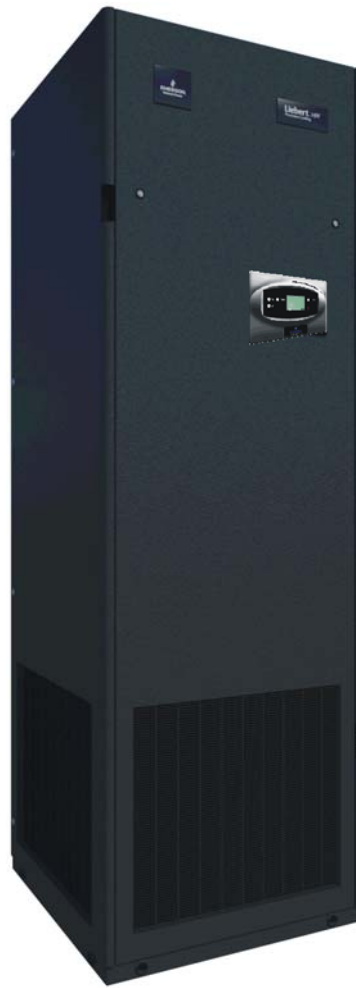


## Liebert HPF

*Indoor Package Cooling System for Telecom Mobile Nodes and Small Enterprises*



# PRODUCT DOCUMENTATION

# Liebert HPF 05 – 15

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## Reliability, Flexibility and TCO

**Liebert HPF** is the newest high performance indoor package cooling system, designed to assure the proper environmental conditions inside technological environments like BTS or Node B for Mobile Telecom networks as well as IT rooms or small Enterprises.

**It's reliable:** thanks its generous design suitable to provide the needed quality to the cooling effect in any critical condition and emergency situation.

**It's flexible:** thanks to the wide possibility of configuration that can be selected to best fit the site needs. Upflow, Underflow and Displacement, with frontal, lateral or back air ducting, frontal and/or lateral air delivery (over) with up to 250 Pa of available static pressure.

**It's a synonymous** of low TCO (Total Cost of Ownership), easy to be installed, easy to be effectively serviced, it reduces to a minimum the power consumption thanks to the availability of the direct FC through the use of 230 Vac or 48 Vdc fan, or even more by selecting the high efficiency EC fan versions.



# Index of Contents

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## Contents

1	Features and Benefits
2	Model Description and Selection
3	Mechanical Specifications
4	Control
5	Options
6	Test and Reference Norms
7	Technical Data
8	Overall Dimensions
9	Installation

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The product conforms to European Union directives 2006/42/EC; 2004/108/EC; 2006/95/EC and 97/23/EC.

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Units are supplied complete with a test certificate and conformity declaration and control component list.



**Liebert HPF** units are CE marked as they comply with the European directives concerning mechanical, electrical and electromagnetic safety.

# 1

## Features and Benefits

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### Use the most suitable configuration!

- *Multiple choice of versions and configurations*

**Liebert HPF** can be selected in Upflow, Downflow or Displacement version resulting extremely flexible and ideal for different site layouts; whatever version is chosen the condenser can be ducted to outside through back or lateral connections facilitating the **Liebert HPF** installation in the center, along the site sides or in a corner.

### Distribute the air in the best way!

- *Cooling effectiveness*
- *Cooling Efficiency*

Use the **Liebert HPF–D** (Displacement) version to maximize the efficiency and effectiveness at same time: **Liebert HPF–D** delivers the cold air straight down, close to the racks suction area and intakes the hot air out—coming from the heat sources in the top part of the room. In this way the mixing effect between cooling unit cold air and the electronic equipment hot air is denied resulting in a double beneficial effect: the racks are fed by cold air where it is needed and the air conditioner treats only the hot air maximising its efficiency.

Proper temperature inside the racks, high efficiency of the cooling equipment, hot spot absence in the site: distributing the air in a smart way is very effective.

### Save energy!

- *Enhanced Freecooling*

The use of the freecooling gives the possibility to stop the compressor and condenser fan, using the external fresh air to cool the site: the annual energy absorption, requested to cool the site, goes sensibly down. The 0–100% fine modulation allows to keep constantly the desired set point inside the site. Thanks to its own air distribution (only hot air is exhausted) the **Liebert HPF–D** version, extends the yearly freecooling use, increasing the energy saving.

### Maximize the site reliability!

- *Continue revenue from site*

**Liebert HPF**, equipped with the Emergency Cooling feature, does not stop the operation even in case of mains failure: fed by 48 VDC emergency supply from back up systems, **Liebert HPF** auto—sets its parameters to ventilate and maximise the freecooling to keep the indoor temperature below the shut down limit, reliability of the site means also reliability of the unit. The Displacement model allows to start the Emergency Freecooling at a higher external temperature, reducing the site shut down risks.

### Fast installation and start–up!

- *No piping, fast electrical connections*

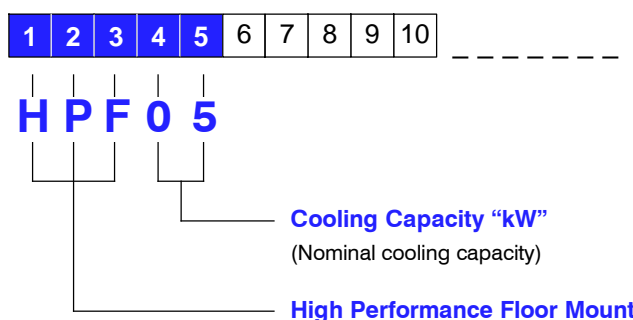
No piping or refrigeration work is requested on site: just prepare cut–outs in the wall and make power available. Fix the remote display in a suitable position and feed the unit.

Installation can be further speeded up using the fast plug connector option (available on request): no wiring is requested on site and the connection can be performed even by non skilled personnel. In case of unit replacement, the fast plugs allow replacement in a few minutes.

# 2

## Model Description and Selections

### Model Nomenclature / Digit Numbers



### Liebert HPF 05/07/10/12/15 Over/Under/Displacement

#### BASE UNIT: DIGITS 1, 2, 3, 4, 5

Packaged indoor floor mounted air conditioner, direct expansion (R407C) with built-in air cooled condenser

#### Digit 6 – Version

O = Over  
U = Under  
D = Displacement

#### Digit 7 – Emergency cooling (EFC)

0 = No emergency cooling  
1 = Emergency cooling through 48Vdc fan (\*)  
2 = Emergency cooling through 230Vac (\*)  
3 = EC fan  
4 = EC fan and emergency cooling (230Vac) (\*)  
A = No emergency cooling + Alarm board  
B = Emergency cooling through 48Vdc fan + Alarm board (\*)  
C = Emergency cooling through 230Vac + Alarm board (\*)  
D = EC fan + Alarm board  
E = EC fan and emergency cooling (230Vac) + Alarm board (\*)

(\*) Option possible only if digit 9 = 1, 2, A, or B

#### Digit 8 – Main power supply and electric heating

0 = 230V / 1Ph / 50Hz, no electric heating (for HPF 05)  
400V / 3Ph / 50Hz, no electric heating (for HPF 07–15)  
1 = 230V / 1Ph / 50Hz, with electric heating (for HPF 05)  
400V / 3Ph / 50Hz, with electric heating (for HPF 07–15)

#### Digit 9 – Fresh air freecooling (FC)

0 = No freecooling  
1 = Freecooling with modulating damper  
2 = Freecooling with fast return damper  
A = Freecooling with modulating damper and Humitemp  
B = Freecooling with fast return damper and Humitemp

#### Digit 10 –Microprocessor control

A = Powerface with display  
B = Powerface with display + Conn. cable for stand-by  
Powerface with Hiromat Evolution (\*)  
(inclusive of RS422 with RJ connectors)  
C = Languages Set 1, temperature control  
(GB, F, I, D, E, P, NL, S)  
D = Languages Set 2, temperature control  
(GB, PL, CZ, H, RUS, TK)

#### Digit 11 –Air filter

0 = G3  
1 = G4  
2 = G3 + clogged filter pressure switch on indoor air  
3 = G4 + clogged filter pressure switch on indoor air

#### Digit 12 –Packing

P = PLP and pallet  
C = Cardboard and wooden crate  
S = Seaworthy

#### Digit 13 –Condensing control

1 = Modulating condenser fan speed control (Variex)

#### Digit 14 –Coils

0 = Standard aluminium fins  
1 = Standard evaporator fins and epoxy coated condenser fins  
2 = Epoxy coated evaporator fins and standard condenser fins  
3 = Epoxy coated evaporator and condenser fins  
4 = Standard evaporator coil and Cu/Cu condenser coil  
5 = Cu/Cu evaporator coil and standard condenser coil  
6 = Cu/Cu evaporator and condenser coil

#### Digit 15 –Inlet / Outlet air configurations

0 = Air supply: Standard  
Inlet and outlet condenser air: standard back  
1 = Air supply: Standard (\*)  
Inlet and outlet condenser air: all directions  
2 = Air supply: All directions (\*\*)  
Inlet and outlet condenser air: standard back  
3 = Air supply: All directions (\*\*\*)  
Inlet and outlet condenser air: all directions

(\*) 1 is valid just for Under and Displacement versions

(\*\*) 2 and 3 are valid just for Over version

(\*\*\*) 3 is valid for Over version, mod. 10–12 and 15, is realized selecting option 2 and adding the lateral plenum

#### Digit 16 –Colour

0 = Bright grey (RAL 7035)  
1 = Charcoal grey  
2 = Black Emerson 7021

#### Digit 17 –Special requirements

0 = None  
X = Special

# 3

## Mechanical Specifications

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### Cabinet

The structure of **Liebert HPF** is made up of bearing panels in riveted galvanized steel, enclosed by a paneling screwed to the unit, in galvanized steel, powder – painted. The insulation of the panels is 30 kg/m<sup>3</sup> type, self – extinguishing material (class 1). An important result which has been achieved, is the compactness of the unit: a great cooling capacity with reduced dimensions and footprint.

- *Compactness*

### Refrigerant circuit

**Liebert HPF** is equipped with a single refrigerating circuit with hermetic compressor, Scroll type, complete with an internal thermal protection against overheating of the motor.

The crankcase heater maintains minimum refrigerant temperature and is energised while the unit is powered and the compressor is off: in this way reliable start – up and operation are allowed even in very cold climate. The circuit incorporates a thermostatic valve which controls the refrigerant flow to the evaporator. A filter dryer is provided in the liquid line to eliminate all moisture for maximum efficiency and an increased working life.

- *Efficiency*

The compressor is equipped with two pressure switches for protection against high condensing and low evaporating pressures. The low pressure switch features automatic reset and a delay for winter operation. The high pressure switch is equipped with manual reset, for maximum safety.

### Evaporating section

This consists of a plate coil in copper tubes with aluminium fins; the large face area increases the Sensible Heat Ratio (SHR) and optimises the Energy Efficiency Ratio (EER); this is achieved by reducing the air pressure drop and turbulence and by increasing the evaporating temperature, thus the efficiency of the compressor. A galvanized steel basin is provided for the drainage water.

- *Cooling capacity*

### Evaporator fan

The units are equipped with one or two centrifugal fans, backward curved blade, motor direct driven fan. The aluminum impeller is statically and dynamically balanced with lifetime lubricated bearings for quiet, vibration – free operation.

The fan motor is completed by an internal thermal protection.

### Condenser section

A built – in air cooled condensing coil is provided. It is designed in copper tubes with aluminium fins and sized to allow operations in harsh ambient conditions.

A special flat metallic prefilter protects the condensing coil against dirt: the prefilter can be easily checked and can be removed from the unit front for cleaning or replacing.

- *Reliability*

### Condenser fan

Units are equipped with a centrifugal, with blades curved backwards. The fan is statically and dynamically balanced. The fan wheel and the body are in aluminium in order to protect against corrosion. The direct drive motor includes sealed – for – life bearings, and internal thermal protection.

### Air filter

The filter section is located horizontally within the cabinet, before the evaporating coil and provides filtration of recirculated or fresh air in order to obtain the required degree of air cleanliness in the room. The filters can be removed from the front of the unit simply by opening the relevant panel. The air filter is 60 mm deep on models **HPF 05 / 07** and 50 mm deep on models **HPF 10 / 12 / 15**, plated type, especially designed to minimize the pressure drop and to improve efficiency. The standard filter class is EU3, according to Eurovent EU4/5 standard.

- *Air Purity*

# Mechanical Specifications

## Electrical panel

The electrical board is housed in a compartment isolated from the air stream and closed by a screwed panel. The electrical board is built in accordance with EN 60204 – 1 recommendations. The unit **HPF 05** is designed for 230 V / 1 ph / 50 Hz power supply. The units **HPF 07 / 10 / 12** and **HPF 15** are designed for 400 V / 3 ph / 50 Hz power supply.

- *Power Supply with Safety*

One circuit breaker with thermal protection against short circuits is supplied for the electrical apparatus. A single phase transformer for 24 V power supply to the electronic control and to a secondary circuit is provided for maximum safety.

Automatic restart is provided after a power failure.

## PLP packing

**Liebert HPF** unit is packed as standard on a wooden pallet with shock – proof angle pieces and a top cover made of pressed cardboard/polystyrene sandwich, protected by flexible polythene film.

- *Cardboard, polystyrene and wood standard packing*

## Connectivity

**LAN** (Local Area Networking) among several units is allowed as standard through the use of Hirobus cables (8 poles shielded cables, either 3 or 5 or 20 meters long); sharing setting parameters, rotating the units during their operation, keeping units in stand – by and re – activating them when required.

- *LAN availability as standard*

## Operational limits

### Liebert HPF O / U (Over / Under) models in all the versions

HPF	05 O/U	07 O/U	10 O/U	12 O/U	15 O/U	
Power supply voltage	230V ±10% / 1Ph / 50Hz	400V ±10% / 3Ph + N + PE / 50Hz				
Outdoor working conditions	from	–30°C				
	to	52.0°C (*)	46.5°C (*)	50.5°C (*)	48.5°C (*)	45.0°C (*)
Indoor working conditions (***)	from	22.0°C; 30–80% R.H.	23.0°C; 30–80% R.H.	20.0°C; 30–80% R.H.	21.0°C; 30–80% R.H.	
	to	32.5°C; 40% R.H.	35.0°C; 40% R.H.	33.5°C; 40% R.H.	34.5°C; 40% R.H.	33.5°C; 40% R.H.
Storage conditions	from	–40°C; 5% R.H.				
	to	55°C; 90% R.H.				

### Liebert HPF D (Displacement) models in all the versions

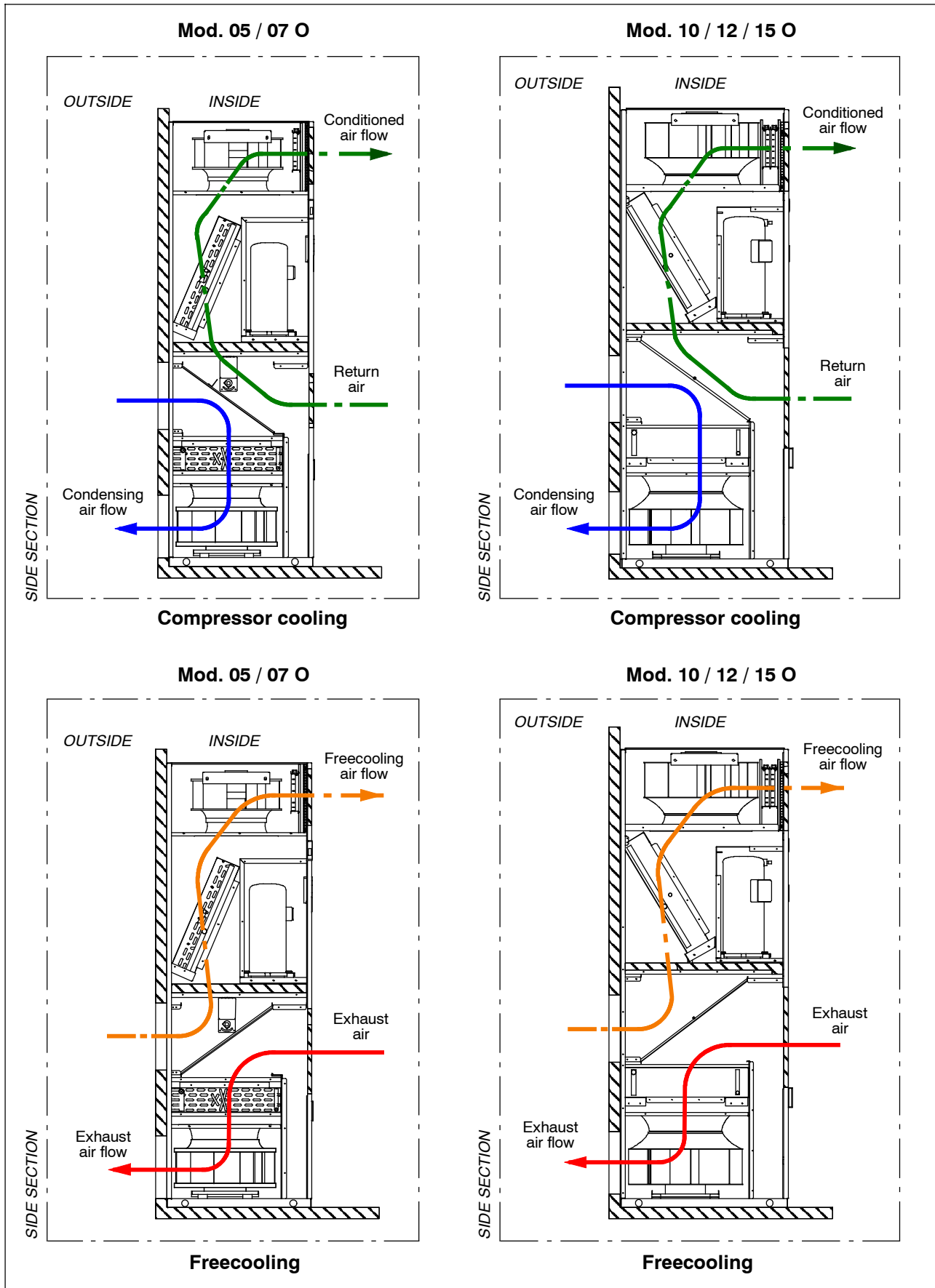
HPF	05 D	07 D	10 D	12 D	15 D	
Power supply voltage	230V ±10% / 1Ph / 50Hz	400V ±10% / 3Ph + N + PE / 50Hz				
Outdoor working conditions	from	–30°C				
	to	52.0°C (**)	46.5°C (**)	50.0°C (**)	48.0°C (**)	45.0°C (**)
Indoor working conditions (***)	from	22.0°C; 30–80% R.H.	23.0°C; 30–80% R.H.	20.0°C; 30–80% R.H.	21.0°C; 30–80% R.H.	
	to	33.0°C; 40% R.H.		32.0°C; 40% R.H.		34.5°C; 40% R.H.
Storage conditions	from	–40°C; 5% R.H.				
	to	55°C; 90% R.H.				

#### Notes:

- (\*) Maximum external air temperature is referred to 27°C / 47% R.H. at the evaporating suction side.
- (\*\*) Maximum external air temperature is referred to 30°C / 39.5% R.H. at the evaporating suction side.
- (\*\*\*) Conditions referred to the evaporating suction side; the min. indoor temperature is referred to 30% of indoor relative humidity and to the min. outdoor temperature; for higher relative humidity and/or outdoor temperatures, the min. indoor temperature is lower than the table data. The max. indoor temperature is referred to outdoor temperature of 35°C; for higher indoor relative humidities and/or outdoor temperatures, the max indoor temperature is lower than the table data.

# Mechanical Specifications

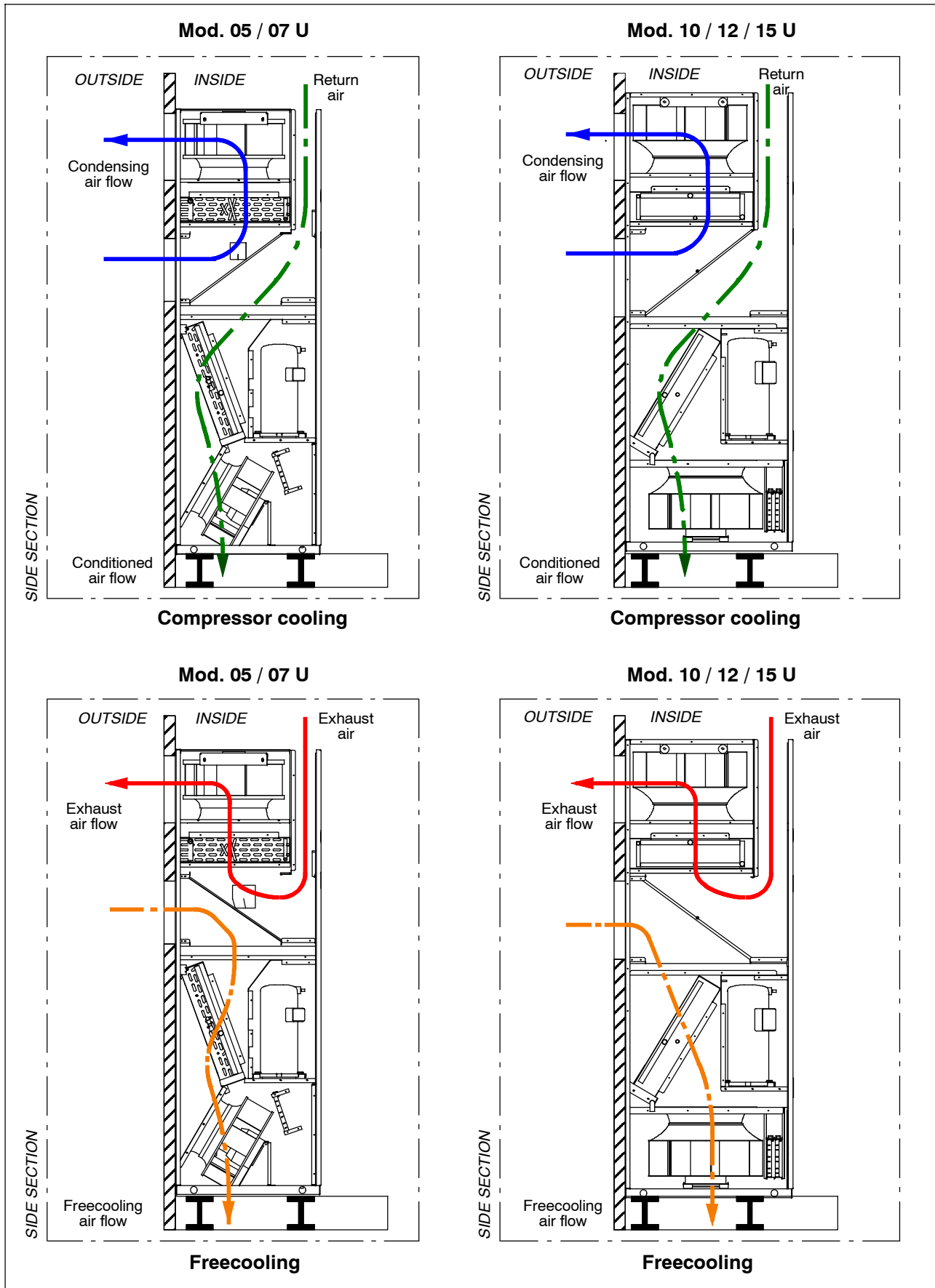
Fig. 1 – Air flow operating diagram – Liebert HPF Over





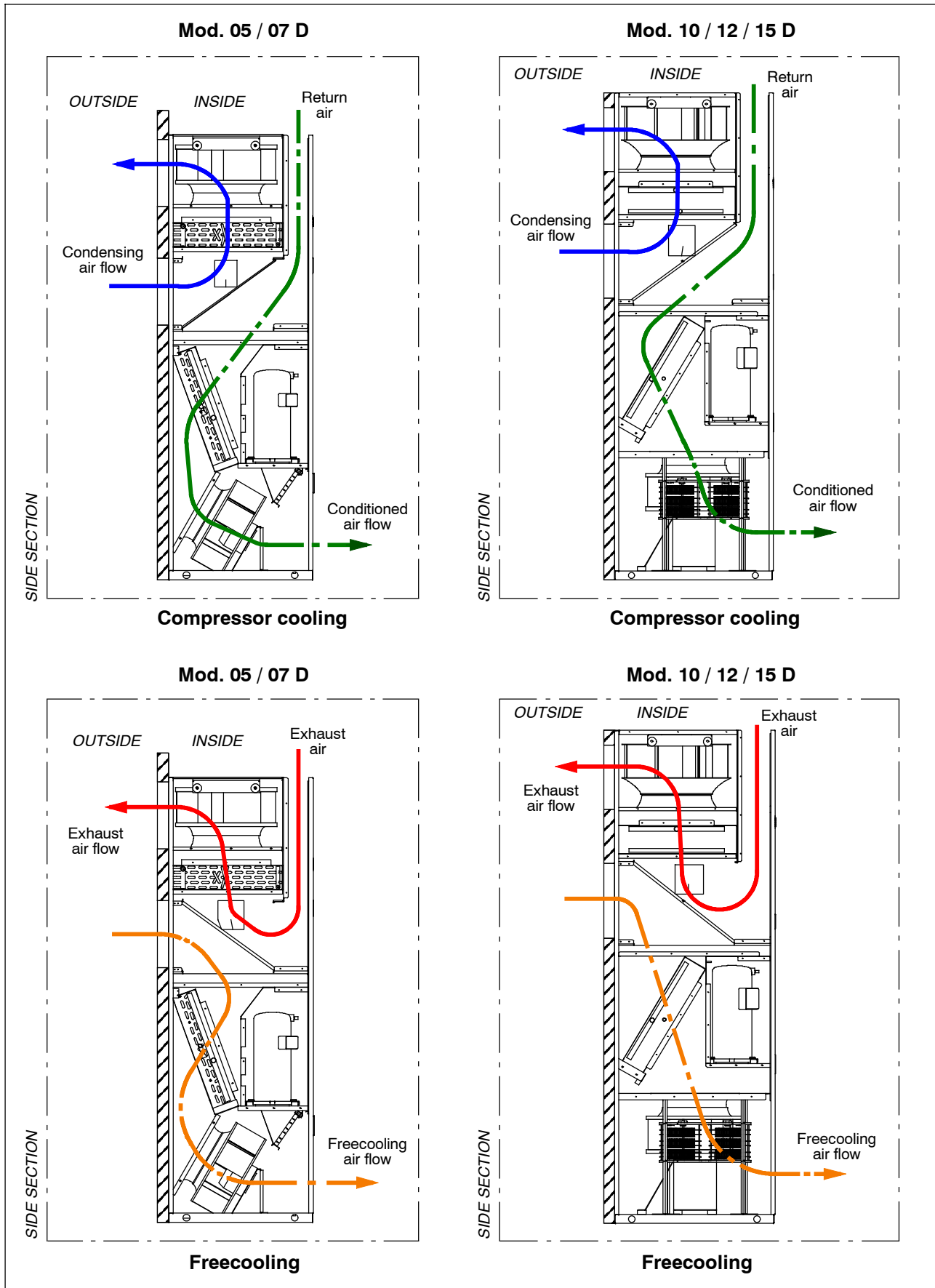
# Mechanical Specifications

Fig. 2 – Air flow operating diagram – Liebert HPF Under



# Mechanical Specifications

Fig. 3 – Air flow operating diagram – Liebert HPF Displacement



## Main features

The electronic board is located in the electrical panel, connected to the display, placed on the frontal panel.

- The user interface (option) is the 3–digit back–lit display showing parameter values and relevant symbols/codes in a tree menu. It features navigation push buttons and status leds.
- General warning and general alarm signals are available: both of them activate a visual indicator in the optional display.
- Input for remote On–Off and volt–free contacts for simple remote monitoring of general warning and alarms are available.
- The self –test function automatically activates / deactivates the main components (evaporator or fan, compressor, free cooling damper, heaters, alarms) without changing the pre–set parameters, to easily start–up and commission the unit. No skilled personnel are requested (\*).
- All settings are protected through a 3–Level password system (\*).
- Automatic restart is provided after a power failure.



(\*). The Remote display is required to activate the function.

## Technical data

- Power supply: ..... 24 Vac / 24 Vdc / 48 Vdc
- E2prom: ..... 64 Kbit
- Eprom / Flash memory: ..... 2 or 4 Mbit
- RAM memory space: ..... 256 Kbit
- Analogue Input: ..... 1 x Analogue 0–10V  
2 x Analogue 0–5V
- Digital Input: ..... 3 x PTC input  
5 x Flexible Digital multi input
- Analogue Output: 2 x Analogue 0–10V
- Digital output: ..... 3 x relay high power output  
2 x relay 24Vac / 48Vdc output  
2 x relay low power output  
1 x open collector 12Vdc output
- Time and date function buffered by LI–battery.
- Hirobus LAN connectors (optional): 3 RJ45 sockets (to and from LAN connected units, remote display)
- Hironet connectors: ..... 1 RJ9 socket for RS485 (direct connection to proprietary supervision)
- Hiromatic E display (optional).
- SMM mobile phones communications via SMS (optional).

- *Uninterruptible ventilation*
- *48VDC Freecooling*
- *Customized alarms on board*

## Emergency cooling

The unit is optionally equipped with an emergency cooling system that allows to ventilate or to cool through external fresh air the site in case of main electrical supply fault.

For this purpose the evaporating fan section, the control, and the free cooling damper are supplied in 48 VDC power supply (from rectifier in normal mode, from batteries in emergency mode). This option guarantees the air circulation inside the site and if the control recognizes the proper external temperature to run the freecooling mode, the damper will open to fresh the site and get the required set point. The emergency cooling system is also available in 230 and 400 VAC.

The compressor and the condenser fan are supplied by standard AC power.

## Heating

The heating option includes one stage electric heaters and ON – OFF regulation.

A safety thermostat, with automatic reset and fuse, prevents from reaching dangerous temperatures.

- *ON – OFF control*
- *Safety thermostat*

## Freecooling

All units can be made available with Freecooling (FC) option.

In this way we save energy and increase reliability, for the lower number of compressor starts and stops, and the shorter running time.

The internal damper modulates his position from 0 to 100% of fresh air, just to achieve the required cooling capacity. Through the unit the exhaust air is discharged outdoor: no overpressure dampers are needed.

There is an intelligent management of the Freecooling, starting not at a fixed ambient temperature: the consensus to FC is given when the difference between the indoor and outdoor air temperatures is higher than a set value. A dedicated sensor checks the air supply temperature, in order to avoid too low values (stressful for telecommunications electronic equipment) during FC operation.

If equipped with the additional humidity sensor (Humitemp, optional), the unit can modulate the Freecooling damper in order to avoid too high or too low humidity due to the fresh air inlet.

In case of total power failure (both the power supplies, main (both the power supplies, main 230VAC or 400VAC and emergency 48VDC for EFC optional versions), the motor of the Freecooling damper is not powered: an integrated spring device (option) closes it, in order to avoid uncontrolled fresh air inlet.

## EC fan

**Liebert HPF** can be supplied with an exclusive evaporator fan type that enables to greatly increase the unit's efficiency and reduce the operating costs.

The EC fan (Electronically commutated DC motors) has the main advantage of higher fan shaft motor efficiency (85% – 90%) that leads to energy/cost saving up to 30%.

Furthermore the peak inrush current is lower than the operating current, featuring a soft start effect. The EC fan is optimized, when modulating, to reduce the power input and the sound emission compared to a traditional AC fan, being more flexible in terms of adaptability to the site needs thanks to the regulation obtained through the unit control: airflow and ESP can be easily adjusted to raised floor, false ceiling and ducting pressure needs. In freecooling mode the EC fan offers the possibility of modulating its speed adapting the system cooling capacity to the site demand thanks to the automatic regulation offered by the control, leading to concrete additional energy saving when working at partial load conditions or when the low external temperature allows reducing the needed airflow.

The EC fan option can be selected together with the emergency cooling option offering even more reliability to the system.

# Options

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## Control

- *Safety option*
- *Graphic display*

"No Display" option let just authorized people to change main parameters set, using a "service display".

Graphic display is available featuring a 24h graphic record of controlled parameters as well as the last 200 events occurred. A back-up battery keeps the data stored in the memory (graphic data record, alarms).

## Special filtration

- *G4 filter*
- *Freshair clogged filter*

Optional high-level filtration can be reached.

A clogged filter system can be supplied to advise when the indoor air filter is dirty.

## Package

- *Wooden crate*
- *Wooden case*

Standard packing consists of a wooden pallet and cardboard box. Polythene foam protects the unit painted surfaces. On request, a cardboard box with an additional wooden crate or wooden case for sea transport can be supplied.

## Protection from corrosive environment

- *Epoxy protection*
- *Cu/Cu coils*

Condenser and evaporator coils are available with aluminium fins coated by an epoxy film or copper/copper version, for aggressive environments.

# 6

## Test and Reference Norms

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### Safety

**Liebert HPF** units are designed, manufactured and tested according to the European Union directives:

- 2006/42/EC;
- 2004/108/EC;
- 2006/95/EC;
- 97/23/EC.

### Electrical Board

Design and manufacturing is compliant with EN 60204 – 1.

### Electro–Magnetic compatibility (EMC)

**Liebert HPF** complies with the following EMC standards:

- EN 61000–6–3:2001, Emission (“Generic emission standard: Residential, commercial and light industry”).
- EN 61000–6–2:2001, Immunity (“Generic immunity standard: Industrial environment”).

### Mark

Each unit is supplied complete with individual test certificate and a declaration of conformity to the European Union directives. The units are marked “CE”.



Tab. 1 – Technical Data

**Liebert HPF 05–07–10–12 Over** (no Freecooling, Freecooling, Emergency Freecooling 230Vac)  
**Liebert HPF15 Over** (no Freecooling, Freecooling, Emergency Freecooling 400Vac)

MODEL: HPF		050	070	100	120	150
Air supply	–	Up–flow				
Main power supply	–	230V ±10% / 1Ph / 50Hz	400V ±10% / 3Ph + N + PE / 50Hz			
Emergency power supply	–	230V ±10% / 1Ph / 50Hz				400V±10% /3Ph/50Hz
<b>PERFORMANCE</b>						
Total cooling capacity <sup>(1)</sup>	kW	4.9	7.1	11.5	13.2	16.2
Sensible cooling capacity <sup>(1)</sup>	kW	4.9	6.4	11.0	11.6	14.3
Compressor – AC power input <sup>(1)</sup>	kW	1.20	2.10	2.90	3.63	4.69
Compressor – AC operative current (OA) <sup>(1)</sup>	A	5.5	3.8	5.3	6.5	8.6
Compressor – AC max current (FLA)	A	10.0	5.1	7.0	10.0	11.0
Compressor – AC starting current (LRA)	A	35.0	32.0	46.0	50.0	65.5
Condenser fan – AC max. power input	kW	0.68	0.68	1.27	1.27	1.27
Condenser fan – AC operative power input <sup>(1)</sup>	kW	0.67	0.67	1.27	1.27	1.27
Condenser fan – AC operative current (OA) <sup>(1)</sup>	A	3.0	3.0	2.7	2.7	2.7
Condenser fan – AC max. current (FLA)	A	3.0	3.0	2.8	2.8	2.8
Condenser fan – AC start–up current (LRA)	A	12.0	12.0	11.0	11.0	11.0
Evaporator fan – AC power input <sup>(1)</sup>	kW	0.44	0.44	0.67	0.67	1.15
Evaporator fan – AC operative current (OA) <sup>(1)</sup>	A	2.0	2.0	3.0	3.0	2.5
Evaporator fan – AC max. current (FLA) <sup>(2)</sup>	A	2.3	2.3	3.0	3.0	2.8
Evaporator fan – AC start–up current (LRA)	A	9.2	9.2	12.0	12.0	11.0
Evaporator air flow <sup>(5)</sup>	m <sup>3</sup> /h	1950	1910	2910	2910	3610
Condenser max. air flow <sup>(5)</sup>	m <sup>3</sup> /h	2740	2740	4830	4830	4830
Z.E.T. in FC working condition (100% DX total cooling capacity) <sup>(6)</sup>	°C	17.8	13.4	13.8	11.8	12.0
Z.E.T. in FC working condition (100% DX sensible cooling capacity) <sup>(6)</sup>	°C	17.8	14.7	14.3	13.6	13.7
Z.E.T. in FC working condition (50% DX total cooling capacity) <sup>(6)</sup>	°C	22.4	20.2	20.4	19.4	19.5
Z.E.T. in FC working condition (50% DX sensib. cooling capacity) <sup>(6)</sup>	°C	22.4	20.8	20.7	20.3	20.4
Outdoor sound pressure level <sup>(3)</sup>	dB(A)	57.0	58.0	58.0	61.0	62.5
Indoor sound pressure level <sup>(3)</sup>	dB(A)	56.5	56.5	60.5	60.5	65.5
Max. ambient temperature <sup>(4)</sup>	°C	52.0	46.5	50.5	48.5	45.0
<b>REFRIGERATION CIRCUIT</b>						
Compressor – type / quantity	–	Scroll / 1				
Refrigerant	–	R407C				
Expansion device	–	Thermostatic valve				
Evaporator coil – tubes / fins material	–	Copper / Aluminium				
Condenser coil – tubes / fins material	–	Copper / Aluminium				
<b>AIR FILTRATION</b>						
Main air filter – quantity / type	–	1 / Pleated				
Efficiency (CEN–EU)	–	G3				
Filter dimension	mm	540 x 620 x 60		720 x 790 x 50		
<b>EVAPORATOR FAN</b>						
Quantity / Type / Poles	–	1 / Plug / 4				
Driven / Motor protection	–	Direct / IP54				
<b>CONDENSER FAN</b>						
Quantity / Type / Poles	–	1 / Plug / 4				
Driven / Motor protection	–	Direct / IP54				
Control system	–	Continuously variable speed				
<b>ELECTRIC HEATING</b>						
Type / Steps	–	Wires / 1				
Heating capacity	kW	1.5	3.0	4.5	6.0	6.0
Heating – max. current	A	6.5	6.5	6.5	13.0	13.0
<b>CABINET</b>						
Frame	–	Galvanized steel				
Painting	–	Polyester – Charcoal grey				
<b>DIMENSIONS</b>						
Length x Height x Depth	mm	650 x 1990 x 650		900 x 2050 x 750		
Weight	kg	197	200	288	290	295

**Notes:**

- (1) – Values are referred to DX working conditions, 35°C outdoor temperature, to nominal power supply and to the 27°C / 47% R.H. at the evaporating suction side.  
(2) – Value is referred to nominal speed (factory set).  
(3) – Measured in DX working conditions, with 35°C outdoor temperature, at 2 m from the unit, in free field conditions.  
(4) – Maximum outdoor temperature is referred to DX working conditions, 27°C / 47% R.H. at the evaporating suction side.  
(5) – Referred to 50Pa as External Static Pressure (ESP).  
(6) – Z.E.T. stands for Zero Energy Temperature, that is the external air temperature at which 100% or 50% of DX total or DX sensible cooling capacity is supplied by mean of unit freecooling functionality.

# Technical Data

## Liebert HPF 05–07–10–12–15 Over (Emergency Freecooling 48Vdc)

MODEL: HPF		050	070	100	120	150
Air supply	–	Up–flow				
Main power supply	–	230V ±10% / 1Ph / 50Hz	400V ±10% / 3Ph + N + PE / 50Hz			
Emergency power supply	–	48 Vdc ±17%				
<b>PERFORMANCE</b>						
Total cooling capacity <sup>(1)</sup>	kW	4.9	7.1	11.3	13.2	15.7
Sensible cooling capacity <sup>(1)</sup>	kW	4.9	6.4	10.5	11.6	13.1
Compressor – AC power input <sup>(1)</sup>	kW	1.20	2.10	2.90	3.63	4.67
Compressor – AC operative current (OA) <sup>(1)</sup>	A	5.5	3.8	5.3	6.5	8.5
Compressor – AC max current (FLA)	A	10.0	5.1	7.0	10.0	11.0
Compressor – AC starting current (LRA)	A	35.0	32.0	46.0	50.0	65.5
Condenser fan – AC max. power input	kW	0.68	0.68	1.27	1.27	1.27
Condenser fan – AC operative power input <sup>(1)</sup>	kW	0.67	0.67	1.27	1.27	1.27
Condenser fan – AC operative current (OA) <sup>(1)</sup>	A	3.0	3.0	2.7	2.7	2.7
Condenser fan – AC max. current (FLA)	A	3.0	3.0	2.8	2.8	2.8
Condenser fan – AC start–up current (LRA)	A	12.0	12.0	11.0	11.0	11.0
Evaporator fan – DC power input <sup>(1)</sup>	kW	0.28	0.33	0.45	0.54	0.64
Evaporator fan – DC operative current (OA) <sup>(1)</sup>	A	5.8	7.0	9.5	11.1	13.4
Evaporator fan – DC max. current (FLA) <sup>(2)</sup>	A	9.6	9.6	9.6	19.2	19.2
Evaporator fan – DC start–up current (LRA)	A	0.1	0.1	0.1	0.1	0.1
Evaporator air flow <sup>(5)</sup>	m <sup>3</sup> /h	1780	1910	2710	2870	3070
Condenser max. air flow <sup>(5)</sup>	m <sup>3</sup> /h	2740	2740	4830	4830	4830
Z.E.T. in FC working condition (100% DX total cooling capacity) <sup>(6)</sup>	°C	16.9	13.4	13.0	11.6	9.9
Z.E.T. in FC working condition (100% DX sensible cooling capacity) <sup>(6)</sup>	°C	16.9	14.7	14.0	13.5	12.7
Z.E.T. in FC working condition (50% DX total cooling capacity) <sup>(6)</sup>	°C	21.9	20.2	20.0	19.3	18.4
Z.E.T. in FC working condition (50% DX sensib. cooling capacity) <sup>(6)</sup>	°C	21.9	20.8	20.5	20.2	19.9
Outdoor sound pressure level <sup>(3)</sup>	dB(A)	57.0	58.0	58.0	61.0	62.5
Indoor sound pressure level <sup>(3)</sup>	dB(A)	58.5	60.5	62.0	60.5	62.0
Max. ambient temperature <sup>(4)</sup>	°C	52.0	46.5	50.5	48.5	45.0
<b>REFRIGERATION CIRCUIT</b>						
Compressor – type / quantity	–	Scroll / 1				
Refrigerant	–	R407C				
Expansion device	–	Thermostatic valve				
Evaporator coil – tubes / fins material	–	Copper / Aluminium				
Condenser coil – tubes / fins material	–	Copper / Aluminium				
<b>AIR FILTRATION</b>						
Main air filter – quantity / type	–	1 / Pleated				
Efficiency (CEN–EU)	–	G3				
Filter dimension	mm	540 x 620 x 60		720 x 790 x 50		
<b>EVAPORATOR FAN</b>						
Quantity / Type	–	1 / Plug		2 / Plug		
Driven / Motor protection	–	Direct / IP20				
<b>CONDENSER FAN</b>						
Quantity / Type / Poles	–	1 / Plug / 4				
Driven / Motor protection	–	Direct / IP54				
Control system	–	Continuously variable speed				
<b>ELECTRIC HEATING</b>						
Type / Steps	–	Wires / 1				
Heating capacity	kW	1.5	3.0	4.5	6.0	6.0
Heating – max. current	A	6.5	6.5	6.5	13.0	13.0
<b>CABINET</b>						
Frame	–	Galvanized steel				
Painting	–	Polyester – Charcoal grey				
<b>DIMENSIONS</b>						
Length x Height x Depth	mm	650 x 1990 x 650		900 x 2050 x 750		
Weight	kg	197	200	288	290	295

### Notes:

- (1) – Values are referred to DX working conditions, 35°C outdoor temperature, to nominal power supply and to the 27°C / 47% R.H. at the evaporating suction side.
- (2) – Value is referred to nominal speed (factory set).
- (3) – Measured in DX working conditions, with 35°C outdoor temperature, at 2 m from the unit, in free field conditions.
- (4) – Maximum outdoor temperature is referred to DX working conditions, 27°C / 47% R.H. at the evaporating suction side.
- (5) – Referred to 50Pa as External Static Pressure (ESP).
- (6) – Z.E.T. stands for Zero Energy Temperature, that is the external air temperature at which 100% or 50% of DX total or DX sensible cooling capacity is supplied by mean of unit freecooling functionality.



# Technical Data

## Liebert HPF 05–07–10–12–15 Over (Freecooling, Emergency Freecooling 230Vac, EC fan)

MODEL: HPF		050	070	100	120	150
Air supply	–	Up–flow				
Main power supply	–	230V ±10% / 1Ph / 50Hz	400V ±10% / 3Ph + N + PE / 50Hz			
Emergency power supply	–	230V ±10% / 1Ph / 50Hz				
<b>PERFORMANCE</b>						
Total cooling capacity <sup>(1)</sup>	kW	4.9	7.1	11.3	13.2	15.9
Sensible cooling capacity <sup>(1)</sup>	kW	4.9	6.4	10.5	11.6	13.4
Compressor – AC power input <sup>(1)</sup>	kW	1.20	2.10	2.90	3.63	4.68
Compressor – AC operative current (OA) <sup>(1)</sup>	A	5.5	3.8	5.3	6.5	8.6
Compressor – AC max current (FLA)	A	10.0	5.1	7.0	10.0	11.0
Compressor – AC starting current (LRA)	A	35.0	32.0	46.0	50.0	65.5
Condenser fan – AC max. power input	kW	0.68	0.68	1.27	1.27	1.27
Condenser fan – AC operative power input <sup>(1)</sup>	kW	0.67	0.67	1.27	1.27	1.27
Condenser fan – AC operative current (OA) <sup>(1)</sup>	A	3.0	3.0	2.7	2.7	2.7
Condenser fan – AC max. current (FLA)	A	3.0	3.0	2.8	2.8	2.8
Condenser fan – AC start–up current (LRA)	A	12.0	12.0	11.0	11.0	11.0
Evaporator fan – AC power input <sup>(1)</sup>	kW	0.26	0.30	0.42	0.52	0.60
Evaporator fan – AC operative current (OA) <sup>(1)</sup>	A	1.1	1.3	2.6	2.2	2.6
Evaporator fan – AC max. current (FLA) <sup>(2)</sup>	A	2.6	2.6	2.6	5.2	5.2
Evaporator fan – AC start–up current (LRA)	A	0.1	0.1	0.1	0.1	0.1
Evaporator air flow <sup>(5)</sup>	m <sup>3</sup> /h	1730	1960	2780	3190	3320
Condenser max. air flow <sup>(5)</sup>	m <sup>3</sup> /h	2740	2740	4830	4830	4830
Z.E.T. in FC working condition (100% DX total cooling capacity) <sup>(6)</sup>	°C	18.6	15.4	13.0	15.7	12.7
Z.E.T. in FC working condition (100% DX sensible cooling capacity) <sup>(6)</sup>	°C	18.6	16.5	14.0	17.1	14.9
Z.E.T. in FC working condition (50% DX total cooling capacity) <sup>(6)</sup>	°C	22.8	21.2	20.0	21.4	19.8
Z.E.T. in FC working condition (50% DX sensib. cooling capacity) <sup>(6)</sup>	°C	22.8	21.8	20.5	22.1	21.0
Outdoor sound pressure level <sup>(3)</sup>	dB(A)	57.0	58.0	58.0	61.0	62.5
Indoor sound pressure level <sup>(3)</sup>	dB(A)	58.0	60.5	62.0	60.5	62.5
Max. ambient temperature <sup>(4)</sup>	°C	52.0	46.5	50.5	48.5	45.0
<b>REFRIGERATION CIRCUIT</b>						
Compressor – type / quantity	–	Scroll / 1				
Refrigerant	–	R407C				
Expansion device	–	Thermostatic valve				
Evaporator coil – tubes / fins material	–	Copper / Aluminium				
Condenser coil – tubes / fins material	–	Copper / Aluminium				
<b>AIR FILTRATION</b>						
Main air filter – quantity / type	–	1 / Pleated				
Efficiency (CEN–EU)	–	G3				
Filter dimension	mm	540 x 620 x 60		720 x 790 x 50		
<b>EVAPORATOR FAN</b>						
Quantity / Type	–	1 / Plug		2 / Plug		
Driven / Motor protection	–	Direct / IP44				
<b>CONDENSER FAN</b>						
Quantity / Type / Poles	–	1 / Plug / 4				
Driven / Motor protection	–	Direct / IP54				
Control system	–	Continuously variable speed				
<b>ELECTRIC HEATING</b>						
Type / Steps	–	Wires / 1				
Heating capacity	kW	1.5	3.0	4.5	6.0	6.0
Heating – max. current	A	6.5	6.5	6.5	13.0	13.0
<b>CABINET</b>						
Frame	–	Galvanized steel				
Painting	–	Polyester – Charcoal grey				
<b>DIMENSIONS</b>						
Length x Height x Depth	mm	650 x 1990 x 650		900 x 2050 x 750		
Weight	kg	197	200	288	290	295

### Notes:

- (1) – Values are referred to DX working conditions, 35°C outdoor temperature, to nominal power supply and to the 27°C / 47% R.H. at the evaporating suction side.
- (2) – Value is referred to nominal speed (factory set).
- (3) – Measured in DX working conditions, with 35°C outdoor temperature, at 2 m from the unit, in free field conditions.
- (4) – Maximum outdoor temperature is referred to DX working conditions, 27°C / 47% R.H. at the evaporating suction side.
- (5) – Referred to 50Pa as External Static Pressure (ESP).
- (6) – Z.E.T. stands for Zero Energy Temperature, that is the external air temperature at which 100% or 50% of DX total or DX sensible cooling capacity is supplied by mean of unit freecooling functionality.

# Technical Data

## Liebert HPF 05–07–10–12–15 Under (no Freecooling, Freecooling, Emergency Freecooling 230Vac)

MODEL: HPF		05U	07U	10U	12U	15U
Air supply	–	Down–flow				
Main power supply	–	230V ±10% / 1Ph / 50Hz	400V ±10% / 3Ph + N + PE / 50Hz			
Emergency power supply	–	230V ±10% / 1Ph / 50Hz				
<b>PERFORMANCE</b>						
Total cooling capacity <sup>(1)</sup>	kW	4.9	7.2	11.3	12.9	15.7
Sensible cooling capacity <sup>(1)</sup>	kW	4.9	6.6	11.1	12.0	14.7
Compressor – AC power input <sup>(1)</sup>	kW	1.20	2.10	2.91	3.64	4.69
Compressor – AC operative current (OA) <sup>(1)</sup>	A	5.5	3.8	5.3	6.5	8.6
Compressor – AC max current (FLA)	A	10.0	5.1	7.0	10.0	11.0
Compressor – AC starting current (LRA)	A	35.0	32.0	46.0	50.0	65.5
Condenser fan – AC max. power input	kW	0.68	0.68	1.27	1.27	1.27
Condenser fan – AC operative power input <sup>(1)</sup>	kW	0.67	0.67	1.27	1.27	1.27
Condenser fan – AC operative current (OA) <sup>(1)</sup>	A	3.0	3.0	2.7	2.7	2.7
Condenser fan – AC max. current (FLA)	A	3.0	3.0	2.8	2.8	2.8
Condenser fan – AC start–up current (LRA)	A	12.0	12.0	11.0	11.0	11.0
Evaporator fan – AC power input <sup>(1)</sup>	kW	0.44	0.45	0.68	0.68	1.18
Evaporator fan – AC operative current (OA) <sup>(1)</sup>	A	2.0	2.0	3.0	3.0	2.6
Evaporator fan – AC max. current (FLA) <sup>(2)</sup>	A	2.3	2.3	3.0	3.0	2.8
Evaporator fan – AC start–up current (LRA)	A	9.2	9.2	12.0	12.0	11.0
Evaporator air flow <sup>(7)</sup>	m <sup>3</sup> /h	1950	2040	3130	3130	3880
Condenser max. air flow <sup>(5)</sup>	m <sup>3</sup> /h	2740	2740	4830	4830	4830
Z.E.T. in FC working condition (100% DX total cooling capacity) <sup>(6)</sup>	°C	18.4	14.1	15.2	13.5	14.0
Z.E.T. in FC working condition (100% DX sensible cooling capacity) <sup>(6)</sup>	°C	18.4	15.1	15.4	14.4	14.8
Z.E.T. in FC working condition (50% DX total cooling capacity) <sup>(6)</sup>	°C	22.7	20.5	21.1	20.2	20.5
Z.E.T. in FC working condition (50% DX sensib. cooling capacity) <sup>(6)</sup>	°C	22.7	21.1	21.2	20.7	20.9
Outdoor sound pressure level <sup>(3)</sup>	dB(A)	57.0	58.0	57.5	61.0	62.5
Indoor sound pressure level <sup>(3)</sup>	dB(A)	49.5	49.5	52.5	52.5	59.5
Max. ambient temperature <sup>(4)</sup>	°C	52.0	46.5	50.5	48.5	45.0
<b>REFRIGERATION CIRCUIT</b>						
Compressor – type / quantity	–	Scroll / 1				
Refrigerant	–	R407C				
Expansion device	–	Thermostatic valve				
Evaporator coil – tubes / fins material	–	Copper / Aluminium				
Condenser coil – tubes / fins material	–	Copper / Aluminium				
<b>AIR FILTRATION</b>						
Main air filter – quantity / type	–	1 / Pleated				
Efficiency (CEN–EU)	–	G3				
Filter dimension	mm	540 x 620 x 60		720 x 790 x 50		
<b>EVAPORATOR FAN</b>						
Quantity / Type / Poles	–	1 / Plug / 4				
Driven / Motor protection	–	Direct / IP54				
<b>CONDENSER FAN</b>						
Quantity / Type / Poles	–	1 / Plug / 4				
Driven / Motor protection	–	Direct / IP54				
Control system	–	Continuously variable speed				
<b>ELECTRIC HEATING</b>						
Type / Steps	–	Wires / 1				
Heating capacity	kW	1.5	3.0	4.5	6.0	6.0
Heating – max. current	A	6.5	6.5	6.5	13.0	13.0
<b>CABINET</b>						
Frame	–	Galvanized steel				
Painting	–	Polyester – Charcoal grey				
<b>DIMENSIONS</b>						
Length x Height x Depth	mm	650 x 1990 x 650		900 x 2050 x 750		
Weight	kg	197	200	288	290	295

### Notes:

- (1) – Values are referred to DX working conditions, 35°C outdoor temperature, to nominal power supply and to the 27°C / 47% R.H. at the evaporating suction side.
- (2) – Value is referred to nominal speed (factory set).
- (3) – Measured in DX working conditions, with 35°C outdoor temperature, at 2 m from the unit, in free field conditions.
- (4) – Maximum outdoor temperature is referred to DX working conditions, 27°C / 47% R.H. at the evaporating suction side.
- (5) – Referred to 50Pa as External Static Pressure (ESP).
- (6) – Z.E.T. stands for Zero Energy Temperature, that is the external air temperature at which 100% or 50% of DX total or DX sensible cooling capacity is supplied by mean of unit freecooling functionality.
- (7) – Referred to 20 Pa as external Static Pressure (ESP).

# Technical Data

## Liebert HPF 05–07–10–12–15 Under (Emergency Freecooling 48Vdc)

MODEL: HPF		05U	07U	10U	12U	15U
Air supply	–	Down–flow				
Main power supply	–	230V ±10% / 1Ph / 50Hz	400V ±10% / 3Ph + N + PE / 50Hz			
Emergency power supply	–	48 Vdc ±17%				
<b>PERFORMANCE</b>						
Total cooling capacity <sup>(1)</sup>	kW	4.9	7.2	11.1	12.9	15.3
Sensible cooling capacity <sup>(1)</sup>	kW	4.9	6.6	10.5	12.0	13.4
Compressor – AC power input <sup>(1)</sup>	kW	1.20	2.10	2.91	3.64	4.67
Compressor – AC operative current (OA) <sup>(1)</sup>	A	5.5	3.8	5.3	6.5	8.5
Compressor – AC max current (FLA)	A	10.0	5.1	7.0	10.0	11.0
Compressor – AC starting current (LRA)	A	35.0	32.0	46.0	50.0	65.5
Condenser fan – AC max. power input	kW	0.68	0.68	1.27	1.27	1.27
Condenser fan – AC operative power input <sup>(1)</sup>	kW	0.67	0.67	1.27	1.27	1.27
Condenser fan – AC operative current (OA) <sup>(1)</sup>	A	3.0	3.0	2.7	2.7	2.7
Condenser fan – AC max. current (FLA)	A	3.0	3.0	2.8	2.8	2.8
Condenser fan – AC start–up current (LRA)	A	12.0	12.0	11.0	11.0	11.0
Evaporator fan – DC power input <sup>(1)</sup>	kW	0.28	0.34	0.45	0.56	0.66
Evaporator fan – DC operative current (OA) <sup>(1)</sup>	A	5.8	7.0	9.5	11.3	13.6
Evaporator fan – DC max. current (FLA) <sup>(2)</sup>	A	9.6	9.6	9.6	19.2	19.2
Evaporator fan – DC start–up current (LRA)	A	0.1	0.1	0.1	0.1	0.1
Evaporator air flow <sup>(7)</sup>	m <sup>3</sup> /h	1890	2020	2850	3110	3310
Condenser max. air flow <sup>(5)</sup>	m <sup>3</sup> /h	2740	2740	4830	4830	4830
Z.E.T. in FC working condition (100% DX total cooling capacity) <sup>(6)</sup>	°C	18.1	13.9	14.2	13.4	12.2
Z.E.T. in FC working condition (100% DX sensible cooling capacity) <sup>(6)</sup>	°C	18.1	15.0	14.9	14.3	14.0
Z.E.T. in FC working condition (50% DX total cooling capacity) <sup>(6)</sup>	°C	22.5	20.5	20.6	20.2	19.6
Z.E.T. in FC working condition (50% DX sensib. cooling capacity) <sup>(6)</sup>	°C	22.5	21.0	21.0	20.7	20.5
Outdoor sound pressure level <sup>(3)</sup>	dB(A)	57.0	58.0	57.5	61.0	62.5
Indoor sound pressure level <sup>(3)</sup>	dB(A)	49.5	50.5	54.5	54.5	57.5
Max. ambient temperature <sup>(4)</sup>	°C	52.0	46.5	50.5	48.5	45.0
<b>REFRIGERATION CIRCUIT</b>						
Compressor – type / quantity	–	Scroll / 1				
Refrigerant	–	R407C				
Expansion device	–	Thermostatic valve				
Evaporator coil – tubes / fins material	–	Copper / Aluminium				
Condenser coil – tubes / fins material	–	Copper / Aluminium				
<b>AIR FILTRATION</b>						
Main air filter – quantity / type	–	1 / Pleated				
Efficiency (CEN–EU)	–	G3				
Filter dimension	mm	540 x 620 x 60		720 x 790 x 50		
<b>EVAPORATOR FAN</b>						
Quantity / Type	–	1 / Plug			2 / Plug	
Driven / Motor protection	–	Direct / IP20				
<b>CONDENSER FAN</b>						
Quantity / Type / Poles	–	1 / Plug / 4				
Driven / Motor protection	–	Direct / IP54				
Control system	–	Continuously variable speed				
<b>ELECTRIC HEATING</b>						
Type / Steps	–	Wires / 1				
Heating capacity	kW	1.5	3.0	4.5	6.0	6.0
Heating – max. current	A	6.5	6.5	6.5	13.0	13.0
<b>CABINET</b>						
Frame	–	Galvanized steel				
Painting	–	Polyester – Charcoal grey				
<b>DIMENSIONS</b>						
Length x Height x Depth	mm	650 x 1990 x 650			900 x 2050 x 750	
Weight	kg	197	200	288	290	295

### Notes:

- (1) – Values are referred to DX working conditions, 35°C outdoor temperature, to nominal power supply and to the 27°C / 47% R.H. at the evaporating suction side.
- (2) – Value is referred to nominal speed (factory set).
- (3) – Measured in DX working conditions, with 35°C outdoor temperature, at 2 m from the unit, in free field conditions.
- (4) – Maximum outdoor temperature is referred to DX working conditions, 27°C / 47% R.H. at the evaporating suction side.
- (5) – Referred to 50Pa as External Static Pressure (ESP).
- (6) – Z.E.T. stands for Zero Energy Temperature, that is the external air temperature at which 100% or 50% of DX total or DX sensible cooling capacity is supplied by mean of unit freecooling functionality.
- (7) – Referred to 20 Pa as external Static Pressure (ESP).

# Technical Data

## Liebert HPF 05–07–10–12–15 Under (Freecooling, Emergency Freecooling 230Vac, EC fan)

MODEL: HPF		05U	07U	10U	12U	15U
Air supply	–	Down–flow				
Main power supply	–	230V ±10% / 1Ph / 50Hz	400V ±10% / 3Ph + N + PE / 50Hz			
Emergency power supply	–	230V ±10% / 1Ph / 50Hz				
<b>PERFORMANCE</b>						
Total cooling capacity <sup>(1)</sup>	kW	4.9	7.2	11.1	12.9	15.7
Sensible cooling capacity <sup>(1)</sup>	kW	4.9	6.6	10.5	12.0	13.7
Compressor – AC power input <sup>(1)</sup>	kW	1.20	2.10	2.91	3.64	4.69
Compressor – AC operative current (OA) <sup>(1)</sup>	A	5.5	3.8	5.3	6.5	8.6
Compressor – AC max current (FLA)	A	10.0	5.1	7.0	10.0	11.0
Compressor – AC starting current (LRA)	A	35.0	32.0	46.0	50.0	65.5
Condenser fan – AC max. power input	kW	0.68	0.68	1.27	1.27	1.27
Condenser fan – AC operative power input <sup>(1)</sup>	kW	0.67	0.67	1.27	1.27	1.27
Condenser fan – AC operative current (OA) <sup>(1)</sup>	A	3.0	3.0	2.7	2.7	2.7
Condenser fan – AC max. current (FLA)	A	3.0	3.0	2.8	2.8	2.8
Condenser fan – AC start–up current (LRA)	A	12.0	12.0	11.0	11.0	11.0
Evaporator fan – AC power input <sup>(1)</sup>	kW	0.26	0.30	0.42	0.50	0.60
Evaporator fan – AC operative current (OA) <sup>(1)</sup>	A	1.1	1.3	2.6	2.2	2.6
Evaporator fan – AC max. current (FLA) <sup>(2)</sup>	A	2.6	2.6	2.6	5.2	5.2
Evaporator fan – AC start–up current (LRA)	A	0.1	0.1	0.1	0.1	0.1
Evaporator air flow <sup>(7)</sup>	m <sup>3</sup> /h	1800	2000	2740	3100	3280
Condenser max. air flow <sup>(5)</sup>	m <sup>3</sup> /h	2740	2740	4830	4830	4830
Z.E.T. in FC working condition (100% DX total cooling capacity) <sup>(6)</sup>	°C	19.0	15.3	13.7	16.0	13.5
Z.E.T. in FC working condition (100% DX sensible cooling capacity) <sup>(6)</sup>	°C	19.0	16.3	14.7	16.8	15.2
Z.E.T. in FC working condition (50% DX total cooling capacity) <sup>(6)</sup>	°C	23.0	21.2	20.4	21.5	20.2
Z.E.T. in FC working condition (50% DX sensib. cooling capacity) <sup>(6)</sup>	°C	23.0	21.6	20.7	21.9	21.1
Outdoor sound pressure level <sup>(3)</sup>	dB(A)	57.0	58.0	57.5	61.0	62.5
Indoor sound pressure level <sup>(3)</sup>	dB(A)	45.0	48.0	52.5	52.5	55.5
Max. ambient temperature <sup>(4)</sup>	°C	52.0	46.5	50.5	48.5	45.0
<b>REFRIGERATION CIRCUIT</b>						
Compressor – type / quantity	–	Scroll / 1				
Refrigerant	–	R407C				
Expansion device	–	Thermostatic valve				
Evaporator coil – tubes / fins material	–	Copper / Aluminium				
Condenser coil – tubes / fins material	–	Copper / Aluminium				
<b>AIR FILTRATION</b>						
Main air filter – quantity / type	–	1 / Pleated				
Efficiency (CEN–EU)	–	G3				
Filter dimension	mm	540 x 620 x 60		720 x 790 x 50		
<b>EVAPORATOR FAN</b>						
Quantity / Type	–	1 / Plug		2 / Plug		
Driven / Motor protection	–	Direct / IP44				
<b>CONDENSER FAN</b>						
Quantity / Type / Poles	–	1 / Plug / 4				
Driven / Motor protection	–	Direct / IP54				
Control system	–	Continuously variable speed				
<b>ELECTRIC HEATING</b>						
Type / Steps	–	Wires / 1				
Heating capacity	kW	1.5	3.0	4.5	6.0	6.0
Heating – max. current	A	6.5	6.5	6.5	13.0	13.0
<b>CABINET</b>						
Frame	–	Galvanized steel				
Painting	–	Polyester – Charcoal grey				
<b>DIMENSIONS</b>						
Length x Height x Depth	mm	650 x 1990 x 650		900 x 2050 x 750		
Weight	kg	197	200	288	290	295

### Notes:

- (1) – Values are referred to DX working conditions, 35°C outdoor temperature, to nominal power supply and to the 27°C / 47% R.H. at the evaporating suction side.
- (2) – Value is referred to nominal speed (factory set).
- (3) – Measured in DX working conditions, with 35°C outdoor temperature, at 2 m from the unit, in free field conditions.
- (4) – Maximum outdoor temperature is referred to DX working conditions, 27°C / 47% R.H. at the evaporating suction side.
- (5) – Referred to 50Pa as External Static Pressure (ESP).
- (6) – Z.E.T. stands for Zero Energy Temperature, that is the external air temperature at which 100% or 50% of DX total or DX sensible cooling capacity is supplied by mean of unit freecooling functionality.
- (7) – Referred to 20 Pa as external Static Pressure (ESP).

# Technical Data

## Liebert HPF05- 07- 10- 12 Displacement (no Freecooling, Freecooling, Emergency Freecooling 230Vac) Liebert HPF 15 Displacement (no Freecooling, Freecooling, Emergency Freecooling 400Vac)

MODEL: HPF		05D	07D	10D	12D	15D
Air supply	-	Frontal				
Main power supply	-	230V ±10% / 1Ph / 50Hz	400V ±10% / 3Ph + N + PE / 50Hz			
Emergency power supply	-	230V ±10% / 1Ph / 50Hz				400V±10%/ 3Ph/50Hz
<b>PERFORMANCE</b>						
Total cooling capacity <sup>(1)</sup>	kW	5.0	7.4	12.5	14.4	16.3
Sensible cooling capacity <sup>(1)</sup>	kW	5.0	7.4	12.5	14.2	16.1
Compressor - AC power input <sup>(1)</sup>	kW	1.20	2.10	2.88	3.62	4.69
Compressor - AC operative current (OA) <sup>(1)</sup>	A	5.5	3.8	5.2	6.5	8.6
Compressor - AC max current (FLA)	A	10.0	5.1	7.0	10.0	11.0
Compressor - AC starting current (LRA)	A	35.0	32.0	46.0	50.0	65.5
Condenser fan - AC max. power input	kW	0.68	0.68	1.27	1.27	1.27
Condenser fan - AC operative power input <sup>(1)</sup>	kW	0.67	0.67	1.27	1.27	1.27
Condenser fan - AC operative current (OA) <sup>(1)</sup>	A	3.0	3.0	2.7	2.7	2.7
Condenser fan - AC max. current (FLA)	A	3.0	3.0	2.8	2.8	2.8
Condenser fan - AC start- up current (LRA)	A	12.0	12.0	11.0	11.0	11.0
Evaporator fan - AC power input <sup>(1)</sup>	kW	0.44	0.44	0.68	0.68	1.00
Evaporator fan - AC operative current (OA) <sup>(1)</sup>	A	2.0	2.0	3.0	3.0	2.8
Evaporator fan - AC max. current (FLA) <sup>(2)</sup>	A	2.3	2.3	3.0	3.0	2.8
Evaporator fan - AC start- up current (LRA)	A	9.2	9.2	12.0	12.0	11.0
Evaporator air flow <sup>(7)</sup>	m <sup>3</sup> /h	1900	1900	3350	3350	3610
Condenser max. air flow <sup>(5)</sup>	m <sup>3</sup> /h	2740	2740	4830	4830	4830
Z.E.T. in FC working condition (100% DX total cooling capacity) <sup>(6)</sup>	°C	22.2	18.2	16.9	16.1	15.5
Z.E.T. in FC working condition (100% DX sensible cooling capacity) <sup>(6)</sup>	°C	22.2	18.2	16.9	16.3	15.7
Z.E.T. in FC working condition (50% DX total cooling capacity) <sup>(6)</sup>	°C	26.1	24.1	23.4	23.0	22.7
Z.E.T. in FC working condition (50% DX sensib. cooling capacity) <sup>(6)</sup>	°C	26.1	24.1	23.4	23.1	22.8
Outdoor sound pressure level <sup>(3)</sup>	dB(A)	57.0	58.0	60.0	61.0	62.5
Indoor sound pressure level <sup>(3)</sup>	dB(A)	57.0	57.0	62.5	62.5	63.0
Max. ambient temperature <sup>(4)</sup>	°C	52.0	46.5	50.0	48.0	45.0
<b>REFRIGERATION CIRCUIT</b>						
Compressor - type / quantity	-	Scroll / 1				
Refrigerant	-	R407C				
Expansion device	-	Thermostatic valve				
Evaporator coil - tubes / fins material	-	Copper / Aluminium				
Condenser coil - tubes / fins material	-	Copper / Aluminium				
<b>AIR FILTRATION</b>						
Main air filter - quantity / type	-	1 / Pleated				
Efficiency (CEN- EU)	-	G3				
Filter dimension	mm	540 x 620 x 60		720 x 790 x 50		
<b>EVAPORATOR FAN</b>						
Quantity / Type / Poles	-	1 / Plug / 4				
Driven / Motor protection	-	Direct / IP54				
<b>CONDENSER FAN</b>						
Quantity / Type / Poles	-	1 / Plug / 4				
Driven / Motor protection	-	Direct / IP54				
Control system	-	Continuously variable speed				
<b>ELECTRIC HEATING</b>						
Type / Steps	-	Wires / 1				
Heating capacity	kW	1.5	3.0	4.5	6.0	6.0
Heating - max. current	A	6.5	6.5	6.5	13.0	13.0
<b>CABINET</b>						
Frame	-	Galvanized steel				
Painting	-	Polyester – Charcoal grey				
<b>DIMENSIONS</b>						
Length x Height x Depth	mm	650 x 1990 x 650			900 x 2300 x 750	
Weight	kg	197	200	288	315	320

### Notes:

- (1) – Values are referred to DX working conditions, 35°C outdoor temperature, to nominal power supply and to the 30°C / 39.5% R.H. at the evaporating suction side.
- (2) – Value is referred to nominal speed (factory set).
- (3) – Measured in DX working conditions, with 35°C outdoor temperature, at 2 m from the unit, in free field conditions.
- (4) – Maximum outdoor temperature is referred to DX working conditions, 30°C / 39.5% R.H. at the evaporating suction side.
- (5) – Referred to 50Pa as External Static Pressure (ESP).
- (6) – Z.E.T. stands for Zero Energy Temperature, that is the external air temperature at which 100% or 50% of DX total or DX sensible cooling capacity is supplied by mean of unit freecooling functionality.
- (7) – Referred to 0 Pa as external Static Pressure (ESP).

# Technical Data

## Liebert HPF 05- 07- 10- 12- 15 Displacement (Emergency Freecooling 48Vdc)

MODEL: HPF		05D	07D	10D	12D	15D
Air supply	-	Frontal				
Main power supply	-	230V ±10% / 1Ph / 50Hz	400V ±10% / 3Ph + N + PE / 50Hz			
Emergency power supply	-	48 Vdc ±17%				
<b>PERFORMANCE</b>						
Total cooling capacity <sup>(1)</sup>	kW	5.0	7.3	12.3	14.4	16.3
Sensible cooling capacity <sup>(1)</sup>	kW	5.0	7.3	12.3	14.2	16.0
Compressor - AC power input <sup>(1)</sup>	kW	1.19	2.10	2.88	3.62	4.69
Compressor - AC operative current (OA) <sup>(1)</sup>	A	5.5	3.8	5.2	6.5	8.6
Compressor - AC max current (FLA)	A	10.0	5.1	7.0	10.0	11.0
Compressor - AC starting current (LRA)	A	35.0	32.0	46.0	50.0	65.5
Condenser fan - AC max. power input	kW	0.68	0.68	1.27	1.27	1.27
Condenser fan - AC operative power input <sup>(1)</sup>	kW	0.67	0.67	1.27	1.27	1.27
Condenser fan - AC operative current (OA) <sup>(1)</sup>	A	3.0	3.0	2.7	2.7	2.7
Condenser fan - AC max. current (FLA)	A	3.0	3.0	2.8	2.8	2.8
Condenser fan - AC start- up current (LRA)	A	12.0	12.0	11.0	11.0	11.0
Evaporator fan - DC power input <sup>(1)</sup>	kW	0.21	0.28	0.44	0.54	0.66
Evaporator fan - DC operative current (OA) <sup>(1)</sup>	A	4.5	5.8	9.3	11.4	13.8
Evaporator fan - DC max. current (FLA) <sup>(2)</sup>	A	9.6	9.6	9.6	19.2	19.2
Evaporator fan - DC start- up current (LRA)	A	0.1	0.1	0.1	0.1	0.1
Evaporator air flow <sup>(7)</sup>	m <sup>3</sup> /h	1800	1800	3060	3350	3580
Condenser max. air flow <sup>(5)</sup>	m <sup>3</sup> /h	2740	2740	4830	4830	4830
Z.E.T. in FC working condition (100% DX total cooling capacity) <sup>(6)</sup>	°C	21.8	17.8	15.8	16.1	15.4
Z.E.T. in FC working condition (100% DX sensible cooling capacity) <sup>(6)</sup>	°C	21.8	17.8	15.8	16.3	15.6
Z.E.T. in FC working condition (50% DX total cooling capacity) <sup>(6)</sup>	°C	25.9	23.9	22.9	23.0	22.7
Z.E.T. in FC working condition (50% DX sensib. cooling capacity) <sup>(6)</sup>	°C	25.9	23.9	22.9	23.1	22.8
Outdoor sound pressure level <sup>(3)</sup>	dB(A)	57.0	58.0	59.5	61.0	62.5
Indoor sound pressure level <sup>(3)</sup>	dB(A)	50.0	51.0	62.5	62.5	63.0
Max. ambient temperature <sup>(4)</sup>	°C	52.0	46.5	50.0	48.0	45.0
<b>REFRIGERATION CIRCUIT</b>						
Compressor - type / quantity	-	Scroll / 1				
Refrigerant	-	R407C				
Expansion device	-	Thermostatic valve				
Evaporator coil - tubes / fins material	-	Copper / Aluminium				
Condenser coil - tubes / fins material	-	Copper / Aluminium				
<b>AIR FILTRATION</b>						
Main air filter - quantity / type	-	1 / Pleated				
Efficiency (CEN- EU)	-	G3				
Filter dimension	mm	540 x 620 x 60		720 x 790 x 50		
<b>EVAPORATOR FAN</b>						
Quantity / Type	-	1 / Plug		2 / Plug		
Driven / Motor protection	-	Direct / IP20				
<b>CONDENSER FAN</b>						
Quantity / Type / Poles	-	1 / Plug / 4				
Driven / Motor protection	-	Direct / IP54				
Control system	-	Continuously variable speed				
<b>ELECTRIC HEATING</b>						
Type / Steps	-	Wires / 1				
Heating capacity	kW	1.5	3.0	4.5	6.0	6.0
Heating - max. current	A	6.5	6.5	6.5	13.0	13.0
<b>CABINET</b>						
Frame	-	Galvanized steel				
Painting	-	Polyester – Charcoal grey				
<b>DIMENSIONS</b>						
Length x Height x Depth	mm	650 x 1990 x 650		900 x 2300 x 750		
Weight	kg	197	200	288	315	320

### Notes:

- (1) – Values are referred to DX working conditions, 35°C outdoor temperature, to nominal power supply and to the 30°C / 39.5% R.H. at the evaporating suction side.
- (2) – Value is referred to nominal speed (factory set).
- (3) – Measured in DX working conditions, with 35°C outdoor temperature, at 2 m from the unit, in free field conditions.
- (4) – Maximum outdoor temperature is referred to DX working conditions, 30°C / 39.5% R.H. at the evaporating suction side.
- (5) – Referred to 50Pa as External Static Pressure (ESP).
- (6) – Z.E.T. stands for Zero Energy Temperature, that is the external air temperature at which 100% or 50% of DX total or DX sensible cooling capacity is supplied by mean of unit freecooling functionality.
- (7) – Referred to 0 Pa as external Static Pressure (ESP).

# Technical Data

## Liebert HPF 05- 07- 10- 12- 15 Displacement (Freecooling, Emergency Freecooling 230Vac, EC fan)

MODEL: HPF		05D	07D	10D	12D	15D
Air supply	-	Frontal				
Main power supply	-	230V ±10% / 1Ph / 50Hz	400V ±10% / 3Ph + N + PE / 50Hz			
Emergency power supply	-	230V ±10% / 1Ph / 50Hz				
<b>PERFORMANCE</b>						
Total cooling capacity <sup>(1)</sup>	kW	5.0	7.3	12.3	14.4	16.3
Sensible cooling capacity <sup>(1)</sup>	kW	5.0	7.2	12.3	14.2	16.1
Compressor - AC power input <sup>(1)</sup>	kW	1.19	2.10	2.88	3.62	4.69
Compressor - AC operative current (OA) <sup>(1)</sup>	A	5.5	3.8	5.2	6.5	8.6
Compressor - AC max current (FLA)	A	10.0	5.1	7.0	10.0	11.0
Compressor - AC starting current (LRA)	A	35.0	32.0	46.0	50.0	65.5
Condenser fan - AC max. power input	kW	0.68	0.68	1.27	1.27	1.27
Condenser fan - AC operative power input <sup>(1)</sup>	kW	0.67	0.67	1.27	1.27	1.27
Condenser fan - AC operative current (OA) <sup>(1)</sup>	A	3.0	3.0	2.7	2.7	2.7
Condenser fan - AC max. current (FLA)	A	3.0	3.0	2.8	2.8	2.8
Condenser fan - AC start- up current (LRA)	A	12.0	12.0	11.0	11.0	11.0
Evaporator fan - AC power input <sup>(1)</sup>	kW	0.21	0.26	0.42	0.50	0.60
Evaporator fan - AC operative current (OA) <sup>(1)</sup>	A	0.9	1.1	2.6	2.2	2.6
Evaporator fan - AC max. current (FLA) <sup>(2)</sup>	A	2.6	2.6	2.6	5.2	5.2
Evaporator fan - AC start- up current (LRA)	A	0.1	0.1	0.1	0.1	0.1
Evaporator air flow <sup>(7)</sup>	m <sup>3</sup> /h	1710	1800	2850	3080	3390
Condenser max. air flow <sup>(5)</sup>	m <sup>3</sup> /h	2740	2740	4830	4830	4830
Z.E.T. in FC working condition (100% DX total cooling capacity) <sup>(6)</sup>	°C	22.5	18.8	15.4	17.3	15.6
Z.E.T. in FC working condition (100% DX sensible cooling capacity) <sup>(6)</sup>	°C	22.5	19.0	15.4	17.5	15.8
Z.E.T. in FC working condition (50% DX total cooling capacity) <sup>(6)</sup>	°C	26.2	24.4	22.7	23.6	22.8
Z.E.T. in FC working condition (50% DX sensib. cooling capacity) <sup>(6)</sup>	°C	26.2	24.5	22.7	23.7	22.9
Outdoor sound pressure level <sup>(3)</sup>	dB(A)	57.0	58.0	59.5	61.0	62.5
Indoor sound pressure level <sup>(3)</sup>	dB(A)	50.0	51.0	63.0	61.0	63.0
Max. ambient temperature <sup>(4)</sup>	°C	52.0	46.5	50.0	48.0	45.0
<b>REFRIGERATION CIRCUIT</b>						
Compressor - type / quantity	-	Scroll / 1				
Refrigerant	-	R407C				
Expansion device	-	Thermostatic valve				
Evaporator coil - tubes / fins material	-	Copper / Aluminium				
Condenser coil - tubes / fins material	-	Copper / Aluminium				
<b>AIR FILTRATION</b>						
Main air filter - quantity / type	-	1 / Pleated				
Efficiency (CEN- EU)	-	G3				
Filter dimension	mm	540 x 620 x 60		720 x 790 x 50		
<b>EVAPORATOR FAN</b>						
Quantity / Type	-	1 / Plug			2 / Plug	
Driven / Motor protection	-	Direct / IP44				
<b>CONDENSER FAN</b>						
Quantity / Type / Poles	-	1 / Plug / 4				
Driven / Motor protection	-	Direct / IP54				
Control system	-	Continuously variable speed				
<b>ELECTRIC HEATING</b>						
Type / Steps	-	Wires / 1				
Heating capacity	kW	1.5	3.0	4.5	6.0	6.0
Heating - max. current	A	6.5	6.5	6.5	13.0	13.0
<b>CABINET</b>						
Frame	-	Galvanized steel				
Painting	-	Polyester – Charcoal grey				
<b>DIMENSIONS</b>						
Length x Height x Depth	mm	650 x 1990 x 650			900 x 2300 x 750	
Weight	kg	197	200	288	315	320

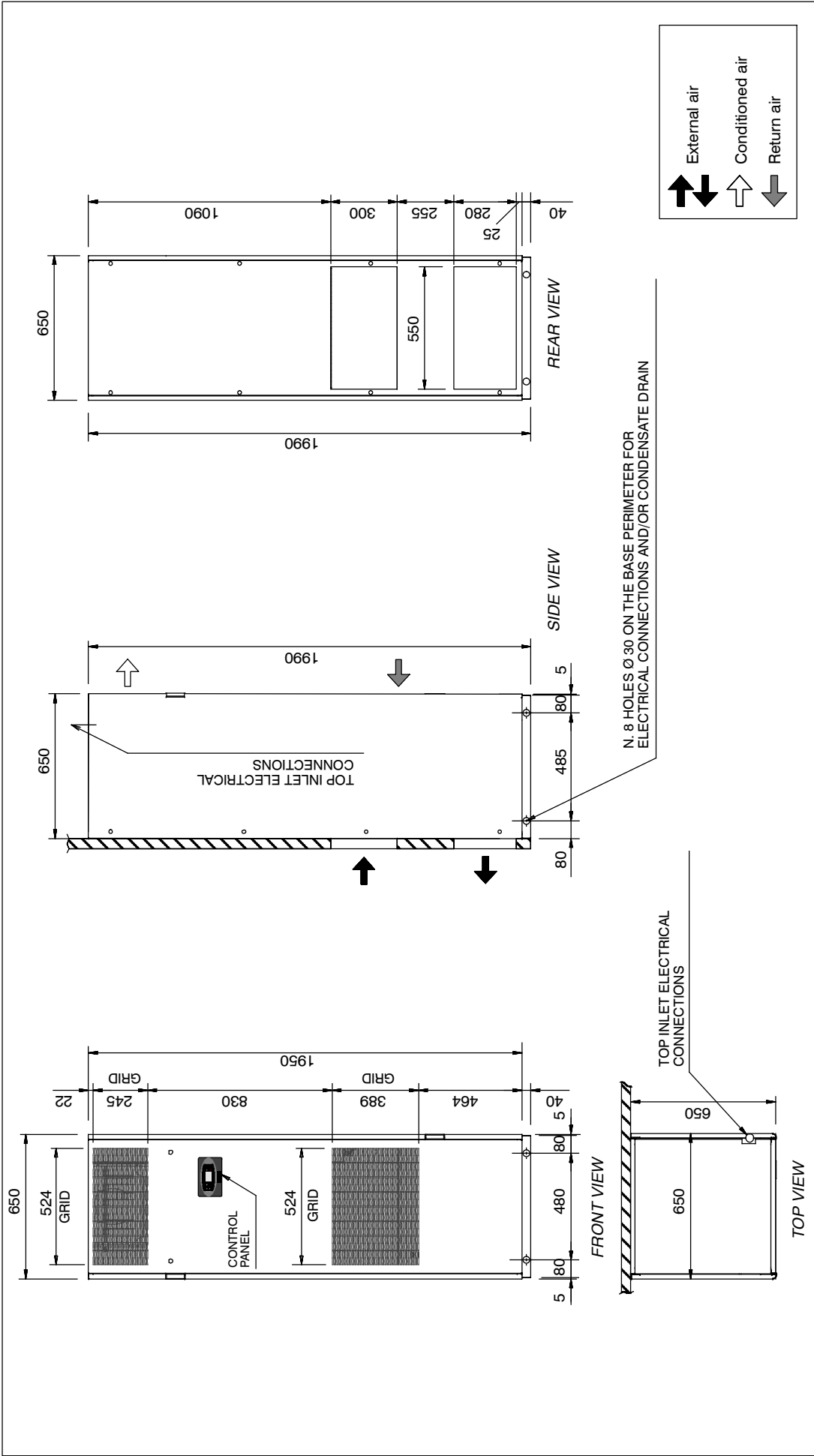
### Notes:

- (1) – Values are referred to DX working conditions, 35°C outdoor temperature, to nominal power supply and to the 30°C / 39.5% R.H. at the evaporating suction side.
- (2) – Value is referred to nominal speed (factory set).
- (3) – Measured in DX working conditions, with 35°C outdoor temperature, at 2 m from the unit, in free field conditions.
- (4) – Maximum outdoor temperature is referred to DX working conditions, 30°C / 39.5% R.H. at the evaporating suction side.
- (5) – Referred to 50Pa as External Static Pressure (ESP).
- (6) – Z.E.T. stands for Zero Energy Temperature, that is the external air temperature at which 100% or 50% of DX total or DX sensible cooling capacity is supplied by mean of unit freecooling functionality.
- (7) – Referred to 0 Pa as external Static Pressure (ESP).

# 8

## Overall Dimensions

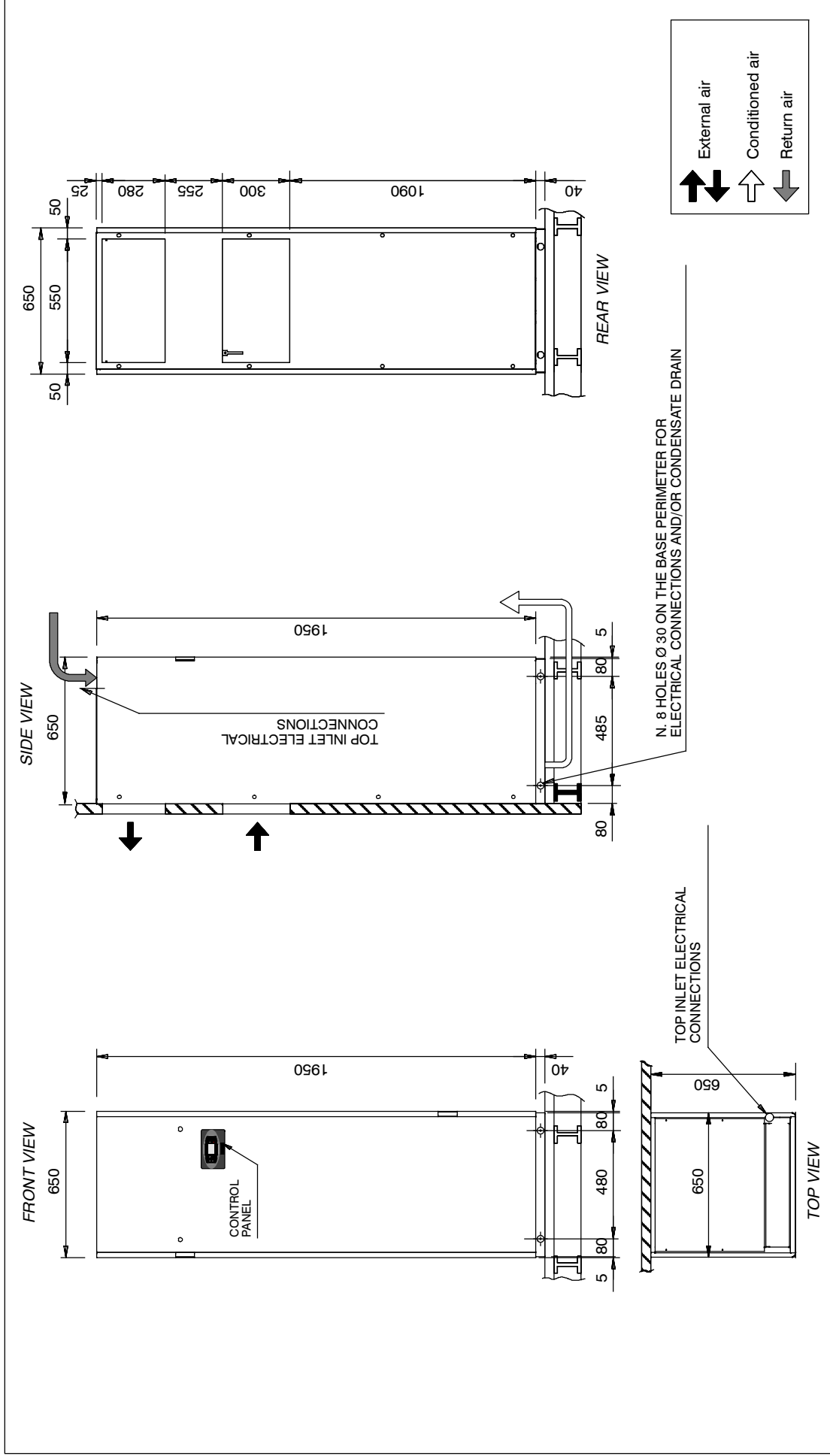
Fig. 4 – Overall dimensions  
Liebert HPF 05 – 07 Over





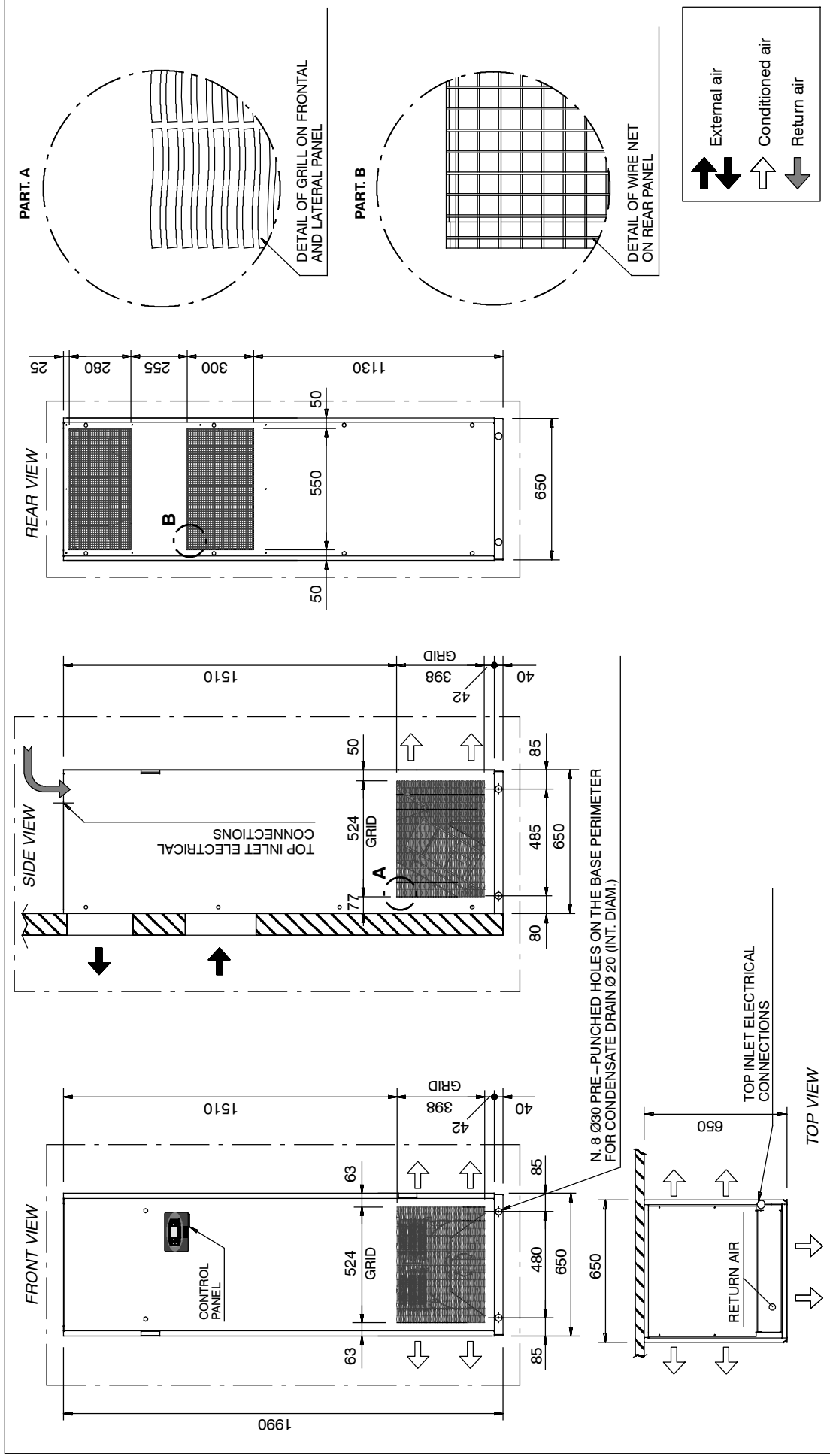
# Overall Dimensions

Liebert HPF 05 – 07 Under



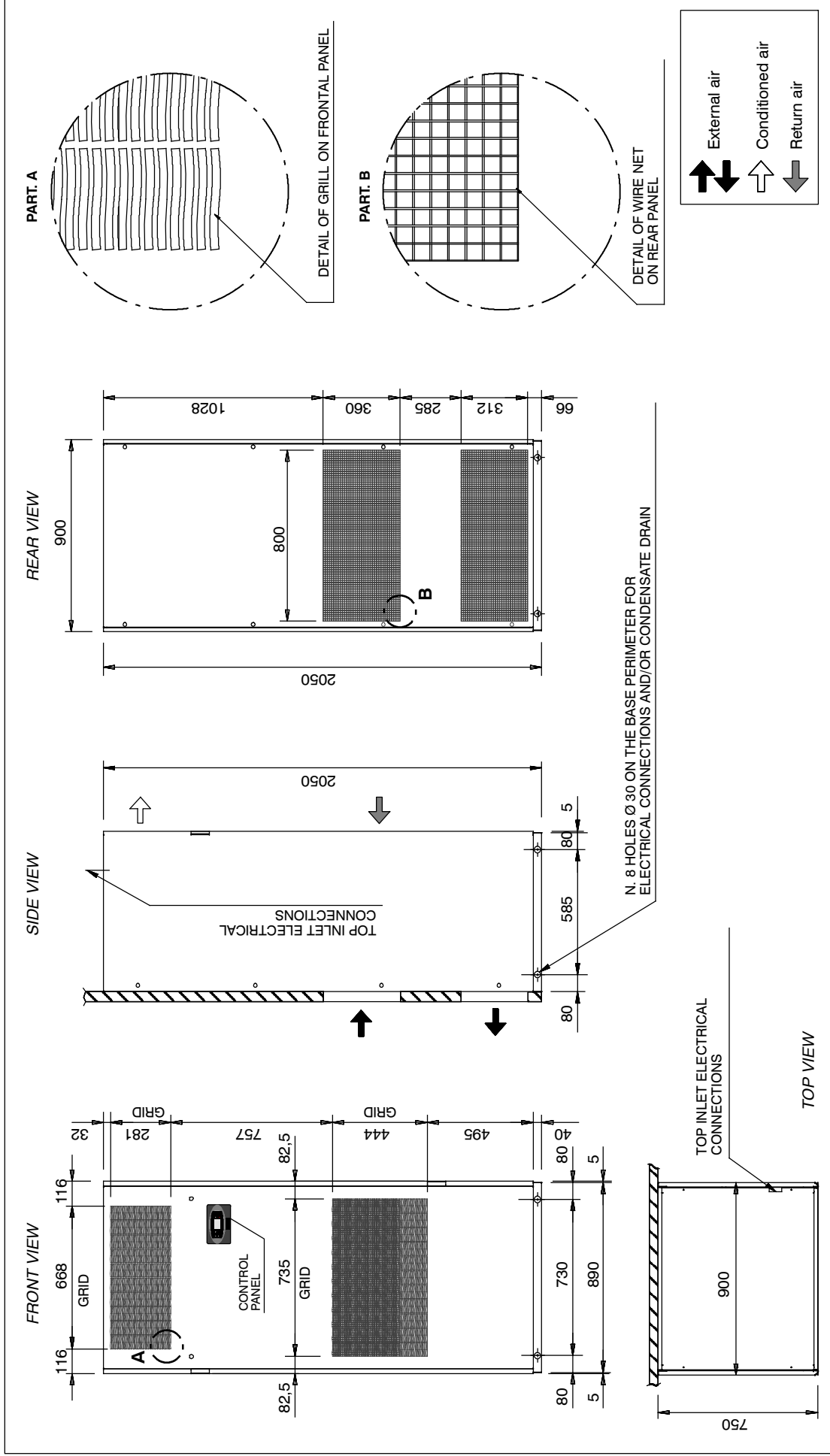
# Overall Dimensions

## Liebert HPF 05 – 07 Displacement



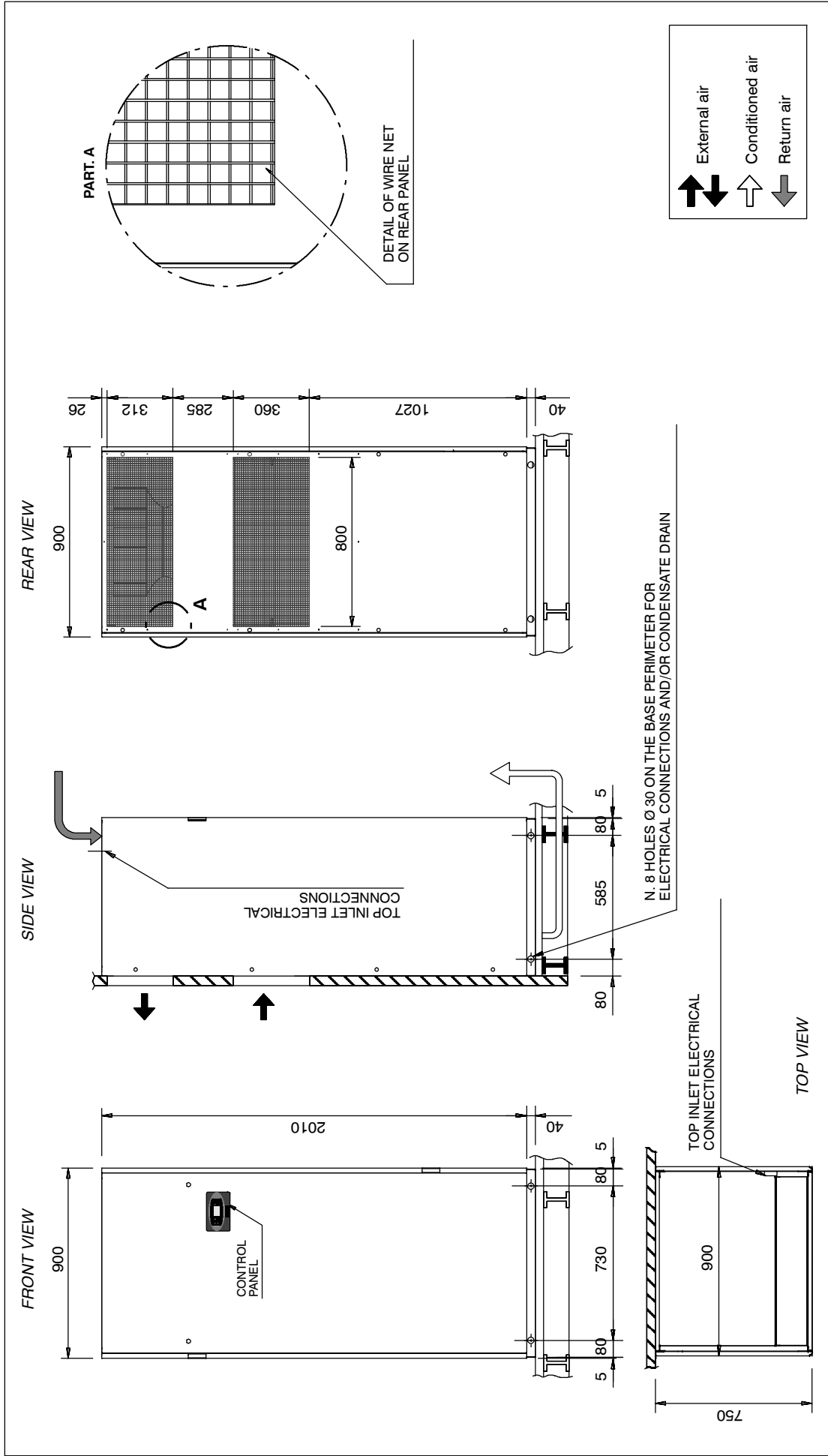
# Overall Dimensions

Liebert HPF 10 – 12 – 15 Over



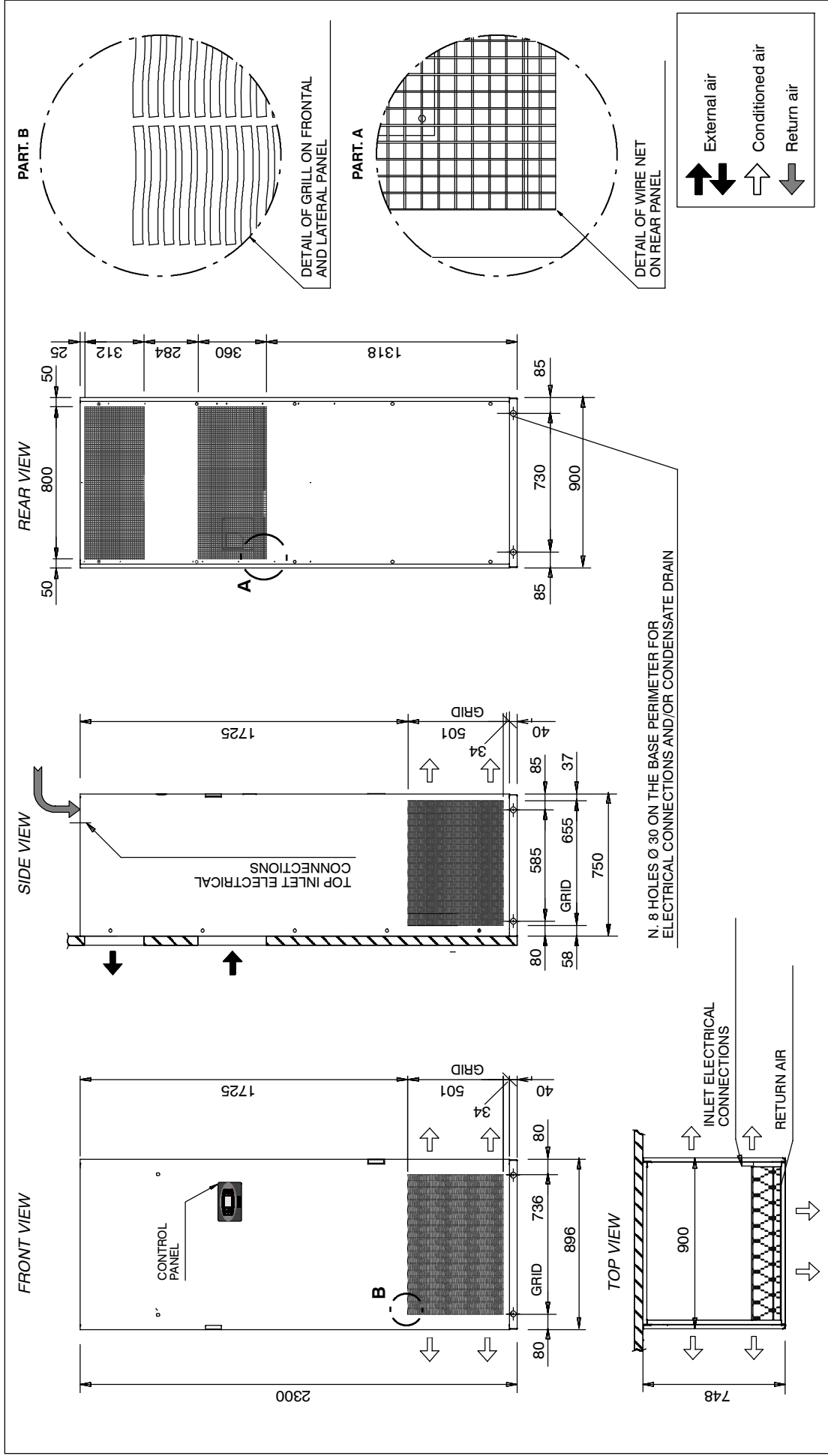
# Overall Dimensions

Liebert HPF 10 -- 12 -- 15 Under



# Overall Dimensions

## Liebert HPF 10 -- 12 -- 15 Displacement



# 9

## Installation

Fig. 5 – Service area – Liebert HPF

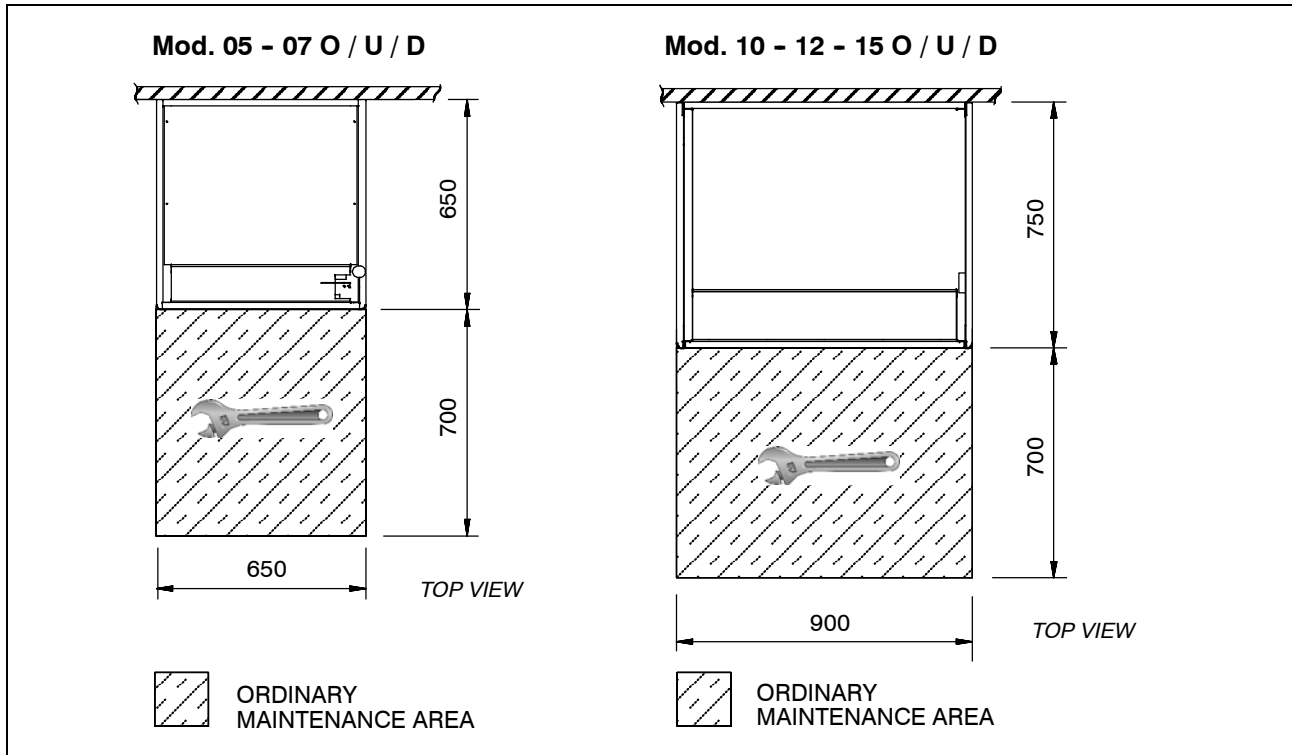
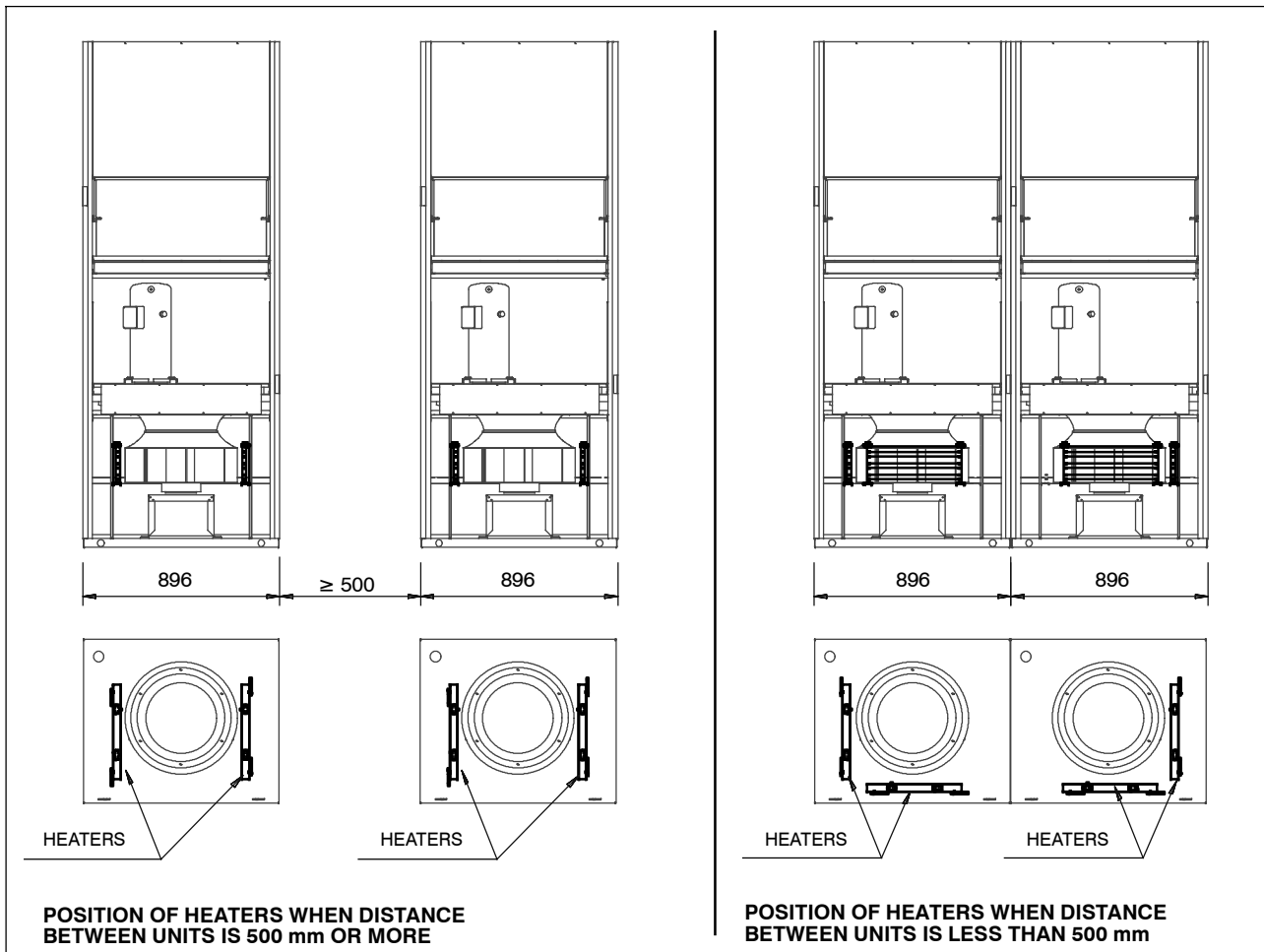


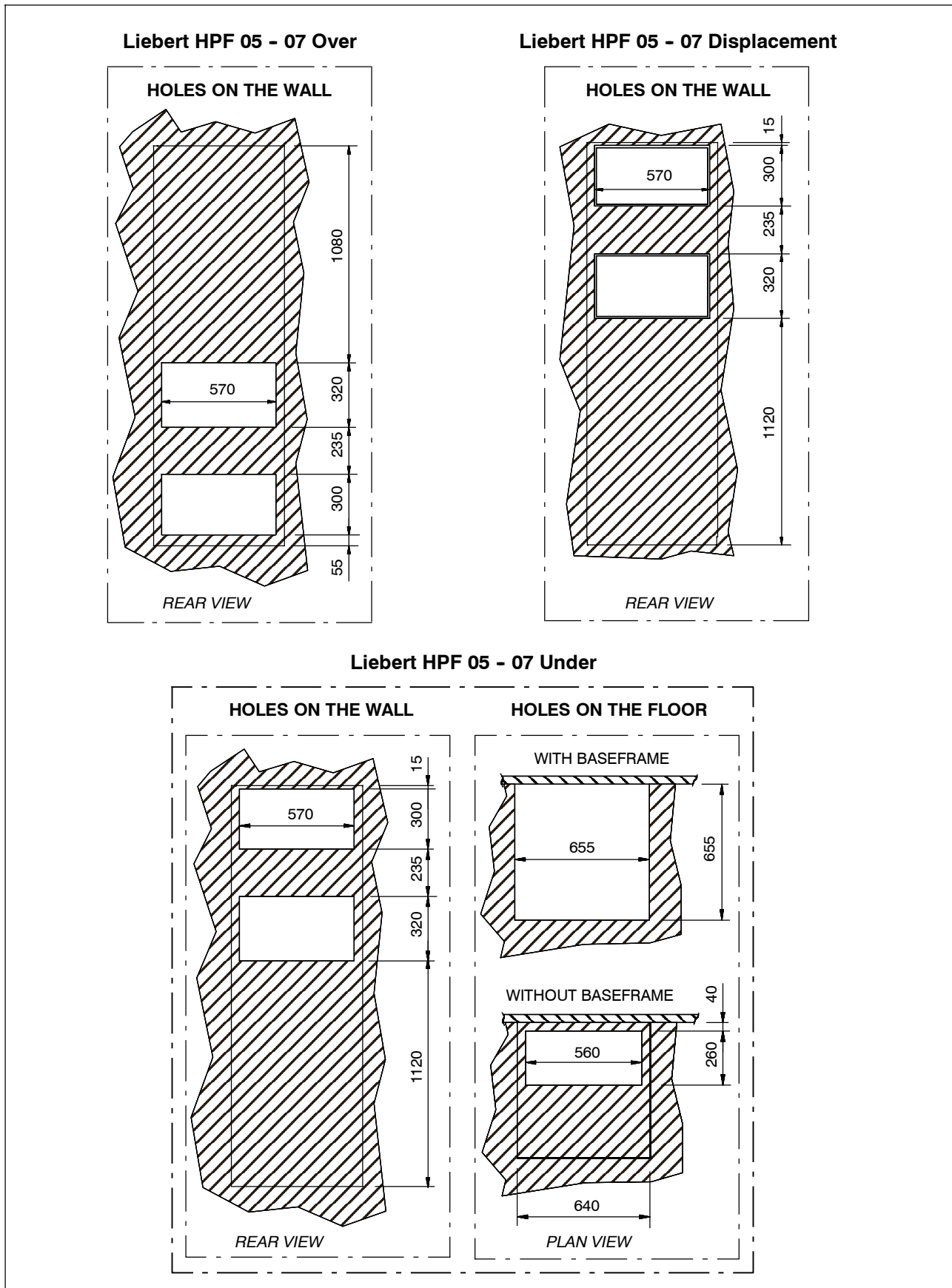
Fig. 6 – 2 units installation – Liebert HPF 10–12–15 D and 10 D (48Vdc) – with heating



# Installation

Fig. 7 – Holes on the floor / wall

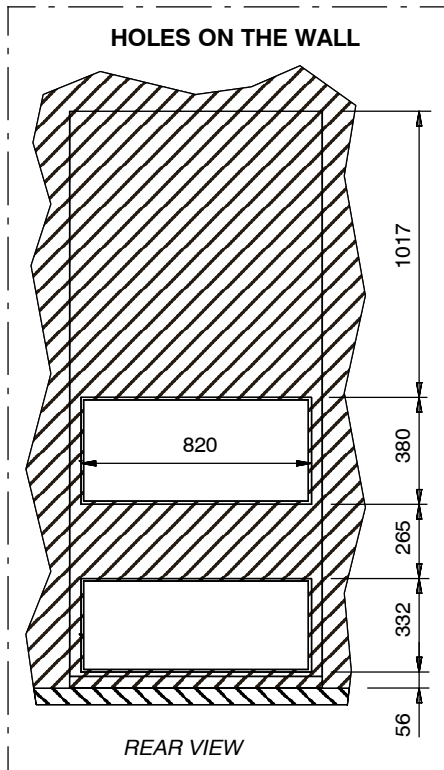
Liebert HPF 05 – 07 O / U / D



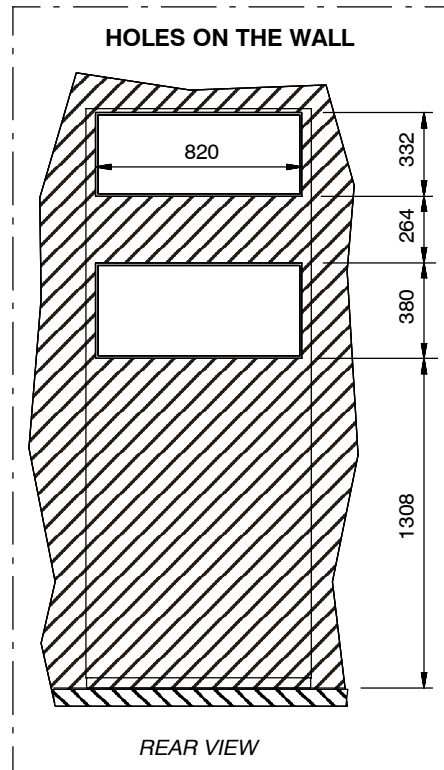
# Installation

## Liebert HPF 10 – 12 – 15 O / U / D

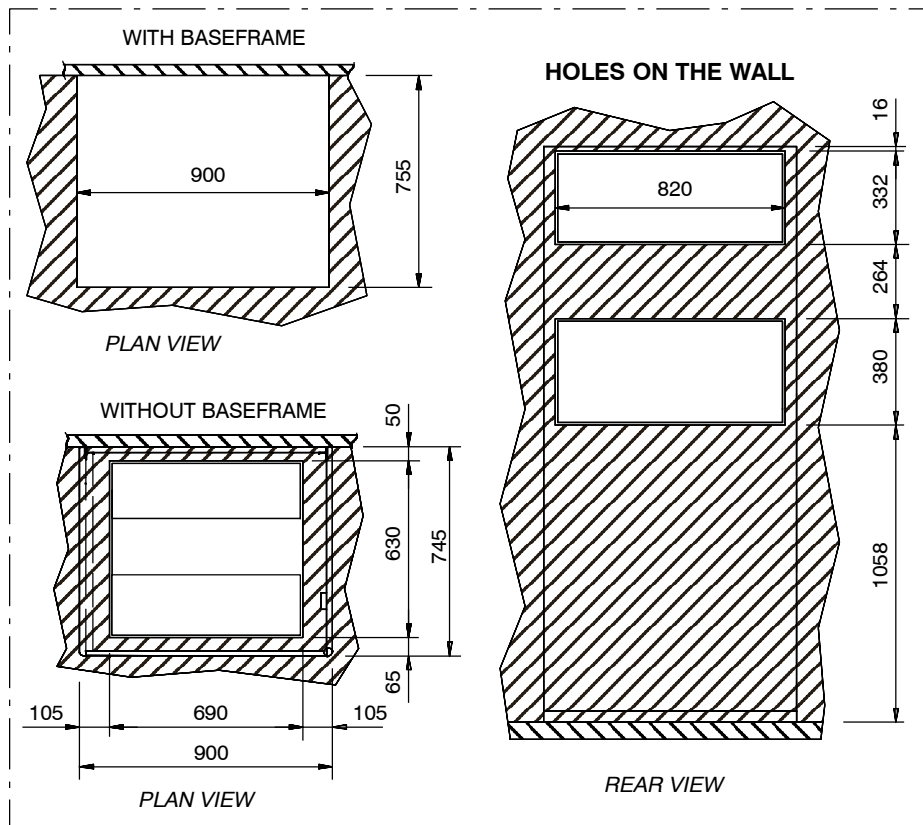
Liebert HPF 10 - 12 - 15 Over



Liebert HPF 10 - 12 - 15 Displacement



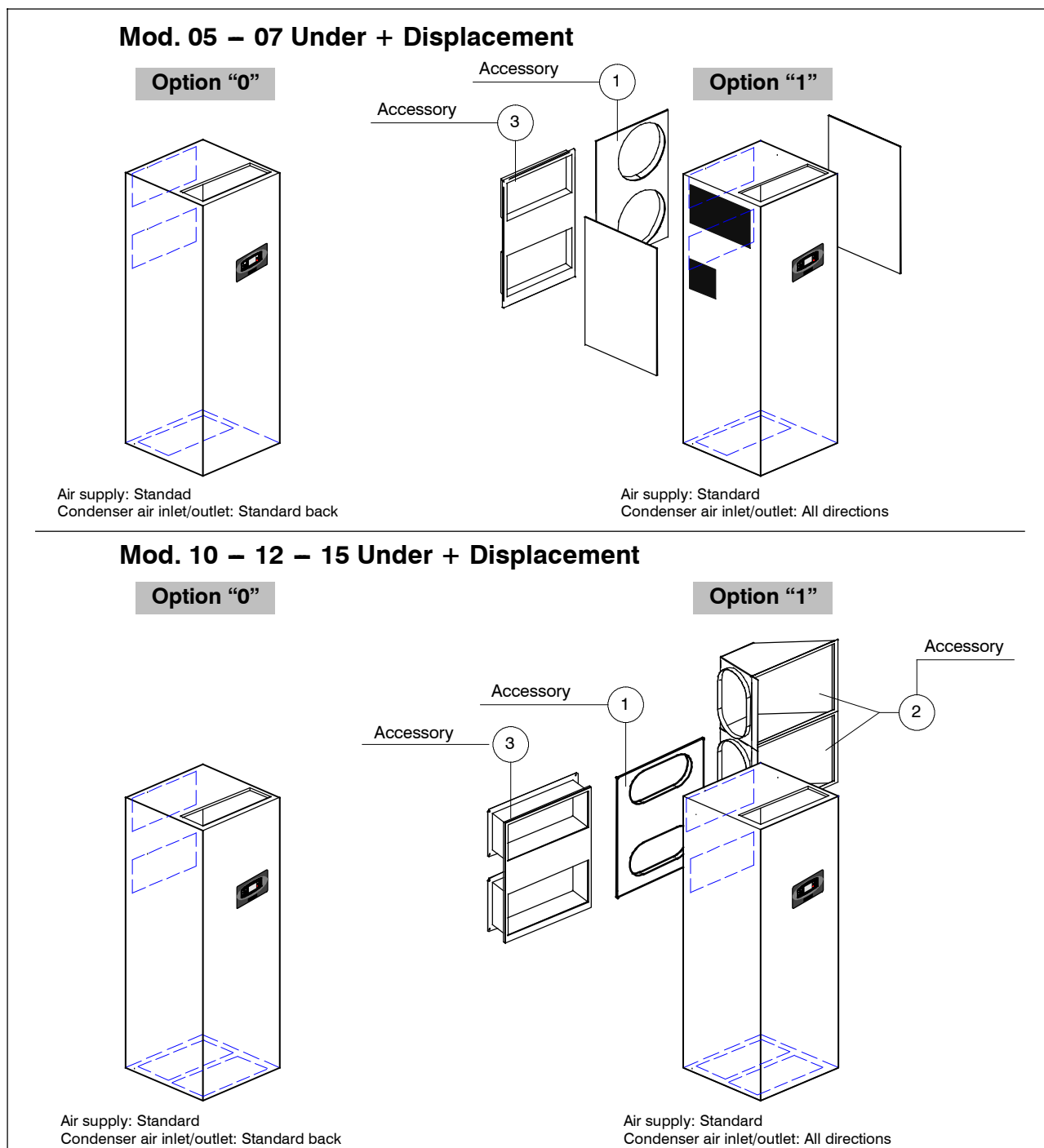
Liebert HPF 10 - 12 - 15 Under





# Installation

Fig. 8 – Air flow configurations (see cap. 2, Digit 15)

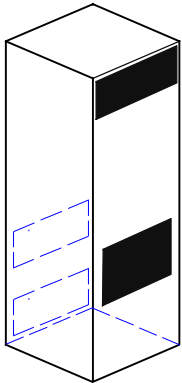


POS.	DESCRIPTION	COLOUR	Q.TY	HPF – U / D	
				05 – 07	10 – 12 – 15
1	Flange for circular connection	Charcoal grey	1	13682402	13686902
		Black Emerson 7021	1	13682411	13686911
		RAL 7035	1	13682401	13686901
2	Connection plenum for side duct	Charcoal grey	2	-	13685902
		Black Emerson 7021	2	-	13685911
		RAL 7035	2	-	13685901
3	Flange for rectangular connection	Charcoal grey	1	13690002	13690702
		Black Emerson 7021	1	13690011	13690711
		RAL 7035	1	13690001	13690701

# Installation

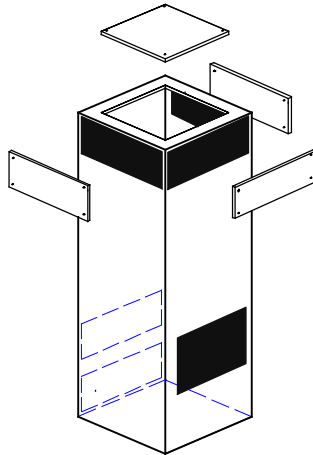
## Mod. 05 – 07 Over

Option "0"



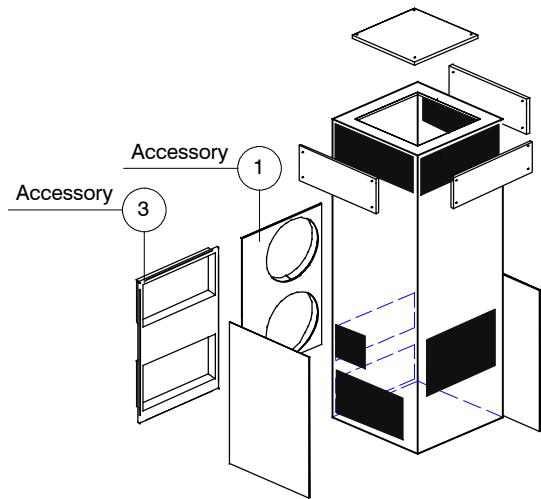
Air supply: Standard front  
Condenser air inlet/outlet: Standard back

Option "2"



Air supply: All directions  
Condenser air inlet/outlet: Standard back

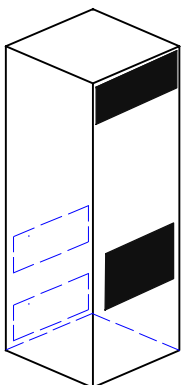
Option "3"



Air supply: All directions  
Condenser air inlet/outlet: Standard back

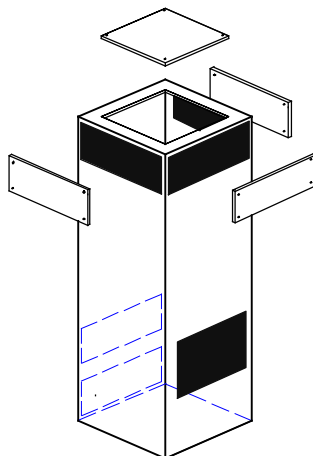
## Mod. 10 – 12 – 15 Over

Option "0"



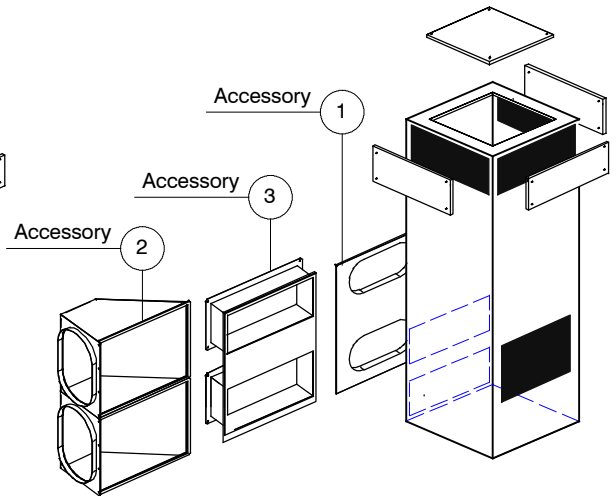
Air supply: Standard front  
Condenser air inlet/outlet: Standard back

Option "2"



Air supply: All directions  
Condenser air inlet/outlet: Standard back

Option "3"



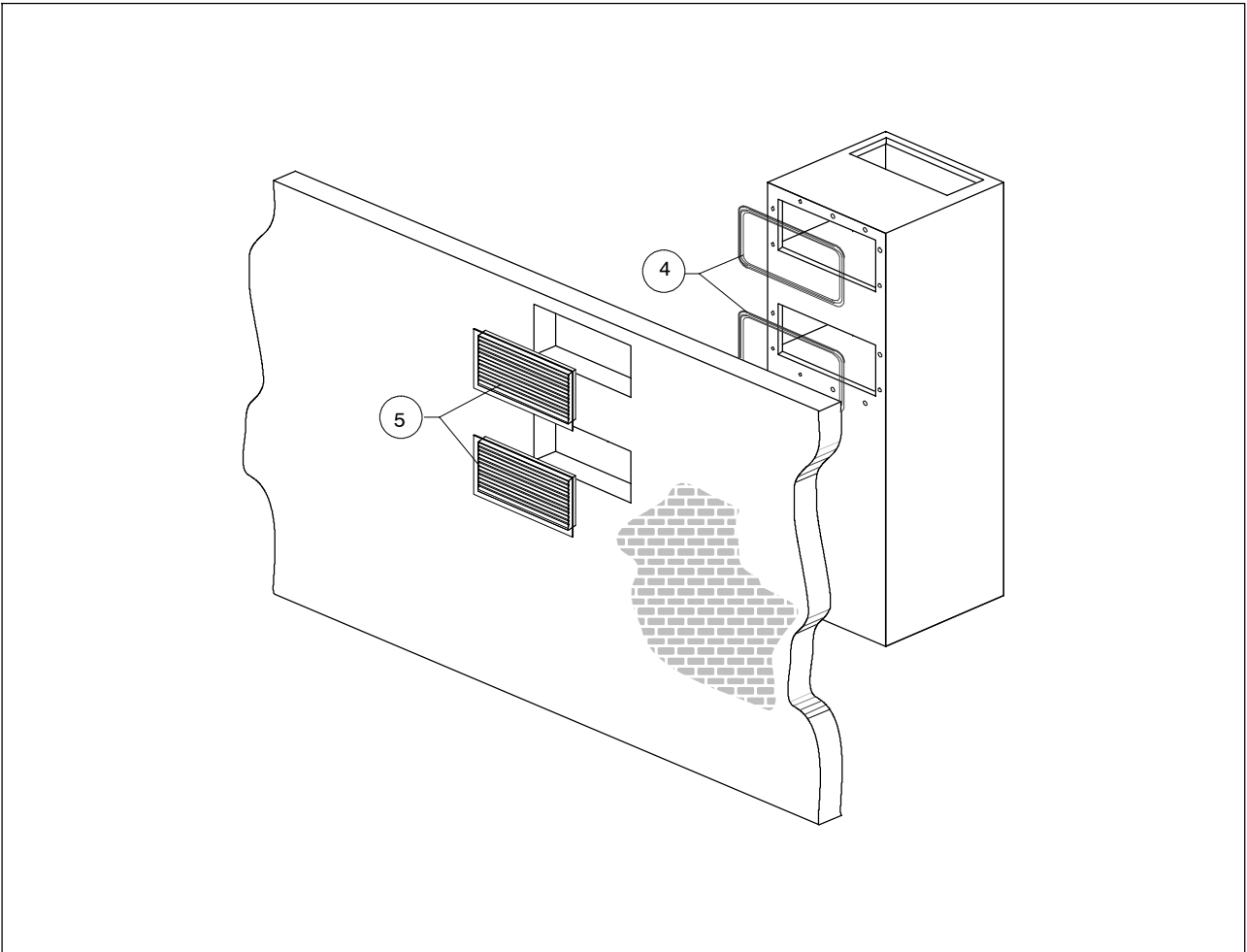
Air supply: All directions  
Condenser air inlet/outlet: Standard back

POS.	DESCRIPTION	COLOUR	Q.TY	HPF – O	
				05 – 07	10 – 12 – 15
1	Flange for circular connection	Charcoal grey	1	13682402	13686902
		Black Emerson 7021	1	13682411	13686911
		RAL 7035	1	13682401	13686901
2	Connection plenum for side duct	Charcoal grey	2	–	13685902
		Black Emerson 7021	2	–	13685911
		RAL 7035	2	–	13685901
3	Flange for rectangular connection	Charcoal grey	1	13690002	13690702
		Black Emerson 7021	1	13690011	13690711
		RAL 7035	1	13690001	13690701

# Installation

Fig. 9 – Installation

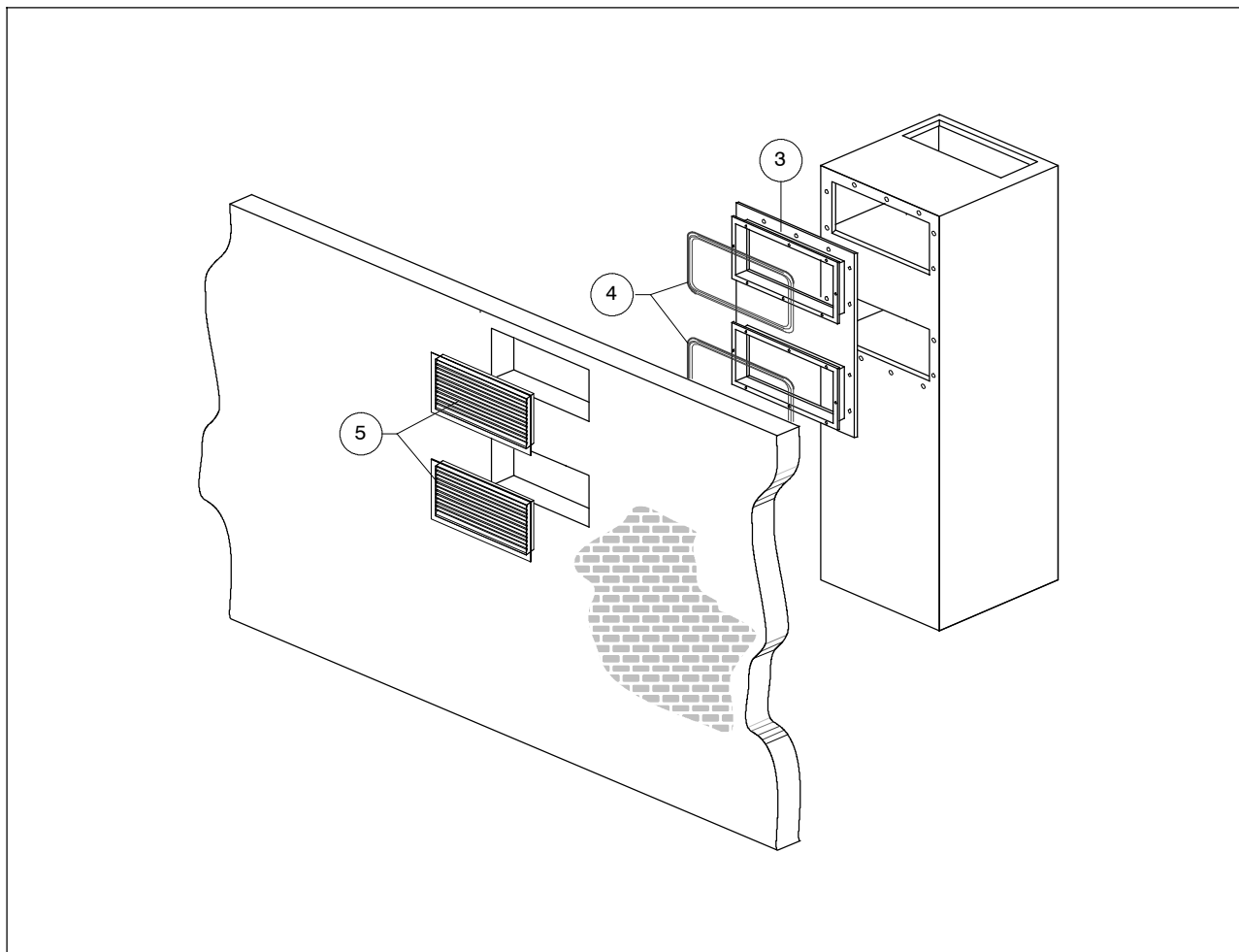
**Direct wall mounting** (example for Under version)



POS.	DESCRIPTION	Q.TY	HPF – Under / Displ.		HPF – Over	
			05 – 07	10 – 12 – 15	05 – 07	10 – 12 – 15
4	Kit of seal and vibration – damping gaskets	1	N.S			
5	Kit of anti – rain outer grilles	1	454205	454206	484300	454109
N.S. : <i>Not Supplied by Emerson Network Power</i>						

# Installation

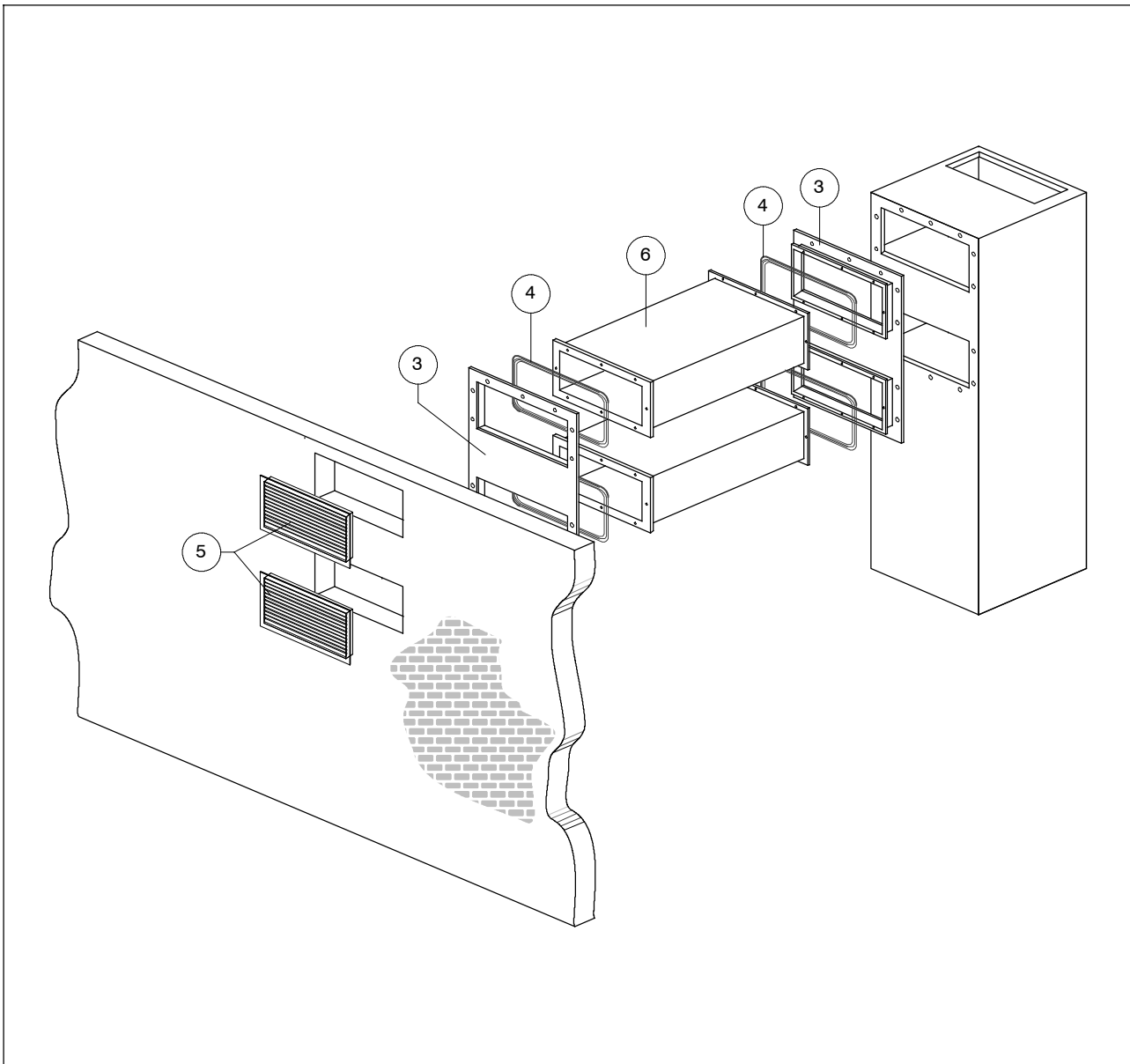
## Wall mounting with flange (example for Under version)



POS.	DESCRIPTION	COLOUR	Q.TY	HPF – Under / Displ.		HPF – Over	
				05 – 07	10 – 12 – 15	05 – 07	10 – 12 – 15
3	Flange for rectangular connection	Charcoal grey	1	13690002	13690702	13690002	13690702
		Black Emerson 7021	1	13690011	13690711	13690011	13690711
		RAL 7035	1	13690001	13690701	13690001	13690701
4	Kit of seal and vibration – damping gaskets		1	N.S			
5	Kit of anti – rain outer grilles		1	454205	454206	484300	454109
N.S. : <i>Not Supplied by Emerson Network Power</i>							

# Installation

## Installation with stiff rectangular channel (example for Under version)

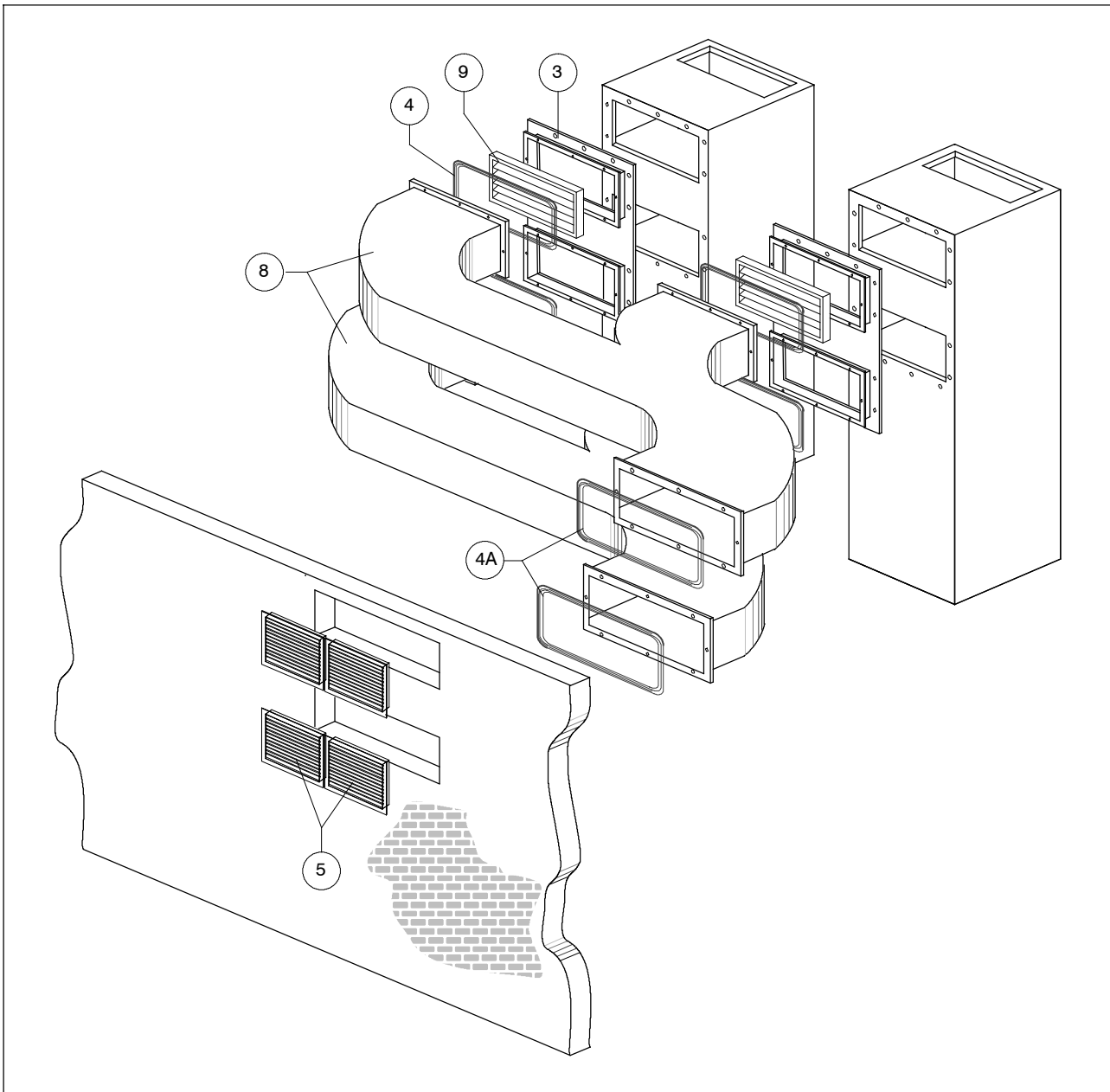


POS.	DESCRIPTION	COLOUR	Q.TY	HPF – Under / Displ.		HPF – Over	
				05 – 07	10 – 12 – 15	05 – 07	10 – 12 – 15
3	Flange for rectangular connection	Charcoal grey	2	13690002	13690702	13690002	13690702
		Black Emerson 7021	2	13690011	13690711	13690011	13690711
		RAL 7035	2	13690001	13690701	13690001	13690701
4	Kit of seal and vibration – damping gaskets		2	N.S			
5	Kit of anti – rain outer grilles		1	454205	454206	484300	454109
6	Stiff rectangular duct		2	N.S			
N.S. : <i>Not Supplied by Emerson Network Power</i>							



# Installation

## Two ducted units – Installation with stiff rectangular channel (example for Under version)

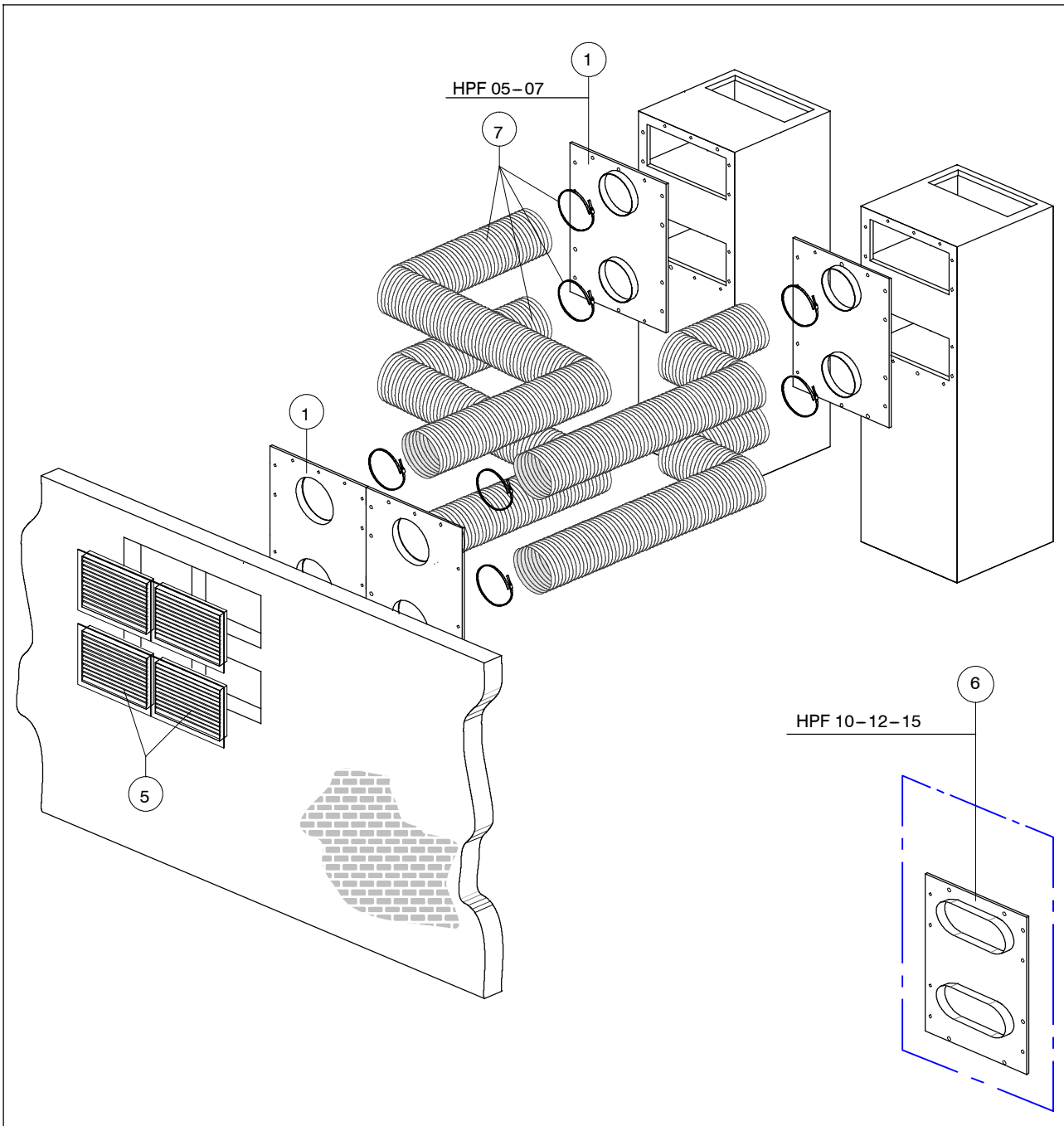


POS.	DESCRIPTION	COLOUR	Q.TY	HPF – Under / Displ.		HPF – Over	
				05 – 07	10 – 12 – 15	05 – 07	10 – 12 – 15
3	Flange for rectangular connection	Charcoal grey	2	13690002	13690702	13690002	13690702
		Black Emerson 7021	2	13690011	13690711	13690011	13690711
		RAL 7035	2	13690001	13690701	13690001	13690701
4	Seal and vibration–damping gasket		4	N.S			
4A	Seal and vibration–damping gasket		2				
5	Anti–rain outer grille kit		2	454205	454206	484300	454109
8	Stiff rectangular duct		2	N.S			
9	Overpressure damper		2				

N.S. : Not Supplied by **Emerson Network Power**

# Installation

## Two ducted units – Installation with flexible circulat channel (example for Under version)

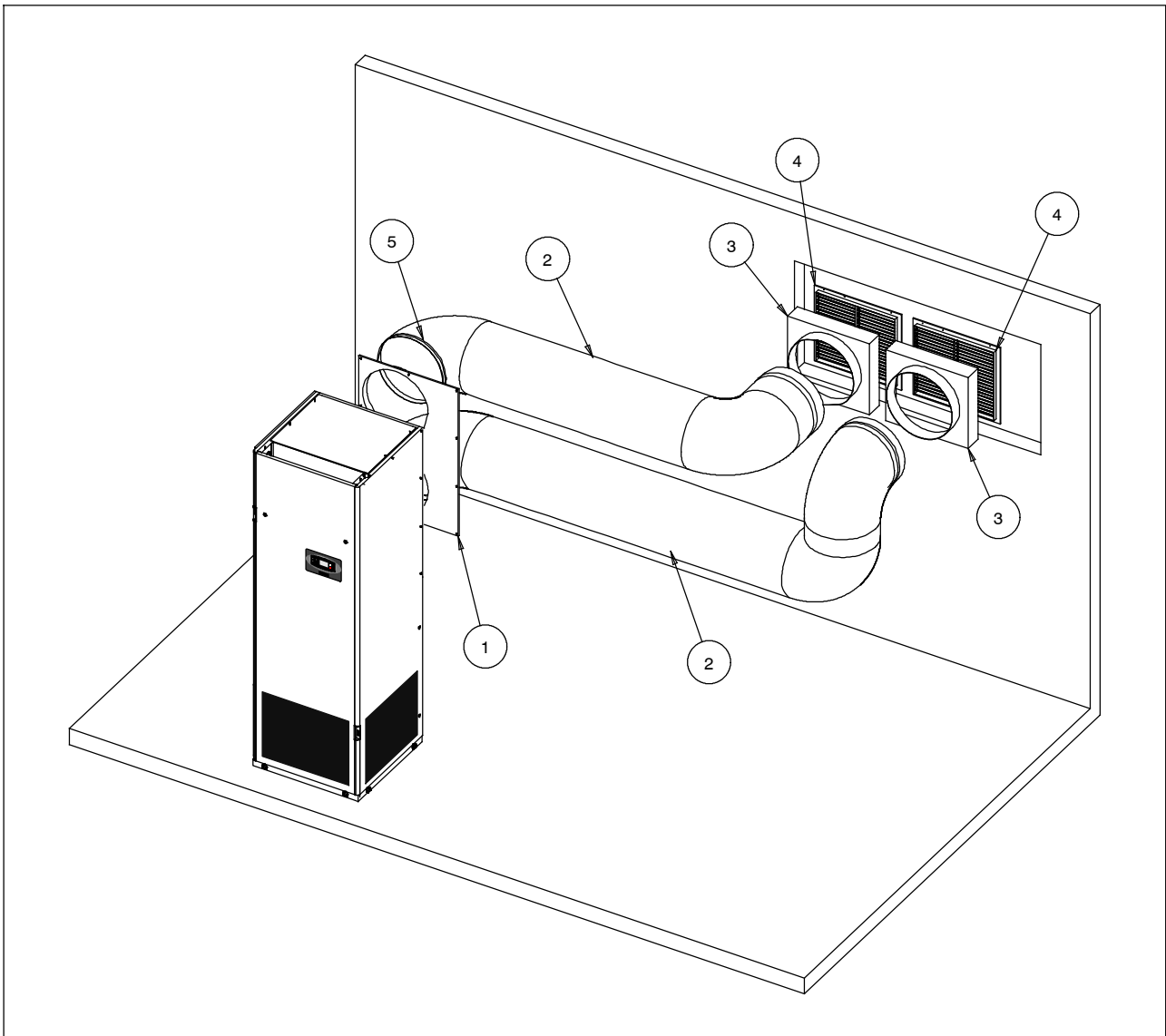


POS.	DESCRIPTION	COLOUR	Q.TY	HPF – Under / Displ.		HPF – Over	
				05 – 07	10 – 12 – 15	05 – 07	10 – 12 – 15
1	Flange for circular connection	Charcoal grey	4	13682402	13686902	13682402	13686902
		Black Emerson 7021	4	13682411	13686911	13682411	13686911
		RAL 7035	4	13682401	13686901	13682401	13686901
5	Anti-rain outer grille kit		2	454205	454206	484300	454109
7	Kit of flexible ducts L=6 m Ø 400 mm		2				
	Pipe – fastening clamp		4	483020	–	483020	–
	Kit of flexible ducts L=6 m Ø 500 mm		2	–	483022	–	483022
	Pipe – fastening clamp		4				



# Installation

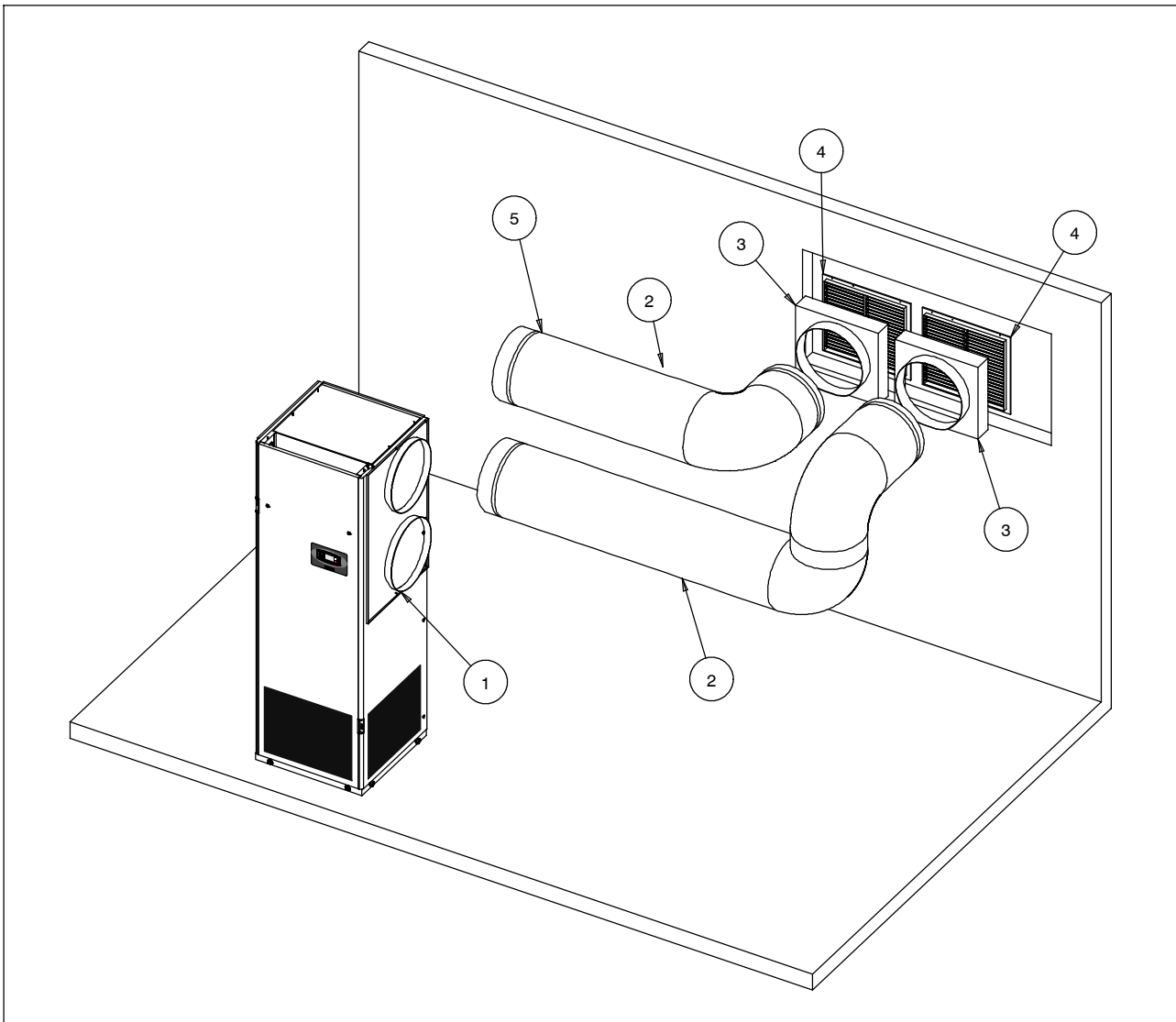
## HPF 05 – 07 D – Installation accessories with rear connections



POS.	DESCRIPTION	Q.TY	Kit Code		
			Colour Charcoal grey	Colour Black Emerson 7021	Colour RAL 7035
1	Kit 6 m length	Circular connection flange	454236	45423611	454044
2		Flexible hose Ø 406, L = 6 m			
3		Suction/discharge duct 450 x 450 (hole 460 x 460)			
4		Suction/discharge grille 450 x 450			
5		Hose clamp			
1	Kit 3 m length	Circular connection flange	454237	45423711	454059
2		Flexible hose Ø 406, L = 3 m			
3		Suction/discharge duct 450 x 450 (hole 460 x 460)			
4		Suction/discharge grille 450 x 450			
5		Hose clamp			

# Installation

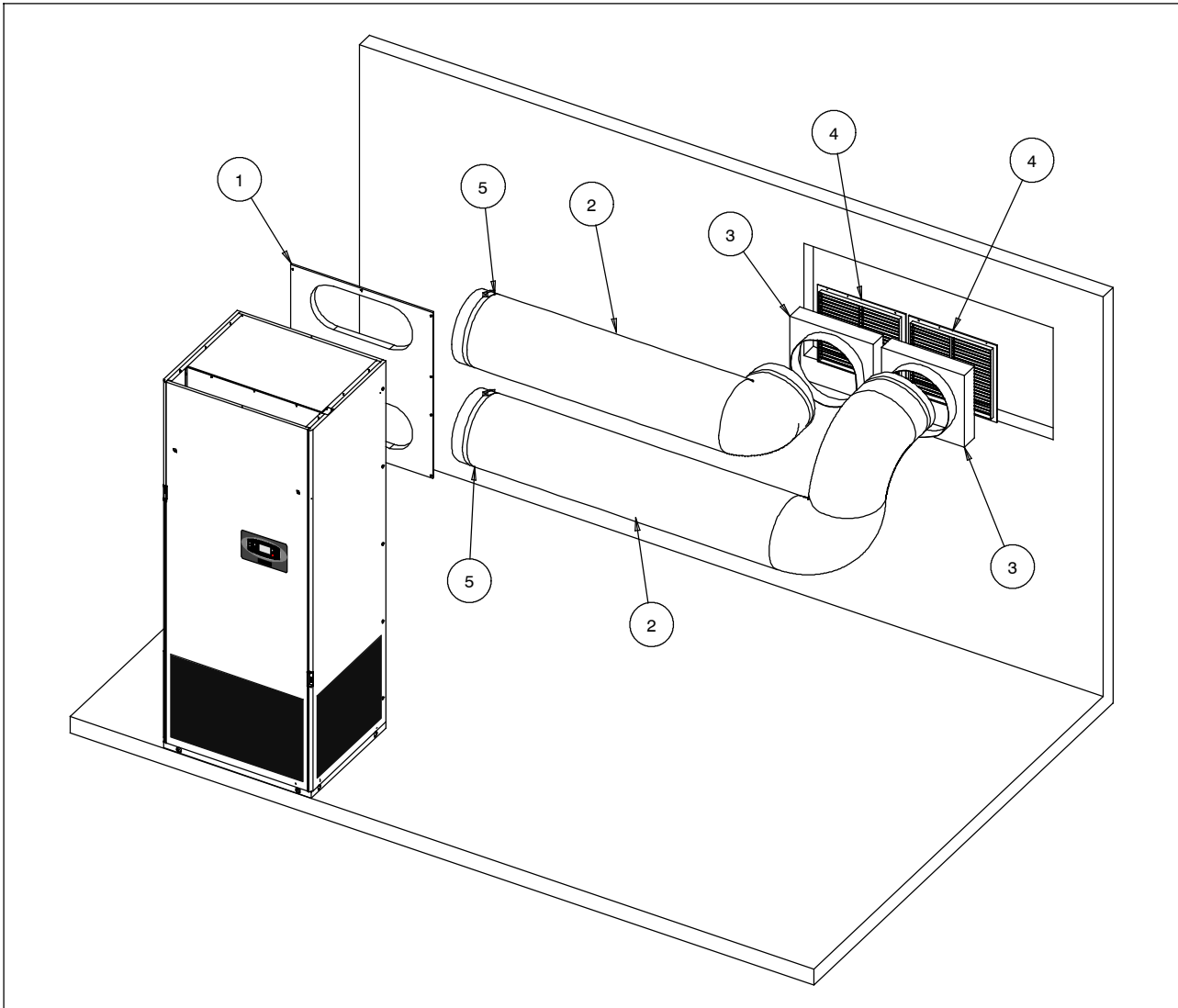
## HPF 05 – 07 D – Installation accessories with lateral connections



POS.	DESCRIPTION	Q.TY	Kit Code		
			Colour Charcoal grey	Colour Black Emerson 7021	Colour RAL 7035
1	Circular connection flange	1	454236	45423611	454044
2	Flexible hose Ø 406, L = 6 m	2			
3	Suction/discharge duct 450 x 450 (hole 460 x 460)	2			
4	Suction/discharge grille 450 x 450	2			
5	Hose clamp	4			
1	Circular connection flange	1	454237	45423711	454059
2	Flexible hose Ø 406, L = 3 m	2			
3	Suction/discharge duct 450 x 450 (hole 460 x 460)	2			
4	Suction/discharge grille 450 x 450	2			
5	Hose clamp	4			

# Installation

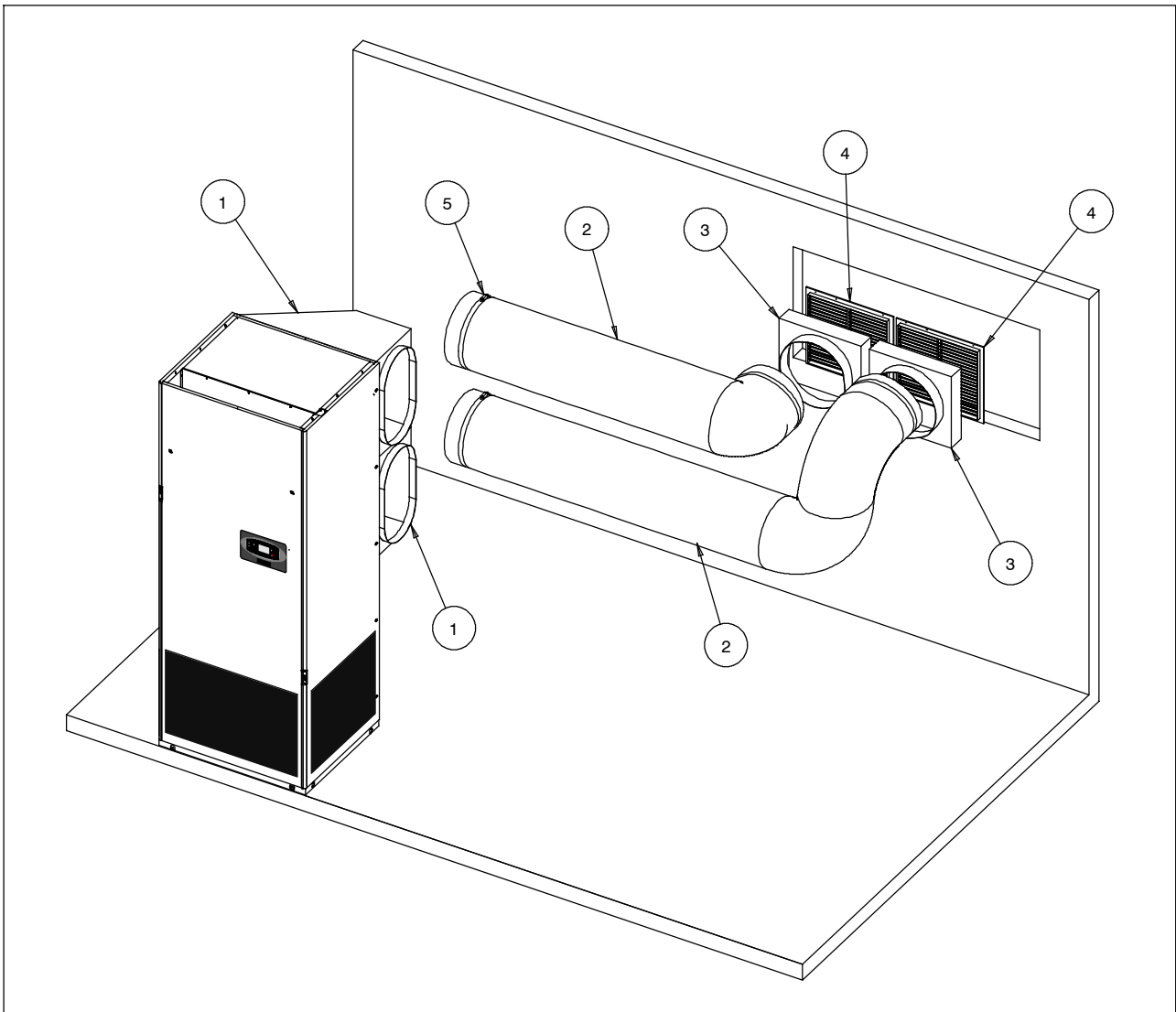
## HPF 10 – 12 – 15 D – Installation accessories with rear connections



POS.	DESCRIPTION	Q.TY	Kit Code		
			Colour Charcoal grey	Colour Black Emerson 7021	Colour RAL 7035
1	Circular connection flange	1	454231	45423111	454043
2	Flexible hose Ø 508, L = 6 m	2			
3	Suction/discharge duct 550 x 550 (hole 560 x 560)	2			
4	Suction/discharge grille 550 x 550	2			
5	Hose clamp	4			
1	Circular connection flange	1	454232	45423211	454060
2	Flexible hose Ø 508, L = 3 m	2			
3	Suction/discharge duct 550 x 550 (hole 560 x 560)	2			
4	Suction/discharge grille 550 x 550	2			
5	Hose clamp	4			

# Installation

## HPF 10 – 12 – 15 D – Installation accessories with lateral connections



POS.	DESCRIPTION	Q.TY	Kit Code		
			Colour Charcoal grey	Colour Black Emerson 7021	Colour RAL 7035
1	Kit 6 m length	Plenum for lateral connections	454242	45424211	454042
2		Flexible hose Ø 508, L = 6 m			
3		Suction/discharge duct 550 x 550 (hole 560 x 560)			
4		Suction/discharge grille 550 x 550			
5		Hose clamp			
1	Kit 3 m length	Plenum for lateral connections	454243	45424311	454061
2		Flexible hose Ø 508, L = 3 m			
3		Suction/discharge duct 550 x 550 (hole 560 x 560)			
4		Suction/discharge grille 550 x 550			
5		Hose clamp			

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