   | Check valve 10 bar (145 psi)                         |
| 11   | Temperature sensor for EEV       | 25   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 12   | Check valve                      | 26   | Access valve 1/4"                                    |
| 14   | Reheating coil (optional)        |      |  |

# Refrigerant and Hydraulic Circuits

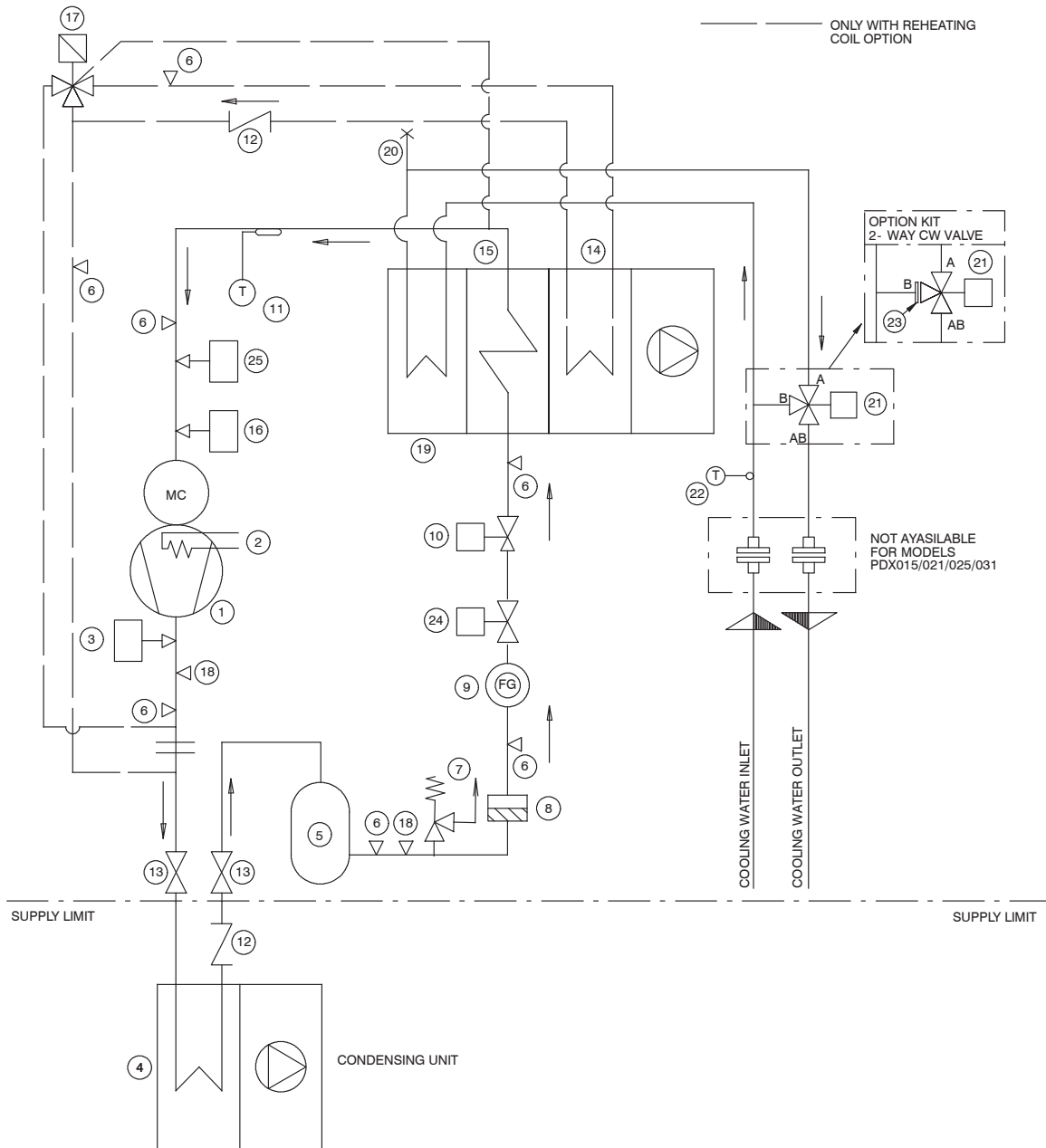
Fig. 14.35 - Refrigerant circuit D version - Single circuit - Single SCROLL compressor - TXV



| POS. | DESCRIPTION                  | POS. | DESCRIPTION                                     |
|------|------------------------------|------|---|
| 1    | Compressor                   | 13   | Shut- off valve                                 |
| 2    | Crankcase heater             | 14   | Reheating coil (optional)                       |
| 3    | High pressure switch (HP)    | 15   | Evaporator                                      |
| 4    | Air cooled condenser         | 16   | Low pressure transducer                         |
| 5    | Liquid receiver              | 17   | Reheating solenoid valve (optional)             |
| 6    | Access valve 5/16"           | 18   | Access valve 1/4"                               |
| 7    | Safety valve                 | 19   | Chilled water coil                              |
| 8    | Filter dryer                 | 20   | Manual bleed valve                              |
| 9    | Sight glass                  | 21   | Chilled water 3- way valve                      |
| 10   | Thermostatic expansion valve | 22   | Inlet water sensor                              |
| 11   | Shut- off solenoid valve     | 23   | Blind disk - only with optional 2- way CW valve |
| 12   | Check valve                  |      |   |

# Refrigerant and Hydraulic Circuits

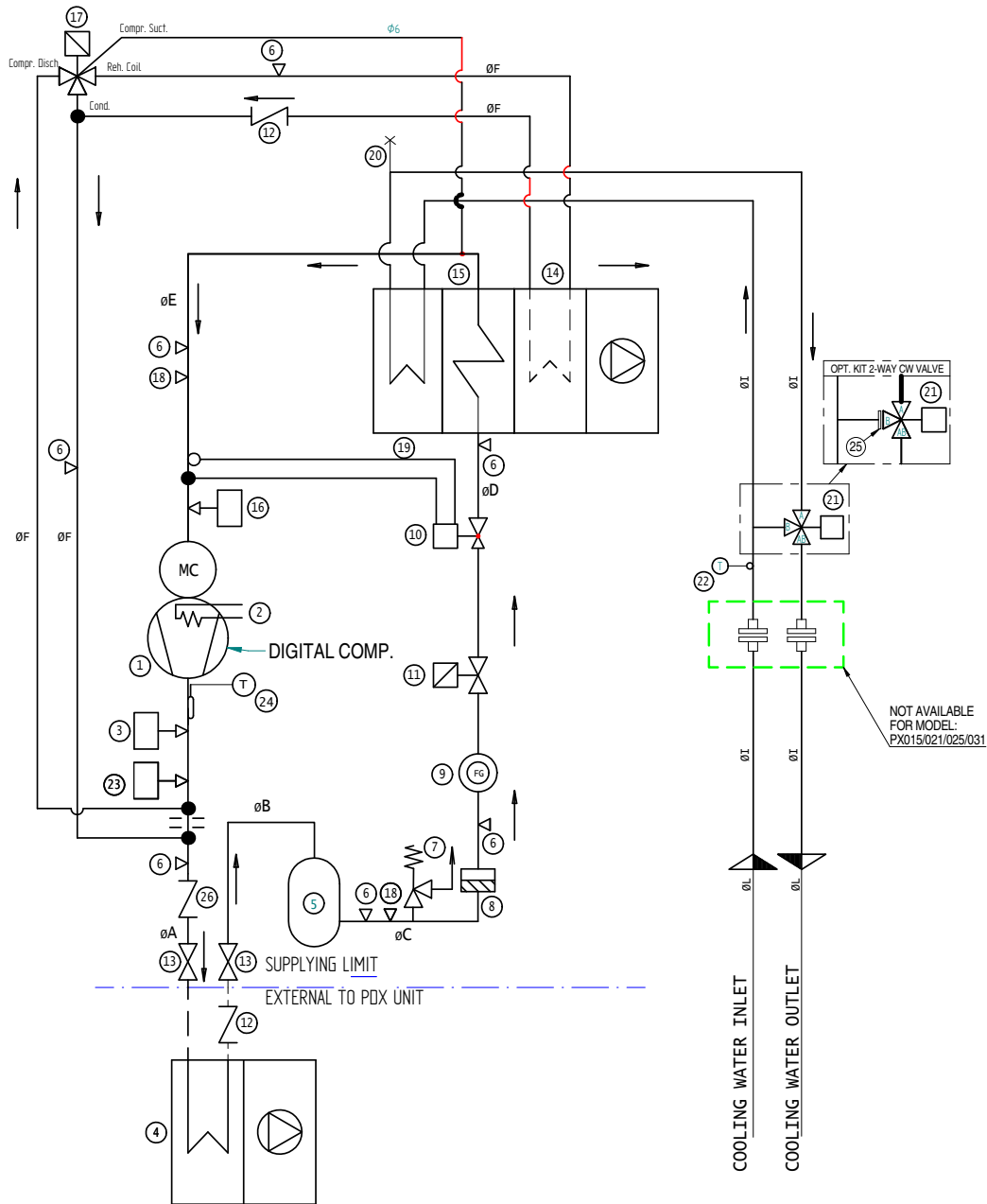
Fig. 14.36 - Refrigerant circuit D version - Single circuit - Single SCROLL compressor - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION                                     |
|------|----------------------------------|------|---|
| 1    | Compressor                       | 13   | Shut-off valve                                  |
| 2    | Crankcase heater                 | 14   | Reheating coil (optional)                       |
| 3    | High pressure switch (HP)        | 15   | Evaporator                                      |
| 4    | Air cooled condenser             | 16   | Low pressure transducer EEV                     |
| 5    | Liquid receiver                  | 17   | Reheating solenoid valve (optional)             |
| 6    | Access valve 5/16"               | 18   | Access valve 1/4"                               |
| 7    | Safety valve                     | 19   | Chilled water coil                              |
| 8    | Filter dryer                     | 20   | Manual bleed valve                              |
| 9    | Sight glass                      | 21   | Chilled water 3- way valve                      |
| 10   | Electronic expansion valve (EEV) | 22   | Inlet water sensor                              |
| 11   | Temperature sensor for EEV       | 23   | Blind disk - only with optional 2- way CW valve |
| 12   | Check valve                      | 24   | Shut-off solenoid valve                         |

# Refrigerant and Hydraulic Circuits

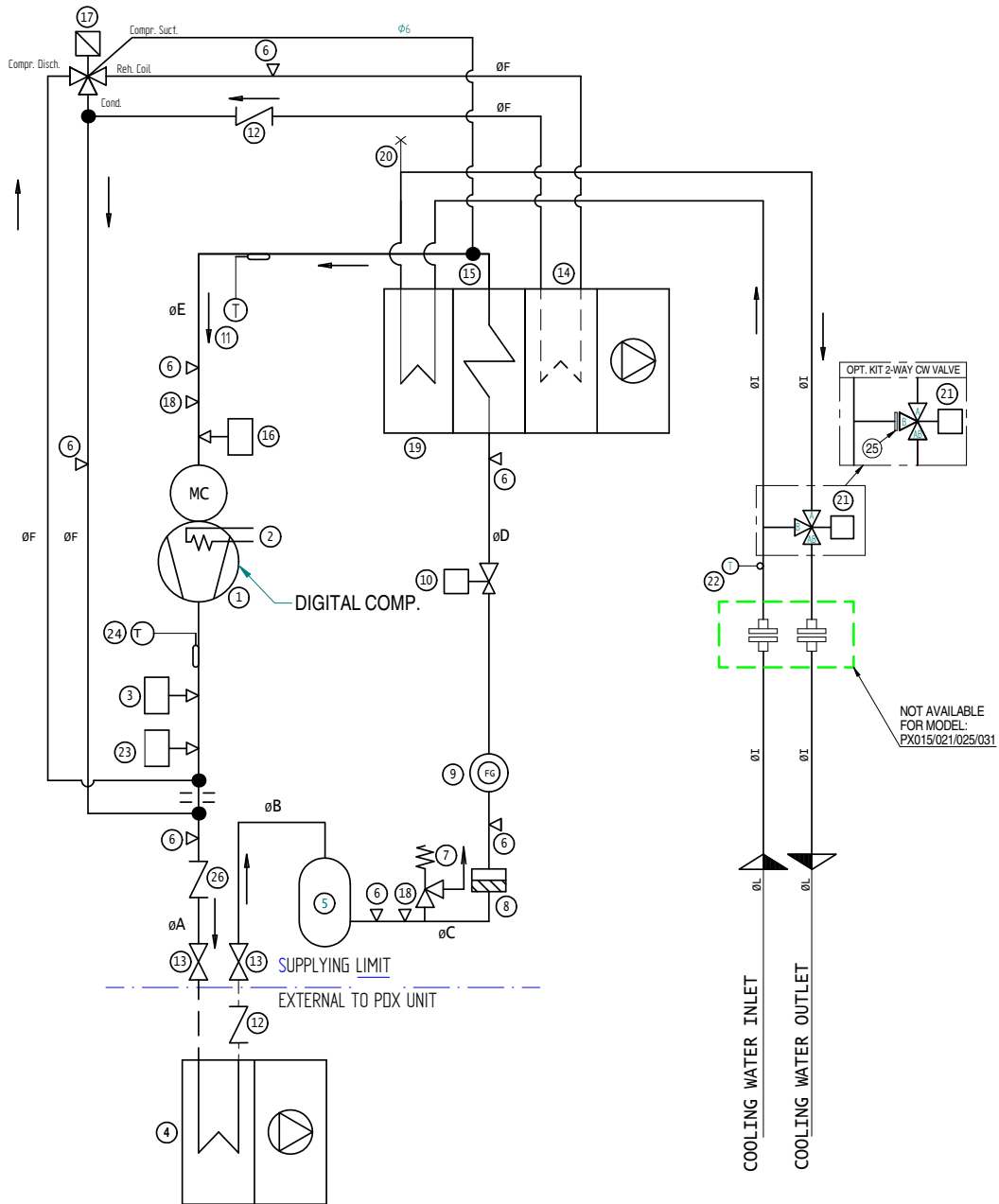
Fig. 14.37 - Refrigerant circuit D version - Single circuit - Single DIGITAL SCROLL compressor - TXV



| POS. | DESCRIPTION                  | POS. | DESCRIPTION  |
|------|------------------------------|------|--|
| 1    | Compressor                   | 14   | Reheating coil (optional)                            |
| 2    | Crankcase heater             | 15   | Evaporator   |
| 3    | High pressure switch (HP)    | 16   | Low pressure transducer                              |
| 4    | Air cooled condenser         | 17   | Reheating solenoid valve (optional)                  |
| 5    | Liquid receiver              | 18   | Access valve 1/4"                                    |
| 6    | Access valve 5/16"           | 19   | Chilled water coil                                   |
| 7    | Safety valve                 | 20   | Manual bleed valve                                   |
| 8    | Filter dryer                 | 21   | Chilled water 3- way valve                           |
| 9    | Sight glass                  | 22   | Inlet water sensor                                   |
| 10   | Thermostatic expansion valve | 23   | High pressure transducer                             |
| 11   | Shut- off solenoid valve     | 24   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 12   | Check valve                  | 25   | Blind disk - only with optional 2- way CW valve      |
| 13   | Shut- off valve              | 26   | CHECK VALVE(ONLY FOR PX015,021,025,031)              |

# Refrigerant and Hydraulic Circuits

Fig. 14.38 - Refrigerant circuit D version - Single circuit - Single DIGITAL SCROLL compressor - EEV

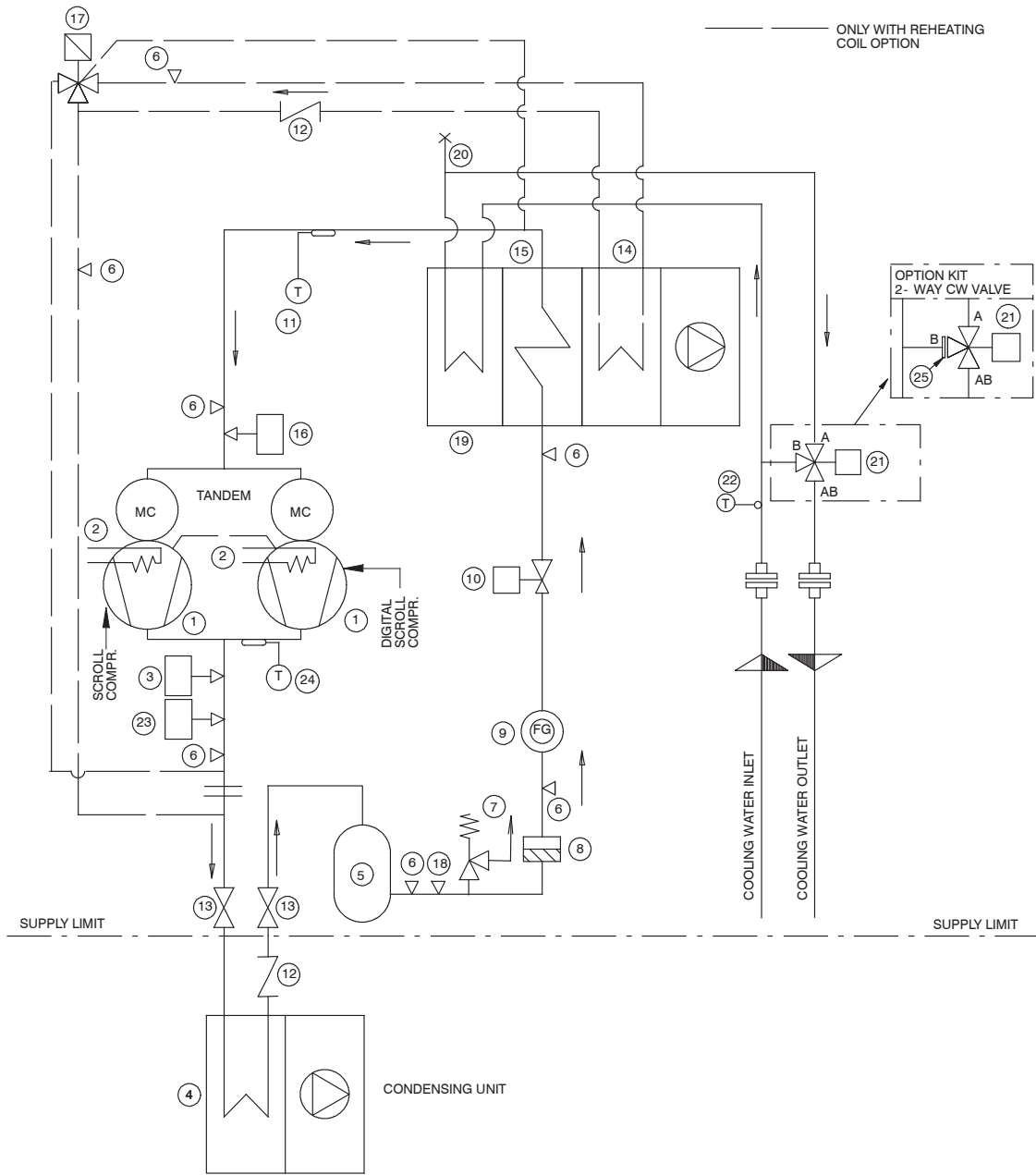


| POS. | DESCRIPTION                      | POS. | DESCRIPTION  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 14   | Reheating coil (optional)                            |
| 2    | Crankcase heater                 | 15   | Evaporator   |
| 3    | High pressure switch (HP)        | 16   | Low pressure transducer EEV                          |
| 4    | Air cooled condenser             | 17   | Reheating solenoid valve (optional)                  |
| 5    | Liquid receiver                  | 18   | Access valve 1/4"                                    |
| 6    | Access valve 5/16"               | 19   | Chilled water coil                                   |
| 7    | Safety valve                     | 20   | Manual bleed valve                                   |
| 8    | Filter dryer                     | 21   | Chilled water 3- way valve                           |
| 9    | Sight glass                      | 22   | Inlet water sensor                                   |
| 10   | Electronic expansion valve (EEV) | 23   | High pressure transducer                             |
| 11   | Temperature sensor for EEV       | 24   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 12   | Check valve                      | 25   | Blind disk - only with optional 2- way CW valve      |
| 13   | Shut- off valve                  | 26   | CHECK VALVE(ONLY FOR PX015,021,025,031)              |



# Refrigerant and Hydraulic Circuits

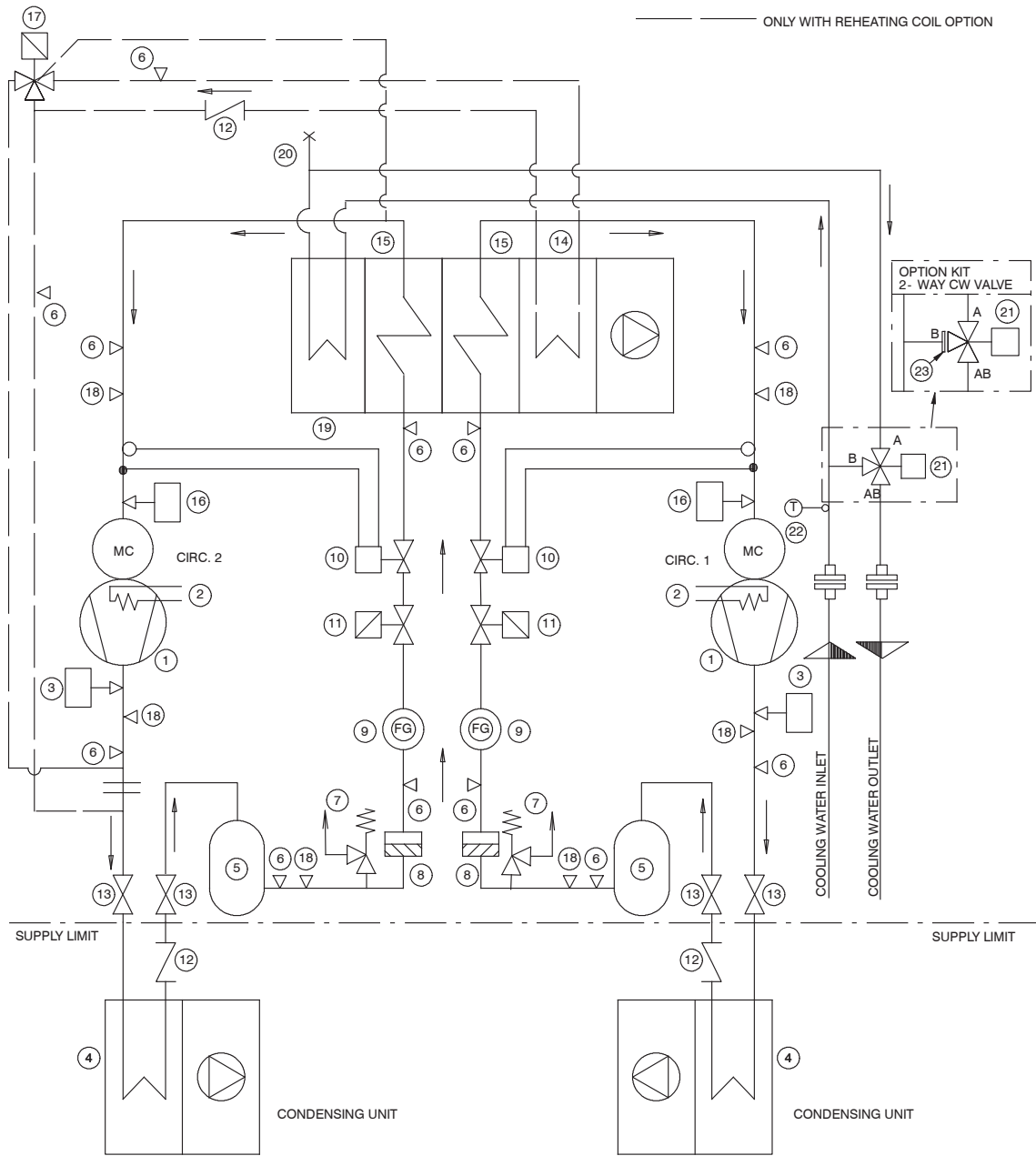
Fig. 14.39 - Refrigerant circuit D version - Single circuit - Tandem DIGITAL SCROLL compressors - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 14   | Reheating coil (optional)                            |
| 2    | Crankcase heater                 | 15   | Evaporator   |
| 3    | High pressure switch (HP)        | 16   | Low pressure transducer EEV                          |
| 4    | Air cooled condenser             | 17   | Reheating solenoid valve (optional)                  |
| 5    | Liquid receiver                  | 18   | Access valve 1/4"                                    |
| 6    | Access valve 5/16"               | 19   | Chilled water coil                                   |
| 7    | Safety valve                     | 20   | Manual bleed valve                                   |
| 8    | Filter dryer                     | 21   | Chilled water 3- way valve                           |
| 9    | Sight glass                      | 22   | Inlet water sensor                                   |
| 10   | Electronic expansion valve (EEV) | 23   | High pressure transducer                             |
| 11   | Temperature sensor for EEV       | 24   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 12   | Check valve                      | 25   | Blind disk - only with optional 2- way CW valve      |
| 13   | Shut- off valve                  |      |  |

# Refrigerant and Hydraulic Circuits

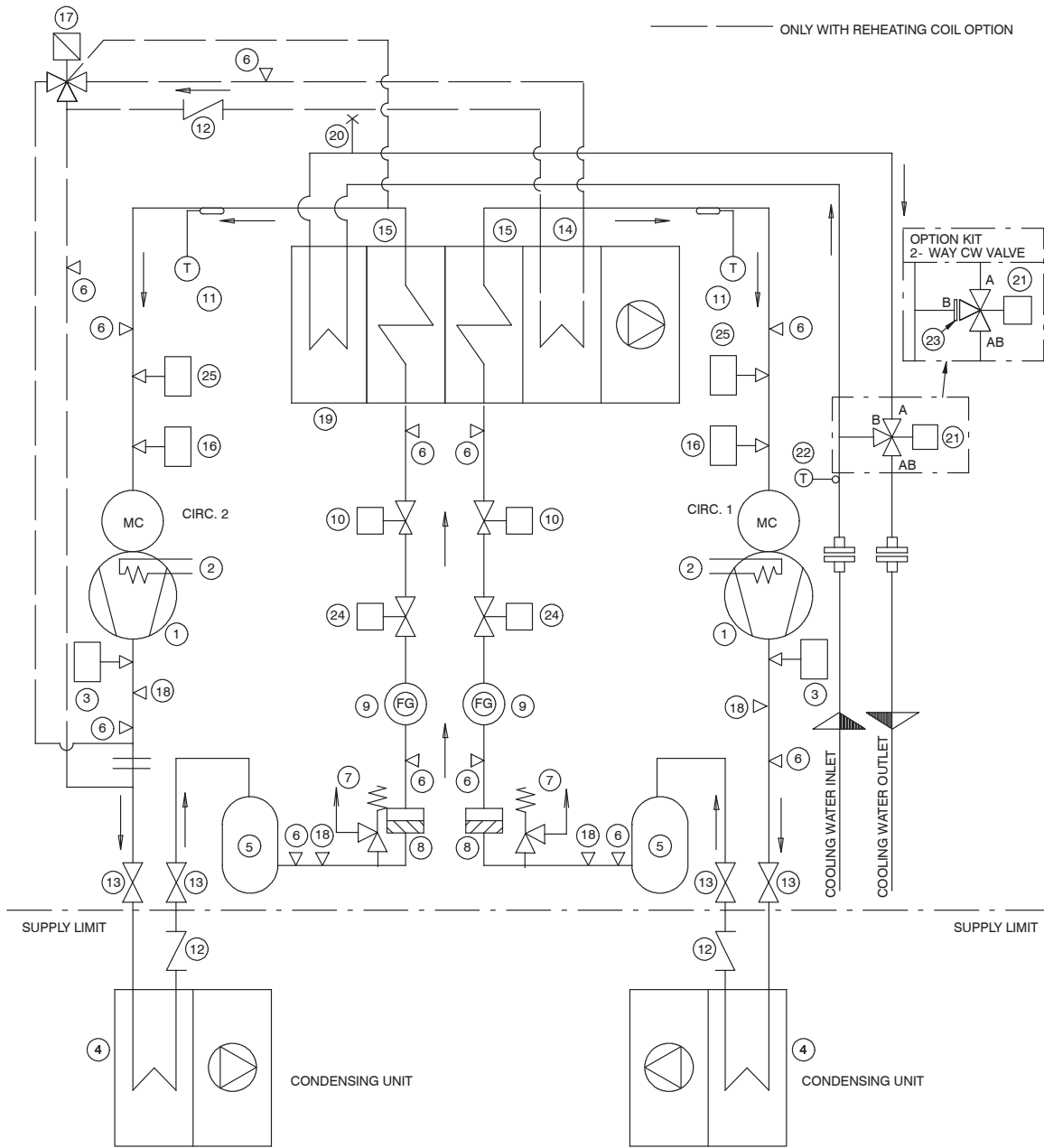
Fig. 14.40 - Refrigerant circuit D version - Dual circuits - Single SCROLL compressor - TXV



| POS. | DESCRIPTION                  | POS. | DESCRIPTION                                     |
|------|------------------------------|------|---|
| 1    | Compressor                   | 13   | Shut-off valve                                  |
| 2    | Crankcase heater             | 14   | Reheating coil (optional)                       |
| 3    | High pressure switch (HP)    | 15   | Evaporator                                      |
| 4    | Air cooled condenser         | 16   | Low pressure transducer                         |
| 5    | Liquid receiver              | 17   | Reheating solenoid valve (optional)             |
| 6    | Access valve 5/16"           | 18   | Access valve 1/4"                               |
| 7    | Safety valve                 | 19   | Chilled water coil                              |
| 8    | Filter dryer                 | 20   | Manual bleed valve                              |
| 9    | Sight glass                  | 21   | Chilled water 3- way valve                      |
| 10   | Thermostatic expansion valve | 22   | Inlet water sensor                              |
| 11   | Shut-off solenoid valve      | 23   | Blind disk - only with optional 2- way CW valve |
| 12   | Check valve                  |      |   |

# Refrigerant and Hydraulic Circuits

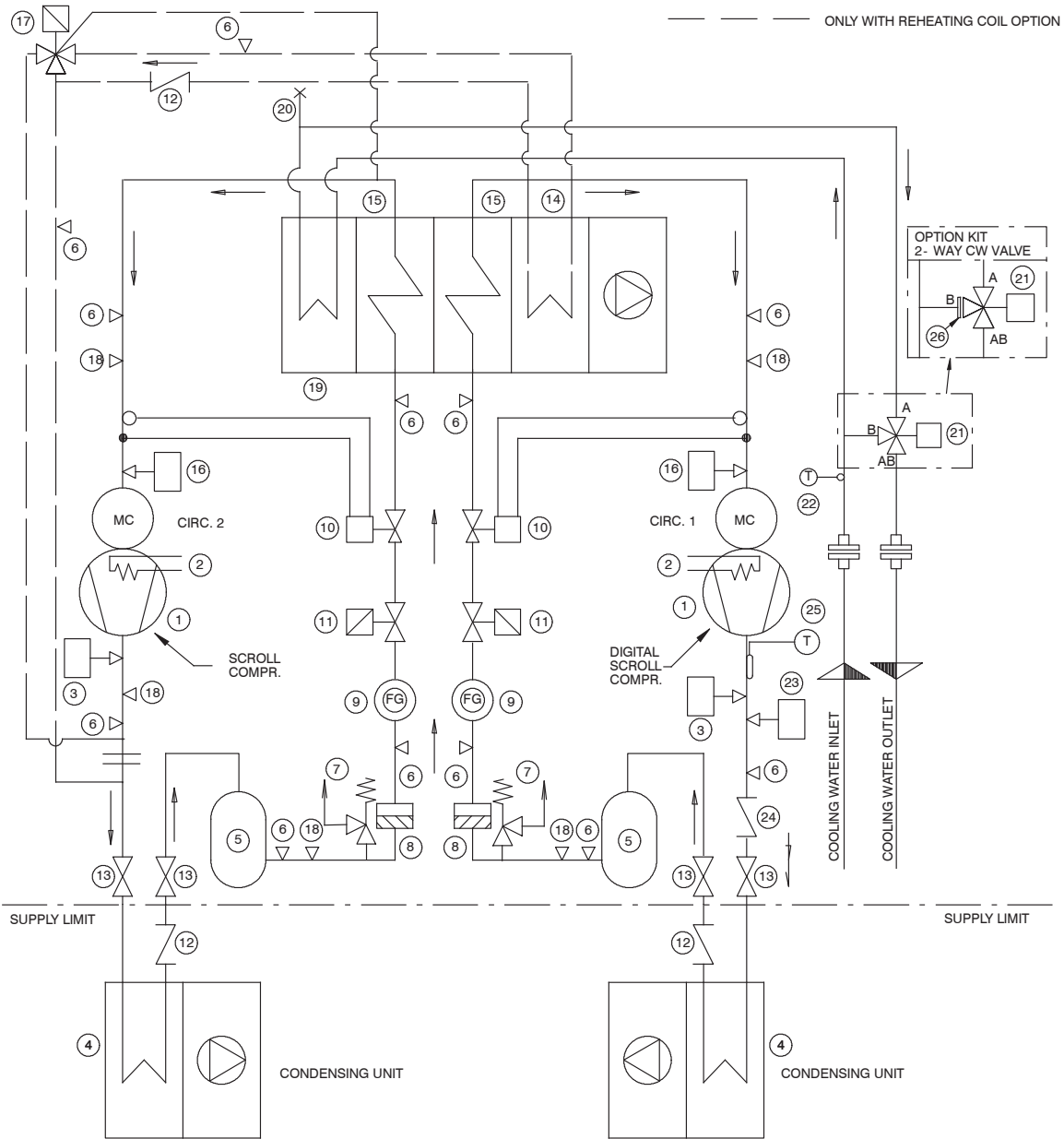
Fig. 14.41 - Refrigerant circuit D version - Dual circuits - Single SCROLL compressor - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION                                     |
|------|----------------------------------|------|---|
| 1    | Compressor                       | 14   | Reheating coil (optional)                       |
| 2    | Crankcase heater                 | 15   | Evaporator                                      |
| 3    | High pressure switch (HP)        | 16   | Low pressure transducer EEV                     |
| 4    | Air cooled condenser             | 17   | Reheating solenoid valve (optional)             |
| 5    | Liquid receiver                  | 18   | Access valve 1/4"                               |
| 6    | Access valve 5/16"               | 19   | Chilled water coil                              |
| 7    | Safety valve                     | 20   | Manual bleed valve                              |
| 8    | Filter dryer                     | 21   | Chilled water 3- way valve                      |
| 9    | Sight glass                      | 22   | Inlet water sensor                              |
| 10   | Electronic expansion valve (EEV) | 23   | Blind disk - only with optional 2- way CW valve |
| 11   | Temperature sensor for EEV       | 24   | Shut-off solenoid valve (EEV)                   |
| 12   | Check valve                      | 25   | Low pressure transducer EEV                     |
| 13   | Shut- off valve                  |      |   |

# Refrigerant and Hydraulic Circuits

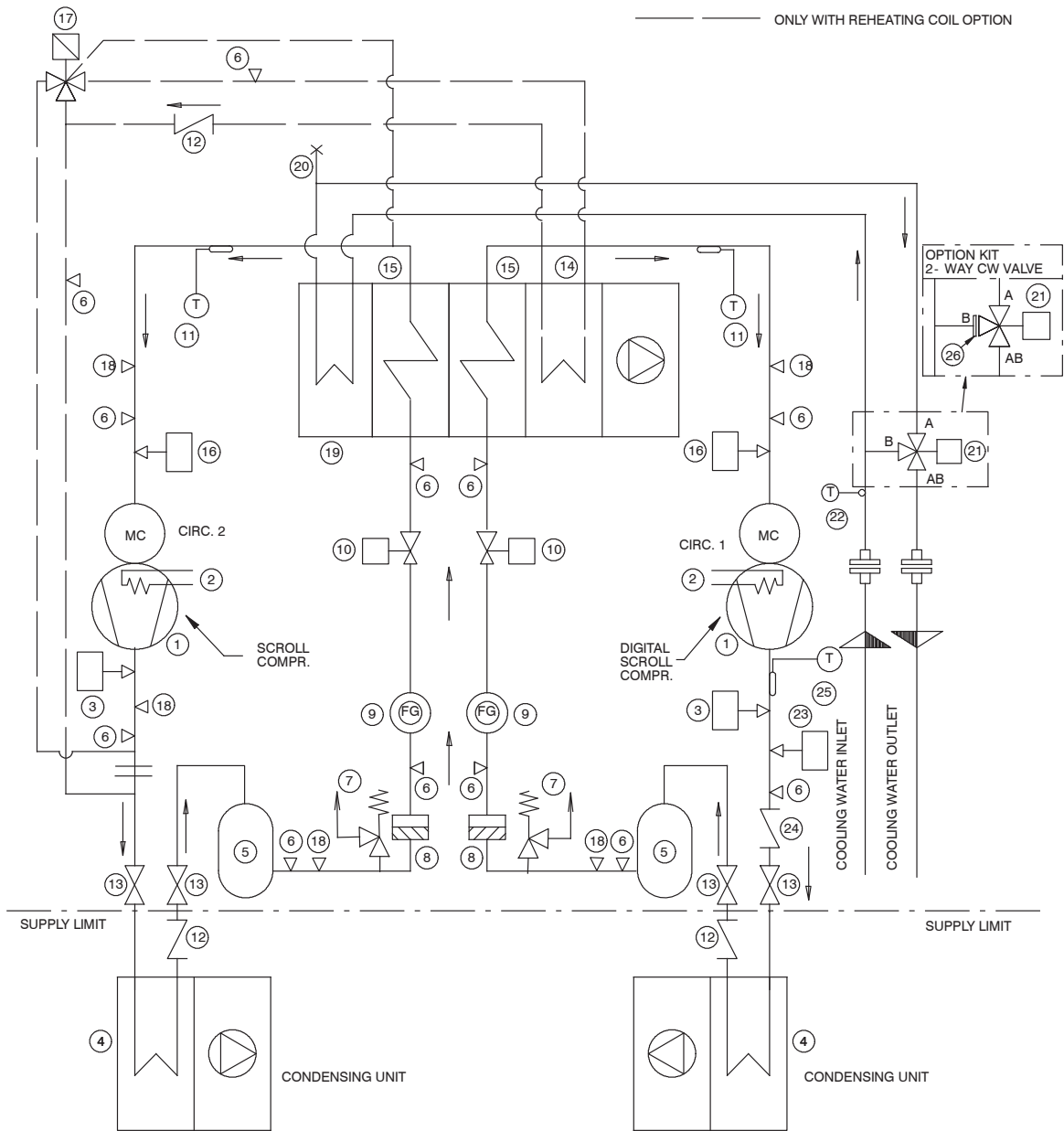
Fig. 14.42 - Refrigerant circuit D version - Dual circuits - Single SCROLL+DIGITAL SCROLL compressor - TXV



| POS. | DESCRIPTION                  | POS. | DESCRIPTION  |
|------|------------------------------|------|--|
| 1    | Compressor                   | 14   | Reheating coil (optional)                            |
| 2    | Crankcase heater             | 15   | Evaporator   |
| 3    | High pressure switch (HP)    | 16   | Low pressure transducer                              |
| 4    | Air cooled condenser         | 17   | Reheating solenoid valve (optional)                  |
| 5    | Liquid receiver              | 18   | Access valve 1/4"                                    |
| 6    | Access valve 5/16"           | 19   | Chilled water coil                                   |
| 7    | Safety valve                 | 20   | Manual bleed valve                                   |
| 8    | Filter dryer                 | 21   | Chilled water 3- way valve                           |
| 9    | Sight glass                  | 22   | Inlet water sensor                                   |
| 10   | Thermostatic expansion valve | 23   | High pressure transducer                             |
| 11   | Shut- off solenoid valve     | 24   | Check valve (only for PX044 - 054)                   |
| 12   | Check valve                  | 25   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 13   | Shut- off valve              | 26   | Blind disk - only with optional 2- way CW valve      |

# Refrigerant and Hydraulic Circuits

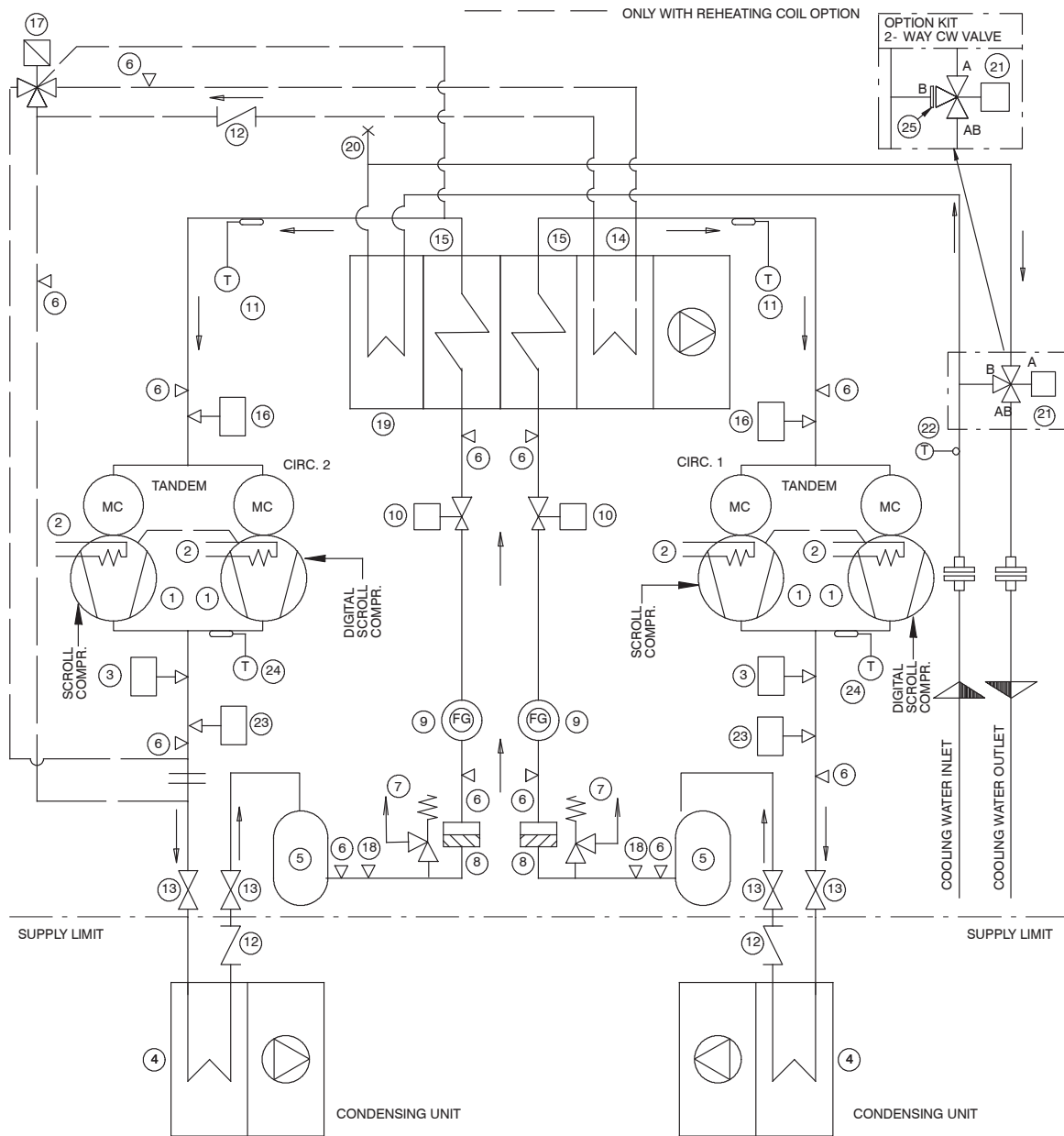
Fig. 14.43 - Refrigerant circuit D version - Dual circuits - Single SCROLL+DIGITAL SCROLL compressor - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 14   | Reheating coil (optional)                            |
| 2    | Crankcase heater                 | 15   | Evaporator   |
| 3    | High pressure switch (HP)        | 16   | Low pressure transducer                              |
| 4    | Air cooled condenser             | 17   | Reheating solenoid valve (optional)                  |
| 5    | Liquid receiver                  | 18   | Access valve 1/4"                                    |
| 6    | Access valve 5/16"               | 19   | Chilled water coil                                   |
| 7    | Safety valve                     | 20   | Manual bleed valve                                   |
| 8    | Filter dryer                     | 21   | Chilled water 3- way valve                           |
| 9    | Sight glass                      | 22   | Inlet water sensor                                   |
| 10   | Electronic expansion valve (EEV) | 23   | High pressure transducer                             |
| 11   | Temperature sensor for EEV       | 24   | Check valve (only for PX044 - 054)                   |
| 12   | Check valve                      | 25   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 13   | Shut- off valve                  | 26   | Blind disk - only with optional 2- way CW valve      |

# Refrigerant and Hydraulic Circuits

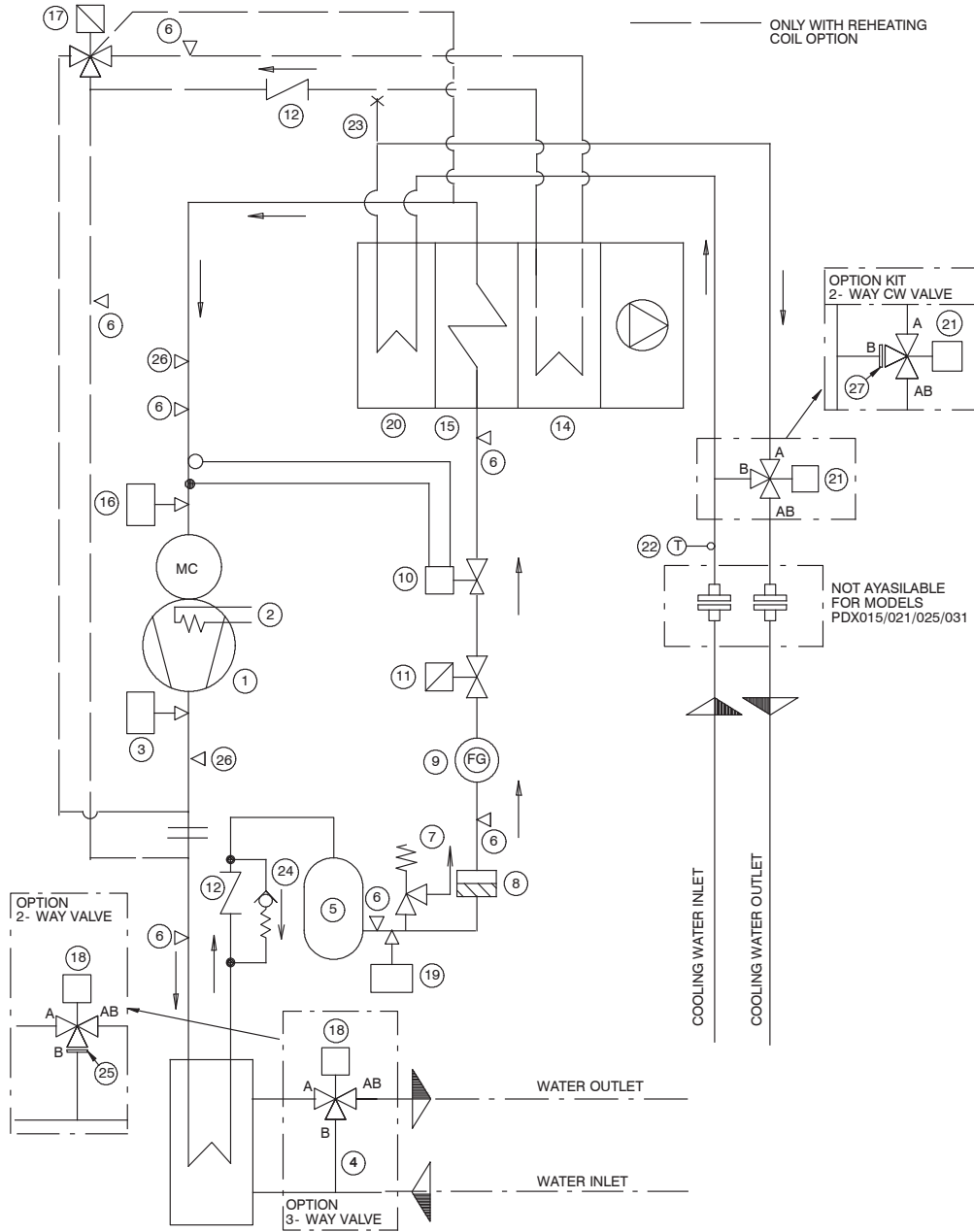
Fig. 14.44 - Refrigerant circuit D version - Dual circuits - Tandem DIGITAL SCROLL compressors - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 14   | Reheating coil (optional)                            |
| 2    | Crankcase heater                 | 15   | Evaporator   |
| 3    | High pressure switch (HP)        | 16   | Low pressure transducer                              |
| 4    | Air cooled condenser             | 17   | Reheating solenoid valve (optional)                  |
| 5    | Liquid receiver                  | 18   | Access valve 1/4"                                    |
| 6    | Access valve 5/16"               | 19   | Chilled water coil                                   |
| 7    | Safety valve                     | 20   | Manual bleed valve                                   |
| 8    | Filter dryer                     | 21   | Chilled water 3- way valve                           |
| 9    | Sight glass                      | 22   | Inlet water sensor                                   |
| 10   | Electronic expansion valve (EEV) | 23   | High pressure transducer                             |
| 11   | Temperature sensor for EEV       | 24   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 12   | Check valve                      | 25   | Blind disk - only with optional 2- way CW valve      |
| 13   | Shut- off valve                  |      |  |

# Refrigerant and Hydraulic Circuits

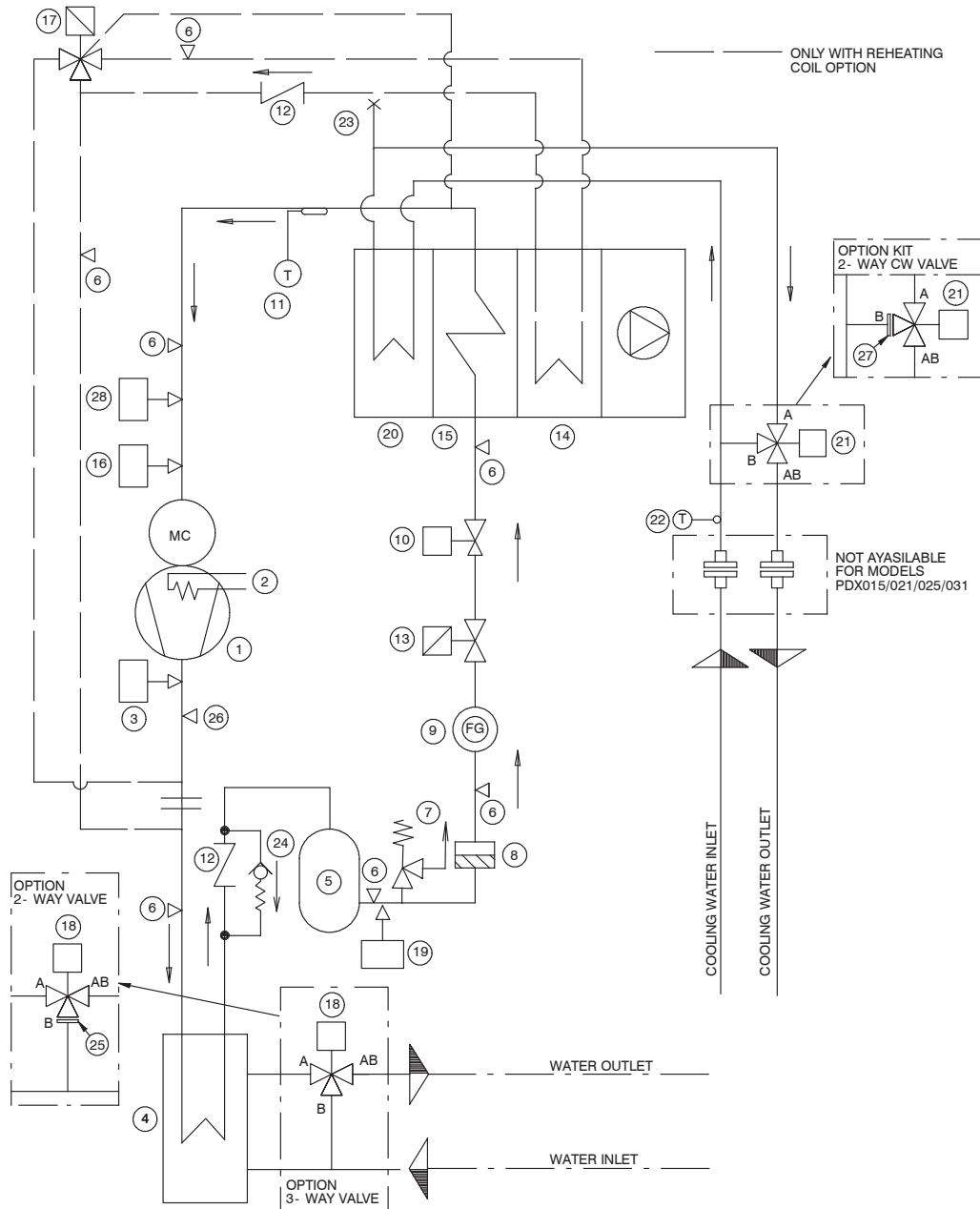
Fig. 14.45 - Refrigerant circuit H version - Single circuit - Single SCROLL compressor - TXV



| POS. | DESCRIPTION                  | POS. | DESCRIPTION                                     |
|------|------------------------------|------|---|
| 1    | Compressor                   | 15   | Evaporator                                      |
| 2    | Crankcase heater             | 16   | Low pressure transducer                         |
| 3    | High pressure switch (HP)    | 17   | Reheating solenoid valve (optional)             |
| 4    | Water cooled condenser       | 18   | Condensing regulation water valve               |
| 5    | Liquid receiver              | 19   | Pressure transducer condensing regulation       |
| 6    | Access valve 5/16"           | 20   | Chilled water coil                              |
| 7    | Safety valve                 | 21   | Chilled water 3- way valve                      |
| 8    | Filter dryer                 | 22   | Inlet water sensor                              |
| 9    | Sight glass                  | 23   | Manual bleed valve                              |
| 10   | Thermostatic expansion valve | 24   | Check valve 10 bar (145 psi)                    |
| 11   | Shut- off solenoid valve     | 25   | Blind disk - only with optional 2- way valve    |
| 12   | Check valve                  | 26   | Access valve 1/4"                               |
| 14   | Reheating coil (optional)    | 27   | Blind disk - only with optional 2- way CW valve |

# Refrigerant and Hydraulic Circuits

Fig. 14.46 - Refrigerant circuit H version - Single circuit - Single SCROLL compressor - EEV

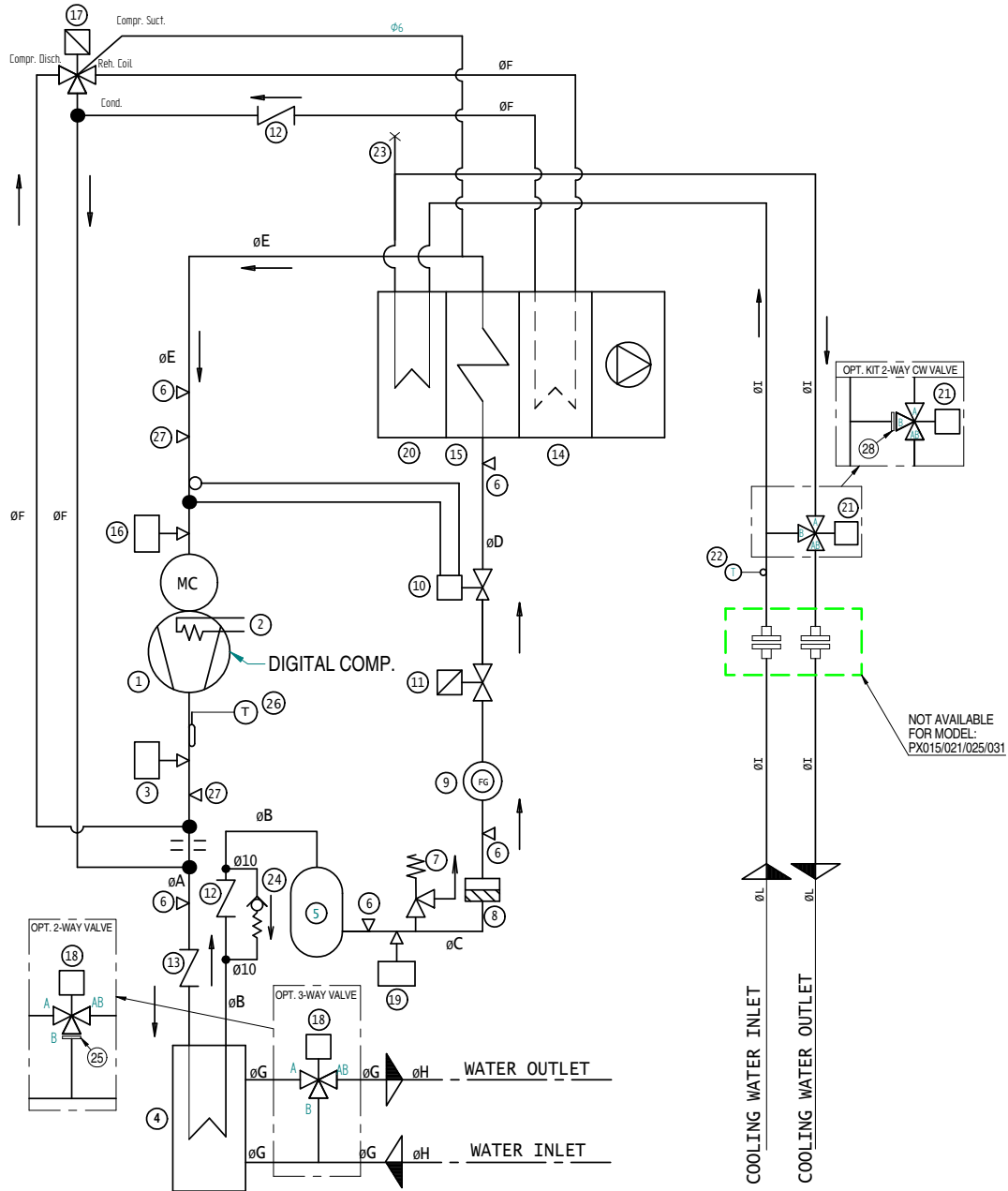


| POS. | DESCRIPTION                      | POS. | DESCRIPTION                                     |
|------|----------------------------------|------|---|
| 1    | Compressor                       | 15   | Evaporator                                      |
| 2    | Crankcase heater                 | 16   | Low pressure transducer                         |
| 3    | High pressure switch (HP)        | 17   | Reheating solenoid valve (optional)             |
| 4    | Water cooled condenser           | 18   | Condensing regulation water valve               |
| 5    | Liquid receiver                  | 19   | Pressure transducer condensing regulation       |
| 6    | Access valve 5/16"               | 20   | Chilled water coil                              |
| 7    | Safety valve                     | 21   | Chilled water 3- way valve                      |
| 8    | Filter dryer                     | 22   | Inlet water sensor                              |
| 9    | Sight glass                      | 23   | Manual bleed valve                              |
| 10   | Electronic expansion valve (EEV) | 24   | Check valve 10 bar (145 psi)                    |
| 11   | Temperature sensor for EEV       | 25   | Blind disk - only with optional 2- way valve    |
| 12   | Check valve                      | 26   | Access valve 1/4"                               |
| 13   | Shut-off solenoid valve (EEV)    | 27   | Blind disk - only with optional 2- way CW valve |
| 14   | Reheating coil (optional)        | 28   | Shut-off solenoid valve                         |



# Refrigerant and Hydraulic Circuits

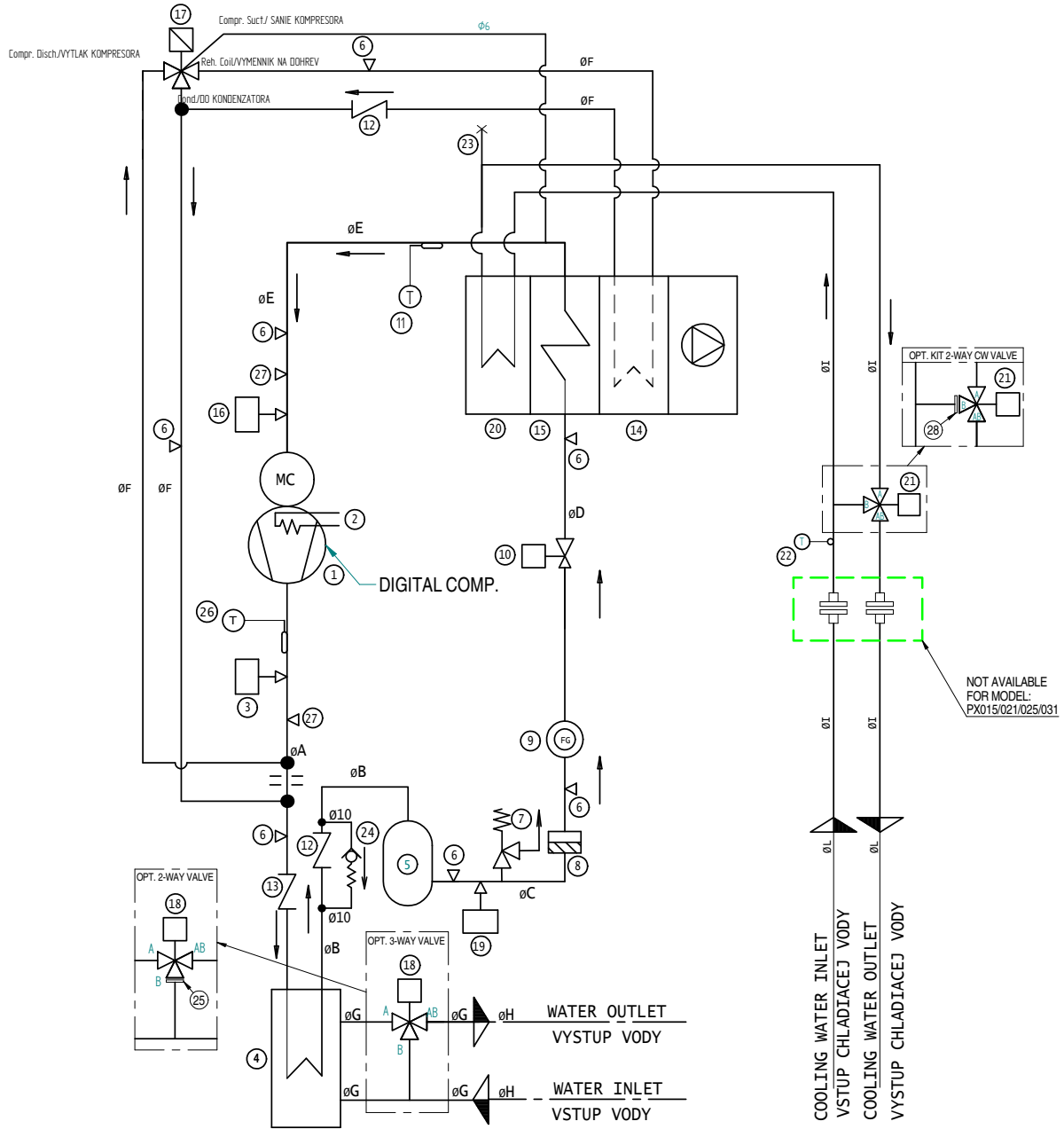
Fig. 14.47 - Refrigerant circuit H version - Single circuit - Single DIGITAL SCROLL compressor - TXV



| POS. | DESCRIPTION                               | POS. | DESCRIPTION  |
|------|---|------|--|
| 1    | Compressor                                | 15   | Evaporator   |
| 2    | Crankcase heater                          | 16   | Low pressure transducer                              |
| 3    | High pressure switch (HP)                 | 17   | Reheating solenoid valve (optional)                  |
| 4    | Water cooled condenser                    | 18   | Condensing regulation water valve                    |
| 5    | Liquid receiver                           | 19   | Pressure transducer condensing regulation            |
| 6    | Access valve 5/16"                        | 20   | Chilled water coil                                   |
| 7    | Safety valve                              | 21   | Chilled water 3- way valve                           |
| 8    | Filter dryer                              | 22   | Inlet water sensor                                   |
| 9    | Sight glass                               | 23   | Manual bleed valve                                   |
| 10   | Thermostatic expansion valve              | 24   | Check valve 10 bar (145 psi)                         |
| 11   | Shut- off solenoid valve                  | 25   | Blind disk - only with optional 2- way valve         |
| 12   | Check valve                               | 26   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 13   | CHECK VALV E (ONLY FOR PX015,021,025,031) | 27   | Access valve 1/4"                                    |
| 14   | Reheating coil (optional)                 | 28   | Blind disk - only with optional 2- way CW valve      |

# Refrigerant and Hydraulic Circuits

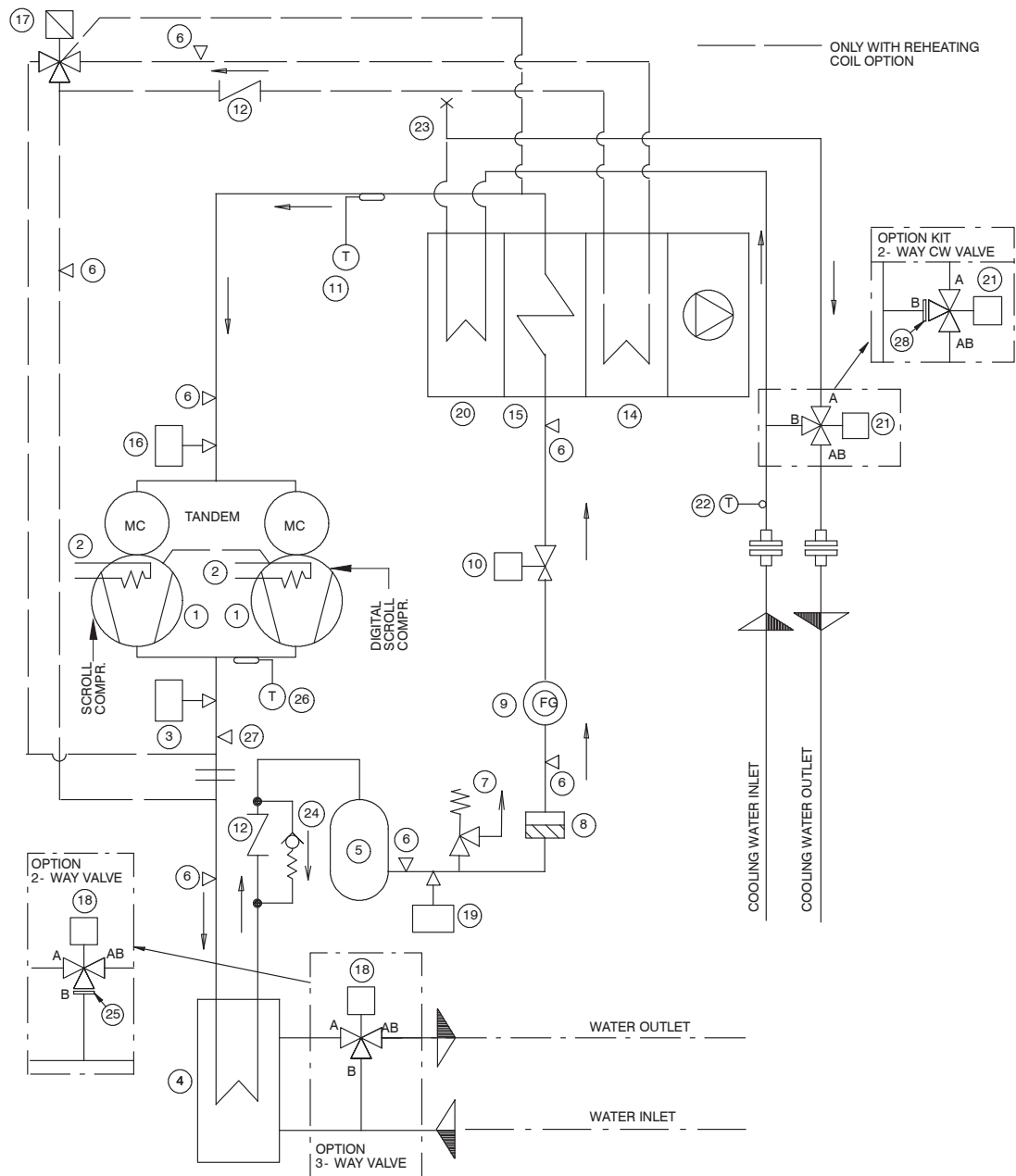
Fig. 14.48 - Refrigerant circuit H version - Single circuit - Single DIGITAL SCROLL compressor - EEV



| POS. | DESCRIPTION                              | POS. | DESCRIPTION  |
|------|--|------|--|
| 1    | Compressor                               | 15   | Evaporator   |
| 2    | Crankcase heater                         | 16   | Low pressure transducer                              |
| 3    | High pressure switch (HP)                | 17   | Reheating solenoid valve (optional)                  |
| 4    | Water cooled condenser                   | 18   | Condensing regulation water valve                    |
| 5    | Liquid receiver                          | 19   | Pressure transducer condensing regulation            |
| 6    | Access valve 5/16"                       | 20   | Chilled water coil                                   |
| 7    | Safety valve                             | 21   | Chilled water 3- way valve                           |
| 8    | Filter dryer                             | 22   | Inlet water sensor                                   |
| 9    | Sight glass                              | 23   | Manual bleed valve                                   |
| 10   | Electronic expansion valve (EEV)         | 24   | Check valve 10 bar (145 psi)                         |
| 11   | Temperature sensor for EEV               | 25   | Blind disk - only with optional 2- way valve         |
| 12   | Check valve                              | 26   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 13   | CHECK VALV E(ONLY FOR PX015,021,025,031) | 27   | Access valve 1/4"                                    |
| 14   | Reheating coil (optional)                | 28   | Blind disk - only with optional 2- way CW valve      |

# Refrigerant and Hydraulic Circuits

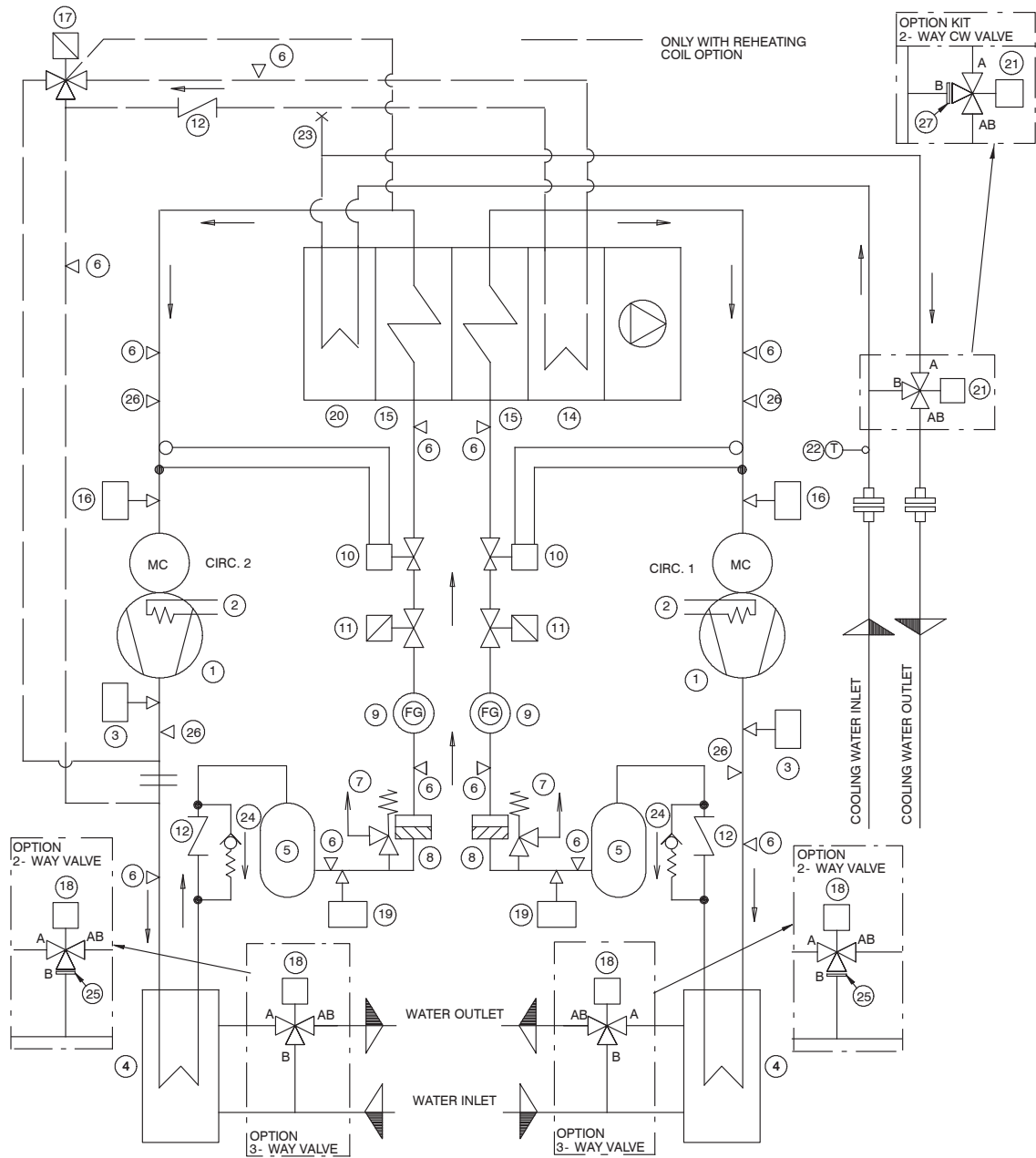
Fig. 14.49 - Refrigerant circuit H version - Single circuit - Tandem DIGITAL SCROLL compressors - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 16   | Low pressure transducer                              |
| 2    | Crankcase heater                 | 17   | Reheating solenoid valve (optional)                  |
| 3    | High pressure switch (HP)        | 18   | Condensing regulation water valve                    |
| 4    | Water cooled condenser           | 19   | Pressure transducer condensing regulation            |
| 5    | Liquid receiver                  | 20   | Chilled water coil                                   |
| 6    | Access valve 5/16"               | 21   | Chilled water 3- way valve                           |
| 7    | Safety valve                     | 22   | Inlet water sensor                                   |
| 8    | Filter dryer                     | 23   | Manual bleed valve                                   |
| 9    | Sight glass                      | 24   | Check valve 10 bar (145 psi)                         |
| 10   | Electronic expansion valve (EEV) | 25   | Blind disk - only with optional 2- way valve         |
| 11   | Temperature sensor for EEV       | 26   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 12   | Check valve                      | 27   | Access valve 1/4"                                    |
| 14   | Reheating coil (optional)        | 28   | Blind disk - only with optional 2- way CW valve      |
| 15   | Evaporator                       |      |  |

# Refrigerant and Hydraulic Circuits

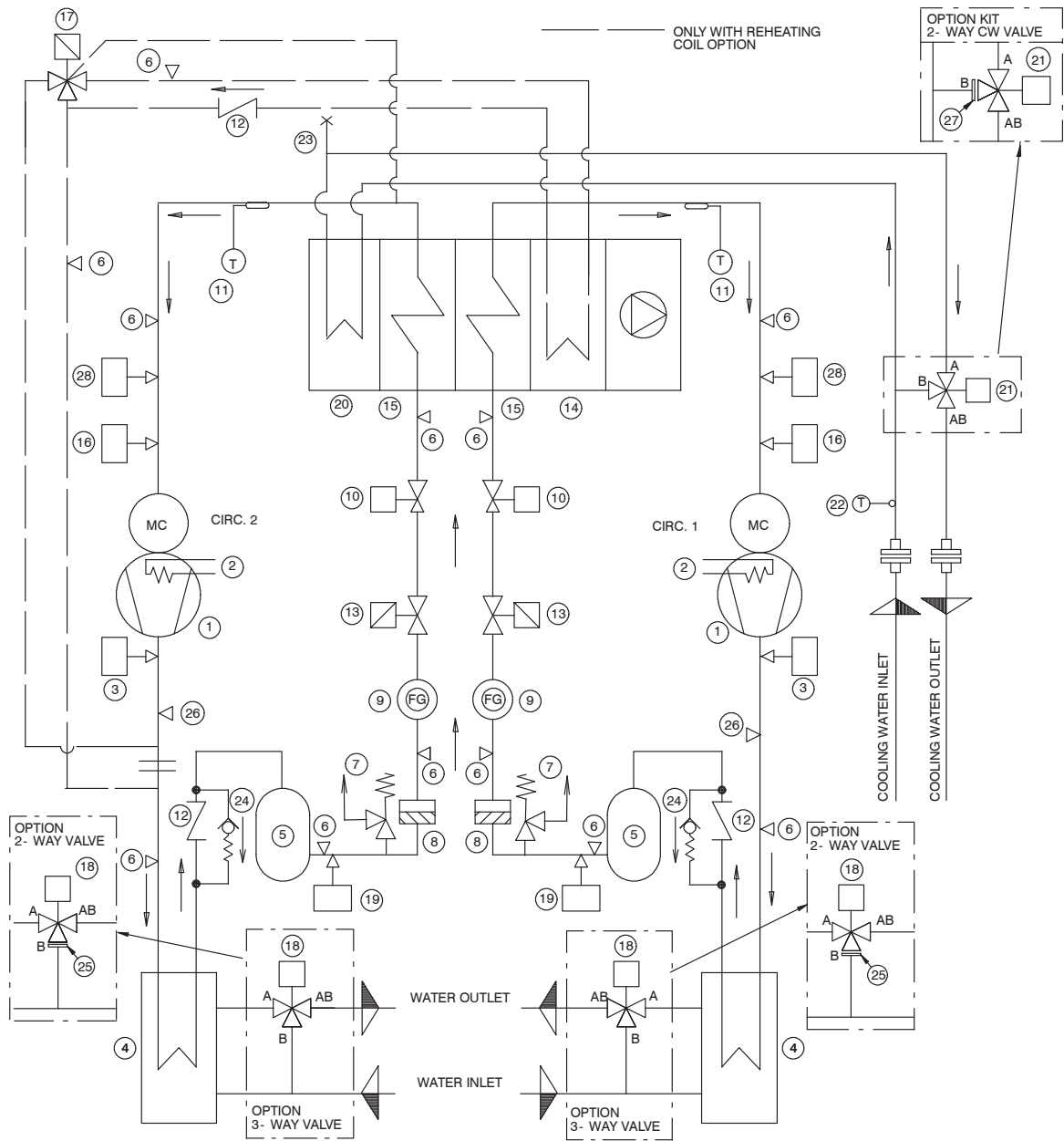
Fig. 14.50 - Refrigerant circuit H version - Dual circuits - Single SCROLL compressor - TXV



| POS. | DESCRIPTION                  | POS. | DESCRIPTION                                     |
|------|------------------------------|------|---|
| 1    | Compressor                   | 15   | Evaporator                                      |
| 2    | Crankcase heater             | 16   | Low pressure transducer                         |
| 3    | High pressure switch (HP)    | 17   | Reheating solenoid valve (optional)             |
| 4    | Water cooled condenser       | 18   | Condensing regulation water valve               |
| 5    | Liquid receiver              | 19   | Pressure transducer condensing regulation       |
| 6    | Access valve 5/16"           | 20   | Chilled water coil                              |
| 7    | Safety valve                 | 21   | Chilled water 3- way valve                      |
| 8    | Filter dryer                 | 22   | Inlet water sensor                              |
| 9    | Sight glass                  | 23   | Manual bleed valve                              |
| 10   | Thermostatic expansion valve | 24   | Check valve 10 bar (145 psi)                    |
| 11   | Shut- off solenoid valve     | 25   | Blind disk - only with optional 2- way valve    |
| 12   | Check valve                  | 26   | Access valve 1/4"                               |
| 14   | Reheating coil (optional)    | 27   | Blind disk - only with optional 2- way CW valve |

# Refrigerant and Hydraulic Circuits

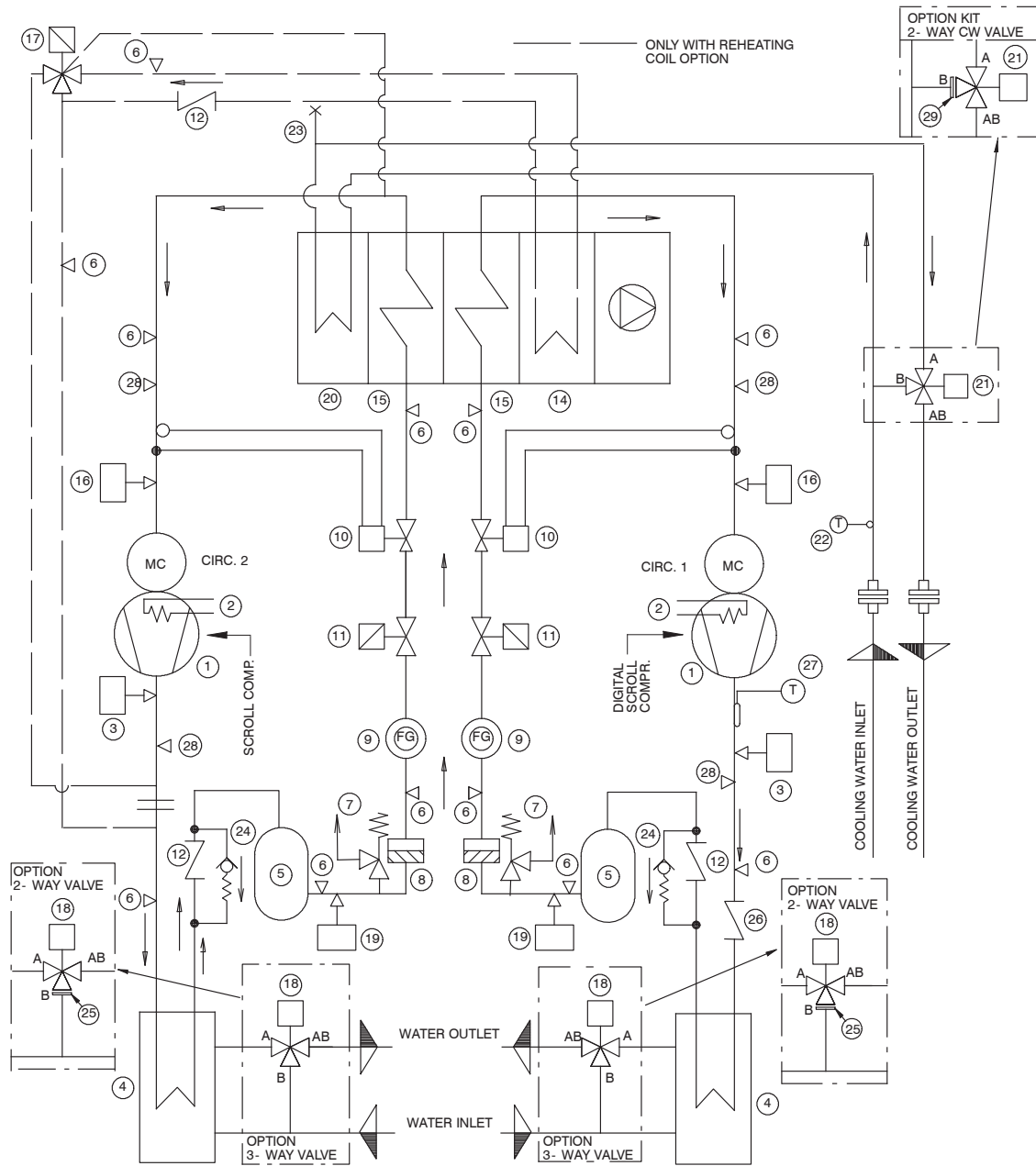
Fig. 14.51 - Refrigerant circuit H version - Dual circuits - Single SCROLL compressor - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION                                     |
|------|----------------------------------|------|---|
| 1    | Compressor                       | 15   | Evaporator                                      |
| 2    | Crankcase heater                 | 16   | Low pressure transducer                         |
| 3    | High pressure switch (HP)        | 17   | Reheating solenoid valve (optional)             |
| 4    | Water cooled condenser           | 18   | Condensing regulation water valve               |
| 5    | Liquid receiver                  | 19   | Pressure transducer condensing regulation       |
| 6    | Access valve 5/16"               | 20   | Chilled water coil                              |
| 7    | Safety valve                     | 21   | Chilled water 3- way valve                      |
| 8    | Filter dryer                     | 22   | Inlet water sensor                              |
| 9    | Sight glass                      | 23   | Manual bleed valve                              |
| 10   | Electronic expansion valve (EEV) | 24   | Check valve 10 bar (145 psi)                    |
| 11   | Temperature sensor for EEV       | 25   | Blind disk - only with optional 2- way valve    |
| 12   | Check valve                      | 26   | Access valve 1/4"                               |
| 13   | Shut-off solenoid valve (EEV)    | 27   | Blind disk - only with optional 2- way CW valve |
| 14   | Reheating coil (optional)        | 28   | Low pressure transducer EEV                     |

# Refrigerant and Hydraulic Circuits

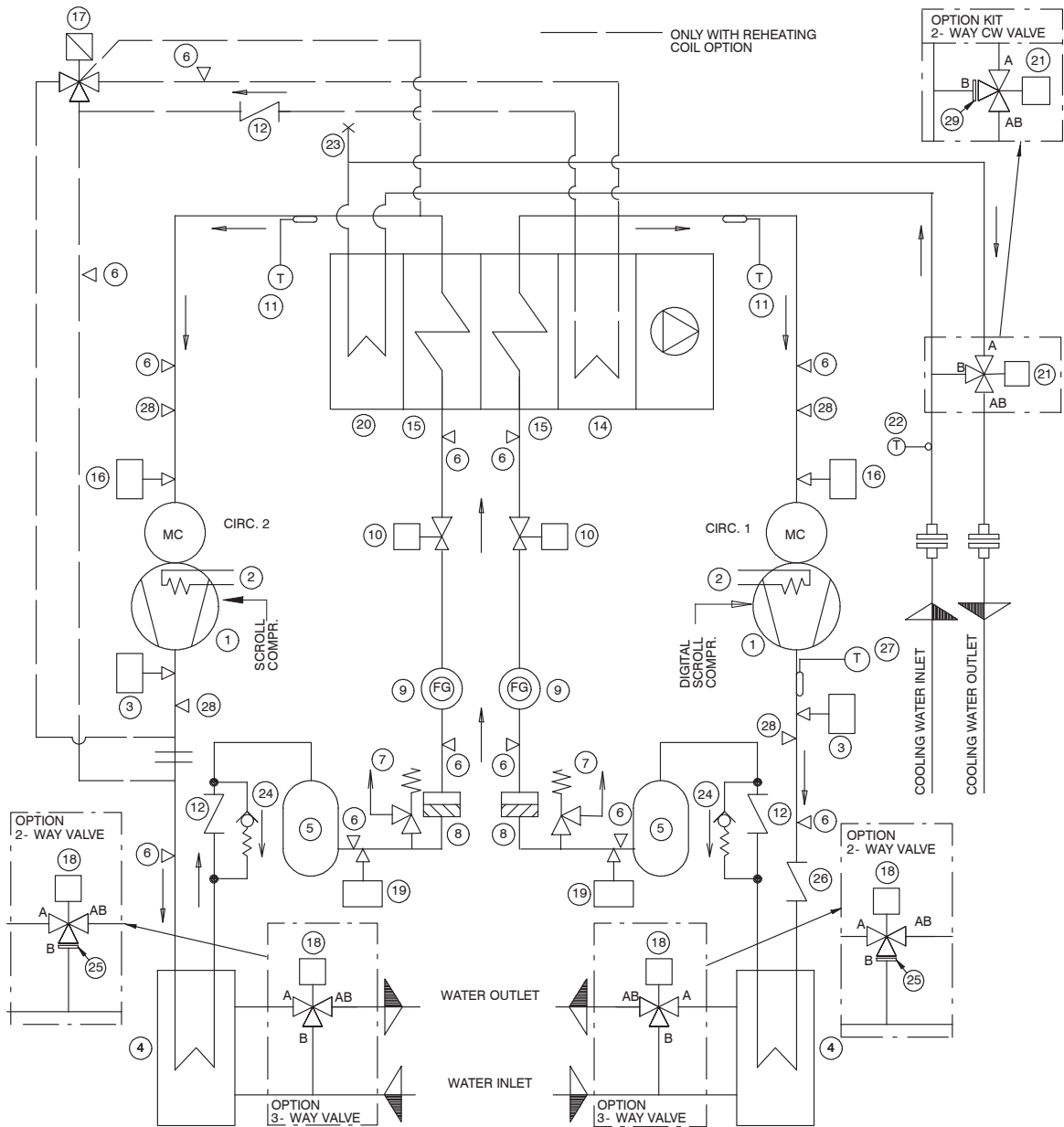
Fig. 14.52 - Refrigerant circuit H version - Dual circuits - Single SCROLL+DIGITAL SCROLL compressor - TXV



| POS. | DESCRIPTION                  | POS. | DESCRIPTION                                     |
|------|------------------------------|------|---|
| 1    | Compressor                   | 16   | Low pressure transducer                         |
| 2    | Crankcase heater             | 17   | Reheating solenoid valve (optional)             |
| 3    | High pressure switch (HP)    | 18   | Condensing regulation water valve               |
| 4    | Water cooled condenser       | 19   | Pressure transducer condensing regulation       |
| 5    | Liquid receiver              | 20   | Chilled water coil                              |
| 6    | Access valve 5/16"           | 21   | Chilled water 3- way valve                      |
| 7    | Safety valve                 | 22   | Inlet water sensor                              |
| 8    | Filter dryer                 | 23   | Manual bleed valve                              |
| 9    | Sight glass                  | 24   | Check valve 10 bar (145 psi)                    |
| 10   | Thermostatic expansion valve | 25   | Blind disk - only with optional 2- way valve    |
| 11   | Shut- off solenoid valve     | 26   | Check valve for PX044 - 054                     |
| 12   | Check valve                  | 27   | NTC Temp. sensor for DIGITAL SCROLL compressor  |
| 14   | Reheating coil (optional)    | 28   | Access valve 1/4"                               |
| 15   | Evaporator                   | 29   | Blind disk - only with optional 2- way CW valve |

# Refrigerant and Hydraulic Circuits

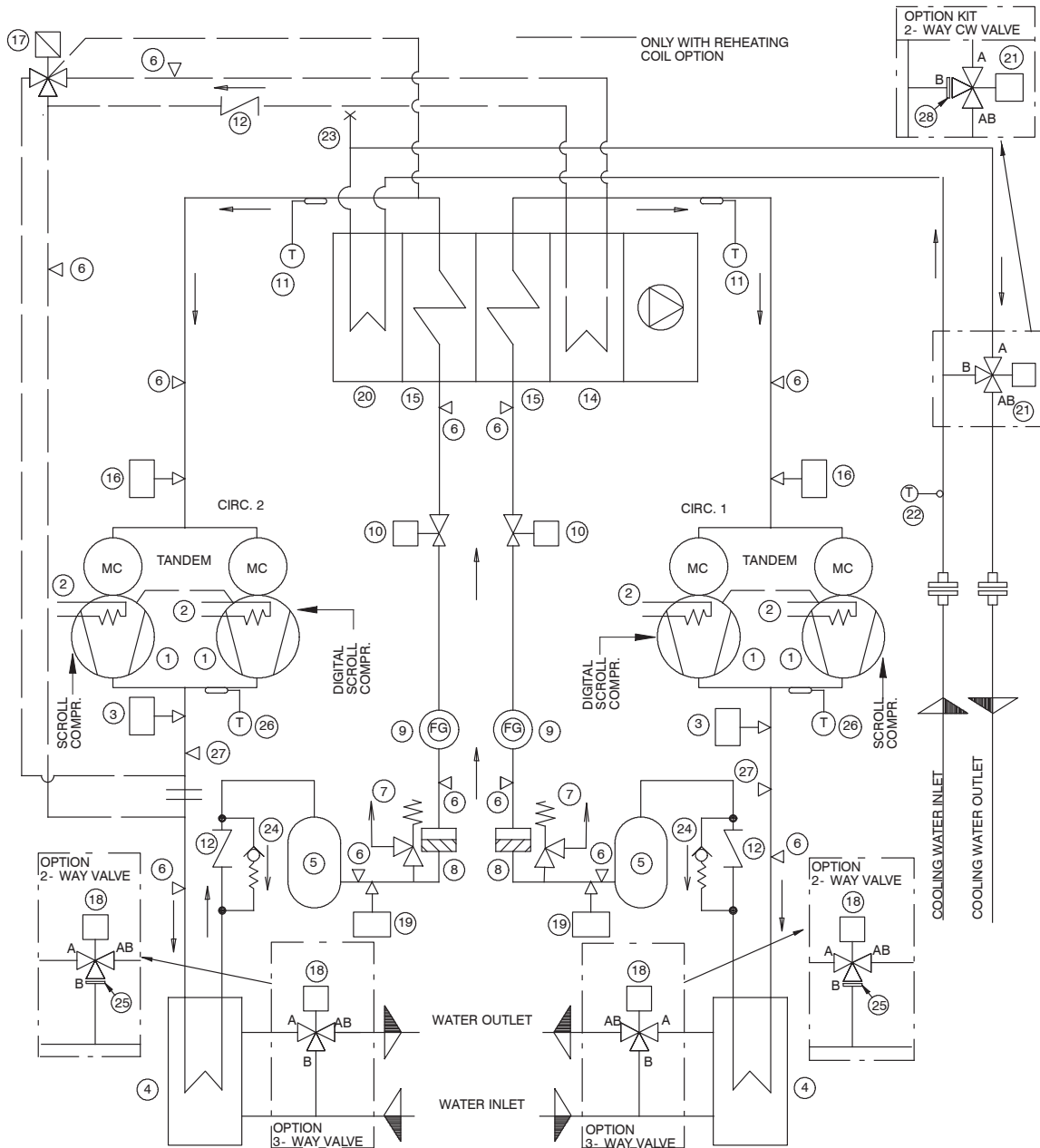
Fig. 14.53 - Refrigerant circuit H version - Dual circuits - Single SCROLL+DIGITAL SCROLL compressor - EEV



| POS. | DESCRIPTION                      | POS. | DESCRIPTION                                    |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 16   | Low pressure transducer                        |
| 2    | Crankcase heater                 | 17   | Reheating solenoid valve (optional)            |
| 3    | High pressure switch (HP)        | 18   | Condensing regulation water valve              |
| 4    | Water cooled condenser           | 19   | Pressure transducer condensing regulation      |
| 5    | Liquid receiver                  | 20   | Chilled water coil                             |
| 6    | Access valve 5/16"               | 21   | Chilled water 3- way valve                     |
| 7    | Safety valve                     | 22   | Inlet water sensor                             |
| 8    | Filter dryer                     | 23   | Manual bleed valve                             |
| 9    | Sight glass                      | 24   | Check valve 10 bar (145 psi)                   |
| 10   | Electronic expansion valve (EEV) | 25   | Blind disk - only with optional 2- way valve   |
| 11   | Temperature sensor for EEV       | 26   | Check valve for PX044 - 054                    |
| 12   | Check valve                      | 27   | NTC Temp. sensor for DIGITAL SCROLL compressor |
| 14   | Reheating coil (optional)        | 28   | Access valve 1/4"                              |
| 15   | Evaporator                       | 29   | Blind disk - only with optional 2- way valve   |

# Refrigerant and Hydraulic Circuits

Fig. 14.54 - Refrigerant circuit H version - Dual circuits - Tandem DIGITAL SCROLL compressors - EEV

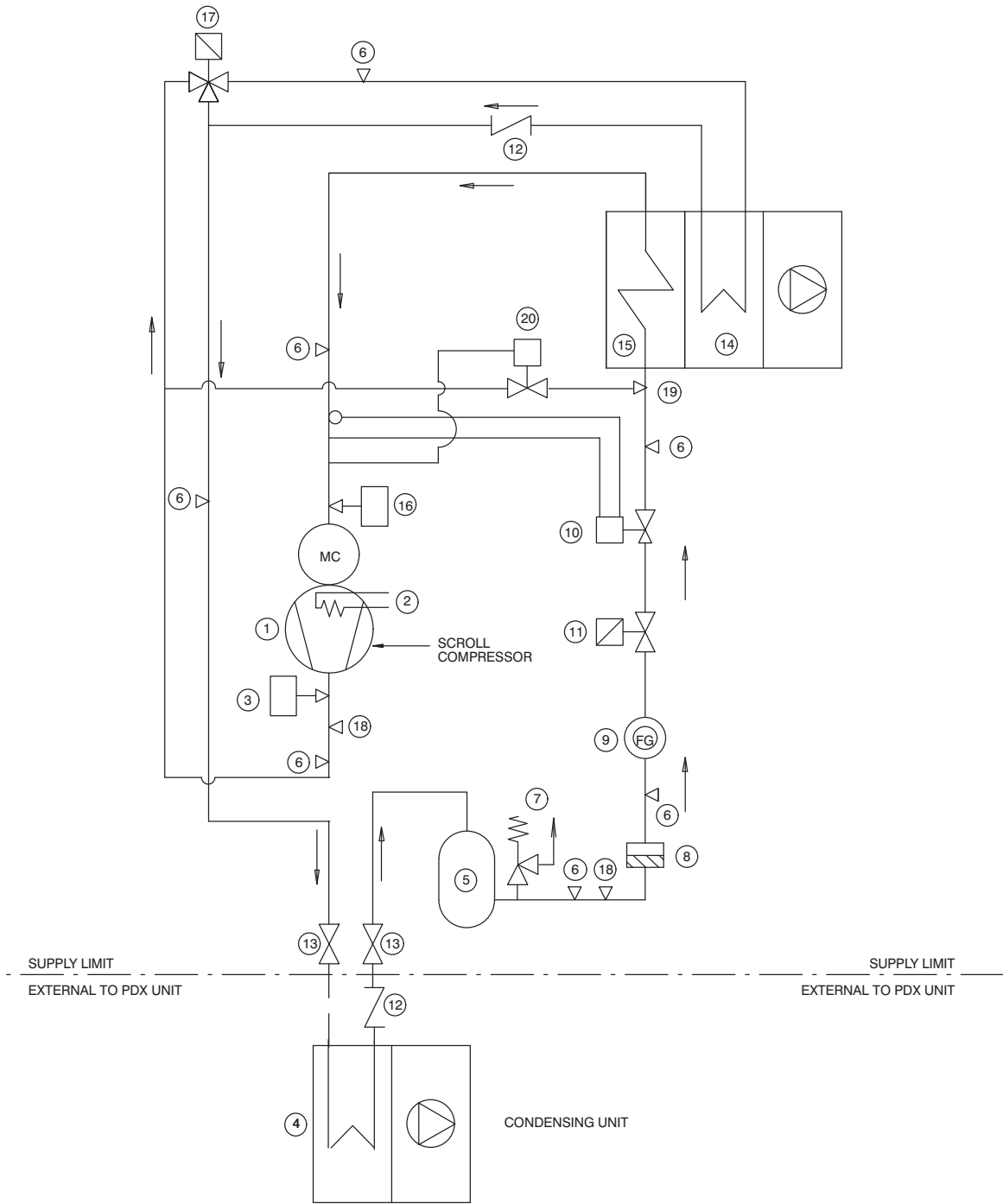


| POS. | DESCRIPTION                      | POS. | DESCRIPTION  |
|------|----------------------------------|------|--|
| 1    | Compressor                       | 16   | Low pressure transducer                              |
| 2    | Crankcase heater                 | 17   | Reheating solenoid valve (optional)                  |
| 3    | High pressure switch (HP)        | 18   | Condensing regulation water valve                    |
| 4    | Water cooled condenser           | 19   | Pressure transducer condensing regulation            |
| 5    | Liquid receiver                  | 20   | Chilled water coil                                   |
| 6    | Access valve 5/16"               | 21   | Chilled water 3- way valve                           |
| 7    | Safety valve                     | 22   | Inlet water sensor                                   |
| 8    | Filter dryer                     | 23   | Manual bleed valve                                   |
| 9    | Sight glass                      | 24   | Check valve 10 bar (145 psi)                         |
| 10   | Electronic expansion valve (EEV) | 25   | Blind disk - only with optional 2- way valve         |
| 11   | Temperature sensor for EEV       | 26   | NTC Temperature sensor for DIGITAL SCROLL compressor |
| 12   | Check valve                      | 27   | Access valve 1/4"                                    |
| 14   | Reheating coil (optional)        | 28   | Blind disk - only with optional 2- way CW valve      |
| 15   | Evaporator                       |      |  |



# Refrigerant and Hydraulic Circuits

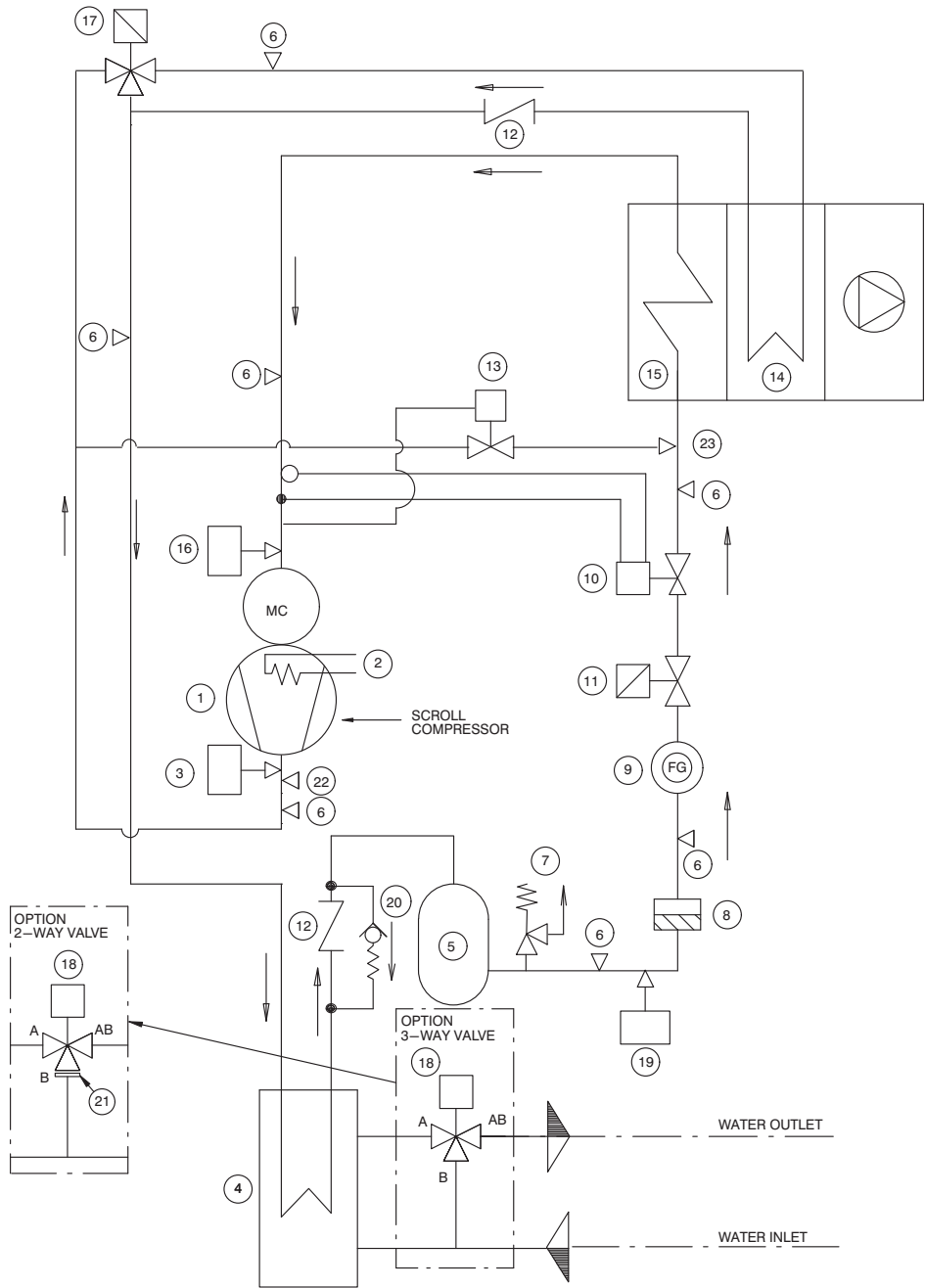
Fig. 14.55 - Refrigerant circuit KA version (PX015-021-025-031) - Single circuit - Single SCROLL compressor



| POS. | DESCRIPTION                        | POS. | DESCRIPTION                    |
|------|------------------------------------|------|--------------------------------|
| 1    | Compressor                         | 11   | Shutoff solenoid valve         |
| 2    | Crankcase heater                   | 12   | Check valve                    |
| 3    | High pressure switch               | 13   | Shutoff valve                  |
| 4    | Air cooled condenser               | 14   | Reheating coil (optional)      |
| 5    | Liquid receiver                    | 15   | Evaporator                     |
| 6    | Access valve 5/16"                 | 16   | Low pressure transducer        |
| 7    | Safety valve                       | 17   | 3-way hot gas modulating valve |
| 8    | Filter dryer                       | 18   | Access valve 1/4"              |
| 9    | Sight glass                        | 19   | Hot gas injector               |
| 10   | Thermostatic expansion valve (TXV) | 20   | Hot gas injection valve        |

# Refrigerant and Hydraulic Circuits

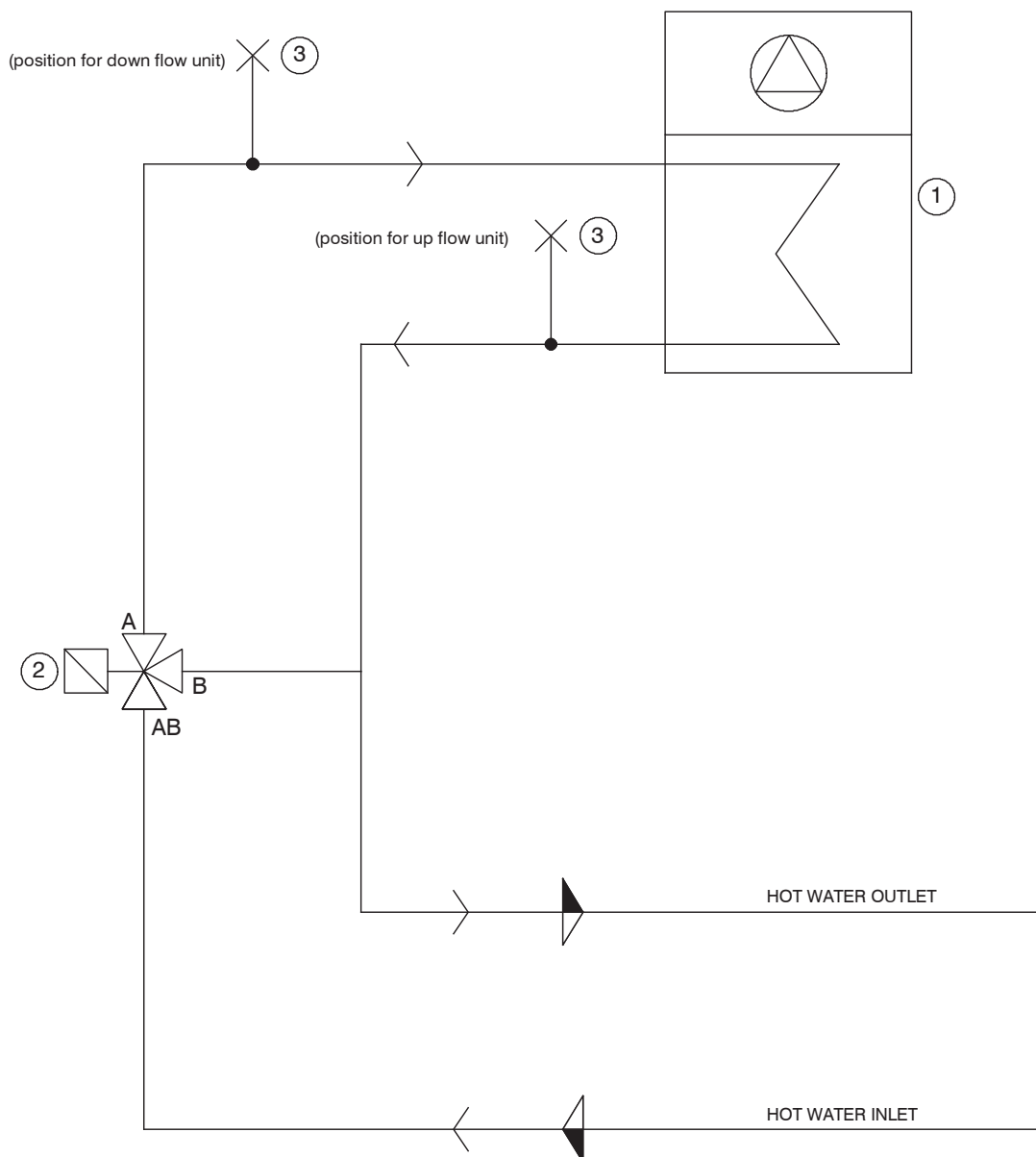
Fig. 14.56 - Refrigerant circuit KW version (PX015-021-025-031) - Single circuit - Single SCROLL compressor



| POS. | DESCRIPTION             | POS. | DESCRIPTION                                 |
|------|-------------------------|------|---|
| 1    | Compressor              | 13   | Hot gas injection valve                     |
| 2    | Crankcase heater        | 14   | Reheating coil (optional)                   |
| 3    | High pressure switch    | 15   | Evaporator                                  |
| 4    | Water cooled condenser  | 16   | Low pressure transducer                     |
| 5    | Liquid receiver         | 17   | 3-way hot gas modulating valve              |
| 6    | Access valve 5/16"      | 18   | Condensing regulation water valve           |
| 7    | Safety valve            | 19   | Pressure transducer condensing regulation   |
| 8    | Filter dryer            | 20   | Check valve 10 bar (145 psi)                |
| 9    | Sight glass             | 21   | Blind disk (only with optional 2-way valve) |
| 10   | Expansion valve         | 22   | Access valve 1/4"                           |
| 11   | Shut-off solenoid valve | 23   | Hot gas injector                            |
| 12   | Check valve             |      |   |

# Refrigerant and Hydraulic Circuits

Fig. 14.57 - Hydraulic circuit hot water 3 way

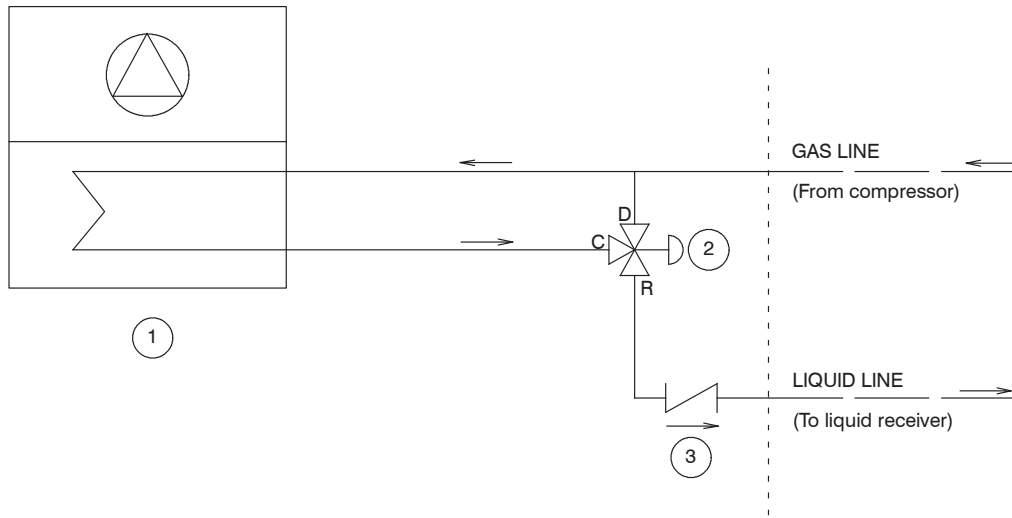


| POS. | Components           |
|------|----------------------|
| 1    | Reheating coil       |
| 2    | On/off 3 - way valve |
| 3    | Manual bleed valve   |

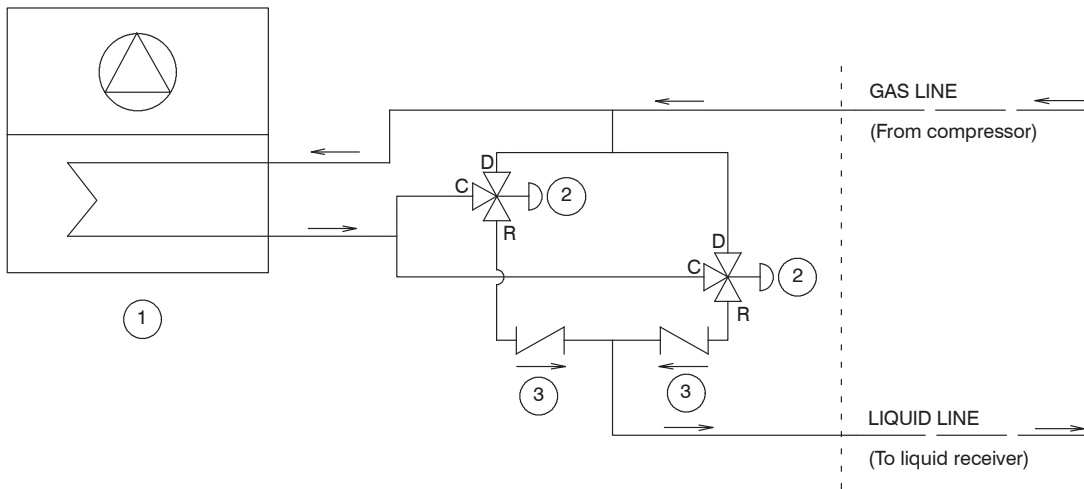
# Refrigerant and Hydraulic Circuits

Fig. 14.58 - Refrigerant circuit for head pressure control valve installation

PX041... PX104 (no PX057)  
(FOR EACH REFRIGERANT CIRCUIT)



PX057 / PX120  
(FOR EACH REFRIGERANT CIRCUIT)



| POS. | Components                  |
|------|-----------------------------|
| 1    | Air cooled condenser        |
| 2    | Head pressure control valve |
| 3    | Check valve                 |

### Silencing cartridges for supply hoods

See Chap. 7

### High efficiency filters

See Chap. 9

### Filter holding duct

See Chap. 9

### Fresh air kit

See Chap. 9

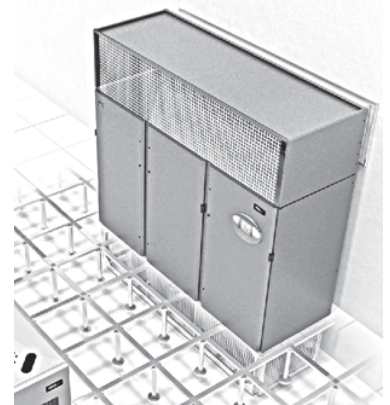
### Air Economizer

The Air Economizer comprises an extension hood 860 mm height with a dampers system installable on top of the Downflow units. This system allows the free-cooling taking advantage of cool outdoor air to condition indoor space.

The iCOM checks the external air condition (temperature/humidity) and depending on environment conditions controls the dampers system mixing the indoor unit air with cool outdoor air; it is possible to have 100% outdoor air, mixed outdoor air and water cooling or 100% water cooling.

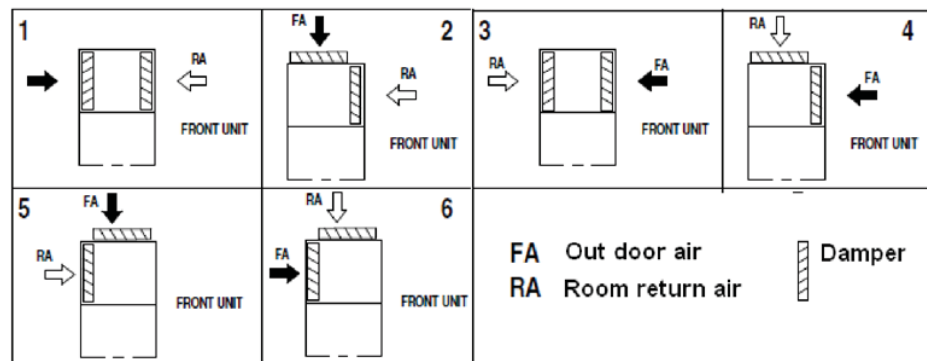
The Air Economizer system delivers high energy\ savings reducing or eliminating the cost of refrigerant pumping.

To use the Air Economizer the building has to be equipped with suitable air ducts and the dampers system modulating permits to use different channel configurations.



**Note:** it is required a flange 50 mm high to connect the air economizer to the unit (see Connecting Flange).

Air economizer available configuration:



# Accessories

## Horizontal hood with grill

A supply plenum with horizontal air flow can be installed on top of the unit. The 600mm high plenum has the same design as the unit; it consists of sandwich panels lined with non-flammable insulation material of class 0 (ISO 1182.2), density 30 kg/m<sup>3</sup>. It is equipped with a double deflection grill.

This option is not available for PX150 - 165.



## Base modules

A 200 mm high base module can be supplied on request to support Liebert® PDX Upflow and at the same time allow pipework to enter the base of the unit when a raised floor is not installed.

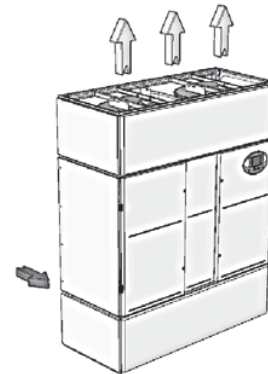
This option is not available for PX150 - 165.



## Base Module h 600/300 mm with rear air intake

A base module can be supplied on request to allow Liebert® PDX Upflow to work with a rear/bottom or bottom air intake. The rear/bottom air intake base module is 600 mm high, the bottom air intake base module is 300mm high. This accessory at the same time supports the unit allowing the piping connection when a raised floor is not installed. Note that in this case the air conditioning unit must be ordered with a blind front panel and an open basement.

This option is not available for PX150 - 165.



## Vertical flow extension hood

An extension hood can be supplied on request and can be installed on top of the unit. It is available with different height: 500mm; 600mm; 700mm; 800mm; 900 mm. It has the same design as the unit and consists of sandwich panels lined with non-flammable insulation material of class 0 (ISO 1182.2), density 30 kg/m<sup>3</sup>.

Note: on Downflow units it is required a flange 50 mm high to connect the extension hood to the unit (see Connecting Flange).



# Accessories

## Base frames

A base frame can be supplied on request to support Liebert® PDX when installed with a raised floor. The frame could be regulated with a height from 120mm to 800mm and the unit is fixed on it.

## Kit Legs

Legs kit can be supplied on request to support Liebert® PDX when installed with a raised floor. The legs are fixed with the unit frame and allow to support the unit at different height, three kits are available with different height: adjustable in the range: h1- 30-370mm; h2 370- 570mm; h3 570- 800mm.

**Note:** Kit legs not available for PX015-21-25-31-33.

## Flooding alarm (Liquistat)

The flooding alarm detects the presence of water or of any other conductive liquid and, opening a circuit, activates an alarm.

There are no moving parts and it is not subject to dirt or vibration. Up to 5 sensors can be connected to the same flooding alarm device to control many points in the room. The alarm device is supplied with a sensor. Additional sensors can be ordered separately.

## Smoke alarm (Smokestat)

A smoke alarm can be installed to stop the conditioning system when the presence of smoke in the intake air is perceived. This is an optical smoke detector (it uses the Tyndall effect), which absorbs very low current (100mA) and is absolutely insensitive to light or wind.

## Fire alarm (Firestat)

In some applications the fire regulations require the installation of an alarm device (Firestat) which deactivates the air conditioner when the intake air temperature is too high.

## Floor tiles support kit

Floor tiles support kit can be supplied on request to support tiles around Liebert® PDX

Downflow Down, when installed with a raised floor.

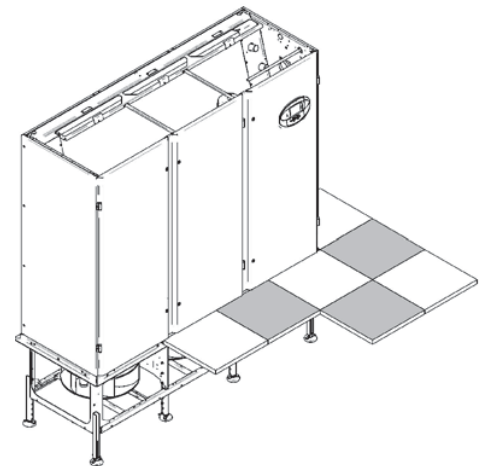
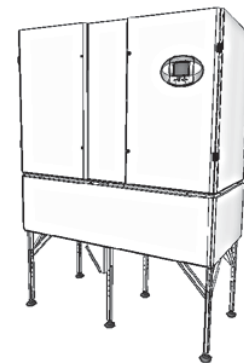
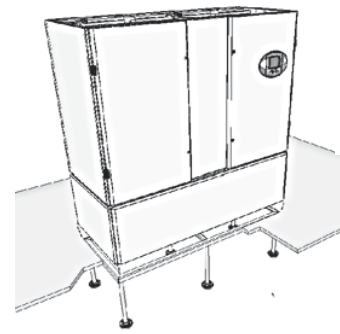
Floor tiles support is fixed on the unit frame/fan module and allows to support tiles until 40 mm thickness.

With a correct installation, the maximum admitted vertical distributed load on the perimeter is 180 kg/m.

I.e.: on the lateral side, 870 mm long, the maximum admitted distributed load is 157kg.

Floor tiles support is earthed with the unit frame.

Follow local rules for system grounding.



## Accessories

### Fans maintenance kit

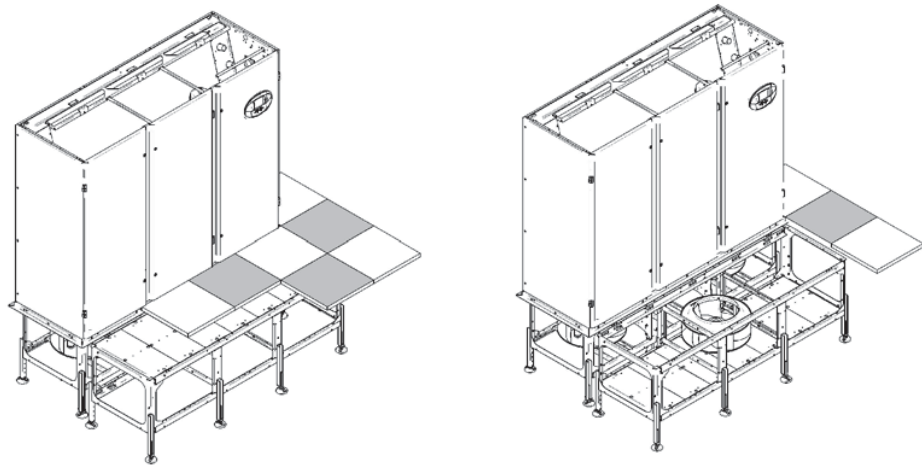
Fans maintenance kit can be supplied on request to support tiles on Liebert® PDX Downflow Down when installed with a raised floor.

Fans maintenance kit allows maintenance operations, in particular fans replacement, when the fans are installed below the floor level.

Removing tiles on the frontal area, it is possible to lift some footboards, moving them on the lower level, creating a service volume in the raised floor.

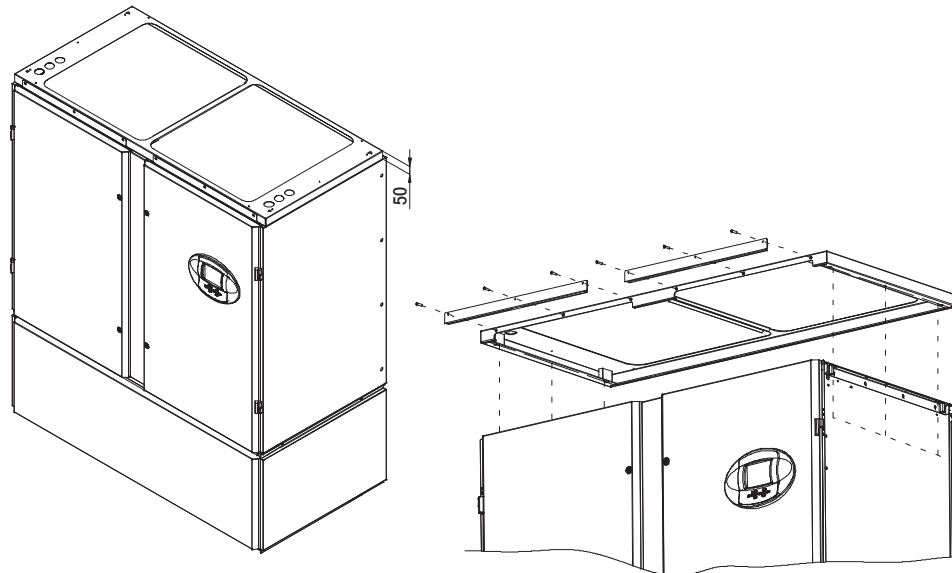
With a correct installation, the maximum admitted vertical distributed load is 600 kg/m<sup>2</sup>. Footboards are designed to support distributed load as indicated above, and the maximum concentrated load is 150 kg (on the area 50x50 mm).

Fans maintenance kit must be earthed following the local rules.



### Connecting Flange

In Downflow Up, Downflow Frontal, Downflow Down units with predisposition for damper, economizer and plenum installation the unit is shipped with a connecting flange 50 mm high fixed on the unit top, so the unit is 50 mm higher. If required, the flange can be removed by unscrewing the fixing screws (removing the side panel to access the screws head) and repositioned later.









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