

*Air cooled full inverter  
water chiller for outdoor  
installation*

# Large EVO

**SERIE WiSAT-YEE1 45.4-90.4**

TECHNICAL BULLETIN



SIZE - EXCELLENCE	45.4	50.4	55.4	60.4	65.4	70.4	75.4	80.4	85.4	90.4
COOLING CAPACITY [KW]	110	118	133	142	156	169	183	196	209	226
SIZE - PREMIUM	45.4	50.4	55.4	60.4	65.4	70.4	75.4	80.4	85.4	90.4
COOLING CAPACITY [KW]	125	135	143	155	174	192	211	226	241	252

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Clivet participates in the ECP Programme for “Liquid Chillers and Hydronic Heat Pumps”.  
Check ongoing validity of certificate on [www.eurovent-certification.com](http://www.eurovent-certification.com)”

# Features and benefits

LARGE EVO is the new generation of air cooled liquid chillers and heat pumps, equipped with Full DC Inverter technology and R-32 refrigerant with low environmental impact, designed for outdoor installation.

## WiSAT-YEE1

Air cooled chiller with full DC inverter technology and R-32 refrigerant

- Range 110 ÷ 252 kW
- Excellence / Premium Version
- Seasonal efficiency (SEER) 5.16/4.90
- Operating with 48°C of outdoor air temperature
- Operating with -20°C of outdoor air temperature
- Full aluminium microchannel coils
- Partial recovery of the condensing heat
- Plate exchanger
- 2 refrigeration circuits



## WiSAN-YEE1

Air cooled reversible heat pump with full DC inverter technology and R-32 refrigerant

- Range 115 ÷ 233 kW
- Seasonal efficiency (SCOP) up to 4,22
- Seasonal efficiency (SEER) up to 4.51
- Operating with 48°C of outdoor air temperature in cooling
- Operating with 48°C of outdoor air temperature in heating
- Hot water production up to 60°C
- Copper/aluminum condensing coil
- Partial recovery of the condensing heat
- Plate exchanger
- 2 refrigeration circuits



The LARGE EVO series is available from 110 kW up to 252 kW in two different energy versions.

EXCELLENCE (EXC) with high levels of efficiency both in full load and partial load operation while maintaining very silent operation

PREMIUM (PRM) most effective and valuable solution both in terms of capital investment and running cost thanks to competitive efficiency and enhanced delivered capacity by each size.

## Energy Efficiency

SEER up to 5,34 which makes it extremely competitive

Capacity modulation from 20% to 100%.

## Extensive operating limits

Outdoor temperature	max	min
Cooling	48°C	-20°C
Outlet water temperature	max	min
Cooling	20°C	-8°C

## Functionality

- Climatic compensation with external temperature
- Double set-point management
- SG Ready
- EVU lock ready (remote on/off)
- Demand limit

## Acoustic configuration

Three sound configurations levels:

- Standard acoustic configuration
- Silenced acoustic configuration (-3 dB(A))
- Super-silenced acoustic configuration (-6 dB(A))

## Application versatility

All the main system components are supplied on the unit, ensuring maximum manufacturing reliability and easy installation:

- Hydropack with 1 inverter pump, low or high head
- Hydropack with 1 on/off pump, low or high head
- Hydropack with 2 inverter pumps in duty/stand-by configuration, low or high head
- Hydropack with 2 on/off pumps in duty/stand-by configuration, low or high head
- System storage tank
- Partial energy recovery

## Cascade management

LARGE EVO is designed to connect up to 8 units in a local network, reaching a maximum unit capacity of 2016 kW.

# Standard unit technical specifications

## Compressor

### Size 45.4 - 50.4 EXC / 45.4 - 55.4 PRM

Inverter-controlled rotary hermetic compressor fitted with a motor protection device for overheating, overcurrents and excessive temperatures of the supply gas. It is installed on rubber anti-vibration mounts and comes with a full oil charge. The compressor is wrapped in a sound-absorbing hood, that reduces its sound emissions. A crankcase heater with automatic activation prevents the refrigerant from diluting the oil when the compressor stops.

### Size 55.4 - 60.4 EXC / 60.4 PRM

#### Circuit 1

Inverter-controlled rotary hermetic compressor fitted with a motor protection device for overheating, overcurrents and excessive temperatures of the supply gas. It is installed on rubber anti-vibration mounts and comes with a full oil charge. The compressor is wrapped in a sound-absorbing hood, that reduces its sound emissions. A crankcase heater with automatic activation prevents the refrigerant from diluting the oil when the compressor stops.

#### Circuit 2

Inverter-controlled hermetic Scroll compressor with steam injection fitted with a motor protection device for overheating, overcurrents and excessive temperatures of the supply gas. It is installed on rubber antivibration mounts and comes with a full oil charge. The compressor has a sound blanket, that reduces its sound emissions and thermally insulates it.

### Size 65.4 - 90.4 EXC / 65.4 - 90.4 PRM

Inverter-controlled hermetic Scroll compressor with steam injection fitted with a motor protection device for overheating, overcurrents and excessive temperatures of the supply gas. It is installed on rubber antivibration mounts and comes with a full oil charge. The compressor has a sound blanket, that reduces its sound emissions and thermally insulates it.

## Structure

Supporting structure and base made entirely of sturdy sheet steel, 12/10 thick, with hot-dip galvanised surface treatment and parts in full view painted with polyester powder RAL9001, which guarantees excellent mechanical characteristics and high corrosion resistance over time.

## Panelling

External panelling made of sheet steel, 12/10 thick, with hot-dip galvanised surface treatment and painted with polyester powder RAL9001 that guarantees greater corrosion resistance in outdoor installations and eliminates the need for periodic painting. The panels can be easily removed to fully access internal components.

## Internal exchanger

Direct expansion heat exchanger, braze-welded AISI 316 stainless steel plates, in pack without seals using copper as the brazing material, with low refrigerant charge and large exchange surface, complete with:

- 17 mm thick external no-condensation thermal insulation in sintered expanded polypropylene;
- antifreeze heater to protect the water side exchanger, preventing the formation of frost if the water temperature falls below a set value.

## External exchanger

Full aluminium microchannel coil. The entire exchanger (tubes, fins and manifolds) is made of aluminum and welded into a single body through a special brazing technology in a controlled-temperature chamber. The fins have a special corrugated surface to ensure maximum heat exchange efficiency. The special flat configuration of the pipes reduces the section that opposes to the air flow, limiting the pressure drops and maximizing the surface. The total refrigerant charge into the microchannel coil is reduced by 40% compared to an equivalent copper coil.

## Fan

Axial fans with sickle-shaped blades made of ABS ASG-20 resin reinforced with 20% glass fibre, directly coupled to the electronically controlled motor (IP23), driven by the continuous magnetic switching of the stator. The brushless technology and the special power supply increase both the lifecycle and the efficiency. Consumption is thus reduced by as much as 50%. The fans are housed in aerodynamically shaped nozzles to increase efficiency and minimise noise levels and are fitted with accident prevention grilles. Both fans and grilles are designed with CFD technology. Supplied with variable speed control.

## Refrigeration circuit

Two independent refrigeration circuits made of copper, brazed and factory-assembled, complete with:

- electronic expansion valve;
- safety high pressure switch;
- low pressure safety switch;
- oil separator;
- suction separator;
- high pressure transducer;
- safety thermostat against compressor drain overheating;
- temperature sensors;
- low pressure safety valve.

### Size 55.4 - 90.4 EXC / 60.4 - 90.4 PRM

- economizer exchanger

## Electrical panel

The power section includes:

- main disconnecting switch;
- general protection fuses;
- insulation transformer for powering the auxiliary circuit;
- auxiliary component protection fuses;
- AC filter on power supply
- power supply phase sequence protection;
- protection for compressor over current;
- protection for compressor overload;
- sensor malfunction protection;
- phase monitor.

The control section includes:

- compressor overload protection and timer;
- relay for remote cumulative fault signal;
- condenser control;
- dry contact for remote on-off control;

The control keypad includes:

- interface terminal with graphic display;
- multifunction keys for ON/OFF control;
- alarms display and reset;
- daily or weekly schedule;
- power output for remote control;
- serial port with Modbus outlet (RS 485) for remote communication.

## Water circuit

- temperature sensors;
- drain valve;
- antifreeze heaters to protect the water side exchanger to prevent ice from forming if the water temperature drops below the pre-set value;
- differential pressure switch, water side;
- relief valve.

## Test

Unit subjected to factory-tested in specific steps and test pressure of the piping of the refrigerant circuit (with nitrogen and hydrogen), before shipping them.

## Unit equipment with outdoor air low temperatures

MINIMUM OUTDOOR AIR TEMPERATURE		OPERATING UNIT		UNIT IN STAND-BY <sup>(5)</sup> (fed unit)	UNIT IN STORAGE (unit not fed)
		COOL*			
+11°C	1				
+2°C	2				
-5°C	4				
-7°C	3				
-10 °C	4				
From -10°C to -20°C		✓ STANDARD UNIT	✓ STANDARD UNIT	✓ STANDARD UNIT <sup>(6)</sup>	
From -20°C to -30°C		✓ NOT POSSIBLE	✓ WATER EMPTY UNIT OR WITH AN APPROPRIATE GLYCOL PERCENTAGE  ✗ NOT SUITABLE: BUILT-IN PUMPS	NOT POSSIBLE	

Data referred to the following conditions:

\*chilled water production:

cold side exchanger water = 12/7°C

1. Part load unit and air speed equal to 1 m/s.
2. Part load unit and air speed equal to 0.5 m/s.
3. Part load unit and outdoor air temperature at rest.
4. Full load unit and outdoor air temperature at rest.

<sup>(5)</sup> The water pumping unit must be fed and connected to the unit according to the manual.

<sup>(6)</sup> Unit without water or containing water with an appropriate quantity of glycol.

At the unit start-up the water temperature or water with glycol must be inside the operating range indicated in the "Operating range" graph.

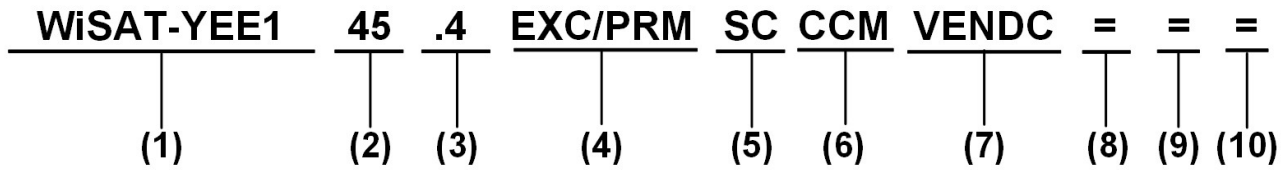
To know the water freezing temperature on varying the glycol percentage refer to the specific 'Correction factors for glycol use' table.

⚠ Air conditions which are at rest are defined as the absence of air flowing towards the unit. Weak winds can induce air to flow through the exchanger and air-levels which can cause a reduction in the operating range.

In the presence of predominant winds it is necessary to use suitable windbreak barriers.

⚠ The unit, with an outdoor air temperature on average lower than -10°C, can remain stored for a maximum of 1 month.

# Unit configuration



## (1) Range

WiSAT = Air-cooled liquid chiller with inverter compressors

## (2) Size

45 = Nominal compressor capacity (HP)

## (3) Compressors

.4 = Compressor quantity

## (4) Energy version

EXC = EXCELLENCE Version (standard)

PRM = PREMIUM Version

## (5) Acoustic configuration

SC = Acoustic configuration with compressor soundproofing (standard)

LN = Silenced acoustic configuration

EN = Super-silenced acoustic configuration

## (6) Condensing coil

CCM = Aluminum microchannel condensing coils (Standard)

CCME = E-coated microchannel coil

## (7) Fan

VENDC = DC high efficiency fans (standard)

## (8) Hydronic unit on the user side

(-) Not required (standard)

1PM = Hydropack with N° 1 pump

1PMH = Hydropack with N° 1 high static pressure pump

1PMV = Hydropack with N° 1 inverter pump

1PMVH = Hydropack with N° 1 high static pressure inverter pump

1P1SB = Hydropack with N° 1 pump + N° 1 in stand-by

1PAP+S = Hydropack with N° 1 high static pressure pump + N° 1 in stand-by pump

1P1SBV = Hydropack with N° 1 inverter pump and N° 1 stand-by pump with dedicated inverter

1PAPSV = Hydropack with 1 high head inverter pump and 1 stand-by pump with dedicated inverter

## (9) Storage tank

(-) not required (standard)

ACC = Storage tank

## (10) Energy recovery

(-) not required (standard)

D = Partial energy recovery

<b>ACC</b>	<b>Storage tank</b> <p>Steel storage tank complete with double layer covering with closed-cell insulation, stainless steel anti-freeze immersion resistance, bleed valve, draw off cock, cast-iron shut-off butterfly valve with quick connections and activation lever with a mechanical calibration lock at the evaporator output, quick connections with insulated casing.</p> <p>The water tank capacity is 300 litres for sizes 45.4 to 60.4.</p> <p>The water tank capacity is 500 litres for sizes 65.4 to 90.4.</p> <p>The device is installed and wired on the unit and is located on the system's return line.</p>
<b>CMSC13</b>	<b>Serial communication module ModBus TCP/IP, BACnet/IP, BACnet MS/TP</b> <p>This enables the serial connection of the supervision system, using ModBus TCP/IP, BACnet/IP, BACnet MS/TP as the communication protocol. It enables access to the complete list of operational variables, commands and alarms. Using this accessory every unit can dialogue with the main supervision systems.</p> <p>The device is installed and wired on the unit.</p> <p>⚠ The configuration and management activities for the BACnet networks are the responsibility of the client.</p> <p>⚠ The total length of each individual serial line must not exceed 1000 m and the line must be connected in bus type (input/output).</p>
<b>CCME</b>	<b>E-coated microchannel coil</b> <p>The full aluminium microchannel coil is completely treated by electrolysis so as to create a protective layer of epoxy polymer on the surface, with the following characteristics:</p> <ul style="list-style-type: none"><li>• over 3000 hours of protection against salt spray (ASTM G85 A3 - SWAAT);</li><li>• over 2000 hours of protection against UV rays (ASTM G155-05a)</li></ul> <p>provide a very high resistance against corrosion.</p>
<b>PGFC</b>	<b>Finned coil protection grilles</b> <p>The grilles protect the external coil from accidental contact with objects or persons. Ideal for installation in places where persons can pass from, such as car parks, terraces, etc.</p>
<b>PGCCH</b>	<b>Anti-hail protection grilles</b> <p>Grille made of electro-welded and painted drawn steel suitable for protecting the external coil from hail damage.</p> <p>Accessories supplied and installed on the unit.</p>
<b>RPR</b>	<b>Refrigerant leak detector</b> <p>The leak detector device, in-built on the unit and positioned inside the compressor compartment, detects leaks from the internal refrigeration circuit.</p>
<b>REMAU</b>	<b>Additional board for advanced functions management</b> <p>Multifunction board installed in the electrical panel of the unit for the advanced functions management.</p> <p>The available digital contacts allow the following remote functions:</p> <ul style="list-style-type: none"><li>• remote on/off</li><li>• Double set-point management</li><li>• Sgready function</li><li>• EVUlock function</li><li>• Demand limit</li><li>• Activation of silent or super-silent acoustic version (selectable on the user interface)</li></ul> <p>The additional board does not allow the simultaneous use of digital inputs and Modbus signal.</p>
<b>ABU</b>	<b>Water connections flush with the unit are required</b> <p>The water connections of the unit in standard configuration (without hydronic groups installed on board, or accumulation tank or DHW switching valve), end at the plate heat exchanger.</p> <p>It is necessary to select this option if water connections flush with the unit are required.</p> <p>If hydronic groups or buffer tank or DHW switching valve are selected, the ABU option is automatically selected.</p>



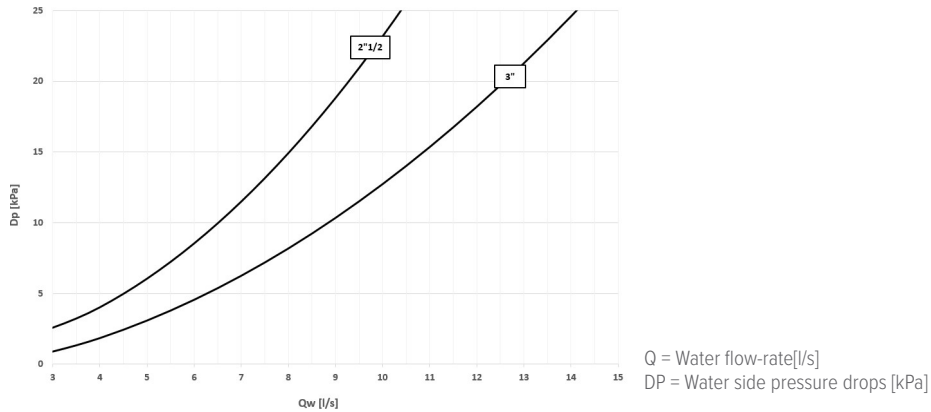
# Accessories separately supplied

## IFWX

### Steel mesh strainer on the water side

The device prevents any impurity in the hydraulic circuit from soiling the exchanger. The stainless steel mesh mechanical filter must be placed on the water inlet line. It needs to be easy to remove for periodical maintenance and cleaning operations. The Victaulic filter water connections are 2" 1/2 for sizes 45.4 to 60.4 and 3" for sizes 65.4 to 90.4.

### Filter pressure drop



## AVIBX

### Anti-vibration mount support

The rubber antivibration mounts are attached in special housing on the support frame and serve to smooth the vibrations produced by the unit, thus reducing the noise transmitted to the support structure.

## AMMSX

### Anti-seismic spring antivibration mounts

The anti-seismic spring antivibration mounts must be fastened in special housings on the supporting metal struts. The containment structure is designed to ensure high resistance multidirectional forces acting on the surface of the unit in the presence of wind and / or telluric movements. The antivibration mounts have been tested according to ANSI/ASHRAE standard 171-2008 (Method of Testing Seismic Restraint devices for HVAC&R Equipment). The performance levels and test methodology have been validated and certified by Lloyd's Register.

⚠ Installation is a responsibility of the Customer.

## PGFCX

### Finned coil protection grilles

The grilles protect the external coil from accidental contact with objects or persons. Ideal for installation in places where persons can pass from, such as car parks, terraces, etc.

## PGCCHX

### Anti-hail protection grilles

Grille made of electro-welded and painted drawn steel suitable for protecting the external coil from hail damage.

## IOTX

### IoT industrial module for cloud based interoperability & services

This device allows the monitoring and the remote control the unit via Clivet Eye, the supervision cloud system for Clivet units.

With IoT module (i-LINK) it will be possible to monitor and manage the unit through the mobile app Clivet Eye and the dedicated web page.

Among the main functions, for all monitored units they allow to:

- display the main working parameters;
- display the alarms;
- switch on/off the unit;
- change the setpoint;
- change the operating mode;
- set the daily/weekly start-up or power-off programming of the unit;
- create charts of main system parameters trend (via web interface);
- display in a map the units monitored by Clivet Eye (via web interface).

Web interface at [www.cliveteye.com](http://www.cliveteye.com).

Clivet Eye app available in Google Play and Apple Store

- ⚠ IoT module to be provided for each unit to be remotely monitored.
- ⚠ Internet ethernet connection in charge of customer.
- ⚠ Clivet Eye management is alternative to an external BMS supervision system.
- ⚠ Installation is a responsibility of the Customer.



## Performances

### Acoustic configuration with compressor soundproofing (SC) - Excellence

Size			45.4	50.4	55.4	60.4	65.4	70.4	75.4	80.4	85.4	90.4
<b>Cooling</b>												
Cooling capacity	1	[kW]	110	118	133	142	156	169	183	197	209	226
Compressor power input	1	[kW]	30,3	34,6	42,2	46,3	45,7	49,3	58,0	53,3	59,3	68,0
Total power input	2	[kW]	33,9	38,2	45,8	50,0	49,6	54,2	63,5	58,7	64,8	73,4
Partial recovery heating capacity	3	[kW]	33,7	36,6	42,0	45,2	48,4	52,4	57,8	60,1	64,4	70,6
EER	1	-	3,25	3,10	2,91	2,84	3,14	3,12	2,89	3,35	3,23	3,08
Water flow-rate (User Side)	1	[l/s]	5,2	5,6	6,3	6,7	7,4	8,0	8,7	9,3	9,9	10,7
Internal exchanger pressure drop	1	[kPa]	18,1	20,6	18,2	20,4	18,9	22,0	25,5	29,0	32,5	37,4
Cooling capacity (EN14511:2022)	4	[kW]	110	118	133	142	156	169	183	196	209	226
Total power input (EN14511:2022)	4	[kW]	34,2	38,5	46,1	50,3	50,0	54,6	64,0	59,4	65,5	74,2
EER (EN14511:2022)	4	-	3,22	3,08	2,89	2,82	3,12	3,09	2,86	3,31	3,19	3,04
SEER	6	-	5,07	5,05	4,94	4,93	5,25	5,24	5,19	5,34	5,31	5,28
SEPR	7	-	6,33	6,31	6,18	6,16	6,57	6,55	6,49	6,67	6,64	6,61
Cooling capacity (AHRI 550/590)	5	[kW]	110	118	133	142	156	169	183	197	209	226
Total power input (AHRI 550/590)	5	[kW]	33,9	38,2	45,8	50,0	49,6	54,2	63,5	58,7	64,8	73,4
COPR	5	-	3,24	3,09	2,90	2,84	3,15	3,12	2,88	3,36	3,23	3,08
IPLV	5	-	4,67	4,64	4,57	4,54	4,80	4,79	4,70	4,87	4,90	4,86

### Acoustic configuration with compressor soundproofing (SC) - Premium

Size			45.4	50.4	55.4	60.4	65.4	70.4	75.4	80.4	85.4	90.4
<b>Cooling</b>												
Cooling capacity	1	[kW]	125	135	143	155	174	193	211	226	241	252
Compressor power input	1	[kW]	40,3	45,2	49,4	54,8	56,5	67,1	65,4	71,8	73,9	79,5
Total power input	2	[kW]	43,9	48,8	53,0	58,4	61,9	72,6	70,9	77,2	79,4	84,9
Partial recovery heating capacity	3	[kW]	39,7	43,2	46,2	50,4	55,3	62,4	66,3	71,5	75,6	79,6
EER	1	-	2,85	2,76	2,70	2,66	2,81	2,65	2,98	2,93	3,04	2,97
Water flow-rate (User Side)	1	[l/s]	6,0	6,4	6,8	7,4	8,3	9,2	10,0	10,8	11,5	12,0
Internal exchanger pressure drop	1	[kPa]	22,8	26,2	29,2	24,1	23,2	27,9	33,0	37,6	42,2	45,8
Cooling capacity (EN14511:2022)	4	[kW]	125	135	143	155	174	192	211	226	241	252
Total power input (EN14511:2022)	4	[kW]	44,2	49,2	53,5	58,8	62,4	73,2	71,6	78,1	80,3	86,0
EER (EN14511:2022)	4	-	2,83	2,74	2,67	2,64	2,79	2,63	2,94	2,90	3,00	2,93
SEER	6	-	4,76	4,71	4,70	4,77	4,91	4,90	5,06	5,03	5,06	5,05
SEPR	7	-	5,95	5,89	5,88	5,97	6,14	6,13	6,32	6,29	6,32	6,32
Cooling capacity (AHRI 550/590)	5	[kW]	125	135	143	155	174	193	211	226	241	252
Total power input (AHRI 550/590)	5	[kW]	43,9	48,8	53,0	58,4	61,9	72,6	70,9	77,2	79,4	84,9
COPR	5	-	2,85	2,77	2,70	2,65	2,81	2,66	2,98	2,93	3,04	2,97
IPLV	5	-	4,57	4,53	4,55	4,49	4,74	4,61	4,85	4,85	4,82	4,83

II The Product complies with the European ErP Directive (Energy Related Products), which includes the Commission Regulation (EU) 2016/2281, also known as Ecodesign LOT21.

Contains fluorinated greenhouse gases (GWP 675)

1. Data referring to the following conditions: Water temperature to the internal exchanger = 12/7 °C. Temperature of air entering the external exchanger = 35°C. Evaporator fouling factor =  $0.44 \times 10^{(-4)}$  m<sup>2</sup> K/W
2. The Total Power Input value does not take into account the part related to the pumps and required to overcome the pressure drops for the circulation of the solution inside the exchangers.
3. Recovery exchanger water = 40/45°C
4. Data compliant to Standard EN 14511:2022 referred to the following conditions: internal exchanger water temperature = 12/7 °C. Entering external exchanger air temperature = 35°C
5. Data calculated in accordance with AHRI 550/590 under the following conditions: Water temperature to the internal exchanger = 6.7 °C. Water flow-rate 0.043 l/s per kW. Temperature of air entering the external exchanger = 35°C. Evaporator fouling factor =  $0.18 \times 10^{(-4)}$  m<sup>2</sup> K/W
6. Data calculated in compliance with EN 14825:2018.
7. Data compliant according to EU regulation 2016/2281

# General technical data

## Performances

### Silenced acoustic configuration (LN) - Excellence

Size			45.4	50.4	55.4	60.4	65.4	70.4	75.4	80.4	85.4	90.4
<b>Cooling</b>												
Cooling capacity	1	[kW]	105	113	126	135	148	161	174	187	199	215
Compressor power input	1	[kW]	31,2	35,5	42,8	47,2	46,2	50,2	59,5	54,8	60,7	69,4
Total power input	2	[kW]	34,0	38,2	45,6	50,0	49,7	54,3	63,5	58,8	64,8	73,5
Partial recovery heating capacity	3	[kW]	32,7	35,6	40,5	43,7	46,6	50,7	56,0	58,0	62,3	68,3
EER	1	-	3,08	2,94	2,76	2,70	2,98	2,96	2,74	3,18	3,07	2,92
Water flow-rate (User Side)	1	[l/s]	5,0	5,3	6,0	6,4	7,0	7,6	8,3	8,9	9,4	10,2
Internal exchanger pressure drop	1	[kPa]	16,4	18,8	16,5	18,6	17,2	20,0	23,2	26,4	29,5	34,0
Cooling capacity (EN14511:2022)	4	[kW]	105	112	126	135	148	161	174	187	198	214
Total power input (EN14511:2022)	4	[kW]	34,2	38,4	45,8	50,2	50,0	54,6	64,0	59,4	65,5	74,2
EER (EN14511:2022)	4	-	3,06	2,92	2,75	2,68	2,96	2,94	2,72	3,14	3,03	2,89
SEER	6	-	5,01	5,01	4,85	4,84	5,16	5,16	5,13	5,30	5,28	5,24
SEPR	7	-	6,26	6,27	6,06	6,05	6,44	6,45	6,41	6,62	6,60	6,55
Cooling capacity (AHRI 550/590)	5	[kW]	105	113	126	135	148	161	174	187	199	215
Total power input (AHRI 550/590)	5	[kW]	34,0	38,2	45,6	50,0	49,7	54,3	63,5	58,8	64,8	73,5
COPR	5	-	3,09	2,96	2,76	2,70	2,98	2,97	2,74	3,18	3,07	2,93
IPLV	5	-	4,61	4,60	4,52	4,51	4,72	4,72	4,64	4,83	4,87	4,83

### Silenced acoustic configuration (LN) - Premium

Size			45.4	50.4	55.4	60.4	65.4	70.4	75.4	80.4	85.4	90.4
<b>Cooling</b>												
Cooling capacity	1	[kW]	119	128	136	154	166	183	201	215	229	240
Compressor power input	1	[kW]	41,2	46,1	50,3	59,8	57,9	68,6	66,9	73,2	75,4	80,9
Total power input	2	[kW]	43,9	48,9	53,1	62,5	62,0	72,7	70,9	77,3	79,5	85,0
Partial recovery heating capacity	3	[kW]	38,4	41,8	44,7	51,3	53,7	60,4	64,3	69,2	73,1	77,0
EER	1	-	2,71	2,62	2,56	2,47	2,67	2,52	2,83	2,78	2,88	2,82
Water flow-rate (User Side)	1	[l/s]	5,7	6,1	6,5	7,3	7,9	8,7	9,5	10,2	10,9	11,4
Internal exchanger pressure drop	1	[kPa]	20,8	23,8	26,6	23,8	21,1	25,4	30,0	34,2	38,4	41,7
Cooling capacity (EN14511:2022)	4	[kW]	119	128	136	154	165	183	200	215	229	239
Total power input (EN14511:2022)	4	[kW]	44,2	49,2	53,5	62,9	62,4	73,2	71,6	78,1	80,3	86,0
EER (EN14511:2022)	4	-	2,69	2,60	2,54	2,45	2,65	2,50	2,80	2,75	2,85	2,78
SEER	6	-	4,73	4,66	4,67	4,67	4,85	4,83	5,01	4,99	5,02	5,01
SEPR	7	-	5,91	5,82	5,83	5,84	6,06	6,04	6,26	6,23	6,28	6,27
Cooling capacity (AHRI 550/590)	5	[kW]	119	128	136	154	166	183	201	215	229	240
Total power input (AHRI 550/590)	5	[kW]	43,9	48,9	53,1	62,5	62,0	72,7	70,9	77,3	79,5	85,0
COPR	5	-	2,71	2,62	2,56	2,46	2,68	2,52	2,83	2,78	2,88	2,82
IPLV	5	-	4,54	4,47	4,51	4,43	4,68	4,54	4,80	4,81	4,79	4,79

II The Product complies with the European ErP Directive (Energy Related Products), which includes the Commission Regulation (EU) 2016/2281, also known as Ecodesign LOT21.

Contains fluorinated greenhouse gases (GWP 675)

1. Data referring to the following conditions: Water temperature to the internal exchanger = 12/7 °C. Temperature of air entering the external exchanger = 35°C. Evaporator fouling factor =  $0.44 \times 10^{(-4)}$  m<sup>2</sup> K/W
2. The Total Power Input value does not take into account the part related to the pumps and required to overcome the pressure drops for the circulation of the solution inside the exchangers.
3. Recovery exchanger water = 40/45°C
4. Data compliant to Standard EN 14511:2022 referred to the following conditions: internal exchanger water temperature = 12/7 °C. Entering external exchanger air temperature = 35°C
5. Data calculated in accordance with AHRI 550/590 under the following conditions: Water temperature to the internal exchanger = 6.7 °C. Water flow-rate 0.043 l/s per kW. Temperature of air entering the external exchanger = 35°C. Evaporator fouling factor =  $0.18 \times 10^{(-4)}$  m<sup>2</sup> K/W
6. Data calculated in compliance with EN 14825:2018.
7. Data compliant according to EU regulation 2016/2281

## Performances

### Super-silenced acoustic configuration (EN) - Excellence

Size			45.4	50.4	55.4	60.4	65.4	70.4	75.4	80.4	85.4	90.4
<b>Cooling</b>												
Cooling capacity	1	[kW]	98,1	105	118	126	139	151	163	175	186	201
Compressor power input	1	[kW]	30,9	35,1	42,3	46,6	46,0	49,7	58,8	54,2	60,1	68,5
Total power input	2	[kW]	33,3	37,5	44,7	49,0	48,7	53,2	62,3	57,7	63,6	72,1
Partial recovery heating capacity	3	[kW]	31,0	33,6	38,5	41,4	44,4	48,2	53,2	55,0	59,1	64,7
EER	1	-	2,94	2,81	2,64	2,58	2,85	2,83	2,62	3,03	2,93	2,79
Water flow-rate (User Side)	1	[l/s]	4,7	5,0	5,6	6,0	6,6	7,2	7,8	8,3	8,8	9,6
Internal exchanger pressure drop	1	[kPa]	14,6	16,6	14,6	16,5	15,3	17,7	20,5	23,4	26,2	30,2
Cooling capacity (EN14511:2022)	4	[kW]	98,0	105	118	126	139	150	163	175	186	201
Total power input (EN14511:2022)	4	[kW]	33,5	37,7	44,9	49,2	49,0	53,5	62,7	58,2	64,1	72,7
EER (EN14511:2022)	4	-	2,93	2,79	2,63	2,56	2,83	2,81	2,60	3,00	2,90	2,76
SEER	6	-	4,96	4,96	4,80	4,81	5,10	5,13	5,09	5,24	5,23	5,19
SEPR	7	-	6,20	6,20	6,00	6,01	6,38	6,41	6,36	6,55	6,54	6,49
Cooling capacity (AHRI 550/590)	5	[kW]	98,1	105	118	126	139	151	163	175	186	201
Total power input (AHRI 550/590)	5	[kW]	33,3	37,5	44,7	49,0	48,7	53,2	62,3	57,7	63,6	72,1
COPR	5	-	2,95	2,80	2,64	2,57	2,85	2,84	2,62	3,03	2,92	2,79
IPLV	5	-	4,57	4,56	4,48	4,47	4,67	4,68	4,60	4,78	4,82	4,78

### Super-silenced acoustic configuration (EN) - Premium

Size			45.4	50.4	55.4	60.4	65.4	70.4	75.4	80.4	85.4	90.4
<b>Cooling</b>												
Cooling capacity	1	[kW]	111	120	127	145	155	171	188	202	215	224
Compressor power input	1	[kW]	40,7	45,6	49,7	58,9	57,3	67,7	66,0	72,3	74,4	79,3
Total power input	2	[kW]	43,1	47,9	52,1	61,3	60,8	71,3	69,6	75,8	77,9	83,4
Partial recovery heating capacity	3	[kW]	36,4	39,7	42,4	48,9	51,0	57,3	61,0	65,8	69,5	72,8
EER	1	-	2,59	2,50	2,45	2,36	2,55	2,40	2,70	2,66	2,75	2,69
Water flow-rate (User Side)	1	[l/s]	5,3	5,7	6,1	6,9	7,4	8,1	8,9	9,6	10,2	10,7
Internal exchanger pressure drop	1	[kPa]	18,4	21,1	23,6	21,1	18,7	22,5	26,6	30,3	34,0	36,9
Cooling capacity (EN14511:2022)	4	[kW]	111	120	127	144	155	171	188	201	214	224
Total power input (EN14511:2022)	4	[kW]	43,3	48,2	52,4	61,7	61,1	71,7	70,1	76,5	78,7	84,2
EER (EN14511:2022)	4	-	2,57	2,49	2,43	2,34	2,53	2,39	2,67	2,63	2,72	2,66
SEER	6	-	4,69	4,62	4,62	4,64	4,81	4,80	4,97	4,94	4,98	4,98
SEPR	7	-	5,86	5,77	5,77	5,80	6,01	6,00	6,21	6,18	6,23	6,22
Cooling capacity (AHRI 550/590)	5	[kW]	111	120	127	145	155	171	188	202	215	224
Total power input (AHRI 550/590)	5	[kW]	43,1	47,9	52,1	61,3	60,8	71,3	69,6	75,8	77,9	83,4
COPR	5	-	2,58	2,51	2,44	2,37	2,55	2,40	2,70	2,66	2,76	2,69
IPLV	5	-	4,50	4,43	4,46	4,40	4,65	4,51	4,77	4,76	4,75	4,76

II The Product complies with the European ErP Directive (Energy Related Products), which includes the Commission Regulation (EU) 2016/2281, also known as Ecodesign LOT21. Contains fluorinated greenhouse gases (GWP 675)

1. Data referring to the following conditions: Water temperature to the internal exchanger = 12/7 °C. Temperature of air entering the external exchanger = 35°C. Evaporator fouling factor =  $0,44 \times 10^{(-4)}$  m<sup>2</sup> K/W
2. The Total Power Input value does not take into account the part related to the pumps and required to overcome the pressure drops for the circulation of the solution inside the exchangers.
3. Recovery exchanger water = 40/45°C
4. Data compliant to Standard EN 14511:2022 referred to the following conditions: internal exchanger water temperature = 12/7 °C. Entering external exchanger air temperature = 35°C
5. Data calculated in accordance with AHRI 550/590 under the following conditions: Water temperature to the internal exchanger = 6.7 °C. Water flow-rate 0.043 l/s per kW. Temperature of air entering the external exchanger = 35°C. Evaporator fouling factor =  $0,18 \times 10^{(-4)}$  m<sup>2</sup> K/W
6. Data calculated in compliance with EN 14825:2018.
7. Data compliant according to EU regulation 2016/2281

# General technical data

## Construction - Excellence

Size		45.4	50.4	55.4	60.4	65.4	70.4	75.4	80.4	85.4	90.4
<b>Compressor</b>											
Type of compressors		ROTARY INVERTER			ROTARY INVERTER / SCROLL INVERTER			SCROLL INVERTER			
Refrigerant		R-32									
N° compressors	[Nr]	4	4	4	4	4	4	4	4	4	4
Rated power (C1)	[HP]	25	25	25	25	35	35	35	45	45	45
Rated power (C2)	[HP]	25	25	35	35	35	35	35	45	45	45
Std Capacity control steps		STEPLESS									
Oil charge (C1)	[l]	4,6	4,6	4,6	4,6	6,2	6,2	6,2	7,2	7,2	7,2
Oil charge (C2)	[l]	4,6	4,6	6,2	6,2	6,2	6,2	6,2	7,2	7,2	7,2
Refrigerant charge (C1)	[Kg]	6,5	6,5	6,5	6,5	10,5	10,5	10,5	10,5	10,5	10,5
Refrigerant charge (C2)	[Kg]	6,5	6,5	6,5	6,5	10,5	10,5	10,5	10,5	10,5	10,5
Refrigeration circuits	[Nr]	2	2	2	2	2	2	2	2	2	2
Internal Exchanger											
Type of internal exchanger	1	PHE									
N. of internal exchanger	[Nr]	1	1	1	1	1	1	1	1	1	1
Water content	[l]	10,5	10,5	13,2	13,2	15,4	15,4	15,4	15,4	15,4	15,4
Minimum system water content	[l]										
External exchanger											
Type of external exchanger	2	CCM									
Number of coils	[Nr]	2	2	2	2	2	2	2	2	2	2
External Section Fans											
Type of fans	3	AX									
Number of fans	[Nr]	2	2	2	2	3	3	3	3	3	3
Type of motor		BRUSHLESS DC									
Standard airflow (SC)	[l/s]	16667	16667	16667	16667	25000	25000	25000	25000	25000	25000
Standard airflow (LN)	[l/s]	15556	15556	15556	15556	23333	23333	23333	23333	23333	23333
Standard airflow (EN)	[l/s]	14444	14444	14444	14444	21667	21667	21667	21667	21667	21667
Connections											
Water fittings		2"1/2	2"1/2	2"1/2	2"1/2	3"	3"	3"	3"	3"	3"
Power supply											
Standard power supply		400/3/50									
Electrical data											
F.L.A. - Total	[A]	110	112	145	146	168	170	175	200	205	211
F.L.L. - Total	[kW]	69,9	71,0	74,8	75,6	75,3	76,4	78,7	99,5	102	105
M.I.C. - Value	4 [A]	110	112	145	146	168	170	175	200	205	211

1. PHE = Plate exchanger
2. CCM = Aluminum microchannel condensing coils
3. AX = Axial fan
4. M.I.C.=Maximum unit starting current. The M.I.C. value is obtained adding the max. compressor starting current of the highest size to the power input at max. admissible conditions (F.L.A.) of the remaining electric components.

Voltage unbalance between phases: max 2 %

Voltage variation: max +/- 10%

Electrical data refer to standard units; according to the installed accessories, the data can suffer some variations.

## Construction - Premium

Size		45.4	50.4	55.4	60.4	65.4	70.4	75.4	80.4	85.4	90.4
<b>Compressor</b>											
Type of compressors		ROTARY INVERTER				ROTARY INVERTER/ SCROLL INVERTER	SCROLL INVERTER				
Refrigerant		R-32									
N° compressors	[Nr]	4	4	4	4	4	4	4	4	4	4
Rated power (C1)	[HP]	25	25	25	25	35	35	45	45	45	45
Rated power (C2)	[HP]	25	25	25	35	35	35	45	45	45	45
Std Capacity control steps		STEPLESS									
Oil charge (C1)	[l]	4,6	4,6	4,6	4,6	6,2	6,2	7,2	7,2	7,2	7,2
Oil charge (C2)	[l]	4,6	4,6	4,6	6,2	6,2	6,2	7,2	7,2	7,2	7,2
Refrigerant charge (C1)	[Kg]	6,5	6,5	6,5	6,5	10,5	10,5	10,5	10,5	10,5	10,5
Refrigerant charge (C2)	[Kg]	6,5	6,5	6,5	6,5	10,5	10,5	10,5	10,5	10,5	10,5
Refrigeration circuits	[Nr]	2	2	2	2	2	2	2	2	2	2
<b>Internal exchanger</b>											
Type of internal exchanger	1	PHE									
N. of internal exchanger	[Nr]	1	1	1	1	1	1	1	1	1	1
Water content	[l]	10,5	10,5	10,5	13,2	15,4	15,4	15,4	15,4	15,4	15,4
Minimum system water content	[l]										
<b>External exchanger</b>											
Type of external exchanger	2	CCM									
Number of coils	[Nr]	2	2	2	2	2	2	2	2	2	2
<b>External Section Fans</b>											
Type of fans	3	AX									
Number of fans	[Nr]	2	2	2	2	3	3	3	3	3	3
Type of motor		BRUSHLESS DC									
Standard airflow (SC)	[l/s]	16667	16667	16667	16667	25000	25000	25000	25000	25000	25000
Standard airflow (LN)	[l/s]	15556	15556	15556	15556	23333	23333	23333	23333	23333	23333
Standard airflow (EN)	[l/s]	14444	14444	14444	14444	21667	21667	21667	21667	21667	21667
<b>Connections</b>											
Water fittings		2"1/2	2"1/2	2"1/2	2"1/2	3"	3"	3"	3"	3"	3"
<b>Power supply</b>											
Standard power supply		400/3/50									
<b>Electrical data</b>											
F.L.A. - Total	[A]	113	115	117	147	173	178	205	211	216	221
F.L.I. - Total	[kW]	72,1	73,2	74,3	76,4	77,6	79,9	102	105	107	110
M.I.C. - Value	4 [A]	113	115	117	147	173	178	205	211	216	221

1. PHE = Plate exchanger
2. CCM = Aluminum microchannel condensing coils
3. AX = Axial fan
4. M.I.C.=Maximum unit starting current. The M.I.C. value is obtained adding the max. compressor starting current of the highest size to the power input at max. admissible conditions (F.L.A.) of the remaining electric components.

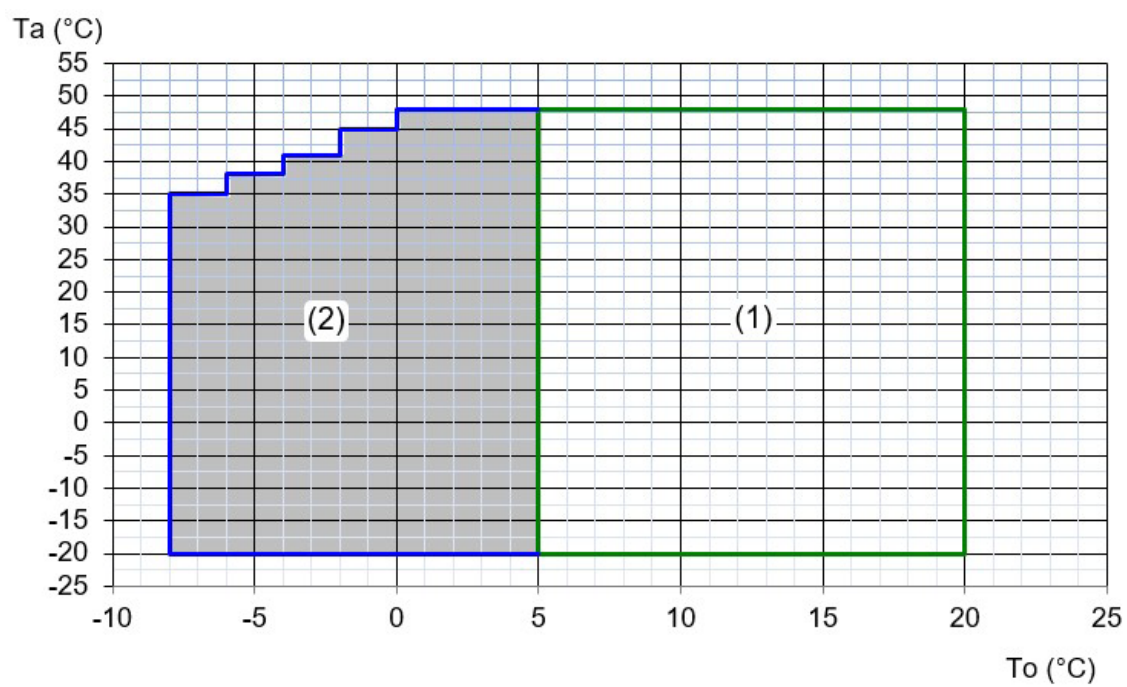
Voltage unbalance between phases: max 2 %

Voltage variation: max +/- 10%

Electrical data refer to standard units; according to the installed accessories, the data can suffer some variations.

# General technical data

## Operating range - Cooling



1. Standard unit operating range
2. Operating range where the use of glycol is mandatory in relation to the temperature of the outlet water from the user side exchanger

## Sound levels - Excellence

### Acoustic configuration with compressor soundproofing (SC)

SIZE	Sound Power Level								Sound Pressure Level dB(A)	Sound Power Level dB(A)
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000		
<b>45.4</b>	67	70	76	77	80	80	69	65	66	84
<b>50.4</b>	67	70	76	77	80	80	69	65	66	84
<b>55.4</b>	67	70	76	77	80	80	69	65	66	84
<b>60.4</b>	67	70	76	77	80	80	69	65	66	84
<b>65.4</b>	79	75	75	76	80	81	71	67	66	85
<b>70.4</b>	79	75	75	76	80	81	71	67	66	85
<b>75.4</b>	79	75	75	76	80	81	71	67	66	85
<b>80.4</b>	82	78	78	79	83	84	74	70	69	88
<b>85.4</b>	83	79	79	80	84	85	75	71	70	89
<b>90.4</b>	83	79	79	80	84	85	75	71	70	89

### Silenced acoustic configuration (LN)

SIZE	Sound Power Level								Sound Pressure Level dB(A)	Sound Power Level dB(A)
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000		
<b>45.4</b>	64	67	73	74	77	77	66	62	63	81
<b>50.4</b>	64	67	73	74	77	77	66	62	63	81
<b>55.4</b>	64	67	73	74	77	77	66	62	63	81
<b>60.4</b>	64	67	73	74	77	77	66	62	63	81
<b>65.4</b>	76	72	72	73	77	78	68	64	63	82
<b>70.4</b>	76	72	72	73	77	78	68	64	63	82
<b>75.4</b>	76	72	72	73	77	78	68	64	63	82
<b>80.4</b>	78	74	74	75	79	80	70	66	65	84
<b>85.4</b>	79	75	75	76	80	81	71	67	66	85
<b>90.4</b>	79	75	75	76	80	81	71	67	66	85

### Super-silenced acoustic configuration (EN)

SIZE	Sound Power Level								Sound Pressure Level dB(A)	Sound Power Level dB(A)
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000		
<b>45.4</b>	61	64	70	71	74	74	63	59	60	78
<b>50.4</b>	61	64	70	71	74	74	63	59	60	78
<b>55.4</b>	61	64	70	71	74	74	63	59	60	78
<b>60.4</b>	61	64	70	71	74	74	63	59	60	78
<b>65.4</b>	73	69	69	70	74	75	65	61	60	79
<b>70.4</b>	73	69	69	70	74	75	65	61	60	79
<b>75.4</b>	73	69	69	70	74	75	65	61	60	79
<b>80.4</b>	74	70	70	71	75	76	66	62	61	80
<b>85.4</b>	75	71	71	72	76	77	67	63	62	81
<b>90.4</b>	75	71	71	72	76	77	67	63	62	81

Sound levels refer to full load units, in test nominal conditions. The sound pressure level refers to 1 m. from the standard unit outer surface operating in open field. Measures according to UNI EN ISO 9614-2 regulations, with respect to the EUROVENT 8/1 certification, which provides for a tolerance of 3 dB(A).

Data referred to the following conditions:  
 - cold side exchanger water temperature = 12/7 °C  
 Entering external exchanger air temperature = 35°C



# General technical data

## Sound levels - Premium

### Acoustic configuration with compressor soundproofing (SC)

SIZE	Sound Power Level								Sound Pressure Level dB(A)	Sound Power Level dB(A)
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000		
<b>45.4</b>	69	72	78	79	82	82	71	67	68	86
<b>50.4</b>	69	72	78	79	82	82	71	67	68	86
<b>55.4</b>	69	72	78	79	82	82	71	67	68	86
<b>60.4</b>	70	73	79	80	83	83	72	68	69	87
<b>65.4</b>	81	77	77	78	82	83	73	69	68	87
<b>70.4</b>	84	80	80	81	85	86	76	72	71	90
<b>75.4</b>	85	81	81	82	86	87	77	73	72	91
<b>80.4</b>	85	81	81	82	86	87	77	73	72	91
<b>85.4</b>	85	81	81	82	86	87	77	73	72	91
<b>90.4</b>	85	81	81	82	86	87	77	73	72	91

### Silenced acoustic configuration (LN)

SIZE	Sound Power Level								Sound Pressure Level dB(A)	Sound Power Level dB(A)
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000		
<b>45.4</b>	66	69	75	76	79	79	68	64	65	83
<b>50.4</b>	66	69	75	76	79	79	68	64	65	83
<b>55.4</b>	66	69	75	76	79	79	68	64	65	83
<b>60.4</b>	67	70	76	77	80	80	69	65	66	84
<b>65.4</b>	78	74	74	75	79	80	70	66	65	84
<b>70.4</b>	81	77	77	78	82	83	73	69	68	87
<b>75.4</b>	82	78	78	79	83	84	74	70	69	88
<b>80.4</b>	82	78	78	79	83	84	74	70	69	88
<b>85.4</b>	82	78	78	79	83	84	74	70	69	88
<b>90.4</b>	82	78	78	79	83	84	74	70	69	88

### Super-silenced acoustic configuration (EN)

SIZE	Sound Power Level								Sound Pressure Level dB(A)	Sound Power Level dB(A)
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000		
<b>45.4</b>	63	66	72	73	76	76	65	61	62	80
<b>50.4</b>	63	66	72	73	76	76	65	61	62	80
<b>55.4</b>	63	66	72	73	76	76	65	61	62	80
<b>60.4</b>	64	67	73	74	77	77	66	62	63	81
<b>65.4</b>	75	71	71	72	76	77	67	63	62	81
<b>70.4</b>	78	74	74	75	79	80	70	66	65	84
<b>75.4</b>	79	75	75	76	80	81	71	67	66	85
<b>80.4</b>	79	75	75	76	80	81	71	67	66	85
<b>85.4</b>	79	75	75	76	80	81	71	67	66	85
<b>90.4</b>	79	75	75	76	80	81	71	67	66	85

Sound levels refer to full load units, in test nominal conditions. The sound pressure level refers to 1 m. from the standard unit outer surface operating in open field. Measures according to UNI EN ISO 9614-2 regulations, with respect to the EUROVENT 8/1 certification, which provides for a tolerance of 3 dB(A).

Data referred to the following conditions:

- cold side exchanger water temperature = 12/7 °C

Entering external exchanger air temperature = 35°C

## Correction factors for ethylene glycol use

% ETHYLENE GLYCOL BY WEIGHT		5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
Freezing temperature	°C	-2	-3,9	-6,5	-8,9	-11,8	-15,6	-19	-23,4	-27,8	-32,7
Safety temperature	°C	3	1	-1	-4	-6	-10	-14	-19	-23,8	-29,4
Cooling Capacity Factor	Nr	0,997	0,994	0,990	0,986	0,981	0,976	0,970	0,964	0,957	0,950
Compressor power input Factor	Nr	0,999	0,999	0,998	0,997	0,996	0,996	0,995	0,994	0,993	0,993
Internal exchanger pressure drop factor	Nr	1,016	1,035	1,056	1,080	1,106	1,135	1,166	1,200	1,236	1,275

## Correction factors for propylene glycol use

% PROPYLENE GLYCOL BY WEIGHT		5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
Freezing temperature	°C	-2	-3,9	-6,5	-8,9	-11,8	-15,6	-19	-23,4	-27,8	-32,7
Safety temperature	°C	3	1	-1	-4	-6	-10	-14	-19	-23,8	-29,4
Cooling Capacity Factor	Nr	0,995	0,99	0,983	0,976	0,968	0,96	0,95	0,939	0,928	0,916
Compressor power input Factor	Nr	0,999	0,997	0,995	0,993	0,991	0,988	0,986	0,983	0,98	0,977
Internal exchanger pressure drop factor	Nr	1,027	1,058	1,093	1,133	1,176	1,224	1,276	1,332	1,393	1,457

## Fouling Correction Factors

### INTERNAL EXCHANGER (EVAPORATOR)

M <sup>2</sup> C/W	F1	FK1
0,44x10 (-4)	1	1
0,88x10 (-4)	0,97	0,99
1,76x10 (-4)	0,94	0,98

F1 = Cooling capacity correction factors

FK1 = Compressor power input correction factor

## Exchanger operating range

### INTERNAL EXCHANGER

		DPR	DPW
Plate exchanger	PED (CE)	4500	1000

DPr = Maximum operating pressure on refrigerant side in kPa

DPw = Maximum operating pressure on water side in kPa

## Overload and control device calibrations

		OPEN	CLOSE	VALUE
<b>Refrigerant side</b>				
High pressure safety pressure switch	kPa	4200	3200	-
Low pressure safety pressure switch	kPa	140	300	-
Gas-liquid separator safety valve	kPa	-	-	3000
Safety thermostat against compressor drain overheating	°C	75	115	-
<b>Water side</b>				
Antifreeze protection	°C	8	4	-
High pressure safety valve	kPa	-	-	1000

# Performance

## Cooling - Excellence - SC

SIZE	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		45		48	
		kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot
45.4	5	109	28,0	104	31,0	98,5	34,2	84,2	33,8	62,6	30,6	50,5	26,6
	6	114	28,0	108	31,1	104	34,1	87,8	34,0	65,1	30,9	52,4	26,8
	7	118	28,0	113	31,2	110	34,0	91,4	34,2	67,6	31,1	54,2	26,9
	10	126	28,0	120	31,3	113	34,7	96,5	34,4	71,8	31,4	57,8	27,2
	15	145	28,0	139	31,4	132	35,0	113	34,9	83,9	32,1	67,3	27,7
	18	159	27,8	152	31,4	145	35,1	124	35,1	91,4	32,4	73,2	27,9
	20	168	27,7	161	31,4	153	35,2	131	35,2	96,4	32,6	77,2	28,0
50.4	5	118	30,5	112	33,9	106	37,4	89,6	36,5	67,1	32,3	55,4	29,3
	6	122	30,5	116	34,0	112	37,8	93,5	36,7	69,8	32,5	57,5	29,5
	7	127	30,6	121	34,1	118	38,2	97,3	37,0	72,6	32,7	59,5	29,7
	10	136	30,6	129	34,2	122	38,0	103	37,2	77,0	33,0	63,4	30,0
	15	156	30,6	149	34,5	142	38,5	121	37,9	90,2	33,8	74,0	30,7
	18	171	30,5	163	34,5	155	38,7	132	38,1	98,4	34,1	80,6	31,0
	20	181	30,4	173	34,5	164	38,7	140	38,2	104	34,3	85,0	31,1
55.4	5	132	35,2	126	39,3	121	45,1	102	42,3	75,8	37,8	63,5	35,8
	6	137	35,4	131	39,5	127	45,5	106	42,5	78,5	38,0	65,6	36,0
	7	142	35,5	136	39,7	133	45,8	110	42,7	81,2	38,2	67,8	36,2
	10	150	35,7	143	40,0	137	46,0	116	43,1	86,1	38,6	72,3	36,6
	15	172	36,2	165	40,6	158	45,9	135	43,9	100	39,5	84,2	37,4
	18	187	36,4	180	40,9	172	46,2	147	44,3	109	39,8	91,9	37,7
	20	198	36,5	190	41,0	183	46,4	156	44,4	116	40,0	97,3	37,8
60.4	5	141	38,7	135	43,2	128	48,7	109	45,4	79	39,0	65,9	37,3
	6	146	38,8	140	43,5	135	49,4	113	45,7	82	39,2	68,2	37,5
	7	151	39,0	145	43,7	142	50,0	117	46,0	85	39,5	70,4	37,7
	10	160	39,3	153	44,1	146	50,2	124	46,3	90	39,8	75,0	38,2
	15	183	40,0	176	44,9	168	50,5	144	47,3	105	40,7	87,4	39,0
	18	199	40,3	192	45,3	183	51,0	157	47,7	114	41,0	95,5	39,4
	20	211	40,5	203	45,5	194	51,2	166	47,8	121	41,2	101	39,6
65.4	5	154	40,0	148	44,1	142	48,8	122	48,5	90,6	43,7	74,4	41,9
	6	160	40,2	154	44,3	149	49,2	126	48,7	93,6	43,9	75,4	42,0
	7	165	40,4	159	44,5	156	49,6	130	48,9	96,6	44,1	76,4	42,1
	10	173	40,7	166	44,8	160	49,6	137	49,2	102	44,4	84,6	42,6
	15	198	41,4	191	45,6	184	50,4	158	50,0	119	45,1	98,9	43,3
	18	215	41,8	208	45,9	201	50,6	173	50,2	131	45,3	109	43,5
	20	227	41,9	220	46,0	213	50,7	183	50,2	139	45,3	115	43,6
70.4	5	165	44,2	159	48,7	153	53,8	132	53,5	97,2	47,1	80,2	46,3
	6	171	44,4	165	48,9	161	54,0	137	53,8	100	47,3	82,9	46,5
	7	177	44,7	170	49,2	169	54,2	142	54,0	104	47,5	85,5	46,7
	10	186	45,0	179	49,5	172	54,6	148	54,3	110	47,9	91,2	47,1
	15	212	45,8	205	50,4	198	55,5	172	55,1	128	48,6	107	48,0
	18	231	46,3	223	50,8	215	55,9	188	55,3	140	48,8	117	48,3
	20	244	46,5	236	50,9	228	55,9	199	55,3	149	48,7	124	48,4
75.4	5	185	52,7	178	58,3	170	62,5	144	59,0	107	52,5	87,6	48,4
	6	191	53,0	184	58,6	177	63,0	150	59,2	111	52,7	90,6	48,6
	7	198	53,3	190	58,9	183	63,5	155	59,5	115	52,9	93,5	48,8
	10	208	53,8	200	59,4	192	64,3	162	59,8	121	53,3	99,5	49,1
	15	237	55,0	229	60,6	220	66,8	188	60,6	141	54,1	116	49,9
	18	258	55,8	249	61,3	240	67,4	205	60,9	154	54,4	128	50,1
	20	272	56,2	263	61,7	254	67,6	217	60,9	164	54,3	136	50,1
80.4	5	194	48,5	187	53,0	180	58,0	157	62,3	118	59,8	93,6	50,9
	6	201	48,7	194	53,2	188	58,4	162	62,8	121	60,2	96,4	51,2
	7	208	48,9	200	53,5	197	58,8	168	63,2	125	60,6	99,2	51,5
	10	219	49,2	211	53,8	202	59,1	175	63,8	132	61,5	105	52,1
	15	248	49,9	239	54,9	231	60,4	200	66,0	149	64,1	119	53,9
	18	268	50,4	259	55,6	249	61,4	216	67,6	160	66,0	128	55,2
	20	282	50,7	272	56,1	262	62,1	227	68,7	168	67,4	134	56,2
85.4	5	209	54,3	201	59,3	193	64,8	166	68,4	127	63,0	101	55,6
	6	216	54,6	208	59,6	201	64,8	172	69,0	131	63,5	105	55,9
	7	223	54,9	215	59,9	209	64,8	178	69,5	135	64,0	108	56,3
	10	236	55,3	227	60,5	217	66,2	186	70,2	142	64,8	114	57,0
	15	267	56,4	257	61,9	248	68,0	213	72,9	161	67,6	129	59,1
	18	288	57,2	278	62,9	268	69,3	229	74,8	173	69,5	139	60,7
	20	303	57,8	293	63,7	282	70,2	241	76,2	181	70,9	145	61,9
90.4	5	225	61,7	217	67,2	208	73,4	181	74,1	131	66,3	111	62,1
	6	233	62,1	224	67,7	217	73,4	187	74,7	136	66,9	115	62,5
	7	241	62,5	232	68,2	226	73,4	194	75,2	140	67,4	118	62,9
	10	250	63,0	245	68,9	235	75,3	203	76,1	147	68,3	125	63,8
	15	288	64,8	278	70,9	267	77,6	232	78,8	167	71,3	142	66,5
	18	312	66,0	301	72,4	289	79,3	250	80,8	180	73,5	152	68,5
	20	328	66,9	316	73,4	304	80,6	263	82,3	188	75,0	159	69,9

kWf = cooling capacity in kW  
 kWe\_tot = Total power input in kW  
 To (°C) = Internal exchanger outlet water temperature  
 Performances in function of the inlet/outlet water temperature differential = 5°C

\*Always check the actual temperature differential in the configurator as this is related to the minimum or maximum flow rate limits of the exchanger

## Cooling - Excellence - LN

SIZE	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		45		48	
		kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot
45.4	5	105	26,6	100	29,6	94,7	33,4	80,3	32,3	58,9	27,7	48,0	24,4
	6	109	26,7	104	29,7	99,7	33,7	83,7	32,5	61,2	27,9	49,8	24,6
	7	114	26,7	108	29,8	105	34,0	87,1	32,7	63,5	28,1	51,5	24,7
	10	121	26,8	115	29,9	109	33,6	91,8	33,0	67,5	28,4	55,0	25,0
	15	140	26,8	133	30,1	127	33,5	108	33,6	78,8	29,0	63,9	25,4
	18	153	26,7	146	30,1	139	33,7	118	33,9	85,9	29,2	69,5	25,6
20	162	26,6	155	30,1	147	33,8	125	34,0	90,6	29,4	73,2	25,7	
50.4	5	112	28,7	106	31,9	100	37,3	86,7	34,4	63,9	30,5	51,8	26,4
	6	116	28,7	111	32,0	106	37,8	90,5	34,6	66,4	30,7	53,7	26,6
	7	121	28,8	115	32,1	113	38,2	94,2	34,8	68,9	30,9	55,6	26,7
	10	128	28,9	122	32,3	116	38,1	100	35,0	73,2	31,3	59,2	27,0
	15	148	28,9	141	32,6	134	38,2	117	35,6	85,5	32,0	69,0	27,6
	18	162	28,9	155	32,7	147	38,4	128	35,9	93,2	32,4	75,1	27,8
20	172	28,9	164	32,7	156	38,5	135	36,0	98,3	32,6	79,1	27,9	
55.4	5	124	32,4	118	37,7	113	44,8	98,6	40,1	70,6	34,7	58,3	31,8
	6	129	32,6	123	37,9	119	45,2	102	40,3	73,0	34,9	60,2	31,9
	7	133	32,7	127	38,1	126	45,6	106	40,6	75,5	35,1	62,1	32,1
	10	140	32,9	134	38,3	128	45,7	112	40,9	80,2	35,4	66,3	32,4
	15	161	33,4	155	39,0	148	45,2	130	41,7	93,3	36,2	77,2	33,0
	18	175	33,6	168	39,3	161	45,3	142	42,1	102	36,5	84,3	33,3
20	185	33,7	178	39,4	171	45,4	150	42,2	108	36,7	89,2	33,3	
60.4	5	133	35,9	127	41,7	121	48,8	104	42,3	77,3	37,9	63,5	34,9
	6	138	36,1	132	42,0	128	49,4	108	42,6	80,0	38,1	65,6	35,1
	7	143	36,2	136	42,2	135	50,0	112	42,8	82,8	38,3	67,8	35,3
	10	150	36,5	144	42,6	137	50,1	118	43,2	87,8	38,7	72,3	35,7
	15	172	37,2	165	43,4	158	50,3	137	44,0	102	39,6	84,2	36,5
	18	188	37,6	180	43,9	172	50,8	149	44,4	112	40,0	91,9	36,9
20	198	37,7	190	44,1	182	51,0	158	44,6	118	40,2	97,3	37,0	
65.4	5	146	36,9	140	40,6	134	48,6	115	45,6	86	41,9	70,5	39,2
	6	151	37,0	145	40,8	141	49,1	119	45,8	89	42,1	72,7	39,4
	7	156	37,2	150	41,0	148	49,7	123	46,0	92	42,3	74,9	39,5
	10	163	37,4	157	41,3	150	49,5	130	46,3	97	42,7	80,1	39,9
	15	187	38,1	180	41,9	174	49,6	150	47,0	113	43,4	93,6	40,5
	18	203	38,3	196	42,2	189	49,8	164	47,2	124	43,7	103	40,6
20	215	38,4	207	42,2	201	49,9	174	47,2	132	43,7	109	40,6	
70.4	5	158	41,5	152	46,3	146	53,2	124	49,0	93	45,0	77,7	43,2
	6	164	41,7	158	46,5	154	53,7	129	49,2	95,6	45,2	79,6	43,4
	7	170	41,9	163	46,7	161	54,3	133	49,5	98,7	45,4	81,4	43,5
	10	178	42,3	171	47,0	164	54,0	140	49,8	105	45,7	86,9	43,9
	15	204	43,0	197	47,8	189	53,9	162	50,5	122	46,5	102	44,7
	18	221	43,4	214	48,2	207	54,2	177	50,7	133	46,7	111	44,9
20	234	43,6	226	48,3	219	54,3	187	50,6	142	46,7	119	44,9	
75.4	5	174	48,2	167	53,3	160	62,0	136	54,3	102	47,7	83,0	45,6
	6	180	48,5	173	53,6	167	62,8	141	54,5	105	47,9	85,7	45,9
	7	186	48,8	179	53,9	174	63,6	146	54,8	109	48,1	88,5	46,1
	10	196	49,2	188	54,4	180	63,1	153	55,1	115	48,4	94,3	46,5
	15	223	50,4	215	55,5	207	63,1	177	55,9	134	49,1	110	47,2
	18	242	51,0	234	56,1	226	63,7	194	56,1	146	49,3	121	47,5
20	256	51,4	247	56,4	239	63,9	205	56,1	156	49,2	129	47,5	
80.4	5	184	44,7	177	49,5	170	57,2	154	59,5	118	58,4	94	49,6
	6	190	44,9	183	49,8	178	58,0	159	59,9	121	58,8	96,4	49,8
	7	197	45,1	189	50,0	187	58,8	165	60,3	125	59,3	99,2	50,1
	10	206	45,4	199	50,3	191	58,2	172	60,9	132	60,1	105	50,7
	15	234	46,1	226	51,4	218	58,0	197	63,0	149	62,8	119	52,5
	18	253	46,5	244	52,1	235	58,4	212	64,5	160	64,6	128	53,8
20	265	46,8	256	52,6	247	59,1	223	65,6	168	66,0	134	54,8	
85.4	5	198	50,6	191	55,9	183	62,8	159	62,5	118	58,4	98,9	52,6
	6	205	50,8	198	56,2	191	63,8	165	62,9	121	58,8	102	53,0
	7	212	51,1	204	56,6	199	64,8	170	63,4	125	59,3	105	53,3
	10	223	51,5	215	57,1	206	64,9	178	64,0	132	60,1	111	54,0
	15	253	52,6	244	58,5	235	66,5	203	66,3	149	62,8	126	56,0
	18	273	53,4	264	59,6	254	67,8	219	68,0	160	64,6	135	57,5
20	287	54,0	277	60,4	267	68,8	230	69,2	168	66,0	141	58,6	
90.4	5	212	56,7	204	62,6	196	71,9	169	68,6	127	61,7	104	56
	6	220	57,1	211	63,0	205	72,7	175	69,2	131	62,1	107	56,2
	7	227	57,5	219	63,5	215	73,5	181	69,7	135	62,6	110	56,5
	10	239	58,1	230	64,2	221	73,8	189	70,5	142	63	116	57,3
	15	271	59,6	261	66,1	251	74,5	216	73,3	161	66,2	132	59,6
	18	293	60,8	282	67,6	271	76,2	233	75,3	173	68,1	142	61,3
20	307	61,6	296	68,6	285	77,4	244	76,7	181	69,6	149	62,5	

kWf = cooling capacity in kW  
 kWe\_tot = Total power input in kW  
 To (°C) = Internal exchanger outlet water temperature

\*Always check the actual temperature differential in the configurator as this is related to the minimum or maximum flow rate limits of the exchanger

Performances in function of the inlet/outlet water temperature differential = 5°C

# Performance

## Cooling - Excellence - EN

SIZE	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		45		48	
		kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot
45.4	5	98,1	24,6	93,3	27,8	88,4	32,5	75,9	30,2	57,7	26,7	45,6	22,8
	6	102	24,7	97,2	27,9	93,2	32,9	79,0	30,4	59,9	26,8	47,2	22,9
	7	106	24,7	101	28,0	98,1	33,3	82,2	30,6	62,1	27,0	48,8	23,1
	10	113	24,8	107	28,1	101	32,7	87	30,8	66,1	27,3	52,1	23,3
	15	130	24,8	124	28,4	118	32,5	102	31,4	77,2	27,9	60,5	23,7
	18	143	24,7	136	28,4	130	32,7	111	31,7	84,0	28,1	65,7	23,8
20	151	24,6	144	28,4	137	32,7	118	31,8	88,6	28,2	69,2	23,9	
50.4	5	106	27,2	101	30,1	95,5	36,6	80,3	31,9	60,2	28,0	49,3	24,7
	6	110	27,2	105	30,3	100	37,0	83,7	32,1	62,5	28,2	51,1	24,9
	7	115	27,3	109	30,4	105	37,5	87,1	32,4	64,9	28,4	52,9	25,0
	10	122	27,4	116	30,6	110	37,2	91,8	32,6	68,9	28,7	56,4	25,3
	15	141	27,5	134	30,9	128	37,2	108	33,2	80,5	29,4	65,7	25,8
	18	154	27,5	147	31,0	140	37,1	118	33,5	87,7	29,6	71,4	26,0
20	163	27,5	155	31,1	148	37,2	125	33,7	92,5	29,8	75,2	26,0	
55.4	5	116	29,9	111	34,7	106	43,5	93,3	37,5	67,6	33,3	56,7	30,5
	6	120	30,0	115	34,9	112	44,1	96,8	37,8	69,9	33,5	58,5	30,7
	7	125	30,2	119	35,1	118	44,7	100	38,0	72,2	33,7	60,4	30,8
	10	131	30,3	125	35,3	119	44,4	106	38,3	76,8	34,0	64,5	31,1
	15	151	30,8	145	36,0	138	44,5	123	39,1	89,3	34,8	75,1	31,7
	18	164	31,0	157	36,2	151	44,1	134	39,4	97,4	35,2	81,9	31,9
20	173	31,1	166	36,3	160	44,2	142	39,5	103	35,3	86,7	31,9	
60.4	5	125	33,3	119	38,7	114	48,2	98,6	39,7	72,1	35,2	59,8	32,3
	6	129	33,5	124	38,9	120	48,6	102	39,9	74,6	35,4	61,8	32,5
	7	134	33,7	128	39,2	126	49,0	106	40,2	77,2	35,6	63,8	32,6
	10	141	33,9	135	39,5	128	49,2	112	40,5	81,9	36,0	68,1	33,0
	15	162	34,6	155	40,3	149	49,3	130	41,4	95,4	36,9	79,3	33,6
	18	176	34,9	169	40,8	162	49,4	142	41,7	104	37,2	86,6	33,9
20	186	35,0	179	40,9	171	49,6	150	41,8	110	37,3	91,7	34,0	
65.4	5	138	34,6	133	40,1	127	47,5	107	41,4	83,1	41,0	64,4	35,2
	6	143	34,8	137	40,3	133	48,1	111	41,6	85,8	41,2	66,4	35,4
	7	148	35,0	142	40,5	139	48,7	114	41,8	88,5	41,4	68,3	35,5
	10	154	35,2	148	40,8	142	48,7	120	42,1	94,1	41,8	73,2	35,8
	15	177	35,8	171	41,5	165	48,3	139	42,7	110	42,6	85,5	36,2
	18	192	36,1	186	41,8	179	48,5	152	42,9	120	42,9	93,9	36,3
20	203	36,2	196	41,9	190	48,6	161	42,8	127	43,0	100	36,2	
70.4	5	148	37,6	142	41,5	136	45,9	118	45,9	85,9	41,9	72,5	40,3
	6	153	37,8	147	41,7	143	46,6	122	46,1	88,7	42,1	74,8	40,5
	7	158	38,0	152	41,9	151	47,2	126	46,3	91,5	42,3	77,1	40,7
	10	165	38,2	159	42,2	153	46,7	133	46,6	97,2	42,7	82,4	41,0
	15	189	38,9	183	42,9	176	47,4	154	47,3	113	43,4	96,2	41,7
	18	206	39,2	199	43,1	192	47,7	168	47,5	124	43,7	106	41,9
20	218	39,3	210	43,2	203	47,7	178	47,4	132	43,7	112	41,8	
75.4	5	163	44,1	157	51,2	151	61,0	128	50,0	95,3	44,7	80,2	44,9
	6	169	44,4	163	51,5	157	61,7	133	50,3	98,5	44,9	82,9	45,1
	7	175	44,6	168	51,8	163	62,3	138	50,5	102	45,1	85,5	45,4
	10	184	45,0	177	52,2	169	62,4	144	50,8	108	45,4	91,2	45,8
	15	210	46,0	202	53,3	195	62,8	167	51,5	125	46,1	107	46,7
	18	228	46,6	220	53,8	212	63,3	183	51,7	137	46,2	117	47,0
20	241	46,9	233	54,1	225	63,5	194	51,6	146	46,2	124	47,0	
80.4	5	177	42,6	170	47,3	163	56,8	142	58,1	102	48,5	85,5	44,6
	6	183	42,8	176	47,5	169	57,3	147	58,5	106	48,8	87,9	44,8
	7	189	43,0	182	47,8	175	57,7	152	59,0	109	49,1	90,4	45,0
	10	198	43,2	191	48,1	183	57,9	159	59,7	115	49,7	95,8	45,5
	15	225	43,9	217	49,1	209	58,3	181	62,2	130	51,5	109	47,0
	18	243	44,4	234	49,8	225	58,3	195	63,9	140	52,9	117	48,0
20	255	44,7	246	50,4	237	59,0	204	65,2	146	53,9	122	48,8	
85.4	5	188	47,3	181	52,9	174	62,2	149	59,8	113	54,7	90,9	47,6
	6	195	47,5	188	53,2	180	62,9	154	60,2	116	55,1	93,6	47,8
	7	202	47,8	194	53,5	186	63,6	159	60,7	120	55,4	96,3	48,1
	10	212	48,1	203	54,0	195	63,6	166	61,4	126	56,2	102	48,6
	15	240	49,2	231	55,4	223	64,9	190	63,9	143	58,6	116	50,3
	18	259	49,9	250	56,4	240	65,9	204	65,6	154	60,3	124	51,5
20	272	50,4	262	57,1	252	66,9	214	66,8	161	61,5	130	52,4	
90.4	5	202	53,4	195	59,0	187	70,5	162	63,5	120	59,5	98,9	52,1
	6	209	53,7	202	59,5	194	71,3	167	64,0	124	60,0	102	52,5
	7	217	54,1	208	59,9	201	72,1	173	64,4	128	60,5	105	52,8
	10	228	54,6	219	60,5	210	72,4	181	65,1	134	61,3	111	53,5
	15	258	56,1	249	62,4	239	73,5	206	67,5	152	64,1	126	55,5
	18	279	57,2	269	63,8	258	73,2	223	69,3	164	66,1	135	57,0
20	293	58,0	282	64,8	271	74,4	234	70,5	171	67,6	141	58,1	

kWf = cooling capacity in kW  
kWe\_tot = Total power input in kW  
To (°C) = Internal exchanger outlet water temperature  
Performances in function of the inlet/outlet water temperature differential = 5°C

\*Always check the actual temperature differential in the configurator as this is related to the minimum or maximum flow rate limits of the exchanger

## Cooling - Premium - SC

SIZE	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		45		48	
		kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot
45.4	5	128	33,7	121,1	37,5	114,5	42,7	96,8	39,8	71,3	34,2	60,1	32,2
	6	133	33,7	126,0	37,6	119,9	43,3	100,9	40,1	74,2	34,4	62,5	32,4
	7	137	33,8	131	37,8	125	43,9	105,1	40,3	77,2	34,7	64,8	32,6
	10	147	33,9	140	38,0	132	43,3	111	40,6	81,7	35,0	68,9	33,0
	15	169	34,0	161	38,3	153	43,5	130	41,4	95,8	35,8	80,5	33,8
	18	185	34,0	176	38,5	168	43,8	143	41,7	104,7	36,1	87,7	34,2
	20	196	33,9	187	38,6	178	44,0	151	41,8	110,6	36,3	92,5	34,4
50.4	5	136	36,4	129	41,5	122	48,0	103	42,5	75,4	36,1	62,9	33,4
	6	141	36,5	134	41,7	128	48,4	107	42,8	78,6	36,4	65,4	33,7
	7	146	36,6	139	41,8	135	48,8	111	43,1	81,8	36,6	67,9	33,9
	10	157	36,7	149	42,1	140	48,3	118	43,4	86	36,9	72,1	34,3
	15	179	36,9	171	42,6	162	48,7	138	44,2	102	37,8	84,4	35,1
	18	196	37,0	187	42,9	178	49,1	151	44,6	111	38,2	92,0	35,5
	20	208	37,0	198	43,0	188	49,4	160	44,8	117	38,4	97,1	35,7
55.4	5	143	38,7	135	43,3	128	52,1	108	45,6	79,1	36,9	64,5	33,9
	6	148	38,8	140	43,5	135	52,6	113	45,9	82,6	37,1	67,1	34,2
	7	153	38,9	145	43,7	143	53,0	117	46,2	86,0	37,3	69,6	34,4
	10	165	39,1	156	44,1	147	53,1	124	46,6	90,8	37,6	74,0	34,7
	15	188	39,4	179	44,7	169	53,1	145	47,6	107	38,3	86,7	35,6
	18	205	39,6	196	45,0	186	53,2	159	48,0	117	38,6	94,5	35,9
	20	218	39,7	207	45,2	197	53,5	168	48,3	124	38,8	100	36,1
60.4	5	163	48,5	156	54,0	148	58,0	126	55,2	93	45,2	76,3	41,4
	6	169	48,8	161	54,3	152	58,2	131	55,6	97	45,4	79,0	41,7
	7	175	49,1	167	54,7	155	58,4	136	55,9	100	45,7	81,8	41,9
	10	186	49,7	177	55,3	168	61,3	144	56,4	106	46,1	86,9	42,3
	15	210	50,9	202	56,7	192	62,9	166	57,7	124	47,1	101	43,2
	18	229	51,7	220	57,6	210	63,8	181	58,3	135	47,4	111	43,6
	20	242	52,2	232	58,1	222	64,3	192	58,6	143	47,6	117	43,8
65.4	5	185	52,7	178	58,3	170	61,2	144	59,0	107	52,5	87,6	48,4
	6	191	53,0	184	58,6	172	61,6	150	59,2	111	52,7	90,6	48,6
	7	198	53,3	190	58,9	174	62,0	155	59,5	115	52,9	93,5	48,8
	10	208	53,8	200	59,4	192	63,6	162	59,8	121	53,3	99,5	49,1
	15	237	55,0	229	60,6	220	64,8	188	60,6	141	54,1	116	49,9
	18	258	55,8	249	61,3	240	65,4	205	60,9	154	54,4	128	50,1
	20	272	56,2	263	61,7	254	65,6	217	60,9	164	54,3	136	50,1
70.4	5	194	57,2	186	63,3	178	71,5	153	64,1	114	54,3	94,1	50,9
	6	200	57,5	193	63,7	186	72,0	159	64,4	118	54,5	97,3	51,1
	7	207	57,9	199	64,1	193	72,6	165	64,7	122	54,7	101	51,3
	10	219	58,5	210	64,7	201	72,9	173	65,0	129	55,1	107	51,7
	15	248	60,0	239	66,1	230	73,6	200	66,0	150	55,8	125	52,5
	18	270	60,9	260	67,0	251	74,4	218	66,3	164	56,0	137	52,6
	20	285	61,5	275	67,5	265	74,8	231	66,4	174	55,9	145	52,6
75.4	5	209	54,3	201	59,3	193	69,3	166	68,4	127	63,0	101	55,6
	6	216	54,6	208	59,6	202	70,1	172	69,0	131	63,5	105	55,9
	7	223	54,9	215	59,9	211	70,9	178	69,5	135	64,0	108	56,3
	10	236	55,3	227	60,5	217	70,8	186	70,2	142	64,8	114	57,0
	15	267	56,4	257	61,9	248	71,4	213	72,9	161	67,6	129	59,1
	18	288	57,2	278	62,9	268	72,7	229	74,8	173	69,5	139	60,7
	20	303	57,8	293	63,7	282	73,7	241	76,2	181	70,9	145	61,9
80.4	5	225	61,7	217	67,2	208	74,8	181	74,1	131	66,3	111	62,1
	6	233	62,1	224	67,7	217	76,0	187	74,7	136	66,9	115	62,5
	7	241	62,5	232	68,2	226	77,3	194	75,2	140	67,4	118	62,9
	10	250	63,0	245	68,9	235	76,0	203	76,1	147	68,3	125	63,8
	15	288	64,8	278	70,9	267	78,4	232	78,8	167	71,3	142	66,5
	18	312	66,0	301	72,4	289	79,3	250	80,8	180	73,5	152	68,5
	20	328	66,9	316	73,4	304	80,6	263	82,3	188	75,0	159	69,9
85.4	5	236	66,9	227	72,9	218	79,4	189	77,9	139	66,5	116	65,4
	6	244	67,4	235	73,4	229	79,4	196	78,5	144	66,9	120	65,9
	7	252	67,9	243	73,9	241	79,4	203	79,1	149	67,4	123	66,4
	10	268	68,7	257	74,9	246	81,7	212	80,0	156	68	130	67,4
	15	302	70,7	291	77,2	279	84,4	242	82,9	178	70,9	148	70,4
	18	327	72,2	315	79,0	302	86,4	262	85,0	192	72,8	158	72,5
	20	344	73,3	331	80,3	318	87,9	275	86,5	201	74,2	166	74,1
90.4	5	249	73,7	239	80,2	229	84,7	199	83,4	144	69,7	123	67,1
	6	257	74,3	247	80,9	240	84,8	206	84,1	149	70,3	126	67,6
	7	266	74,9	255	81,5	252	84,9	214	84,7	154	70,8	130	68,1
	10	283	76,0	271	82,7	259	87,4	224	85,8	161	72	137	69,0
	15	318	78,5	306	85,6	293	91,4	256	88,9	184	74,6	156	72,0
	18	344	80,4	331	87,8	318	93,8	277	91,2	198	76,7	168	74,1
	20	362	81,7	349	89,3	335	95,6	291	92,9	208	78,2	175	75,6

kWf = cooling capacity in kW

kWe\_tot = Total power input in kW

To (°C) = Internal exchanger outlet water temperature

Performances in function of the inlet/outlet water temperature differential = 5°C

\*Always check the actual temperature differential in the configurator as this is related to the minimum or maximum flow rate limits of the exchanger

# Performance

## Cooling - Premium - LN

SIZE	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		45		48	
		kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot
45.4	5	121	31,9	115,3	36,2	109,0	42,8	92,1	37,2	68,4	32,1	56,6	29,2
	6	126	32,0	120,0	36,4	114,0	43,4	96,1	37,4	71,1	32,4	58,7	29,4
	7	131	32,0	125	36,5	119	43,9	100,0	37,7	73,9	32,6	60,9	29,6
	10	140	32,2	133	36,8	125	43,7	106	38,0	78,4	32,9	64,8	29,9
	15	161	32,4	153	37,3	145	42,8	124	38,7	91,8	33,7	75,7	30,6
	18	176	32,5	168	37,5	159	43,2	136	39,0	100,2	34,0	82,4	30,9
	20	186	32,5	177	37,6	169	43,4	144	39,2	105,8	34,2	86,9	31,0
50.4	5	128	34,1	121	40,0	115	48,0	96,7	40,6	71,3	33,3	60,1	31,3
	6	133	34,2	126	40,2	121	48,4	101	40,9	74,2	33,6	62,5	31,5
	7	138	34,3	131	40,4	128	48,9	105	41,2	77,2	33,8	64,8	31,8
	10	147	34,5	140	40,7	132	48,7	111	41,6	81,7	34,1	68,9	32,1
	15	169	34,8	161	41,3	153	47,5	130	42,6	95,8	34,9	80,5	33,0
	18	185	35,0	176	41,6	167	48,0	142	43,1	105	35,3	87,7	33,3
	20	195	35,0	186	41,8	177	48,3	150	43,3	111	35,4	92,5	33,5
55.4	5	134	36,5	127	42,8	120	51,9	103	43,1	75,4	35,3	62,9	32,6
	6	140	36,6	132	43,0	128	52,5	107	43,5	78,6	35,5	65,4	32,8
	7	145	36,7	137	43,2	136	53,1	111	43,8	81,8	35,8	67,9	33,0
	10	155	37,0	147	43,6	139	53,2	118	44,2	86,5	36,1	72,1	33,4
	15	177	37,4	169	44,4	160	52,9	138	45,2	102	36,9	84,4	34,3
	18	194	37,6	184	44,8	175	53,6	151	45,7	111	37,3	92,0	34,6
	20	205	37,8	195	45,1	185	54,0	160	46,0	117	37,5	97,1	34,8
60.4	5	153	45,0	146	50,5	139	60,9	119	51,5	88,2	41,9	73,0	39,3
	6	158	45,3	151	50,9	147	61,7	124	51,9	91,5	42,2	75,6	39,5
	7	164	45,6	157	51,2	154	62,5	128	52,3	94,8	42,4	78,2	39,8
	10	174	46,1	166	51,8	157	62,5	135	52,7	100	42,8	83,1	40,2
	15	198	47,3	189	53,2	181	62,6	157	54,1	117	43,7	97,0	41,1
	18	215	48,1	206	54,1	197	62,3	171	54,7	128	44,1	106	41,5
	20	227	48,6	218	54,6	208	62,8	181	55,0	135	44,2	112	41,6
65.4	5	174	48,2	167	53,3	160	60,2	136	54,3	102	47,7	83,0	45,6
	6	180	48,5	173	53,6	163	61,1	141	54,5	105	47,9	85,7	45,9
	7	186	48,8	179	53,9	166	62,0	146	54,8	109	48,1	88,5	46,1
	10	196	49,2	188	54,4	180	61,9	153	55,1	115	48,4	94,3	46,5
	15	223	50,4	215	55,5	207	61,3	177	55,9	134	49,1	110	47,2
	18	242	51,0	234	56,1	226	61,8	194	56,1	146	49,3	121	47,5
	20	256	51,4	247	56,4	239	62,1	205	56,1	156	49,2	129	47,5
70.4	5	183	52,6	176	58,3	169	71,7	152	64,2	114	52,9	94,1	49,6
	6	189	53,0	182	58,7	176	72,2	158	64,5	118	53,2	97,3	49,8
	7	196	53,3	188	59,0	183	72,7	163	64,8	122	53,4	101	50,0
	10	206	53,9	198	59,6	190	72,8	171	65,2	129	53,7	107	50,4
	15	234	55,3	226	61,0	218	73,1	197	66,4	150	54,4	125	51,1
	18	255	56,1	246	61,8	237	73,1	216	66,8	164	54,6	137	51,3
	20	269	56,6	260	62,2	251	73,2	228	66,9	174	54,5	145	51,2
75.4	5	198	50,6	191	58,1	183	69,2	159	62,5	118	58,4	98,9	52,6
	6	205	50,8	198	58,4	192	70,1	165	62,9	121	58,8	102	53,0
	7	212	51,1	204	58,8	201	70,9	170	63,4	125	59,3	105	53,3
	10	223	51,5	215	59,3	206	70,8	178	64,0	132	60,1	111	54,0
	15	253	52,6	244	60,9	235	70,3	203	66,3	149	62,8	126	56,0
	18	273	53,4	264	62,0	254	71,1	219	68,0	160	64,6	135	57,5
	20	287	54,0	277	62,7	267	72,1	230	69,2	168	66,0	141	58,6
80.4	5	212	56,7	204	62,6	196	74,6	169	68,6	127	61,7	104	55,8
	6	220	57,1	211	63,0	205	76,0	175	69,2	131	62,1	107	56,2
	7	227	57,5	219	63,5	215	77,3	181	69,7	135	62,6	110	56,5
	10	239	58,1	230	64,2	221	77,3	189	70,5	142	63,4	116	57,3
	15	271	59,6	261	66,1	251	78,4	216	73,3	161	66,2	132	59,6
	18	293	60,8	282	67,6	271	78,0	233	75,3	173	68,1	142	61,3
	20	307	61,6	296	68,6	285	79,3	244	76,7	181	69,6	149	62,5
85.4	5	225	63,2	217	69,0	208	76,9	181	72,7	131	65,0	111	60,7
	6	233	63,7	224	69,6	218	78,2	187	73,3	136	65,5	115	61,1
	7	241	64,2	232	70,1	229	79,5	194	73,9	140	66,0	118	61,6
	10	255	65,0	245	71,0	234	79,2	203	74,7	147	66,9	125	62,5
	15	288	67,1	277	73,5	266	81,3	232	77,5	167	70,0	142	65,2
	18	311	68,6	300	75,3	288	82,5	250	79,5	180	72,1	152	67,1
	20	327	69,7	315	76,6	303	84,0	263	80,9	188	73,7	159	68,6
90.4	5	236	65,6	227	72,2	218	82,7	189	76,5	139	65,1	116	64,1
	6	244	66,0	235	72,8	229	83,9	196	77,1	144	65,6	120	64,6
	7	252	66,5	243	73,3	240	85,0	203	77,7	149	66,1	123	65,1
	10	268	67,4	257	74,3	246	85,1	212	78,6	156	66,8	130	66,0
	15	302	69,4	291	76,6	279	86,3	242	81,5	178	69,5	148	69,0
	18	327	70,9	315	78,4	302	88,5	262	83,6	192	71,4	158	71,2
	20	344	71,9	331	79,7	318	90,0	275	85,1	201	72,8	166	72,7

kWf = cooling capacity in kW  
 kWe\_tot = Total power input in kW  
 To (°C) = Internal exchanger outlet water temperature  
 Performances in function of the inlet/outlet water temperature differential = 5°C

\*Always check the actual temperature differential in the configurator as this is related to the minimum or maximum flow rate limits of the exchanger



## Cooling - Premium - EN

SIZE	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		45		48	
		kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot	kWf	kWe_tot
45.4	5	114	29,8	108,3	34,8	102,5	42,1	88,8	37,6	63,9	30,1	55,4	28,1
	6	119	29,9	112,8	35,0	107,0	42,6	92,6	37,8	66,4	30,3	57,5	28,3
	7	123	30,0	117	35,1	111	43,1	96,4	38,1	68,9	30,6	59,5	28,5
	10	131	30,1	125	35,4	118	42,6	102	38,4	73,2	30,9	63,4	28,8
	15	151	30,3	144	35,9	137	42,3	119	39,2	85,5	31,7	74,0	29,4
	18	165	30,4	158	36,1	150	42,7	130	39,5	93,2	32,0	80,6	29,7
20	175	30,5	167	36,2	159	42,9	138	39,7	98,3	32,2	85,0	29,9	
50.4	5	121	32,0	114	37,4	108	46,9	91,4	39,1	68,4	31,8	56,6	28,8
	6	125	32,1	119	37,6	114	47,4	95,3	39,4	71,1	32,0	58,7	29,0
	7	130	32,3	124	37,8	120	47,9	99,3	39,6	73,9	32,2	60,9	29,2
	10	139	32,4	132	38,1	124	47,6	105	40,0	78,4	32,5	64,8	29,5
	15	159	32,8	152	38,8	144	47,0	123	40,8	91,8	33,3	75,7	30,2
	18	174	32,9	166	39,1	158	47,5	134	41,3	100	33,7	82,4	30,5
20	184	33,0	176	39,3	167	47,8	142	41,5	106	33,8	86,9	30,7	
55.4	5	129	35,0	122	40,9	115	50,9	96,7	40,2	71,3	33,0	60,1	30,9
	6	133	35,1	127	41,2	121	51,5	101	40,5	74,2	33,2	62,5	31,2
	7	138	35,2	131	41,4	127	52,1	105	40,8	77,2	33,4	64,8	31,4
	10	148	35,5	140	41,8	132	52,2	111	41,2	81,7	33,7	68,9	31,8
	15	169	36,0	161	42,6	153	52,1	130	42,2	96	34,5	80,5	32,6
	18	185	36,3	176	43,1	167	52,8	142	42,7	105	34,9	87,7	32,9
20	196	36,4	187	43,4	177	53,2	150	42,9	111	35,0	92,5	33,1	
60.4	5	143	41,5	137	48,4	130	59,7	114	49,1	82,8	39,1	67,9	36,5
	6	149	41,8	142	48,8	137	60,5	118	49,4	85,9	39,3	70,3	36,8
	7	154	42,1	147	49,1	145	61,3	123	49,8	88,9	39,6	72,6	37,0
	10	162	42,6	155	49,7	147	61,3	129	50,2	94,1	39,9	77,4	37,4
	15	185	43,7	178	51,1	170	61,0	149	51,6	110	40,8	90,2	38,2
	18	202	44,4	193	51,9	185	61,3	163	52,2	120	41,2	98,5	38,6
20	213	44,8	204	52,3	196	61,3	173	52,5	127	41,3	104	38,7	
65.4	5	163	44,1	157	51,2	151	59,4	128	50,0	95,3	44,7	80,2	44,9
	6	169	44,4	163	51,5	153	60,1	133	50,3	98,5	44,9	82,9	45,1
	7	175	44,6	168	51,8	155	60,8	138	50,5	102	45,1	85,5	45,4
	10	184	45,0	177	52,2	169	60,8	144	50,8	108	45,4	91,2	45,8
	15	210	46,0	202	53,3	195	61,1	167	51,5	125	46,1	107	46,7
	18	228	46,6	220	53,8	212	61,1	183	51,7	137	46,2	117	47,0
20	241	46,9	233	54,1	225	61,3	194	51,6	146	46,2	124	47,0	
70.4	5	173	48,5	166	56,3	159	69,6	138	55,4	102	47,2	83,0	45,1
	6	179	48,8	172	56,7	165	70,4	143	55,6	105	47,4	85,7	45,3
	7	185	49,1	178	57,1	171	71,3	148	55,9	109	47,6	88,5	45,5
	10	194	49,6	187	57,6	179	71,0	154	56,2	115	47,9	94,3	45,9
	15	221	50,8	214	58,9	206	71,3	179	57,1	134	48,6	110	46,7
	18	241	51,6	232	59,6	224	71,4	195	57,4	146	48,8	121	46,9
20	254	52,0	246	60,0	237	71,7	207	57,5	156	48,7	129	47,0	
75.4	5	188	47,3	181	54,4	174	67,9	149	59,8	113	54,7	90,9	47,6
	6	195	47,5	188	54,8	181	68,7	154	60,2	116	55,1	93,6	47,8
	7	202	47,8	194	55,1	188	69,6	159	60,7	120	55,4	96,3	48,1
	10	212	48,1	203	55,6	195	69,4	166	61,4	126	56,2	102	48,6
	15	240	49,2	231	57,0	223	70,3	190	63,9	143	58,6	116	50,3
	18	259	49,9	250	58,1	240	71,1	204	65,6	154	60,3	124	51,5
20	272	50,4	262	58,8	252	72,2	214	66,8	161	61,5	130	52,4	
80.4	5	202	53,4	195	61,4	187	73,8	162	63,5	120	59,5	98,9	52,1
	6	209	53,7	202	61,8	194	74,8	167	64,0	124	60,0	102	52,5
	7	217	54,1	208	62,2	202	75,8	173	64,4	128	60,5	105	52,8
	10	228	54,6	219	62,9	210	76,3	181	65,1	134	61,3	111	53,5
	15	258	56,1	249	64,9	239	76,9	206	67,5	152	64,1	126	55,5
	18	279	57,2	269	66,3	258	76,6	223	69,3	164	66,1	135	57,0
20	293	58,0	282	67,3	271	77,9	234	70,5	171	67,6	141	58,1	
85.4	5	213	58,5	205	64,6	197	75,7	173	68,6	127	61,1	104	55,3
	6	221	59,0	212	65,2	206	76,8	179	69,1	131	61,6	107	55,7
	7	228	59,4	220	65,7	215	78,0	185	69,6	135	62,1	110	56,0
	10	241	60,1	231	66,5	221	78,3	193	70,4	142	62,9	116	56,8
	15	272	62,0	262	68,8	251	79,3	221	73,0	161	65,7	132	59,1
	18	294	63,4	283	70,5	272	80,6	238	74,9	173	67,6	142	60,8
20	308	64,4	297	71,7	286	81,3	250	76,3	181	69,1	149	62,0	
90.4	5	225	63,2	217	69,7	208	81,5	181	72,7	131	65,0	111	60,7
	6	233	63,7	224	70,3	216	82,4	187	73,3	136	65,5	115	61,1
	7	241	64,2	232	70,8	224	83,4	194	73,9	140	66,0	118	61,6
	10	255	65,0	245	71,7	234	83,8	203	74,7	147	66,9	125	62,5
	15	288	67,1	277	74,2	266	85,3	232	77,5	167	70,0	142	65,2
	18	311	68,6	300	76,0	288	86,7	250	79,5	180	72,1	152	67,1
20	327	69,7	315	77,3	303	88,2	263	80,9	188	73,7	159	68,6	

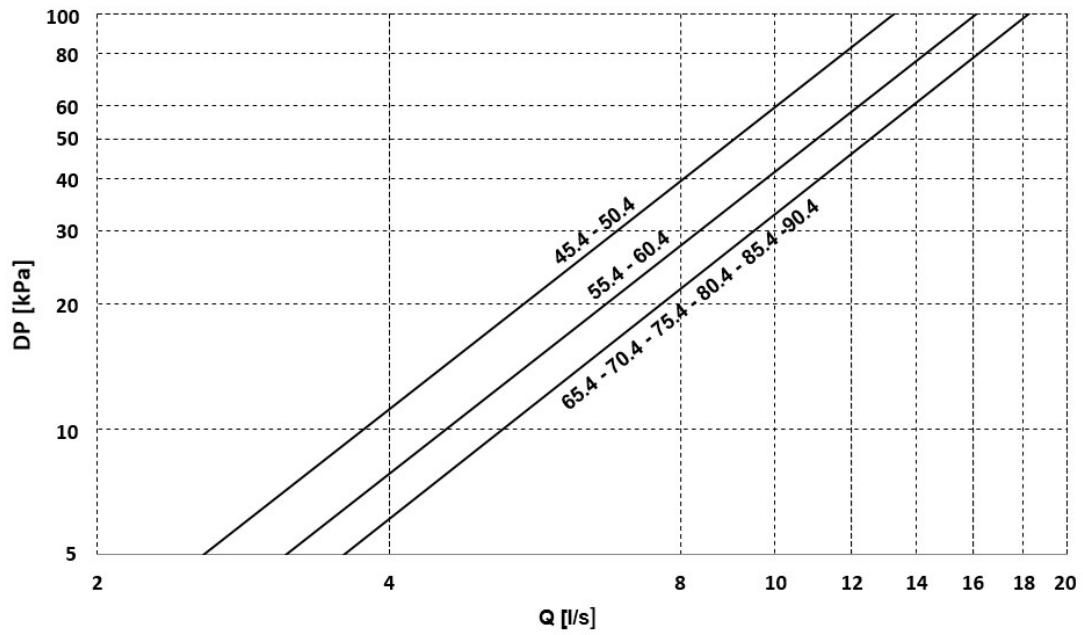
kWf = cooling capacity in kW  
 kWe\_tot = Total power input in kW  
 To (°C) = Internal exchanger outlet water temperature  
 Performances in function of the inlet/outlet water temperature differential = 5°C

\*Always check the actual temperature differential in the configurator as this is related to the minimum or maximum flow rate limits of the exchanger



# Performance

## Plate exchangers pressure drop (EVPHE) - Excellence



The pressure drops are calculated considering a water temperature of 7°C

Q = Water flow-rate[l/s]

DP = Water side pressure drops [kPa]

The water flow-rate must be calculated with the following formula

$$Q \text{ [l/s]} = \frac{kWf}{4,186 \times DT}$$

kWf = cooling capacity in kW

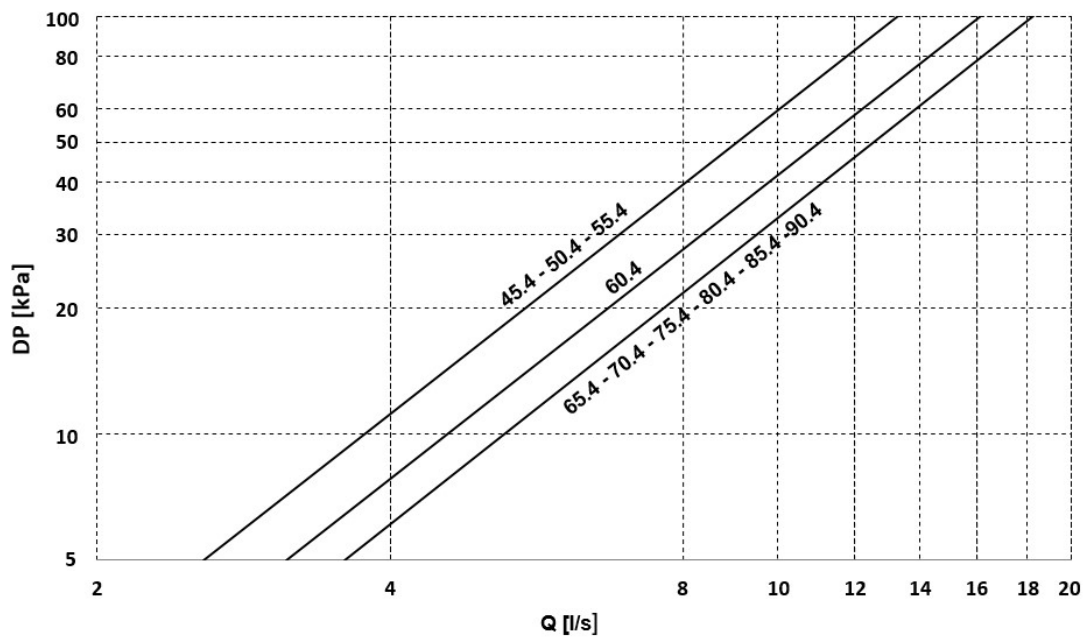
DT = Temperature difference between inlet / outlet water

### Admissible water flow-rates

Minimum (Qmin) and maximum (Qmax) admissible water flow rates for correct operation of the unit.

SIZE		45.4	50.4	55.4	60.4	65.4	70.4	75.4	80.4	85.4	90.4
Qmin	[l/s]	2,6	2,6	3,1	3,1	3,6	3,6	3,6	3,6	3,6	3,6
Qmax	[l/s]	13,3	13,3	16,2	16,2	18,3	18,3	18,3	18,3	18,3	18,3

## Plate exchangers pressure drop (EVPHE) - Premium



The pressure drops are calculated considering a water temperature of 7°C

Q = Water flow-rate[l/s]

DP = Water side pressure drops [kPa]

The water flow-rate must be calculated with the following formula

$$Q \text{ [l/s]} = \frac{kWf}{4,186 \times DT}$$

kWf = cooling capacity in kW

DT = Temperature difference between inlet / outlet water

### Admissible water flow-rates

Minimum (Qmin) and maximum (Qmax) admissible water flow rates for correct operation of the unit.

SIZE		45.4	50.4	55.4	60.4	65.4	70.4	75.4	80.4	85.4	90.4
Qmin	[l/s]	2,6	2,6	2,6	3,1	3,6	3,6	3,6	3,6	3,6	3,6
Qmax	[l/s]	13,3	13,3	13,3	16,2	18,3	18,3	18,3	18,3	18,3	18,3

# Performance

## Cooling at part load - Excellence - SC

SIZE	Load	Entering external exchanger air temperature (°C)											
		35°C			30°C			25°C			20°C		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
45.4	100	110	34,0	3,25	113	31,2	3,61	118	28,0	4,22	124	25,0	4,94
	75	81,9	25,5	3,21	86,5	23,1	3,74	90,9	20,8	4,37	95,3	18,6	5,11
	50	53,8	15,4	3,49	57,2	13,9	4,12	60,5	12,4	4,86	63,7	11,1	5,72
	Minimum	23,0	7,09	3,25	24,6	6,40	3,84	26,1	5,78	4,52	27,6	5,23	5,29
50.4	100	118	38,2	3,10	121	34,1	3,55	127	30,6	4,15	133	27,2	4,89
	75	87,2	27,3	3,19	92,0	24,7	3,72	96,6	22,3	4,34	101	19,9	5,08
	50	58,4	17,0	3,44	61,9	15,3	4,05	65,4	13,7	4,76	68,8	12,3	5,59
	Minimum	23,0	7,09	3,25	24,6	6,40	3,84	26,1	5,78	4,52	27,6	5,23	5,29
55.4	100	133	45,8	2,91	136	39,7	3,43	142	35,5	4,00	148	32,1	4,62
	75	94,8	30,0	3,16	99,7	27,0	3,70	105	24,3	4,30	109	22,0	4,97
	50	64,5	19,1	3,38	68,5	16,9	4,04	72,5	15,2	4,78	76,4	13,7	5,57
	Minimum	26,5	8,08	3,27	28,5	7,07	4,02	30,4	6,33	4,80	32,4	5,87	5,52
60.4	100	142	50,0	2,84	145	43,7	3,32	151	39,0	3,88	158	35,1	4,49
	75	103	33,3	3,11	109	30,0	3,62	114	27,0	4,21	119	24,5	4,86
	50	69,5	20,9	3,33	73,6	18,6	3,96	77,7	16,7	4,66	81,7	15,1	5,42
	Minimum	27,7	8,44	3,28	29,7	7,39	4,01	31,6	6,63	4,77	33,7	6,13	5,49
65.4	100	156	49,6	3,14	159	44,5	3,56	165	40,4	4,08	171	36,9	4,64
	75	113	34,8	3,26	118	31,1	3,81	124	28,0	4,41	129	25,6	5,04
	50	77,8	22,7	3,42	82,3	20,0	4,11	86,8	17,8	4,86	91,2	16,3	5,61
	Minimum	30,4	9,07	3,35	32,5	7,97	4,08	34,6	7,15	4,84	36,7	6,60	5,56
70.4	100	169	54,2	3,12	170	49,2	3,46	177	44,7	3,96	183	40,7	4,50
	75	123	38,1	3,23	129	34,2	3,76	134	30,9	4,34	140	28,2	4,94
	50	82,5	24,4	3,37	87,0	21,6	4,04	91,6	19,2	4,76	96,2	17,5	5,49
	Minimum	31,6	9,46	3,34	32,8	8,32	3,94	35,9	7,46	4,81	38,0	6,88	5,53
75.4	100	183	63,5	2,89	190	58,9	3,23	198	53,3	3,71	205	48,3	4,24
	75	135	42,5	3,17	141	38,3	3,67	146	34,7	4,22	152	31,6	4,81
	50	89,4	27,1	3,30	94,1	24,0	3,92	98,8	21,4	4,61	103	19,5	5,32
	Minimum	36,5	11,0	3,31	38,7	9,76	3,97	40,9	8,76	4,67	43,1	8,04	5,36
80.4	100	197	58,8	3,35	200	53,5	3,75	208	48,9	4,25	215	45,0	4,79
	75	146	48,0	3,05	153	42,9	3,57	160	38,4	4,15	166	34,6	4,79
	50	98,3	27,3	3,60	103	23,7	4,37	108	20,6	5,27	113	18,1	6,26
	Minimum	42,1	12,2	3,45	44,5	10,5	4,25	46,9	9,06	5,17	49,1	7,94	6,18
85.4	100	209	64,8	3,23	215	59,9	3,59	223	54,9	4,07	231	50,5	4,58
	75	158	50,7	3,11	165	45,6	3,61	171	41,0	4,18	178	37,1	4,80
	50	105	29,8	3,52	110	26,0	4,24	115	22,7	5,07	120	20,1	6,00
	Minimum	42,5	12,0	3,54	44,9	10,3	4,34	47,2	8,98	5,26	49,5	7,90	6,26
90.4	100	226	73,4	3,08	232	68,2	3,41	241	62,5	3,86	250	57,5	4,34
	75	166	53,6	3,10	173	48,3	3,59	180	43,6	4,13	187	39,6	4,73
	50	111	32,4	3,44	117	28,3	4,12	122	24,9	4,90	127	22,1	5,76
	Minimum	45,9	13,2	3,48	48,3	11,4	4,23	50,7	9,97	5,09	53,1	8,82	6,02

Load = % of cooling capacity compared to the value at full load

kWf = cooling capacity in kW

kWe\_tot = Total power input in kW

Internal heat exchanger water temperature = outlet 7°C / inlet 12°C / variable flow-rate with external exchanger air T.

## Cooling at part load - Excellence - LN

SIZE	Load	Entering external exchanger air temperature (°C)											
		35°C			30°C			25°C			20°C		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
45.4	100	105	34,0	3,08	108	29,8	3,64	114	26,7	4,26	119	23,8	5,00
	75	77,1	23,7	3,25	81,5	21,5	3,79	85,7	19,3	4,43	89,9	17,3	5,18
	50	50,7	14,4	3,52	54,0	12,9	4,17	57,2	11,6	4,93	60,3	10,4	5,82
	Minimum	23,0	7,09	3,25	24,6	6,40	3,84	26,1	5,78	4,52	27,6	5,23	5,29
50.4	100	113	38,2	2,94	115	32,1	3,58	121	28,8	4,19	126	25,6	4,93
	75	82,7	25,8	3,20	87,3	23,4	3,73	91,7	21,1	4,36	96,1	18,9	5,10
	50	55,3	15,9	3,47	58,7	14,3	4,10	62,1	12,9	4,82	65,4	11,5	5,68
	Minimum	22,3	6,85	3,25	23,8	6,18	3,85	25,3	5,58	4,54	26,8	5,04	5,32
55.4	100	126	45,6	2,76	127	38,1	3,35	133	32,7	4,07	139	29,5	4,70
	75	91,7	29,4	3,12	96,5	26,4	3,66	101	23,8	4,26	106	21,5	4,93
	50	58,7	17,1	3,44	62,5	15,1	4,14	66,3	13,5	4,91	70,1	12,2	5,73
	Minimum	26,5	8,08	3,27	28,5	7,07	4,02	30,4	6,33	4,80	32,4	5,87	5,52
60.4	100	135	50,0	2,70	136	42,2	3,23	143	36,2	3,93	149	32,6	4,55
	75	99,2	31,9	3,11	104	28,7	3,63	109	25,9	4,22	114	23,4	4,87
	50	64,5	19,1	3,38	68,5	16,9	4,04	72,5	15,2	4,78	76,4	13,7	5,57
	Minimum	26,5	8,08	3,27	28,5	7,07	4,02	30,4	6,33	4,80	32,4	5,87	5,52
65.4	100	148	49,7	2,98	150	41,0	3,65	156	37,2	4,19	162	34,0	4,75
	75	108	33,3	3,24	113	29,8	3,80	118	26,8	4,41	123	24,4	5,05
	50	73,0	21,1	3,47	77,4	18,5	4,19	81,8	16,5	4,96	86,2	15,1	5,73
	Minimum	29,1	8,70	3,35	31,2	7,62	4,09	33,3	6,84	4,87	35,4	6,33	5,60
70.4	100	161	54,3	2,96	163	46,7	3,50	170	41,9	4,04	176	38,3	4,60
	75	117	36,7	3,20	123	32,9	3,74	128	29,6	4,33	134	27,0	4,95
	50	77,8	22,7	3,42	82,3	20,0	4,11	86,8	17,8	4,86	91,2	16,3	5,61
	Minimum	30,4	9,07	3,35	32,5	7,97	4,08	34,6	7,15	4,84	36,7	6,60	5,56
75.4	100	174	63,6	2,74	179	53,9	3,32	186	48,8	3,82	193	44,2	4,36
	75	128	39,8	3,21	133	35,8	3,73	139	32,4	4,30	145	29,5	4,89
	50	84,8	25,3	3,35	89,4	22,3	4,00	94,0	20,0	4,71	98,6	18,2	5,43
	Minimum	34,1	10,2	3,33	36,2	9,02	4,02	38,4	8,10	4,74	40,6	7,45	5,45
80.4	100	187	58,8	3,18	189	50,0	3,79	197	45,1	4,36	204	41,3	4,93
	75	146	48,0	3,05	153	42,9	3,57	160	38,4	4,15	166	34,6	4,79
	50	98,3	27,3	3,60	103	23,7	4,37	108	20,6	5,27	113	18,1	6,26
	Minimum	42,1	12,2	3,45	44,5	10,5	4,25	46,9	9,06	5,17	49,1	7,94	6,18
85.4	100	199	64,8	3,07	204	56,6	3,61	212	51,1	4,15	220	46,8	4,69
	75	149	48,2	3,09	156	43,1	3,61	162	38,7	4,19	168	34,9	4,83
	50	98,3	27,3	3,60	103	23,7	4,37	108	20,6	5,27	113	18,1	6,26
	Minimum	42,1	12,2	3,45	44,5	10,5	4,25	46,9	9,06	5,17	49,1	7,94	6,18
90.4	100	215	73,5	2,92	219	63,5	3,44	227	57,5	3,95	235	52,7	4,46
	75	158	50,7	3,11	165	45,6	3,61	171	41,0	4,18	178	37,1	4,80
	50	105	29,8	3,52	110	26,0	4,24	115	22,7	5,07	120	20,1	6,00
	Minimum	42,5	12,0	3,54	44,9	10,3	4,34	47,2	8,98	5,26	49,5	7,90	6,26

Load = % of cooling capacity compared to the value at full load

kWf = cooling capacity in kW

kWe\_tot = Total power input in kW

Internal heat exchanger water temperature = outlet 7°C / inlet 12°C / variable flow-rate with external exchanger air T.

# Performance

## Cooling at part load - Excellence - EN

SIZE	Load	Entering external exchanger air temperature (°C)											
		35°C			30°C			25°C			20°C		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
45.4	100	98,1	33,3	2,94	101	28,0	3,61	106	24,7	4,30	111	22,1	5,04
	75	74,3	22,9	3,25	78,6	20,7	3,80	82,8	18,6	4,44	86,8	16,7	5,20
	50	49,2	13,9	3,53	52,4	12,5	4,20	55,6	11,2	4,97	58,7	10,0	5,87
	Minimum	22,3	6,85	3,25	23,8	6,18	3,85	25,3	5,58	4,54	26,8	5,04	5,32
50.4	100	105	37,5	2,81	109	30,4	3,60	115	27,3	4,21	120	24,3	4,94
	75	78,6	24,3	3,23	83,0	22,0	3,77	87,4	19,8	4,40	91,6	17,8	5,15
	50	50,7	14,4	3,52	54,0	12,9	4,17	57,2	11,6	4,93	60,3	10,4	5,82
	Minimum	23,0	7,09	3,25	24,6	6,40	3,84	26,1	5,78	4,52	27,6	5,23	5,29
55.4	100	118	44,7	2,64	119	35,1	3,40	125	30,2	4,13	130	27,3	4,77
	75	87,0	27,8	3,13	91,7	25,0	3,67	96,3	22,4	4,29	101	20,3	4,98
	50	56,8	16,4	3,46	60,5	14,5	4,17	64,3	13,0	4,96	68,0	11,7	5,79
	Minimum	26,5	8,08	3,27	28,5	7,07	4,02	30,4	6,33	4,80	32,4	5,87	5,52
60.4	100	126	49,0	2,58	128	39,2	3,27	134	33,7	3,98	140	30,3	4,61
	75	101	32,8	3,08	106	29,5	3,59	111	26,6	4,18	116	24,0	4,83
	50	62,6	18,4	3,40	66,5	16,3	4,08	70,4	14,6	4,82	74,3	13,2	5,62
	Minimum	26,5	8,08	3,27	28,5	7,07	4,02	30,4	6,33	4,80	32,4	5,87	5,52
65.4	100	139	48,7	2,85	142	40,5	3,50	148	35,0	4,22	153	31,9	4,81
	75	104	32,4	3,20	109	28,9	3,76	114	25,9	4,39	119	23,6	5,04
	50	70,6	20,2	3,49	75,0	17,7	4,23	79,3	15,8	5,01	83,7	14,5	5,79
	Minimum	30,4	9,07	3,35	32,5	7,97	4,08	34,6	7,15	4,84	36,7	6,60	5,56
70.4	100	151	53,2	2,83	152	41,9	3,63	158	38,0	4,16	164	34,7	4,72
	75	111	34,1	3,24	116	30,5	3,80	121	27,5	4,40	126	25,0	5,04
	50	75,4	21,9	3,45	79,8	19,2	4,15	84,3	17,2	4,91	88,8	15,7	5,67
	Minimum	29,1	8,70	3,35	31,2	7,62	4,09	33,3	6,84	4,87	35,4	6,33	5,60
75.4	100	163	62,3	2,62	168	51,8	3,25	175	44,6	3,92	181	40,5	4,48
	75	122	37,7	3,22	127	33,9	3,75	133	30,6	4,33	138	27,9	4,94
	50	80,1	23,6	3,40	84,7	20,8	4,08	89,2	18,5	4,81	93,7	16,9	5,55
	Minimum	31,6	9,46	3,34	32,8	8,32	3,94	35,9	7,46	4,81	38,0	6,88	5,53
80.4	100	175	57,7	3,03	182	47,8	3,81	189	43,0	4,40	196	39,3	4,99
	75	131	41,4	3,17	137	36,7	3,74	143	32,7	4,38	149	29,2	5,09
	50	88,4	23,8	3,72	93,2	20,3	4,59	98,0	17,5	5,59	103	15,3	6,71
	Minimum	44,2	12,6	3,51	46,6	10,9	4,28	49,0	9,47	5,17	51,3	8,36	6,14
85.4	100	186	63,6	2,93	194	53,5	3,63	202	47,8	4,22	209	43,7	4,78
	75	142	45,8	3,11	149	40,8	3,64	155	36,5	4,24	161	32,8	4,91
	50	95,1	26,1	3,64	100	22,5	4,44	105	19,5	5,37	110	17,2	6,40
	Minimum	42,1	12,2	3,45	44,5	10,5	4,25	46,9	9,06	5,17	49,1	7,94	6,18
90.4	100	201	72,1	2,79	208	59,9	3,48	217	54,1	4,00	224	49,5	4,53
	75	150	48,9	3,07	157	43,8	3,59	164	39,3	4,16	170	35,4	4,79
	50	102	28,6	3,56	107	24,8	4,31	112	21,6	5,17	117	19,1	6,12
	Minimum	42,1	12,20	3,45	44,5	10,5	4,25	46,9	9,06	5,17	49,1	7,94	6,18

Load = % of cooling capacity compared to the value at full load

kWf = cooling capacity in kW

kWe\_tot = Total power input in kW

Internal heat exchanger water temperature = outlet 7°C / inlet 12°C / variable flow-rate with external exchanger air T.

## Cooling at part load - Premium - SC

SIZE	Load	Entering external exchanger air temperature (°C)											
		35°C			30°C			25°C			20°C		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
45.4	100	125	43,9	2,85	131	37,8	3,46	137	33,8	4,07	144	29,9	4,81
	75	93,5	29,5	3,17	98,6	26,7	3,69	104	24,0	4,31	108	21,5	5,05
	50	62,9	18,6	3,39	66,7	16,8	3,98	70,4	15,1	4,67	74,0	13,5	5,47
	Minimum	25,4	7,82	3,24	27,0	7,08	3,81	28,6	6,41	4,46	30,2	5,79	5,20
50.4	100	135	48,8	2,76	139	41,8	3,32	146	36,6	3,99	153	32,3	4,74
	75	97,6	31,1	3,14	103	28,1	3,66	108	25,3	4,28	113	22,5	5,02
	50	66,0	19,7	3,35	69,9	17,8	3,93	73,7	16,0	4,60	77,4	14,3	5,40
	Minimum	25,4	7,82	3,24	27,0	7,08	3,81	28,6	6,41	4,46	30,2	5,79	5,20
55.4	100	143	53,0	2,70	145	43,7	3,33	153	38,9	3,93	160	34,3	4,67
	75	103	33,0	3,12	109	29,9	3,64	114	26,9	4,25	120	24,0	4,99
	50	70,6	21,4	3,30	74,7	19,3	3,86	78,7	17,4	4,52	82,5	15,6	5,29
	Minimum	27,7	8,58	3,22	29,4	7,78	3,77	31,0	7,05	4,40	32,7	6,37	5,13
60.4	100	155	58,4	2,66	167	54,7	3,05	175	49,1	3,55	182	44,0	4,14
	75	120	39,4	3,04	125	35,6	3,52	131	32,1	4,08	137	29,0	4,71
	50	79,5	25,0	3,18	84,0	22,4	3,75	88,4	20,1	4,39	92,7	18,2	5,11
	Minimum	32,4	9,95	3,25	34,4	8,76	3,93	36,5	7,86	4,64	38,5	7,23	5,33
65.4	100	174	62,0	2,81	190	58,9	3,23	198	53,3	3,71	205	48,3	4,24
	75	135	42,5	3,17	141	38,3	3,67	146	34,7	4,22	152	31,6	4,81
	50	89,4	27,1	3,30	94,1	24,0	3,92	98,8	21,4	4,61	103	19,5	5,32
	Minimum	36,5	11,0	3,31	38,7	9,76	3,97	40,9	8,76	4,67	43,1	8,04	5,36
70.4	100	193	72,6	2,65	199	64,1	3,11	207	57,9	3,58	215	52,3	4,10
	75	143	45,6	3,14	149	41,1	3,63	155	37,3	4,16	161	34,0	4,73
	50	96,2	30,2	3,19	101	26,8	3,77	106	24,0	4,42	111	21,8	5,09
	Minimum	37,7	11,5	3,29	39,9	10,1	3,94	42,1	9,09	4,64	44,4	8,34	5,32
75.4	100	211	70,9	2,98	215	59,9	3,59	223	54,9	4,07	231	50,5	4,58
	75	158	50,7	3,11	165	45,6	3,61	171	41,0	4,18	178	37,1	4,80
	50	105	29,8	3,52	110	26,0	4,24	115	22,7	5,07	120	20,1	6,00
	Minimum	42,5	12,0	3,54	44,9	10,3	4,34	47,2	8,98	5,26	49,5	7,90	6,26
80.4	100	226	77,3	2,93	232	68,2	3,41	241	62,5	3,86	250	57,5	4,34
	75	166	53,6	3,10	173	48,3	3,59	180	43,6	4,13	187	39,6	4,73
	50	111	32,4	3,44	117	28,3	4,12	122	24,9	4,90	127	22,1	5,76
	Minimum	45,9	13,2	3,48	48,3	11,4	4,23	50,7	9,97	5,09	53,1	8,82	6,02
85.4	100	241	79,4	3,04	243	73,9	3,28	252	67,9	3,72	261	62,4	4,19
	75	176	57,0	3,09	184	51,5	3,57	191	46,7	4,09	198	42,5	4,66
	50	118	35,0	3,36	123	30,8	4,00	129	27,2	4,74	134	24,2	5,55
	Minimum	47,5	13,8	3,45	50,0	12,0	4,18	52,5	10,5	5,00	54,9	9,29	5,90
90.4	100	252	84,9	2,97	255	81,5	3,13	266	74,9	3,55	275	68,8	4,00
	75	183	59,3	3,09	191	53,7	3,55	199	48,8	4,07	206	44,5	4,63
	50	121	36,4	3,32	126	32,0	3,94	132	28,3	4,66	137	25,2	5,45
	Minimum	49,2	14,4	3,42	51,7	12,5	4,12	54,2	11,0	4,92	56,6	9,77	5,80

Load = % of cooling capacity compared to the value at full load

kWf = cooling capacity in kW

kWe\_tot = Total power input in kW

Internal heat exchanger water temperature = outlet 7°C / inlet 12°C / variable flow-rate with external exchanger air T.

# Performance

## Cooling at part load - Premium - LN

SIZE	Load	Entering external exchanger air temperature (°C)											
		35°C			30°C			25°C			20°C		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
45.4	100	119	43,9	2,71	125	36,5	3,41	131	32,0	4,09	137	28,4	4,83
	75	87,9	27,6	3,18	92,8	25,0	3,71	97,5	22,5	4,33	102	20,1	5,07
	50	58,4	17,0	3,44	61,9	15,3	4,05	65,4	13,7	4,76	68,8	12,3	5,59
	Minimum	23,0	7,09	3,25	24,6	6,40	3,84	26,1	5,78	4,52	27,6	5,23	5,29
50.4	100	128	48,9	2,62	131	40,4	3,25	138	34,3	4,01	144	30,4	4,75
	75	94,6	30,1	3,14	99,8	27,3	3,66	105	24,5	4,28	110	21,9	5,02
	50	62,9	18,6	3,39	66,7	16,8	3,98	70,4	15,1	4,67	74,0	13,5	5,47
	Minimum	25,4	7,82	3,24	27,0	7,08	3,81	28,6	6,41	4,46	30,2	5,79	5,20
55.4	100	136	53,1	2,56	137	43,2	3,18	145	36,7	3,94	151	32,4	4,67
	75	97,6	31,1	3,14	103	28,1	3,66	108	25,3	4,28	113	22,5	5,02
	50	64,5	19,1	3,37	68,3	17,3	3,95	72,0	15,5	4,63	75,7	13,9	5,43
	Minimum	25,4	7,82	3,24	27,0	7,08	3,81	28,6	6,41	4,46	30,2	5,79	5,20
60.4	100	154	62,5	2,47	157	51,2	3,06	164	45,6	3,59	171	40,9	4,18
	75	114	37,1	3,07	119	33,4	3,56	125	30,2	4,13	130	27,3	4,77
	50	75,1	23,1	3,26	79,4	20,6	3,86	83,7	18,5	4,53	87,9	16,7	5,27
	Minimum	30,0	9,18	3,27	32,0	8,07	3,97	34,1	7,23	4,71	36,1	6,67	5,41
65.4	100	166	62,0	2,67	179	53,9	3,32	186	48,8	3,82	193	44,2	4,36
	75	128	39,8	3,21	133	35,8	3,73	139	32,4	4,30	145	29,5	4,89
	50	84,8	25,3	3,35	89,4	22,3	4,00	94,0	20,0	4,71	98,6	18,2	5,43
	Minimum	34,1	10,2	3,33	36,2	9,02	4,02	38,4	8,10	4,74	40,6	7,45	5,45
70.4	100	183	72,7	2,52	188	59,0	3,19	196	53,3	3,67	203	48,2	4,21
	75	143	45,4	3,16	149	40,9	3,65	155	37,1	4,19	161	33,8	4,76
	50	96,2	30,2	3,19	101	26,8	3,77	106	24,0	4,42	111	21,8	5,09
	Minimum	37,7	11,5	3,29	39,9	10,1	3,94	42,1	9,09	4,64	44,4	8,34	5,32
75.4	100	201	70,9	2,83	204	58,8	3,48	212	51,1	4,15	220	46,8	4,69
	75	149	48,2	3,09	156	43,1	3,61	162	38,7	4,19	168	34,9	4,83
	50	98,3	27,3	3,60	103	23,7	4,37	108	20,6	5,27	113	18,1	6,26
	Minimum	42,1	12,2	3,45	44,5	10,5	4,25	46,9	9,06	5,17	49,1	7,94	6,18
80.4	100	215	77,3	2,78	219	63,5	3,44	227	57,5	3,95	235	52,7	4,46
	75	158	50,7	3,11	165	45,6	3,61	171	41,0	4,18	178	37,1	4,80
	50	105	29,8	3,52	110	26,0	4,24	115	22,7	5,07	120	20,1	6,00
	Minimum	42,5	12,0	3,54	44,9	10,3	4,34	47,2	8,98	5,26	49,5	7,90	6,26
85.4	100	229	79,5	2,88	232	70,1	3,31	241	64,2	3,76	250	58,9	4,24
	75	166	53,6	3,10	173	48,3	3,59	180	43,6	4,13	187	39,6	4,73
	50	111	32,4	3,44	117	28,3	4,12	122	24,9	4,90	127	22,1	5,76
	Minimum	45,9	13,2	3,48	48,3	11,4	4,23	50,7	9,97	5,09	53,1	8,82	6,02
90.4	100	240	85,0	2,82	243	73,3	3,31	252	66,5	3,79	261	61,0	4,28
	75	176	56,7	3,11	184	51,3	3,59	191	46,4	4,12	198	42,2	4,70
	50	118	35,0	3,36	123	30,8	4,00	129	27,2	4,74	134	24,2	5,55
	Minimum	47,5	13,8	3,45	50,0	12,0	4,18	52,5	10,5	5,00	54,9	9,29	5,90

Load = % of cooling capacity compared to the value at full load

kWf = cooling capacity in kW

kWe\_tot = Total power input in kW

Internal heat exchanger water temperature = outlet 7°C / inlet 12°C / variable flow-rate with external exchanger air T.

## Cooling at part load - Premium - EN

SIZE	Load	Entering external exchanger air temperature (°C)											
		35°C			30°C			25°C			20°C		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
45.4	100	111	43,1	2,59	117	35,1	3,34	123	30,0	4,11	129	26,7	4,84
	75	85,2	26,8	3,18	89,9	24,2	3,71	94,5	21,8	4,34	99,1	19,5	5,08
	50	55,3	15,9	3,47	58,7	14,3	4,10	62,1	12,9	4,82	65,4	11,5	5,68
	Minimum	22,3	6,85	3,25	23,8	6,18	3,85	25,3	5,58	4,54	26,8	5,04	5,32
50.4	100	120	47,9	2,50	124	37,8	3,27	130	32,3	4,03	136	28,6	4,76
	75	87,9	27,6	3,18	92,8	25,0	3,71	97,5	22,5	4,33	102	20,1	5,07
	50	58,4	17,0	3,44	61,9	15,3	4,05	65,4	13,7	4,76	68,8	12,3	5,59
	Minimum	23,0	7,09	3,25	24,6	6,40	3,84	26,1	5,78	4,52	27,6	5,23	5,29
55.4	100	127	52,1	2,45	131	41,4	3,17	138	35,2	3,92	145	31,2	4,65
	75	94,6	30,1	3,14	99,8	27,3	3,66	105	24,5	4,28	110	21,9	5,02
	50	62,9	18,6	3,39	66,7	16,8	3,98	70,4	15,1	4,67	74,0	13,5	5,47
	Minimum	25,4	7,82	3,24	27,0	7,08	3,81	28,6	6,41	4,46	30,2	5,79	5,20
60.4	100	145	61,3	2,36	147	49,1	2,99	154	42,1	3,65	160	37,8	4,24
	75	107	34,8	3,08	113	31,4	3,59	118	28,3	4,17	123	25,6	4,81
	50	71,4	21,6	3,31	75,6	19,2	3,93	79,7	17,2	4,62	83,8	15,6	5,37
	Minimum	28,9	8,81	3,27	30,8	7,73	3,99	32,9	6,93	4,74	34,9	6,40	5,45
65.4	100	155	60,8	2,55	168	51,8	3,25	175	44,6	3,92	181	40,5	4,48
	75	122	37,7	3,22	127	33,9	3,75	133	30,6	4,33	138	27,9	4,94
	50	80,1	23,6	3,40	84,7	20,8	4,08	89,2	18,5	4,81	93,7	16,9	5,55
	Minimum	31,6	9,46	3,34	32,8	8,32	3,94	35,9	7,46	4,81	38,0	6,88	5,53
70.4	100	171	71,3	2,40	178	57,1	3,12	185	49,1	3,76	192	44,5	4,31
	75	128	39,8	3,21	133	35,8	3,73	139	32,4	4,30	145	29,5	4,89
	50	84,8	25,3	3,35	89,4	22,3	4,00	94,0	20,0	4,71	98,6	18,2	5,43
	Minimum	34,1	10,2	3,33	36,2	9,02	4,02	38,4	8,10	4,74	40,6	7,45	5,45
75.4	100	188	69,6	2,70	194	55,1	3,52	202	47,8	4,22	209	43,7	4,78
	75	142	45,8	3,11	149	40,8	3,64	155	36,5	4,24	161	32,8	4,91
	50	95,1	26,1	3,64	100	22,5	4,44	105	19,5	5,37	110	17,2	6,40
	Minimum	42,1	12,2	3,45	44,5	10,5	4,25	46,9	9,06	5,17	49,1	7,94	6,18
80.4	100	202	75,8	2,66	208	62,2	3,35	217	54,1	4,00	224	49,5	4,53
	75	150	48,9	3,07	157	43,8	3,59	164	39,3	4,16	170	35,4	4,79
	50	102	28,6	3,56	107	24,8	4,31	112	21,6	5,17	117	19,1	6,12
	Minimum	42,1	12,2	3,45	44,5	10,5	4,25	46,9	9,06	5,17	49,1	7,94	6,18
85.4	100	215	78,0	2,75	220	65,7	3,34	228	59,4	3,84	236	54,4	4,34
	75	159	51,5	3,09	166	46,3	3,59	173	41,7	4,15	179	37,7	4,76
	50	105	29,8	3,52	110	26,0	4,24	115	22,7	5,07	120	20,1	6,00
	Minimum	42,5	12,0	3,54	44,9	10,3	4,34	47,2	8,98	5,26	49,5	7,90	6,26
90.4	100	224	83,4	2,69	232	70,8	3,28	241	64,2	3,76	250	58,9	4,24
	75	166	53,6	3,10	173	48,3	3,59	180	43,6	4,13	187	39,6	4,73
	50	111	32,4	3,44	117	28,3	4,12	122	24,9	4,90	127	22,1	5,76
	Minimum	45,9	13,2	3,48	48,3	11,4	4,23	50,7	9,97	5,09	53,1	8,82	6,02

Load = % of cooling capacity compared to the value at full load

kWf = cooling capacity in kW

kWe\_tot = Total power input in kW

Internal heat exchanger water temperature = outlet 7°C / inlet 12°C / variable flow-rate with external exchanger air T.



# Configurations

## D - Partial energy recovery

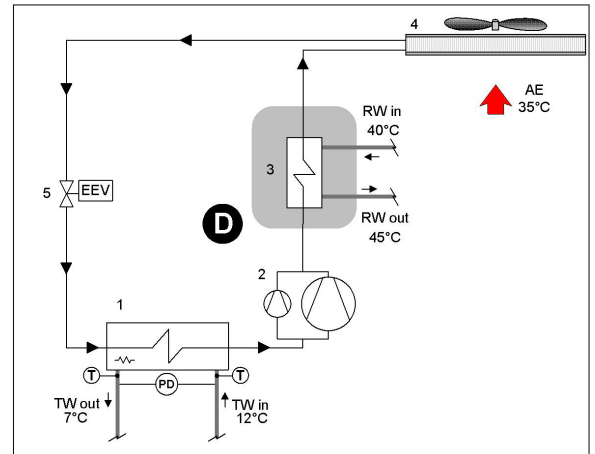
A configuration which enables the production of hot water free-of-charge while operating in the cooling mode, thanks to the partial recovery of condensation heat that would otherwise be disposed of into the external heat source.

This option is also known as “desuperheater”. It is made up of a Inox 316 stainless steel brazed plate heat exchangers, suitable for recovering a part of the capacity dispersed by the unit (the dispersed heating capacity is equal to the sum of the cooling capacity and the electrical input capacity of the compressors).

The partial recovery device is considered to be operating when it is powered by the water flow which is to be heated. This condition improves the unit performance, since it reduces the condensation temperature: in nominal conditions the cooling capacity increases indicatively by 3.2% and the power input of the compressors is reduced by 3.6%.

When the temperature of water to be heated is particularly low, it is necessary to control the flow-rate to maintain the outlet temperature at recovery above 35°C and prevent condensation of the refrigerant in the partial energy recovery device.

The water connections of the partial energy recovery device are 1” 1/4 for all sizes.

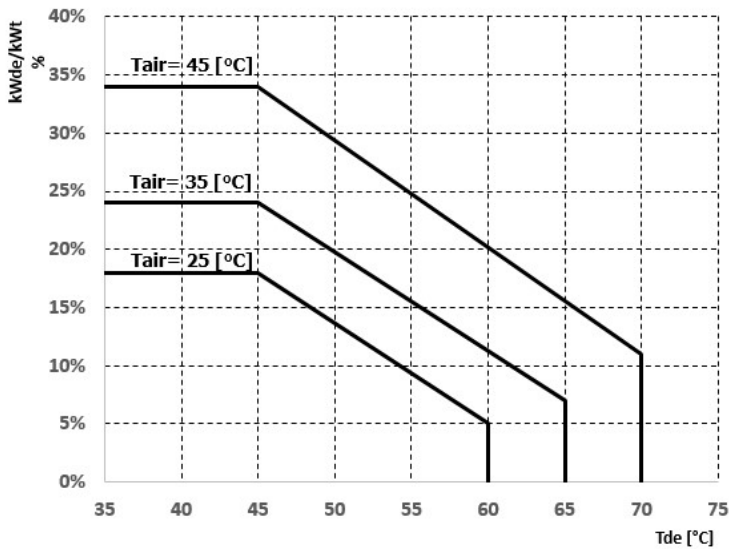


### D - Partial recovery device

- 1 - Internal exchanger
- 2 - Compressors
- 3 - Recovery exchanger
- 4 - External exchanger
- 5 - Electronic expansion valve

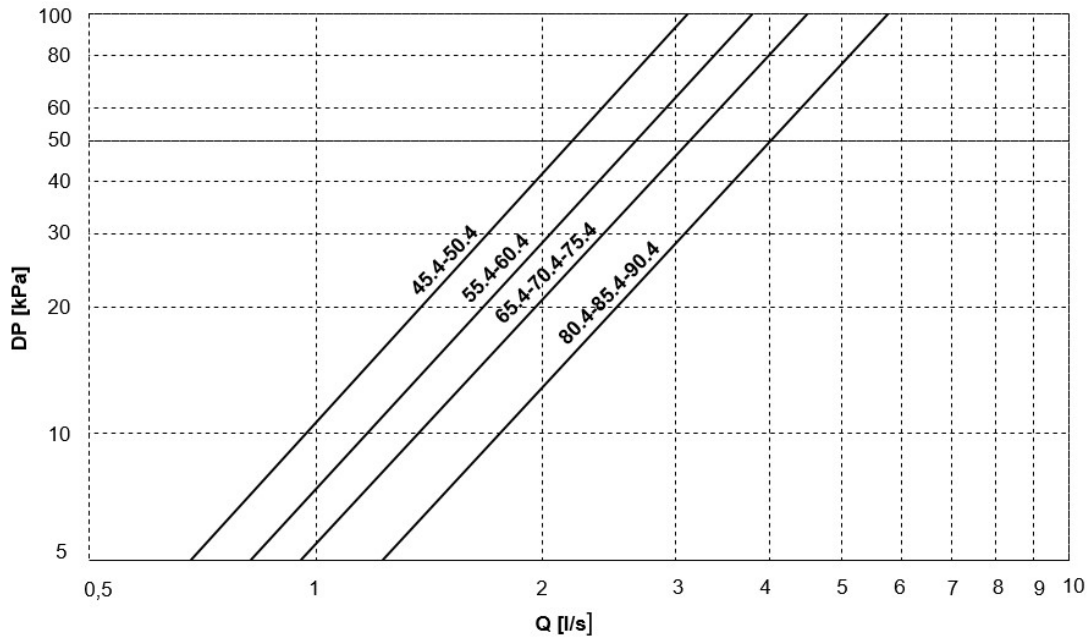
- TW in chilled water inlet
- TW out chilled water outlet
- RW in - Ingresso acqua recupero
- RW out - Uscita acqua recupero
- T - Temperature probe
- PD - Differential pressure switch
- AE Aria esterna

## Partial recovery heating capacity



$kWde/kWt$  = Heat recovered / Condenser heating capacity (cooling capacity + compressor power input) [%]  
 $Tde$  = Desuperheater water outlet temperature [°C]

## Partial energy recovery exchanger pressure drops - Excellence



Q = Water flow-rate[l/s]

DP = Water side pressure drops [kPa]

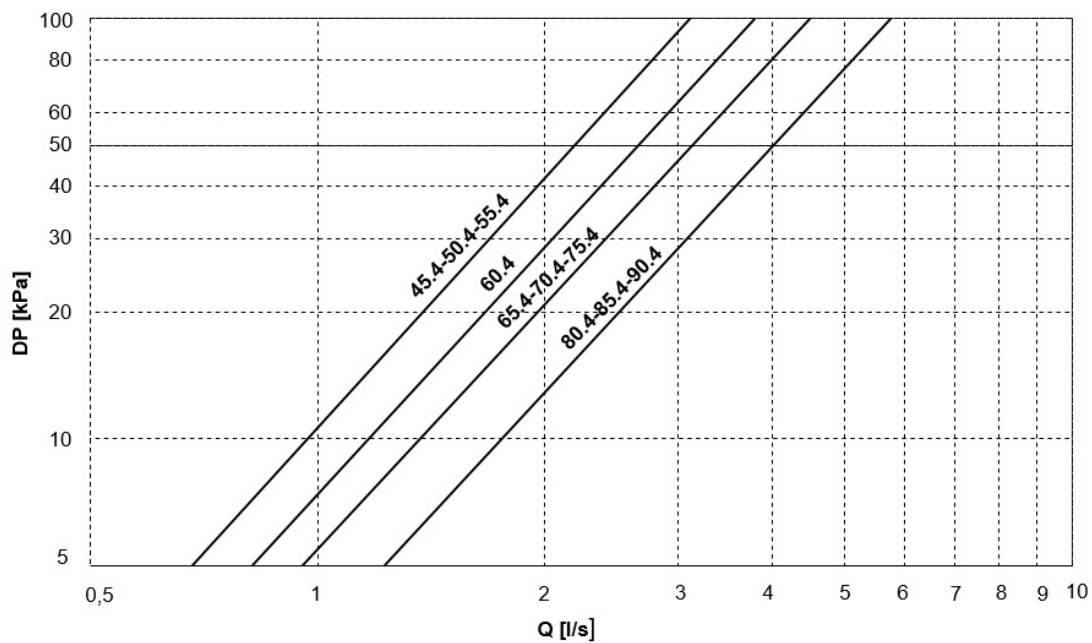
### Admissible water flow-rates

Minimum (Qmin) and maximum (Qmax) admissible water flow rates for correct operation of the unit.

SIZE		45.4	50.4	55.4	60.4	65.4	70.4	75.4	80.4	85.4	90.4
Qmin	[l/s]	0,7	0,7	0,8	0,8	1,0	1,0	1,0	1,2	1,2	1,2
Qmax	[l/s]	3,1	3,1	3,8	3,8	4,5	4,5	4,5	5,7	5,7	5,7

# Configurations

## Partial energy recovery exchanger pressure drops - Premium



Q = Water flow-rate[l/s]  
 DP = Water side pressure drops [kPa]

### Admissible water flow-rates

Minimum (Qmin) and maximum (Qmax) admissible water flow rates for correct operation of the unit.

SIZE		45.4	50.4	55.4	60.4	65.4	70.4	75.4	80.4	85.4	90.4
Qmin	[l/s]	0,7	0,7	0,7	0,8	1,0	1,0	1,2	1,2	1,2	1,2
Qmax	[l/s]	3,1	3,1	3,1	3,8	4,5	4,5	5,7	5,7	5,7	5,7

## 1PM - HydroPack with N° 1 pump

Pumping group consisting of an electric centrifugal pump with cast iron pump body and stainless steel or cast iron impeller (depending on the model).

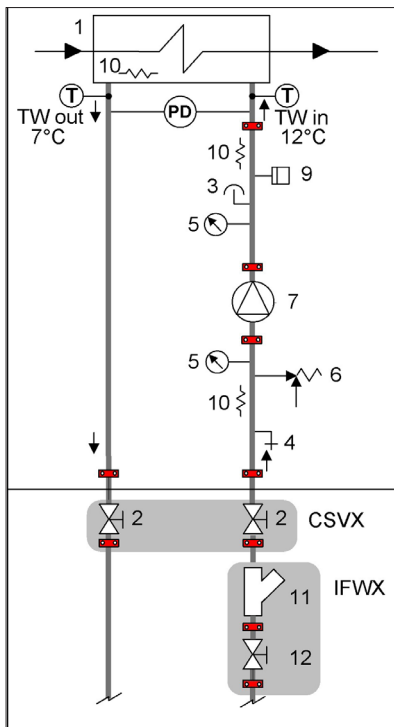
Mechanical seal using ceramic, carbon and EPDM elastomer components.

Three-phase electric motor with IP55 protection rating. Complete with thermoformed insulating casing, quick-release couplings with an insulated casing, safety valve, pressure gauges, system load safety pressure switch, stainless steel immersion antifreeze heaters fitted on the supply and suction lines.

All the water connections are Victaulic.

Option supplied on the unit.

### CONNECTION DIAGRAM 1PM - Group with n° 1 pump



- 1 - Internal exchanger
- 2 - Cutoff valve - (CSVX - Couple of manually operated shut-off valves)
- 3 - Vent valve
- 4 - Discharge stop valve
- 5 - Pressure gauge
- 6 - Safety valve (6 Bar)
- 7 - Packaged electric pump with high efficiency impeller
- 9 - System load safety pressure switch (it avoids the pump operation if water is not present)
- 10 - Antifreeze heater
- 11 - Steel mesh strainer water side - (IFWX)
- 12 - Cutoff valve with quick joints

T - Temperature probe  
PD - Differential pressure switch

TW in chilled water inlet  
TW out chilled water outlet

The grey area indicates further optional components.

- ⚠ Provide hydraulic interceptions outside the unit ('CSVX - Couple of manually operated shut-off valves' option) to facilitate any possible extraordinary maintenance interventions.
- ⚠ **It is necessary to provide a non-return valve for each unit installed in hydraulic parallel and equipped with an hydronic assembly installed on board (Installation by the Customer).**

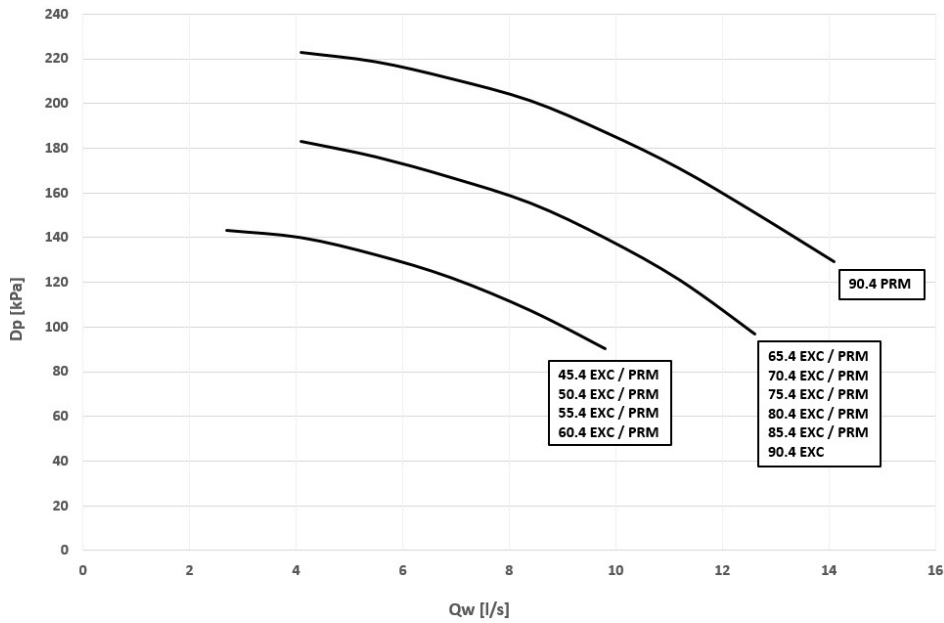
### Hydropack electrical data

PUMP	Nominal capacity [kW]	Rated power [kW]
1PM 45.4-60.4 EXC/PRM	1,5	3,17
1PM 65.4-90.4 EXC / 65.4-85.4 PRM	2,2	4,56
1PM 90.4 PRM	3,0	6,33

# Accessories - Hydronic assembly

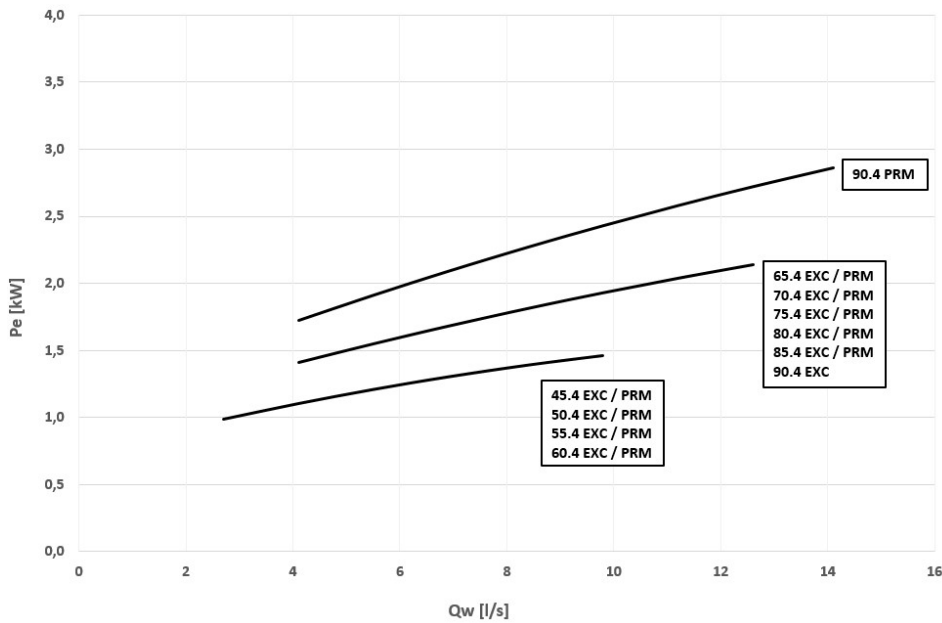
## 1PM - HydroPack with N° 1 pump

### Head



Dp = Pump head [kPa]  
QW = Water flow-rate [l/s]

### Power input



Pe = Power input [kW]  
QW = Water flow-rate [l/s]

## 1PMH - HydroPack with N° 1 high static pressure pump

Pumping group consisting of an electric centrifugal pump with cast iron pump body and stainless steel or cast iron impeller (depending on the model).

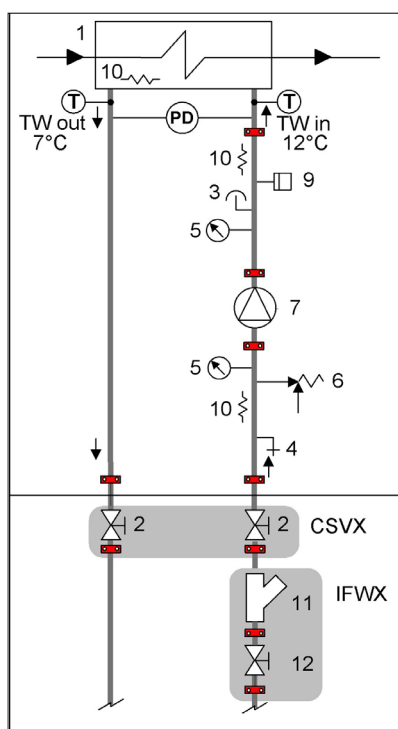
Mechanical seal using ceramic, carbon and EPDM elastomer components.

Three-phase electric motor with IP55 protection rating. Complete with thermoformed insulating casing, quick-release couplings with an insulated casing, safety valve, pressure gauges, system load safety pressure switch, stainless steel immersion antifreeze heaters fitted on the supply and suction lines.

All water fittings are Victaulic.

Option supplied on the unit.

### CONNECTION DIAGRAM 1PMH - Group with 1 high head pump



- 1 - Internal exchanger
- 2 - Cutoff valve - (CSVX - Couple of manually operated shut-off valves)
- 3 - Vent valve
- 4 - Discharge stop valve
- 5 - Pressure gauge
- 6 - Safety valve (6 Bar)
- 7 - Packaged electric pump with high efficiency impeller
- 9 - System load safety pressure switch (it avoids the pump operation if water is not present)
- 10 - Antifreeze heater
- 11 - Steel mesh strainer water side - (IFWX)
- 12 - Cutoff valve with quick joints

T - Temperature probe  
PD - Differential pressure switch

TW in chilled water inlet  
TW out chilled water outlet

The grey area indicates further optional components.

- ⚠ Provide hydraulic interceptions outside the unit ('CSVX - Couple of manually operated shut-off valves' option) to facilitate any possible extraordinary maintenance interventions.
- ⚠ **It is necessary to provide a non-return valve for each unit installed in hydraulic parallel and equipped with an hydronic assembly installed on board (Installation by the Customer).**

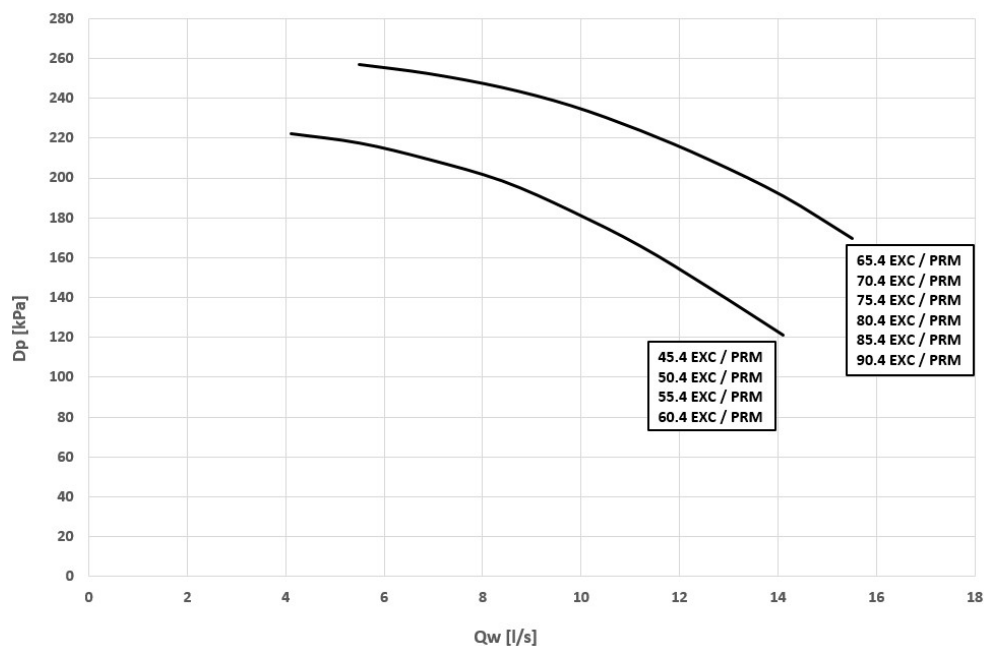
### Hydropack electrical data

POMPA	Potenza nominale [kW]	Corrente assorbita nominale [A]
1PMH 45.4-60.4 EXC/PRM	3,0	6,33
1PMH 65.4-90.4 EXC/PRM	4,0	7,62

# Accessories - Hydronic assembly

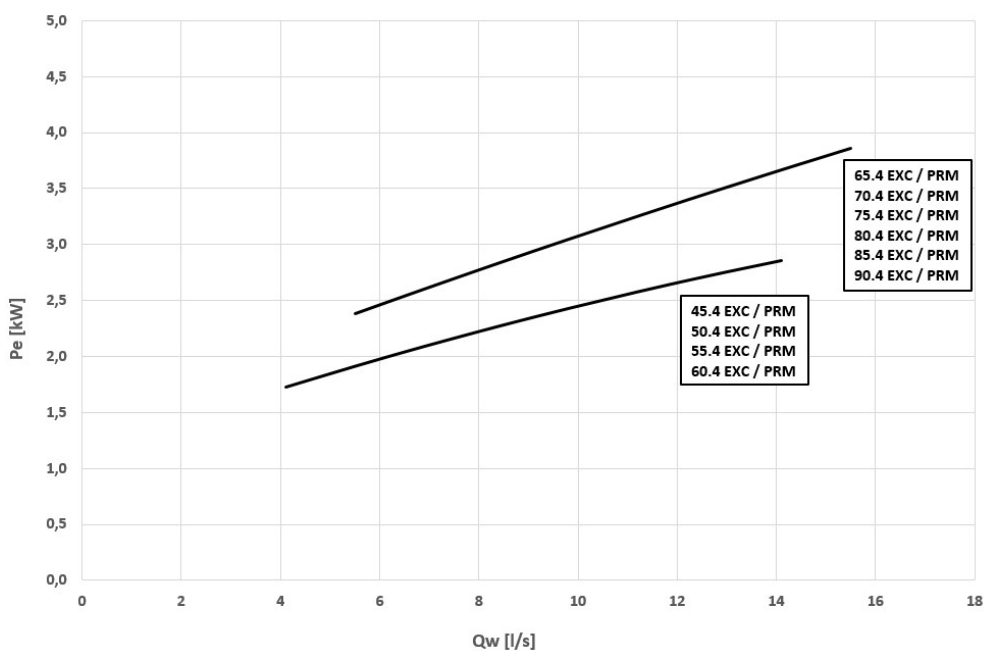
## 1PMH - HydroPack with N° 1 high static pressure pump

### Head



Dp = Pump head [kPa]  
QW = Water flow-rate [l/s]

### Power input



Pe = Power input [kW]  
QW = Water flow-rate [l/s]

## 1PMV - User side Hydropack with 1 inverter pump

Pumping group consisting of an electric pump controlled by inverter to adapt to different conditions of use.

It enables the automatic reduction of the liquid flow-rate in critical conditions, avoiding blocks due to overloading and consequential intervention work by specialised technical personnel.

Through the inverter calibration, standard supplied, it is possible to adapt the pump flow-rate/head to the installation feature.

Centrifugal electric pump with the pump body made of cast iron and the impeller made stainless steel or cast iron (depending on the models)

Mechanical seal using ceramic, carbon and EPDM elastomer components.

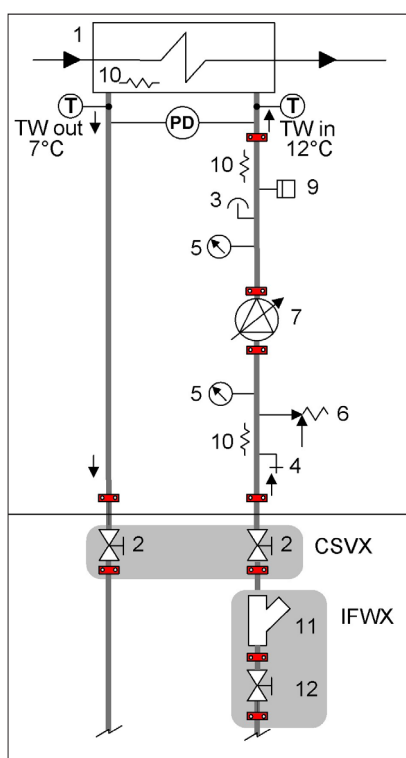
Three-phase electric motor with IP55 protection rating. Complete with thermoformed insulating casing, quick-release couplings with an insulated casing, safety valve, pressure gauges, system load safety pressure switch, stainless steel immersion antifreeze heaters fitted on the suction and supply lines.

In combination with the "IVFDT" - Variable flow-rate control option, it allows variation of the water flow-rate to the system under partial-load to achieve the highest unit efficiency and lower consumption of the pumping group.

All water fittings are Victaulic.

Option supplied on the unit.

## CONNECTION DIAGRAM 1PMV - Group with n° 1 inverter pump



- 1 - Internal exchanger
- 2 - Cutoff valve - (CSVX - Couple of manually operated shut-off valves)
- 3 - Vent valve
- 4 - Discharge stop valve
- 5 - Pressure gauge
- 6 - Safety valve (6 Bar)
- 7 - Packaged electric pump with high efficiency impeller
- 9 - System load safety pressure switch (it avoids the pump operation if water is not present)
- 10 - Antifreeze heater
- 11 - Steel mesh strainer water side - (IFWX)
- 12 - Cutoff valve with quick joints

T - Temperature probe  
PD - Differential pressure switch

TW in chilled water inlet  
TW out chilled water outlet

The grey area indicates further optional components.

- ⚠ Provide hydraulic interceptions outside the unit ('CSVX - Couple of manually operated shut-off valves' option) to facilitate any possible extraordinary maintenance interventions.
- ⚠ It is necessary to provide a non-return valve for each unit installed in hydraulic parallel and equipped with an hydronic assembly installed on board (Installation by the Customer).

## Hydropack electrical data

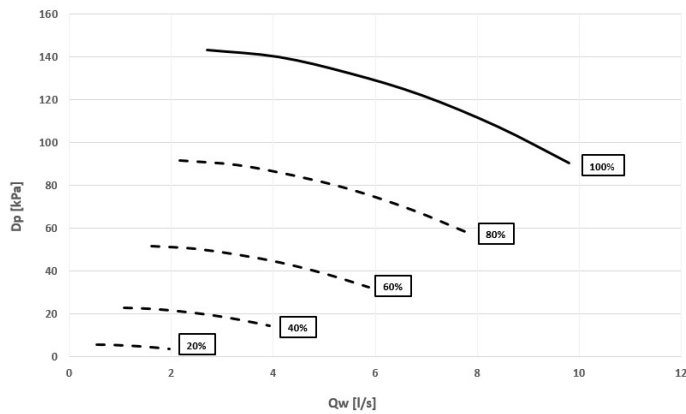
POMPA	Potenza nominale [kW]	Corrente assorbita nominale [A]
1PMV 45.4-60.4 EXC/PRM	1,5	3,17
1PMV 65.4-90.4 EXC / 65.4-85.4 PRM	2,2	4,56
1PMV 90.4 PRM	3,0	6,33



# Accessories - Hydronic assembly

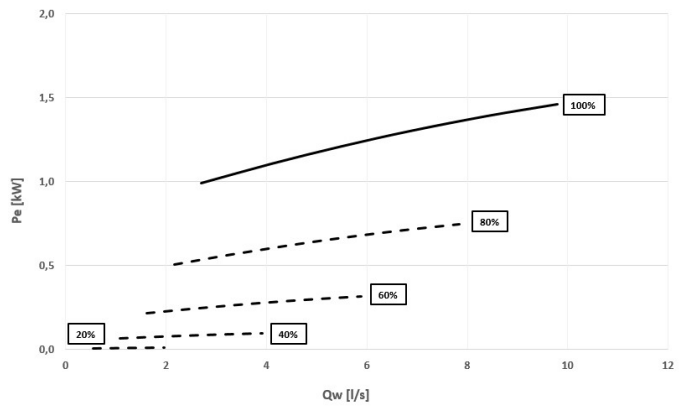
## 1PMV - User side Hydropack with 1 inverter pump

### Head - Size 45.4 - 60.4 EXC/PRM



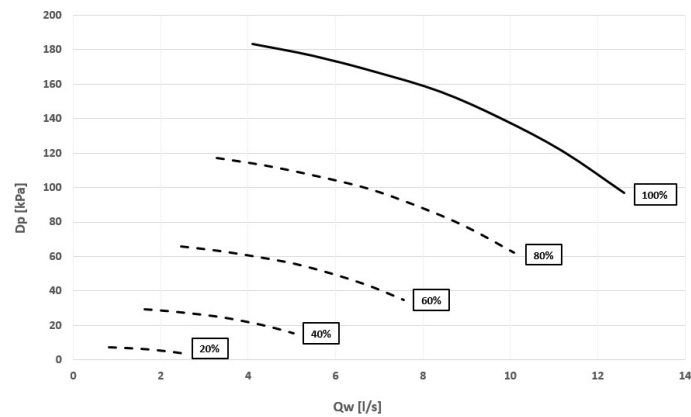
Dp = Pump head [kPa]  
QW = Water flow-rate [l/s]

### Power input - Size 45.4 - 60.4 EXC/PRM



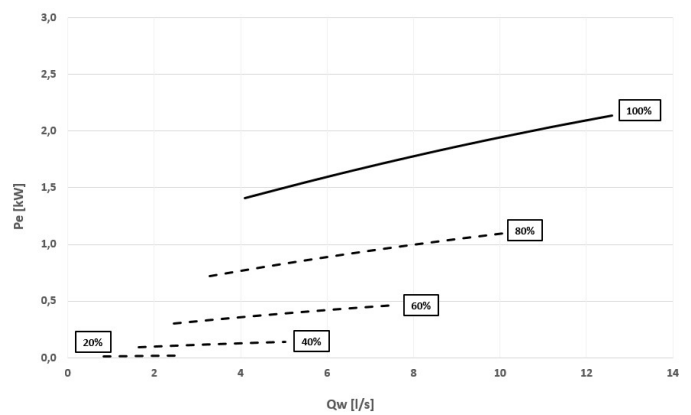
Pe = Power input [kW]  
QW = Water flow-rate [l/s]

### Head - Size 65.4 - 90.4 EXC / 65.4 - 85.4 PRM



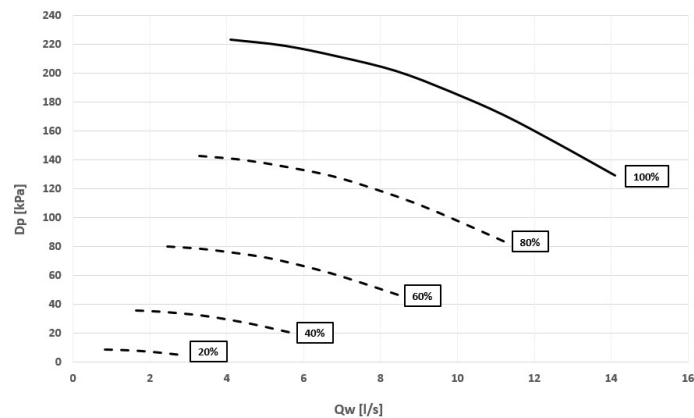
Dp = Pump head [kPa]  
QW = Water flow-rate [l/s]

### Power input - Size 65.4 - 90.4 EXC / 65.4 - 85.4 PRM



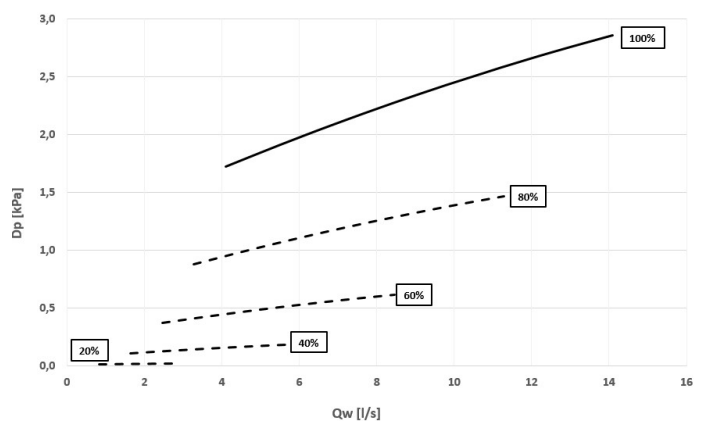
Pe = Power input [kW]  
QW = Water flow-rate [l/s]

### Head - Size 90.4 PRM



Dp = Pump head [kPa]  
QW = Water flow-rate [l/s]

### Power input - Size 90.4 PRM



Pe = Power input [kW]  
QW = Water flow-rate [l/s]

## 1PMVH - User side Hydropack with 1 high head inverter pump

Pumping group consisting of an electric pump controlled by inverter to adapt to different conditions of use.

It enables the automatic reduction of the liquid flow-rate in critical conditions, avoiding blocks due to overloading and consequential intervention work by specialised technical personnel.

Through the inverter calibration, standard supplied, it is possible to adapt the pump flow-rate/head to the installation feature.

Centrifugal electric pump with the pump body made of cast iron and the impeller made stainless steel or cast iron (depending on the models)

Mechanical seal using ceramic, carbon and EPDM elastomer components.

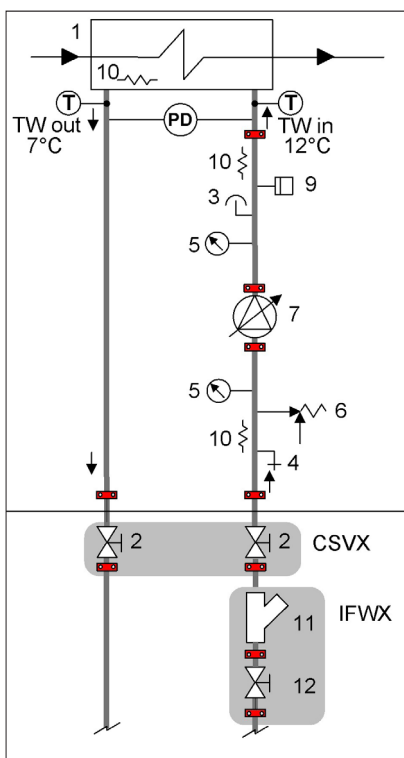
Three-phase electric motor with IP55 protection rating. Complete with thermoformed insulating casing, quick-release couplings with an insulated casing, safety valve, pressure gauges, system load safety pressure switch, stainless steel immersion antifreeze heaters fitted on the suction and supply lines.

In combination with the "IVFDT" - Variable flow-rate control option, it allows variation of the water flow-rate to the system under partial-load to achieve the highest unit efficiency and lower consumption of the pumping group.

All water fittings are Victaulic.

Option supplied on the unit.

### CONNECTION DIAGRAM 1PMVH - Group with 1 inverter pump



- 1 - Internal exchanger
- 2 - Cutoff valve - (CSVX - Couple of manually operated shut-off valves)
- 3 - Vent valve
- 4 - Discharge stop valve
- 5 - Pressure gauge
- 6 - Safety valve (6 Bar)
- 7 - Packaged electric pump with high efficiency impeller
- 9 - System load safety pressure switch (it avoids the pump operation if water is not present)
- 10 - Antifreeze heater
- 11 - Steel mesh strainer water side - (IFWX)
- 12 - Cutoff valve with quick joints

T - Temperature probe  
PD - Differential pressure switch

TW in chilled water inlet  
TW out chilled water outlet

The grey area indicates further optional components.

- ⚠ Provide hydraulic interceptions outside the unit ("CSVX - Couple of manually operated shut-off valves" option) to facilitate any possible extraordinary maintenance interventions.
- ⚠ It is necessary to provide a non-return valve for each unit installed in hydraulic parallel and equipped with an hydronic assembly installed on board (Installation by the Customer).

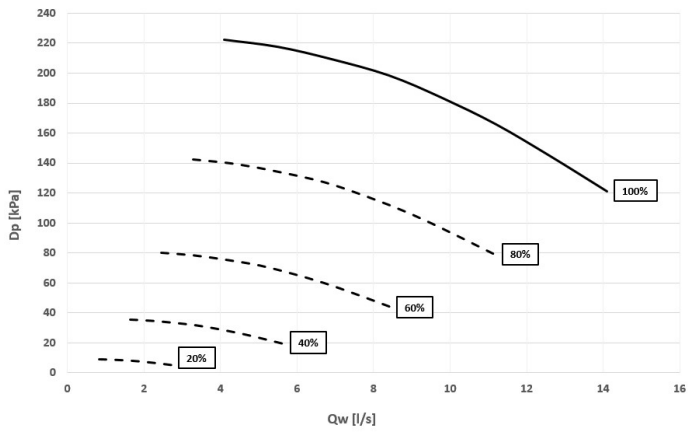
### Hydropack electrical data

POMPA	Potenza nominale [kW]	Corrente assorbita nominale [A]
1PMVH 45.4-60.4 EXC/PRM	3,0	6,33
1PMVH 65.4-90.4 EXC/PRM	4,0	7,62

# Accessories - Hydronic assembly

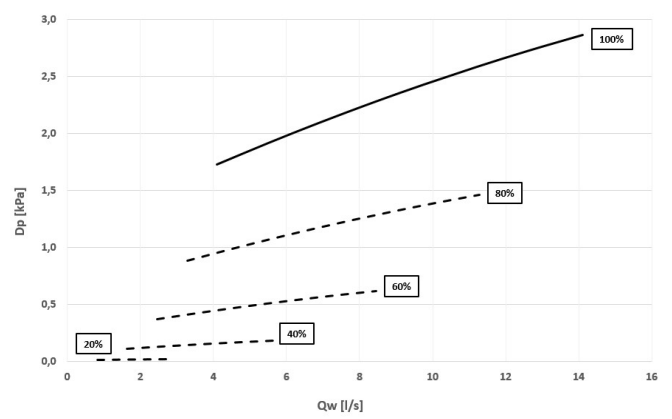
## 1PMVH - User side Hydropack with 1 high head inverter pump

Head - Size 45.4 - 60.4 EXC/PRM



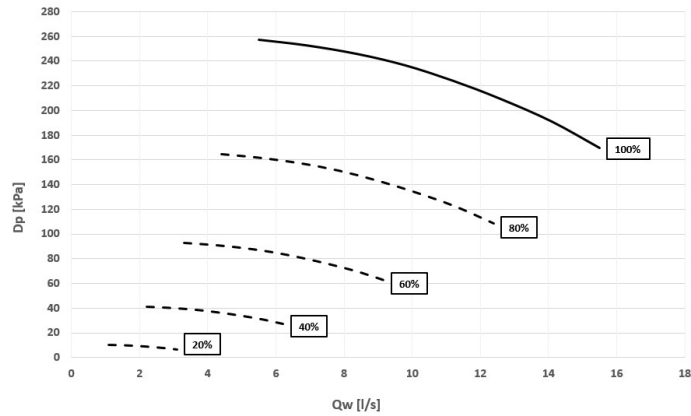
Dp = Pump head [kPa]  
QW = Water flow-rate [l/s]

Power input - Size 45.4 - 60.4 EXC/PRM



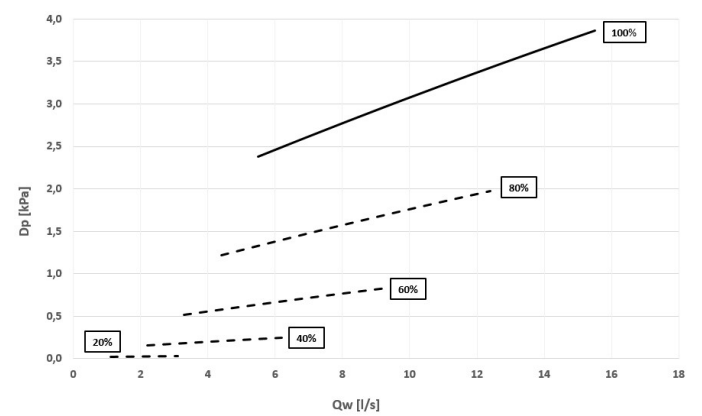
Pe = Power input [kW]  
QW = Water flow-rate [l/s]

Head - Size 65.4 - 90.4 EXC/PRM



Dp = Pump head [kPa]  
QW = Water flow-rate [l/s]

Power input - Size 65.4 - 90.4 EXC/PRM



Pe = Power input [kW]  
QW = Water flow-rate [l/s]

## 1P1SB - Hydropack with 1 pump + 1 stand-by

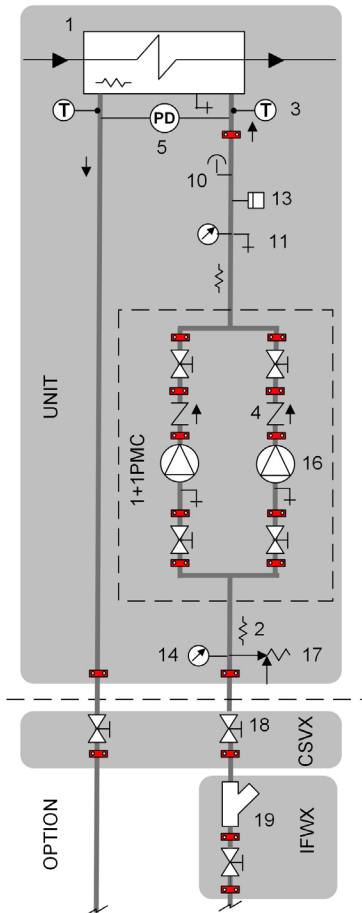
Pumping group consisting of 1+1 electric pump (1 stand-by) with cast iron pump body and stainless steel or cast iron impeller (depending on the model). Mechanical seal using ceramic, carbon and EPDM elastomer components.

Three-phase electric motor with IP55 protection rating. Complete with thermoformed insulating casing, quick-release couplings with an insulated casing, safety valve, pressure gauges, system load safety pressure switch, stainless steel immersion antifreeze heaters fitted on the supply and suction lines.

All water fittings are Victaulic.

Option supplied on the unit.

### CONNECTION DIAGRAM 1P1SB - Hydropack with 1 pump + 1 stand-by



1. Exchanger
2. Antifreeze heater
3. Water temperature probe
4. Non-return valve
5. Differential pressure switch
10. Vent
11. Drain
13. System load safety pressure switch
14. Pressure gauge
16. Packaged electric pump with high efficiency impeller
17. Safety valve
18. Shut-off valve
19. Filter

T - Temperature probe  
PD - Differential pressure switch

TW in chilled water inlet  
TW out chilled water outlet

- ⚠ Provide hydraulic interceptions outside the unit ('CSVX - Couple of manually operated shut-off valves' option) to facilitate any possible extraordinary maintenance interventions.
- ⚠ The head and consumption graphs of the pumping group refer to operation with pure water. If there is a water-glycol mix, please contact Clivet's office to check the correct operating point of the pumping group.

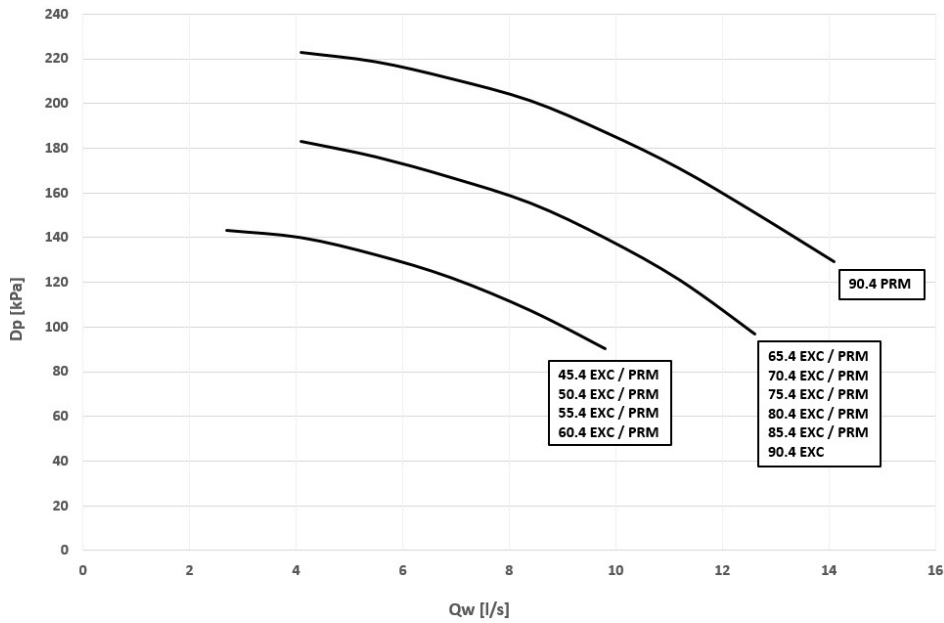
### Hydropack electrical data

PUMP	Nominal capacity [kW]	Rated current input [A]
1P1SB 45.4-60.4 EXC/PRM	1,5	3,17
1P1SB 65.4-90.4 EXC / 65.4-85.4 PRM	2,2	4,56
1P1SB 90.4 PRM	3,0	6,33

# Accessories - Hydronic assembly

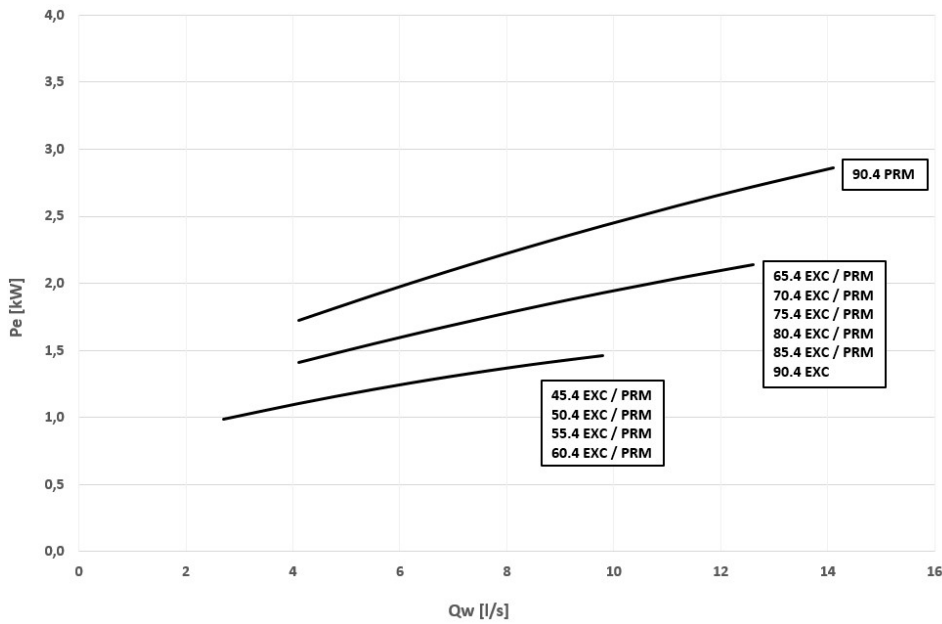
## 1P1SB - Hydropack with 1 pump + 1 stand-by

### Head



Dp = Pump head [kPa]  
QW = Water flow-rate [l/s]

### Power input



Pe = Power input [kW]  
QW = Water flow-rate [l/s]

## 1PAP+S - Hydropack with 1 high head pump + 1 standby

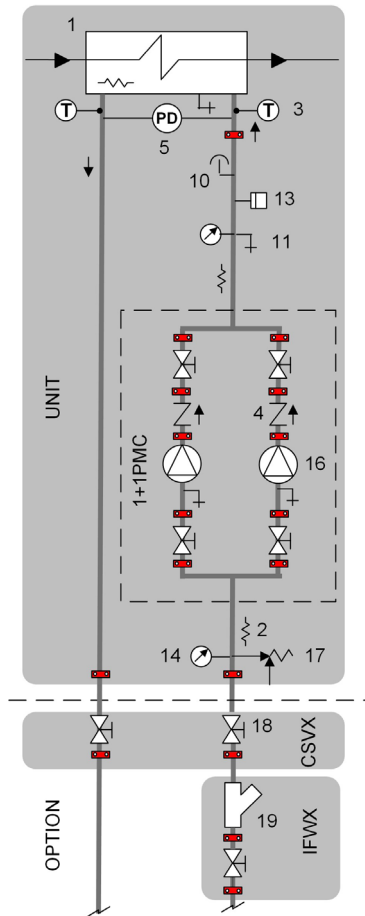
Pumping group consisting of 1+1 electric pump (1 stand-by) with cast iron pump body and stainless steel or cast iron impeller (depending on the model). Mechanical seal using ceramic, carbon and EPDM elastomer components.

Three-phase electric motor with IP55 protection rating. Complete with thermoformed insulating casing, quick-release couplings with an insulated casing, safety valve, pressure gauges, system load safety pressure switch, stainless steel immersion antifreeze heaters fitted on the supply and suction lines.

All water fittings are Victaulic.

Option supplied on the unit.

## CONNECTION DIAGRAM 1PAP+S - Group with 1 high head pump + 1 standby



1. Exchanger
2. Antifreeze heater
3. Water temperature probe
4. Non-return valve
5. Differential pressure switch
10. Vent
11. Drain
13. System load safety pressure switch
14. Pressure gauge
16. Packaged electric pump with high efficiency impeller
17. Safety valve
18. Shut-off valve
19. Filter

T - Temperature probe  
PD - Differential pressure switch

TW in chilled water inlet  
TW out chilled water outlet

- ⚠ Provide hydraulic interceptions outside the unit ('CSVX - Couple of manually operated shut-off valves' option) to facilitate any possible extraordinary maintenance interventions.
- ⚠ The head and consumption graphs of the pumping group refer to operation with pure water. If there is a water-glycol mix, please contact Clivet's office to check the correct operating point of the pumping group.

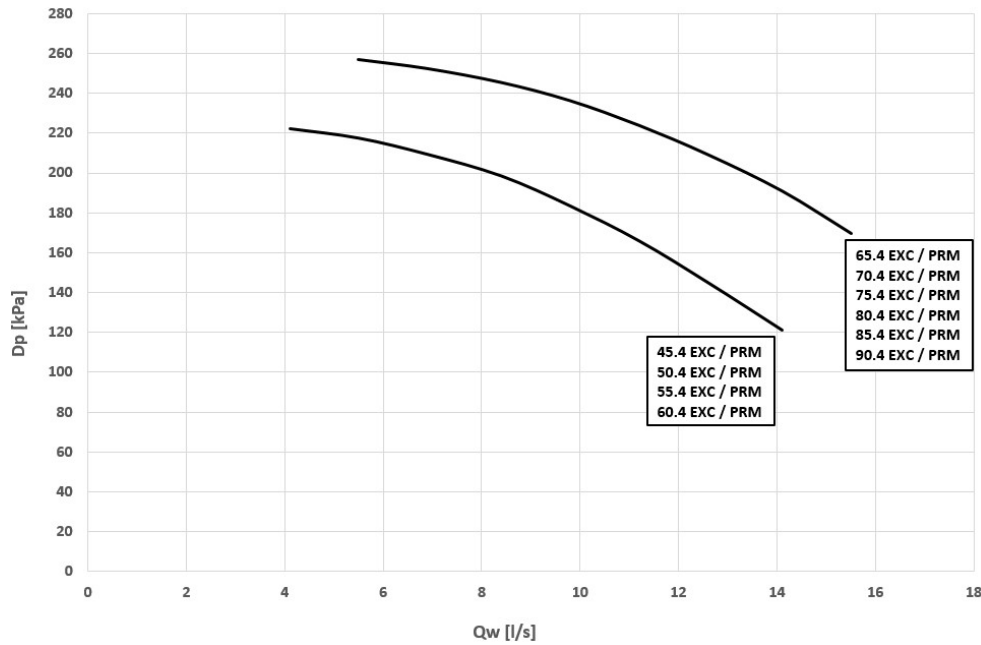
## Hydropack electrical data

PUMP	Nominal capacity [kW]	Rated power [kW]
1PAP+S 45.4-60.4 EXC/PRM	3,0	6,33
1PAP+S 65.4-90.4 EXC/PRM	4,0	7,62

# Accessories - Hydronic assembly

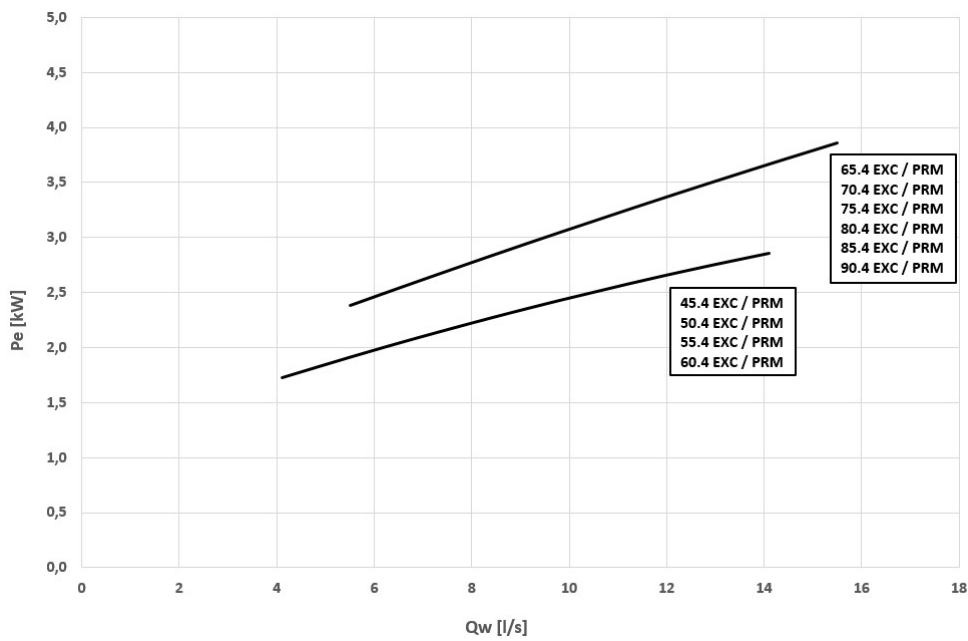
## 1PAP+S - Hydpack with 1 high head pump + 1 standby

### Head



Dp = Pump head [kPa]  
QW = Water flow-rate [l/s]

### Power input



Pe = Power input [kW]  
QW = Water flow-rate [l/s]

## 1P1SBV - User side Hydropack with 1 inverter pump and 1 stand-by pump with dedicated inverter

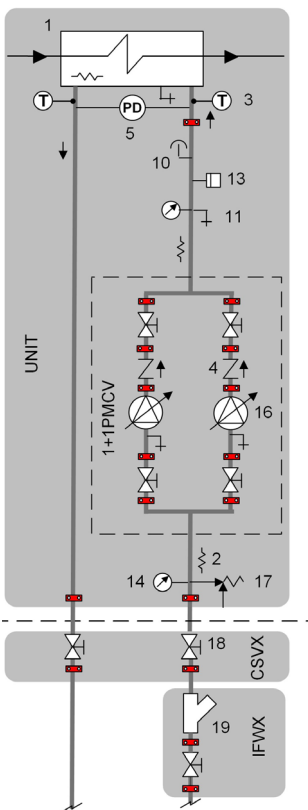
Pumping group consisting of 1+1 electric pump (1 stand-by) with cast iron pump body and stainless steel or cast iron impeller (depending on the model). Mechanical seal using ceramic, carbon and EPDM elastomer components.

Three-phase electric motor with IP55 protection rating. Complete with thermoformed insulating casing, quick-release couplings with an insulated casing, safety valve, pressure gauges, system load safety pressure switch, stainless steel immersion antifreeze heaters fitted on the supply and suction lines.

All water fittings are Victaulic.

Option supplied on the unit.

### CONNECTION DIAGRAM 1P1SBV - Group with 1 inverter pump and 1 stand-by pump with dedicated inverter



1. Exchanger
2. Antifreeze heater
3. Water temperature probe
4. Non-return valve
5. Differential pressure switch
10. Vent
11. Drain
13. System load safety pressure switch
14. Pressure gauge
16. Packaged electric pump with high efficiency impeller
17. Safety valve
18. Shut-off valve
19. Filter

T - Temperature probe  
PD - Differential pressure switch

TW in chilled water inlet  
TW out chilled water outlet

⚠ Provide hydraulic interceptions outside the unit ('CSVX - Couple of manually operated shut-off valves' option) to facilitate any possible extraordinary maintenance interventions.

⚠ The head and absorption graphs of the hydronic assembly refer to operation with pure water. In the presence of a mixture of water and glycol, please contact Clivet office to check the correct operating point of the hydronic assembly.

### Hydropack electrical data

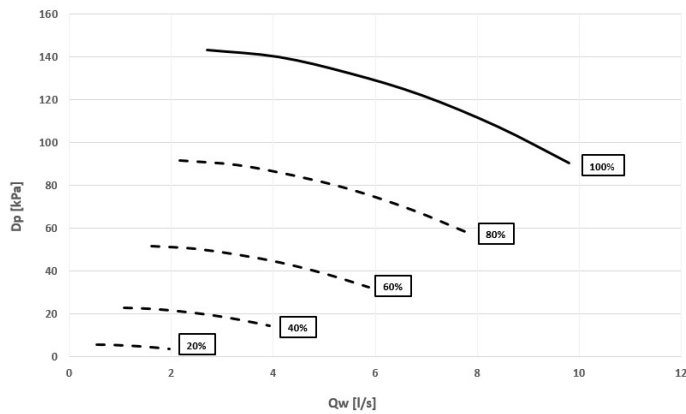
POMPA	Potenza nominale [kW]	Corrente assorbita nominale [A]
1P1SBV 45.4-60.4 EXC/PRM	1,5	3,17
1P1SBV 65.4-90.4 EXC / 65.4-85.4 PRM	2,2	4,56
1P1SBV 90.4 PRM	3,0	6,33



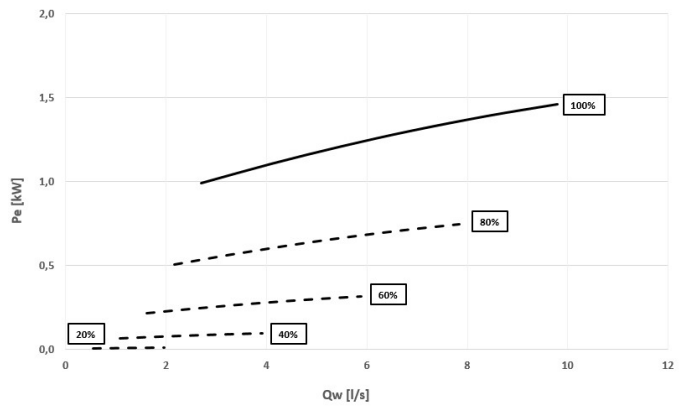
# Accessories - Hydronic assembly

## 1P1SBV - User side Hydropack with 1 inverter pump and 1 stand-by pump with dedicated inverter

### Head - Size 45.4 - 60.4 EXC/PRM



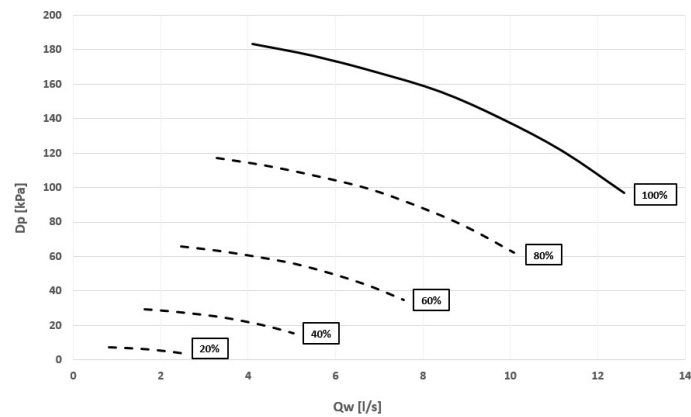
### Power input - Size 45.4 - 60.4 EXC/PRM



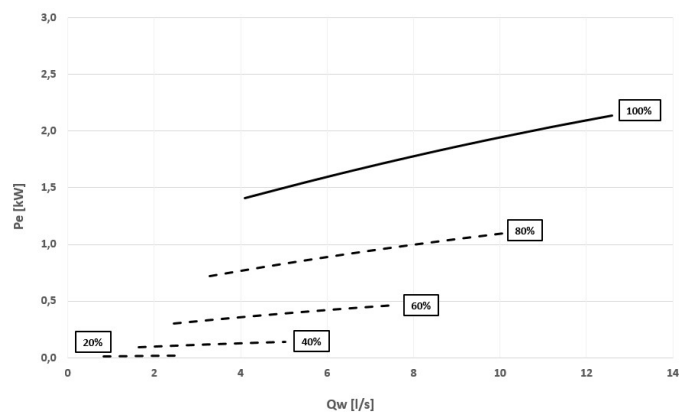
Dp = Pump head [kPa]  
QW = Water flow-rate [l/s]

Pe = Power input [kW]  
QW = Water flow-rate [l/s]

### Head - Size 65.4 - 90.4 EXC / 65.4-85.4 PRM



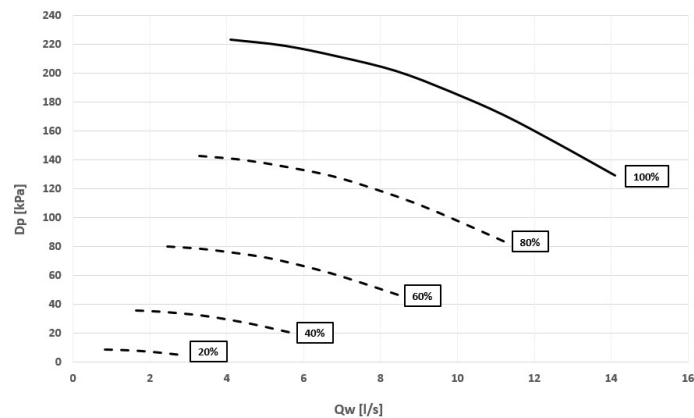
### Power input - Size 65.4 - 90.4 EXC / 65.4-85.4 PRM



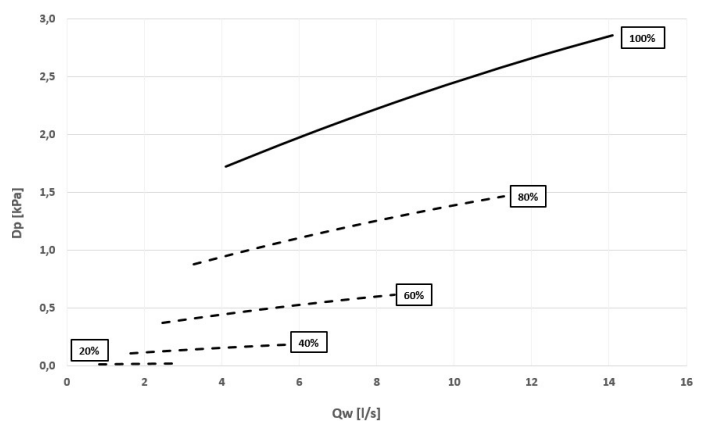
Dp = Pump head [kPa]  
QW = Water flow-rate [l/s]

Pe = Power input [kW]  
QW = Water flow-rate [l/s]

### Head - Size 90.4 PRM



### Assorbimento - Size 90.4 PRM



Dp = Pump head [kPa]  
QW = Water flow-rate [l/s]

Pe = Power input [kW]  
QW = Water flow-rate [l/s]

## 1PAPSV - User side Hydropack with 1 high head inverter pump and 1 standby pump with dedicated inverter

Pumping group consisting of 1+1 electric pump (1 stand-by) controlled by inverter to adapt to different conditions of use.

It enables the automatic reduction of the liquid flow-rate in critical conditions, avoiding blocks due to overloading and consequential intervention work by specialised technical personnel.

Through the inverter calibration, standard supplied, it is possible to adapt the pump flow-rate/head to the installation feature.

Centrifugal electric pump with the pump body made of cast iron and the impeller made stainless steel or cast iron (depending on the models)

Mechanical seal using ceramic, carbon and EPDM elastomer components.

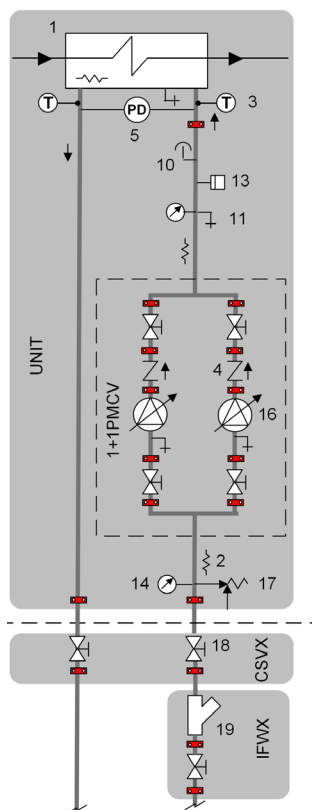
Three-phase electric motor with IP55 protection rating. Complete with thermoformed insulating casing, quick-release couplings with an insulated casing, safety valve, pressure gauges, system load safety pressure switch, stainless steel immersion antifreeze heaters fitted on the suction and supply lines.

In combination with the "IVFDT" - Variable flow-rate control option, it allows variation of the water flow-rate to the system under partial-load to achieve the highest unit efficiency and lower consumption of the pumping group.

All water fittings are Victaulic.

Option supplied on the unit.

## CONNECTION DIAGRAM 1PAPSV - Group with 1 high head inverter pump and 1 standby pump with dedicated inverter



1. Exchanger
2. Antifreeze heater
3. Water temperature probe
4. Non-return valve
5. Differential pressure switch
10. Vent
11. Drain
13. System load safety pressure switch
14. Pressure gauge
16. Packaged electric pump with high efficiency impeller
17. Safety valve
18. Shut-off valve
19. Filter

T - Temperature probe  
PD - Differential pressure switch

TW in chilled water inlet  
TW out chilled water outlet

⚠ Provide hydraulic interceptions outside the unit ('CSVX - Couple of manually operated shut-off valves' option) to facilitate any possible extraordinary maintenance interventions.

⚠ The head and absorption graphs of the hydronic assembly refer to operation with pure water. In the presence of a mixture of water and glycol, please contact Clivet office to check the correct operating point of the hydronic assembly.

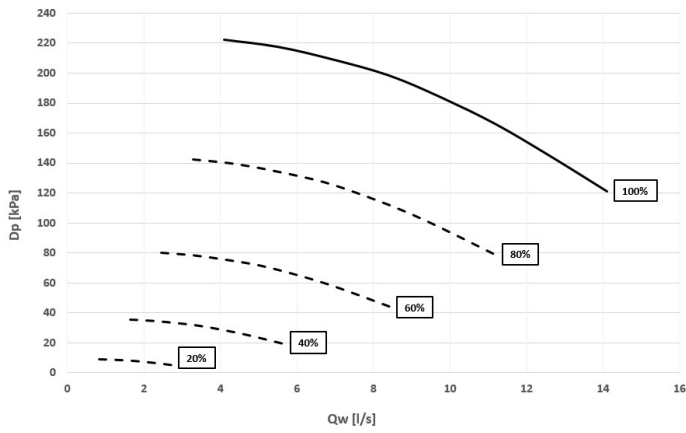
### Hydropack electrical data

POMPA	Potenza nominale [kW]	Corrente assorbita nominale [A]
1PAPSV 45.4-60.4 EXC/PRM	3,0	6,33
1PAPSV 65.4-90.4 EXC/PRM	4,0	7,62

# Accessories - Hydronic assembly

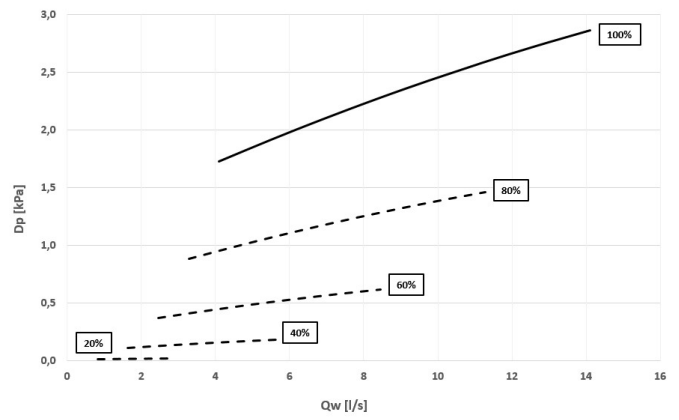
## 1PAPSV - User side Hydropack with 1 high head inverter pump and 1 standby pump with dedicated inverter

Head - Size 45.4 - 60.4 EXC/PRM



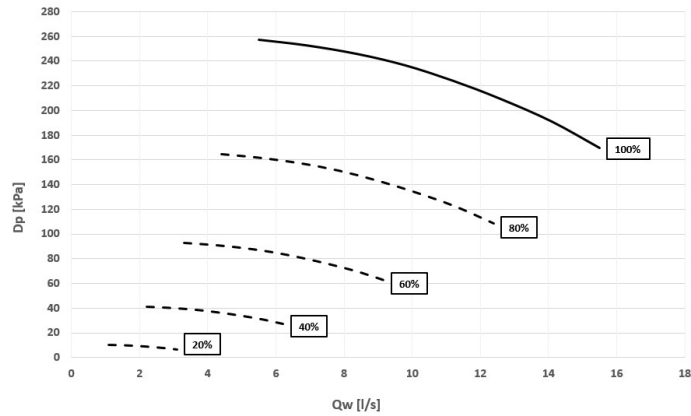
Dp = Pump head [kPa]  
Qw = Water flow-rate [l/s]

Power input - Size 45.4 - 60.4 EXC/PRM



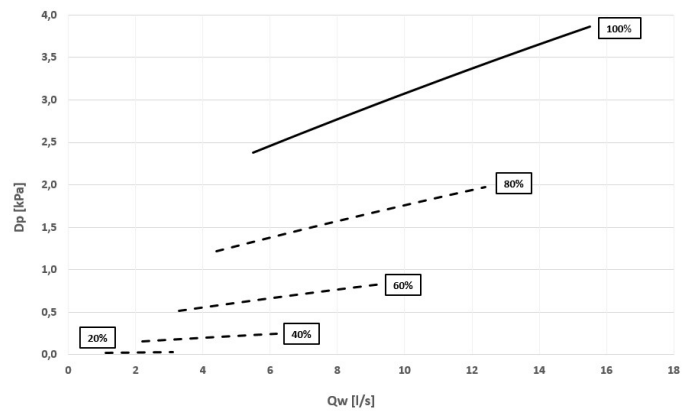
Pe = Power input [kW]  
Qw = Water flow-rate [l/s]

Head - Size 65.4 - 90.4 EXC/PRM



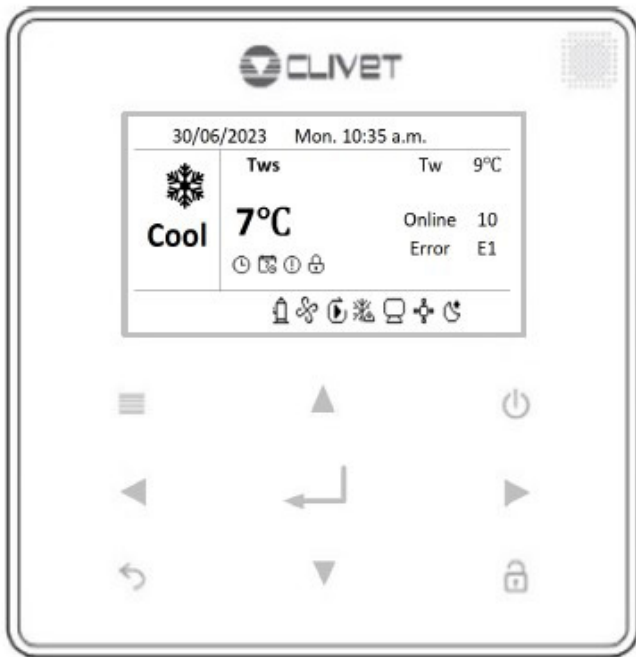
Dp = Pump head [kPa]  
Qw = Water flow-rate [l/s]

Power input - Size 65.4 - 90.4 EXC/PRM



Pe = Power input [kW]  
Qw = Water flow-rate [l/s]

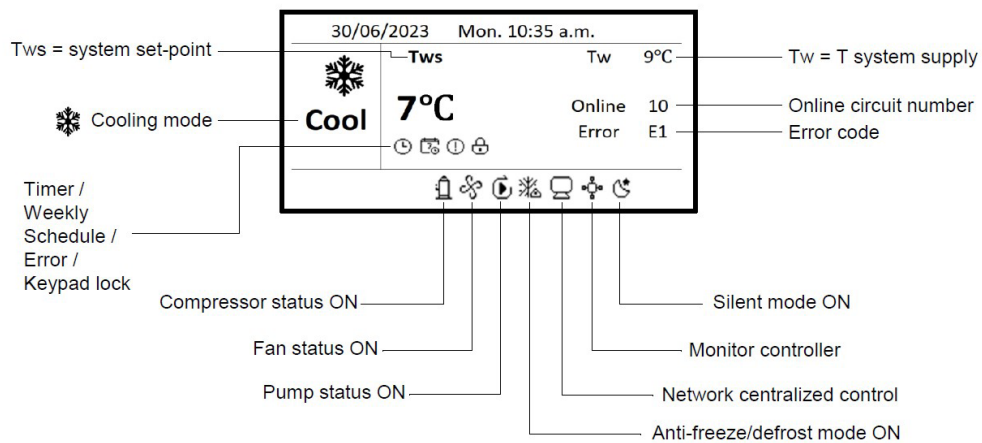
## User interface (HMI)



Resolution	1°C	
Temperature sensor	NTC 5k 1%	
Power input	< 1 W	
Storage temperature	-20÷50°C	
Communication	RS485	
Wiring	Type	Shielded cable
	MAX Length	40 m

The unit is equipped with a user interface (HMI) installed on board, to be used for managing the functions and equipped with an integrated temperature probe.

The user interface comes standard with 22 selectable languages: Italian / English / French / Spanish / Polish / Portuguese / German / Dutch / Romanian / Russian / Turkish / Greek / Swedish / Slovenian / Czech / Slovakian / Bulgarian / Serbian / Danish / Ukrainian / Hungarian / Croatian



# Features and options

## Double Set-Point function

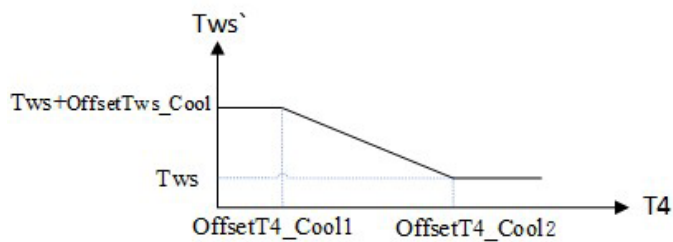
It allows to enable the Double setpoint function with HMI. Once enabled, you need to configure the first target water temperature (SetPoint1) and second target water temperature (SetPoint2). At this point the unit detects the closed status of the Double\_SP door (normally open). If the contact is open, the unit will operate at the first target water temperature; otherwise, it will operate at the second target temperature.

## Set-Point compensation function based on the outside air temperature

Allows to enable the temperature compensation function via HMI. Once the function has been enabled, it is necessary to set:

- The two offset points for the external air temperature (OffsetT4\_1 ; OffsetT4\_2), which will define the external air temperature field on which the set-point variation will take place;
- The offset point for the water production temperature (OffsetTws) which represents the maximum variation of the set-point allowed. Consequently the unit will update the proportional set-point according to the calculation cycle of the compensation function.

## Example of temperature compensation in heating



- When the external air temperature ( $T_4$ ) is lower than the offset one ( $T_4 < \text{Offset}T_4\_Cool1$ ) the set-point remains unchanged
- When the external air temperature ( $T_4$ ) is between the two offset temperatures ( $\text{Offset}T_4\_Cool1 \leq T_4 < \text{Offset}T_4\_Cool2$ ), the set-point is reduced in direct proportion to the increase in external air temperature.
- When the outside air temperature ( $T_4$ ) is higher than the highest offset temperature ( $T_4 \geq \text{Offset}T_4\_Cool2$ ) there will be the maximum reduction in the set-point temperature.

## ENEMON function

Through the HMI it is possible to access the display of the main energy parameters of the displayed circuit and in detail

Power Output = instantaneous power produced in kW

Power Input = instantaneous power absorbed in kW

Current efficiency = instantaneous efficiency represents the EER or the COP

Total energy production is the cumulative energy produced in MWh

The total energy input is the cumulative energy input in MWh

STATE QUERY	
POWER OUTPUT	100 KW
POWER INPUT	50 KW
CURRENT EFFICIENCY	2
TOTAL ENERGY OUTPUT	10 MWh
TOTAL ENERGY INPUT	3 MWh
BACK	2/2 ▲▼ ◀▶

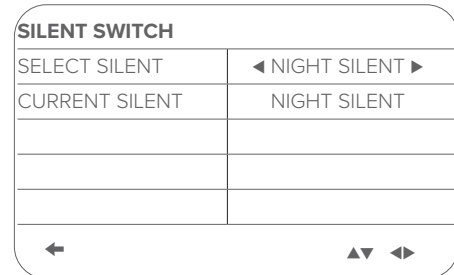
All energy meter display items are available via Modbus, on addresses from  $232 + (\text{Circuit adress}) * 100$  a  $236 + (\text{Circuit adress}) * 100$ .

## SILENT function

The function allows to select up to four acoustic modes, for maximum sound configurability of the units. For three of these modes, Standard, Silent and Supersilent, the heating/cooling capacity, efficiencies and sound levels of all sizes are shown in the general technical data section of the bulletin, as well as on the navigator.

The Night Mode configuration, on the other hand, allows for a further reduction in the sound level of up to 3 dB(A) compared to the supersilent mode, for an even lower acoustic impact of the unit.

To select the mode of interest, simply set it from the HMI through the User menu as shown in the following screen.



## Smart Grid & EVU functions (REMAU option required)

The unit is certified Smart Grid Ready and is equipped with logic for connection to devices that balance the loads connected to the electric grid and optimize general electricity consumption. The connection is optional, the function can be enabled from the REMAU and is linked to the ON/OFF SG input, which receives a status signal from the electrical network.

The regulation logic of the contacts SG and EVU is:

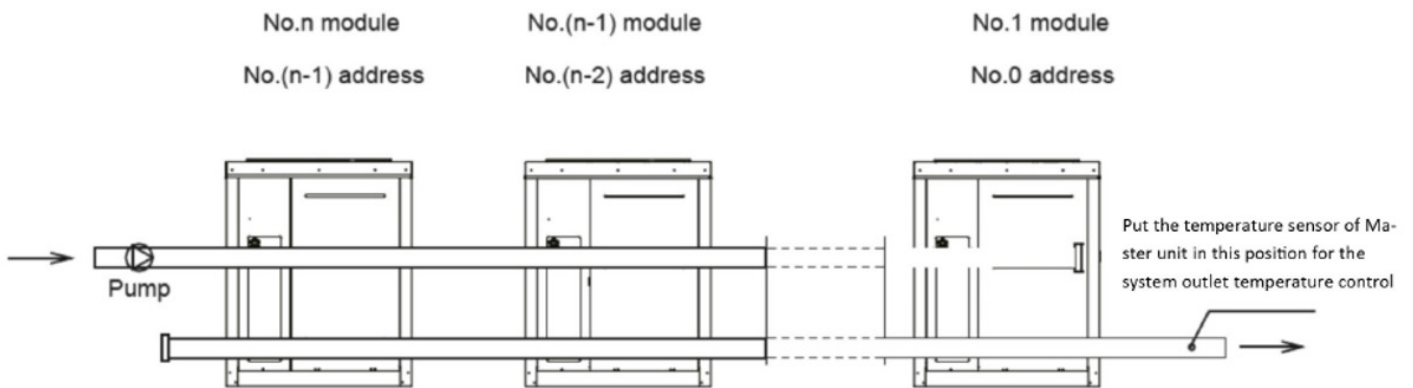
CONTACT		OPERATION
SG	EVU	SYSTEM
ON	ON	ON forced
OFF	ON	OFF forced
OFF	OFF	Standard
ON	OFF	Standard

# Features and options

## Modularity

Many applications require drives to be installed as back-up to the main system or have loads that can change significantly during annual operation.

Through this function, without the aid of further accessories, it is possible to operate with up to 8 units hydraulically connected in parallel. From the user interface of the unit defined as Master, the other units are electrically connected in series through the dedicated terminals P, Q and E. Each connected module is identified by an address, from 0 to 15: the Master unit is identified as 0. Complete control of the system (including ancillary elements such as external pumping system and auxiliary heater) is handled by the Master unit.

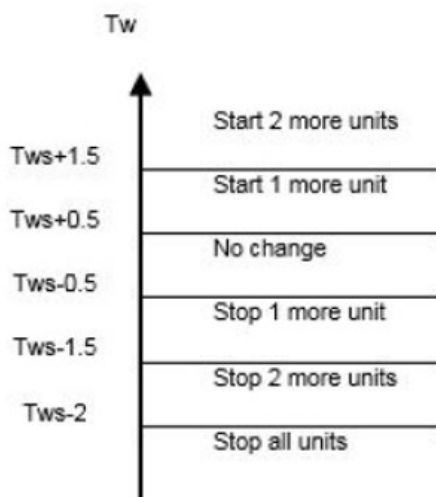


## Operation

The Master unit calculates the required cooling capacity of the system based on the water delivery temperature and the temperature set-point. Instead, each individual unit calculates its required cooling capacity based on the delivery and return temperatures. The activation of the units takes place according to the last in first out logic (the last unit to be activated will also be the first to be deactivated) and is indicated in the following two figures.

- $T_w$  = Water supply temperature
- $T_{ws}$  = Water supply temperature set-point

## Cooling mode

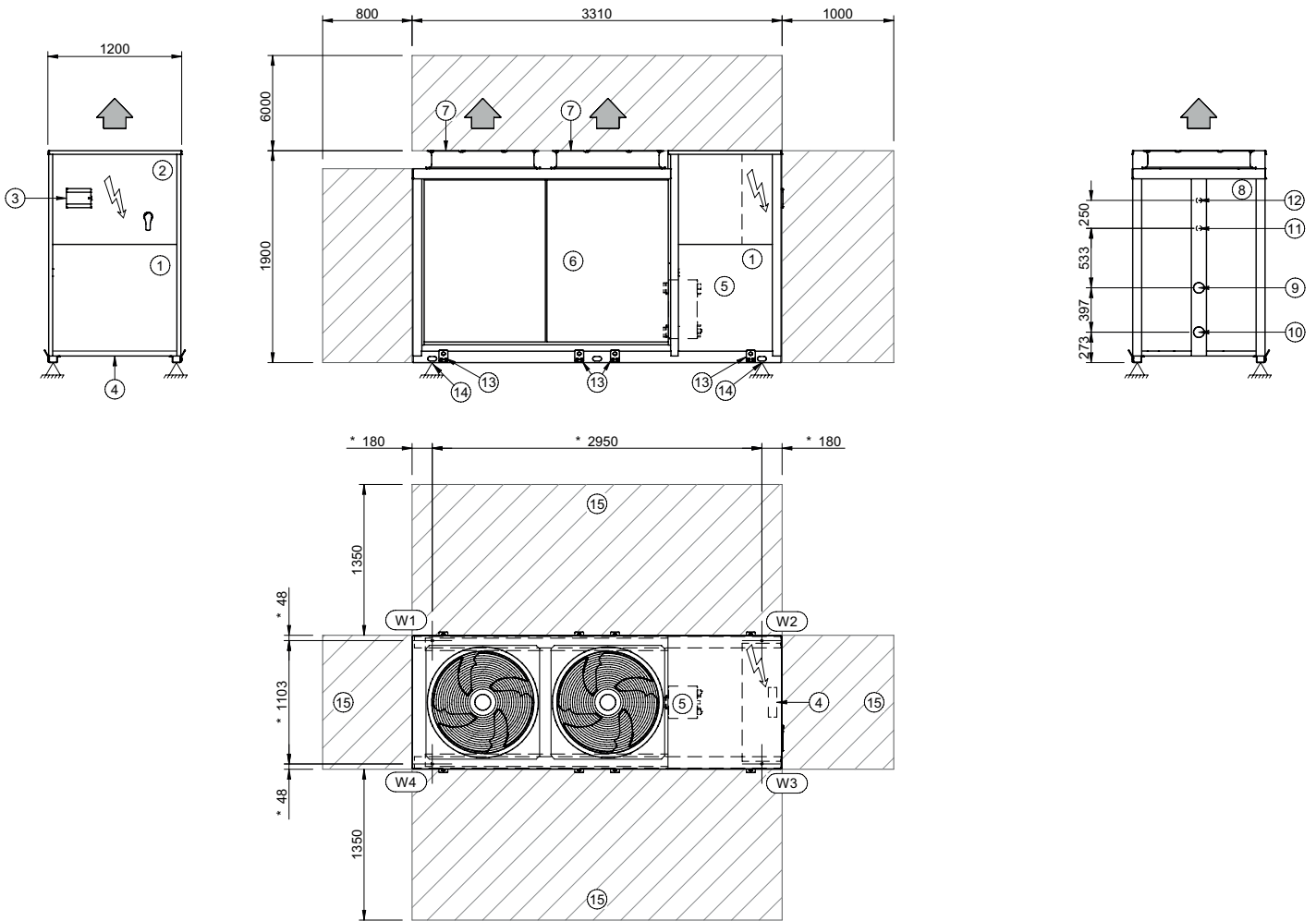


In cooling mode, if  $T_w \geq T_{ws} - 10^\circ\text{C}$  50% of the system units are activated.

After having satisfied the system load and having deactivated the units, at the next start-up the first unit to have been deactivated will be the first to be started, in order to guarantee the correct balancing of the operating hours.

SIZE 45.4 ÷ 60.4 - EXC/PRM

DAAH40001\_00  
DATA/DATE 21/10/2022



1. Compressor compartment
2. Electrical panel
3. Control keypad
4. Power input
5. Internal exchanger
6. External exchanger
7. Fan
8. Rear enclosure
9. Victaulic 2" 1/2 water inlet connection
10. Victaulic 2" 1/2 water outlet connection

11. Victaulic 1" 1/4 gas partial inlet recovery water connection
  12. Victaulic 1" 1/4 gas partial outlet recovery water connection
  13. Lifting bracket (removed)
  14. Support points
  15. Functional clearances
- \* Position of antivibration mounts

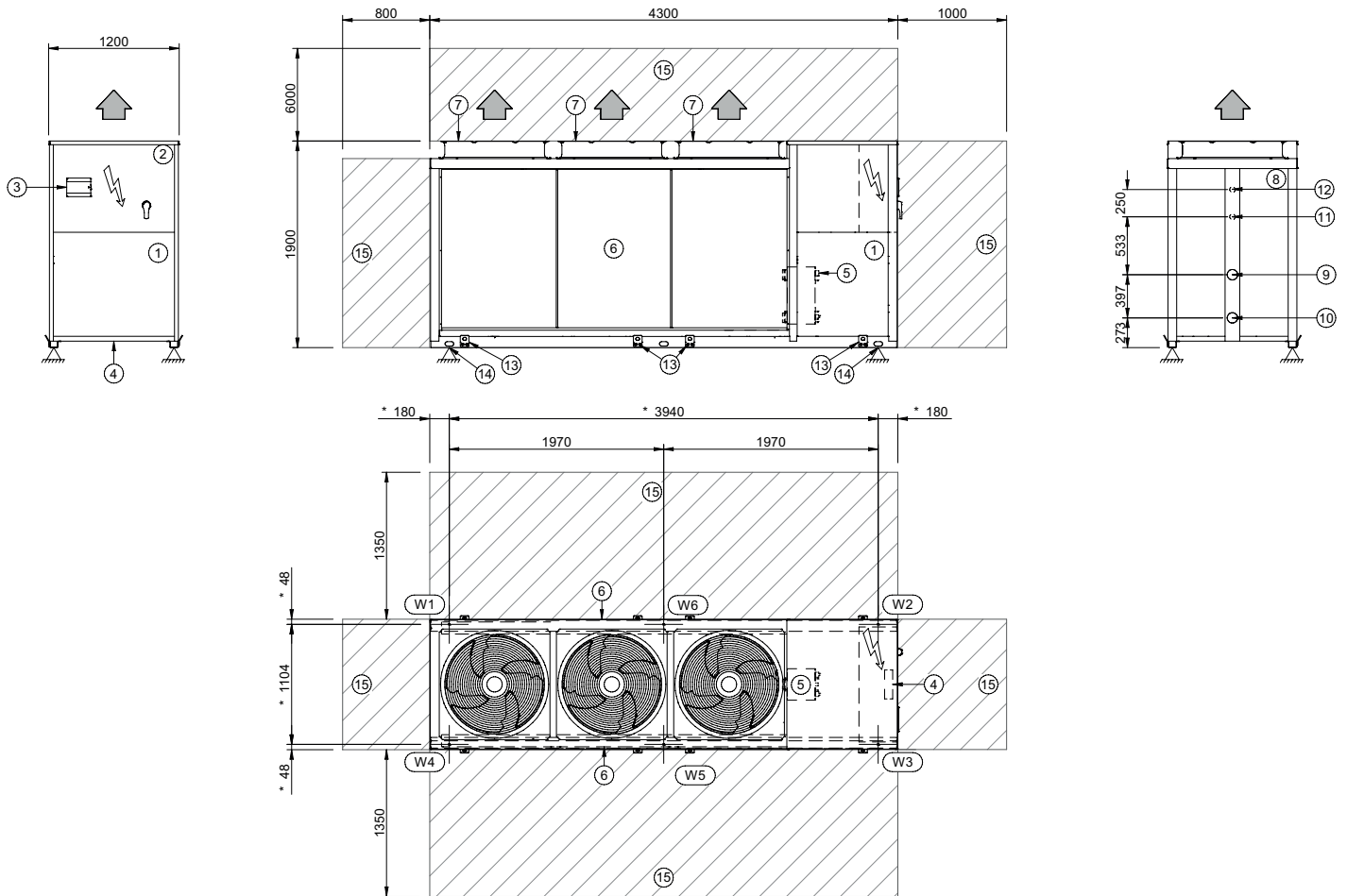
SIZE		45.4	50.4	55.4	60.4
Length	mm	3310	3310	3310	3310
Depth	mm	1200	1200	1200	1200
Height	mm	1900	1900	1900	1900
W1 Support point	kg	164	164	153	153
W2 Support point	kg	283	283	287	287
W3 Support point	kg	283	283	303	303
W4 Support point	kg	164	164	161	161
Operation weight	kg	894	894	904	904
Shipping weight	kg	925	925	934	934



# Dimensional drawings

SIZE 65.4 ÷ 90.4 - EXC/PRM

DAAH40002\_02  
DATA/DATE 21/10/2022



1. Compressor compartment
2. Electrical panel
3. Control keypad
4. Power input
5. Internal exchanger
6. External exchanger
7. Fan
8. Rear enclosure
9. Victaulic 3" water inlet connection
10. Victaulic 3" water outlet connection

11. Victaulic 1" 1/4 gas partial inlet recovery water connection
  12. Victaulic 1" 1/4 gas partial outlet recovery water connection
  13. Lifting bracket (removed)
  14. Support points
  15. Functional clearances
- \* Position of antivibration mounts

SIZE		65.4	70.4	75.4	80.4	85.4	90.4
Length	mm	4300	4300	4300	4300	4300	4300
Depth	mm	1200	1200	1200	1200	1200	1200
Height	mm	1900	1900	1900	1900	1900	1900
W1 Support point	kg	203	203	198	198	198	198
W2 Support point	kg	374	374	392	392	392	392
W3 Support point	kg	374	374	392	392	392	392
W4 Support point	kg	203	203	198	198	198	198
Operation weight	kg	1154	1154	1179	1179	1179	1179
Shipping weight	kg	1135	1135	1160	1160	1160	1160

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