AERMEC
air conditioning


R410A

TECHNICAL - INSTALLATION MANUAL

CHILLERS
REVERSIBLE HEAT PUMPS
CONDENSING UNIT

# ANL-ANLH 020-200

- OUTDOOR UNIT
- HIGH EFFICIENCY
- PRODUCTION OF HOT WATER UP TO 50 ° C

UK

IANLTZ.1108.6755514_05 replace 6755514_04

Dear Customer,
Thank you for choosing an AERMEC product. This product is the result of many years of experience and in-depth engineering research, and it is built using top quality materials and advanced technologies.
In addition, the CE mark guarantees that our appliances fully comply with the requirements of the European Machinery Directive in terms of safety. We constantly monitor the quality level of our products, and as a result they are synonymous with Safety, Quality, and Reliability.

Product data may be subject to modifications deemed necessary for improving the product without the obligation to give prior notice.

Thank you again.
AERMEC S.p.A

AERMEC
la prima per il clima

# ANL
# ANLH

| NUMERO DI SERIE | |
|---|---|

DICHIARAZIONE DI CONFORMITÀ CE — We, the undersigned, hereby declare under our own responsibility that the assembly in question, defined as follows:

NAME — ANL - ANLH

TYPE — WATER/AIR chiller, heat pump

MODEL

To which this declaration refers, complies with the following harmonised standards:

| | |
|---|---|
| **CEI EN 60335-2-40** | Safety standard regarding electrical heat pumps, air conditioners and dehumidifiers |
| **CEI EN 61000-6-1**<br>**CEI EN 61000-6-3** | Immunity and electromagnetic emissions for residential environments |
| **CEI EN 61000-6-2**<br>**CEI EN 61000-6-4** | Immunity and electromagnetic emissions for industrial environments |
| **EN378** | Refrigerating systems and heat pumps - Safety and environmental requirements |
| **EN12735** | Copper and copper alloys - Seamless, round copper tubes for air conditioning and refrigeration |
| **UNI 12735** | Seamless, round copper tubes for air conditioning and refrigeration |
| **UNI 14276** | Pressure equipment for cooling systems and heat pumps |

Therefore complying with the essential requisites of the following Directives:

- LVD Directive: **2006/95/CE**
- Electromagnetic compatibility Directive **2004/108/CE**
- Machinery Directive **2006/42/CE**
- PED Directive regarding pressurised devices **97/23/CE**

The product, in agreement with Directive 97/23/CE, satisfies the Total quality Guarantee procedure (form H) with certificate n.06/270-QT3664 Rev.5 issued by the notified body n.1131 CEC via Pisacane 46 Legnano (MI) - Italy

**The person authorised to constitute the technical file is: Massimiliano Sfragara - 37040 Bevilacqua (VR) Italy - via Roma,996**

Bevilacqua — 20/06/2010

AERMEC
la prima per il clima

# ANLC

| NUMERO DI SERIE | |
|---|---|

| | |
|---|---|
| DICHIARAZIONE DI CONFORMITÀ CE | We, the undersigned, hereby declare under our own responsibility that the assembly in question, defined as follows: |
| NOME | ANL C |
| TIPO | **MOTORCONDENSING CHILLER** |
| MODELLO | |

To which this declaration refers, complies with the following harmonised standards:

| | |
|---|---|
| **CEI EN 60335-2-40** | Safety standard regarding electrical heat pumps, air conditioners and dehumidifiers |
| **CEI EN 61000-6-1**<br>**CEI EN 61000-6-3** | Immunity and electromagnetic emissions for industrial environments |
| **CEI EN 61000-6-2**<br>**CEI EN 61000-6-4** | Immunità ed emissione elettromagnetica per l'ambiente industriale |
| **EN378** | Refrigerating systems and heat pumps - Safety and environmental requirements |
| **EN12735** | Copper and copper alloys - Seamless, round copper tubes for air conditioning and refrigeration |
| **UNI 12735** | Seamless, round copper tubes for air conditioning and refrigeration |
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**The person authorised to constitute the technical file is: Massimiliano Sfragara - 37040 Bevilacqua (VR) Italy - via Roma,996**

| | |
|---|---|
| **DECLARATION OF INCORPORATION** | We, the undersigned, declare under our own responsibility, in compliance with paragraph 2, art. 4 of the Machinery Directive 98/37/CE, that start-up is prohibited before the machine in which it has been incorporated has been declared conform with the provisions of the Machinery Directive and/or all applicable Directives. |
| Bevilacqua | 20/06/2010 |

Marketing manager
Signature

**Standards and Directives respected on designing and constructing the unit:**

**SAFETY**

1. Machinery Directive 2006/42/CE
2. Low Voltage Directive LVD 2006/95/CE
3. Electromagnetic compatibility Directive EMC 2004/108/CE
4. Pressure Equipment Directive PED 97/23/CE, EN 378,
5. UNI12735, UNI14276

**ELECTRIC PART**

1. CEI EN 60335-2-40,
2. CEI EN 61000-6-1/2/3/4

**ACUSTIC PART**

1. ISO DIS 9614/2 (intensimetric method)

**PROTECTION RATING**

IP24

**CERTIFICATIONS**

EUROVENT

**REFRIGERANT GAS**

Questa unità contiene gas floururali a effetto serra coperti dal protocollo di Kyoto. Le operazioni di manutenzione e smaltimento devono essere eseguite solo da personale qualificato, nel rispetto delle norme vigenti

## 1. DESCRIPTION AND CHOCE OF UNIT

Chillers and heat pumps for OUTDOOR condensed in the air with R410A Series ANL have been designed and manufactured to satisfy heating and cooling needs and the production of domestic hot water (DHW) in medium to small commercial or residential buildings.

These units, have extremely silent functioning and are highly efficient and reliable, thanks to the use of exchangers with a large exchange surface and low-noise high-efficiency scroll compressors

They are available in the following versions:

1. **ANL "°" Standard**
2. **ANL "H" Heat pumps [1]**
3. **ANL "C" Moto condensing unit**

The versions can be in different set-ups at the same time in order to satisfy a wide range of plant engineering solutions:

1. **"°" STANDARD**
2. **"P" PUMPS**
3. **"N" INCREASED PUM**
4. **"A" PUMP |STORAGE TANK**
5. **"Q" INCREASED PUM|STORAGE TANK**
6. **"D" DESUPERHEATER**

## 2. CONFIGURATOR

| Campo | DESCRIPTION |
|---|---|
| 1,2,3 | ANL |

| 4,5,6 | SIZE |
|---|---|
| | 020 - 025 - 030 - 040 - 050 - 070 - 080 - 090 - 100 - 150 - 200 |

| 7 | MODEL |
|---|---|
| ° | Cooling |
| H | Heat pumps [1] |

| 8 | VERSION |
|---|---|
| ° | Standard |
| P | With pump |
| N | With increased pump (solo ANL 100 - 150 - 200) |
| A | With storage tank |
| Q | Storake tank \| increased pump (only ANL 50 - 70 - 80 - 90 - 100 - 150 - 200) |

| 9 | HEAT RECOVERY |
|---|---|
| ° | Without recovery |
| D | With desuperheater [2] |

| 10 | COIL |
|---|---|
| ° | Aluminium |
| R | Copper |
| S | Tinned copper |
| V | Painted aluminium |

| 11 | FIELD OF USE |
|---|---|
| ° | Standard (temperature of water produced up to 4°C) |
| Z | Low temperature (temperature of water produced: 4°C up to 0°C) |
| Y | Low temperature(temperature of water produced: 0°C up to -6°C) |

| 12 | EVAPORATOR |
|---|---|
| ° | Standard (temperature of water produced up to 4°C) |
| C | Motor condenser |

| 13 | POWER SUPPLY |
|---|---|
| ° | 400V/3N/50Hz |
| M | 230V/1/50Hz (only ANL 020 - 025 - 030 - 040) |

[1] Possibility of production of D.H.W. (DCPX | VMF-ACS | MODU-485A required)

[2] The DESUPERHEATER is not possible with:

- Version "C"
- With the thermostatic valve Y

## 3. COMPONENTS AND CONFIGURATIONS

| Ciruit | Components | | | |
|---|---|---|---|---|
| **Chiller circuit** **Model** | **°** | **H** | **C** | **with D** |
| Resistance compressor | std | std | std | std |
| High pressure switch | std | std | std | std |
| Low pressure switch | std | No | std | std |
| High pressure trasducer | No | std | No | std |
| Low pressure trasducer | No | std | No | No |
| Solenoid valve of hot gas injecton | No | std | No | No |
| By-pass valve of hot gas injecton | No | No | No | std |
| Plate exchanger (EV- EV/CN) | std | std | No | std |
| Plate exchanger (desuperheater) | No | No | No | std |
| Cock the liquid and discharge | No | No | std | No |

| **Hydraulic circuit** **Version "°"** | **020** | **025** | **030** | **040** | **050** | **070** | **080** | **090** | **100** | **150** | **200** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Water filter | Std | Std | Std | Std | Std | Std | Std | Std | Std | Std | Std |
| Pressure switch | Std | Std | std | std | std | std | std | std | std | std | std |
| Safety valve | no | no | no | no | no | no | no | no | no | no | no |
| Air vent | no | no | no | no | no | no | no | no | no | no | no |

| **Hydraulic circuit** **Version "P/N"** | **020** | **025** | **030** | **040** | **050** | **070** | **080** | **090** | **100** | **150** | **200** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Water filter | std | std | std | std | std | std | std | std | std | std | std |
| Pressure switch | std | std | std | std | std | std | std | std | std | std | std |
| Flow switch | no | no | no | no | no | no | no | no | no | no | no |
| Safety valve | std | std | std | std | std | std | std | std | std | std | std |
| Air vent | std | std | std | std | std | std | std | std | std | std | std |
| Pump | **vers. P** | **vers. P** | **vers. P** | **vers. P** | **vers. P** | **vers. P** | **vers. P** | **vers. P** | **vers. P** | **vers. P** | **vers. P** |
| Pump incresed | No | no | no | no | no | no | no | no | **vers. N** | **vers. N** | **vers. N** |
| Expansion tank | std | std | std | std | std | std | std | std | std | std | std |

| **Hydraulic circuit** **Version "A/Q"** | **020** | **025** | **030** | **040** | **050** | **070** | **080** | **090** | **100** | **150** | **200** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Water filter | std | std | std | std | std | std | std | std | std | std | std |
| Pressure switch | no | no | no | no | std | std | std | std | std | std | std |
| Flow switch | std | std | std | std | no | no | no | no | no | no | no |
| Safety valve | std | std | std | std | std | std | std | std | std | std | std |
| Air vent | std | std | std | std | std | std | std | std | std | std | std |
| Pump (P) | **vers.A** | **vers.A** | **vers.A** | **vers.A** | **vers.A** | **vers.A** | **vers.A** | **vers.A** | **vers.A** | **vers.A** | **vers.A** |
| Pump incresed | No | No | No | No | **vers.Q** | **vers.Q** | **vers.Q** | **vers.Q** | **vers.Q** | **vers.Q** | **vers.Q** |
| Expansion tank | std | std | std | std | std | std | std | std | std | std | std |
| Storge tank | std | std | std | std | std | std | std | std | std | std | std |

**Version with DESUPERHEATER "D"**

| **Hydraulic circuit** **Version "° with D"** | **020** | **025** | **030** | **040** | **050** | **070** | **080** | **090** | **100** | **150** | **200** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Water filter | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | std | std | std |
| Pressure switch | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | std | std | std |
| Flow switch | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | no | no | no |
| Plate exchanger (desuperheater) | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | std | std | std |

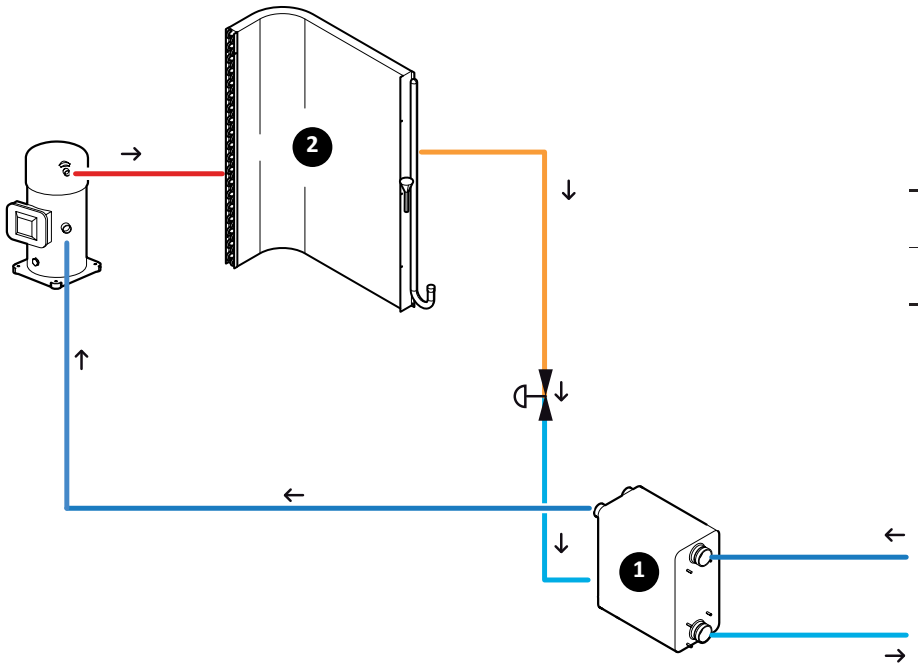
| **Hydraulic circuit** **Version "A with D "** | **020** | **025** | **030** | **040** | **050** | **070** | **080** | **090** | **100** | **150** | **200** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Water filter | N.D. | N.D. | N.D. | N.D. | std | std | std | std | std | std | std |
| Pressure switch | N.D. | N.D. | N.D. | N.D. | std | std | std | std | std | std | std |
| Flow switch | N.D. | N.D. | N.D. | N.D. | no | no | no | no | no | no | no |
| Plate exchanger (desuperheater) | N.D. | N.D. | N.D. | N.D. | std | std | std | std | std | std | std |
| Safety valve | N.D. | N.D. | N.D. | N.D. | std | std | std | std | std | std | std |
| Air vent | N.D. | N.D. | N.D. | N.D. | std | std | std | std | std | std | std |
| Pump (P) | N.D. | N.D. | N.D. | N.D. | std | std | std | std | std | std | std |
| Expansion tank | N.D. | N.D. | N.D. | N.D. | std | std | std | std | std | std | std |
| Storge tank | N.D. | N.D. | N.D. | N.D. | std | std | std | std | std | std | std |

**KEY**

| | |
|---|---|
| **N.D.** | not supplied |

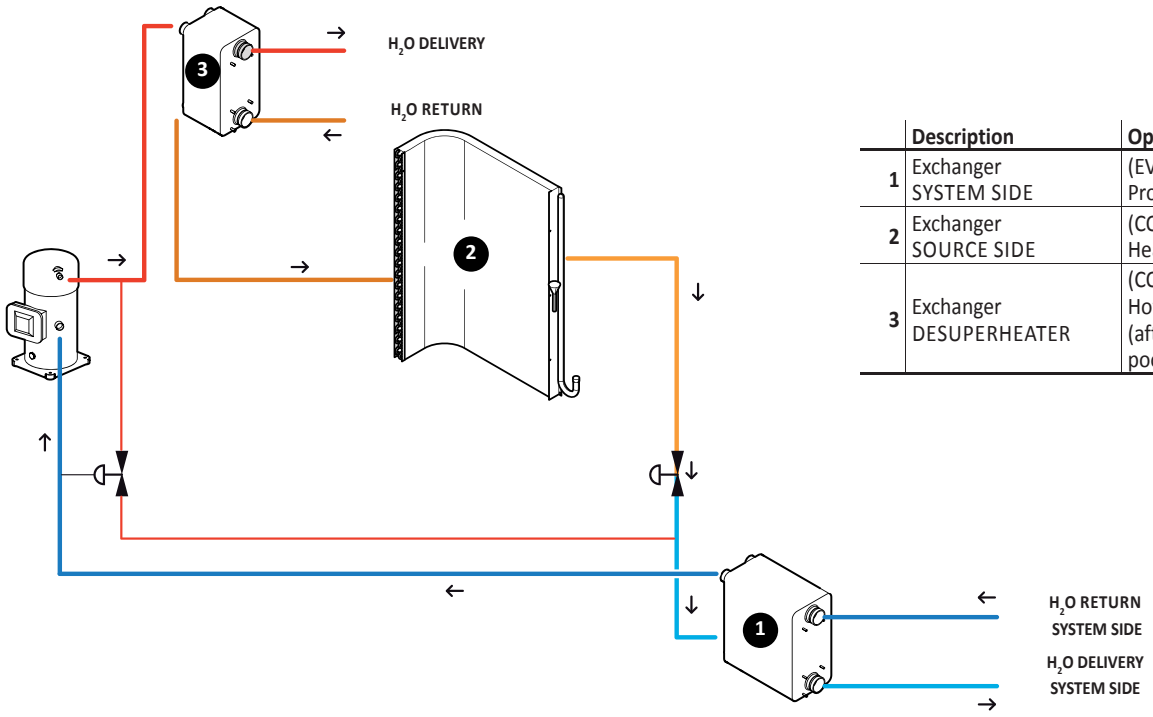
## 4. PRINCIPLE OF OPERATION DIAGRAMS COOLING

### 4.1. PRODACTION COLD WATER TO THE SYSTEM



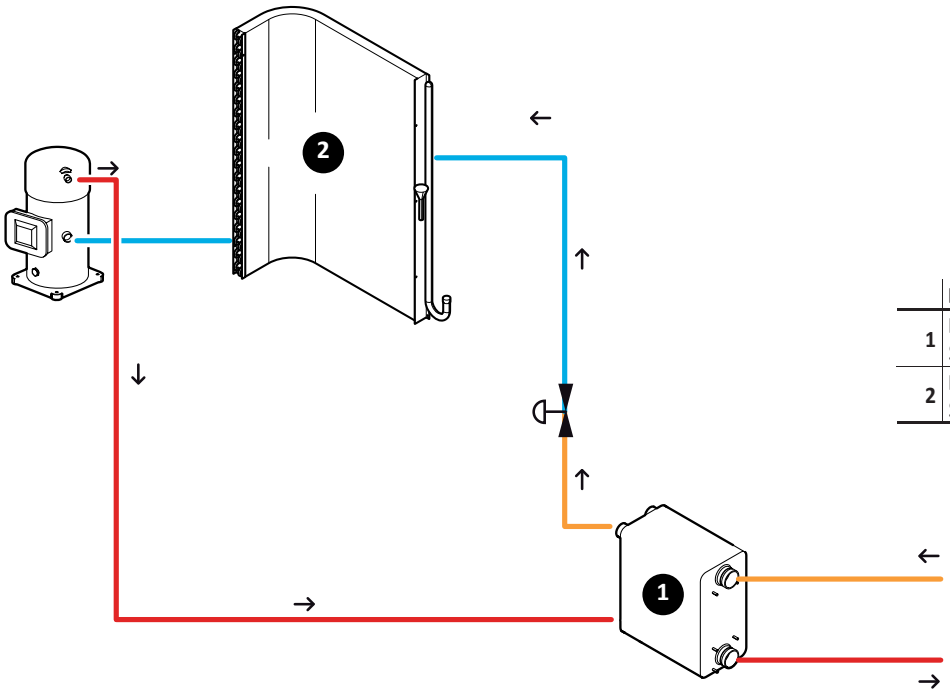

| | Description | Operation |
|---|---|---|
| 1 | Exchanger<br>SYSTEM SIDE | (EVAPORATION)<br>Production cold water |
| 2 | Exchanger<br>SOURCE SIDE | (CONDENSATION)<br>Heat exchanger with the air |

### 4.2. PRODACTION COL WATER TO THE SYSTEM AND HOT WATER TO DESUPERHEATER



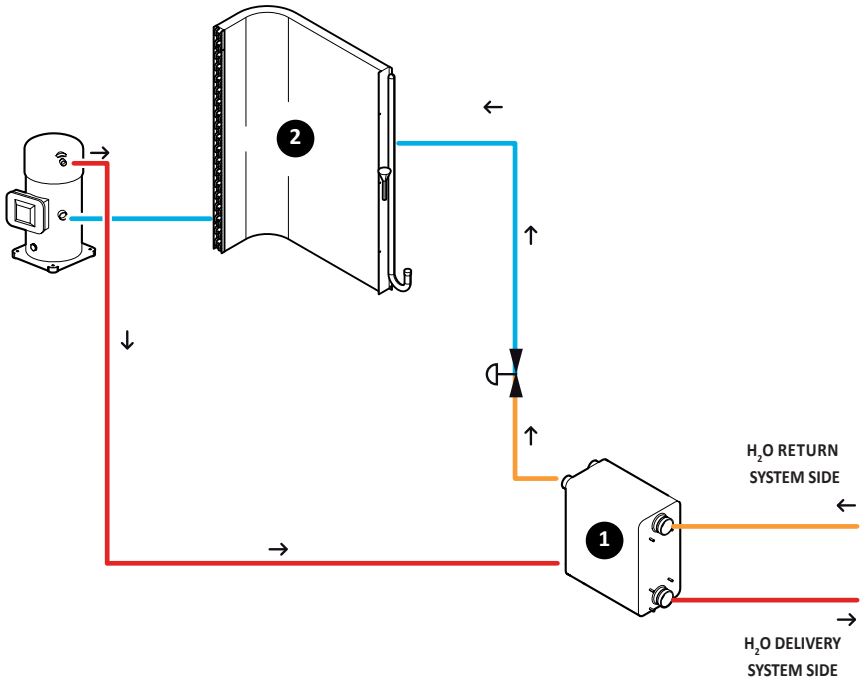

| | Description | Operation |
|---|---|---|
| 1 | Exchanger<br>SYSTEM SIDE | (EVAPORATION)<br>Production cold water |
| 2 | Exchanger<br>SOURCE SIDE | (CONDENSATION)<br>Heat exchanger with the air |
| 3 | Exchanger<br>DESUPERHEATER | (CONDENSATION)<br>Hot water<br>(after heating - Swimming pools ...) |

## 4.4. PRODACTION HOT WATER TO THE SYSTEM




| | Description | Operation |
|---|---|---|
| 1 | Exchanger<br>SYSTEM SIDE | (CONDENSATION)<br>Production hot water |
| 2 | Exchanger<br>SOURCE SIDE | (EVAPORATION)<br>Heat exchanger with the air |

## 4.3. PRODACTION HOT WATER TO THE SYSTEM | DHW [3]




| | Description | Operation |
|---|---|---|
| 1 | Exchanger<br>SYSTEM SIDE | (CONDENSATION)<br>Production hot water |
| 2 | Exchanger<br>SOURCE SIDE | (EVAPORATION)<br>Heat exchanger with the air |

**ATTENTION**

**[3] For the production of the DHW is mandatory the use of accessories:**

- DCPX
- VMF-ACS
- MODU-485A

# 5. DESCRIPTION OF COMPONENTS

## 4.5. COOLING CIRCUIT

**COMPRESSORI SCROLL with RESISTANCE ELECTRICA**
High efficient scroll type on anti-vibration mounts, activated by a 2-pole electric motor with internal circuit breaker protection.
They are supplied, as standard, with an electric anti-freeze resistance, powered automatically when the unit stops as long as the unit is live.

**EVAPORATOR**
Plate type (AISI 316). It is insulated externally with closed cell material to reduce thermal dispersions.

**DESUPERHEATER**
**(Only "D" version)**
Unit with (AISI 316) heat plate, insulated externally with closed cell material to reduce heat loss.

**SOURCE SIDE HEAT EXCHANGER**
Made with copper pipes and aluminium louvered fins blocked by mechanical expansion of the pipes. Provided with protective grid.

**4-WAY CYCLE REVERSE VALVE**
**(Only "H" version)**
Inverts the flow of refrigerant gas.

**STORAGE LIQUID**
**(Only "H" version)**
Compensates the difference in volume between louvered fin coil and plate exchanger, withholding excess liquid during winter functioning.

**DEHYDRATOR FILTER**
Hermetic-mechanical with cartridges made of ceramic and hygroscopic material, able to withhold impurities and any traces of humidity present in the cooling circuit.

**ONE-WAY VALVES**
Allows the passage of the refrigerant in just one direction.

**MECHANICAL THERMOSTATIC VALVE**
The mechanical valve, with external equaliser positioned at the evaporator inlet, modulates the flow of gas to the evaporator, according to the heat load, in order to ensure a correct heating level of the intake gas.

**BY-PASS VALVE of HOT GAS INJECTION**
**(Only "D" version)**
Device for hot gas injection of evaporator, mounted on versions with partial recovery.

**INDICATOR FOR LIQUID PASSAGE WITH HUMIDITY PRESENCE SIGNAL**
Used to check the refrigerant gas load and the eventual presence of humidity in the cooling circuit.

**COCK THE LIQUID AND DISCHARGE**
Allows interruption of the refrigerant in the case of extraordinary maintenance.

## 4.6. FRAME AND FANS

**BASE AND SUPPORT STRUCTURE**
Made up from hot galvanised sheet steel elements with suitable thickness. All parts painted with polyester powder paints (RAL 9002), resistant to atmospheric agents. Realised in a way to allow total accessibility to the components internal components. All panels are covered with sound-absorbent material with suitable thickness.

**FANS**
Axial, external rotor with helical blades, housed in the nozzle, complete network protection against accidents. 6-pole electric motor equipped with thermal protection.

## 4.7. HYDRAULIC CIRCUIT STANDARD

**WATER FILTER**
Equipped with steel filtering mesh; prevents the heat exchangers from clogging.

**FLOW SWITCH**
**(provided on ANL 025...040°A|HA)**
It checks that there is circulation of water.If this is not the case, it blocks the unit

**DIFFERENTIAL PRESSURE SWITCH**
**(provided on ANL 020...200° -°P N|H - HP N)**
**(provided on ANL 050...200°A Q |HA Q)**
It checks that here is water circulation inside the heat exchangers. Adversary, it blocks the unit.

### 4.7.1. HYDRAULIC COMPONENTS IN CONFIGURABLE VERSIONS

**PUMPS**
Standard or plus

**EXPANSION TANK**
With nitrogen pre-load membrane.

**SAFETY VALVE**
Equipped with a piped discharger and intervenes by discharges the over pressure in case of anomalous pressures.

**AIR VENT**
**(Only "P-N-A-Q" version)**
assembled on the upper part of the hydraulic system; it releases any air bubbles that may be present in the system.

**STORAGE TANK**
In order to reduce the thermal dispersion and eliminate the phenomenon of the formation of condensation, it is insulated with polyurethane material of a suitable thickness.
It is required to reduce the number of peaks of the compressor and to even the temperature of water to be sent to the utilities.

## 4.8. WATER FEATURES

| PH | 6-8 |
|---|---|
| **Electric conductivity** | less than 200 mV/cm (25°C) |
| **Chloride ions** | less than 50 ppm |
| **Sulphuric acid ions** | less than 50 ppm |
| **Total iron** | less than 0,3 ppm |
| **Alkalinity M** | less than 50 ppm |
| **Total hardness** | less than 50 ppm |
| **Sulphur ions** | none |
| **ammonia ions** | None |
| **Silicone ions** | less than 30 ppm |

## 4.9. CONTROL AND SAFETY COMPONENTS

**HIGH PRESSURE SWITCH**
With fixed calibration, placed on high pressure side of cooling circuit, inhibits functioning of compressor if abnormal work pressure occurs.

**LOW PRESSURE SWITCH**
**(Only "° | C" version)**
With fixed calibration, placed on low pressure side of cooling circuit, inhibits functioning of compressor if abnormal work pressure occurs.

**HIGH PRESSURE TRANSDUCER**
Placed on high pressure side of cooling circuit, signals the work pressure to control board, generating a pre-warning in case abnormal pressure occurs.

**LOW PRESSURE TRANSDUCER**
**(Only "H" version)**
Allows displaying, on the microprocessor board display, the value of the compressor's suction pressure (one per circuit) on the low-pressure side of the cooling circuit

## 4.10. ELECTRIC BOARD, CONTROL AND POWER

Electric board in compliance with the standards EN 60204-1/IEC 204-1, complete with:
- transformer for the control circuit,
- door lock main isolating switch,
- fuses and contactors for compressors and fans,
- clamps for REMOTE PANEL
- terminal boards of the spring type control circuits,
- outdoor electric control board, with double port and gaskets,
- electronic control,
- evaporator pump command consent relay and recovery pump (only for version without group pumps).
- All the cables numbered

**DOOR-LOCK ISOLATING SWITCH**
The electric control board can be accessed by removing the voltage. Act on the opening lever of the control board itself. This lever can be locked using one or more padlocks during maintenance interventions to prevent the machine being powered up accidentally.

**CONTROL BOARD**
**Allows the complete control of the appliance. For a more detailed description please refer to the user manual.**

**Regolazione elettronica**
**MODU CONTROL**

Temperature control of the output water with proportional-integral algorithm: maintains average output temperature at value set
- Self-adapting differential switch: guarantees minimum functioning times of the compressor in systems with low water content.
- Intelligent defrosting for pressure reduction: allows to determine when the coil is effectively defrosted, avoiding useless defrosting
- Set-point compensation with external temperature (with external air probe accessory): reduces energy consumption
- Condensation check based on the pressure rather than on temperature for absolute stability (with DCPX revs. adjuster accessory ) Inverse condensation check for the heat pump functioning mode also in summer (with dcpx revs. adjuster accessory)
- Pre-alarms with automatic reset: in the case of alarm, a certain number of re-starts are allowed before the definitive block alarm on the ΔT: to identify wiring errors (reverse rotation) or blocked cycle reversing valve
- Compressor functioning hours count.
- Compressor peak count.
- Historical alarms
- Autostart after voltage drop.
- Local or remote control

Display of the start of the unit:
1. Voltage presence
2. compressor ON/OFF
3. functioning mode (hot/cold)
4. alarm active

**Probes, transducers and parameters display**
1. Water outlet
2. water inlet
3. Coil temperature (heat pumps)
4. Pressing gas temperature
5. External air temperature (heat pumps, cooling only with DCPX and probe)
6. Pressure delivery (heat pumps)
7. Intake pressure (heat pumps)
8. Temperature error (sum of the proportional and integral error)
9. Stand-by times for start-up/switch-off of the compressor
10. Alarms management:
11. Low pressure
12. High pressure (primary alarm: switch directly blocks supply to compressor)
13. High discharge temperature
14. Anti-freeze
15. Water differential flow switch. Alarm on the ΔT

– Alarms with automatic reset with limited number of re-starts before blocking.
– ON/OFF external contact
– Change season from external contact

For further information please refer to user manual.

[4] Accessories MODU-485A | DCPX are required for the production and management of DHW

[5] Available only with 400V/3N applicable only in the factory.

[6] L'accessoires is not available for the: ANL 020...040°A | HA.

[7] applicable only in the factory.

## 6. ACCESSORIES

**VT ANTI-VIBRATION**
**Group of anti-vibration**

**MODU-485A [4]**
RS-485 interface for supervision system with MODBUS protocol

**DCPX [4]**
Low temperature device for correct cooling mode operation with ambient temperature less than 19 °C down to – 10 °C.

**DRE [5]**
Current soft starter device (about 30% reduction for single-circuit-units, 26% for two-circuit-units, 22% for three-circuit-units)

**RA [7]**
**Electrical resistance for storage tank**
(only A|Q version). Avoids freezing of water stored in the tank during winter breaks.

**KR [6] [7]**
**Electrical resistance for plate exchanger**
Avoids freezing of water stored in the tank during winter breaks.

**BSKW**
Kit electrical resistance of various external powers, with both single-phase power:
- BS4KW230M (4 kW, 230V/1/50Hz)
- BS6KW230M (6 kW, 230V/1/50Hz)
- BS6KW400T (6 kW, 400V/3/50Hz)
- BS9KW400T (9 kW, 400V/3/50Hz)

**BDX**
Condensate drip tray for outdoor unit.

**VMF-ACS**
Control box for command / control of a domestic water storage:
1. 3 way valve control
2. legionella
3. Temperature probe

Supplementary electric heater:
3 kW 230V-1|400V-3
6 kW 400V-3
8 kW 400V-3

**VMF-E5B|N**
**black or white panel for recessed installation, with backlit graphic LCD display and capacitive keyboard, allows the centralised command/control of:**
1. an hydronic complete system made up of Fan coils consisting of 1 master + a maximum of 5 slaves;
2. chillerPompa (mandatory accessory interface RS 485, respectively MODU-485A)
3. Circulators: maximum 12 zone circulators configurable;
4. boiler: boiler consent management for the production of domestic hot water;
5. Heat recuperators: maximum 3 consents for programmable recuperators according to time periods and/or by air quality detection obtained with the accessory VMF-VOC, module domestic hot water
6. complete management of water production external boiler (ACCESSORY VMF-ACS see above)

| | | ANL 20 | ANL 25 | ANL 30 | ANL 40 | ANL 50 | ANL 70 | ANL 80 | ANL 90 | ANL 100 | ANL 150 | ANL 200 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PR3** | **(°) - H - C** | • | • | • | • | • | • | • | • | • | • | • |
| **MODU-485A [4]** | **TUTTE** | • | • | • | • | • | • | • | • | • | • | • |
| **DRE [5]** | **(°) - H - C** | - | - | - | - | 5 | 5 | 5 | 5 | 5x2 | 5x2 | 5X2 |
| **DCPX [4]** | **(°) - C** | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 52 | 52 | 52 |
| | **H** | 51 | 51 | 51 | 51 | 51 | 51 | 51 | 51 | 53 | 53 | 53 |
| **VT** | **(°) - H - HP - C** | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 15 | 15 | 15 |
| | **A** | 9 | 9 | 9 | 9 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| **RA** | **A** | • | • | • | • | • | • | • | • | • | • | • |
| **BDX** | **(°) / P** | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | - | - | - |
| | **A** | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | - | - | - |
| **KR [6]** | **(°) / P** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | **A** | - | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| **BSK4KW230M** | **230V/1** | • | • | • | • | - | - | - | - | - | - | - |
| **BSK6KW230M** | **230V/1** | • | • | • | • | - | - | - | - | - | - | - |
| **BSK6KW400VT** | **400V/3N** | • | • | • | • | • | • | • | • | • | • | • |
| **BSK9KW400VT** | **400V/3N** | • | • | • | • | • | • | • | • | • | • | • |
| **VMF-E5B|N [4]** | **TUTTE** | • | • | • | • | • | • | • | • | • | • | • |
| **VMF-ACS3KM [4]** | **230V/1** | • | • | • | • | | | | | | | |
| **VMF-ACS3KTN [4]** | **400V/3N** | • | • | • | • | • | • | • | • | • | • | • |
| **VMF-ACS6KTN [4]** | **400V/3N** | • | • | • | • | • | • | • | • | • | • | • |
| **VMF-ACS8KTN [4]** | **400V/3N** | • | • | • | • | • | • | • | • | • | • | • |

## 7. TECHNICAL DATA

| Model | | | | 020° | 025° | 030° | 040° | 050° | 070° | 080° | 090° | 100° | 150° | 200° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ① | | | | | | | | | | | | | | |
| Cooling capacity | | All | kW | 5,7 | 6,2 | 7,5 | 9,6 | 13,4 | 16,5 | 20,5 | 22,3 | 26,6 | 33,0 | 43,0 |
| Total input power | | ° | kW | 1,84 | 2 | 2,46 | 3,25 | 4,03 | 4,88 | 6,33 | 6,63 | 8.4 | 10.0 | 13.7 |
| | | P\|A | kW | 1,99 | 2,15 | 2,61 | 3,4 | 4,3 | 5,15 | 6,6 | 6,9 | 9.2 | 11.5 | 15.2 |
| | | N\|Q | kW | - | - | - | - | 4,48 | 5,33 | 6,78 | 7,08 | 9.4 | 11.3 | 15.0 |
| Water flow rate | | All | l/h | 980 | 1070 | 1290 | 1650 | 2310 | 2840 | 3530 | 3840 | 4580 | 5680 | 7400 |
| Pressure drops exchanger \| piping | | ° | kPa | 20 | 20 | 20 | 21 | 21 | 21 | 26 | 25 | 43 | 39 | 32 |
| Pressure drops filter | | | kPa | 1 | 1 | 2 | 3 | 4 | 5,5 | 8 | 10 | 6 | 9 | 15 |
| Useful static pressur SYSTEM SIDE | | P\|A | kPa | 60 | 60 | 59 | 55 | 82 | 80 | 69 | 66 | 84 | 115 | 90 |
| | | N\|Q | kPa | - | - | - | - | 160 | 158 | 144 | 140 | 140 | 185 | 158 |
| **ENERGY INDICES** | | | | | | | | | | | | | | |
| EER | | ° | W/W | 3,10 | 3,10 | 3,05 | 2,95 | 3,33 | 3,38 | 3,24 | 3,36 | 3,17 | 3,30 | 3,14 |
| | | P\|A | W/W | 2,86 | 2,88 | 2,87 | 2,82 | 3,12 | 3,20 | 3,11 | 3,23 | 2,89 | 2,87 | 2,83 |
| | | N\|Q | W/W | - | - | - | - | 2,99 | 3,10 | 3,02 | 3,15 | 2,83 | 2,92 | 2,87 |
| ESEER | | | | 3,72 | 3,72 | 3,66 | 3,54 | 3,99 | 4,06 | 3,88 | 4,03 | 4,14 | 4,25 | 4,12 |
| ② | | | | | | | | | | | | | | |
| **DESUPERHEATER** | | | | | | | | | | | | | | |
| Power recovered | | | kW | - | - | - | - | 5,4 | 6,6 | 8,2 | 8,9 | 13,8 | 17,1 | 18,9 |
| Water flow rate | | | l/h | - | - | - | - | 930 | 1140 | 1410 | 1530 | 2370 | 2940 | 3260 |
| Pressure drops | | | kPa | - | - | - | - | 8 | 10 | 11 | 13 | 14 | 24 | 30 |
| **PROTECTION RATING** | | | | | | | | | | | | | | |
| IP | | | | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| **ELECTRICAL DATA** | | | | | | | | | | | | | | |
| Total input current | 230V/1 | ° | A | 9,4 | 10 | 13 | 16,3 | - | - | - | - | - | - | - |
| | 400V/3N | ° | A | 3,7 | 4,2 | 4,7 | 6,2 | 8,7 | 9,7 | 12,2 | 12,8 | 16,7 | 18,8 | 25,7 |
| | 230V/1 | P\|A | A | 10,40 | 11,00 | 14,00 | 17,30 | - | - | - | - | - | - | - |
| | 400V/3N | P\|A | A | 4,70 | 5,20 | 5,70 | 7,20 | 10.7 | 11.7 | 14.2 | 14.8 | 17.9 | 20.8 | 27.7 |
| | 400V/3N | N\|Q | A | - | - | - | - | 11,40 | 12,40 | 14,90 | 15,50 | 18.7 | 21.4 | 28.3 |
| Maximum current (FLA) | 230V/1 | ° | A | 16,50 | 16,50 | 19,70 | 23,70 | - | - | - | - | - | - | - |
| | 400V/3N | ° | A | 6 | 6 | 6,7 | 8,7 | 11,3 | 13,5 | 16,3 | 17,3 | 22 | 26 | 34 |
| | 230V/1 | P\|A | A | 17,5 | 17,5 | 20,7 | 24,7 | - | - | - | - | - | - | - |
| | 400V/3N | P\|A | A | 7 | 7,00 | 7,70 | 9,70 | 13,30 | 15,50 | 18,30 | 19,30 | 23,4 | 28,8 | 36,8 |
| | 400V/3N | N\|Q | A | - | - | - | - | 14 | 16,2 | 19 | 20 | 24.8 | 29.5 | 37.5 |
| Peak current (LRA) | 230V/1 | ° | A | 59,5 | 62,5 | 83,7 | 98,7 | - | - | - | - | - | - | - |
| | 400V/3N | ° | A | 26,5 | 32,5 | 35,7 | 48,7 | 65,3 | 75,3 | 102,3 | 96,3 | 76 | 87 | 117 |
| | 230V/1 | P\|A | A | 60,5 | 63,5 | 84,7 | 99,7 | - | - | - | - | - | - | - |
| | 400V/3N | P\|A | A | 27,5 | 33,5 | 36,7 | 49,7 | 67,3 | 77,3 | 104,3 | 98,3 | 77.4 | 89.8 | 119.8 |
| | 400V/3N | N\|Q | A | - | - | - | - | 68 | 78 | 105 | 99 | 78.8 | 90.5 | 120.5 |
| **COMPRESSORS SCROLL** | | | | | | | | | | | | | | |
| Number / circuit | | n°/n° | | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 2/1 | 2/1 | 2/1 |
| Compressors sump resistance | | n°/kW | | 1x70 | 1x70 | 1x70 | 1x70 | 1x35 | 1x35 | 1x35 | 1x65 | 2X35 | 2X35 | 2X65 |
| Partload | | % | | 0-100 | 0-100 | 0-100 | 0-100 | 0-100 | 0-100 | 0-100 | 0-100 | 0-50-100 | 0-50-100 | 0-50-100 |
| **EXCHANGER SYSTEM SIDE** | | | | | | | | | | | | | | |
| Number | | | n° | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Water content | | | $dm^3$ | | | | | | | | | | | |
| hydraulic connections | IN\|OUT | | Ø | 1"¼ | 1"¼ | 1"¼ | 1"¼ | 1"¼ | 1"¼ | 1"¼ | 1"¼ | 1"¼ | 1"¼ | 1"¼ |

**① COOLING MODE**

| | |
|---|---|
| Evaporator water inlet | 7°C |
| Evaporator water outlet | 12°C |
| External air temperatures | 35 °C |

**② COOLING MODE with DESUPERHEATER**

| | |
|---|---|
| Desuperheater water inlet | 50°C |
| Evaporator water inlet | 7 °C |
| Δt | 5° C |

| Model | | | | 020° | 025° | 030° | 040° | 050° | 070° | 080° | 090° | 100° | 150° | 200° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **HYDRONIC KIT SYSTEM SIDE** | | | | | | | | | | | | | | |
| **STORAGE TANK** | | | | | | | | | | | | | | |
| Storage tank | | | l | 25 | 25 | 35 | 35 | 75 | 75 | 75 | 75 | 100 | 100 | 100 |
| Electri heater | | | N°/W | ACCESSORIES | | | | | | | | | | |
| **EXPANSION TANK** | | | | | | | | | | | | | | |
| Expansion tank | | | n°/l | 2 | 2 | 2 | 2 | 5 | 5 | 5 | 5 | 8 | 8 | 8 |
| Calibration expansion tank | | | bar | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 |
| **STANDARD PUMP "P"** | | | | | | | | | | | | | | |
| Input power | | | kW | 0,15 | 0,15 | 0,15 | 0,15 | 0,27 | 0,27 | 0,27 | 0,27 | 0.6 | 1.0 | 1.0 |
| Input current | | | A | 1,04 | 1,04 | 1,04 | 1,04 | 1,95 | 1,95 | 1,95 | 1,95 | 1.2 | 2.0 | 2.0 |
| **INCREASED PUMP "N"** | | | | | | | | | | | | | | |
| Input power | | | kW | - | - | - | - | 0,45 | 0,45 | 0,45 | 0,45 | 1 | 1.3 | 1.3 |
| Input current | | | A | - | - | - | - | 2,7 | 2,7 | 2,7 | 2,7 | 2 | 2.6 | 2.6 |
| **SAFETY VALVE** | | | | | | | | | | | | | | |
| Safety valve | | | n°/bar | 1/6 | 1/6 | 1/6 | 1/6 | 1/6 | 1/6 | 1/6 | 1/6 | 1/6 | 1/6 | 1/6 |
| **DESUPERHEATER** | | | | | | | | | | | | | | |
| Number | | | n° | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Water content | | | $dm^3$ | | | | | | | | | | | |
| hydraulic connections | IN\|OUT | | Ø | | | | | | | | | | | |
| **FANS** | | | | | | | | | | | | | | |
| Number | | | n° | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Air flow rate | | | $m^3/h$ | 2500 | 2500 | 3500 | 3500 | 7200 | 7200 | 7300 | 7200 | 13200 | 12000 | 12000 |
| Input power | | | A | 0,085 | 0,085 | 0,14 | 0,14 | 0,28 | 0,28 | 0,28 | 0,28 | 0,6 | 0,6 | 0,6 |
| Input current | | | kW | 0,45 | 0,45 | 0,66 | 0,66 | 1,32 | 1,32 | 1,32 | 1,32 | 2,6 | 2,6 | 2,6 |
| **SOUND DATA** | | | | | | | | | | | | | | |
| Sound pressure | | | dB(A) | 30 | 30 | 37 | 37 | 38 | 38 | 38 | 37 | 44 | 45 | 46 |
| Sound power | | | dB(A) | 61 | 61 | 68 | 68 | 69 | 69 | 69 | 68 | 76 | 77 | 78 |
| **LOAD (ATTENTION: the declared data can be amended at any time by Aermec, if deemed necessary).** | | | | | | | | | | | | | | |
| Refrigerant R410A | | °\|P | kg | 1,25 | 1,30 | 1,56 | 2,00 | 3,48 | 3,79 | 3,73 | 4,7 | 8,00 | 11,5 | 12,0 |
| Oil | | A | kg | 1,30 | 1,30 | 1,56 | 2,00 | 3,41 | 3,74 | 3,73 | 4,7 | 8,00 | 11,5 | 12,0 |
| **DIMENSIONS - WEIGHT** | | | | | | | | | | | | | | |
| Height | | °\|P | mm | 868 | 868 | 1000 | 1000 | 1252 | 1252 | 1252 | 1252 | 1345 | 1345 | 1345 |
| | | A | mm | 868 | 868 | 1015 | 1015 | 1281 | 1281 | 1281 | 1281 | | | |
| | | Q | mm | - | - | - | - | 1281 | 1281 | 1281 | 1281 | | | |
| Width | | °\|P | mm | 900 | 900 | 900 | 900 | 1124 | 1124 | 1124 | 1124 | 750 | 750 | 750 |
| | | A | mm | 1124 | 1124 | 1124 | 1124 | 1165 | 1165 | 1165 | 1165 | | | |
| | | Q | mm | - | - | - | - | 1165 | 1165 | 1165 | 1165 | | | |
| Depth (without feet / with feet) | | °\|P | mm | 310/354 | 310/354 | 310/354 | 310/354 | 384/428 | 384/428 | 384/428 | 384/428 | 1750 | 1750 | 1750 |
| | | A | mm | 384/428 | 384/428 | 384/428 | 384/428 | 550 | 550 | 550 | 550 | | | |
| | | Q | mm | - | - | - | - | 550 | 550 | 550 | 550 | | | |
| Weight | | ° | kg | 75 | 75 | 86 | 86 | 120 | 120 | 120 | 156 | 270 | 293 | 329 |
| | | P | kg | 77 | 77 | 91 | 91 | 127 | 127 | 163 | 163 | 288 | 314 | 350 |
| | | A | kg | 99 | 99 | 103 | 103 | 147 | 147 | 147 | 183 | 338 | 364 | 400 |
| | | Q | kg | - | - | - | - | 151 | 151 | 187 | 187 | | | |

**Sound power**
Aermec determines sound power values in agreement with the 9614 Standard, in compliance with that requested by Eurovent certification

**Sound Pressure**
Sound pressure measured in free field conditions with reflective surface (directivity factor Q=2) at 10 mt distance from external surface of unit, in compliance with ISO 3744 regulations.

| Model | | | | 020H | 025H | 030H | 040H | 050H | 070H | 080H | 090H | 100H | 150H | 200H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Heating capacity | | **TUTTE** | kW | 6,2 | 7 | 8,4 | 10,6 | 14 | 17,3 | 22,2 | 24,2 | 29 | 35 | 46 |
| Total input power | | **H** | kW | 1,91 | 2,12 | 2,62 | 3,18 | 4,3 | 4,9 | 6,3 | 6,85 | 8,6 | 10,1 | 13,3 |
| | | **P\|A** | kW | 2,06 | 2,27 | 2,77 | 3,33 | 4,57 | 5,17 | 6,57 | 7,12 | 9.2 | 11.1 | 14.3 |
| | | **N\|Q** | kW | - | - | - | - | 4,75 | 5,35 | 6,75 | 7,3 | 9.6 | 11.4 | 14.6 |
| Water flow rate | | **TUTTE** | l/h | 1070 | 1200 | 1450 | 1820 | 2410 | 2980 | 3820 | 4160 | 4990 | 6020 | 7910 |
| Pressure drops exchanger \| piping | | **H** | kPa | 32 | 35 | 35 | 30 | 30 | 30 | 38 | 53 | 52 | 44 | 37 |
| Pressure drops filter | | | kPa | 1 | 1 | 2 | 3 | 4 | 5,5 | 8 | 10 | 6 | 9 | 15 |
| Useful static pressur SYSTEM SIDE | | **P\|A** | kPa | 60 | 60 | 59 | 55 | 82 | 80 | 69 | 66 | 84 | 115 | 90 |
| | | **N\|Q** | kPa | - | - | - | - | 160 | 158 | 144 | 140 | 142 | 187 | 162 |
| Cooling capacity | | **TUTTE** | kW | 5,7 | 6,2 | 7,5 | 9,6 | 13,4 | 16,5 | 20,5 | 22,3 | 26 | 32 | 42 |
| Total input power | | **H** | kW | 1,84 | 2 | 2,46 | 3,25 | 4,03 | 4,88 | 6,33 | 6,63 | 8,6 | 10,2 | 13,9 |
| | | **P\|A** | kW | 1,99 | 2,15 | 2,61 | 3,4 | 4,3 | 5,15 | 6,6 | 6,9 | 9.2 | 11.2 | 14.9 |
| | | **N\|Q** | kW | - | - | - | - | 4,48 | 5,33 | 6,78 | 7,08 | 9.6 | 11.5 | 15.2 |
| Water flow rate | | **TUTTE** | l/h | 980 | 1070 | 1290 | 1650 | 2310 | 2840 | 3530 | 3840 | 4470 | 5500 | 7220 |
| Pressure drops exchanger \| piping | | **H** | kPa | 29 | 30 | 30 | 27 | 30 | 30 | 36 | 50 | 41 | 37 | 31 |
| Useful static pressur SYSTEM SIDE | | **P\|A** | kPa | 60 | 60 | 59 | 55 | 82 | 80 | 69 | 66 | 84 | 115 | 90 |
| | | **N\|Q** | kPa | - | - | - | - | 160 | 158 | 144 | 140 | | | |
| **ENERGY INDICES** | | | | | | | | | | | | | | |
| EER | | **H** | W/W | 3,10 | 3,10 | 3,05 | 2,95 | 3,33 | 3,38 | 3,24 | 3,36 | 3,02 | 3,14 | 3,02 |
| | | **P\|A** | W/W | 2,86 | 2,88 | 2,87 | 2,82 | 3,12 | 3,20 | 3,11 | 3,23 | 2,83 | 2,86 | 2,82 |
| | | **N\|Q** | W/W | - | - | - | - | 2,99 | 3,10 | 3,02 | 3,15 | 2,71 | 2,78 | 2,76 |
| COP | | **H** | W/W | 3,25 | 3,30 | 3,21 | 3,33 | 3,26 | 3,53 | 3,52 | 3,53 | 3,37 | 3,47 | 3,46 |
| | | **P\|A** | W/W | 3,01 | 3,08 | 3,03 | 3,18 | 3,06 | 3,35 | 3,38 | 3,40 | 3,15 | 3,15 | 3,22 |
| | | **N\|Q** | W/W | - | - | - | - | 2,95 | 3,23 | 3,29 | 3,32 | 3,02 | 3,07 | 3,15 |
| ESEER | | | | 3,72 | 3,72 | 3,66 | 3,54 | 3,99 | 4,06 | 3,88 | 4,03 | 4,14 | 4,25 | 4,12 |
| **PROTECTION RATING** | | | | | | | | | | | | | | |
| IP | | | | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| **ELECTRICAL DATA** | | | | | | | | | | | | | | |
| Total input current cooling mode | 230V/1 | **H** | A | 9,4 | 10 | 13 | 16,3 | - | - | - | - | - | - | - |
| | 400V/3N | **H** | A | 3,7 | 4,2 | 4,7 | 6,2 | 8,7 | 9,7 | 12,2 | 12,8 | 17 | 19,2 | 26,2 |
| | 230V/1 | **P\|A** | A | 9,4 | 10 | 13 | 16,3 | - | - | - | - | - | - | - |
| | 400V/3N | **P\|A** | A | 4,7 | 5,2 | 5,7 | 7,2 | 10,7 | 11,7 | 14,2 | 14,8 | 18,2 | 21,2 | 28,2 |
| | 400V/3N | **N\|Q** | A | - | - | - | - | 11,4 | 12,4 | 14,9 | 15,5 | 19 | 21,8 | 28,8 |
| Total input current heating mode | 230V/1 | **H** | A | 10,4 | 11 | 14 | 17,3 | - | - | - | - | - | - | - |
| | 400V/3N | **H** | A | 3,8 | 4,4 | 5,4 | 6,8 | 9,5 | 10,3 | 12,9 | 13,8 | 17 | 19 | 25 |
| | 230V/1 | **P\|A** | A | 10,4 | 12,3 | 14 | 19,3 | - | - | - | - | - | - | - |
| | 400V/3N | **P\|A** | A | 4,8 | 5,4 | 6,4 | 7,8 | 11,5 | 12,3 | 14,9 | 15,8 | 18,2 | 21,0 | 27,0 |
| | 400V/3N | **N\|Q** | A | - | - | - | - | 12,2 | 13 | 15,6 | 16,5 | 19,0 | 21,6 | 27,6 |
| Maximum current (FLA) | 230V/1 | **H** | A | 16,5 | 16,5 | 19,7 | 23,7 | - | - | - | - | - | - | - |
| | 400V/3N | **H** | A | 6 | 6 | 6,7 | 8,7 | 11,3 | 13,5 | 16,3 | 17,3 | 22 | 26 | 34 |
| | 230V/1 | **P\|A** | A | 17,5 | 17,5 | 20,7 | 24,7 | - | - | - | - | - | - | - |
| | 400V/3N | **P\|A** | A | 7 | 7 | 7,7 | 9,7 | 13,3 | 15,5 | 18,3 | 19,3 | 23,4 | 28,8 | 36,8 |
| | 400V/3N | **N\|Q** | A | - | - | - | - | 14 | 16,2 | 19 | 20 | 23,4 | 28,8 | 36,8 |
| Peak current (LRA) | 230V/1 | **H** | A | 59,5 | 62,5 | 83,7 | 98,7 | - | - | - | - | - | - | - |
| | 400V/3N | **H** | A | 26,5 | 32,5 | 35,7 | 48,7 | 65,3 | 75,3 | 102,3 | 96,3 | 76 | 87 | 117 |
| | 230V/1 | **P\|A** | A | 60,5 | 63,5 | 84,7 | 99,7 | - | - | - | - | - | - | - |
| | 400V/3N | **P\|A** | A | 27,5 | 33,5 | 36,7 | 49,7 | 67,3 | 77,3 | 104,3 | 98,3 | 77,4 | 89,8 | 119,8 |
| | 400V/3N | **N\|Q** | A | - | - | - | - | 68 | 78 | 105 | 99 | 78,8 | 90,5 | 120,5 |

**① HEATING MODE**

| | |
|---|---|
| Condenser water inlet | 40°C |
| Condenser water outlet | 45°C |
| External air temperatures | b.s. 7 °C/b.u. 6 °C |

**② COOLING MODE**

| | |
|---|---|
| Evaporator water inlet | 7°C |
| Evaporator water outlet | 12°C |
| External air temperatures | 35 °C |

| Model | | | | 020H | 025H | 030H | 040H | 050H | 070H | 080H | 090H | 100H | 150H | 200H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **COMPRESSORS SCROLL** | | | | | | | | | | | | | | |
| Number / circuit | | n°/n° | | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 2/1 | 2/1 | 2/1 |
| Compressors sump resistance | | n°/kW | | 1x70 | 1x70 | 1x70 | 1x70 | 1x35 | 1x35 | 1x35 | 1x65 | 2X35 | 2X35 | 2X65 |
| Capacity controls | | % | | 0-100 | 0-100 | 0-100 | 0-100 | 0-100 | 0-100 | 0-100 | 0-100 | 0-50-100 | 0-50-100 | 0-50-100 |
| **EXCHANGER SYSTEM SIDE** | | | | | | | | | | | | | | |
| Number | | | n° | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Water content | | | $dm^3$ | | | | | | | | | | | |
| hydraulic connections | IN\|OUT | | Ø | 1"¼ | 1"¼ | 1"¼ | 1"¼ | 1"¼ | 1"¼ | 1"¼ | 1"¼ | 1"¼ | 1"¼ | 1"¼ |
| **HYDRONIC KIT SYSTEM SIDE** | | | | | | | | | | | | | | |
| **STORAGE TANK** | | | | | | | | | | | | | | |
| Storage tank | | | l | 25 | 25 | 35 | 35 | 75 | 75 | 75 | 75 | 100 | 100 | 100 |
| Electri heater | | | N°/W | ACCESSORIES | | | | | | | | | | |
| **EXPANSION TANK** | | | | | | | | | | | | | | |
| Expansion tank | | | n°/l | 2 | 2 | 2 | 2 | 5 | 5 | 5 | 5 | 8 | 8 | 8 |
| Calibration expansion tank | | | bar | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 |
| **STANDARD PUMP "P"** | | | | | | | | | | | | | | |
| Input power | | | kW | 0,15 | 0,15 | 0,15 | 0,15 | 0,27 | 0,27 | 0,27 | 0,27 | 0.6 | 1.0 | 1.0 |
| Input current | | | A | 1,04 | 1,04 | 1,04 | 1,04 | 1,95 | 1,95 | 1,95 | 1,95 | 1.2 | 2.0 | 2.0 |
| **INCREASED PUMP "N"** | | | | | | | | | | | | | | |
| Input power | | | kW | - | - | - | - | 0,45 | 0,45 | 0,45 | 0,45 | 1 | 1.3 | 1.3 |
| Input current | | | A | - | - | - | - | 2,7 | 2,7 | 2,7 | 2,7 | 2 | 2.6 | 2.6 |
| **SAFETY VALVE** | | | | | | | | | | | | | | |
| Safety valve | | | n°/bar | 1/6 | 1/6 | 1/6 | 1/6 | 1/6 | 1/6 | 1/6 | 1/6 | 1/6 | 1/6 | 1/6 |
| **FANS** | | | | | | | | | | | | | | |
| Number | | | n° | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Air flow rate | | | $m^3/h$ | 2500 | 2500 | 3500 | 3500 | 7200 | 7200 | 7300 | 7200 | 13200 | 12000 | 12000 |
| Input power | | | A | 0,085 | 0,085 | 0,14 | 0,14 | 0,28 | 0,28 | 0,28 | 0,28 | 0,6 | 0,6 | 0,6 |
| Input current | | | kW | 0,45 | 0,45 | 0,66 | 0,66 | 1,32 | 1,32 | 1,32 | 1,32 | 2,6 | 2,6 | 2,6 |
| **SOUND DATA** | | | | | | | | | | | | | | |
| Sound pressure | | | dB(A) | 30 | 30 | 37 | 37 | 38 | 38 | 38 | 37 | 44 | 45 | 46 |
| Sound power | | | dB(A) | 61 | 61 | 68 | 68 | 69 | 69 | 69 | 68 | 76 | 77 | 78 |
| **LOAD (ATTENTION: the declared data can be amended at any time by Aermec, if deemed necessary).** | | | | | | | | | | | | | | |
| Refrigerant R410A | | °\|P | kg | 1,50 | 1,50 | 1,80 | 1,99 | 4,15 | 4,10 | 4,14 | 5,08 | 12,70 | 16,00 | 17,00 |
| Oil | | A | kg | | | | | | | | | | | |
| **DIMENSIONS - WEIGHT** | | | | | | | | | | | | | | |
| Height | | °\|P | mm | 868 | 868 | 1000 | 1000 | 1252 | 1252 | 1252 | 1252 | 1345 | 1345 | 1345 |
| | | A | mm | 868 | 868 | 1015 | 1015 | 1281 | 1281 | 1281 | 1281 | | | |
| | | Q | mm | - | - | - | - | 1281 | 1281 | 1281 | 1281 | | | |
| Width | | °\|P | mm | 900 | 900 | 900 | 900 | 1124 | 1124 | 1124 | 1124 | 750 | 750 | 750 |
| | | A | mm | 1124 | 1124 | 1124 | 1124 | 1165 | 1165 | 1165 | 1165 | | | |
| | | Q | mm | - | - | - | - | 1165 | 1165 | 1165 | 1165 | | | |
| Depth (without feet / with feet) | | °\|P | mm | 310/354 | 310/354 | 310/354 | 310/354 | 384/428 | 384/428 | 384/428 | 384/428 | 1750 | 1750 | 1750 |
| | | A | mm | 384/428 | 384/428 | 384/428 | 384/428 | 550 | 550 | 550 | 550 | | | |
| | | Q | mm | - | - | - | - | 550 | 550 | 550 | 550 | | | |
| Weight | | ° | kg | 75 | 75 | 86 | 86 | 120 | 120 | 120 | 156 | 295 | 322 | 358 |
| | | P | kg | 77 | 77 | 91 | 91 | 127 | 127 | 163 | 163 | 313 | 343 | 379 |
| | | A | kg | 99 | 99 | 103 | 103 | 147 | 147 | 147 | 183 | 363 | 393 | 429 |
| | | Q | kg | - | - | - | - | 151 | 151 | 187 | 187 | 423 | 447 | 457 |

**Sound power**
Aermec determines sound power values in agreement with the 9614 Standard, in compliance with that requested by Eurovent certification

**Sound Pressure**
Sound pressure measured in free field conditions with reflective surface (directivity factor Q=2) at 10 mt distance from external surface of unit, in compliance with ISO 3744 regulations.

| Model | | | | 020C | 025C | 030C | 040C | 050C | 070C | 080C | 090C | 100C | 150C | 200C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ① | | | | | | | | | | | | | | |
| Cooling capacity | | **TUTTE** | kW | 5,7 | 6 | 7,5 | 9,6 | 13,7 | 16,8 | 20,8 | 22,5 | 26,9 | 33,4 | 43,7 |
| Total input power | | ° | kW | 1,85 | 2,05 | 2,5 | 3,3 | 4,1 | 5 | 6,5 | 6,8 | 8,6 | 10,2 | 14,1 |
| **ENERGY INDICES** | | | | | | | | | | | | | | |
| EER | | ° | W/W | 3,08 | 2,93 | 3,00 | 2,91 | 3,34 | 3,36 | 3,20 | 3,31 | 3,13 | 3,27 | 3,10 |
| **PROTECTION RATING** | | | | | | | | | | | | | | |
| IP | | | | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| **ELECTRICAL DATA** | | | | | | | | | | | | | | |
| Total input current | 230V/1 | ° | A | 9,50 | 10,00 | 13,00 | 16,30 | - | - | - | - | - | - | - |
| | 400V/3N | ° | A | 3,70 | 4,20 | 4,70 | 6,30 | 8,90 | 9,90 | 12,40 | 13,10 | 17,10 | 19,30 | 26,40 |
| Maximum current (FLA) | 230V/1 | ° | A | 16,5 | 16,5 | 19,7 | 23,7 | - | - | - | - | - | - | - |
| | 400V/3N | ° | A | 6 | 6 | 6,7 | 8,7 | 11,3 | 13,5 | 16,3 | 17,3 | 22 | 26 | 34 |
| Peak current (LRA) | 230V/1 | ° | A | 59,5 | 62,5 | 83,7 | 98,7 | - | - | - | - | - | - | - |
| | 400V/3N | ° | A | 26,5 | 32,5 | 35,7 | 48,7 | 65,3 | 75,3 | 102,3 | 96,3 | 76 | 87 | 117 |
| **COMPRESSORS SCROLL** | | | | | | | | | | | | | | |
| Number / circuit | | n°/n° | | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 2/1 | 2/1 | 2/1 |
| Compressors sump resistance | | n°/kW | | 1x70 | 1x70 | 1x70 | 1x70 | 1x35 | 1x35 | 1x35 | 1x65 | 2X35 | 2X35 | 2X65 |
| Capacity controls | | % | | 0-100 | 0-100 | 0-100 | 0-100 | 0-100 | 0-100 | 0-100 | 0-100 | 0-50-100 | 0-50-100 | 0-50-100 |
| **FANS** | | | | | | | | | | | | | | |
| Number | | | n° | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Air flow rate | | | $m^3/h$ | 2500 | 2500 | 3500 | 3500 | 7200 | 7200 | 7300 | 7200 | 13200 | 12000 | 12000 |
| Input power | | | A | 0,085 | 0,085 | 0,14 | 0,14 | 0,28 | 0,28 | 0,28 | 0,28 | 0,6 | 0,6 | 0,6 |
| Input current | | | kW | 0,45 | 0,45 | 0,66 | 0,66 | 1,32 | 1,32 | 1,32 | 1,32 | 2,6 | 2,6 | 2,6 |
| **LOAD (ATTENTION: the declared data can be amended at any time by Aermec, if deemed necessary).** | | | | | | | | | | | | | | |
| Refrigerant R410A | | | kg | 1,25 | 1,30 | 1,56 | 2,00 | 3,48 | 3,79 | 3,73 | 4,70 | | | |
| Oil | | | kg | | | | | | | | | | | |
| **CONNECTIONE** | | | | | | | | | | | | | | |
| Line gas | | | Ø | 15,88 | 15,88 | 15,88 | 15,88 | 22 | 22 | 22 | 28 | 28 | 28 | 35 |
| Line liquid | | | Ø | 9,52 | 9,52 | 12,7 | 12,7 | 15,88 | 15,88 | 15,88 | 15,88 | 15,88 | 15,88 | 15,88 |
| **DIMENSIONS - WEIGHT** | | | | | | | | | | | | | | |
| Height | | | mm | 868 | 868 | 1000 | 1000 | 1252 | 1252 | 1252 | 1252 | 1345 | 1345 | 1345 |
| Width | | | mm | 900 | 900 | 900 | 900 | 1124 | 1124 | 1124 | 1124 | 750 | 750 | 750 |
| Depth (without feet / with feet) | | | mm | 310/354 | 310/354 | 310/354 | 310/354 | 384/428 | 384/428 | 384/428 | 384/428 | 1750 | 1750 | 1750 |
| Weight | | | kg | 70 | 70 | 78 | 78 | 110 | 110 | 141 | 141 | | | |

**① COOLING MODE**

| | |
|---|---|
| Evaporating temperature | 5°C |
| External air temperatures | 35 °C |

**Sound power**

Aermec determines sound power values in agreement with the 9614 Standard, in compliance with that requested by Eurovent certification

**Sound Pressure**

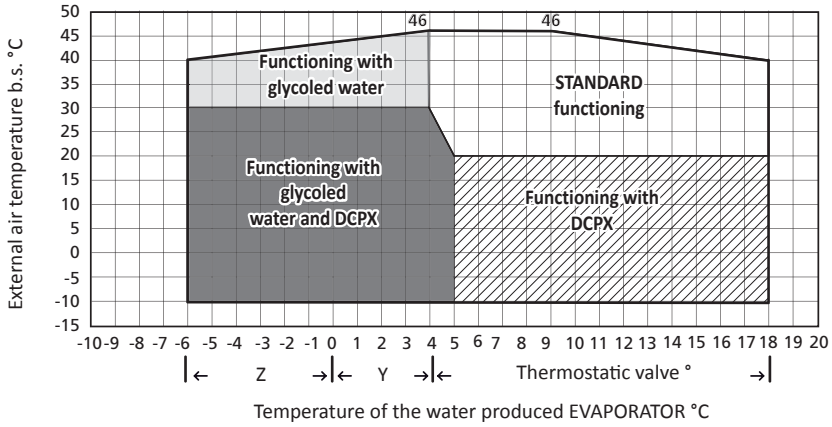
Sound pressure measured in free field conditions with reflective surface (directivity factor Q=2) at 10 mt distance from external surface of unit, in compliance with ISO 3744 regulations.

## 8. OPERATION LIMIT

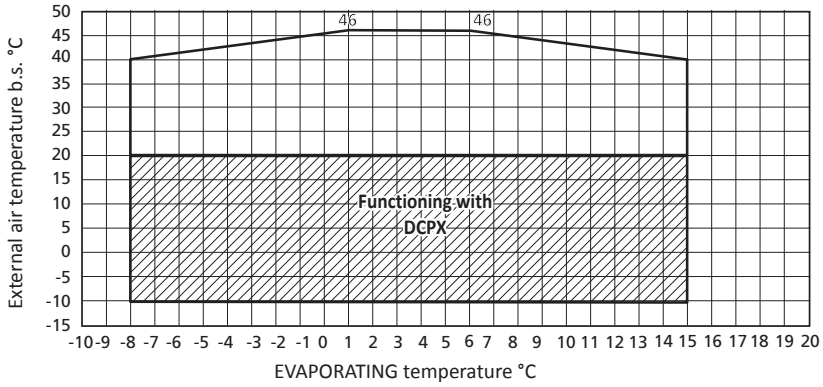
### 8.1. COOLING MODE [8]

The units, in standard configuration, are not suitable for installation in salty environments. The maximum and minimum limits for water flow rate to the heat exchanger are indicated by the pressure drop diagram curves. For functioning limits, please refer to the diagrams below, valid for Δt = 5°C

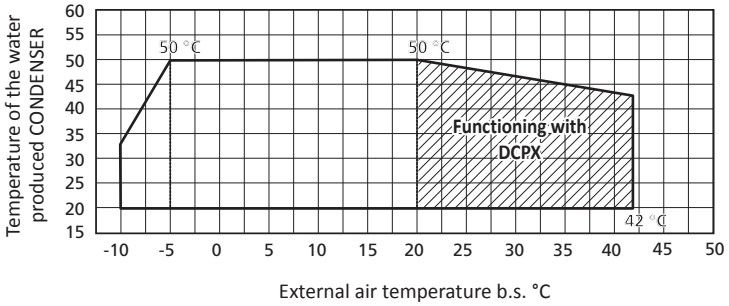
If it is installed in a particularly windy zone, a windbreak should be provided to avoid unstable operation of the DCPX device.




### 8.2. COOLING MODE FOR VERSION "C"




### 8.3. HEATING MODE [8]




Note:

8 In summer mode the unit can be started with external air 46°C and water inlet 35°C.
In winter mode the unit can be started with external air -15°C and water inlet 20°C.
Operate in such conditions is permitted only for a short time and to bring the system up to temperature.
To reduce the time of this operation, it is recommended to install a three-way valve that allows bypassing water from the system utilities, until the conditions that allow the unit to work within the permitted operation limits are achieved.

## 9. PERFORMANCE AND ABSORPTION THAT DIFFER FROM THE NOMINAL - STANDARD COOLING MODE

### 9.1. ANL 020° (230V/1/50Hz) |(400V/3N/50Hz) Cooling capacity - Total input power

| TAP | EXTERNAL AIR TEMPERATURE (°C) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | | | 25 | | | 30 | | | 35 | | | 40 | | | 45 | | |
| | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER |
| **-6** | 5,07 | 1,23 | 4,12 | 4,79 | 1,42 | 3,37 | 4,49 | 1,61 | 2,79 | 4,18 | 1,78 | 2,35 | - | - | - | - | - | - |
| **-4** | 5,37 | 1,24 | 4,33 | 5,07 | 1,43 | 3,55 | 4,75 | 1,62 | 2,93 | 4,43 | 1,79 | 2,47 | - | - | - | - | - | - |
| **-2** | 5,66 | 1,25 | 4,53 | 5,34 | 1,44 | 3,71 | 5,01 | 1,62 | 3,09 | 4,68 | 1,79 | 2,61 | 4,34 | 1,94 | 2,24 | - | - | - |
| **0** | 5,95 | 1,26 | 4,72 | 5,61 | 1,44 | 3,90 | 5,26 | 1,63 | 3,23 | 4,91 | 1,80 | 2,73 | 4,56 | 1,94 | 2,35 | - | - | - |
| **2** | 6,23 | 1,26 | 4,94 | 5,87 | 1,45 | 4,05 | 5,51 | 1,63 | 3,38 | 5,15 | 1,81 | 2,85 | 4,78 | 1,95 | 2,45 | - | - | - |
| **4** | 6,50 | 1,27 | 5,12 | 6,13 | 1,45 | 4,23 | 5,75 | 1,64 | 3,51 | 5,38 | 1,81 | 2,97 | 5,00 | 1,96 | 2,55 | 4,63 | 2,07 | 2,24 |
| **6** | 6,76 | 1,27 | 5,32 | 6,38 | 1,46 | 4,37 | 5,99 | 1,65 | 3,63 | 5,60 | 1,82 | 3,08 | 5,21 | 1,98 | 2,63 | 4,83 | 2,09 | 2,31 |
| **7** | 6,89 | 1,29 | 5,34 | 6,50 | 1,47 | 4,42 | 6,11 | 1,66 | 3,68 | **5,70** | **1,84** | **3,10** | 5,32 | 1,98 | 2,69 | 4,93 | 2,09 | 2,36 |
| **8** | 7,02 | 1,30 | 5,40 | 6,63 | 1,48 | 4,48 | 6,23 | 1,67 | 3,73 | 5,82 | 1,84 | 3,16 | 5,42 | 1,99 | 2,72 | 5,03 | 2,10 | 2,40 |
| **10** | 7,28 | 1,31 | 5,56 | 6,87 | 1,50 | 4,58 | 6,46 | 1,68 | 3,85 | 6,04 | 1,86 | 3,25 | 5,63 | 2,00 | 2,82 | - | - | - |
| **12** | 7,53 | 1,32 | 5,70 | 7,11 | 1,51 | 4,71 | 6,68 | 1,70 | 3,93 | 6,26 | 1,87 | 3,35 | 5,84 | 2,01 | 2,91 | - | - | - |
| **14** | 7,78 | 1,34 | 5,81 | 7,34 | 1,52 | 4,83 | 6,91 | 1,71 | 4,04 | 6,47 | 1,88 | 3,44 | 6,04 | 2,02 | 2,99 | - | - | - |
| **16** | 8,02 | 1,35 | 5,94 | 7,58 | 1,53 | 4,95 | 7,13 | 1,72 | 4,15 | 6,68 | 1,89 | 3,53 | 6,24 | 2,03 | 3,07 | - | - | - |
| **18** | 8,26 | 1,36 | 6,07 | 7,81 | 1,55 | 5,04 | 7,35 | 1,74 | 4,22 | 6,89 | 1,90 | 3,63 | 6,45 | 2,05 | 3,15 | - | - | - |

### 9.2. ANL 025° (230V/1/50Hz) |(400V/3N/50Hz) Cooling capacity - Total input power

| TAP | EXTERNAL AIR TEMPERATURE (°C) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | | | 25 | | | 30 | | | 35 | | | 40 | | | 45 | | |
| | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER |
| **-6** | 5,51 | 1,34 | 4,12 | 5,21 | 1,54 | 3,38 | 4,88 | 1,75 | 2,79 | 4,55 | 1,93 | 2,35 | - | - | - | - | - | - |
| **-4** | 5,84 | 1,35 | 4,33 | 5,51 | 1,55 | 3,55 | 5,17 | 1,76 | 2,93 | 4,82 | 1,95 | 2,48 | - | - | - | - | - | - |
| **-2** | 6,16 | 1,36 | 4,53 | 5,81 | 1,57 | 3,71 | 5,45 | 1,76 | 3,09 | 5,09 | 1,95 | 2,62 | 4,72 | 2,11 | 2,24 | - | - | - |
| **0** | 6,47 | 1,37 | 4,73 | 6,10 | 1,57 | 3,90 | 5,72 | 1,77 | 3,23 | 5,34 | 1,96 | 2,73 | 4,96 | 2,11 | 2,35 | - | - | - |
| **2** | 6,78 | 1,37 | 4,95 | 6,38 | 1,58 | 4,05 | 5,99 | 1,77 | 3,38 | 5,60 | 1,97 | 2,85 | 5,20 | 2,12 | 2,45 | - | - | - |
| **4** | 7,07 | 1,38 | 5,12 | 6,67 | 1,58 | 4,23 | 6,25 | 1,78 | 3,51 | 5,85 | 1,97 | 2,97 | 5,44 | 2,13 | 2,55 | 5,04 | 2,25 | 2,24 |
| **6** | 7,35 | 1,38 | 5,33 | 6,94 | 1,59 | 4,37 | 6,52 | 1,79 | 3,63 | 6,09 | 1,98 | 3,08 | 5,67 | 2,15 | 2,63 | 5,25 | 2,27 | 2,31 |
| **7** | 7,49 | 1,40 | 5,34 | 7,07 | 1,60 | 4,42 | 6,65 | 1,80 | 3,68 | **6,20** | **2,00** | **3,10** | 5,79 | 2,15 | 2,69 | 5,36 | 2,27 | 2,36 |
| **8** | 7,64 | 1,41 | 5,40 | 7,21 | 1,61 | 4,48 | 6,78 | 1,82 | 3,73 | 6,33 | 2,00 | 3,17 | 5,90 | 2,16 | 2,73 | 5,47 | 2,28 | 2,40 |
| **10** | 7,92 | 1,42 | 5,56 | 7,47 | 1,63 | 4,58 | 7,03 | 1,83 | 3,85 | 6,57 | 2,02 | 3,25 | 6,12 | 2,17 | 2,82 | - | - | - |
| **12** | 8,19 | 1,43 | 5,71 | 7,73 | 1,64 | 4,71 | 7,27 | 1,85 | 3,93 | 6,81 | 2,03 | 3,35 | 6,35 | 2,18 | 2,91 | - | - | - |
| **14** | 8,46 | 1,46 | 5,81 | 7,98 | 1,65 | 4,83 | 7,52 | 1,86 | 4,04 | 7,04 | 2,04 | 3,44 | 6,57 | 2,20 | 2,99 | - | - | - |
| **16** | 8,72 | 1,47 | 5,94 | 8,24 | 1,66 | 4,96 | 7,76 | 1,87 | 4,15 | 7,27 | 2,05 | 3,54 | 6,79 | 2,21 | 3,08 | - | - | - |
| **18** | 8,98 | 1,48 | 6,08 | 8,50 | 1,68 | 5,04 | 7,99 | 1,89 | 4,23 | 7,49 | 2,07 | 3,63 | 7,02 | 2,23 | 3,15 | - | - | - |

| Key | |
|---|---|
| Pc | Cooling capacity |
| Pe | Total Input Power |
| TAP | Produced water temperature |

**ATTENTION**
For intermediate points refer to the diagrams of operating limits (§ 8.1)

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### 8.4. Δt DIFFERENT FROM NOMINAL (Δt 5°C)

| | 3 | 5 | 8 | 10 |
|---|---|---|---|---|
| Cooling capacity correction factors | 0,99 | **1** | 1,02 | 1,03 |
| Total input power correction factors | 0,99 | **1** | 1,01 | 1,02 |

### 8.5. FOULING FACTOR

| [K*m2]/[W] | 0,00005 | 0,0001 | 0,0002 |
|---|---|---|---|
| Cooling capacity correction factors | **1** | 0,98 | 0,94 |
| Total input power correction factors | **1** | 0,98 | 0,95 |

## 9.5. ANL 030° (230V/1/50Hz) |(400V/3N/50Hz) Cooling capacity - Total input power

| TAP | EXTERNAL AIR TEMPERATURE (°C) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | | | 25 | | | 30 | | | 35 | | | 40 | | | 45 | | |
| | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER |
| **-6** | 6,67 | 1,64 | 4,06 | 6,30 | 1,90 | 3,32 | 5,91 | 2,15 | 2,74 | 5,50 | 2,38 | 2,31 | - | - | - | - | - | - |
| **-4** | 7,07 | 1,66 | 4,26 | 6,67 | 1,91 | 3,49 | 6,25 | 2,17 | 2,89 | 5,83 | 2,39 | 2,44 | - | - | - | - | - | - |
| **-2** | 7,45 | 1,67 | 4,46 | 7,03 | 1,93 | 3,65 | 6,59 | 2,17 | 3,04 | 6,16 | 2,39 | 2,57 | 5,71 | 2,59 | 2,20 | - | - | - |
| **0** | 7,83 | 1,68 | 4,65 | 7,38 | 1,93 | 3,83 | 6,92 | 2,18 | 3,18 | 6,46 | 2,41 | 2,68 | 6,00 | 2,59 | 2,31 | - | - | - |
| **2** | 8,20 | 1,68 | 4,87 | 7,72 | 1,94 | 3,98 | 7,25 | 2,18 | 3,33 | 6,78 | 2,42 | 2,80 | 6,29 | 2,61 | 2,41 | - | - | - |
| **4** | 8,55 | 1,70 | 5,04 | 8,07 | 1,94 | 4,16 | 7,57 | 2,19 | 3,45 | 7,08 | 2,42 | 2,93 | 6,58 | 2,62 | 2,51 | 6,09 | 2,77 | 2,20 |
| **6** | 8,89 | 1,70 | 5,24 | 8,39 | 1,95 | 4,30 | 7,88 | 2,21 | 3,57 | 7,37 | 2,43 | 3,03 | 6,86 | 2,65 | 2,59 | 6,36 | 2,79 | 2,27 |
| **7** | 9,07 | 1,72 | 5,26 | 8,55 | 1,97 | 4,35 | 8,04 | 2,22 | 3,62 | **7,50** | **2,46** | **3,05** | 7,00 | 2,65 | 2,64 | 6,49 | 2,79 | 2,32 |
| **8** | 9,24 | 1,74 | 5,31 | 8,72 | 1,98 | 4,41 | 8,20 | 2,23 | 3,67 | 7,66 | 2,46 | 3,11 | 7,13 | 2,66 | 2,68 | 6,62 | 2,81 | 2,36 |
| **10** | 9,58 | 1,75 | 5,47 | 9,04 | 2,01 | 4,51 | 8,50 | 2,25 | 3,78 | 7,95 | 2,49 | 3,20 | 7,41 | 2,67 | 2,77 | - | - | - |
| **12** | 9,91 | 1,76 | 5,61 | 9,36 | 2,02 | 4,63 | 8,79 | 2,27 | 3,87 | 8,24 | 2,50 | 3,29 | 7,68 | 2,69 | 2,86 | - | - | - |
| **14** | 10,24 | 1,79 | 5,71 | 9,66 | 2,03 | 4,75 | 9,09 | 2,29 | 3,98 | 8,51 | 2,51 | 3,39 | 7,95 | 2,70 | 2,94 | - | - | - |
| **16** | 10,55 | 1,80 | 5,85 | 9,97 | 2,05 | 4,88 | 9,38 | 2,30 | 4,08 | 8,79 | 2,53 | 3,48 | 8,21 | 2,71 | 3,03 | - | - | - |
| **18** | 10,87 | 1,82 | 5,98 | 10,28 | 2,07 | 4,96 | 9,67 | 2,33 | 4,16 | 9,07 | 2,54 | 3,57 | 8,49 | 2,74 | 3,10 | - | - | - |

## 9.6. ANL 040° (230V/1/50Hz) |(400V/3N/50Hz) Cooling capacity - Total input power

| TAP | EXTERNAL AIR TEMPERATURE (°C) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | | | 25 | | | 30 | | | 35 | | | 40 | | | 45 | | |
| | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER |
| **-6** | 8,54 | 2,17 | 3,93 | 8,07 | 2,51 | 3,22 | 7,56 | 2,84 | 2,66 | 7,04 | 3,14 | 2,24 | - | - | - | - | - | - |
| **-4** | 9,04 | 2,19 | 4,13 | 8,54 | 2,53 | 3,38 | 8,00 | 2,86 | 2,80 | 7,46 | 3,16 | 2,36 | - | - | - | - | - | - |
| **-2** | 9,53 | 2,21 | 4,32 | 8,99 | 2,54 | 3,54 | 8,44 | 2,86 | 2,95 | 7,88 | 3,16 | 2,49 | 7,31 | 3,43 | 2,13 | - | - | - |
| **0** | 10,02 | 2,23 | 4,50 | 9,45 | 2,54 | 3,71 | 8,86 | 2,88 | 3,08 | 8,27 | 3,18 | 2,60 | 7,68 | 3,43 | 2,24 | - | - | - |
| **2** | 10,49 | 2,23 | 4,71 | 9,89 | 2,56 | 3,86 | 9,28 | 2,88 | 3,22 | 8,67 | 3,20 | 2,71 | 8,05 | 3,44 | 2,34 | - | - | - |
| **4** | 10,95 | 2,24 | 4,88 | 10,32 | 2,56 | 4,03 | 9,68 | 2,90 | 3,34 | 9,06 | 3,20 | 2,83 | 8,42 | 3,46 | 2,43 | 7,80 | 3,66 | 2,13 |
| **6** | 11,39 | 2,24 | 5,08 | 10,75 | 2,58 | 4,17 | 10,09 | 2,91 | 3,46 | 9,43 | 3,21 | 2,93 | 8,77 | 3,50 | 2,51 | 8,13 | 3,69 | 2,20 |
| **7** | 11,60 | 2,28 | 5,09 | 10,95 | 2,60 | 4,22 | 10,29 | 2,93 | 3,51 | **9,60** | **3,25** | **2,95** | 8,96 | 3,50 | 2,56 | 8,30 | 3,69 | 2,25 |
| **8** | 11,82 | 2,30 | 5,15 | 11,17 | 2,61 | 4,27 | 10,49 | 2,95 | 3,56 | 9,80 | 3,25 | 3,02 | 9,13 | 3,51 | 2,60 | 8,47 | 3,71 | 2,28 |
| **10** | 12,26 | 2,31 | 5,30 | 11,57 | 2,65 | 4,37 | 10,88 | 2,97 | 3,67 | 10,17 | 3,29 | 3,10 | 9,48 | 3,53 | 2,68 | - | - | - |
| **12** | 12,68 | 2,33 | 5,44 | 11,97 | 2,67 | 4,49 | 11,25 | 3,00 | 3,75 | 10,54 | 3,30 | 3,19 | 9,84 | 3,55 | 2,77 | - | - | - |
| **14** | 13,10 | 2,37 | 5,54 | 12,36 | 2,68 | 4,60 | 11,64 | 3,02 | 3,85 | 10,90 | 3,32 | 3,28 | 10,17 | 3,57 | 2,85 | - | - | - |
| **16** | 13,51 | 2,38 | 5,66 | 12,77 | 2,70 | 4,72 | 12,01 | 3,04 | 3,95 | 11,25 | 3,34 | 3,37 | 10,51 | 3,59 | 2,93 | - | - | - |
| **18** | 13,91 | 2,40 | 5,79 | 13,15 | 2,74 | 4,80 | 12,38 | 3,07 | 4,03 | 11,60 | 3,36 | 3,46 | 10,86 | 3,62 | 3,00 | - | - | - |

| Key | |
|---|---|
| Pc | Cooling capacity |
| Pe | Total Input Power |
| TAP | Produced water temperature |

**ATTENTION**
For intermediate points refer to the diagrams of operating limits (§ 8.1)

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## 9.3. Δt DIFFERENT FROM NOMINAL (Δt 5°C)

| | 3 | 5 | 8 | 10 |
|---|---|---|---|---|
| Cooling capacity correction factors | 0,99 | **1** | 1,02 | 1,03 |
| Total input power correction factors | 0,99 | **1** | 1,01 | 1,02 |

## 9.4. FOULING FACTOR

| [K*m2]/[W] | 0,00005 | 0,0001 | 0,0002 |
|---|---|---|---|
| Cooling capacity correction factors | **1** | 0,98 | 0,94 |
| Total input power correction factors | **1** | 0,98 | 0,95 |

### 9.9. ANL 050° (400V/3N/50Hz) Cooling capacity - Total input power

| TAP | EXTERNAL AIR TEMPERATURE (°C) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | | | 25 | | | 30 | | | 35 | | | 40 | | | 45 | | |
| | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER |
| **-6** | 11,92 | 2,69 | 4,42 | 11,26 | 3,11 | 3,62 | 10,56 | 3,53 | 2,99 | 9,83 | 3,90 | 2,52 | - | - | - | - | - | - |
| **-4** | 12,62 | 2,72 | 4,65 | 11,92 | 3,13 | 3,81 | 11,17 | 3,55 | 3,15 | 10,41 | 3,92 | 2,66 | - | - | - | - | - | - |
| **-2** | 13,31 | 2,74 | 4,86 | 12,55 | 3,15 | 3,98 | 11,78 | 3,55 | 3,32 | 11,00 | 3,92 | 2,81 | 10,20 | 4,25 | 2,40 | - | - | - |
| **0** | 13,99 | 2,76 | 5,07 | 13,19 | 3,15 | 4,18 | 12,37 | 3,57 | 3,46 | 11,54 | 3,94 | 2,93 | 10,72 | 4,25 | 2,52 | - | - | - |
| **2** | 14,65 | 2,76 | 5,31 | 13,80 | 3,18 | 4,35 | 12,95 | 3,57 | 3,63 | 12,11 | 3,96 | 3,05 | 11,24 | 4,27 | 2,63 | - | - | - |
| **4** | 15,28 | 2,78 | 5,49 | 14,41 | 3,18 | 4,54 | 13,52 | 3,59 | 3,76 | 12,65 | 3,96 | 3,19 | 11,75 | 4,29 | 2,74 | 10,88 | 4,53 | 2,40 |
| **6** | 15,89 | 2,78 | 5,71 | 15,00 | 3,20 | 4,69 | 14,08 | 3,61 | 3,90 | 13,16 | 3,99 | 3,30 | 12,25 | 4,34 | 2,82 | 11,35 | 4,58 | 2,48 |
| **7** | 16,20 | 2,83 | 5,73 | 15,28 | 3,22 | 4,75 | 14,36 | 3,64 | 3,95 | **13,40** | **4,03** | **3,33** | 12,51 | 4,34 | 2,88 | 11,59 | 4,58 | 2,53 |
| **8** | 16,50 | 2,85 | 5,80 | 15,59 | 3,24 | 4,81 | 14,65 | 3,66 | 4,00 | 13,68 | 4,03 | 3,40 | 12,74 | 4,36 | 2,92 | 11,82 | 4,60 | 2,57 |
| **10** | 17,11 | 2,87 | 5,96 | 16,15 | 3,29 | 4,92 | 15,19 | 3,68 | 4,13 | 14,20 | 4,07 | 3,49 | 13,24 | 4,38 | 3,02 | - | - | - |
| **12** | 17,70 | 2,89 | 6,12 | 16,71 | 3,31 | 5,05 | 15,70 | 3,72 | 4,22 | 14,72 | 4,10 | 3,59 | 13,73 | 4,40 | 3,12 | - | - | - |
| **14** | 18,29 | 2,93 | 6,23 | 17,26 | 3,33 | 5,18 | 16,24 | 3,75 | 4,34 | 15,21 | 4,12 | 3,69 | 14,20 | 4,42 | 3,21 | - | - | - |
| **16** | 18,85 | 2,96 | 6,38 | 17,82 | 3,35 | 5,32 | 16,76 | 3,77 | 4,45 | 15,70 | 4,14 | 3,79 | 14,67 | 4,45 | 3,30 | - | - | - |
| **18** | 19,42 | 2,98 | 6,52 | 18,36 | 3,39 | 5,41 | 17,28 | 3,81 | 4,53 | 16,20 | 4,16 | 3,89 | 15,16 | 4,49 | 3,38 | - | - | - |

### 9.10. ANL 070 (400V/3N/50Hz) Cooling capacity - Total input power

| TAP | EXTERNAL AIR TEMPERATURE (°C) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | | | 25 | | | 30 | | | 35 | | | 40 | | | 45 | | |
| | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER |
| **-6** | 14,68 | 3,26 | 4,50 | 13,87 | 3,77 | 3,68 | 13,00 | 4,27 | 3,04 | 12,10 | 4,72 | 2,56 | - | - | - | - | - | - |
| **-4** | 15,54 | 3,29 | 4,73 | 14,68 | 3,79 | 3,87 | 13,75 | 4,30 | 3,20 | 12,82 | 4,75 | 2,70 | - | - | - | - | - | - |
| **-2** | 16,38 | 3,32 | 4,94 | 15,46 | 3,82 | 4,05 | 14,50 | 4,30 | 3,38 | 13,55 | 4,75 | 2,85 | 12,56 | 5,15 | 2,44 | - | - | - |
| **0** | 17,22 | 3,34 | 5,15 | 16,24 | 3,82 | 4,25 | 15,23 | 4,32 | 3,52 | 14,21 | 4,77 | 2,98 | 13,20 | 5,15 | 2,57 | - | - | - |
| **2** | 18,03 | 3,34 | 5,40 | 16,99 | 3,85 | 4,42 | 15,95 | 4,32 | 3,69 | 14,91 | 4,80 | 3,11 | 13,84 | 5,17 | 2,68 | - | - | - |
| **4** | 18,82 | 3,37 | 5,59 | 17,74 | 3,85 | 4,61 | 16,64 | 4,35 | 3,83 | 15,57 | 4,80 | 3,24 | 14,47 | 5,20 | 2,78 | 13,40 | 5,49 | 2,44 |
| **6** | 19,57 | 3,37 | 5,81 | 18,47 | 3,87 | 4,77 | 17,34 | 4,38 | 3,96 | 16,21 | 4,83 | 3,36 | 15,08 | 5,25 | 2,87 | 13,98 | 5,54 | 2,52 |
| **7** | 19,94 | 3,42 | 5,83 | 18,82 | 3,90 | 4,83 | 17,69 | 4,40 | 4,02 | **16,50** | **4,88** | **3,38** | 15,40 | 5,25 | 2,93 | 14,27 | 5,54 | 2,57 |
| **8** | 20,32 | 3,45 | 5,89 | 19,19 | 3,93 | 4,89 | 18,03 | 4,43 | 4,07 | 16,85 | 4,88 | 3,45 | 15,69 | 5,28 | 2,97 | 14,56 | 5,57 | 2,61 |
| **10** | 21,07 | 3,47 | 6,07 | 19,89 | 3,98 | 5,00 | 18,70 | 4,46 | 4,20 | 17,48 | 4,93 | 3,54 | 16,30 | 5,30 | 3,07 | - | - | - |
| **12** | 21,80 | 3,50 | 6,23 | 20,58 | 4,00 | 5,14 | 19,34 | 4,51 | 4,29 | 18,12 | 4,96 | 3,65 | 16,91 | 5,33 | 3,17 | - | - | - |
| **14** | 22,52 | 3,55 | 6,34 | 21,25 | 4,03 | 5,27 | 20,00 | 4,54 | 4,41 | 18,73 | 4,99 | 3,76 | 17,48 | 5,36 | 3,26 | - | - | - |
| **16** | 23,22 | 3,58 | 6,48 | 21,94 | 4,06 | 5,41 | 20,64 | 4,56 | 4,52 | 19,34 | 5,01 | 3,86 | 18,06 | 5,38 | 3,36 | - | - | - |
| **18** | 23,91 | 3,61 | 6,63 | 22,61 | 4,11 | 5,50 | 21,28 | 4,61 | 4,61 | 19,94 | 5,04 | 3,96 | 18,67 | 5,44 | 3,43 | - | - | - |

| Key | |
|---|---|
| Pc | Cooling capacity |
| Pe | Total Input Power |
| TAP | Produced water temperature |

**ATTENTION**
For intermediate points refer to the diagrams of operating limits (§ 8.1)

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### 9.7. Δt DIFFERENT FROM NOMINAL (Δt 5°C)

| | 3 | 5 | 8 | 10 |
|---|---|---|---|---|
| Cooling capacity correction factors | 0,99 | **1** | 1,02 | 1,03 |
| Total input power correction factors | 0,99 | **1** | 1,01 | 1,02 |

### 9.8. FOULING FACTOR

| [K*m2]/[W] | 0,00005 | 0,0001 | 0,0002 |
|---|---|---|---|
| Cooling capacity correction factors | **1** | 0,98 | 0,94 |
| Total input power correction factors | **1** | 0,98 | 0,95 |

## 9.11. ANL 080 (400V/3N/50Hz) Cooling capacity - Total input power

| TAP | EXTERNAL AIR TEMPERATURE (°C) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | | | 25 | | | 30 | | | 35 | | | 40 | | | 45 | | |
| | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER |
| **-6** | 18,23 | 4,23 | 4,31 | 17,23 | 4,89 | 3,53 | 16,15 | 5,54 | 2,92 | 15,03 | 6,12 | 2,45 | - | - | - | - | - | - |
| **-4** | 19,31 | 4,27 | 4,53 | 18,23 | 4,92 | 3,71 | 17,08 | 5,57 | 3,07 | 15,93 | 6,16 | 2,59 | - | - | - | - | - | - |
| **-2** | 20,36 | 4,30 | 4,73 | 19,21 | 4,95 | 3,88 | 18,02 | 5,57 | 3,23 | 16,83 | 6,16 | 2,73 | 15,61 | 6,67 | 2,34 | - | - | - |
| **0** | 21,40 | 4,33 | 4,94 | 20,18 | 4,95 | 4,07 | 18,92 | 5,61 | 3,37 | 17,66 | 6,19 | 2,85 | 16,40 | 6,67 | 2,46 | - | - | - |
| **2** | 22,41 | 4,33 | 5,17 | 21,11 | 4,99 | 4,23 | 19,82 | 5,61 | 3,53 | 18,52 | 6,23 | 2,97 | 17,19 | 6,71 | 2,56 | - | - | - |
| **4** | 23,38 | 4,37 | 5,35 | 22,05 | 4,99 | 4,42 | 20,68 | 5,64 | 3,67 | 19,35 | 6,23 | 3,11 | 17,98 | 6,74 | 2,67 | 16,65 | 7,12 | 2,34 |
| **6** | 24,31 | 4,37 | 5,56 | 22,95 | 5,02 | 4,57 | 21,54 | 5,68 | 3,80 | 20,14 | 6,26 | 3,22 | 18,74 | 6,81 | 2,75 | 17,37 | 7,19 | 2,42 |
| **7** | 24,78 | 4,44 | 5,58 | 23,38 | 5,06 | 4,62 | 21,97 | 5,71 | 3,85 | **20,50** | **6,33** | **3,24** | 19,13 | 6,81 | 2,81 | 17,73 | 7,19 | 2,47 |
| **8** | 25,25 | 4,47 | 5,65 | 23,84 | 5,09 | 4,68 | 22,41 | 5,75 | 3,90 | 20,93 | 6,33 | 3,31 | 19,49 | 6,85 | 2,85 | 18,09 | 7,22 | 2,50 |
| **10** | 26,18 | 4,51 | 5,81 | 24,71 | 5,16 | 4,79 | 23,23 | 5,78 | 4,02 | 21,72 | 6,40 | 3,39 | 20,25 | 6,88 | 2,94 | - | - | - |
| **12** | 27,08 | 4,54 | 5,96 | 25,57 | 5,19 | 4,92 | 24,02 | 5,85 | 4,11 | 22,51 | 6,43 | 3,50 | 21,00 | 6,91 | 3,04 | - | - | - |
| **14** | 27,98 | 4,61 | 6,07 | 26,40 | 5,23 | 5,05 | 24,85 | 5,88 | 4,22 | 23,27 | 6,47 | 3,60 | 21,72 | 6,95 | 3,13 | - | - | - |
| **16** | 28,84 | 4,64 | 6,21 | 27,26 | 5,26 | 5,18 | 25,64 | 5,92 | 4,33 | 24,02 | 6,50 | 3,69 | 22,44 | 6,98 | 3,21 | - | - | - |
| **18** | 29,71 | 4,68 | 6,35 | 28,09 | 5,33 | 5,27 | 26,43 | 5,99 | 4,42 | 24,78 | 6,54 | 3,79 | 23,20 | 7,05 | 3,29 | - | - | - |

## 9.12. ANL 090 (400V/3N/50Hz) Cooling capacity - Total input power

| TAP | EXTERNAL AIR TEMPERATURE (°C) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | | | 25 | | | 30 | | | 35 | | | 40 | | | 45 | | |
| | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER |
| **-6** | 19,84 | 4,43 | 4,48 | 18,74 | 5,12 | 3,66 | 17,57 | 5,80 | 3,03 | 16,35 | 6,41 | 2,55 | - | - | - | - | - | - |
| **-4** | 21,01 | 4,47 | 4,70 | 19,84 | 5,15 | 3,85 | 18,58 | 5,84 | 3,18 | 17,33 | 6,45 | 2,69 | - | - | - | - | - | - |
| **-2** | 22,14 | 4,50 | 4,92 | 20,89 | 5,19 | 4,03 | 19,60 | 5,84 | 3,36 | 18,31 | 6,45 | 2,84 | 16,98 | 6,99 | 2,43 | - | - | - |
| **0** | 23,28 | 4,54 | 5,13 | 21,95 | 5,19 | 4,23 | 20,58 | 5,87 | 3,50 | 19,21 | 6,49 | 2,96 | 17,84 | 6,99 | 2,55 | - | - | - |
| **2** | 24,37 | 4,54 | 5,37 | 22,97 | 5,22 | 4,40 | 21,56 | 5,87 | 3,67 | 20,15 | 6,52 | 3,09 | 18,70 | 7,03 | 2,66 | - | - | - |
| **4** | 25,43 | 4,58 | 5,56 | 23,98 | 5,22 | 4,59 | 22,50 | 5,91 | 3,81 | 21,05 | 6,52 | 3,23 | 19,56 | 7,06 | 2,77 | 18,11 | 7,46 | 2,43 |
| **6** | 26,45 | 4,58 | 5,78 | 24,96 | 5,26 | 4,74 | 23,43 | 5,95 | 3,94 | 21,91 | 6,56 | 3,34 | 20,38 | 7,13 | 2,86 | 18,90 | 7,53 | 2,51 |
| **7** | 26,96 | 4,65 | 5,80 | 25,43 | 5,30 | 4,80 | 23,90 | 5,98 | 4,00 | **22,30** | **6,63** | **3,36** | 20,81 | 7,13 | 2,92 | 19,29 | 7,53 | 2,56 |
| **8** | 27,46 | 4,68 | 5,86 | 25,94 | 5,33 | 4,86 | 24,37 | 6,02 | 4,05 | 22,77 | 6,63 | 3,43 | 21,20 | 7,17 | 2,96 | 19,68 | 7,57 | 2,60 |
| **10** | 28,48 | 4,72 | 6,03 | 26,88 | 5,40 | 4,97 | 25,27 | 6,05 | 4,18 | 23,63 | 6,70 | 3,53 | 22,03 | 7,21 | 3,06 | - | - | - |
| **12** | 29,46 | 4,76 | 6,19 | 27,82 | 5,44 | 5,11 | 26,13 | 6,13 | 4,27 | 24,49 | 6,74 | 3,63 | 22,85 | 7,24 | 3,15 | - | - | - |
| **14** | 30,44 | 4,83 | 6,30 | 28,72 | 5,48 | 5,24 | 27,03 | 6,16 | 4,39 | 25,31 | 6,77 | 3,74 | 23,63 | 7,28 | 3,25 | - | - | - |
| **16** | 31,38 | 4,86 | 6,45 | 29,66 | 5,51 | 5,38 | 27,89 | 6,20 | 4,50 | 26,13 | 6,81 | 3,84 | 24,41 | 7,31 | 3,34 | - | - | - |
| **18** | 32,32 | 4,90 | 6,59 | 30,55 | 5,59 | 5,47 | 28,76 | 6,27 | 4,59 | 26,96 | 6,85 | 3,94 | 25,23 | 7,39 | 3,42 | - | - | - |

| Key | |
|---|---|
| Pc | Cooling capacity |
| Pe | Total Input Power |
| TAP | Produced water temperature |

**ATTENTION**
For intermediate points refer to the diagrams of operating limits (§ 8.1)

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## 9.13. Δt DIFFERENT FROM NOMINAL (Δt 5°C)

| | 3 | 5 | 8 | 10 |
|---|---|---|---|---|
| Cooling capacity correction factors | 0,99 | **1** | 1,02 | 1,03 |
| Total input power correction factors | 0,99 | **1** | 1,01 | 1,02 |

## 9.14. FOULING FACTOR

| [K*m2]/[W] | 0,00005 | 0,0001 | 0,0002 |
|---|---|---|---|
| Cooling capacity correction factors | **1** | 0,98 | 0,94 |
| Total input power correction factors | **1** | 0,98 | 0,95 |

### 9.15. ANL 100° (400V/3N/50Hz) Cooling capacity - Total input power

| TAP | EXTERNAL AIR TEMPERATURE (°C) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | | | 25 | | | 30 | | | 35 | | | 40 | | | 45 | | |
| | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER |
| **-6** | 23,66 | 5,62 | 4,21 | 22,35 | 6,48 | 3,45 | 20,95 | 7,35 | 2,85 | 19,51 | 8,13 | 2,40 | - | - | - | - | - | - |
| **-4** | 25,06 | 5,66 | 4,43 | 23,66 | 6,53 | 3,62 | 22,17 | 7,40 | 3,00 | 20,67 | 8,17 | 2,53 | - | - | - | - | - | - |
| **-2** | 26,41 | 5,71 | 4,63 | 24,92 | 6,57 | 3,79 | 23,38 | 7,40 | 3,16 | 21,84 | 8,17 | 2,67 | 20,25 | 8,86 | 2,29 | - | - | - |
| **0** | 27,77 | 5,75 | 4,83 | 26,18 | 6,57 | 3,98 | 24,55 | 7,44 | 3,30 | 22,91 | 8,22 | 2,79 | 21,28 | 8,86 | 2,40 | - | - | - |
| **2** | 29,07 | 5,75 | 5,05 | 27,39 | 6,62 | 4,14 | 25,71 | 7,44 | 3,46 | 24,03 | 8,26 | 2,91 | 22,31 | 8,90 | 2,51 | - | - | - |
| **4** | 30,33 | 5,80 | 5,23 | 28,61 | 6,62 | 4,32 | 26,83 | 7,49 | 3,58 | 25,11 | 8,26 | 3,04 | 23,33 | 8,95 | 2,61 | 21,61 | 9,45 | 2,29 |
| **6** | 31,55 | 5,80 | 5,44 | 29,77 | 6,67 | 4,47 | 27,95 | 7,53 | 3,71 | 26,13 | 8,31 | 3,15 | 24,31 | 9,04 | 2,69 | 22,54 | 9,54 | 2,36 |
| **7** | 32,15 | 5,89 | 5,46 | 30,33 | 6,71 | 4,52 | 28,51 | 7,58 | 3,76 | **26,60** | **8,40** | **3,17** | 24,83 | 9,04 | 2,75 | 23,01 | 9,54 | 2,41 |
| **8** | 32,76 | 5,93 | 5,52 | 30,94 | 6,76 | 4,58 | 29,07 | 7,62 | 3,81 | 27,16 | 8,40 | 3,23 | 25,29 | 9,08 | 2,78 | 23,47 | 9,59 | 2,45 |
| **10** | 33,97 | 5,98 | 5,68 | 32,06 | 6,85 | 4,68 | 30,15 | 7,67 | 3,93 | 28,19 | 8,49 | 3,32 | 26,27 | 9,13 | 2,88 | - | - | - |
| **12** | 35,14 | 6,03 | 5,83 | 33,18 | 6,89 | 4,81 | 31,17 | 7,76 | 4,02 | 29,21 | 8,54 | 3,42 | 27,25 | 9,18 | 2,97 | - | - | - |
| **14** | 36,31 | 6,12 | 5,93 | 34,25 | 6,94 | 4,94 | 32,25 | 7,81 | 4,13 | 30,19 | 8,58 | 3,52 | 28,19 | 9,22 | 3,06 | - | - | - |
| **16** | 37,43 | 6,16 | 6,07 | 35,37 | 6,98 | 5,06 | 33,27 | 7,85 | 4,24 | 31,17 | 8,63 | 3,61 | 29,12 | 9,27 | 3,14 | - | - | - |
| **18** | 38,55 | 6,21 | 6,21 | 36,45 | 7,08 | 5,15 | 34,30 | 7,94 | 4,32 | 32,15 | 8,67 | 3,71 | 30,10 | 9,36 | 3,22 | - | - | - |

### 9.16. ANL 150 (400V/3N/50Hz) Cooling capacity - Total input power

| TAP | EXTERNAL AIR TEMPERATURE (°C) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | | | 25 | | | 30 | | | 35 | | | 40 | | | 45 | | |
| | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER |
| **-6** | 29,35 | 6,68 | 4,39 | 27,73 | 7,72 | 3,59 | 25,99 | 8,75 | 2,97 | 24,20 | 9,67 | 2,50 | - | - | - | - | - | - |
| **-4** | 31,09 | 6,74 | 4,61 | 29,35 | 7,77 | 3,78 | 27,50 | 8,80 | 3,12 | 25,65 | 9,73 | 2,64 | - | - | - | - | - | - |
| **-2** | 32,77 | 6,79 | 4,82 | 30,92 | 7,83 | 3,95 | 29,01 | 8,80 | 3,29 | 27,09 | 9,73 | 2,79 | 25,13 | 10,54 | 2,38 | - | - | - |
| **0** | 34,45 | 6,85 | 5,03 | 32,48 | 7,83 | 4,15 | 30,45 | 8,86 | 3,44 | 28,43 | 9,78 | 2,91 | 26,40 | 10,54 | 2,50 | - | - | - |
| **2** | 36,07 | 6,85 | 5,27 | 33,98 | 7,88 | 4,31 | 31,90 | 8,86 | 3,60 | 29,82 | 9,84 | 3,03 | 27,67 | 10,60 | 2,61 | - | - | - |
| **4** | 37,63 | 6,90 | 5,45 | 35,49 | 7,88 | 4,50 | 33,29 | 8,91 | 3,73 | 31,15 | 9,84 | 3,17 | 28,95 | 10,65 | 2,72 | 26,81 | 11,25 | 2,38 |
| **6** | 39,14 | 6,90 | 5,67 | 36,94 | 7,93 | 4,66 | 34,68 | 8,97 | 3,87 | 32,42 | 9,89 | 3,28 | 30,16 | 10,76 | 2,80 | 27,96 | 11,36 | 2,46 |
| **7** | 39,89 | 7,01 | 5,69 | 37,63 | 7,99 | 4,71 | 35,37 | 9,02 | 3,92 | **33,00** | **10,00** | **3,30** | 30,80 | 10,76 | 2,86 | 28,54 | 11,36 | 2,51 |
| **8** | 40,64 | 7,07 | 5,75 | 38,38 | 8,04 | 4,77 | 36,07 | 9,08 | 3,97 | 33,69 | 10,00 | 3,37 | 31,38 | 10,82 | 2,90 | 29,12 | 11,41 | 2,55 |
| **10** | 42,15 | 7,12 | 5,92 | 39,77 | 8,15 | 4,88 | 37,40 | 9,13 | 4,10 | 34,97 | 10,11 | 3,46 | 32,59 | 10,87 | 3,00 | - | - | - |
| **12** | 43,59 | 7,17 | 6,08 | 41,16 | 8,21 | 5,02 | 38,67 | 9,24 | 4,19 | 36,24 | 10,16 | 3,57 | 33,81 | 10,92 | 3,10 | - | - | - |
| **14** | 45,04 | 7,28 | 6,18 | 42,49 | 8,26 | 5,14 | 40,01 | 9,29 | 4,30 | 37,46 | 10,22 | 3,67 | 34,97 | 10,98 | 3,19 | - | - | - |
| **16** | 46,43 | 7,34 | 6,33 | 43,88 | 8,32 | 5,28 | 41,28 | 9,35 | 4,42 | 38,67 | 10,27 | 3,77 | 36,13 | 11,03 | 3,27 | - | - | - |
| **18** | 47,82 | 7,39 | 6,47 | 45,22 | 8,42 | 5,37 | 42,55 | 9,46 | 4,50 | 39,89 | 10,33 | 3,86 | 37,34 | 11,14 | 3,35 | - | - | - |

| Key | |
|---|---|
| Pc | Cooling capacity |
| Pe | Total Input Power |
| TAP | Produced water temperature |

**ATTENTION**
For intermediate points refer to the diagrams of operating limits (§ 8.1)

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### 9.17. Δt DIFFERENT FROM NOMINAL (Δt 5°C)

| | 3 | 5 | 8 | 10 |
|---|---|---|---|---|
| Cooling capacity correction factors | 0,99 | **1** | 1,02 | 1,03 |
| Total input power correction factors | 0,99 | **1** | 1,01 | 1,02 |

### 9.18. FOULING FACTOR

| [K*m2]/[W] | 0,00005 | 0,0001 | 0,0002 |
|---|---|---|---|
| Cooling capacity correction factors | **1** | 0,98 | 0,94 |
| Total input power correction factors | **1** | 0,98 | 0,95 |

## 9.21. ANL 200 (400V/3N/50Hz) Cooling capacity - Total input power

| TAP | EXTERNAL AIR TEMPERATURE (°C) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | | | 25 | | | 30 | | | 35 | | | 40 | | | 45 | | |
| | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER | Pc (kW) | Pe (kW) | EER |
| **-6** | 38,25 | 9,16 | 4,18 | 36,14 | 10,57 | 3,42 | 33,87 | 11,99 | 2,83 | 31,53 | 13,25 | 2,38 | - | - | - | - | - | - |
| **-4** | 40,51 | 9,23 | 4,39 | 38,25 | 10,65 | 3,59 | 35,83 | 12,06 | 2,97 | 33,42 | 13,33 | 2,51 | - | - | - | - | - | - |
| **-2** | 42,70 | 9,31 | 4,59 | 40,28 | 10,72 | 3,76 | 37,79 | 12,06 | 3,13 | 35,31 | 13,33 | 2,65 | 32,74 | 14,44 | 2,27 | - | - | - |
| **0** | 44,89 | 9,38 | 4,78 | 42,32 | 10,72 | 3,95 | 39,68 | 12,14 | 3,27 | 37,04 | 13,40 | 2,76 | 34,40 | 14,44 | 2,38 | - | - | - |
| **2** | 47,00 | 9,38 | 5,01 | 44,28 | 10,80 | 4,10 | 41,57 | 12,14 | 3,42 | 38,85 | 13,48 | 2,88 | 36,06 | 14,52 | 2,48 | - | - | - |
| **4** | 49,04 | 9,46 | 5,19 | 46,24 | 10,80 | 4,28 | 43,38 | 12,21 | 3,55 | 40,59 | 13,48 | 3,01 | 37,72 | 14,59 | 2,58 | 34,93 | 15,41 | 2,27 |
| **6** | 51,00 | 9,46 | 5,39 | 48,13 | 10,87 | 4,43 | 45,19 | 12,29 | 3,68 | 42,25 | 13,55 | 3,12 | 39,30 | 14,74 | 2,67 | 36,44 | 15,56 | 2,34 |
| **7** | 51,98 | 9,60 | 5,41 | 49,04 | 10,95 | 4,48 | 46,09 | 12,36 | 3,73 | **43,00** | **13,70** | **3,14** | 40,13 | 14,74 | 2,72 | 37,19 | 15,56 | 2,39 |
| **8** | 52,96 | 9,68 | 5,47 | 50,02 | 11,02 | 4,54 | 47,00 | 12,43 | 3,78 | 43,91 | 13,70 | 3,20 | 40,89 | 14,82 | 2,76 | 37,95 | 15,64 | 2,43 |
| **10** | 54,92 | 9,75 | 5,63 | 51,83 | 11,17 | 4,64 | 48,73 | 12,51 | 3,90 | 45,56 | 13,85 | 3,29 | 42,47 | 14,89 | 2,85 | - | - | - |
| **12** | 56,81 | 9,83 | 5,78 | 53,64 | 11,24 | 4,77 | 50,39 | 12,66 | 3,98 | 47,22 | 13,92 | 3,39 | 44,06 | 14,97 | 2,94 | - | - | - |
| **14** | 58,69 | 9,98 | 5,88 | 55,37 | 11,32 | 4,89 | 52,13 | 12,73 | 4,09 | 48,81 | 14,00 | 3,49 | 45,56 | 15,04 | 3,03 | - | - | - |
| **16** | 60,50 | 10,05 | 6,02 | 57,18 | 11,39 | 5,02 | 53,79 | 12,81 | 4,20 | 50,39 | 14,07 | 3,58 | 47,07 | 15,11 | 3,11 | - | - | - |
| **18** | 62,31 | 10,13 | 6,15 | 58,92 | 11,54 | 5,11 | 55,45 | 12,96 | 4,28 | 51,98 | 14,15 | 3,67 | 48,66 | 15,26 | 3,19 | - | - | - |

| Key | |
|---|---|
| Pc | Cooling capacity |
| Pe | Total Input Power |
| TAP | Produced water temperature |

**ATTENTION**
For intermediate points refer to the diagrams of operating limits (§ 8.1)

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## 9.19. Δt DIFFERENT FROM NOMINAL (Δt 5°C)

| | 3 | 5 | 8 | 10 |
|---|---|---|---|---|
| Cooling capacity correction factors | 0,99 | **1** | 1,02 | 1,03 |
| Total input power correction factors | 0,99 | **1** | 1,01 | 1,02 |

## 9.20. FOULING FACTOR

| [K*m2]/[W] | 0,00005 | 0,0001 | 0,0002 |
|---|---|---|---|
| Cooling capacity correction factors | **1** | 0,98 | 0,94 |
| Total input power correction factors | **1** | 0,98 | 0,95 |

## 10. PERFORMANCE AND ABSORPTION THAT DIFFER FROM THE NOMINAL - HEATING MODE

### 10.1. ANL 020H (230V/1/50Hz) |(400V/3N/50Hz) Heating capacity - total input power

| TAE | WATER TEMPERATURE PRODUCED (°C) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 30 | | | 35 | | | 40 | | | 45 | | | 50 | | |
| | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP |
| **-10** | 3,91 | 1,40 | 2,79 | 3,83 | 1,63 | 2,35 | - | - | - | - | - | - | - | - | - |
| **-8** | 4,13 | 1,40 | 2,95 | 4,04 | 1,63 | 2,48 | 3,93 | 1,76 | 2,23 | - | - | - | - | - | - |
| **-6** | 4,35 | 1,40 | 3,11 | 4,24 | 1,62 | 2,62 | 4,12 | 1,76 | 2,34 | 4,00 | 1,90 | 2,11 | - | - | - |
| **-4** | 4,56 | 1,40 | 3,26 | 4,43 | 1,63 | 2,72 | 4,31 | 1,76 | 2,45 | 4,19 | 1,90 | 2,21 | 4,05 | 2,13 | 1,90 |
| **-2** | 4,77 | 1,40 | 3,41 | 4,63 | 1,63 | 2,84 | 4,50 | 1,76 | 2,56 | 4,37 | 1,90 | 2,30 | 4,25 | 2,13 | 2,00 |
| **0** | 4,98 | 1,40 | 3,56 | 4,82 | 1,63 | 2,96 | 4,68 | 1,77 | 2,64 | 4,55 | 1,90 | 2,39 | 4,44 | 2,13 | 2,08 |
| **2** | 5,11 | 1,40 | 3,65 | 5,08 | 1,63 | 3,12 | 4,90 | 1,77 | 2,77 | 4,77 | 1,90 | 2,51 | 4,65 | 2,13 | 2,18 |
| **4** | 6,08 | 1,40 | 4,34 | 5,97 | 1,63 | 3,66 | 5,86 | 1,77 | 3,31 | 4,55 | 1,90 | 2,39 | 5,62 | 2,14 | 2,63 |
| **6** | 6,44 | 1,40 | 4,60 | 6,31 | 1,63 | 3,87 | 6,18 | 1,77 | 3,49 | 6,06 | 1,91 | 3,17 | 5,91 | 2,14 | 2,76 |
| **7** | 6,61 | 1,41 | 4,69 | 6,47 | 1,63 | 3,97 | 6,33 | 1,77 | 3,58 | **6,20** | **1,91** | **3,25** | 6,04 | 2,14 | 2,82 |
| **8** | 6,78 | 1,41 | 4,81 | 6,62 | 1,64 | 4,04 | 6,48 | 1,77 | 3,66 | 6,33 | 1,91 | 3,31 | 6,17 | 2,14 | 2,88 |
| **10** | 7,09 | 1,41 | 5,03 | 6,91 | 1,64 | 4,21 | 6,75 | 1,78 | 3,79 | 6,58 | 1,91 | 3,45 | 6,40 | 2,14 | 2,99 |
| **12** | 7,39 | 1,41 | 5,24 | 7,19 | 1,64 | 4,38 | 7,00 | 1,78 | 3,93 | 6,81 | 1,92 | 3,55 | 6,61 | 2,14 | 3,09 |
| **14** | 7,69 | 1,41 | 5,45 | 7,46 | 1,64 | 4,55 | 7,25 | 1,78 | 4,07 | 7,04 | 1,92 | 3,67 | 6,81 | 2,15 | 3,17 |
| **16** | 7,99 | 1,41 | 5,67 | 7,74 | 1,64 | 4,72 | 7,50 | 1,78 | 4,21 | 7,27 | 1,92 | 3,79 | 7,02 | 2,15 | 3,27 |
| **18** | 8,31 | 1,4 1 | 5,89 | 8,03 | 1,64 | 4,90 | 7,77 | 1,78 | 4,37 | 7,51 | 1,92 | 3,91 | 7,24 | 2,15 | 3,37 |
| **20** | 8,65 | 1,42 | 6,09 | 8,35 | 1,64 | 5,09 | 8,05 | 1,78 | 4,52 | 7,77 | 1,92 | 4,05 | 7,47 | 2,15 | 3,47 |

### 10.2. ANL 025H (230V/1/50Hz) |(400V/3N/50Hz) Heating capacity - total input power

| TAE | WATER TEMPERATURE PRODUCED (°C) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 30 | | | 35 | | | 40 | | | 45 | | | 50 | | |
| | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP |
| **-10** | 4,41 | 1,55 | 2,84 | 4,32 | 1,81 | 2,39 | - | - | - | - | - | - | - | - | - |
| **-8** | 4,66 | 1,55 | 3,00 | 4,56 | 1,81 | 2,52 | 4,44 | 1,95 | 2,27 | - | - | - | - | - | - |
| **-6** | 4,91 | 1,55 | 3,16 | 4,79 | 1,80 | 2,66 | 4,65 | 1,95 | 2,38 | 4,52 | 2,11 | 2,14 | - | - | - |
| **-4** | 5,15 | 1,55 | 3,31 | 5,00 | 1,81 | 2,76 | 4,87 | 1,95 | 2,49 | 4,73 | 2,11 | 2,24 | 4,57 | 2,36 | 1,93 |
| **-2** | 5,39 | 1,55 | 3,47 | 5,23 | 1,81 | 2,89 | 5,08 | 1,95 | 2,60 | 4,93 | 2,11 | 2,34 | 4,80 | 2,36 | 2,03 |
| **0** | 5,62 | 1,55 | 3,62 | 5,44 | 1,81 | 3,01 | 5,28 | 1,96 | 2,69 | 5,14 | 2,11 | 2,44 | 5,01 | 2,36 | 2,12 |
| **2** | 5,77 | 1,55 | 3,71 | 5,74 | 1,81 | 3,17 | 5,53 | 1,96 | 2,82 | 5,39 | 2,11 | 2,55 | 5,25 | 2,36 | 2,22 |
| **4** | 6,86 | 1,55 | 4,42 | 6,74 | 1,81 | 3,73 | 6,62 | 1,96 | 3,37 | 5,14 | 2,11 | 2,44 | 6,35 | 2,38 | 2,67 |
| **6** | 7,27 | 1,55 | 4,68 | 7,12 | 1,81 | 3,94 | 6,98 | 1,96 | 3,55 | 6,84 | 2,12 | 3,23 | 6,67 | 2,38 | 2,81 |
| **7** | 7,46 | 1,57 | 4,77 | 7,30 | 1,81 | 4,04 | 7,15 | 1,96 | 3,64 | **7,00** | **2,12** | **3,30** | 6,82 | 2,38 | 2,87 |
| **8** | 7,65 | 1,57 | 4,89 | 7,47 | 1,82 | 4,11 | 7,32 | 1,96 | 3,72 | 7,15 | 2,12 | 3,37 | 6,97 | 2,38 | 2,93 |
| **10** | 8,00 | 1,57 | 5,11 | 7,80 | 1,82 | 4,29 | 7,62 | 1,98 | 3,86 | 7,43 | 2,12 | 3,50 | 7,23 | 2,38 | 3,04 |
| **12** | 8,34 | 1,57 | 5,33 | 8,12 | 1,82 | 4,46 | 7,90 | 1,98 | 4,00 | 7,69 | 2,13 | 3,61 | 7,46 | 2,38 | 3,14 |
| **14** | 8,68 | 1,57 | 5,55 | 8,42 | 1,82 | 4,63 | 8,19 | 1,98 | 4,14 | 7,95 | 2,13 | 3,73 | 7,69 | 2,39 | 3,22 |
| **16** | 9,02 | 1,57 | 5,76 | 8,74 | 1,82 | 4,80 | 8,47 | 1,98 | 4,29 | 8,21 | 2,13 | 3,85 | 7,93 | 2,39 | 3,32 |
| **18** | 9,38 | 1,57 | 5,99 | 9,07 | 1,82 | 4,98 | 8,77 | 1,98 | 4,44 | 8,48 | 2,13 | 3,98 | 8,17 | 2,39 | 3,43 |
| **20** | 9,77 | 1,58 | 6,20 | 9,43 | 1,82 | 5,18 | 9,09 | 1,98 | 4,60 | 8,77 | 2,13 | 4,12 | 8,43 | 2,39 | 3,53 |

| Key | |
|---|---|
| Ph | Heating capacity |
| Pe | Total Input Power |
| TAE | External Air temperature |

**ATTENTION**
For intermediate points refer to the diagrams of operating limits (§ 8.3)

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### 9.22. Δt DIFFERENT FROM NOMINAL (Δt 5°C)

| | 3 | 5 | 8 | 10 |
|---|---|---|---|---|
| Heating capacity correction factors | 0,99 | **1** | 1,01 | 1,02 |
| Total input power correction factors | 1,01 | **1** | 0,98 | 0,96 |

COOLING MODE

HEATING MODE

### 10.4. ANL 030H (230V/1/50Hz) |(400V/3N/50Hz) Heating capacity - total input power

| TAE | WATER TEMPERATURE PRODUCED (°C) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 30 | | | 35 | | | 40 | | | 45 | | | 50 | | |
| | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP |
| **-10** | 5,30 | 1,92 | 2,76 | 5,19 | 2,24 | 2,32 | - | - | - | - | - | - | - | - | - |
| **-8** | 5,60 | 1,92 | 2,91 | 5,47 | 2,24 | 2,45 | 5,32 | 2,41 | 2,21 | - | - | - | - | - | - |
| **-6** | 5,89 | 1,92 | 3,07 | 5,74 | 2,22 | 2,59 | 5,58 | 2,41 | 2,31 | 5,42 | 2,61 | 2,08 | - | - | - |
| **-4** | 6,18 | 1,92 | 3,22 | 6,00 | 2,24 | 2,68 | 5,84 | 2,41 | 2,42 | 5,68 | 2,61 | 2,18 | 5,49 | 2,92 | 1,88 |
| **-2** | 6,46 | 1,92 | 3,37 | 6,27 | 2,24 | 2,81 | 6,10 | 2,41 | 2,53 | 5,92 | 2,61 | 2,27 | 5,76 | 2,92 | 1,97 |
| **0** | 6,75 | 1,92 | 3,51 | 6,53 | 2,24 | 2,92 | 6,34 | 2,43 | 2,61 | 6,16 | 2,61 | 2,37 | 6,02 | 2,92 | 2,06 |
| **2** | 6,92 | 1,92 | 3,61 | 6,88 | 2,24 | 3,08 | 6,64 | 2,43 | 2,73 | 6,46 | 2,61 | 2,48 | 6,30 | 2,92 | 2,16 |
| **4** | 8,24 | 1,92 | 4,29 | 8,09 | 2,24 | 3,62 | 7,94 | 2,43 | 3,27 | 6,16 | 2,61 | 2,37 | 7,61 | 2,94 | 2,59 |
| **6** | 8,73 | 1,92 | 4,54 | 8,55 | 2,24 | 3,82 | 8,37 | 2,43 | 3,45 | 8,21 | 2,62 | 3,13 | 8,01 | 2,94 | 2,73 |
| **7** | 8,96 | 1,93 | 4,63 | 8,77 | 2,24 | 3,92 | 8,58 | 2,43 | 3,53 | **8,40** | **2,62** | **3,21** | 8,18 | 2,94 | 2,79 |
| **8** | 9,19 | 1,93 | 4,75 | 8,97 | 2,25 | 3,99 | 8,78 | 2,43 | 3,62 | 8,58 | 2,62 | 3,27 | 8,36 | 2,94 | 2,85 |
| **10** | 9,61 | 1,93 | 4,97 | 9,36 | 2,25 | 4,16 | 9,15 | 2,44 | 3,75 | 8,91 | 2,62 | 3,40 | 8,67 | 2,94 | 2,95 |
| **12** | 10,01 | 1,93 | 5,18 | 9,74 | 2,25 | 4,33 | 9,48 | 2,44 | 3,88 | 9,23 | 2,63 | 3,50 | 8,96 | 2,94 | 3,05 |
| **14** | 10,42 | 1,93 | 5,39 | 10,11 | 2,25 | 4,49 | 9,82 | 2,44 | 4,02 | 9,54 | 2,63 | 3,62 | 9,23 | 2,95 | 3,13 |
| **16** | 10,83 | 1,93 | 5,60 | 10,49 | 2,25 | 4,66 | 10,16 | 2,44 | 4,16 | 9,85 | 2,63 | 3,74 | 9,51 | 2,95 | 3,22 |
| **18** | 11,26 | 1,93 | 5,82 | 10,88 | 2,25 | 4,84 | 10,53 | 2,44 | 4,31 | 10,17 | 2,63 | 3,86 | 9,81 | 2,95 | 3,33 |
| **20** | 11,72 | 1,95 | 6,02 | 11,31 | 2,25 | 5,03 | 10,91 | 2,44 | 4,47 | 10,53 | 2,63 | 4,00 | 10,12 | 2,95 | 3,43 |

### 10.5. ANL 040H (230V/1/50Hz)|(400V/3N/50Hz) Heating capacity - total input power

| TAE | WATER TEMPERATURE PRODUCED (°C) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 30 | | | 35 | | | 40 | | | 45 | | | 50 | | |
| | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP |
| **-10** | 6,68 | 2,33 | 2,87 | 6,55 | 2,71 | 2,41 | - | - | - | - | - | - | - | - | - |
| **-8** | 7,06 | 2,33 | 3,03 | 6,91 | 2,71 | 2,55 | 6,72 | 2,93 | 2,29 | - | - | - | - | - | - |
| **-6** | 7,44 | 2,33 | 3,19 | 7,25 | 2,70 | 2,69 | 7,04 | 2,93 | 2,40 | 6,84 | 3,16 | 2,16 | - | - | - |
| **-4** | 7,80 | 2,33 | 3,34 | 7,57 | 2,71 | 2,79 | 7,37 | 2,93 | 2,51 | 7,16 | 3,16 | 2,26 | 6,92 | 3,55 | 1,95 |
| **-2** | 8,16 | 2,33 | 3,50 | 7,92 | 2,71 | 2,92 | 7,69 | 2,93 | 2,63 | 7,47 | 3,16 | 2,36 | 7,27 | 3,55 | 2,05 |
| **0** | 8,51 | 2,33 | 3,65 | 8,24 | 2,71 | 3,04 | 8,00 | 2,95 | 2,72 | 7,78 | 3,16 | 2,46 | 7,59 | 3,55 | 2,14 |
| **2** | 8,74 | 2,33 | 3,75 | 8,69 | 2,71 | 3,20 | 8,38 | 2,95 | 2,84 | 8,16 | 3,16 | 2,58 | 7,95 | 3,55 | 2,24 |
| **4** | 10,39 | 2,33 | 4,46 | 10,21 | 2,71 | 3,76 | 10,02 | 2,95 | 3,40 | 7,78 | 3,16 | 2,46 | 9,61 | 3,56 | 2,70 |
| **6** | 11,01 | 2,33 | 4,72 | 10,79 | 2,71 | 3,98 | 10,57 | 2,95 | 3,59 | 10,36 | 3,18 | 3,26 | 10,10 | 3,56 | 2,84 |
| **7** | 11,30 | 2,35 | 4,81 | 11,06 | 2,71 | 4,08 | 10,82 | 2,95 | 3,67 | **10,60** | **3,18** | **3,33** | 10,33 | 3,56 | 2,90 |
| **8** | 11,59 | 2,35 | 4,94 | 11,32 | 2,73 | 4,15 | 11,08 | 2,95 | 3,76 | 10,82 | 3,18 | 3,40 | 10,55 | 3,56 | 2,96 |
| **10** | 12,12 | 2,35 | 5,16 | 11,81 | 2,73 | 4,33 | 11,54 | 2,96 | 3,89 | 11,25 | 3,18 | 3,54 | 10,94 | 3,56 | 3,07 |
| **12** | 12,63 | 2,35 | 5,38 | 12,29 | 2,73 | 4,50 | 11,97 | 2,96 | 4,04 | 11,64 | 3,20 | 3,64 | 11,30 | 3,56 | 3,17 |
| **14** | 13,15 | 2,35 | 5,60 | 12,75 | 2,73 | 4,67 | 12,40 | 2,96 | 4,18 | 12,04 | 3,20 | 3,77 | 11,64 | 3,58 | 3,25 |
| **16** | 13,66 | 2,35 | 5,82 | 13,23 | 2,73 | 4,85 | 12,82 | 2,96 | 4,33 | 12,43 | 3,20 | 3,89 | 12,00 | 3,58 | 3,35 |
| **18** | 14,21 | 2,35 | 6,05 | 13,73 | 2,73 | 5,03 | 13,28 | 2,96 | 4,48 | 12,84 | 3,20 | 4,02 | 12,38 | 3,58 | 3,46 |
| **20** | 14,79 | 2,36 | 6,26 | 14,28 | 2,73 | 5,23 | 13,76 | 2,96 | 4,64 | 13,28 | 3,20 | 4,16 | 12,77 | 3,58 | 3,57 |

| Key | |
|---|---|
| Ph | Heating capacity |
| Pe | Total Input Power |
| TAE | External Air temperature |

**ATTENTION**
For intermediate points refer to the diagrams of operating limits (§ 8.3)

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### 10.3. Δt DIFFERENT FROM NOMINAL (Δt 5°C)

| | 3 | 5 | 8 | 10 |
|---|---|---|---|---|
| Heating capacity correction factors | 0,99 | **1** | 1,01 | 1,02 |
| Total input power correction factors | 1,01 | **1** | 0,98 | 0,96 |

### 10.7. ANL 050H (400V/3N/50Hz) Heating capacity - total input power

| TAE | WATER TEMPERATURE PRODUCED (°C) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 30 | | | 35 | | | 40 | | | 45 | | | 50 | | |
| | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP |
| -10 | 8,83 | 3,15 | 2,80 | 8,65 | 3,67 | 2,36 | - | - | - | - | - | - | - | - | - |
| -8 | 9,33 | 3,15 | 2,96 | 9,12 | 3,67 | 2,49 | 8,87 | 3,96 | 2,24 | - | - | - | - | - | - |
| -6 | 9,82 | 3,15 | 3,12 | 9,57 | 3,65 | 2,63 | 9,30 | 3,96 | 2,35 | 9,03 | 4,28 | 2,11 | - | - | - |
| -4 | 10,30 | 3,15 | 3,27 | 10,00 | 3,67 | 2,73 | 9,73 | 3,96 | 2,46 | 9,46 | 4,28 | 2,21 | 9,15 | 4,80 | 1,91 |
| -2 | 10,77 | 3,15 | 3,42 | 10,45 | 3,67 | 2,85 | 10,16 | 3,96 | 2,56 | 9,87 | 4,28 | 2,31 | 9,60 | 4,80 | 2,00 |
| 0 | 11,25 | 3,15 | 3,57 | 10,88 | 3,67 | 2,97 | 10,57 | 3,98 | 2,65 | 10,27 | 4,28 | 2,40 | 10,03 | 4,80 | 2,09 |
| 2 | 11,54 | 3,15 | 3,66 | 11,47 | 3,67 | 3,13 | 11,06 | 3,98 | 2,78 | 10,77 | 4,28 | 2,52 | 10,50 | 4,80 | 2,19 |
| 4 | 13,73 | 3,15 | 4,36 | 13,48 | 3,67 | 3,67 | 13,23 | 3,98 | 3,32 | 10,27 | 4,28 | 2,40 | 12,69 | 4,82 | 2,63 |
| 6 | 14,54 | 3,15 | 4,61 | 14,25 | 3,67 | 3,88 | 13,95 | 3,98 | 3,50 | 13,68 | 4,30 | 3,18 | 13,35 | 4,82 | 2,77 |
| 7 | 14,93 | 3,17 | 4,70 | 14,61 | 3,67 | 3,98 | 14,29 | 3,98 | 3,59 | **14,00** | **4,30** | **3,26** | 13,64 | 4,82 | 2,83 |
| 8 | 15,31 | 3,17 | 4,82 | 14,95 | 3,69 | 4,05 | 14,63 | 3,98 | 3,67 | 14,29 | 4,30 | 3,32 | 13,93 | 4,82 | 2,89 |
| 10 | 16,01 | 3,17 | 5,04 | 15,60 | 3,69 | 4,23 | 15,24 | 4,01 | 3,80 | 14,86 | 4,30 | 3,46 | 14,45 | 4,82 | 3,00 |
| 12 | 16,69 | 3,17 | 5,26 | 16,24 | 3,69 | 4,40 | 15,81 | 4,01 | 3,94 | 15,38 | 4,32 | 3,56 | 14,93 | 4,82 | 3,10 |
| 14 | 17,36 | 3,17 | 5,47 | 16,85 | 3,69 | 4,56 | 16,37 | 4,01 | 4,09 | 15,90 | 4,32 | 3,68 | 15,38 | 4,84 | 3,18 |
| 16 | 18,04 | 3,17 | 5,68 | 17,48 | 3,69 | 4,73 | 16,94 | 4,01 | 4,23 | 16,42 | 4,32 | 3,80 | 15,85 | 4,84 | 3,27 |
| 18 | 18,76 | 3,17 | 5,91 | 18,13 | 3,69 | 4,91 | 17,55 | 4,01 | 4,38 | 16,96 | 4,32 | 3,92 | 16,35 | 4,84 | 3,38 |
| 20 | 19,53 | 3,20 | 6,11 | 18,85 | 3,69 | 5,11 | 18,18 | 4,01 | 4,54 | 17,55 | 4,32 | 4,06 | 16,87 | 4,84 | 3,48 |

### 10.8. ANL 070H (400V/3N/50Hz) Heating capacity - total input power

| TAE | WATER TEMPERATURE PRODUCED (°C) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 30 | | | 35 | | | 40 | | | 45 | | | 50 | | |
| | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP |
| -10 | 10,90 | 3,74 | 2,91 | 10,69 | 4,33 | 2,47 | - | - | - | - | - | - | - | - | - |
| -8 | 11,52 | 3,74 | 3,08 | 11,26 | 4,33 | 2,60 | 10,98 | 4,60 | 2,39 | - | - | - | - | - | - |
| -6 | 12,13 | 3,74 | 3,24 | 11,82 | 4,33 | 2,73 | 11,51 | 4,60 | 2,50 | 11,17 | 4,87 | 2,29 | - | - | - |
| -4 | 12,73 | 3,74 | 3,40 | 12,37 | 4,33 | 2,86 | 12,03 | 4,60 | 2,61 | 11,69 | 4,88 | 2,40 | 11,31 | 5,46 | 2,07 |
| -2 | 13,32 | 3,74 | 3,56 | 12,91 | 4,33 | 2,98 | 12,55 | 4,60 | 2,73 | 12,20 | 4,88 | 2,50 | 11,85 | 5,47 | 2,17 |
| 0 | 13,90 | 3,74 | 3,72 | 13,45 | 4,33 | 3,11 | 13,06 | 4,61 | 2,83 | 12,71 | 4,88 | 2,60 | 12,38 | 5,47 | 2,26 |
| 2 | 14,26 | 3,75 | 3,80 | 14,02 | 4,34 | 3,23 | 13,68 | 4,61 | 2,97 | 13,31 | 4,89 | 2,72 | 12,98 | 5,47 | 2,37 |
| 4 | 16,96 | 3,75 | 4,52 | 16,65 | 4,34 | 3,84 | 16,35 | 4,62 | 3,54 | 16,04 | 4,89 | 3,28 | 15,68 | 5,48 | 2,86 |
| 6 | 17,97 | 3,76 | 4,78 | 17,61 | 4,35 | 4,05 | 17,26 | 4,62 | 3,74 | 16,90 | 4,90 | 3,45 | 16,49 | 5,49 | 3,00 |
| 7 | 18,45 | 3,76 | 4,91 | 18,05 | 4,34 | 4,16 | 17,68 | 4,63 | 3,82 | **17,30** | **4,90** | **3,53** | 16,86 | 5,49 | 3,07 |
| 8 | 18,91 | 3,77 | 5,02 | 18,48 | 4,35 | 4,25 | 18,07 | 4,63 | 3,90 | 17,66 | 4,90 | 3,60 | 17,21 | 5,49 | 3,13 |
| 10 | 19,78 | 3,77 | 5,25 | 19,29 | 4,36 | 4,42 | 18,82 | 4,63 | 4,06 | 18,35 | 4,91 | 3,74 | 17,85 | 5,50 | 3,25 |
| 12 | 20,62 | 3,78 | 5,46 | 20,06 | 4,36 | 4,60 | 19,53 | 4,64 | 4,21 | 19,00 | 4,91 | 3,87 | 18,44 | 5,50 | 3,35 |
| 14 | 21,45 | 3,78 | 5,67 | 20,82 | 4,37 | 4,76 | 20,23 | 4,64 | 4,36 | 19,63 | 4,92 | 3,99 | 19,01 | 5,51 | 3,45 |
| 16 | 22,30 | 3,78 | 5,90 | 21,60 | 4,37 | 4,94 | 20,93 | 4,65 | 4,50 | 20,27 | 4,92 | 4,12 | 19,59 | 5,51 | 3,56 |
| 18 | 23,19 | 3,79 | 6,12 | 22,41 | 4,37 | 5,13 | 21,67 | 4,65 | 4,66 | 20,94 | 4,92 | 4,26 | 20,19 | 5,51 | 3,66 |
| 20 | 24,14 | 3,79 | 6,37 | 23,29 | 4,37 | 5,33 | 22,47 | 4,65 | 4,83 | 21,67 | 4,92 | 4,40 | 20,85 | 5,51 | 3,78 |

| Key | |
|---|---|
| Ph | Heating capacity |
| Pe | Total Input Power |
| TAE | External Air temperature |

**ATTENTION**
For intermediate points refer to the diagrams of operating limits (§ 8.3)

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### 10.6. Δt DIFFERENT FROM NOMINAL (Δt 5°C)

| | 3 | 5 | 8 | 10 |
|---|---|---|---|---|
| Heating capacity correction factors | 0,99 | **1** | 1,01 | 1,02 |
| Total input power correction factors | 1,01 | **1** | 0,98 | 0,96 |

### 10.10. ANL 080H (400V/3N/50Hz) Heating capacity - total input power

| TAE | WATER TEMPERATURE PRODUCED (°C) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 30 | | | 35 | | | 40 | | | 45 | | | 50 | | |
| | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP |
| **-10** | 13,99 | 4,81 | 2,91 | 13,71 | 5,57 | 2,46 | - | - | | - | - | | - | - | - |
| **-8** | 14,79 | 4,81 | 3,08 | 14,45 | 5,57 | 2,60 | 14,09 | 5,91 | 2,38 | - | - | | - | - | - |
| **-6** | 15,57 | 4,81 | 3,24 | 15,17 | 5,57 | 2,72 | 14,77 | 5,91 | 2,50 | 14,33 | 6,26 | 2,29 | - | - | - |
| **-4** | 16,34 | 4,81 | 3,40 | 15,87 | 5,57 | 2,85 | 15,43 | 5,91 | 2,61 | 15,00 | 6,27 | 2,39 | 14,51 | 7,02 | 2,07 |
| **-2** | 17,09 | 4,81 | 3,55 | 16,57 | 5,57 | 2,98 | 16,10 | 5,91 | 2,72 | 15,66 | 6,27 | 2,50 | 15,21 | 7,03 | 2,16 |
| **0** | 17,83 | 4,81 | 3,71 | 17,26 | 5,57 | 3,10 | 16,76 | 5,93 | 2,83 | 16,31 | 6,27 | 2,60 | 15,89 | 7,03 | 2,26 |
| **2** | 18,30 | 4,82 | 3,79 | 17,99 | 5,58 | 3,22 | 17,55 | 5,93 | 2,96 | 17,08 | 6,29 | 2,72 | 16,66 | 7,03 | 2,37 |
| **4** | 21,76 | 4,82 | 4,51 | 21,37 | 5,58 | 3,83 | 20,98 | 5,94 | 3,53 | 20,58 | 6,29 | 3,27 | 20,12 | 7,05 | 2,86 |
| **6** | 23,06 | 4,83 | 4,77 | 22,59 | 5,59 | 4,04 | 22,15 | 5,94 | 3,73 | 21,69 | 6,30 | 3,44 | 21,16 | 7,06 | 3,00 |
| **7** | 23,68 | 4,83 | 4,90 | 23,16 | 5,58 | 4,15 | 22,69 | 5,95 | 3,81 | **22,20** | **6,30** | **3,52** | 21,64 | 7,06 | 3,07 |
| **8** | 24,27 | 4,85 | 5,01 | 23,71 | 5,59 | 4,24 | 23,19 | 5,95 | 3,90 | 22,67 | 6,30 | 3,60 | 22,08 | 7,06 | 3,13 |
| **10** | 25,39 | 4,85 | 5,24 | 24,75 | 5,61 | 4,42 | 24,15 | 5,95 | 4,06 | 23,55 | 6,31 | 3,73 | 22,91 | 7,07 | 3,24 |
| **12** | 26,46 | 4,86 | 5,44 | 25,74 | 5,61 | 4,59 | 25,06 | 5,97 | 4,20 | 24,38 | 6,31 | 3,86 | 23,67 | 7,07 | 3,35 |
| **14** | 27,53 | 4,86 | 5,66 | 26,72 | 5,62 | 4,76 | 25,96 | 5,97 | 4,35 | 25,19 | 6,33 | 3,98 | 24,39 | 7,08 | 3,44 |
| **16** | 28,62 | 4,86 | 5,89 | 27,72 | 5,62 | 4,93 | 26,85 | 5,98 | 4,49 | 26,01 | 6,33 | 4,11 | 25,14 | 7,08 | 3,55 |
| **18** | 29,76 | 4,87 | 6,11 | 28,76 | 5,62 | 5,12 | 27,81 | 5,98 | 4,65 | 26,87 | 6,33 | 4,25 | 25,91 | 7,08 | 3,66 |
| **20** | 30,97 | 4,87 | 6,36 | 29,89 | 5,62 | 5,32 | 28,83 | 5,98 | 4,82 | 27,81 | 6,33 | 4,40 | 26,76 | 7,08 | 3,78 |

### 10.11. ANL 090H (400V/3N/50Hz) Heating capacity - total input power

| TAE | WATER TEMPERATURE PRODUCED (°C) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 30 | | | 35 | | | 40 | | | 45 | | | 50 | | |
| | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP |
| **-10** | 15,25 | 5,23 | 2,92 | 14,95 | 6,05 | 2,47 | - | - | | - | - | | - | - | - |
| **-8** | 16,12 | 5,23 | 3,08 | 15,75 | 6,05 | 2,60 | 15,36 | 6,43 | 2,39 | - | - | | - | - | - |
| **-6** | 16,97 | 5,23 | 3,25 | 16,53 | 6,05 | 2,73 | 16,10 | 6,43 | 2,50 | 15,63 | 6,81 | 2,30 | - | - | - |
| **-4** | 17,81 | 5,23 | 3,41 | 17,30 | 6,05 | 2,86 | 16,82 | 6,43 | 2,62 | 16,35 | 6,82 | 2,40 | 15,82 | 7,63 | 2,07 |
| **-2** | 18,63 | 5,23 | 3,56 | 18,06 | 6,05 | 2,98 | 17,56 | 6,43 | 2,73 | 17,07 | 6,82 | 2,50 | 16,58 | 7,65 | 2,17 |
| **0** | 19,44 | 5,23 | 3,72 | 18,81 | 6,05 | 3,11 | 18,27 | 6,44 | 2,83 | 17,78 | 6,82 | 2,61 | 17,32 | 7,65 | 2,26 |
| **2** | 19,95 | 5,24 | 3,80 | 19,61 | 6,07 | 3,23 | 19,14 | 6,44 | 2,97 | 18,62 | 6,84 | 2,72 | 18,16 | 7,65 | 2,37 |
| **4** | 23,72 | 5,24 | 4,53 | 23,29 | 6,07 | 3,84 | 22,87 | 6,46 | 3,54 | 22,44 | 6,84 | 3,28 | 21,94 | 7,66 | 2,86 |
| **6** | 25,14 | 5,26 | 4,78 | 24,63 | 6,08 | 4,05 | 24,14 | 6,46 | 3,74 | 23,64 | 6,85 | 3,45 | 23,07 | 7,67 | 3,01 |
| **7** | 25,81 | 5,26 | 4,91 | 25,25 | 6,07 | 4,16 | 24,73 | 6,47 | 3,82 | **24,20** | **6,85** | **3,53** | 23,58 | 7,67 | 3,07 |
| **8** | 26,45 | 5,27 | 5,02 | 25,85 | 6,08 | 4,25 | 25,28 | 6,47 | 3,91 | 24,71 | 6,85 | 3,61 | 24,07 | 7,67 | 3,14 |
| **10** | 27,67 | 5,27 | 5,25 | 26,98 | 6,10 | 4,43 | 26,33 | 6,47 | 4,07 | 25,67 | 6,86 | 3,74 | 24,97 | 7,69 | 3,25 |
| **12** | 28,84 | 5,28 | 5,46 | 28,06 | 6,10 | 4,60 | 27,32 | 6,49 | 4,21 | 26,58 | 6,86 | 3,87 | 25,80 | 7,69 | 3,36 |
| **14** | 30,01 | 5,28 | 5,68 | 29,12 | 6,11 | 4,77 | 28,30 | 6,49 | 4,36 | 27,46 | 6,88 | 3,99 | 26,59 | 7,70 | 3,45 |
| **16** | 31,19 | 5,28 | 5,90 | 30,22 | 6,11 | 4,95 | 29,27 | 6,50 | 4,50 | 28,35 | 6,88 | 4,12 | 27,40 | 7,70 | 3,56 |
| **18** | 32,44 | 5,30 | 6,12 | 31,35 | 6,11 | 5,13 | 30,31 | 6,50 | 4,66 | 29,29 | 6,88 | 4,26 | 28,24 | 7,70 | 3,67 |
| **20** | 33,76 | 5,30 | 6,37 | 32,58 | 6,11 | 5,33 | 31,43 | 6,50 | 4,84 | 30,31 | 6,88 | 4,41 | 29,17 | 7,70 | 3,79 |

**Key**

| | |
|---|---|
| Ph | Heating capacity |
| Pe | Total Input Power |
| TAE | External Air temperature |

**ATTENTION**
For intermediate points refer to the diagrams of operating limits (§ 8.3)

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### 10.9. Δt DIFFERENT FROM NOMINAL (Δt 5°C)

| | 3 | 5 | 8 | 10 |
|---|---|---|---|---|
| Heating capacity correction factors | 0,99 | **1** | 1,01 | 1,02 |
| Total input power correction factors | 1,01 | **1** | 0,98 | 0,96 |

### 10.13. ANL 100H (400V/3N/50Hz) Heating capacity - total input power

| TAE | WATER TEMPERATURE PRODUCED (°C) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 30 | | | 35 | | | 40 | | | 45 | | | 50 | | |
| | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP |
| -10 | 18,27 | 6,56 | 2,79 | 17,93 | 7,60 | 2,36 | - | - | - | - | - | - | - | - | - |
| -8 | 19,31 | 6,56 | 2,94 | 18,88 | 7,59 | 2,49 | 18,40 | 8,07 | 2,28 | - | - | - | - | - | - |
| -6 | 20,33 | 6,56 | 3,10 | 19,82 | 7,59 | 2,61 | 19,29 | 8,07 | 2,39 | 18,72 | 8,55 | 2,19 | - | - | - |
| -4 | 21,33 | 6,56 | 3,25 | 20,74 | 7,59 | 2,73 | 20,17 | 8,08 | 2,50 | 19,59 | 8,56 | 2,29 | 18,97 | 9,59 | 1,98 |
| -2 | 22,33 | 6,57 | 3,40 | 21,65 | 7,60 | 2,85 | 21,04 | 8,08 | 2,60 | 20,45 | 8,56 | 2,39 | 19,86 | 9,59 | 2,07 |
| 0 | 23,31 | 6,57 | 3,55 | 22,55 | 7,60 | 2,97 | 21,89 | 8,09 | 2,71 | 21,31 | 8,57 | 2,49 | 20,75 | 9,60 | 2,16 |
| 2 | 23,91 | 6,58 | 3,63 | 23,50 | 7,61 | 3,09 | 22,93 | 8,09 | 2,83 | 22,32 | 8,58 | 2,60 | 21,76 | 9,61 | 2,26 |
| 4 | 28,43 | 6,59 | 4,31 | 27,91 | 7,62 | 3,66 | 27,41 | 8,10 | 3,38 | 26,89 | 8,59 | 3,13 | 26,29 | 9,62 | 2,73 |
| 6 | 30,13 | 6,6 | 4,57 | 29,51 | 7,63 | 3,87 | 28,93 | 8,11 | 3,57 | 28,32 | 8,60 | 3,29 | 27,64 | 9,63 | 2,87 |
| 7 | 30,92 | 6,61 | 4,68 | 30,26 | 7,73 | 3,91 | 29,63 | 8,12 | 3,65 | **29,00** | **8,60** | **3,37** | 28,26 | 9,63 | 2,93 |
| 8 | 31,69 | 6,61 | 4,79 | 30,98 | 7,64 | 4,05 | 30,30 | 8,12 | 3,73 | 29,60 | 8,61 | 3,44 | 28,84 | 9,64 | 2,99 |
| 10 | 33,15 | 6,62 | 5,01 | 32,33 | 7,65 | 4,23 | 31,55 | 8,13 | 3,88 | 30,76 | 8,61 | 3,57 | 29,92 | 9,65 | 3,10 |
| 12 | 34,56 | 6,63 | 5,21 | 33,63 | 7,66 | 4,39 | 32,74 | 8,14 | 4,02 | 31,85 | 8,62 | 3,69 | 30,91 | 9,66 | 3,20 |
| 14 | 35,95 | 6,64 | 5,41 | 34,90 | 7,67 | 4,55 | 33,91 | 8,15 | 4,16 | 32,91 | 8,63 | 3,81 | 31,87 | 9,66 | 3,30 |
| 16 | 37,38 | 6,64 | 5,63 | 36,20 | 7,67 | 4,72 | 35,09 | 8,16 | 4,30 | 33,98 | 8,64 | 3,93 | 32,84 | 9,67 | 3,40 |
| 18 | 38,87 | 6,65 | 5,85 | 37,56 | 7,68 | 4,89 | 36,33 | 8,16 | 4,45 | 35,11 | 8,64 | 4,06 | 33,85 | 9,67 | 3,50 |
| 20 | 40,47 | 6,65 | 6,09 | 39,04 | 7,68 | 5,08 | 37,67 | 8,16 | 4,62 | 36,33 | 8,64 | 4,20 | 34,96 | 9,67 | 3,62 |

### 10.14. ANL 150H (400V/3N/50Hz) Heating capacity - total input power

| TAE | WATER TEMPERATURE PRODUCED (°C) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 30 | | | 35 | | | 40 | | | 45 | | | 50 | | |
| | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP |
| -10 | 22,05 | 7,71 | 2,86 | 21,64 | 8,93 | 2,42 | - | - | - | - | - | - | - | - | - |
| -8 | 23,31 | 7,70 | 3,03 | 22,79 | 8,91 | 2,56 | 22,21 | 9,48 | 2,34 | - | - | - | - | - | - |
| -6 | 24,54 | 7,70 | 3,19 | 23,92 | 8,91 | 2,68 | 23,28 | 9,48 | 2,46 | 22,59 | 10,04 | 2,25 | - | - | - |
| -4 | 25,75 | 7,71 | 3,34 | 25,03 | 8,91 | 2,81 | 24,34 | 9,49 | 2,57 | 23,64 | 10,05 | 2,35 | 22,89 | 11,26 | 2,03 |
| -2 | 26,94 | 7,71 | 3,49 | 26,13 | 8,93 | 2,93 | 25,39 | 9,49 | 2,68 | 24,68 | 10,05 | 2,46 | 23,97 | 11,26 | 2,13 |
| 0 | 28,13 | 7,72 | 3,64 | 27,22 | 8,93 | 3,05 | 26,42 | 9,50 | 2,78 | 25,72 | 10,06 | 2,56 | 25,04 | 11,27 | 2,22 |
| 2 | 28,86 | 7,73 | 3,73 | 28,36 | 8,94 | 3,17 | 27,67 | 9,50 | 2,91 | 26,94 | 10,08 | 2,67 | 26,26 | 11,29 | 2,33 |
| 4 | 34,31 | 7,74 | 4,43 | 33,68 | 8,95 | 3,76 | 33,08 | 9,51 | 3,48 | 32,45 | 10,09 | 3,22 | 31,73 | 11,30 | 2,81 |
| 6 | 36,36 | 7,75 | 4,69 | 35,62 | 8,96 | 3,97 | 34,92 | 9,52 | 3,67 | 34,18 | 10,10 | 3,38 | 33,36 | 11,31 | 2,95 |
| 7 | 37,32 | 7,76 | 4,81 | 36,52 | 9,08 | 4,02 | 35,76 | 9,54 | 3,75 | **35,00** | **10,10** | **3,47** | 34,11 | 11,31 | 3,02 |
| 8 | 38,25 | 7,76 | 4,93 | 37,39 | 8,97 | 4,17 | 36,57 | 9,54 | 3,83 | 35,72 | 10,11 | 3,53 | 34,81 | 11,32 | 3,07 |
| 10 | 40,01 | 7,77 | 5,15 | 39,02 | 8,98 | 4,34 | 38,08 | 9,55 | 3,99 | 37,12 | 10,11 | 3,67 | 36,11 | 11,33 | 3,19 |
| 12 | 41,71 | 7,78 | 5,36 | 40,59 | 9,00 | 4,51 | 39,51 | 9,56 | 4,13 | 38,44 | 10,12 | 3,80 | 37,31 | 11,34 | 3,29 |
| 14 | 46,91 | 7,80 | 6,01 | 42,12 | 9,01 | 4,68 | 40,93 | 9,57 | 4,28 | 39,72 | 10,14 | 3,92 | 38,46 | 11,34 | 3,39 |
| 16 | 45,11 | 7,80 | 5,78 | 43,69 | 9,01 | 4,85 | 42,35 | 9,58 | 4,42 | 41,01 | 10,15 | 4,04 | 39,63 | 11,36 | 3,49 |
| 18 | 45,61 | 7,80 | 5,85 | 45,33 | 9,02 | 5,03 | 43,85 | 9,58 | 4,58 | 42,37 | 10,15 | 4,18 | 40,85 | 11,36 | 3,60 |
| 20 | 48,85 | 7,81 | 6,25 | 47,12 | 9,02 | 5,22 | 45,46 | 9,58 | 4,74 | 43,85 | 10,15 | 4,32 | 42,19 | 11,36 | 3,72 |

| Key | |
|---|---|
| Ph | Heating capacity |
| Pe | Total Input Power |
| TAE | External Air temperature |

**ATTENTION**
For intermediate points refer to the diagrams of operating limits (§ 8.3)

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### 10.12. Δt DIFFERENT FROM NOMINAL (Δt 5°C)

| | 3 | 5 | 8 | 10 |
|---|---|---|---|---|
| Heating capacity correction factors | 0,99 | **1** | 1,01 | 1,02 |
| Total input power correction factors | 1,01 | **1** | 0,98 | 0,96 |

## 10.16. ANL 200H (400V/3N/50Hz) Heating capacity - total input power

| TAE | WATER TEMPERATURE PRODUCED (°C) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 30 | | | 35 | | | 40 | | | 45 | | | 50 | | |
| | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP | Ph (kW) | Pe (kW) | COP |
| **-10** | 28,98 | 10,15 | 2,86 | 28,44 | 11,75 | 2,42 | - | - | - | - | - | - | - | - | - |
| **-8** | 30,63 | 10,15 | 3,02 | 29,95 | 11,74 | 2,55 | 29,19 | 12,48 | 2,34 | - | - | - | - | - | - |
| **-6** | 32,25 | 10,14 | 3,18 | 31,44 | 11,74 | 2,68 | 30,60 | 12,48 | 2,45 | 29,69 | 13,22 | 2,25 | - | - | - |
| **-4** | 33,84 | 10,15 | 3,33 | 32,90 | 11,74 | 2,80 | 31,99 | 12,50 | 2,56 | 31,07 | 13,24 | 2,35 | 30,09 | 14,83 | 2,03 |
| **-2** | 35,41 | 10,15 | 3,49 | 34,34 | 11,75 | 2,92 | 33,37 | 12,50 | 2,67 | 32,44 | 13,24 | 2,45 | 31,50 | 14,83 | 2,12 |
| **0** | 36,97 | 10,16 | 3,64 | 35,77 | 11,75 | 3,04 | 34,72 | 12,51 | 2,78 | 33,80 | 13,25 | 2,55 | 32,91 | 14,85 | 2,22 |
| **2** | 37,92 | 10,18 | 3,72 | 37,28 | 11,77 | 3,17 | 36,37 | 12,51 | 2,91 | 35,40 | 13,27 | 2,67 | 34,52 | 14,86 | 2,32 |
| **4** | 45,09 | 10,19 | 4,42 | 44,27 | 11,78 | 3,76 | 43,48 | 12,53 | 3,47 | 42,65 | 13,28 | 3,21 | 41,70 | 14,88 | 2,80 |
| **6** | 47,79 | 10,21 | 4,68 | 46,81 | 11,80 | 3,97 | 45,89 | 12,54 | 3,66 | 44,92 | 13,30 | 3,38 | 43,84 | 14,89 | 2,94 |
| **7** | 49,05 | 10,21 | 4,80 | 48,00 | 11,95 | 4,02 | 47,00 | 12,56 | 3,74 | **46,00** | **13,30** | **3,46** | 44,83 | 14,89 | 3,01 |
| **8** | 50,27 | 10,22 | 4,92 | 49,14 | 11,82 | 4,16 | 48,06 | 12,56 | 3,83 | 46,95 | 13,32 | 3,53 | 45,75 | 14,91 | 3,07 |
| **10** | 52,59 | 10,24 | 5,14 | 51,28 | 11,83 | 4,33 | 50,04 | 12,57 | 3,98 | 48,79 | 13,32 | 3,66 | 47,46 | 14,92 | 3,18 |
| **12** | 54,82 | 10,25 | 5,35 | 53,34 | 11,85 | 4,50 | 51,93 | 12,59 | 4,13 | 50,52 | 13,33 | 3,79 | 49,03 | 14,94 | 3,28 |
| **14** | 57,03 | 10,26 | 5,56 | 55,36 | 11,86 | 4,67 | 53,79 | 12,60 | 4,27 | 52,20 | 13,35 | 3,91 | 50,55 | 14,94 | 3,38 |
| **16** | 59,29 | 10,27 | 5,77 | 57,42 | 11,86 | 4,84 | 55,66 | 12,62 | 4,41 | 53,90 | 13,36 | 4,03 | 52,09 | 14,95 | 3,48 |
| **18** | 61,65 | 10,28 | 6,00 | 59,58 | 11,88 | 5,02 | 57,63 | 12,62 | 4,57 | 55,69 | 13,36 | 4,17 | 53,69 | 14,95 | 3,59 |
| **20** | 64,2 | 10,28 | 6,25 | 61,93 | 11,88 | 5,21 | 59,75 | 12,62 | 4,73 | 57,63 | 13,36 | 4,31 | 55,45 | 14,95 | 3,71 |

**Key**

| | |
|---|---|
| Ph | Heating capacity |
| Pe | Total Input Power |
| TAE | External Air temperature |

**ATTENTION**
For intermediate points refer to the diagrams of operating limits (§ 8.3)

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## 10.15. Δt DIFFERENT FROM NOMINAL (Δt 5°C)

| | 3 | 5 | 8 | 10 |
|---|---|---|---|---|
| Heating capacity correction factors | 0,99 | **1** | 1,01 | 1,02 |
| Total input power correction factors | 1,01 | **1** | 0,98 | 0,96 |

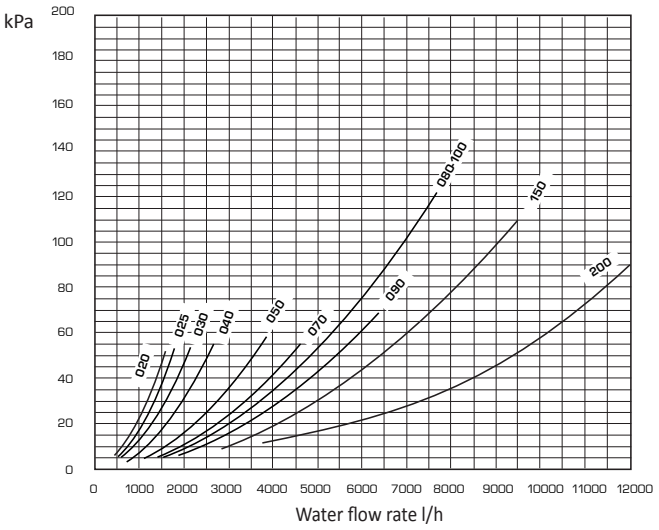
## 11. PRESSURE DROPS AND USEFUL STATIC PRESSURES

### 11.1. EVAPORATOR | PIPING

| | |
|---|---|
| Evaporator water inlet | 7°C |
| Evaporator water outlet | 12°C |
| External air temperatures | 35 °C |
| Average water temperature | 10° C |

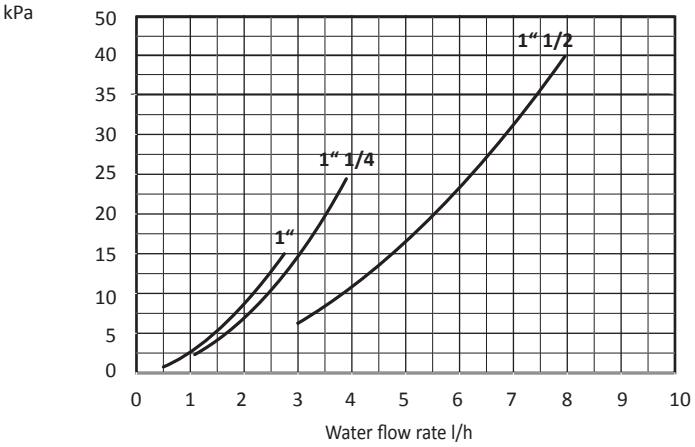
For temperatures other than 10 ° C use a table of correction factors

| Average water temperature | 5 | **10** | 15 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|
| Multiplicative coefficients | 1,02 | **1** | 0,98 | 0,97 | 0,95 | 0,93 | 0,91 |



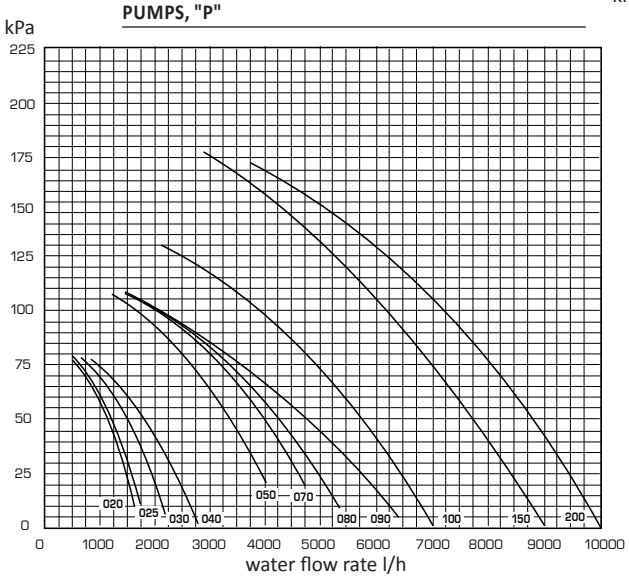

### 11.2. FILTRE

| ø filtro | 1" | 1"¼ | 1"½ |
|---|---|---|---|
| ANL | 020...040 | 050...090 | 100...200 |

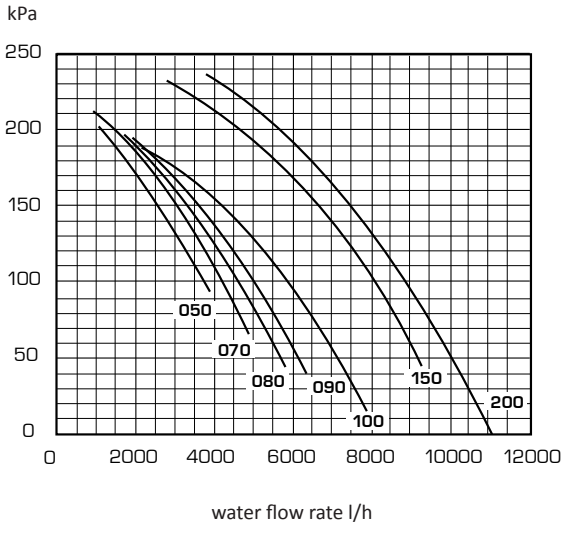



### 11.3. USEFUL STATIC PRESSURES

#### 11.2.1. USEFUL STATIC PRESSURE WITH STORAGE TANK "A" or PUMPS, "P"




#### 11.2.2. USEFUL STATIC PRESSURE WITH STORAGE TANK "A" or PUMPS, "Q"



## 12. ETHYLENE GLYCOL SOLUTIONS

- The correction factors of cooling power and input power take into account the presence of glycol and diverse evaporation temperatures.
- The pressure drop correction factor considers the different flow rate resulting from the application of the water flow rate correction factor.
- The water flow rate correction factor is calculated to keep the same Δt that would be present with the absence of glycol.

NOTE

On the following page an example is given to help graph reading. Using the diagram below it is possible to determine the percentage of glycol required; this percentage can be calculated by taking of the following factors into consideration one:

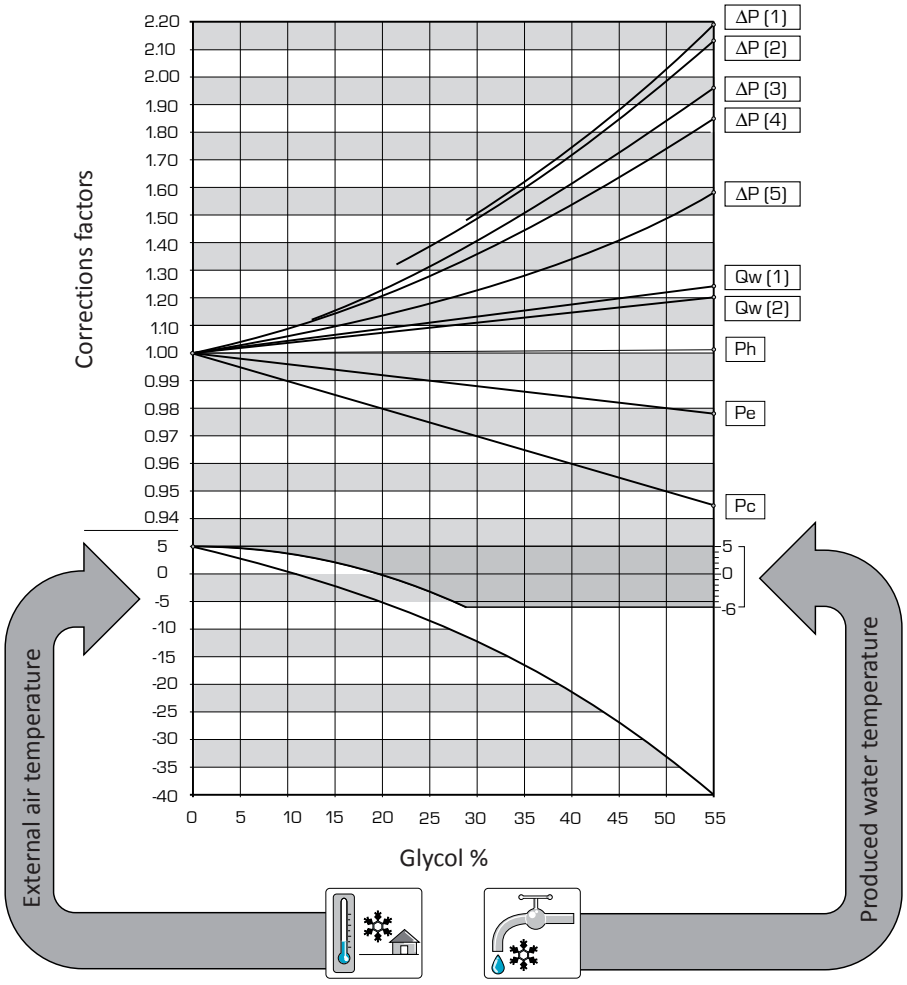
Depending on which fluid is considered (water or air), the graph is interpreted by the right or left side at the crossing point on the curves with the external temperature line or the water produced line. A point from which the vertical line will pass is obtained and this will distinguish both glycol percentage and relative correction coefficients.

### 11.4. HOW TO INTERPRET GLYCOL CURVES

The curves shown in the diagram summarise a significant number of data, each of which is represented by a specific curve. In order to use these curves correctly it is first necessary to make some initial reflections.

1. If you wish to calculate the percentage of glycol on the basis of the external air temperature, enter from the left axis and on reaching the curve draw a vertical line, which in turn will intercept all the other curves; the points obtained from the upper curves represent the coefficients for the correction of the cooling capacity and input power, the flow rates and the pressure drops (remember that these coefficients must be multiplied by the nominal value of the size in question); while the glycol percentage value recommended to produce desired water temperature is on the lower axis.
2. If you wish to calculate the percentage of glycol on the basis of the temperature of the water produced, enter from the right axis and on reaching the curve draw a vertical line, which in turn will intercept all the other curves; the points obtained from the upper curves represent the coefficients for the correction of the cooling capacity and input power, the flow rates and the pressure drops (remember that these coefficients must be multiplied by the nominal value of the
3. size in question); while the lower axis recommends the glycol percentage value necessary to produce water at the desired temperature.

**Initial rates for "EXTERNAL AIR TEMPERATURE" and "TEMPERATURE OF PRODUCED WATER", are not directly related, therefore it is not possible to refer to the curve of one of these rates to obtain corresponding point on the curve of the other rate.**




KEY:

| | |
|---|---|
| Pc | Corrective factors for cooling capacity |
| Pe | Corrective factors of the input power |
| Ph | Corrective factors of heating capacity |
| DP (1) | Correction factors for pressure drop av. temp. = -3,5 °C |
| DP (2) | Correction factors for pressure drop av. temp. = 0,5 °C |
| DP (3) | Correction factors for pressure drop av. temp. = 5,5 °C |
| DP (4) | Correction factors for pressure drop av. temp. = 9,5 °C |
| DP (5) | Correction factors for pressure drop av. temp. = 47,5 °C |
| Qw (1) | Correction factor of flow rates (evap.) av. temp = 9,5 °C |
| Qw (2) | Correction factor of flow rates (cond.) av. temp = 47,5 °C |

**NOTE**

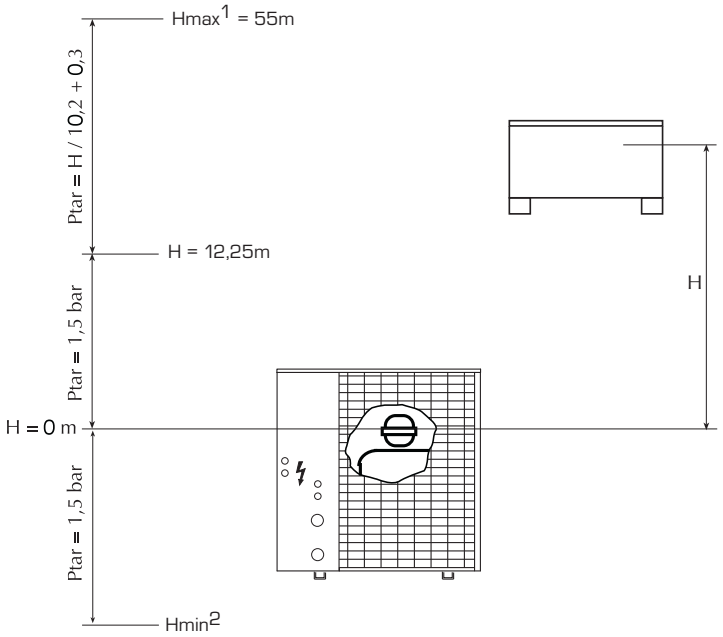
**Although the graph arrives at external air temperatures of -40°C, unit operational limits must be considered.**

## 13. EXPANSION VESSEL CALIBRATION

Standard pre-load pressure value of expansion vessel when empty is 1.5 bar, maximum value is 6 bar. Calibration of the vessel must be regulated using the maximum level difference (H) of the user (see diagram) by using the following formula:

p (calibration) [bar] = H [m] / 10,2 + 0,3.

For example: if level difference (H) is equal to 20m, the calibration value of the vessel will be 2.3 bar. If calibration value obtained from formula is less than 1.5 bar (that is for H < 12.25), keep calibration as standard.




KEY
(1) Check that highest installation is not higher than 55 metres

(2) Ensure that lowest installation can withstand global pressure in that position.

## 14. RECOMMENDED MINIMUM WATER CONTENT

| ANL\|ANLH | | 020 | 025 | 030 | 040 | 050 | 070 | 080 | 090 | 100 | 150 | 200 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number compressor | n° | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 |
| Recommended minimum water content | l/kW | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |

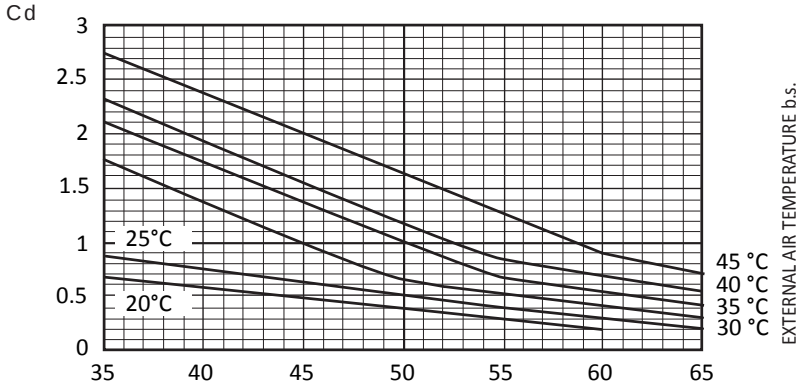
**WARNING**
It is recommended to project systems with a high water content see table for minimum levels advised), to limit:
1. The hourly number of inversions between the various functioning modes
2. The water temperature reduction during the defrosting cycles in the winter period

## 15. DESUPERHEATER

### 15.1. CORRECTION FACTORS

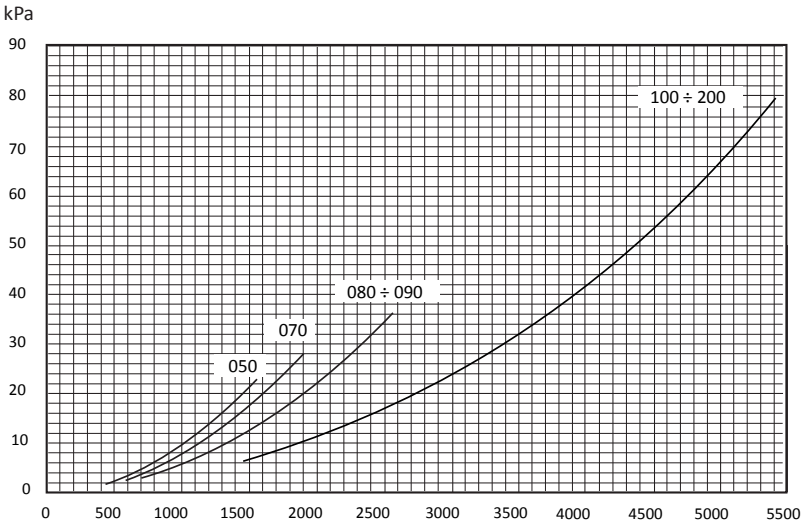
The heating capacity obtained from the desuperheater is obtained by multiplying the nominal value for the coefficient (cd).
The diagram can be used to derive the correction coefficients as a function of outdoor temperature and the temperature of the water produced at the desuperheater.

**ATTENTION**
The use of the desuperheater is possible in cooling function; for heat function it must be intercepted.




Temperature of desuperheater produced water Δt 5° C

### 15.2. PRESSURE DROPS




Water flow rate l/h

| **Average water temperature** | **30** | **40** | **50** | **60** | **70** |
|---|---|---|---|---|---|
| Coefficiente correttivo | 1,04 | 1,02 | **1,00** | 0,98 | 0,96 |

## 16. REFRIGERANT LINES

| Model | lenght line [m] | Line gas Ø [mm] | Linea liquid Ø [mm] | R410A [g/m] |
|---|---|---|---|---|
| ANL 020 C | 0-10 | 12,7 | 9,52 | 70 |
| | 10-20 | 12,7 | 9,52 | 70 |
| | 20-30 | 12,7 | 9,52 | 70 |
| ANL 025 C | 0-10 | 12,7 | 9,52 | 70 |
| | 10-20 | 12,7 | 9,52 | 70 |
| | 20-30 | 12,7 | 9,52 | 70 |
| ANL 030 C | 0-10 | 12,7 | 12,7 | 120 |
| | 10-20 | 12,7 | 12,7 | 120 |
| | 20-30 | 15,88 | 12,7 | 130 |
| ANL 040 C | 0-10 | 12,7 | 12,7 | 120 |
| | 10-20 | 15,88 | 12,7 | 130 |
| | 20-30 | 15,88 | 12,7 | 130 |
| ANL 050 C | 0-10 | 15,88 | 15,88 | 190 |
| | 10-20 | 15,88 | 15,88 | 190 |
| | 20-30 | 18 | 15,88 | 190 |
| ANL 070 C | 0-10 | 15,88 | 15,88 | 190 |
| | 10-20 | 18 | 15,88 | 190 |
| | 20-30 | 18 | 15,88 | 190 |
| ANL 080 C | 0-10 | 15,88 | 15,88 | 190 |
| | 10-20 | 18 | 15,88 | 190 |
| | 20-30 | 22 | 15,88 | 210 |
| ANL 090 C | 0-10 | 18 | 15,88 | 190 |
| | 10-20 | 22 | 15,88 | 210 |
| | 20-30 | 22 | 15,88 | 210 |
| ANL 100 C | 0-10 | 28,00 | 15,88 | 230 |
| | 10-20 | 28,00 | 15,88 | 230 |
| | 20-30 | 28,00 | 15,88 | 230 |
| ANL 150 C | 0-10 | 28,00 | 15,88 | 230 |
| | 10-20 | 28,00 | 15,88 | 230 |
| | 20-30 | 28,00 | 15,88 | 230 |
| ANL 200 C | 0-10 | 35,00 | 15,88 | 260 |
| | 10-20 | 35,00 | 18,00 | 310 |
| | 20-30 | 35,00 | 18,00 | 310 |

## 17. SOUND DATA

**Sound power**
Aermec determines sound power values in agreement with the 9614-2 Standard, in compliance with that requested by Eurovent certification

**Sound pressure**
Sound pressure measured in free field conditions with reflective surface (directivity factor Q=2) at 10mt distance from external surface of unit, in compliance with ISO 3744 regulations.

**① COOLING MODE**

| | |
|---|---|
| Water input temperature | 7°C |
| Water output temperature | 12°C |
| External air temperature | 35 °C |

| ANL/ ANLH | Total sound level | | | Octave band [Hz] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pot. dB(A) | Pressure. | | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
| | | dB(A) 10 m | dB(A) 1 m | Sound power for centre of band [dB] (A) frequence | | | | | | |
| **020** | **61,0** | **30,0** | **46,8** | 70,0 | 64,1 | 59,1 | 52,7 | 46,7 | 41,0 | 35,7 |
| **025** | **61,0** | **30,0** | **46,8** | 70,0 | 64,1 | 59,1 | 52,7 | 46,7 | 41,0 | 35,7 |
| **030** | **68,0** | **37,0** | **53,6** | 75,4 | 69,6 | 64,0 | 63,5 | 56,7 | 51,2 | 44,6 |
| **040** | **68,0** | **37,0** | **53,6** | 75,4 | 69,6 | 64,0 | 63,5 | 56,7 | 51,2 | 44,6 |
| **050** | **69,0** | **38,0** | **53,9** | 76,5 | 69,2 | 64,8 | 64,6 | 58,9 | 53,7 | 46,1 |
| **070** | **69,0** | **38,0** | **54,0** | 76,5 | 69,2 | 64,8 | 64,6 | 58,9 | 53,7 | 46,1 |
| **080** | **69,0** | **38,0** | **54,0** | 73,8 | 69,4 | 65,8 | 64,1 | 59,5 | 56,5 | 51,0 |
| **090** | **68,0** | **37,0** | **53,0** | 74,0 | 68,5 | 64,5 | 62,2 | 59,3 | 56,4 | 48,1 |
| **100** | **76,0** | **44,0** | **60,0** | 61,2 | 66,0 | 71,4 | 72,0 | 68,9 | 60,5 | 48,6 |
| **150** | **77,0** | **45,0** | **61,0** | 62,4 | 67,3 | 72,2 | 72,7 | 69,7 | 61,5 | 49,6 |
| **200** | **78,0** | **46,0** | **62,0** | 63,6 | 68,4 | 73,4 | 73,5 | 70,5 | 62,5 | 50,6 |

## 18. PARAMETER CALIBRATION OF SAFETY AND CONTROL

| SET COOLING | min | Max. | defoult |
|---|---|---|---|
| Water temperature inlet (cooling mode) | -6 °C | 18 °C | 7° C |

| SET HEATING | | | |
|---|---|---|---|
| Water temperature inlet (heating mode) | 35 °C | 55 °C | 48 °C |

| DEFROSTING MODE | | | |
|---|---|---|---|
| | -9 °C | 4 °C | 3 °C |

| TOTAL DIFFERENTIAL | | | |
|---|---|---|---|
| Banda proportional temperature within which the compressors are turned on and off | 3 °C | 10 °C | 5 °C |

| | | | 020 | 025 | 030 | 040 | 050 | 070 | 080 | 090 | 100 | 150 | 200 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **ONLY COOLING VERSION** | | | | | | | | | | | | | |
| **BREAKERS FANS** | | | | | | | | | | | | | |
| MTV1 | A | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| MTV2 | A | | - | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| **BREAKERS COMPRESSOR** | | | | | | | | | | | | | |
| MTC1 | A | 230V | 16 | 16 | 20 | 25 | - | - | - | - | - | - | - |
| | A | 400V/3N | 2,2 | 2,2 | 6 | 8 | 10 | 13 | 15 | 16 | 10 | 12,5 | 15 |
| MTC2 | A | | - | - | - | - | - | - | - | - | 10 | 12,5 | 15 |
| **HIGH PRESSURE SWITCH** | | | | | | | | | | | | | |
| PA | bar | | | | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 |
| **HIGH PRESSURE TRANSDUCER** | | | | | | | | | | | | | |
| TAP | bar | | | | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 |
| **LOW PRESSURE TRANSDUCER** | | | | | | | | | | | | | |
| TBP | bar | | | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **HEAT PUMP VERSION** | | | | | | | | | | | | | |
| **BREAKERS VENTILATORI** | | | | | | | | | | | | | |
| MTV1 | A | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| MTV2 | A | | - | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| **BREAKERS COMPRESSOR** | | | | | | | | | | | | | |
| MTC1 | A | 230V | 16 | 16 | 20 | 25 | - | - | - | - | - | - | - |
| | A | 400V/3N | 2,2 | 2,2 | 6 | 8 | 10 | 13 | 15 | 16 | 10 | 12,5 | 15 |
| MTC2 | A | | - | - | - | - | - | - | - | - | 10 | 12,5 | 15 |
| **HIGH PRESSURE SWITCH** | | | | | | | | | | | | | |
| PA | bar | | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 |
| **LOW PRESSURE SWITCH** | | | | | | | | | | | | | |
| PA | bar | **vers."°"** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| **LOW PRESSURE TRANSDUCER** | | | | | | | | | | | | | |
| TAP | bar | **vers."°"** | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| TAP | bar | **vers."H"** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| **HIGH PRESSURE TRANSDUCER** | | | | | | | | | | | | | |
| TBP | bar | | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 |

**Standards and Directives respected on designing and constructing the unit:**
**SAFETY**

1. Machinery Directive 2006/42/CE
2. Low Voltage Directive LVD 2006/95/CE
3. Electromagnetic compatibility Directive EMC 2004/108/CE
4. Pressure Equipment Directive PED 97/23/CE, EN 378,
5. UNI12735, UNI14276

**ELECTRIC PART**

1. CEI EN 60335-2-40,
2. CEI EN 61000-6-1/2/3/4

**ACUSTIC PART**

1. ISO DIS 9614/2 (intensimetric method)

**PROTECTION RATING**
IP24

**CERTIFICATIONS**
EUROVENT

**REFRIGERANT GAS**
Questa unità contiene gas floururali a effetto serra coperti dal protocollo di Kyoto. Le operazioni di manutenzione e smaltimento devono essere eseguite solo da personale qualificato, nel rispetto delle norme vigenti

DANGER!
The refrigerant circuit is under pressure. Moreover, very high temperatures an be reached. The appliance may only be pened by an SAT service technician or by a qualified technician.
Work on the cooling circuit may only be carried out by a qualified refrigeration technician.

**R410A REFRIGERANT GAS**
The cooler comes supplied with a ufficient quantity of R410A refrigerant gas. This refrigerant is chlorine-free and does not damage the ozone layer. R410A is not flammable. However, all maintenance operations must be carried out exclusively by a specialised technician using suitable protective equipment

**DANGER OF ELECTRICAL DISCHARGE!**
Before opening the heat pump, completely disconnect the appliance from the power mains.

## 20. GENERAL WARNINGS FOR THE INSTALLER

AERMEC ANLs are constructed according to the recognised technical standards and safety regulations. They have been designed for air conditioning and the production of domestic hot water (DHW) and must be destined to this use compatibly with their performance features. Any contractual or extracontractual liability of the Company is excluded for injury/damage to persons, animals or objects owing to installation, regulation and maintenance errors or improper use. All uses not expressly indicated in this manual are prohibited

### 20.1. PRESERVATION OF THE DOCUMENTATION

1. The instructions along with all the related documentation must be given to the user of the system, who assumes the responsibility to conserve the instructions so that they are always at hand in case of need.
2. LRead this sheet carefully; the execution of all works must be performed by qualified staff, according to Standards in force ion this subject in different countries.
3. The appliance must be installed in such a way as to enable maintenance and/or repairs to be carried out.
4. The appliance warranty does not cover the costs for ladder trucks, scaffolding, or other elevation systems that may become necessary for carrying out servicing under warranty.
5. Do not modify or tamper with the chiller as dangerous situations can be created and the manufacturer will not be liable for any damage caused. The validity of the warranty shall be void in the event of failure to comply with the above-mentioned indications.

### 20.2. WARNINGS REGARDING SAFETY AND INSTALLATION STANDARDS

1. The chiller must be installed by a qualifi ed and suitably trained technician, in compliance with the national legislation in force in the country of destination.
   AERMEC will not assume any responsibility for damage due to failure to follow these instructions.
2. Before beginning any operation, READ THESE INSTRUCTIONS CAREFULLY AND CARRY OUT THE SAFETY CHECKS TO REDUCE ALL RISK OF DANGER TO A MINIMUM. All the staff involved must have thorough knowledge of the operations and any dangers that may arise at the moment in which the installation operations are carried out.

## 21. SELECTION AND PLACE OF INSTALLATION

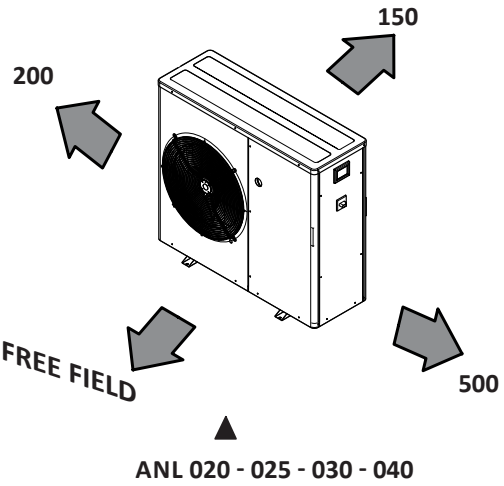
Before beginning installation consent with client and pay attention to the following recommendations:

1. The support surface must be capable of supporting the unit weight;
2. The safety differences between the unit and ther appliances or structures must be scrupulously respected so that the inlet and outlet AIR from the fans is free to circulate;
3. The unit must be installed by an enabled technician in compliance with the national legislation in force in the country of destination, respecting the minimum technical spaces in order to allow maintenance.

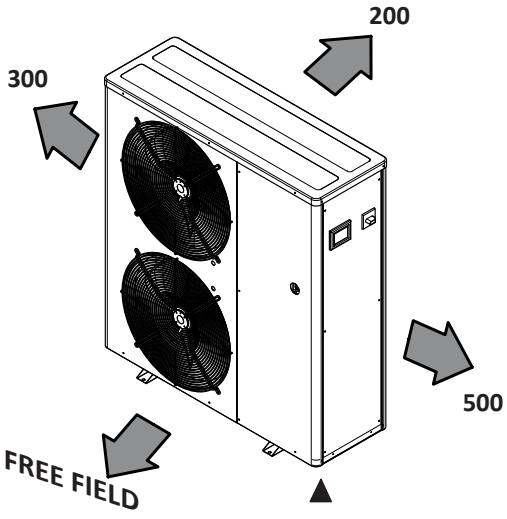
### 21.2.1. POSITIONING

Before handling the unit, verify the lifting capacity of the machines used, respecting the indications given on the packaging.
To handle the machine (ANL 020-090) on horizontal surfaces, se fork lift trucks or similar in the most appropriate manner, paying attention to the distribution of the unit weight.
In the case of lifting (ANL 100-200),insert pipes into the holes supplied on the base (NOT SUPPLIED).The length of the pipes must be such to allow positioning of the lifting belts and relative safety pins.
Position the unit in the place indicated by the customer, placing a rubber covering between the base and the support (min. thickness 10 mm.) or alternatively anti-vibrating feet (ACCESSORIES). For further information, refer to the dimensional tables

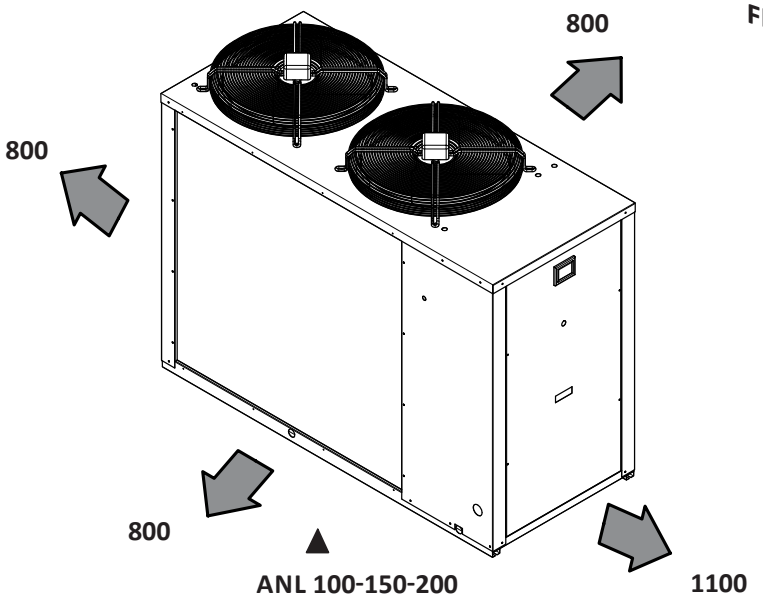
Fix the unit checking that it is level. Make sure that the hydraulic and electric part can be easily reached. In case of installation in places where gusts of wind are frequent, fix the unit suitably using tie-rods. Envision the installation of the condensate drain tray in the versions where envisioned (as ACCESSORY).




ANL 020 - 025 - 030 - 040



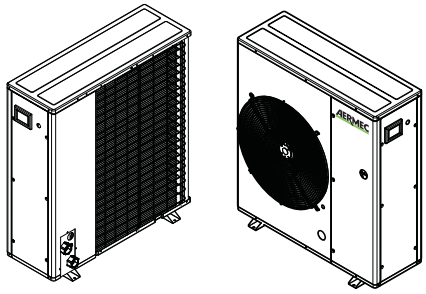

ANL 050 - 080 - 090



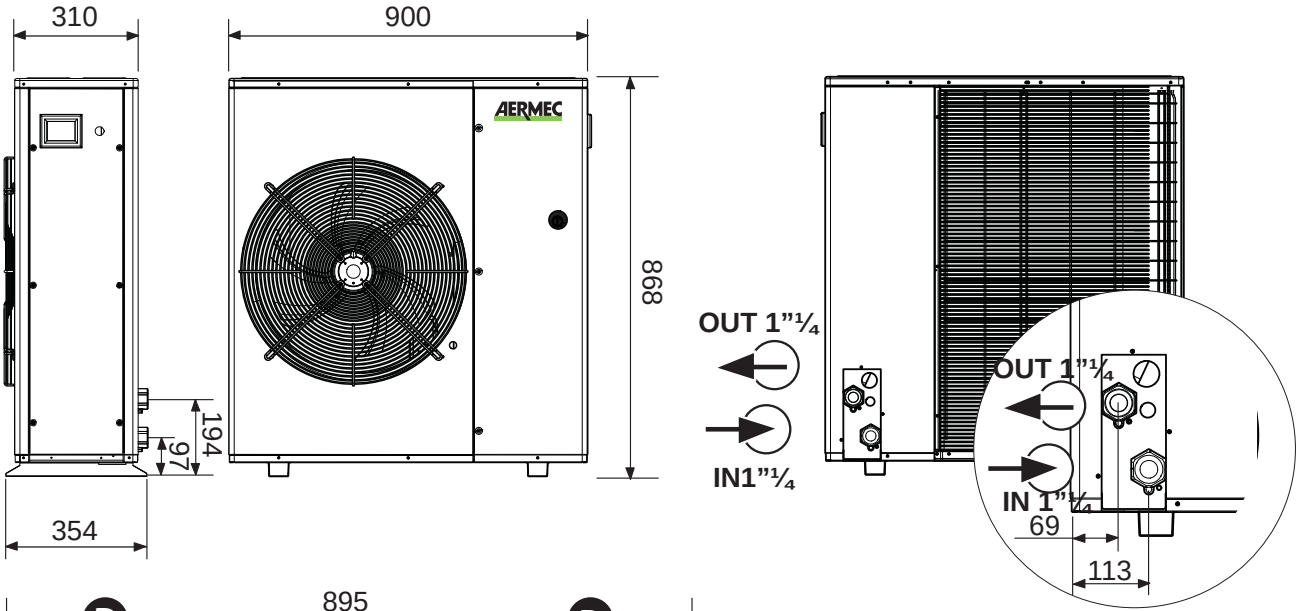

ANL 100-150-200

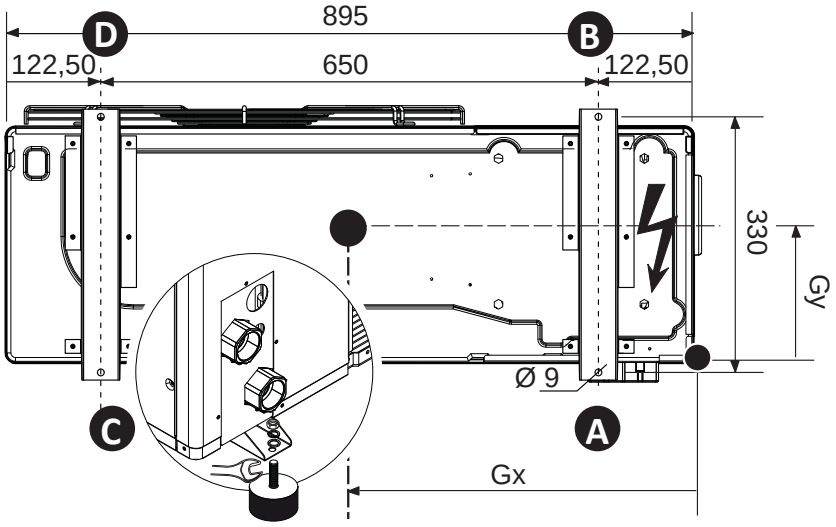
## 22. DIMENSIONS

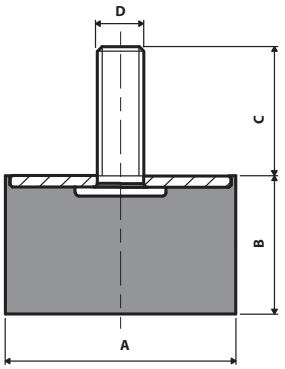
### 22.1. ANL 020 ÷ 025 version °|P|H|HP



| ANL | MOD. | VERS. | WEIGHT | CENTER OF GRAVITY | | A | B | C | D | KIT VT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Gy | Gx | % | % | % | % | |
| 020 | °/H | ° | 75 | 174 | 325 | 32,1% | 31,8% | 18,2% | 18,0% | 9 |
| 020 | °/H | P | 77 | 177 | 326 | 31,6% | 32,2% | 17,9% | 18,3% | 9 |
| 025 | °/H | ° | 75 | 174 | 325 | 32,1% | 31,8% | 18,2% | 18,0% | 9 |
| 025 | °/H | P | 77 | 177 | 326 | 31,6% | 32,2% | 17,9% | 18,3% | 9 |

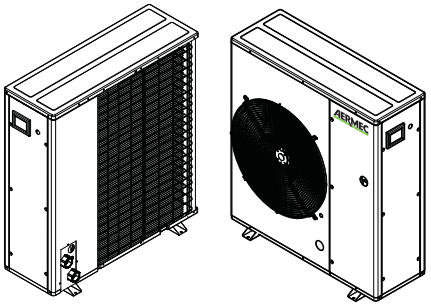


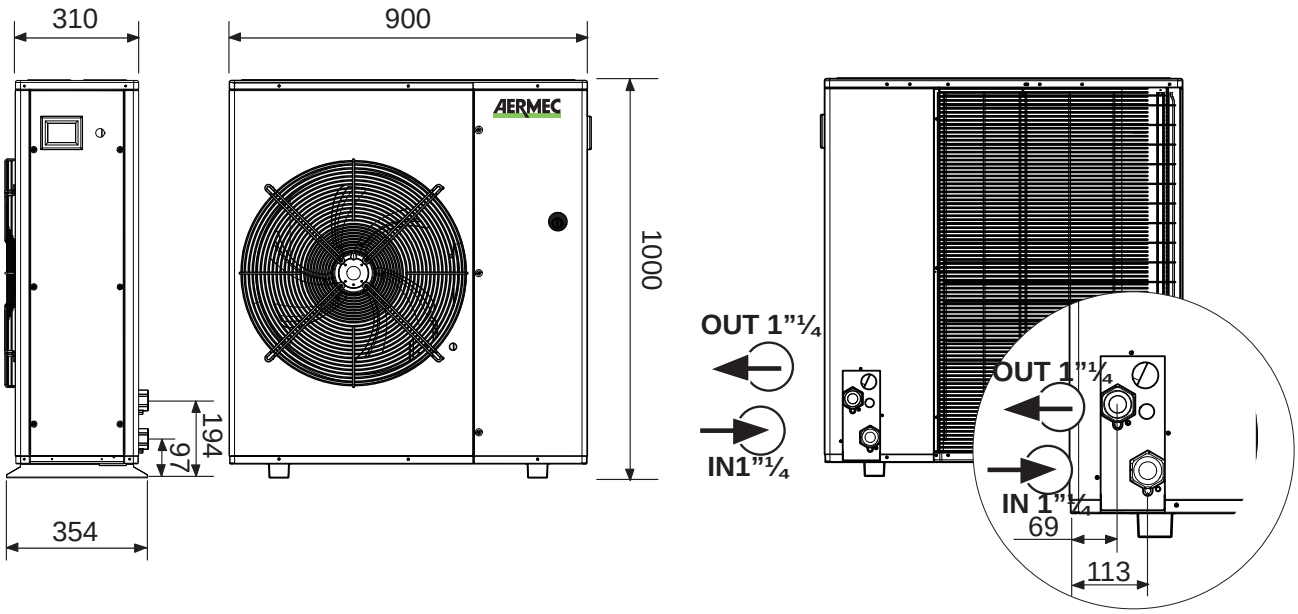



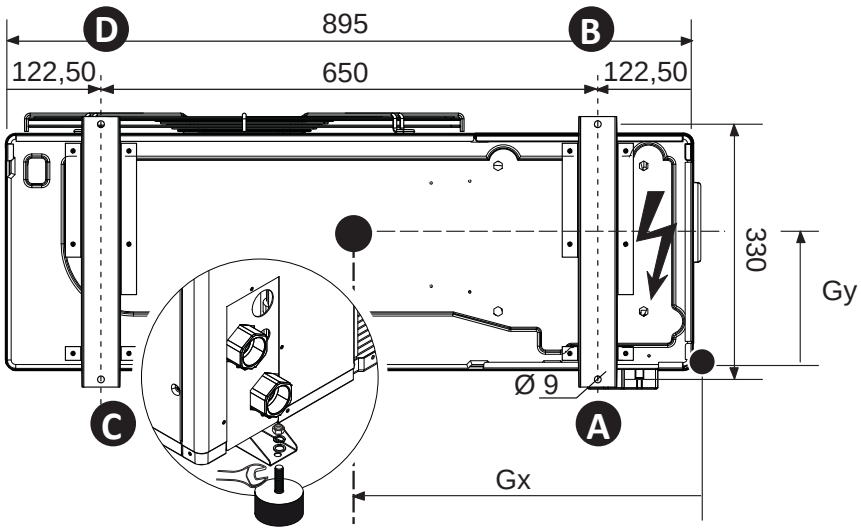

| Mod. | A | B | C | D |
|---|---|---|---|---|
| VT9 | 40 | 30 | 23 | M8 |

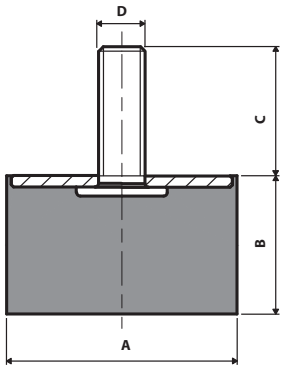
### 22.2. ANL 030 ÷ 040 version °|P|H|HP



| ANL | MOD. | VERS. | WEIGHT | CENTER OF GRAVITY | | A | B | C | D | KIT VT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Gy | Gx | % | % | % | % | |
| 030 | °/H | ° | 86 | 183 | 336 | 30% | 33% | 18% | 19% | 9 |
| 030 | °/H | P | 91 | 180 | 327 | 31% | 33% | 18% | 19% | 9 |
| 040 | °/H | ° | 86 | 183 | 336 | 30% | 33% | 18% | 19% | 9 |
| 040 | °/H | P | 91 | 180 | 327 | 31% | 33% | 18% | 19% | 9 |

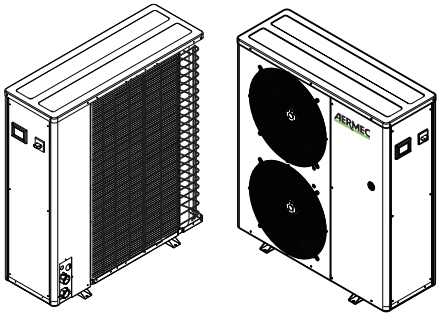


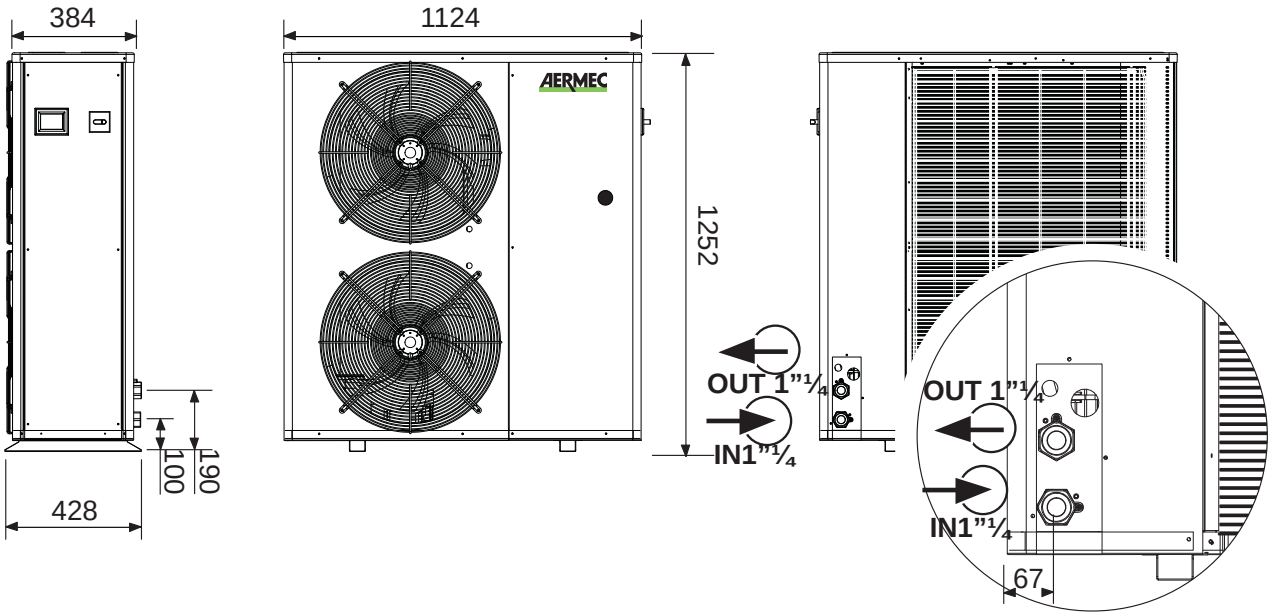



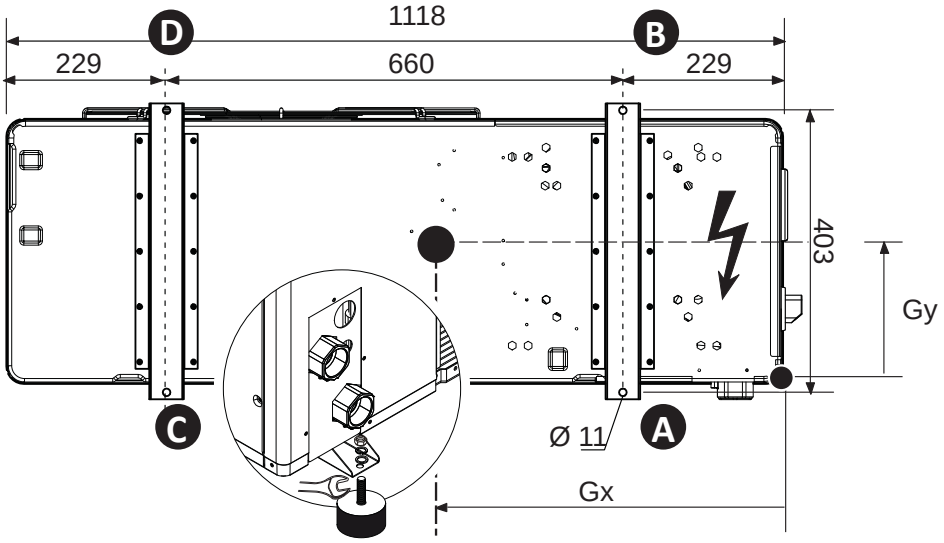

| Mod. | A | B | C | D |
|---|---|---|---|---|
| VT9 | 40 | 30 | 23 | M8 |

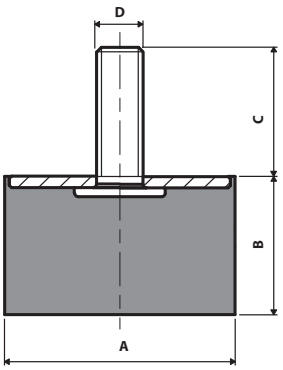
### 22.3. ANL 050 ÷ 090 version °|P|H|HP



| ANL | MOD. | VERS. | WEIGHT | CENTER OF GRAVITY | | A | B | C | D | KIT VT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Gy | Gx | % | % | % | % | |
| 50 | °/H | ° | 120 | 213 | 447 | 30,3% | 29,8% | 20,1% | 19,8% | 9 |
| 50 | °/H | P | 127 | 212 | 436 | 31,0% | 30,1% | 19,8% | 19,2% | 9 |
| 70 | °/H | ° | 120 | 213 | 447 | 30,3% | 29,8% | 20,1% | 19,8% | 9 |
| 70 | °/H | P | 127 | 212 | 436 | 31,0% | 30,1% | 19,8% | 19,2% | 9 |
| 80 | °/H | ° | 156 | 217 | 453 | 30,3% | 29,8% | 20,1% | 19,8% | 9 |
| 80 | °/H | P | 163 | 216 | 444 | 31,0% | 30,1% | 19,8% | 19,2% | 9 |
| 90 | °/H | ° | 156 | 217 | 453 | 29,5% | 30,1% | 20,0% | 20,4% | 9 |
| 90 | °/H | P | 163 | 216 | 444 | 30,0% | 30,3% | 19,8% | 19,9% | 9 |

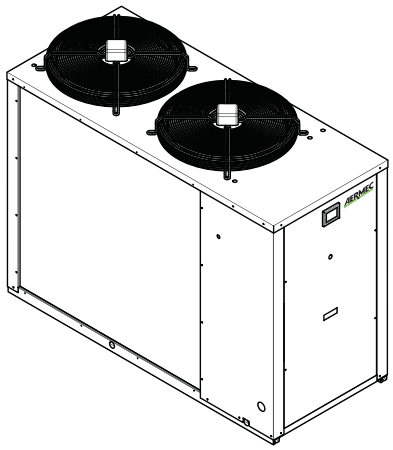


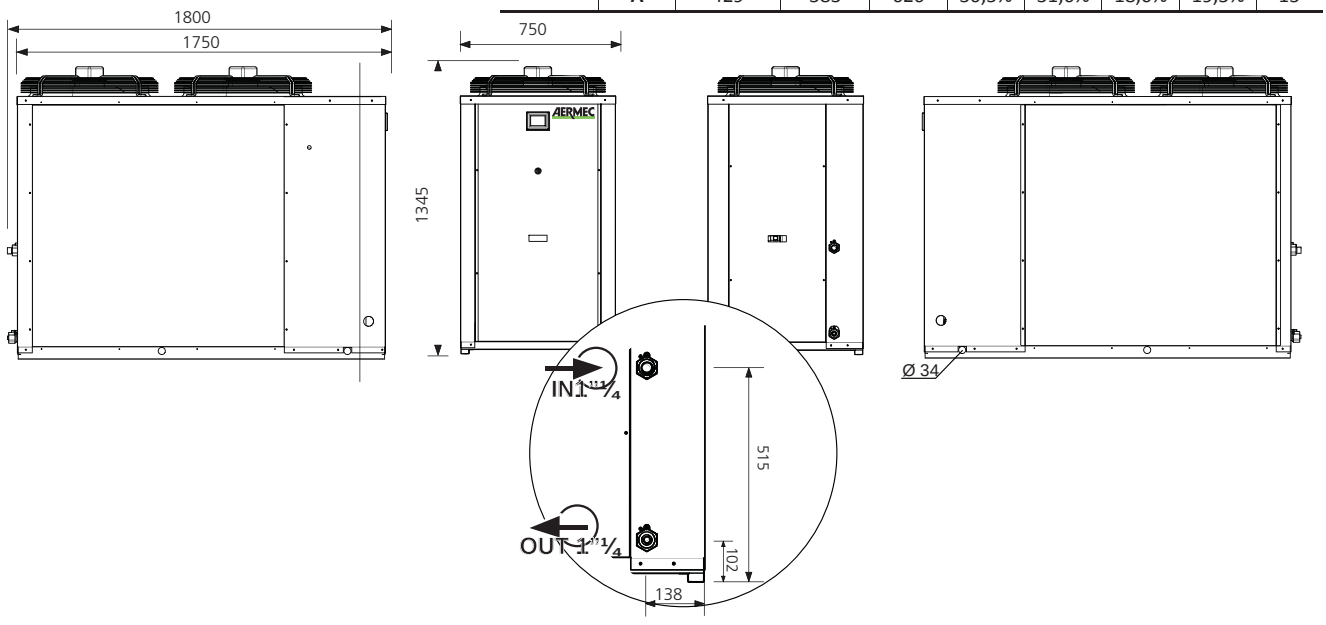



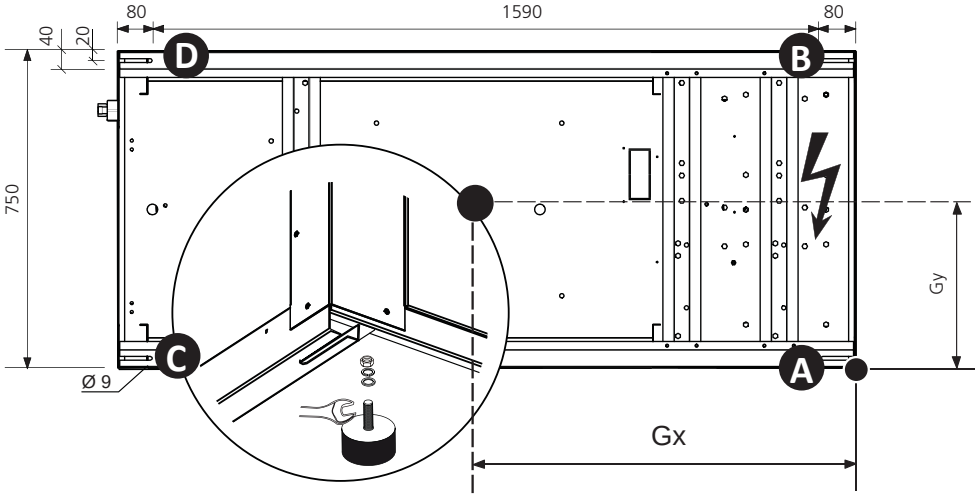

| Mod. | A | B | C | D |
|---|---|---|---|---|
| VT9 | 40 | 30 | 23 | M8 |

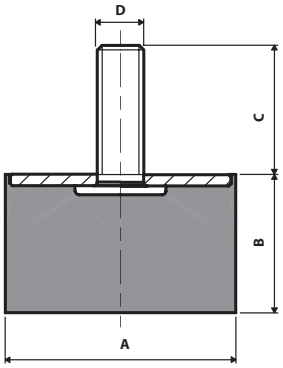
### 22.4. ANL 100 ÷ 200 versione °|P|A|N|Q / H|HP|HA|HN|HQ



| ANL | VERS. | WEIGHT | CENTER OF GRAVITY | | A | B | C | D | KIT VT |
|---|---|---|---|---|---|---|---|---|---|
| | | | Gy | Gx | % | % | % | % | |
| ANL100 | ° | 270 | 381 | 620 | 31,7% | 32,8% | 17,4% | 18,0% | 15 |
| | P | 288 | 382 | 659 | 30,6% | 31,7% | 18,5% | 19,1% | 15 |
| | A | 338 | 382 | 659 | 29,5% | 30,4% | 19,8% | 20,4% | 15 |
| ANL100H | ° | 295 | 381 | 604 | 32,2% | 33,3% | 17,0% | 17,5% | 15 |
| | P | 313 | 381 | 640 | 31,2% | 32,2% | 18,0% | 18,6% | 15 |
| | A | 363 | 381 | 640 | 30,1% | 30,9% | 19,2% | 19,8% | 15 |
| ANL150 | ° | 293 | 383 | 650 | 30,8% | 32,1% | 18,2% | 18,9% | 15 |
| | P | 314 | 383 | 693 | 29,6% | 30,8% | 19,4% | 20,2% | 15 |
| | A | 364 | 383 | 693 | 28,7% | 29,7% | 20,4% | 21,2% | 15 |
| ANL150H | ° | 322 | 382 | 630 | 31,4% | 32,6% | 17,7% | 18,3% | 15 |
| | P | 343 | 382 | 671 | 30,3% | 31,4% | 18,8% | 19,5% | 15 |
| | A | 393 | 382 | 671 | 29,3% | 30,3% | 19,9% | 20,5% | 15 |
| ANL 200 | ° | 329 | 383 | 600 | 32,1% | 33,6% | 16,8% | 17,5% | 15 |
| | P | 350 | 383 | 641 | 31,0% | 32,4% | 17,9% | 18,7% | 15 |
| | A | 400 | 383 | 641 | 30,0% | 31,2% | 19,1% | 19,8% | 15 |
| ANL 200H | ° | 358 | 383 | 586 | 32,6% | 33,9% | 16,4% | 17,1% | 15 |
| | P | 379 | 383 | 626 | 31,5% | 32,8% | 17,5% | 18,2% | 15 |
| | A | 429 | 383 | 626 | 30,5% | 31,6% | 18,6% | 19,3% | 15 |

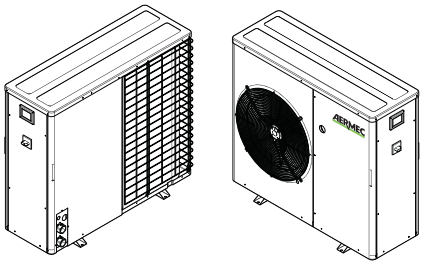


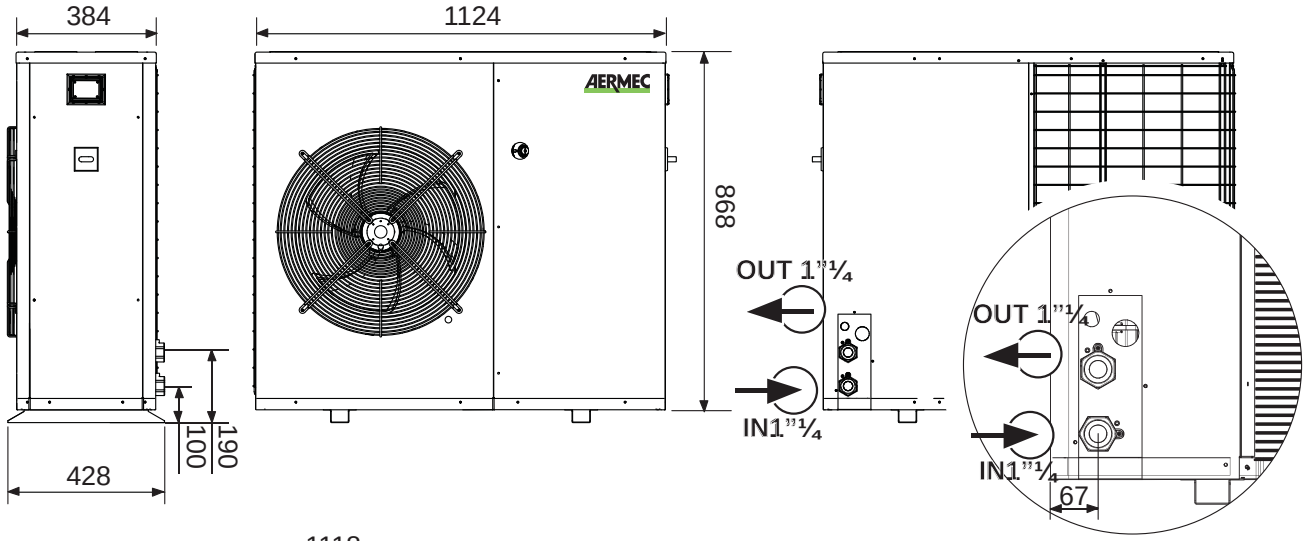



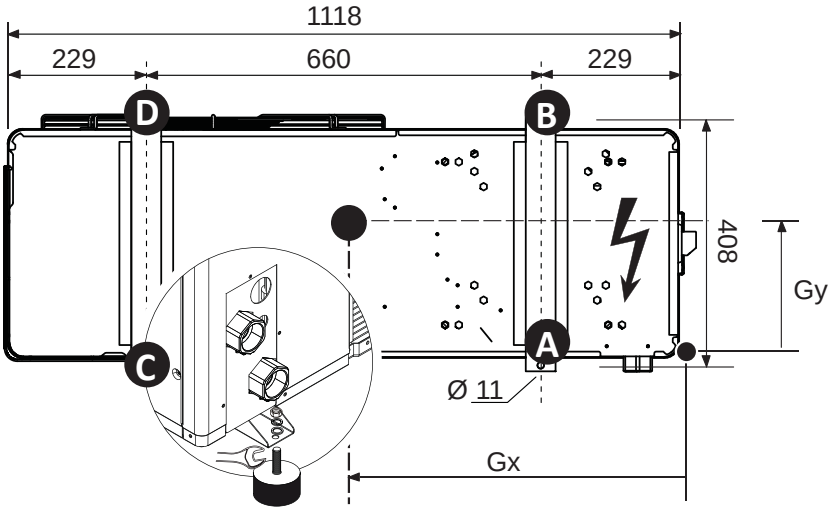

| Mod. | A | B | C | D |
|---|---|---|---|---|
| VT15 | 50 | 30 | 28,5 | M10 |

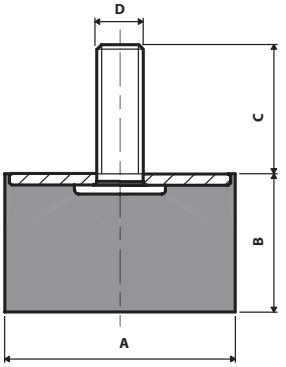
## 22.5. ANL 020 ÷ 025 version °A|HA



| ANL | MOD. | VERS. | WEIGHT | CENTER OF GRAVITY | | A | B | C | D | KIT VT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Gy | Gx | % | % | % | % | |
| 020 | °/H | A | 99 | 177 | 326 | 35,6% | 31,5% | 17,4% | 15,5% | 9 |
| 025 | °/H | A | 77 | 177 | 326 | 31,6% | 32,2% | 17,9% | 18,3% | 9 |

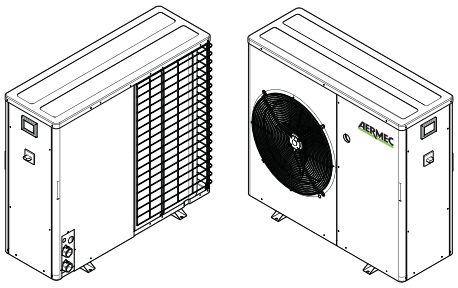


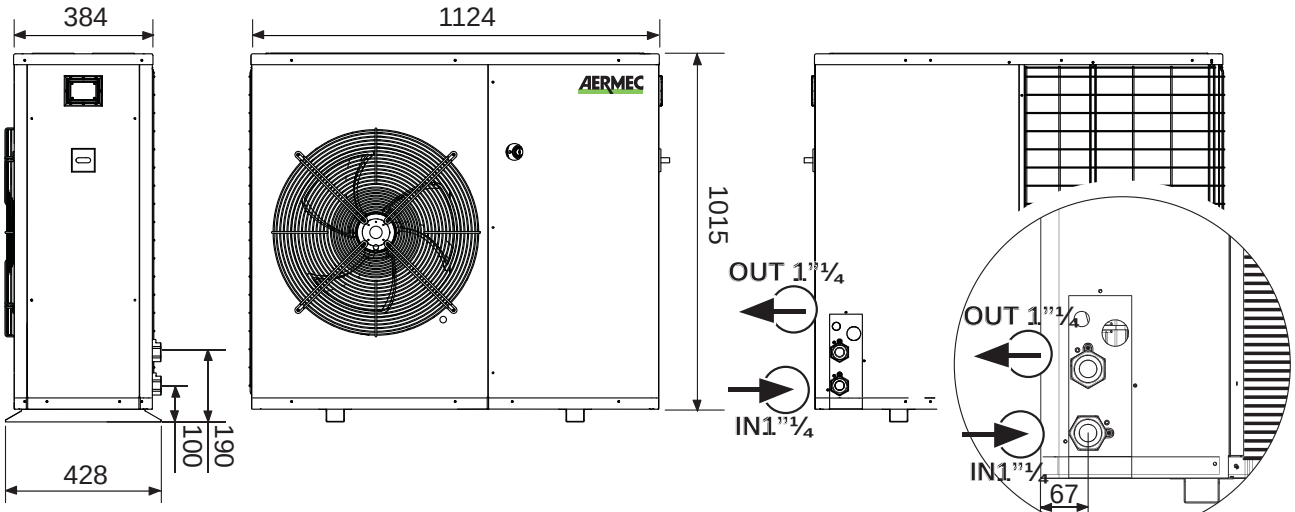



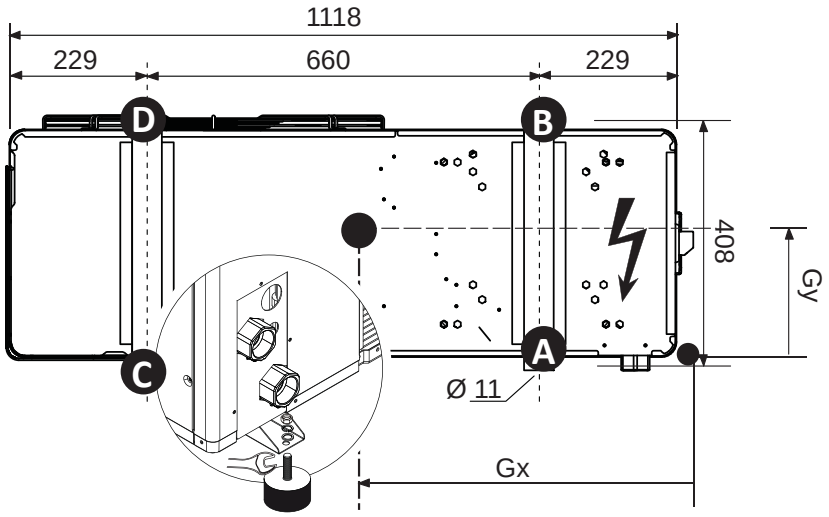

| Mod. | A | B | C | D |
|---|---|---|---|---|
| VT9 | 40 | 30 | 23 | M8 |

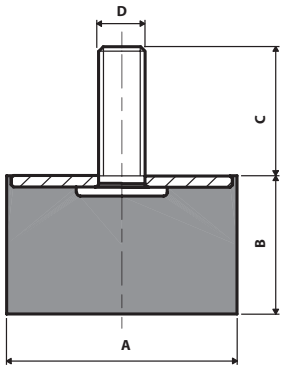
**22.6. ANL 030 ÷ 040 version °A|HA**



| ANL | MOD. | VERS. | WEIGHT | CENTER OF GRAVITY | | A | B | C | D | KIT VT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Gy | Gx | % | % | % | % | |
| 030 | °/H | A | 103 | 180 | 327 | 39% | 32% | 16% | 13% | 9 |
| 040 | °/H | A | 103 | 180 | 327 | 39% | 32% | 16% | 13% | 9 |

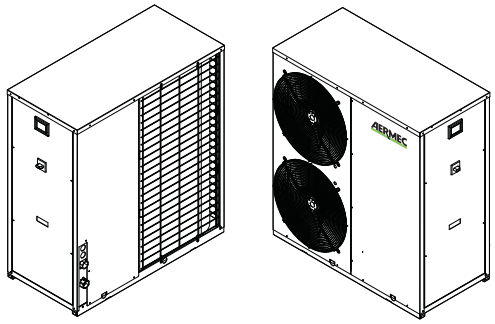


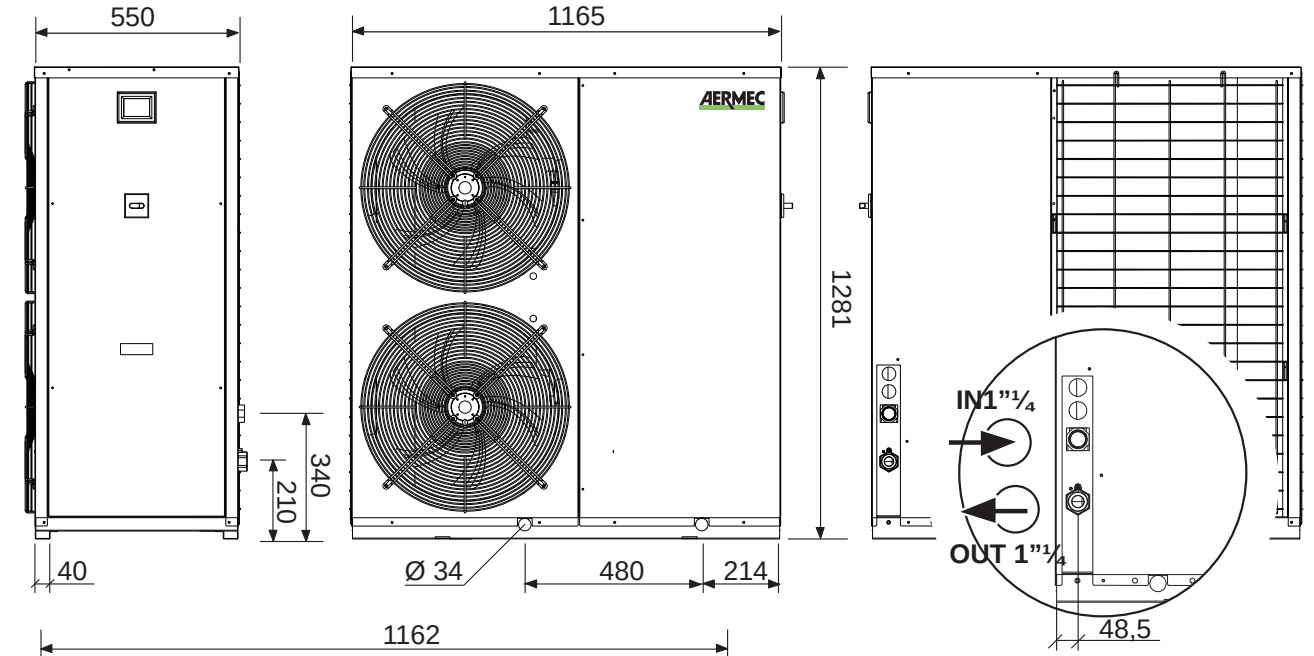



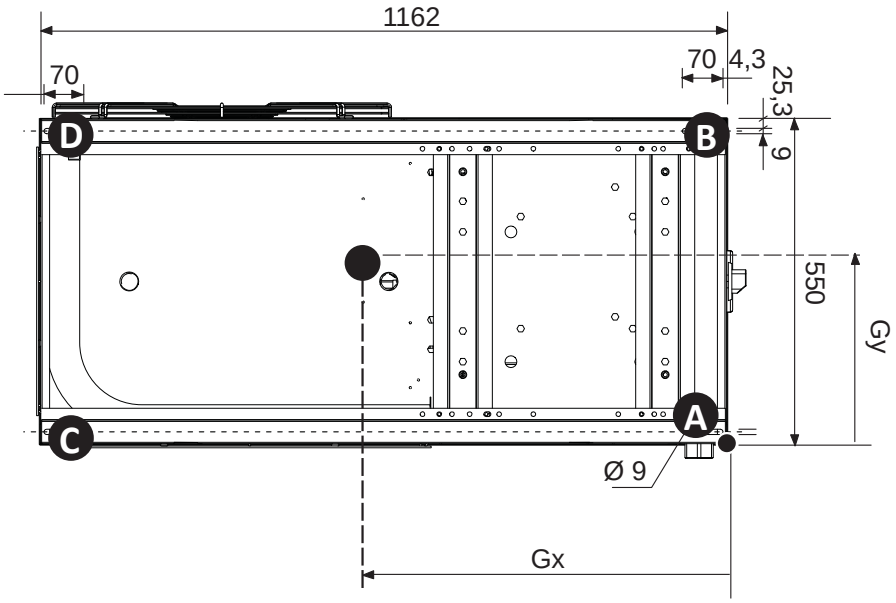

| Mod. | A | B | C | D |
|---|---|---|---|---|
| VT9 | 40 | 30 | 23 | M8 |

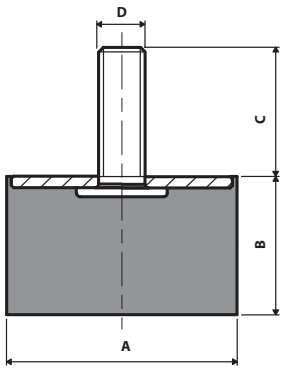
## 22.7. ANL 050 ÷ 090 version °A|°Q |HA |HQ



| ANL | MOD. | VERS. | WEIGHT | CENTER OF GRAVITY | | A | B | C | D | KIT VT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Gy | Gx | % | % | % | % | |
| 50 | °/H | A | 147 | 212 | 436 | 32,2% | 31,3% | 18,5% | 18,0% | 15 |
| 70 | °/H | A | 147 | 212 | 436 | 32,2% | 31,3% | 18,5% | 18,0% | 15 |
| 80 | °/H | A | 147 | 212 | 436 | 32,2% | 31,3% | 18,5% | 18,0% | 15 |
| 90 | °/H | A | 183 | 216 | 444 | 31,1% | 31,3% | 18,8% | 18,9% | 15 |

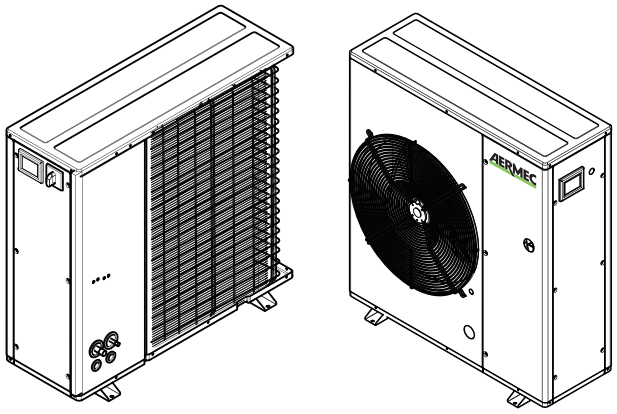


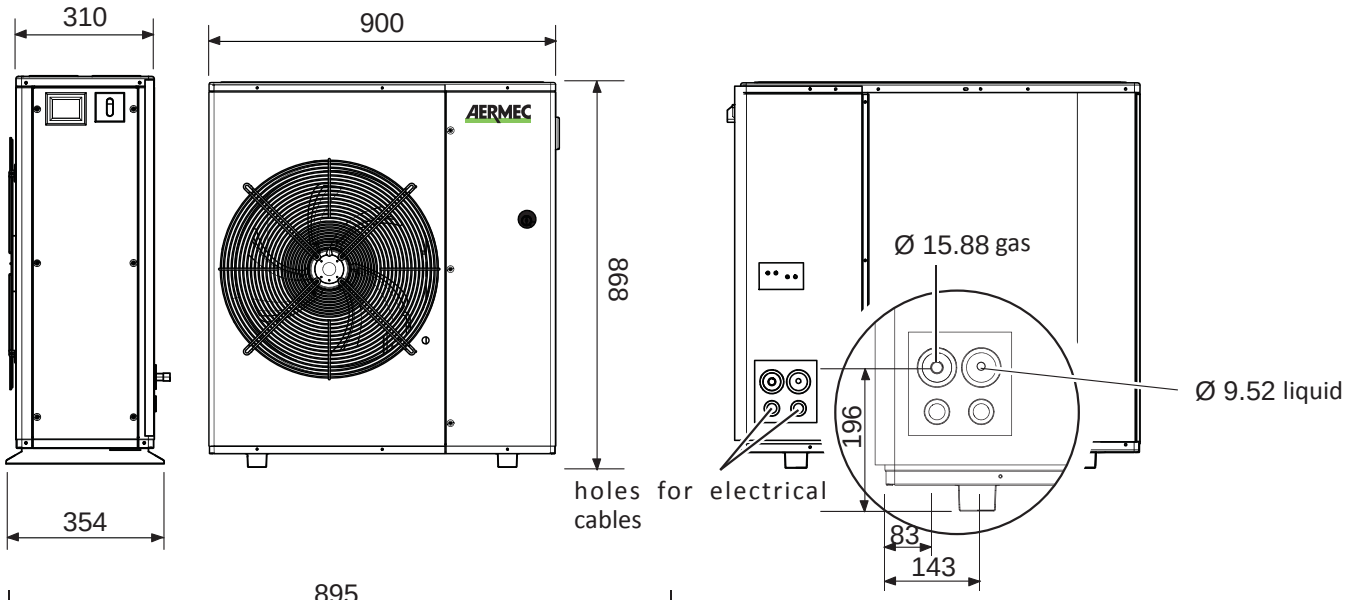



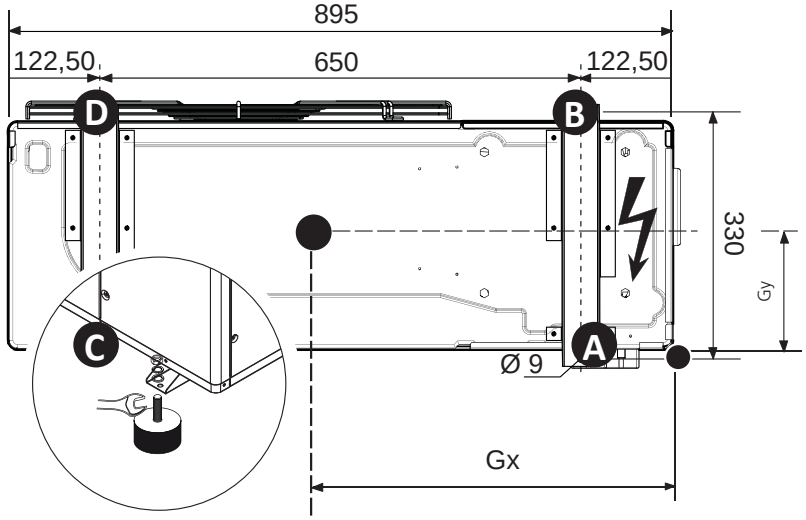

| Mod. | A | B | C | D |
|---|---|---|---|---|
| VT15 | 50 | 30 | 28,5 | M10 |

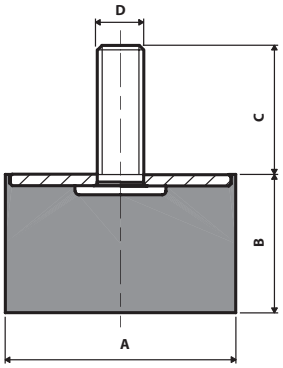
## 22.8. ANL 020 ÷ 025 version C



**ATTENTION**
For the distribution of the weights, refer to verision "° | H"

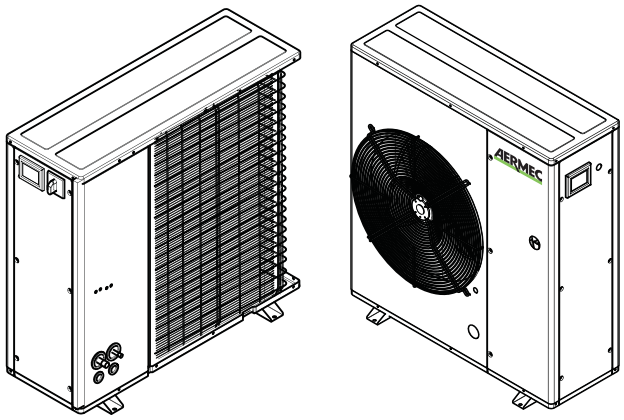


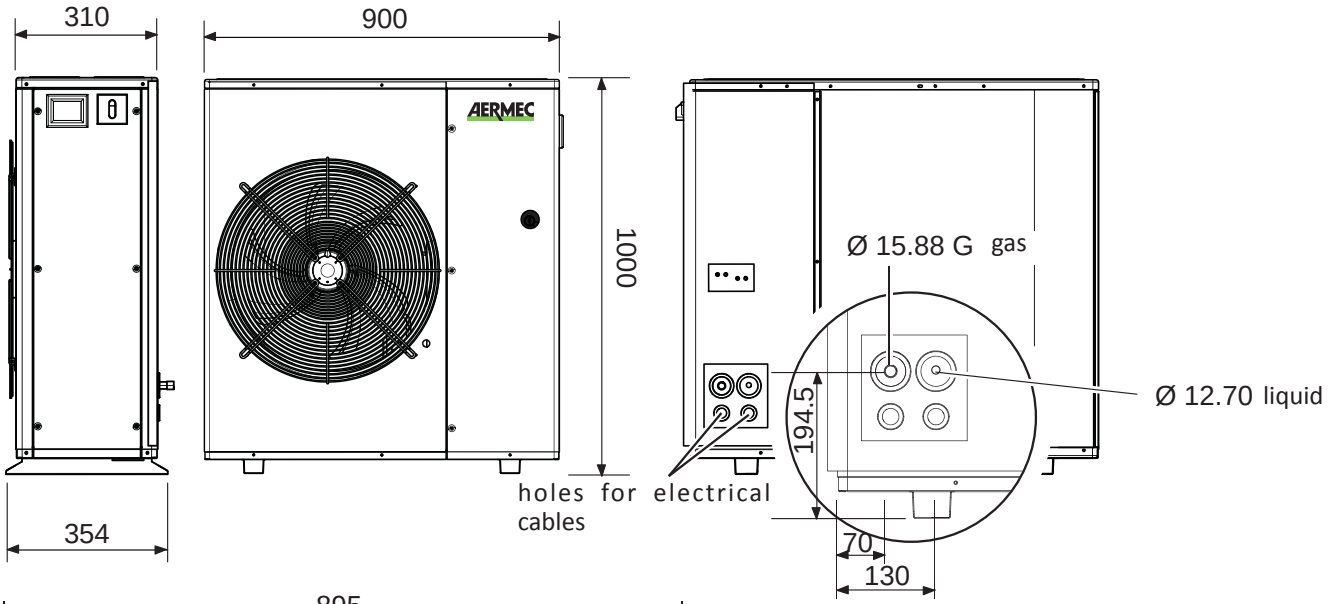



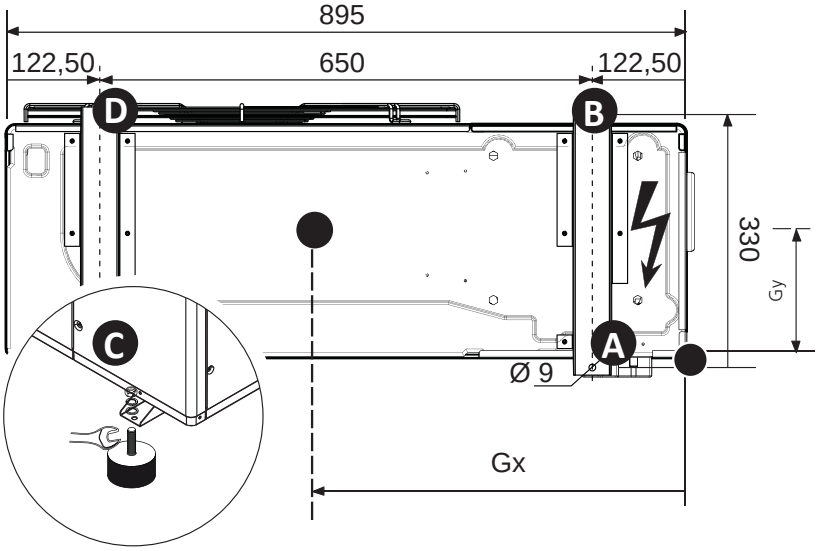

| Mod. | A | B | C | D |
|---|---|---|---|---|
| VT9 | 40 | 30 | 23 | M8 |

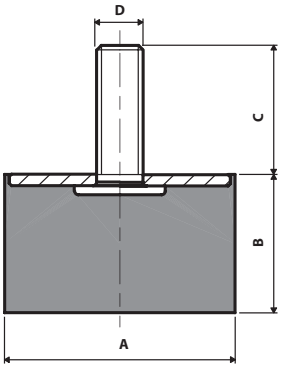
**22.9. ANL 040 ÷ 050 version C**



**ATTENTION**
For the distribution of the weights, refer to verision "° | H"

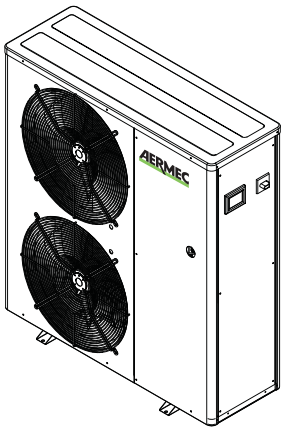


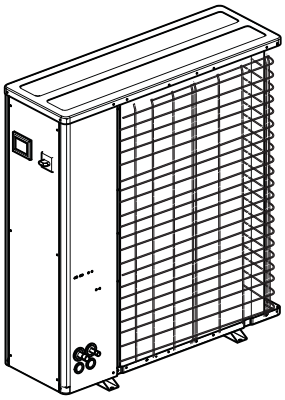



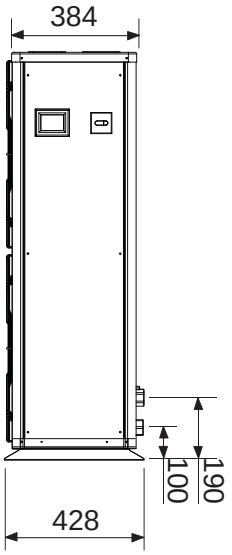

| Mod. | A | B | C | D |
|---|---|---|---|---|
| VT9 | 40 | 30 | 23 | M8 |

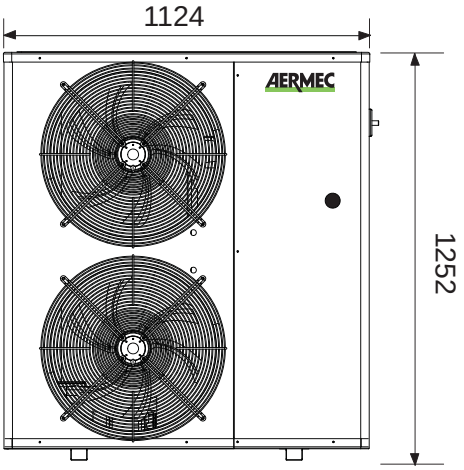
**22.10. ANL 070 ÷ 090 version C**

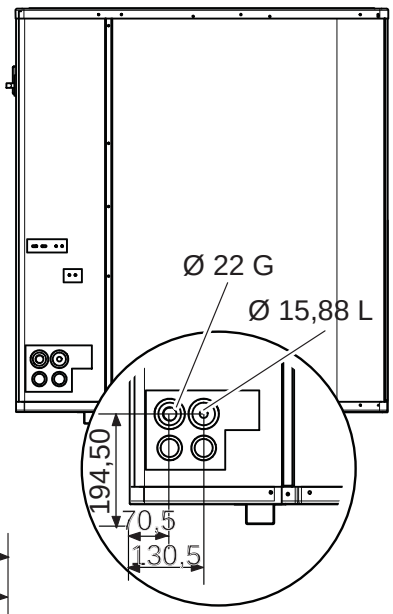


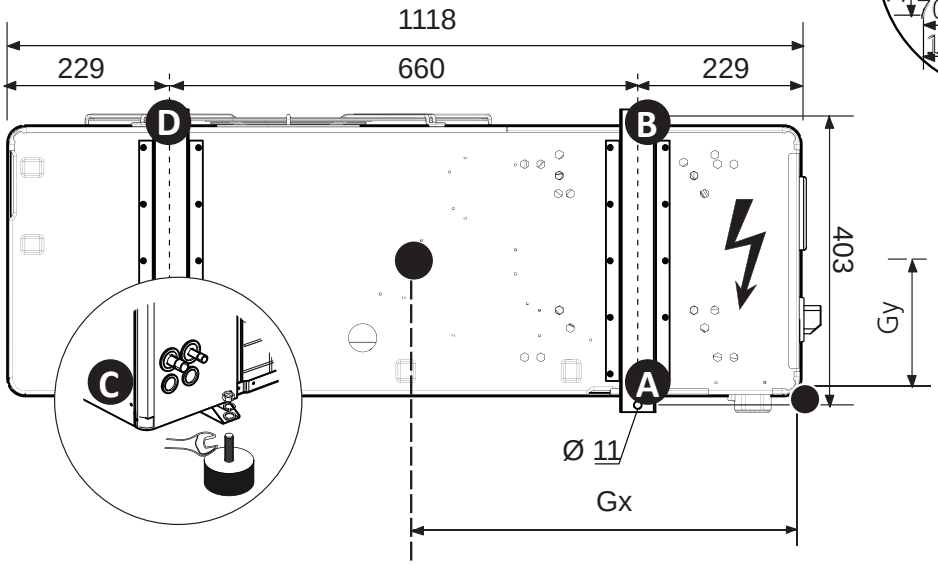


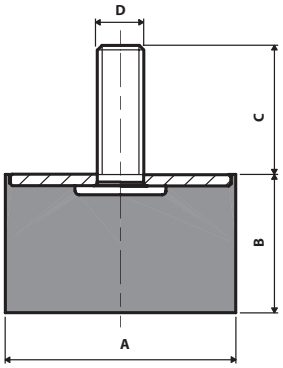
**ATTENTION**
For the distribution of the weights, refer to verision "° | H"



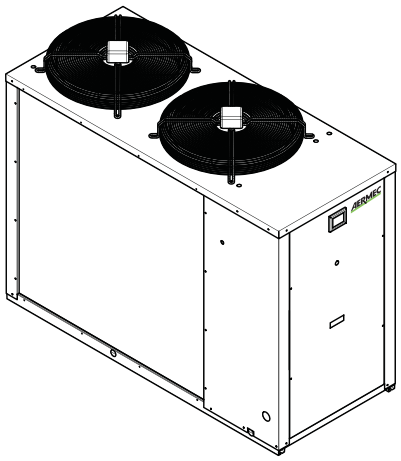



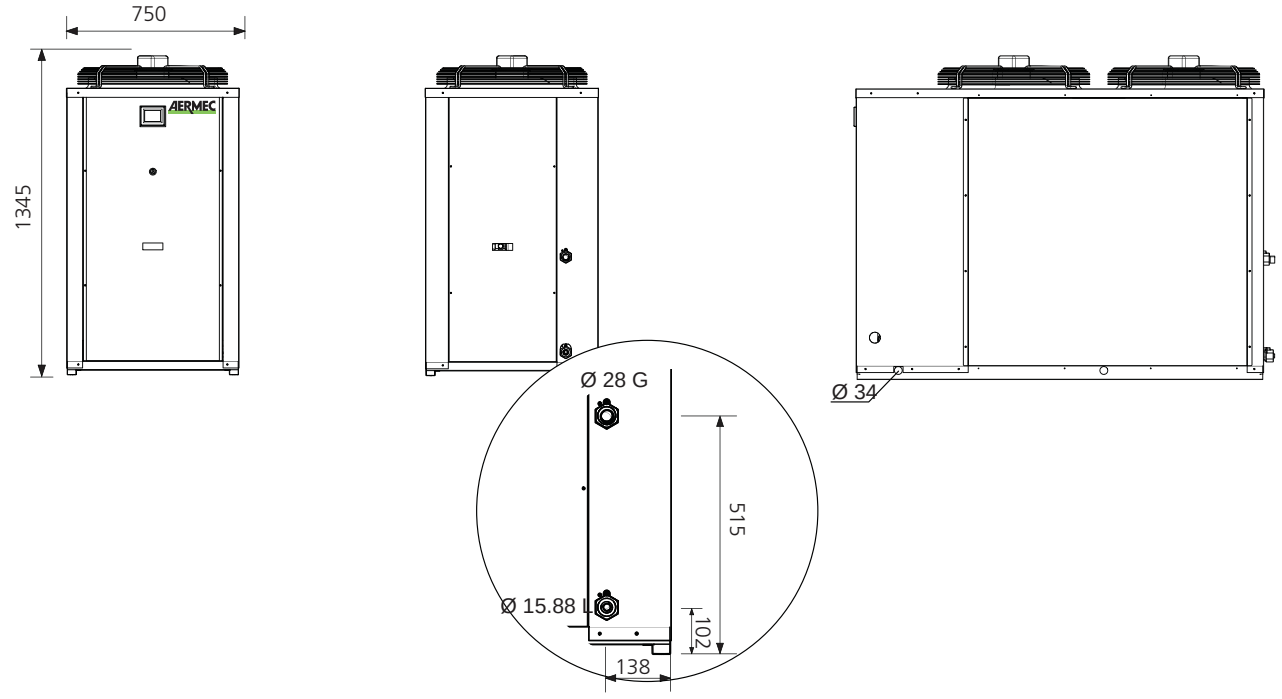



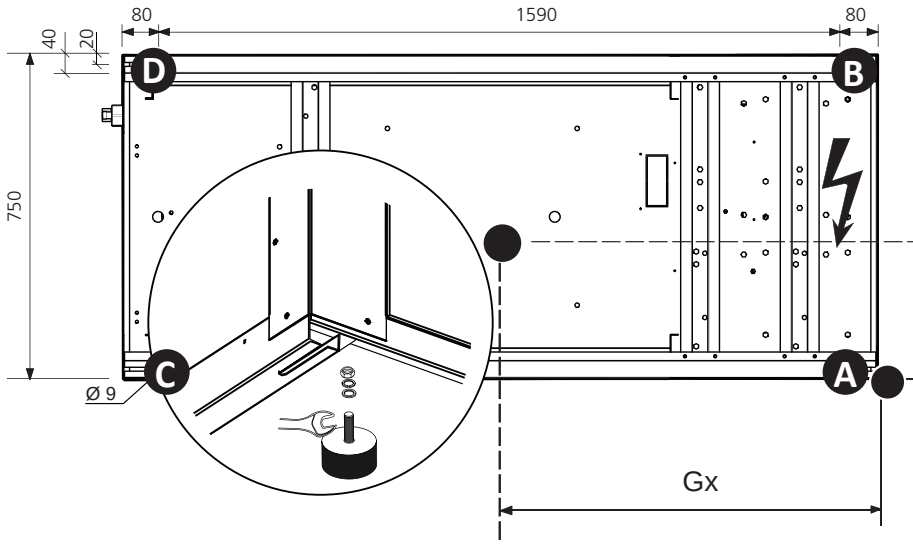

| Mod. | A | B | C | D |
|---|---|---|---|---|
| VT9 | 40 | 30 | 23 | M8 |

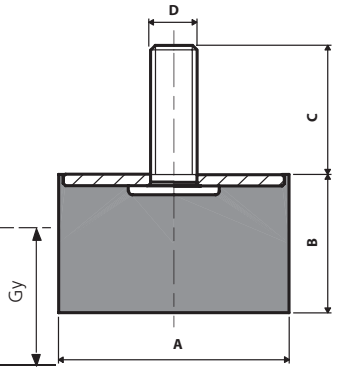
**22.11. ANL 100 ÷ 200 version C**



**ATTENTION**
For the distribution of the weights, refer to verision "° | H"

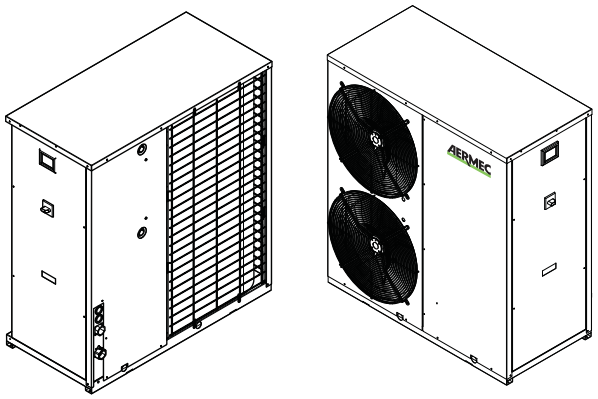


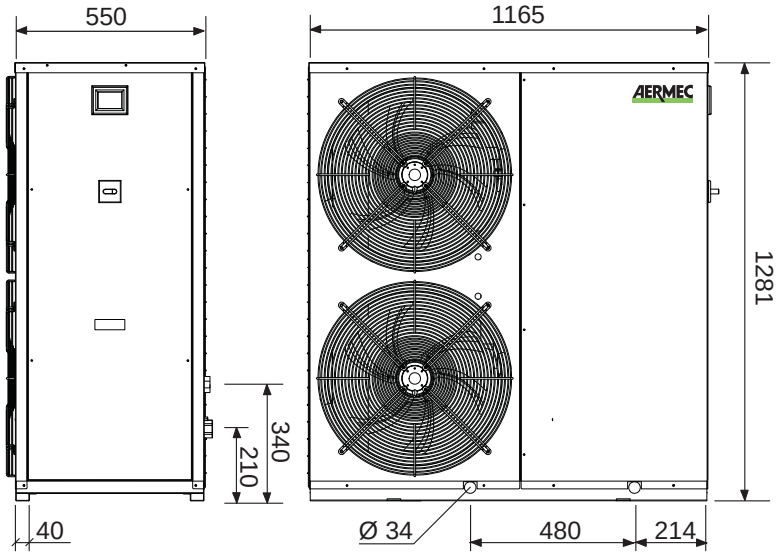



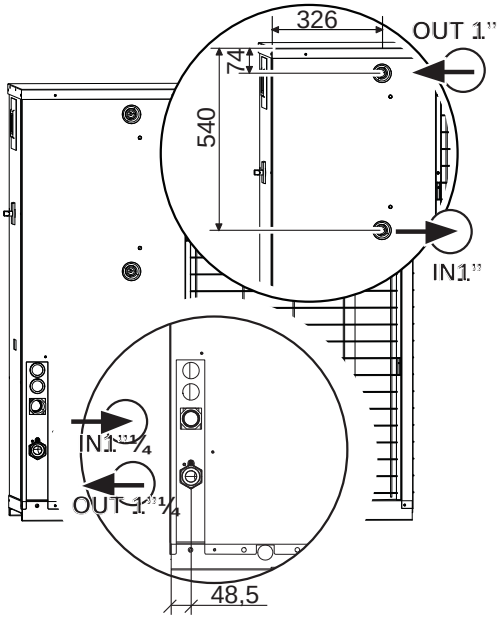



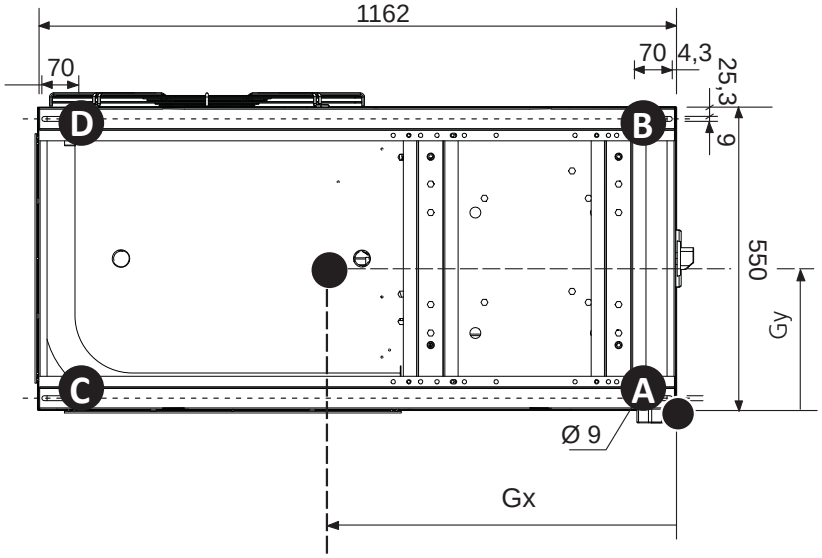

| Mod. | A | B | C | D |
|---|---|---|---|---|
| VT15 | 50 | 30 | 28,5 | M10 |

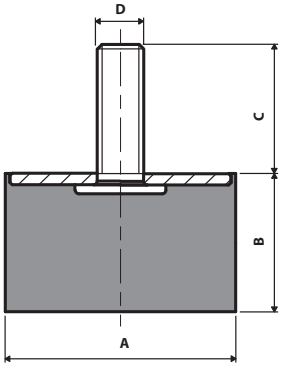
**22.12. ANL 050 ÷ 090 version D|DA / HD|HDA**





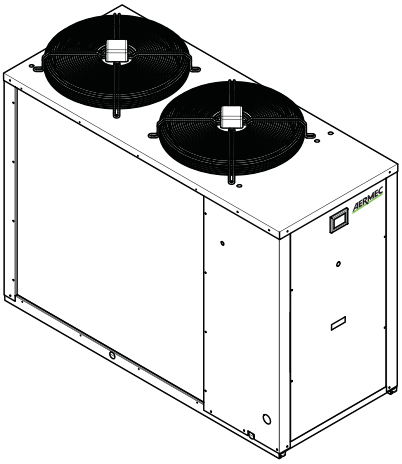



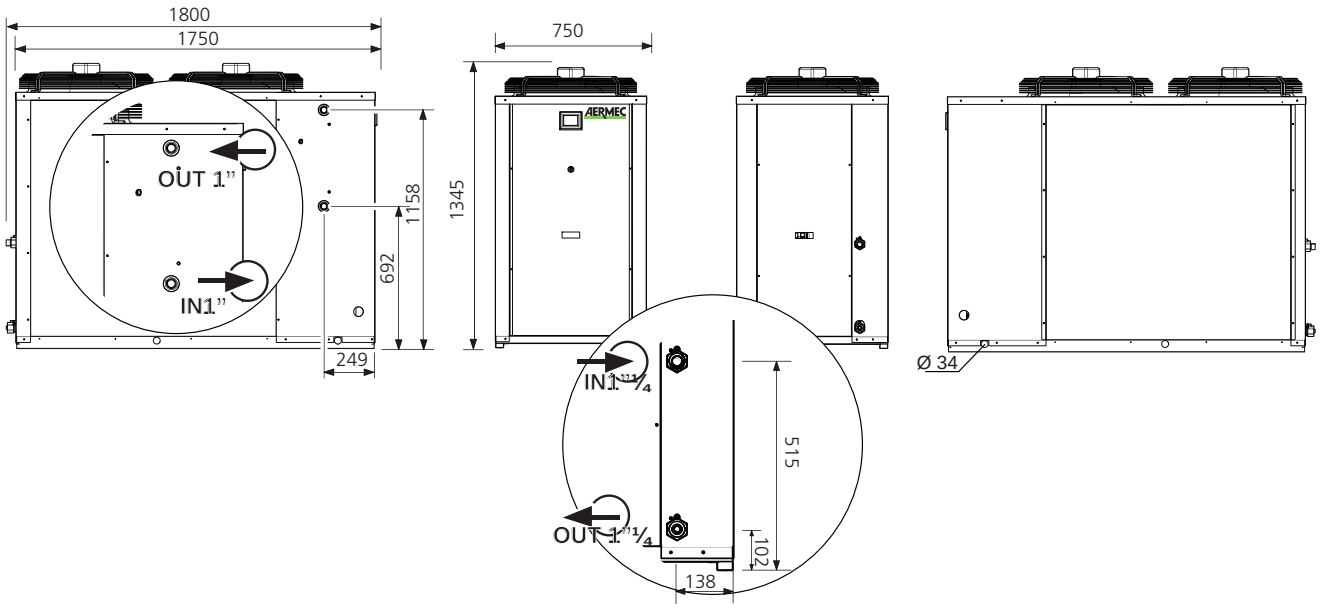



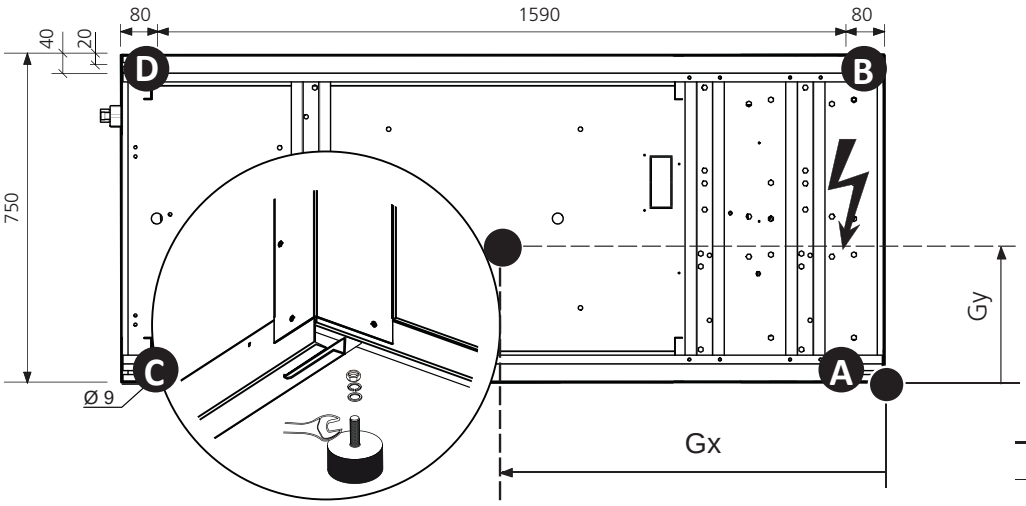



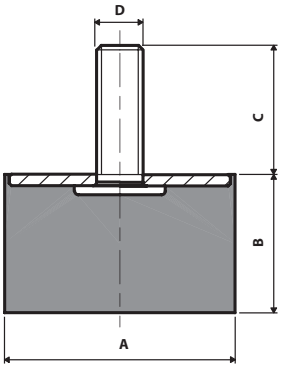

| Mod. | | A | B | C | D |
|---|---|---|---|---|---|
| VT9 | D\|HD | 40 | 30 | 23 | M8 |
| VT15 | DA\|HDA | 50 | 30 | 28,5 | M10 |

**22.13. ANL 100 ÷ 200 version D|DA / HD|HDA**





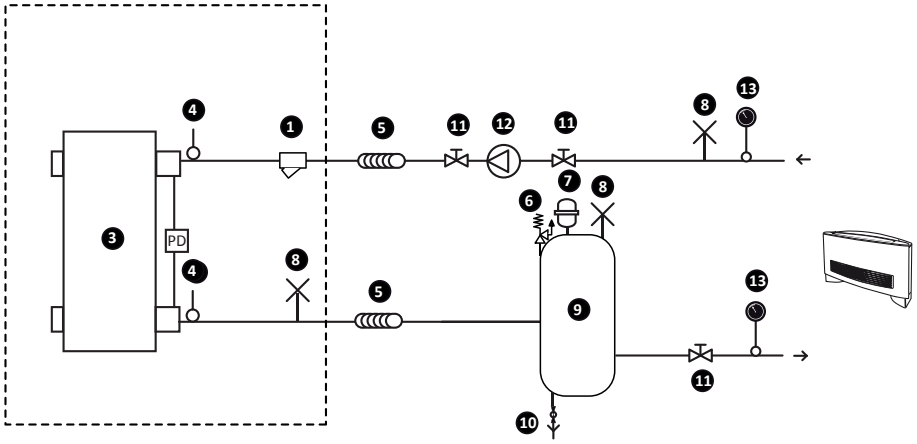

| Mod. | A | B | C | D |
|---|---|---|---|---|
| VT15 | 50 | 30 | 28,5 | M10 |

## 23. HYDRAULIC CIRCUITS OF PRINCIPLE

### 23.1. HYDRAULIC CIRCUIT FOR INTERNAL AND EXTERNAL ANL "°" | "H" (standard)

**HYDRAULIC COMPONENTS ANL**

**HYDRAULIC COMPONENTS SUGGESTED EXTERNAL UNIT**




**ATTENTION**
The choice and the installation of components external to the ANL °|H èup to the installer, who must operate according to the rules of good technical design and in compliance with the regulations in force in the country of destination.

**ATTENTION**
The hydraulic pipes connecting to the machine must be properly sized to the actual flow of water required by the system in operation. The water flow to the exchanger must always be constant.

**ATTENTION**
Carefully wash the plant, before connecting the unit. This allows cleaning to remove any residue such as weld spatter, slag, rust or other impurities from the pipes. These substances may otherwise accumulate in and cause a machine malfunction. The connecting pipes should be supported so as not to weigh, with their weight on the unit

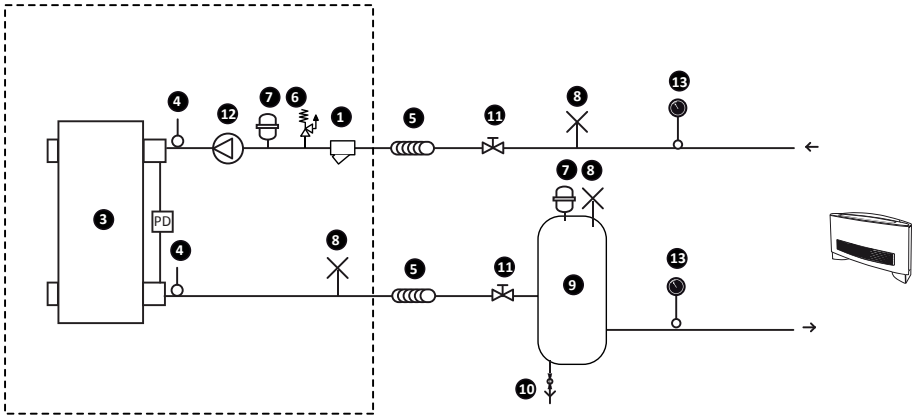
| | COMPONENTS SUPPLIED AS STANDARDS |
|---|---|
| **1** | Water filter |
| **2** | Pressure switch |
| **3** | Plate exchanger |
| **4** | Porbe water temperature (IN/OUT) |
| **8** | Air Vent |

| | NOT SUGGESTED COMPONENTS PROVIDED TO LOAD INSTALLER |
|---|---|
| **5** | anti vibration joints |
| **6** | Safety valve |
| **7** | Expansion tank |
| **9** | Storage tank |
| **10** | Drain cock |
| **11** | Ball Stop |
| **12** | Pump |
| **13** | Manometer |

## 23.2. HYDRAULIC CIRCUIT FOR INTERNAL AND EXTERNAL ANL "°P|°N" / "HP|HN"

**HYDRAULIC COMPONENTS ANL**

**HYDRAULIC COMPONENTS SUGGESTED EXTERNAL UNIT**




| | COMPONENTS SUPPLIED AS STANDARDS |
|---|---|
| **1** | Water filter |
| **2** | Pressure switch |
| **3** | Plate exchanger |
| **4** | Porbe water temperature (IN/OUT) |
| **6** | Safety valve |
| **7** | Expansion tank |
| **8** | Air Vent |
| **12** | Pump |

| | NOT SUGGESTED COMPONENTS PROVIDED TO LOAD INSTALLER |
|---|---|
| **5** | anti vibration joints |
| **7** | Expansion tank (if necessary) |
| **9** | Storage tank |
| **10** | Drain cock |
| **11** | Ball Stop |
| **13** | Manometer |

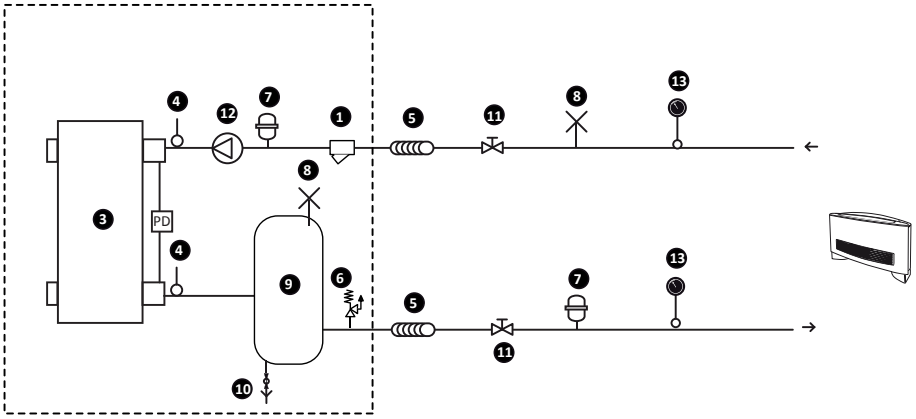
**ATTENTION**
The choice and the installation of components external to the ANL°P|N /ANLHP|HN up to the installer, who must operate according to the rules of good technical design and in compliance with the regulations in force in the country of destination.

**ATTENTION**
The hydraulic pipes connecting to the machine must be properly sized to the actual flow of water required by the system in operation. The water flow to the exchanger must always be constant.

**ATTENTION**
Carefully wash the plant, before connecting the unit. This allows cleaning to remove any residue such as weld spatter, slag, rust or other impurities from the pipes. These substances may otherwise accumulate in and cause a machine malfunction. The connecting pipes should be supported so as not to weigh, with their weight on the unit

## 23.3. HYDRAULIC CIRCUIT FOR INTERNAL AND EXTERNAL ANL "°A|°Q" / "HA|HQ"

**HYDRAULIC COMPONENTS ANL** | **HYDRAULIC COMPONENTS SUGGESTED EXTERNAL UNIT**




| | COMPONENTS SUPPLIED AS STANDARDS |
|---|---|
| **1** | Water filter |
| **2** | Pressure switch / Flow switch dor **(ANL°A\|HA 020...040)** |
| **3** | Scambiatore a piastre |
| **4** | Porbe water temperature (IN/OUT) |
| **6** | Safety valve |
| **7** | Expansion tank |
| **8** | Air Vent |
| **9** | Storage tank |
| **12** | Pump |

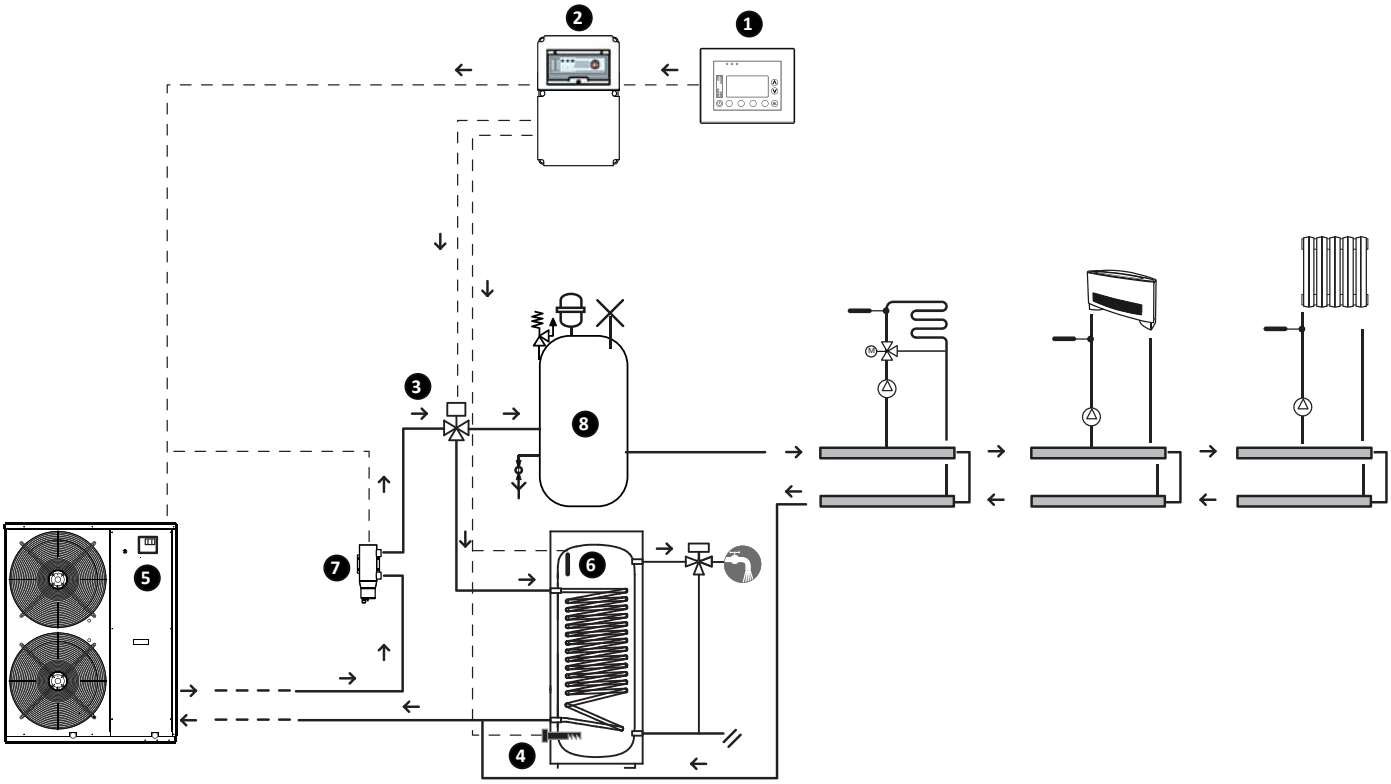
| | NOT SUGGESTED COMPONENTS PROVIDED TO LOAD INSTALLER |
|---|---|
| **5** | anti vibration joints |
| **7** | Expansion tank (if necessary) |
| **10** | Drain cock |
| **11** | Ball Stop |
| **13** | Manometer |

**ATTENTION**
The choice and the installation of components external to the ANL°A|Q /ANLHA|HQ up to the installer, who must operate according to the rules of good technical design and in compliance with the regulations in force in the country of destination.

**ATTENTION**
The hydraulic pipes connecting to the machine must be properly sized to the actual flow of water required by the system in operation. The water flow to the exchanger must always be constant.

**ATTENTION**
Carefully wash the plant, before connecting the unit. This allows cleaning to remove any residue such as weld spatter, slag, rust or other impurities from the pipes. These substances may otherwise accumulate in and cause a machine malfunction. The connecting pipes should be supported so as not to weigh, with their weight on the unit

## 23.4. EXAMPLE PLANT FOR THE PRODUCTION OF DHW ANL50H ° WITH ACCESSORY VMF-ACS




| | ANL050H° |
|---|---|
| | **VMF SYSTEM FOR THE PRODUCTION AND MANAGEMENT ACS (ACCESSORIES) [9]** |
| **1** | E5 (White or black) |
| **2** | VMF-ACS3KTN \| 6KTN \|8KTN<br>management of:<br>- Three-way valve<br>- Probe DHW Storage tank<br>- Electrical heater DHW Storage tank (cycle for integrate and legionella) |
| **3** | Three-way valve (not supplied) |
| **4** | Electrical heater DHW Storage tank (not supplied) (cycle for integrate and legionella) |
| **5** | RS-485 interface **(ACCESSORIES MODU-485A) [10]** |
| **6** | DHW Storage tank (not supplied) |
| **7** | Electrical heater **(ACCESSORIES BSKW)** |
| **8** | Storage tank (not supplied) |

**9** For more information, refer to the documentation for the system VMF available at: www . aermec . com

**10** The accessory is required because the chiller system communicates with the VMF

## 24. ELECTRIC CONNECTIONS

The ANL|ANLH chillers are completely wired at the factory and only require connection to the electrical mains, downstream from a unit switch, according to that envisioned by the Standards in force on this subject in the country of installation.
It s also advised to check that:

1. the electrical mains features are suitable for the absorption values indicated in the electrical data table, also taking into consideration any other machines operating at the same time.
2. The unit is only powered when installation has been completed (hydraulic and electric).
3. Respect the connection indications of the phase, neutral and earth wires.
4. The power supply line must have a relevant protection mounted upstream against short circuits and dispersions to earth, which isolates the system with respect to other utilities.
5. The voltage must be within a tolerance of ±10% of the nominal power supply voltage of the machine (for unbalanced three-phase unit max 3% between the phases). Whenever these parameters are not respected, contact the electric energy public body.
6. For electric connections, use the cables with double isolation according to the Standards in force on this subject in the different countries.

**IT IS REQUIRED**

1. The use of an omnipolar magnet circuit breaker switch is mandatory, in compliance with the IEC-EN Standards (contact opening at least 3 mm), with suitable cut-off power and differential protection on the basis of the electric data table shown below, installed as near as possible to the appliance.
2. to make an effective earth connection. The manufacturer cannot be considered responsible for any damage caused by the lack of or ineffective appliance earth connection.
3. For units with three-phase power supply, check the correct connection of the phases.

The cable sections stated in the table are recommended for a maximum length of 50 m and placed in a cable trough.
For longer lengths or different cable laying, it is up to the PLANNER to calculate the appropriate length of the cables as well as the connection to the earth wire and linking to connected cables:

- the length
- the type of cable
- the absorption of the unit and the physical location, and the ambient temperature.

All the electrical operations must be carried out by STAFF IN POSSESSION OF THE NECESSARY QUALIFICATIONS BY LAW suitably trained and informed on the risks related to these operations

The characteristics of the electrical lines and of the related components must be determined by STAFF QUALIFIED TO DESIGN ELECTRICAL SYSTEMS, in compliance with the international and national regulations of the place of installation of the unit and in compliance with the regulations in force at the moment of installation

For the installation requirements refer only to the electrical diagram supplied with the appliance. The electrical diagram along with the manuals must be kept in good condition and ALWAYS AVAILABLE FOR ANY FUTURE SERVICING ON THE UNIT.

IT IS mandatory to verify that the machine is watertight before making the electrical connections and it must only be powered up after the hydraulic and electrical works have been completed.

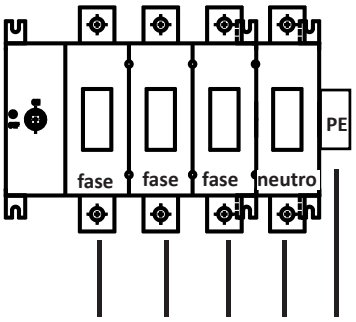
**ATTENTION**
**It is prohibited to use the water pipes to earth the appliance**

**ATTENTION**
Check the tightening of all power wire clamps on commissioning and after 30 days from start-up. Subsequently, check the tightening of all the power clamps every six months. Loose terminals can cause overheating of the cables and components.

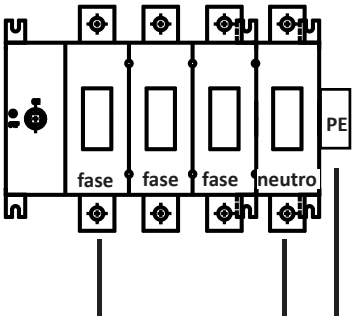
## 25. ELECTRICAL DATA

| ANL° \| H | Power supply | Version | Compressor [n°] | Fans [n°] | TOTAL ABSORPTION | | SUGGESTED CABLE SECTION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | L.R.A. | F.L.A. | SEZ. A | | | | SEZ. B | EARTH | IL |
| | | | | | [A] | [A] | Phase [n°] | cavi per singola fase [n°] | Cable section [mm²] | Total cabels [n°] | [mm²] | [mm²] | [A] |
| 020 | 230V/1/50Hz | ° | 1 | 1 | 59,5 | 16,5 | 1 | 1 | 4 | 2 | 0,5 | 4 | 25 |
| | | P | 1 | 1 | 26,5 | 17,5 | 1 | 1 | 4 | 2 | 0,5 | 4 | 25 |
| 025 | 230V/1/50Hz | ° | 1 | 1 | 62,5 | 16,5 | 1 | 1 | 4 | 2 | 0,5 | 4 | 25 |
| | | P | 1 | 1 | 63,5 | 17,5 | 1 | 1 | 4 | 2 | 0,5 | 4 | 25 |
| 030 | 230V/1/50Hz | ° | 1 | 1 | 83,7 | 19,7 | 1 | 1 | 6 | 2 | 0,5 | 6 | 25 |
| | | P | 1 | 1 | 84,7 | 20,7 | 1 | 1 | 6 | 2 | 0,5 | 6 | 25 |
| 040 | 230V/1/50Hz | ° | 1 | 1 | 98,7 | 23,7 | 1 | 1 | 6 | 2 | 0,5 | 6 | 32 |
| | | P | 1 | 1 | 99,7 | 24,7 | 1 | 1 | 6 | 2 | 0,5 | 6 | 32 |
| 020 | 400V/3N/50Hz | ° | 1 | 1 | 26,5 | 6,0 | 3+N | 1 | 2,5 | 4 | 0,5 | 2,5 | 16 |
| | | P | 1 | 1 | 27,5 | 7,0 | 3+N | 1 | 2,5 | 4 | 0,5 | 2,5 | 16 |
| 025 | 400V/3N/50Hz | ° | 1 | 1 | 32,5 | 6,0 | 3+N | 1 | 2,5 | 4 | 0,5 | 2,5 | 16 |
| | | P | 1 | 1 | 33,5 | 7,0 | 3+N | 1 | 2,5 | 4 | 0,5 | 2,5 | 16 |
| 030 | 400V/3N/50Hz | ° | 1 | 1 | 35,7 | 6,7 | 3+N | 1 | 2,5 | 4 | 0,5 | 2,5 | 16 |
| | | P | 1 | 1 | 36,7 | 7,7 | 3+N | 1 | 2,5 | 4 | 0,5 | 2,5 | 16 |
| 040 | 400V/3N/50Hz | ° | 1 | 1 | 48,7 | 8,7 | 3+N | 1 | 2,5 | 4 | 0,5 | 2,5 | 16 |
| | | P | 1 | 1 | 49,7 | 9,7 | 3+N | 1 | 2,5 | 4 | 0,5 | 2,5 | 16 |
| 050 | 400V/3N/50Hz | ° | 1 | 2 | 65,3 | 11,3 | 3+N | 1 | 4 | 4 | 0,5 | 4 | 16 |
| | | P | 1 | 2 | 67,3 | 13,3 | 3+N | 1 | 4 | 4 | 0,5 | 4 | 16 |
| | | N\|Q | 1 | 2 | 68,0 | 14,0 | 3+N | 1 | 4 | 4 | 0,5 | 4 | 16 |
| 070 | 400V/3N/50Hz | ° | 1 | 2 | 75,3 | 13,5 | 3+N | 1 | 4 | 4 | 0,5 | 4 | 16 |
| | | P | 1 | 2 | 77,3 | 15,5 | 3+N | 1 | 4 | 4 | 0,5 | 4 | 16 |
| | | N\|Q | 1 | 2 | 78,0 | 16,2 | 3+N | 1 | 4 | 4 | 0,5 | 4 | 16 |
| 080 | 400V/3N/50Hz | ° | 1 | 2 | 102,3 | 16,3 | 3+N | 1 | 6 | 4 | 0,5 | 6 | 25 |
| | | P | 1 | 2 | 104,3 | 18,3 | 3+N | 1 | 6 | 4 | 0,5 | 6 | 25 |
| | | N\|Q | 1 | 2 | 105,0 | 19,0 | 3+N | 1 | 6 | 4 | 0,5 | 6 | 25 |
| 090 | 400V/3N/50Hz | ° | 1 | 2 | 96,3 | 17,3 | 3+N | 1 | 6 | 4 | 0,5 | 6 | 25 |
| | | P | 1 | 2 | 98,3 | 19,3 | 3+N | 1 | 6 | 4 | 0,5 | 6 | 25 |
| | | N\|Q | 1 | 2 | 99,0 | 20,0 | 3+N | 1 | 6 | 4 | 0,5 | 6 | 25 |
| 100 | 400V/3N/50Hz | ° | 2 | 2 | 76,0 | 22,0 | 3+N | 1 | 10 | 4 | 0,5 | 10 | 25 |
| | | P | 2 | 2 | 77,4 | 23,4 | 3+N | 1 | 10 | 4 | 0,5 | 10 | 25 |
| | | N\|Q | 2 | 2 | 78,8 | 24,8 | 3+N | 1 | 10 | 4 | 0,5 | 10 | 25 |
| 150 | 400V/3N/50Hz | ° | 2 | 2 | 87,0 | 26,0 | 3+N | 1 | 16 | 4 | 0,5 | 16 | 45 |
| | | P | 2 | 2 | 89,8 | 28,8 | 3+N | 1 | 16 | 4 | 0,5 | 16 | 45 |
| | | N\|Q | 2 | 2 | 90,5 | 29,5 | 3+N | 1 | 16 | 4 | 0,5 | 16 | 45 |
| 200 | 400V/3N/50Hz | ° | 2 | 2 | 117,0 | 34,0 | 3+N | 1 | 16 | 4 | 0,5 | 16 | 45 |
| | | P | 2 | 2 | 119,8 | 36,8 | 3+N | 1 | 16 | 4 | 0,5 | 16 | 45 |
| | | N\|Q | 2 | 2 | 120,5 | 37,5 | 3+N | 1 | 16 | 4 | 0,5 | 16 | 45 |

400V/3N/50Hz




230/1/50Hz




**KEY**

| | |
|---|---|
| **F.L.I.:** | Maximum power consumption |
| **F.L.A.:** | Maximum current |
| **L.R.A.:** | Peack current |
| **Sez A:** | Power supply |
| **3+N:** | 3 Phase + neutre |
| **Sez B:** | Connect controls and safeties |
| **TERRA**: | Earth to bring the machine |
| **IL:** | Main switch |

**ATTENTION**
**CONTROL AND START-UP**
Please note that, on request by the Aermec customer or the legitimate owner of the machine, the units in this series can be started up by the AERMEC After-Sales Service in your area (valid only on Italian territory). The start of operation must be scheduled in advance based on the timeframe for the completion of works for the system. Prior to the work to be carried out by the AERMEC After-Sales Service, all other works (electrical and hydraulic connections, loading and bleeding of air from the system) must have been completed.

## 26. ELECTRICAL CONNECTION OF POWER TO THE POWER SUPPLY

1. Before connecting the unit to the power supply mains , ensure that the isolating switch is open
2. Open the front panel
3. Use the holes for the main electric power supply cable and for the cables of the other external connections under the responsibility of the installer
4. It is forbidden to access positions not specifically envisioned in this manual with electric cables
5. Avoid direct contact with noninsulated copper piping and with compressor
6. Identify the clamps for the wiring diagram, always refer to the electric layout supplied with the unit.
7. For the functional connection of the unit, take the power supply cable to the electric control board inside the unit and connect to clamps L1-L2-L3 and PE respecting the polarities
8. L1-L2-L3 as phases, and PE as earth see figure
9. Re-position the inspection panels
10. Ensure that all protections removed for the electric connection have been restored before electrically powering the unit
11. Position the system master switch (external to the appliance) at “ON”.

## 27. STRAT-UP

**ATTENTION**
Before carrying out the controls indicated below, make sure that the unit is disconnected from the power mains. Make sure that the master switch is locked in the OFF position and an appropriate sign is affixed. Before starting the operations, check that there is no voltage present using a voltmeter or a phase indicator.

### 27.1. PRELIMINARY OPERATIONS TO BE MADE WITHOUT TENSION

check:
1. All safety conditions have been respected
2. The unit is correctly fixed to the support surface
3. The minimum technical spaces have been respected
4. That the power cables are generally of appropriate section, to withstand the overall drive power consumption. (see section Electrical Data), and that the unit is properly connected to earth.
5. All electric and hydraulic connections have been tightened well.

### 27.2. THE FOLLOWING OPERATIONS ARE PERFORMED WHEN THE UNIT IS POWERED.

1. Supply power to the unit by turning the master switch to the ON position. The display will come on a few seconds after voltage has been supplied.
2. Use a tester to check that the value of the power supply voltage to the RST phases is equal to 400V ±10%; also verify that the unbalance between phases is no greater than 3%.
3. Check that the connections made by the installer are in compliance with the documentation.
4. Verify that the resistor of the compressor sump is working by measuring the increase in temperature of the oil pan. The resistance/s must function for at least 12 hours before start-up of the compressor and in all cases the temperature of the oil pan must be 10 -15°C higher than the room temperature.

**HYDRAULIC CIRCUIT**

1. Check that all hydraulic connections are made correctly, that the plate indications are complied
2. Check that the hydraulic system is filled and under pressure and also make sure that no air is present; if so, bleed it.

**SYSTEM LOAD**:
Before starting the load, **CHECK**:
- that the system drain tap is closed.
- Open all the drain valves of the system and of the related terminals.
- Open the shut-off devices of the system.
- Start the filling by slowly opening the water system load cock placed outside the machine.
- When water begins to flow from the terminal vent valves, **close them and continue loading up to read on the gauge the value of 1.5 bar. The system is loaded at a pressure between 1 and 2 bar.** It is advisable to repeat this operation once the machine has worked for some hours and to periodically check the system pressure, restoring if it drops below 1 bar. Check the hydraulic seal of the joints.

3. Verify that any on-off valves present in the system are correctly opened.
4. Make sure that the circulation pump is operating and that the flow rate of the water is sufficient to close the contact of the flow/pressure switch.
5. Check lthe water flow rate, measuring the pressure difference between input and output of the evaporator and calculate the flow rate using theevaporator pressure drop diagram present in technical documentation. (www . aermec . com)
6. Check the correct functioning of the flow/pressure switch if installed. Closing the cut-off valve at the output of the heat exchanger; the unit control panel must show the block. Finally re-open thevalve and rearm the block.

### 27.3. MACHINE COMMISSIONING

After having performed all controls stated above, it is possible to start the unit by pressing the ON key. The display shows the temperature of the water and machine functioning mode. Check the operating parameters (set-point) and reset any alarms present. After a few minutes, the unit will begin operating.

#### 27.3.1. CHECKS THE MACHINE IS ON

**COOLING CIRCUIT**
CHECK:
- **That the compressor input current** is lower than the maximum indicated in the technical data table.
- **That in models with three-phase** power supply, the compressor noise level is not abnormal. If this is the case, invert a phase.
- **That the voltage value lies within the prefixed limits** and that unbalance between the three phases (three-phase power supply) is not above 3%.
- **The presence of any refrigerant GAS leaks** particularly with reference to pressure plugs, pressure transducers and pressure switches. (VIBRATIONS DURING TRANSPORTATION MAY LOOSEN CONNECTIONS).
- **Overheating**
  Comparing the temperature read using a contact thermostat positioned on the compressor intake with the temperature shown on the low pressure manometer (saturation temperature corresponding to the evaporation pressure). The difference between these two temperatures gives the overheating value. Optimal values are between 4 and 8°C
- **The Pressing line temperature**
  If the subcooling and overheating values are regular the temperature measured in the pressing line pipe at the outlet of the compressor must be 30/40°C above the condensation temperature.

**CONTROL AND SAFETY DEVICES**

CHECK:
- **High pressure switch**
  That stops the compressor, generating the respective alarm, when the delivery pressure exceeds the setpoint value. The control of its correct functioning can be performed by closing the air intake to the exchanger (in cooling mode) and keeping the high pressure manometer under control, check the intervention in correspondence of the calibration value. Caution: In the event of failure to intervene at the calibration value, stop the compressor immediately and check the cause. The reset is manual and can only be performed when the pressure falls below the differential value. (For the set and differential values, consult the technical manual).

- **The anti-freeze control**
  The anti-freeze control managed by the electronic regulation and by the temperature probe located at the outlet of the evaporator is to prevent the formation of ice when the water flow rate is too low. Correct operation can be checked by progressively increasingly the anti-freeze set-point until it passes the outlet water temperature and keeping the water temperature controlled with a high precision thermometer, verify that the unit is off and generates the respective alarm. After this operation, take the anti-freeze set-point back to its original value.

## 28. FUNCTIONING FEATURES

### 28.1. SET POINT IN COOLING MODE

**(Factory set) = 7°C, Δt = 5°C.**

### 28.2. SET POINT IN RISCALDAMENTO

**(Factory set) = 45°C, Δt = 5°C.**
If the unit power supply is restored after a temporary interruption, the set mode will be kept in the memory.

### 28.3. COMPRESSOR START-UP DELAY

Two functions have been prepared to prevent compressor start-ups that are too close.
- Minimum time from last switch-off 60 seconds in cooling mode.
- Minimum time from last switch-on 300 seconds in heating mode

### 28.4. CIRCULATION PUMP

The circuit board envisions an output for the management of the circulation pumps.
The pump side utilities start immediately after the first 30 seconds of functioning. When the water flow rate has gone into normal working conditions, the flow meter control functions are activated (if envisioned).
Below find the compressor start-up procedure, by switching the source side pump on with flow meter check if enabled after 20 seconds.
Whenever alarms do not occur, the compressor starts.

### 28.5. ANTI-FREEZE ALARM

The anti-freeze alarm [11] is active if the machine is off or in stand-by mode. In order to prevent the heat exchanger from breaking due to the water it contains freezing, envision compressor block (if the machine is on below 3.5 °C) and ignition of the resistance (if standby below 5 °C). If the temperature detected by the probe positioned in outlet of the heat exchanger and in inlet to the chiller is less than +3.8°C.

The intervention of this alarm [12] determines compressor block and not pump block, which remains active along with the switchon of the resistance if installed. To restore normal functions the temperature of the outlet water. Rearm is manual.

### 28.6. WATER FLOW RATE ALARM

The unit manages a water flow rate alarm controlled by the differential/flow pressure switch installed in series on the machine. This type of safety device intervenes after the first 30 seconds of pump functioning, if the water flow rate is not sufficient.
The intervention of this alarm determines compressor and pump block.

**ATTENTION**

[11] This anti-freeze set temperature can only be varied by an authorised after-sales centre and only after having checked that there is anti-freeze solution in the water system.

[12] Whenever this alarm intervenes, We advise you call the nearest after-sales service immediately

## 29. MAINTENANCE

**ATTENTION**
Consigliamo di prevedere un libretto macchina (non fornito, ma a carico dell'utente), che consenta di tenere traccia degli interventi effettuati sull'unità, in questo modo sarà più facile organizzare adeguatamente gli interventi facilitando la ricerca e la prevenzione di eventuali guasti alla macchina.
Riportare sul libretto data, tipo di intervento effettuato (manutenzione ordinaria, ispezione o riparazione), descrizione dell'intervento, misure attuate

**ATTENZIONE**
[13] è vietato **CARICARE** i circuiti frigoriferi con un refrigerante diverso da quello indicato. Utilizzare un gas refrigerante diverso può causare gravi danni al compressore.

All cleaning is prohibited until the unit has been disconnected from the electric power supply mains. Make sure there is no voltage present before operating. Periodic maintenance is fundamental to keep the unit perfectly efficient under a functional and energetic point of view.

**It is therefore essential to carry out periodic yearly controls for the:**

### 29.1. HYDRAULIC CIRCUIT

**CHECK:**
1. Refilling of water circuit
2. Cleaning the water filter
3. Control of pressure/flow switch
4. No air in the circuit (bleed) that the water flow rate to the
5. Evaporator is constant
6. The thermal insulation state of the hydraulic piping
7. The percentage of glycol where necessary

### 29.2. EMPTYING THE SYSTEM

Before starting to drain the system, turn "off" the unit
- Check that the water system load/restore tap is closed
- Open the drain tap outside the machine and all the vent valves of the system and the corresponding terminals.
- In case of prolonged shut-down of the unit during winter (if not added with glycol) or for other inconveniences, drain the chiller hydraulic circuit by the corresponding knobs. If the system uses glycol, this liquid should not be drained to the environment because it is a pollutant. It must be collected and, if possible, reused.

### 29.3. ELECTRICAL CIRCUIT

**CHECK:**
8. Safety efficiency
9. Electric supply pressure
10. Electrical Input
11. Connection tightness
12. Verify the operation of the carter compressor resistance

### 29.4. COOLING CIRCUIT

**CHECK:**
13. State of compressor
14. Efficiency of the plate heat exchanger resistance if envisioned
15. Work pressure
16. Leak test for watertightness control of the cooling circuit
17. Functioning of high and low pressure switches
18. Carry out the appropriate checks on the filter dryer to check efficiency

### 29.5. MECHANICAL

**CHECK:**
1. Check the tightening of the screws the compressors and the electrical box, as well as the exterior panelling of the unit. Insufficient fastening can lead to undesired noise and vibrations
2. State of the structure.
   Treat any shares if you encounter any oxidized paint suitable to iminate or reduce the phenomenon of oxidation.

### 29.6. EXTRAORDINARY MAINTENANCE

The ANL | ANLH are filled with R410A gas and are inspected at the factory. Under normal conditions they do not require Technical Assistance related to control of refrigerant gas. Through time gas leakage may be generated from the from the joints, causing refrigerant to escape and discharge the circuit, causing appliance malfunctioning. In these cases the leakage points are to be discovered, repaired and the Gas circuit is to be replenished, respecting the December 28 1993 n°549 law.

**Load procedure [13]**
1. Empty and dry the entire cooling circuit using a vacuum pump connected to the low and high pressure socket until 10 Pa is read on the vacuum meter. Wait a few minutes and check that this value does not rise above 50 Pa.
2. Connect the refrigerant gas cylinder or a load cylinder to the socket on the low pressure line.
3. Load the amount of refrigerant gas indicated on the appliance features plate.
4. After a few hours of functioning, check that the liquid indicator indicates the dry circuit (dry-green). In the case of partial loss, the circuit must be emptied completely before being re-loaded.
5. The R410A refrigerant must only be loaded in the liquid state.
6. Functioning conditions that are different to the nominal conditions can give rise to values that are greatly different.
7. The sealing test or the search for leaks must only be performed using R410A refrigerant gas, checking using a suitable leak detector.
8. In the cooling circuit it is prohibited to use oxygen or acetylene or other inflammable or poisonous gases because they are a cause of explosions or intoxication.

## 30. DISPOSAL

Provide that the disposal unit is implemented in accordance with the rules in force in different countries.

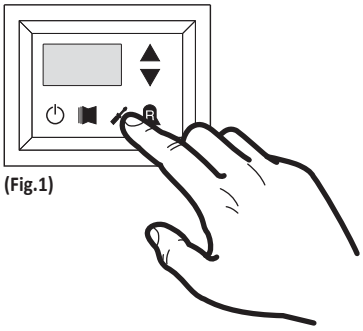
## 31. LIST OF CONTROLS FOR THE GUIDED PROCEDURE

Some parameters in the moducontrol board must be set appropriately on the basis of the type of system in which the unit is installed.
These modifications, performed by the installer, are summarised and organised in the following guided procedures, with which to correctly set the unit circuit board parameters.

### 31.1. HOW TO MODIFY A PARAMETER IN THE USER MENU:

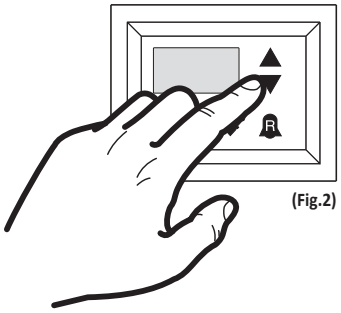
To enter the **USER** presses shown in **(Fig. 1)**, once you press the key you must enter your password to access the various menus;

**User password menù: 000 (displayed by default)**



**(Fig.1)**

to change the value of the password using the arrow keys **(Fig. 2)**. Once the correct password, press shown in **(Fig. 1).**



**(Fig.2)**

The display reads the **USER** parameter index and a three-character string that identifies it, the string is displayed for a second, after which it is replaced by the value for the parameter.

To go to the next, use the arrow keys **(Fig. 2)**. To change a parameter, select it by pressing the button shown in **(Fig. 1)**, change the value assigned by the arrow keys **(Fig. 2)** and to confirm the change, press the switch in **(Fig.1)**.

### 31.2. HOW TO MODIFY A PARAMETER IN THE INSTALLER MENU:

To enter and edit the menu **INSTALLED** following the same procedure for the user menu.

**installer password menu: 030**

| REQUEST | ANSWER | SOLUTIONS |
|---|---|---|
| **(1) What type of system terminals are used in the heating circuit?** | • Is the unit a cooling only model | • Go to question 2 |
| | • Radiant panels | • Set the parameter **StC** (index 3 USER menu) with the value of 35 °C |
| | • Fan coils or low temperature radiators | • Set the parameter **StC** (index 3 USER menu) with the value of 45 °C (default value) |
| | • Other applications | • Set the parameter **StC** (index 3 USER menu) with the value of 55 °C |
| **(2) Is the remote panel accessory installed (PR3)?** | • Not installed | • Go to question 3 |
| | • installed | • Set the parameter **PAN** (index 9 **INSTALLER** menù) with the appropriate value selecting from:<br>**Value (1):**<br>• Season control piloted from the circuit board<br>• ON/OFF control enabled from PR3<br>**Value (2):**<br>• Season control enabled from PR3<br>• ON/OFF control from panel on machine<br>**Value (3):**<br>• Season control enabled from PR3<br>• ON/OFF control enabled from PR3 |
| **(3) Is the production of DHW envisioned?** | • Not envisioned | • Go to question 5 |
| | • envisioned | • Set the parameter **ASA** (index A INSTALLER MENU) with the value (1) |
| **(4) Is a 3-way diverter valve envisioned in the DHW production circuit** | • Not installed | • Go to question 5 |
| | • installed | • Set the parameter **AAS** (index C INSTALLER menu) with the appropriate value (in seconds). This parameter indicates the stand-by time for inversion of the 3-way diverter valve on the DHW production system |
| **(5) Is a room thermostat installed?** | • Not envisioned | • No operation |
| | • envisioned | • This parameter enables a digital clamp **ID** (indicated on the circuit board with the code **TRA**) to which a room thermostat must be connected, used to disable the compressors and the integrative resistances. Set the parameter trA (index **D INSTALLER** menu) with the appropriate value, selecting from:<br>**1. Value (1 o 2): ENABLED**<br>**2. Value (0 o 3): DISABLED**<br>**3. Remember that the OPEN state on the clamp represents:**<br>• the compressors and resistances block function if the parameter is set at 1<br>• the compressors, pumps and resistances block function if the parameter is set at 2<br>• represents the pump alarm (as in the previous software version), if the parameter is set at the value 3 |

| ANOMALY | CAUSE | REMEDY |
|---|---|---|
| The chiller does not start-up | • No electric voltage | • Check the presence of voltage<br>• Check the safety systems upstream from the appliance |
| | • Master switch at OFF<br>• Remote switch at OFF (if present)<br>• Control panel at OFF<br>• Main switch at OFF<br>• Compressor magnet circuit breaker at OFF | • Position at ON |
| | • Power supply voltage too low | • Check power supply line |
| | • Bobina di teleruttore compressore guasta<br>• Circuit board broken<br>• Peak condenser broken<br>• Compressor broken | • Replace the component |
| Insufficient yield | • No refrigerant<br>• Appliance dimensioning<br>• Filtro acqua intasato<br>• Appliance dimensioning<br>• Functioning outside of operational limits | • Verify the charge and the presence of any leaks<br>• Clean the batteries<br>• Clean the filter<br>• Check<br>• Controllare con il grafico dei limiti operativi |
| Noisy compressor | • Liquid return to the compressor<br>• Inadequate fixing | • Check |
| | • Phase inverted | • Invert a phase |
| Noise and vibrations | • Contacts between metal bodies | • Check |
| | • Weak rest | • Restore |
| | • Loose screws | • Tighten the screws |
| The compressor stops due to intervention of the protections | • Excessive flow pressure<br>• Low intake pressure<br>• Power supply voltage low<br>• Electric connections fastened badly<br>• Functioning outside of operational limits | • Check with the operational limits graph |
| | • Pressure switch functions badly | • Replace the component |
| | • Circuit breaker protection intervention | • Check power supply voltage<br>• Check electric isolation of the windings |
| High compressor discharge pressure | • Temperatura acqua esterna elevata<br>• Temperatura acqua ingresso acqua utenze elevate | • Check with the operational limits graph |
| | • Insufficient air flow<br>• Insufficient water flow | • Verify:<br>1. fans operability<br>2. the battery cleaning<br>3. Pump functionality (speed)<br>4. Cleaning the filter |
| | • Anomaly functioning in fans regulation | • Verify or replace in case of breakage |
| | • Air in the hydraulic system | • Bleed the circuit |
| | • Excessive gas load | • Restore the correct load |
| Low discharge pressure | • Low external air temperature<br>• Low water input temperature | • Check with the operational limits graph as above |
| | • Humidity in the cooling circuit | • Empty and restore the gas load |
| | • Air in the hydraulic system | • Bleed the circuit |
| | • Insufficient gas load | • Restore the correct load |
| High intake pressure | • High external air temperature<br>• High water input temperature<br>• Thermostatic expansion valve too open or damaged | • check with the operational limits graph<br>• Adjust or replace if damaged |
| Low intake pressure | • Low utilities water input temperature<br>• Low external water input temperature<br>• Thermostatic expansion valve damaged or blocked | • Check with the operational limits graph<br>• Regolare o sostituire se danneggiata |
| | • Insufficient air flow<br>• Insufficient water flow | • Verify:<br>1. fans operability<br>2. the battery cleaning<br>3. Pump functionality (speed)<br>4. Cleaning the filter |

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la prima per il clima

The technical data on the following documents are not binding.
Aermec reserves the right to make any changes at any time deemed necessary for product improvement.