

ENERGYCAL AW PRO AT

High efficiency air-water heat pumps
with axial fans and with two scroll compressors



 **R410A**



A CLASS



MULTIFUNCTIONAL



**SUPER
SILENT**



**HORIZONTAL AIR
DISCHARGE**

Dedicated heat pumps new series with Scroll compressors, with and without liquid injection.

5 sizes:

Cooling capacity (A35;W7) 37 ÷ 90 kW

Heating capacity (A7;W45) 42 ÷ 77 kW

Energycal AW is a complete dedicated HP series machines which covers the range from 6 to 78 kW using the same refrigerant gas (R410A) with double compressors.

STRONG POINTS

- > **Wide operating limits and power range**
- > **Automatic management for domestic hot water**
- > **DWS version available for all sizes (multifunctional units)**
- > **Smarter defrosting management**
- > **Modularity and full accessibility**
- > **SLN version - super silent**
- > **OD version - Horizontal discharge**

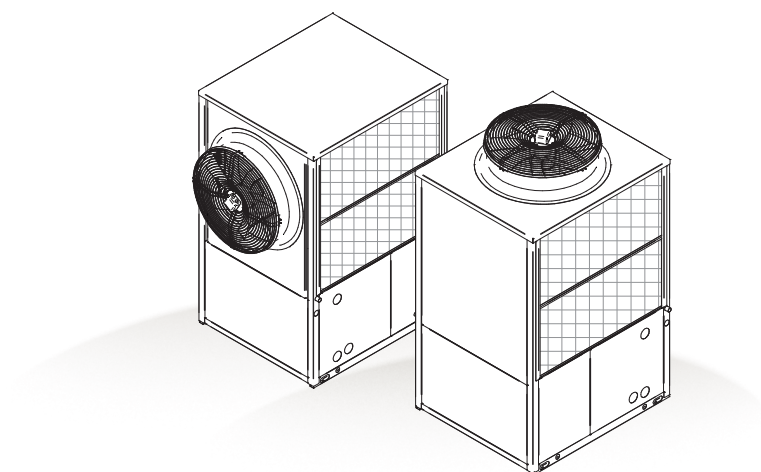
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STANDARD UNIT

STRUCTURE

In galvanised sheet metal and painted with polyester powders RAL 7035 at 180°C, which confer high resistance to atmospheric agents.

The panels can be easily removed to allow total access to the internal components.

All the structures have a condensate drip tray with the relative drain.

ORANGE /HT COMPRESSOR

Hermetic scroll compressor, complete with circuit breaker protection included in the electric motor windings, sump heater and rubber anti-vibration supports. The compressor used in this series is specifically designed to run as a heat pump. Optimising the compression ratio to high values allows for a superior efficiency to be reached when compared with traditional scroll compressors.

The models in size 13 to 41 are equipped with a liquid injection compressor. Liquid injection allows the heat pump to run at very low outdoor temperatures while producing very hot water.

ORANGE COMPRESSOR

Hermetic scroll compressor, complete with circuit breaker protection included in the electric motor windings, sump heater and rubber anti-vibration supports. The compressor used in this series is specifically designed to run as a heat pump. Optimising the compression ratio to high values allows for a superior efficiency to be reached when compared with traditional scroll compressors.

USER SIDE EXCHANGER

AISI 316 stainless steel braze-welded plate evaporator, housed inside a closed-cell insulating casing, which reduces heat loss and prevents condensation from forming.

The exchanger is equipped with a temperature probe for antifreeze protection, with a temperature probe for the water inlet and outlet and with a blade flow switch supplied as standard.

SOURCE SIDE EXCHANGER

This consists of a coil with copper pipes and aluminium fins with a high exchange surface with fin spacing sized so as to maximise heat transfer and reduce the noise impact. The space of the fins in the exchanger has been increased so as to allow the unit to work at very low temperatures and very high moisture concentration.

The subcooler is found at the base of the exchanger, which is an additional cooling circuit that prevents the formation of ice in the lower part of the coil and facilitates the flow of condensate during the defrosting operations. The effects of the subcooler are: reduced defrosting operations and the safety of having a clean heat exchanger at the end of each defrosting operation.

A metal mesh protects the finned core.

FANS

Helicoidal fans coupled directly to the electric motor, made of plastic material with a blade profile equipped with WINGLET, a special shape in the end part of the blades, which allows a reduction in the noise and an increase in the aerodynamic performance.

The control manages the fan speed through a speed regulator phase cut in order to optimise the operating conditions, efficiency and allow the unit to operate as a heat pump also for high outdoor temperatures.

Moreover, this adjustment has a reduced noise level effect on the unit. In fact, the control device will modulate the speed of the fans at night and during mid-season. This means that every time there it is possible, the machine will minimise the fan speed and also its noise level.

The fans are axial fans directly coupled to the 6-pole electric motor, with an IP 54 degree of protection, with shaped nozzles and a safety grille in accordance with EN 294.

COOLING CIRCUIT

It includes: a charging socket in the liquid and inlet line, liquid indicator, a solenoid valve, non-return valves, a dehydrator filter, 2 thermostatic expansion valves (1 for heat pump operation and 1 for chiller operation) equipped with an external pressure equalizer, pressure transducer, high and low pressure switches and a safety valve (excluding 7,9 and 11 for the /HT version and 8, 10 and 12 for the /MT version), liquid receiver and intake separator (sizes 22 to 41 for the /HT version and 23 to 42 for the /MT version).

The models in the /HT version size 13 to 41 are equipped with an additional circuit for liquid injection to the compressor.

ELECTRIC CONTROL BOARD

The electric control board consists of:

- > a main isolating switch and fuse protection of the auxiliary and power circuits
- > a compressor remote control switch
- > condensation/evaporation control with fan speed regulator
- > pump relay or motor protection switch and remote control switch (in /1P, /1PS, /1PV or /1PVS version)
- > potential free contacts for general alarm
- > microprocessor control.

The standard power supply is:

- > 230V/1~/50Hz for size 7 of the /HT version
- > 230V/1~/50Hz for sizes 8 and 10 of the /MT version
- > 400V/3N~/50Hz for sizes 9 to 41 of the /HT version
- > 400V/3N~/50Hz for sizes 12 to 42 of the /MT version.
- > 3-phase power supply is available as an accessory for the single phase models. Single-phase power supply is available as an accessory for certain 3-phase models.

CONTROL

Microprocessor control for the following functions:

- > water temperature adjustment with inlet control
- > anti-freeze protection
- > compressor timing
- > high pressure pre-alarm control
- > alarm signals
- > alarms reset
- > remote on/off digital input
- > summer/winter selection digital input.

The display is used to display the following information:

- > temperature of the outlet water
- > condensation temperature
- > set and differential temperature settings
- > description of the alarms
- > pump and compressor operation counter.

The control integrates the following standard functions:

- > automatic control of domestic hot water
- > smooth defrosting.

Certain functions are only available with the unit adequately configured. Certain functions must be enabled from the control.

CHECKS AND SAFETY DEVICES

The units are equipped with the following safety devices:

- > utility water temperature control probe (situated at the inlet of the utility heat exchanger)
- > anti-freeze probe to activate the anti-freeze alarm (manually reset)
- > low pressure switch (with automatic reset at limited intervals)
- > low pressure switch (automatically reset at limited intervals)
- > standard mechanical blade flow meter (manually reset)
- > high pressure safety valve (excluding sizes 7, 9 and 11 of the /HT version and sizes 8, 10 and 12 of the /MT version)
- > compressor over-heating protection
- > control of the condensation pressure using the speed regulator for operation with low outdoor temperatures.
- > control of the evaporation pressure using the speed regulator for operation with high outdoor temperatures in domestic hot water production or recovery.

INSPECTION

The units are inspected in the factory and supplied complete with oil and refrigerant fluid.

OPTIONS

FEATURES CONSTRUCTION

/LN version silenced unit

As well as the components of the basic version, the unit has a completely sound insulated compressor compartment made of sound-absorbing material, which is used with sound impeding material.

/SLN version super silent unit

The unit envisages the following modifications:

- > increased external (evaporation/condensation battery) exchanger
- > low rpm fan
- > complete compressor/pump compartment soundproofing
- > LOW noise setting of the fan

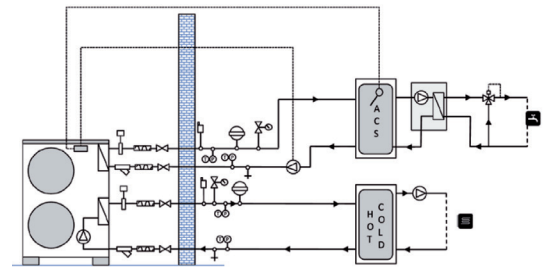
To further decrease noise, you are advised to use the Soft Starter accessory.

/OD version horizontal air discharge Unit

Unit configured for horizontal air discharge version. This version is recommended where there are not space enough for the version with standard fans and wherever the noise level must be very low. If you want to convey the air flow to expulsion through ducts please contact our company.

/DWS version multipurpose heat pump

The unit in this setup is equipped with 2 exchangers: 1 on the system side for air-conditioning and heating, and 1 dedicated exclusively to the production of domestic water.



Sufficient cold or hot water can be produced on the unit system side exchanger to meet the heating and cooling requirements of the building according to the seasons.

The unit on the exchanger dedicated to the DHW produces hot water to be sent to a storage tank outside the machine, which is selected and sized according to the system requirements.

The unit runs in different modes according to the season: these are automatically switched (within the season) via the reading of the temperature probes and the set-point settings.

Switching times and logic are designed to guarantee maximum system efficiency and reliability.

This configuration must be associated to an adequately sized boiler in which very hot water is stored. The boiler must have a well for the domestic water operating probe to be inserted in the upper part, through which the unit controller will monitor the amount of domestic hot water that must be produced.



Summer operation

There are 3 summer modes:

- > Chiller mode: the unit only produces cold chilled water for the system.
- > Chiller mode with simultaneous production of domestic hot water: the unit produces chilled water for the system and domestic hot water. The recovered power for the domestic water production is complete.
- > Heat pump mode for domestic hot water production: when there is no cold water and the domestic water operating probe is required to run, the unit heats the water inside the domestic water storage tank using the finned core coil as an evaporator. Using the hot external air as a source of heat guarantees the extremely high COP to be achieved.

Switching from one mode to another occurs entirely automatically according to a priority logic in the domestic hot water production and when there is load diversity, thereby recovering the condensation energy for the production of domestic hot water.

Winter operation

There are 2 winter modes:

- > Heat pump mode for heating: the unit produces hot water to the system side exchanger for heating purposes.
- > Heat pump for the production of domestic hot water: produces hot water to the connected exchanger of the domestic water storage tank.

Switching from one mode to another occurs entirely automatically according to a priority logic in the domestic hot water production.

In addition to the components of the basic version, the /DWS unit includes:

- > a special exchanger for the production of domestic hot water
- > a temperature probe to be positioned on the domestic water storage tank
- > an electronic thermostatic valve (replaces the 2 mechanical thermostatic valves)

HYDRAULIC MODULE OPTIONS

/1P unit with one pump

The unit includes a circulator or a circulation pump, an expansion tank, a hydraulic circuit water drain valve, a safety valve set at 6 bar that corresponds to the maximum operating pressure value allowed.

/2P unit with two pumps

The unit includes 2 circulation pumps installed inside the unit. Each pump is a reserve of the other, controlled in timed rotation and with automatic switchover in the event of a fault.

/1R unit with domestic side pump

The unit is equipped with a pump for the domestic side (supplied). This module can only be matched with the units in the /HWS version and can be combined with the /1P, /1PV, /1PS or /1PVS modules. The /HWS version units with no /1R module are equipped with consent to control an external pump.

STANDARD EQUIPMENT

- > Smooth defrosting management
- > Compressor stop for external air temperatures lower than the operating limits
- > Condensation/evaporation control with fan speed regulator
- > Flow meter (standard)
- > Directive 97/23 EEC (PED) Certification
- > Summer/winter selection from digital input
- > Remote On/Off from digital input
- > Condensate drip tray
- > Coil protection grid.

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ACCESSORIES

All the units can be configured with various accessories to better meet the requirements of the specific application in which they will be set. To check availability of accessories and compatibility of their size and configuration, please refer to the price list or selection software.

COOLING CIRCUIT ACCESSORIES

- > electronic thermostatic valve (standard on the /DWS unit).

HYDRAULIC CIRCUIT ACCESSORIES

- > filling unit with manometer
- > anti-freeze resistance
 - basic version: electric heater on the utility exchanger
 - /1P and /2P version: electric heater on the utility exchanger and heating cable on the pipes
- > 3-way valve to control the domestic hot water (supplied)
- > system pump with Pulse function
- > water filter.

ELECTRICAL ACCESSORIES

- > electric power supply different from the standard one
- > maximum and minimum voltage relays
- > double set-point from the digital input
- > RS485 serial interface
- > remote user terminal
- > electronic soft starter
- > EC electronic fans
- > compensation of the setpoint according to the external air temperature
- > automatic control of the domestic hot water
- > domestic hot water operating probe (standard on the /DWS unit)
- > anti-legionella function
- > heat source integration/backup management
- > domestic water production with timer
- > individual operating potential free contacts
- > Miniboss S
- > Miniboss M

VARIOUS ACCESSORIES

- > rubber anti-vibration mounts
- > wooden cage packaging

DESCRIPTION OF THE FUNCTIONS AND ACCESSORIES

Remote ON/OFF from digital input (standard)

All the units come with this function as standard. It consists of a remote contact for turning the machine on and off by means of a signal that can be taken inside the building or piloted by a Building Management System (BMS).

Summer/winter selection from digital input (standard)

This function is standard for all heat pumps. When the unit is switched on, an operating mode must be set as either heat pump or chiller. Through this remote contact, the operating mode can be modified even inside the building and without direct access to the microprocessor control.

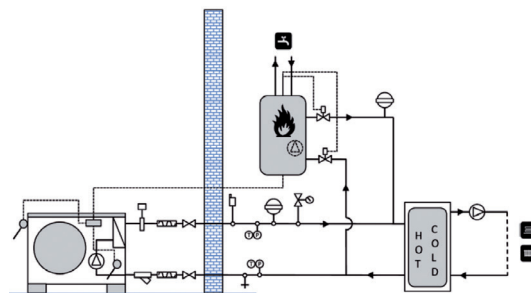
Smooth defrosting (standard)

The control manages the defrosting according to a variable interval threshold, depending on the pressures inside the unit and the external air temperature. Crossing this information, the control can identify the presence of ice on the coil by activating the defrosting sequence only when necessary, so as to maximise the energy efficiency of the unit.

The dynamic management of the defrosting threshold allows for the function to be implemented only when the ice deposited on the coil will affect the performance in outdoor air temperatures below -5°C, when the absolute humidity of the air is very low.

Controlling the auxiliary heat source (accessory)

The controller can manage an external heat source, which can be of integration or backup type, depending on the type of hydraulic connection. In the diagram below, for example, the boiler will be backup to the heat pump.



The auxiliary heat source will be activated when the outdoor air temperature drops below a threshold that can be set from the control and only when the heat pump is insufficient to meet the load. Activation occurs by closing a potential free contact.

It is also possible to set the unit for the controller to switch the compressors off when the unit operates in heat pump mode and the outdoor air temperature drops below a minimum set temperature: the controller will stop the compressors before the unit goes into low pressure alarm, thereby preventing having to manually reactivate the machine.

This function is particularly useful when the heat pump is installed in an area where the external air temperature will definitely drop below the minimum temperature allowed by the threshold (in accordance with the set-point). When the external air temperature returns above the set temperature threshold, the unit restarts automatically without requiring any intervention.

Units with an integrated pump must always be kept running in order to prevent the formation of ice and to ensure correct operation of the temperature probes and anti-freeze safety devices.

The shutdown temperature must be configured according to the higher set-point temperature and the operating limits of the machine.

A shutdown temperature other than the default can be set provided it is compatible with the unit's operating limits.

Standard programming involves the

- > /MT units having the heating set-point set at 30/35° with a shutdown temperature of -16°C
- > /HT units having the heating set-point set at 40/45° with a shutdown temperature of -20°C

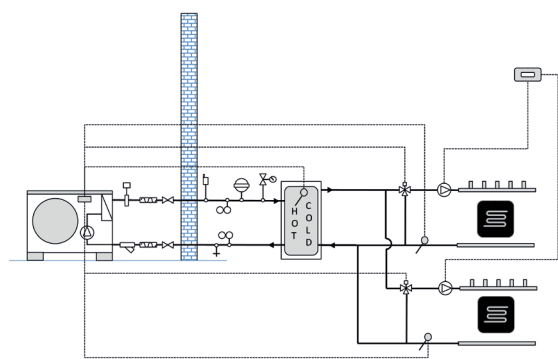
If the unit must also be used to produce domestic hot water, the shutdown temperature must consider the higher water set-point and the operating limits allowed.

Automatic management of two areas (accessory)

By means of two operation probes (accessory), this option enables the unit to control the temperature of two areas of the system. The control detects the input temperature of each area and, to keep it constant, modulates the relative 3-way valve mixer (accessory).

Modulation of the two areas is carried out independently between them.

Adjustment is carried out with winter (Heat Pump) and summer (Chiller) operation.



Automatic domestic hot water control (accessory)

This function allows the unit to control the temperature inside a storage tank for the domestic hot water and a 3-way valve (accessory) outside the unit by means of a domestic water operating probe (accessory). Priority is always given to the production of hot water for domestic use.

The request for the function to be activated must be made when placing the order, however, it can be configured at a later stage (by qualified and authorised technical personnel) provided that the unit is connected with a suitable hydraulic circuit.

The request made when placing the order for special accessories to control the domestic hot water automatically entails the activation of the "automatic domestic hot water control" function.

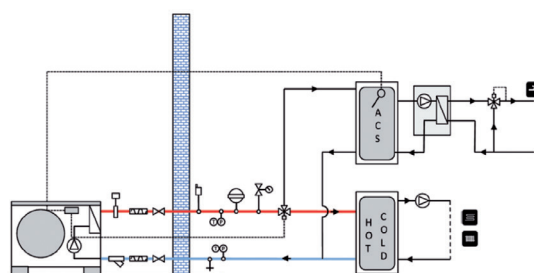
The heat pump normally operates on the system to meet the comfort requirements of the building, however, when the water temperature inside the tank drops below a set threshold, the control manages the production of domestic hot water: if the unit is operating as a heat pump for heating, the 3-way valve will be switched and the set-point changed; if on the other hand, the unit is producing chilled water for air conditioning, the control switches the unit to heat pump mode, assigns it the set-point for domestic hot water (usually higher than the set-point of the system) and turns the 3-way valve in the right position.

Once the temperature inside the domestic water tank has reached the set value, the unit automatically returns to the water production for the heating and air conditioning system.

Description of the winter mode

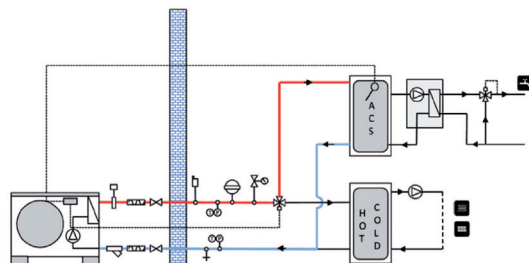
The following conditions occur in winter:

- > Heating request: the temperature of the unit inlet water coming from the system is lower than that expected, therefore, the control switches the compressor on and the unit will run until the set-point temperature is reached.



The compressor stops when the desired temperature is reached and only the circulation pump will keep running, which will keep the water circulating in the system. The unit will wait in this state until the water inlet temperature drops again.

- > Domestic hot water request: let us suppose that the unit is producing hot water for the heating system (45°C) and receives the request to produce hot water from the domestic water operating probe in the storage tank since the water temperature has dropped below the set limit, (e.g. 55°C).
- > Since the hot water is controlled with priority logic, the control will change the set-point bringing it to 55°C and switch the 3-way valve.



As soon as the water inside the tank will reach the required 55°C, the control will switch the 3-way valve once again to work on the system and bring the setpoint back to 45°C.

If the defrosting process must be implemented, regardless of the mode the unit is running in, it will force the 3-way valve to be switched towards the system, which is less sensitive to the reduction in temperature due to the greater inertia.

Description of the mid-season mode

The heating and air conditioning system is not active during the mid-season and therefore, the heat pump is solely dedicated to the production of domestic hot water.

The 3-way valve is firmly positioned on the domestic hot water tank, whereas the pump and heat exchanger will only be activated on demand from the domestic water operating probe.

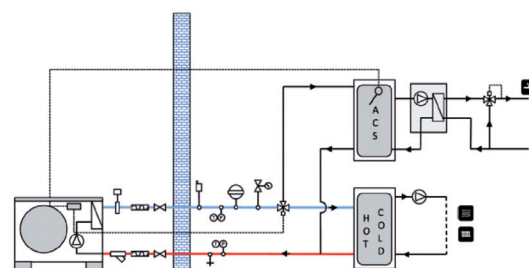
When the domestic water set-point is reached, the compressor and the pump will be switched off and the control will remain in stand-by for the next request.

This function is activated by setting the unit to the "domestic hot water only" function. For further information refer to the wiring diagram supplied with the unit.

Description of the summer mode

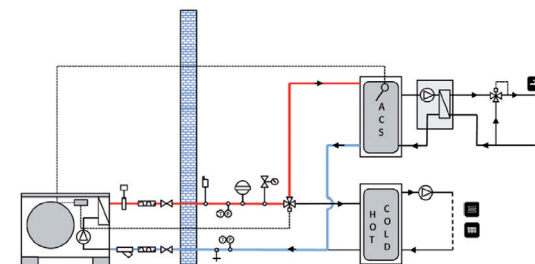
The following conditions occur in summer:

- > Only cooling: the temperature of the unit inlet water coming from the system is higher than that expected, therefore, the control switches the compressor on and the unit will run until the set-point temperature is reached.



The unit then stops and only the pump will keep running, which will keep the water circulating in the system. The unit will wait in this state until the water inlet temperature rises again.

- > Domestic hot water request: let us suppose that the unit is producing chilled water for the air conditioning system (7°C) and receives the request to produce hot water from the domestic water operating probe in the storage tank since the domestic water temperature has dropped below the set limit, (e.g. 55°C). Since the domestic hot water is controlled with priority logic, the control will change the unit mode from chiller to heat pump, set the set-point to 55°C and switch the 3-way valve.



As soon as the water inside the tank will reach the required 55°C, the control will switch the 3-way valve once again to chiller mode, turn the 3-way valve for it to work on the system and bring the set-point back to 7°C.

Domestic water operating probe (accessory)

The controller requires this accessory for the production of domestic hot water: it consists of a temperature probe with a 6 m cable to be placed in a special well in the tank for the production of domestic water. Read the "Heat pump installation tips" section to set it in the correct position.

Standard on DWS units.

Anti-legionella function (accessory)

Anti-legionella cycles may have to be controlled, depending on the type of tank chosen for the production of domestic hot water. The controller can handle activating an auxiliary heat source that will perform the thermal shock on the hot water tank, according to programmed intervals with a weekly timer.

System pump with Pulse function (accessory)

As standard, the unit is set to keep the system side circulation pump always on, even if it reaches the set temperature.

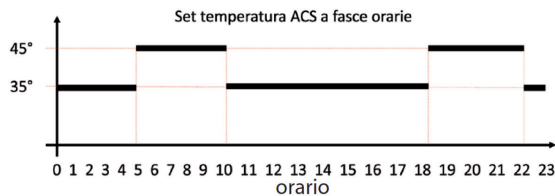
When the unit is equipped with this accessory and the set-point is reached, the controller will switch the pump off, reactivating it periodically for sufficient time to detect the temperature of the water. If the controller verifies that the water temperature is still in set-point conditions, it will then turn the pump off again. Otherwise, the controller will reactivate the compressors to meet the system requirements.

Hence, this accessory allows the electrical consumption due to pumping to be significantly reduced, especially during midseason when the load is extremely low.

The "anti-freeze" accessory must be present for this accessory to be applied.

Domestic water production with timer (accessory)

If this accessory is present, 2 temperatures can be set for the domestic water by associating different time bands: Normal and Saving. This allows you to decide when the heat pump is to concentrate on the production of hot water, however, always keeping the minimum Saving temperature, which is always managed with priority logic. For example, focusing the production of water at Normal temperature at night, the better electricity rates will be taken advantage of and production of hot water just before the time when consumption is higher will be guaranteed.



With this system, the unit will still never cease to control the temperature inside the domestic water tank and if there is occasional use of hot water out of the usual times, the unit will give priority to the production of domestic water until the water in the tank returns to a temperature that is equivalent to the Saving set-point.

Electronic thermostatic valve (accessory)

This accessory is particularly suitable for units that operate in very unstable heat load conditions or in conditions where the outdoor temperature is highly variable or the operating mode is changed often, as in the case of combined air conditioning, heating and production of hot water.

Using the electronic thermostatic valve allows the following:

- > to maximise the heat exchange to the utility exchanger
- > to minimise the response time of the cooling circuit to variations in load and operating conditions
- > to optimise the superheating regulation
- > to maximise the energy efficiency

EC fans (accessory)

The units can be requested with EC fans, a brushless motor with electronic switchover. These motors with permanent magnets rotor guarantee very high levels of efficiency for every work condition and allow for 15% savings on the absorbed power per fan.

Moreover, through a 0-10V analogue signal sent to every fan, the microprocessor allows the condensation/evaporation to be controlled by means of continuous air flow regulations as the outdoor air temperature varies and a consequent reduction in electrical consumption and noise emission.

MINIBOSS S/M (accessory)

In applications in which there is:

- > the need to guarantee continuous system operation and therefore, redundancy must be foreseen by means of a reserve machine
- > a system that will be activated for parts and will therefore require a progressive increase in the installed power
- > there is no physical space to install one unit that guarantees all the power, however, a number of smaller units can be installed
- > in general, the MINIBOSS accessory, which is a control panel provided with the unit, can be used to combine several units and to coordinate the operation and rotation. This allows you to manage multiple units connected in parallel and coordinated by one supervisor in a rational and efficient way.

MINIBOSS S (accessory)

The Miniboss S allows you to connect up to 4 units in parallel: the control allows you to enable and disable them in power steps and rotate them in operation, thereby allowing all units to be used in an identical manner.

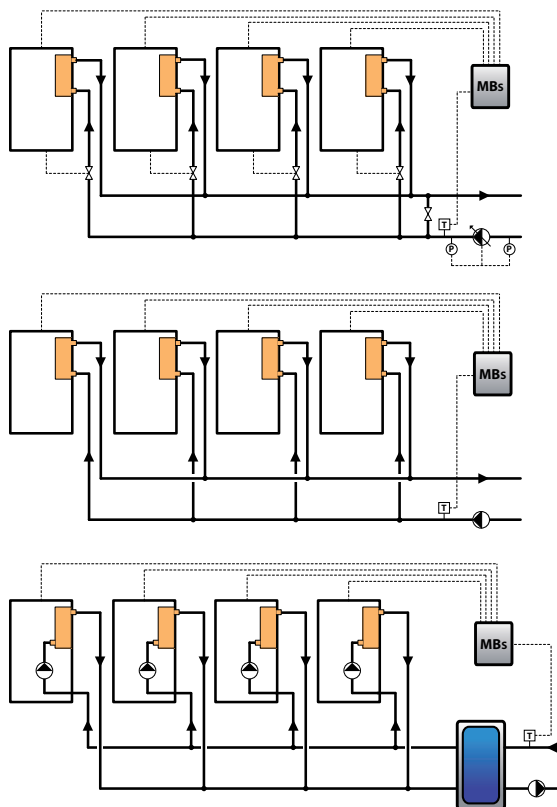
The connected units must all be the same. The Miniboss S cannot control units that have the domestic water control active.

The following can be controlled directly from the Miniboss S panel:

- > the set-point of the system
- > the summer/winter selection of all the machines
- > the ON/OFF of the single units or the entire system.

This accessory is supplied in an electrical panel together with the unit (to be installed in a technical compartment), and must be placed on one of the machines connected in parallel and all connected units must have the same configuration.

When placing the order you must specify the number of units that must be controlled so as to allow for the proper programming of the supervisor. In addition, the hydraulic circuit that connects the units must comply with one of the following formats.



For further information regarding the use, refer to the specific documentation.

MINIBOSS M (accessory)

The Miniboss M allows a maximum of 8 units in parallel to be controlled.

The main functions are:

- > controlling units with DWS configurations
- > control units with "automatic domestic hot water control" logic
- > control systems with a hot/cold tank to heat/air condition and a hot tank for the production of domestic water.

Besides that also implemented by the Miniboss S:

- > the set-point of the system
- > the DHW set-point
- > use a compensation climatic of the system set-point
- > the summer/winter selection of all the machines
- > the ON/OFF of the single units or the entire system
- > 3-way valve switchover
- > control the operation of pumps outside the units

This accessory is supplied in an electrical panel together with the unit (to be installed in a technical compartment), and must be placed on one of the machines connected in parallel and all connected units must have the same configuration.

When placing the order you must specify the number of units that must be controlled so as to allow for the proper programming of the supervisor. In addition, the hydraulic circuit that connects the units must comply with one of the following formats.

For further information regarding the use, refer to the specific documentation.

Filling unit with manometer (accessory)

This accessory allows the hydraulic system to be filled automatically and the correct working pressure to be adjusted, which can always be verified via the manometer, and continuously maintenance maintains this pressure, topping-up the water, if necessary.

Anti-freeze heater (accessory)

This accessory consists of heaters fitted on the utility exchanger, pump and tank (depending on the machine configuration) to prevent damage to the hydraulic components due to the formation of ice when the machine is out of use. The power of the anti-freeze heaters is only a few Watts, depending on the model of the unit, which is sufficient to prevent the components from malfunctioning.

The controller monitors the outlet probe of the exchanger (even when the unit is in standby) and when this detects a water temperature of 5°C or less (or 2°C below the set-point temperature, with a differential of 1°C) and triggers the antifreeze heater.

When the temperature of the outlet water reaches 4°C (or 3°C below the set-point), it also triggers the anti-freeze alarm that stops the compressor, whilst keeping the the heaters active.

The anti-freeze heaters are located in the evaporator (the 1PS version also has an anti-freeze heater installed on the tank, on the pipes and on the pump volute that will be insulated), and on any recovery heat exchangers.

Double set-point from digital input (accessory)

The double set-point allows you to set 2 different operating temperatures for the heating mode and a set-point for the cooling mode. If a double set-point is required for both modes, an electronic thermostatic valve must be installed.

The set-point temperatures must be specified when placing the order. The set-point can be changed from the keypad or digital input.

RS485 serial interface (accessory)

The growing diffusion of domotic and BMS (Building Management System) systems has led to the need to integrate all the system components under one supervision. To meet this requirement, the unit can be equipped with an RS485 serial board with MODBUS protocol.

Remote user terminal (accessory)

This accessory consists of a replica of the remote control panel from which the unit configuration can be completed and all its parameters can be viewed. Passwords must be entered to access the masks that enable the various editing levels.



Soft-starter (accessory)

The units are equipped with the technology required to minimise peak current, however, the unit can also be fitted with a soft-starter accessory as a further precaution. It is an electronic control device that monitors the start-up of the electric motors and reduces the normal peak current of the compressor by 40%.

Domestic hot water 3-way valve (accessory)

It is an on/off 3-way valve that combined with the "automatic domestic hot water control" function, it allows the machine to control 2 separate circuits for comfort and production of domestic hot water, switching automatically from one to another, according to the system requirements.

The 3-way domestic hot water valve must be installed in a technical compartment.

Compensation of the set-point depending on the external temperature (accessory)

The controller allows you to change the set-point of the unit when in chiller mode and in heat pump mode according to the external temperature. Compensation can be positive or positive: positive compensation occurs when there is an increase in the outdoor air temperature and the operating set also increases; whereas, negative compensation occurs when there is an increase in the air temperature and the set decreases.

If the unit is also used for the production of domestic hot water the climatic adjustment will not affect the temperature of the domestic water set.

Unless specified otherwise when placing the order, standard programming involves negative compensation (for both setpoints) as shown in the diagrams below. All the settings can be modified directly by the controller device.

Maximum and minimum voltage relays (accessory)

This device continuously monitors the supply voltage of the unit, thereby verifying that it remains within a permissible range. When the voltage goes exceeds or drops below the range, the device stops the unit to avoid damaging the electric motors.

The device also monitors the phase sequence.

Condensation/evaporation control with an rpm regulator (series)

The unit's microprocessor control controls all the operational parameters of the unit and carries out constant adjustment of the fan speed by means of an rpm regulator in order to optimise the operating conditions and the unit's efficiency.

Moreover, this adjustment is able to reduce the noise made by the unit. In fact, the typical conditions which the fan speed modulator controls are the night-time and in-between season operation.

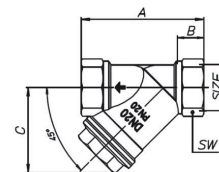
This means that whenever possible, the machine decreases the fan speed to its minimum and, therefore, reduces noise.

Water filter (accessory)

The water filter, which is placed at the unit's water input, has the aim of preventing sludge, operational residues or other things from clogging the unit's exchangers. At the input of each circuit, it is compulsory to have: a filter with a mesh of 0.4 or 0.5 mm at the source, delivery and recovery.

Not having a filter automatically voids the warranty.

The following filters are supplied as accessories:



Condensation-collecting tank (series)

The objective of the condensation-collecting tank is to collect and convey the water coming from melting ice during defrosting. The tank has a connection to which a discharge pipe can be connected.

This accessory is compulsory when installed in a passageway.

INSTALLATION RECOMMENDATIONS

The following indications help improve the use of heat pumps in systems and prevent installation problems.

1. Heat pumps are often coupled with radiant heating systems. Should the radiant system be by area with control of each single head of the collector, it is compulsory to provide at least 20 litres of water per kW of heat performance of the unit in conditions of minimum containment of water, or rather, with all the heads closed. This is required since a situation may be possible in which nearly all the heads are closed and the heat pump has to work with an extremely reduced volume of water. In this case, during defrosting, it is possible that the safety devices intervene due to the excessive cooling of the water.
2. In the DWS version or with the use of "automatic management of DHW", it is compulsory to operate the recovery exchanger on technical water and not on the coil. In fact, coupling the heat pump with the coil has proved, time and again, to be problematic due to incorrect sizing of the surface of the coil.
3. In the DWS version or with the use of "automatic management of DHW", it is fundamental to install the supplied temperature probe. The tank to store DHW must have a well on the upper part long enough to nearly reach the centre of the tank. The probe supplied with the unit must be inserted into the well with conductive paste to enable the probe to accurately read the temperature of the tank. Incorrect temperature reading, caused by incorrect positioning, may lead to a safety intervention or the unit blocking.
4. When using "DHW automatic management" logic, it is necessary to use a 3-way valve which, during switching, still enables a flow of water and a situation of a blocked or reduced flow never happens.
5. Any integration of water into the waterworks must never be inserted in the heat pump input piping. Cold water gushing into the "hot" exchanger may cause a safety intervention. If a tank is used, integration input of water from the waterworks supply must not flow directly into the input pipes of the heat pump.
6. For the following reasons, it is not advisable to position the unit sets on the limits of operation:
 - a. Modify room temperature. The room temperature varies and may cause the unit to work out of limits.
 - b. Presence of water filter. The water filter must always be present in the water input of the unit; failure will void the warranty. Over time, the filter will definitely get dirty. A dirty filter will increase a load loss and, consequently, capacity. DT increases and may go from 4/5° to 9/10°, causing a safety intervention.
 - c. If the hydraulic circuit provides for various areas, it can happen that, when closing the circuit, the pump has to work on the remaining hydraulic circuit. This way, load losses increase, there will be a decrease in capacity and therefore an increase in DT with a possible safety intervention.
 - d. In summer, the unit will be subjected to solar radiation. Hypothesising the air to be at 35°, the battery (made of copper and aluminium and therefore a good conductor) will be at a much higher temperature. When the unit is started, even with the fans off, evaporation will be very high, thus definitely causing the high-pressure pressure switch to intervene.
 - e. Air recirculation may generate a micro-environment with temperatures even less than 4/5°, making the unit work out of its limits.
 - f. The spaces to observe are very important; upstream or downstream clogging of the fan creates load losses that reduce air capacity. This reduction may cause a decrease in operating temperature. This decrease may make the unit go beyond its operation limits.
 - g. Air in the circuit. Even though it is well vented, the air in the system creates thermal exchange coefficient losses and, consequently, a possible high-pressure safety intervention.
7. Use of the unit to dry screed. When a house is built, large quantities of water are used for the mortar, plaster, gypsum, and screed, which then evaporate very slowly after work has been completed. Moreover, rain may definitely increase the rate of humidity of the construction. Due to the high level of humidity present in the entire work, the thermal requirement of the building is very high in the first two periods of heating. Drying of masonry works must be carried out with special equipment. If the thermal capacity of the heat pump has been sufficiently provided for the home, and drying occurs in autumn or winter, you are advised to install additional electrical resistance to compensate for the greater thermal requirement.
8. Starting the system with low external temperature. On starting the system during the winter months, particularly cold water temperatures that are out of the system's operating limits may cause a safety intervention. To make the system run, just reduce the thermal load by disconnecting part of the system. When part of the system's water temperature has been brought within operating limits, it will be possible to reconnect the part of the system that had been previously disconnected.
9. During defrosting, the unit cools the system water in order to eliminate ice in the battery. To avoid any problems, it is advisable to add storage of at least 20 litres of water per thermal kW of the unit.

INSTALLATION ACOUSTICS ASPECTS

It is advisable to keep the following in mind in order to install the unit correctly:

- > Installing the unit close to walls, partitions or similar creates reverberations that increase noise input into the environment.
- > Depending on the place of installation, the measured value may vary in excess.
- > Consider any sensitive receptors when installing the unit, avoid installing the unit close to bedrooms.
- > Verify the acoustic regulations in force where the unit will be installed in order to check the absolute and differential limit.
- > Irrespective of the acoustic class of the territory keep in mind that there is a daytime and night-time differential criteria.

DIFFERENTIAL CRITERIA

The differential level of noise and the difference between the level of environmental noise (meaning what is present when the source of noise that causes disturbance is in operation) and the level of residual noise (meaning the background noise). The level of differential noise must not exceed the following differential limit values of input :

- > 5 dB(A) for daytime periods (from 6.00 a.m. to 10 p.m.)
- > 3 dB(A) for night-time periods (from 10 p.m. to 6 a.m.)

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TECHNICAL
FEATURES

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Technical data ENERGYCAL AW PRO AT

UNIT SIZE				50	60	70	80	90
Heating								
Heating (Gross values) (A7;W35)								
Nominal heating capacity	(1)	kW		40,2	48,9	54,8	67,7	74,0
Heating power input	(1),(2)	kW		9,7	11,5	13,3	16,1	17,8
COP	(1)			4,14	4,26	4,12	4,19	4,15
Efficiency class in heating floor				A	A	A	A	A
Heating (EN 14511) (A7;W35)								
Nominal heating capacity	(1)	kW		40,4	49,2	55,1	68,0	74,4
COP	(1)			4,07	4,18	4,05	4,13	4,09
Efficiency class in heating floor				A	A	A	A	A
Heating (Gross values) (A7;W45)								
Nominal heating capacity	(3)	kW		41,5	49,9	56,0	69,2	75,6
Heating absorbed power	(3),(2)	kW		12,2	14,4	16,8	20,0	22,0
COP	(3)			3,41	3,46	3,33	3,46	3,44
Efficiency class				A	A	A	A	A
Heating (EN 14511) (A7;W45)								
Nominal heating capacity	(3)	kW		41,7	50,2	56,3	69,5	76,0
COP	(3)			3,37	3,41	3,30	3,42	3,40
Efficiency class				A	A	A	A	A
Cooling								
Cooling (Gross values) (A35;W18)								
Nominal cooling capacity	(4)	kW		48,3	55,2	68,6	79,0	90,2
Cooling power input	(4),(2)	kW		13,1	15,4	19,2	21,2	25,1
EER	(4)			3,69	3,59	3,57	3,73	3,59
Efficiency class in heating floor				B	C	C	B	C
Cooling (EN 14511 values) (A35;W18)								
Nominal cooling capacity	(4)	kW		48,1	54,9	68,3	78,7	89,8
EER	(4)			3,62	3,51	3,50	3,65	3,52
Efficiency class in heating floor				C	C	C	B	C
Cooling (Gross values) (A35;W7)								
Nominal cooling capacity	(5)	kW		37,6	43,1	53,5	61,3	70,0
Cooling power input	(5),(2)	kW		12,5	14,5	18,0	20,5	23,5
EER	(5)			3,00	2,96	2,98	3,00	2,98
ESEER				4,33	4,13	4,45	4,50	4,49
Efficiency class				B	B	B	B	B
Cooling (EN 14511 values) (A35;W7)								
Nominal cooling capacity	(5)	kW		37,4	42,8	53,2	61,0	69,6
EER	(5)			2,93	2,89	2,92	2,93	2,92
Efficiency class				B	C	B	B	B

(1) External air temperature 7°C DB, 6°C WB; condenser input-output temperature 30-35°C
(2) The total power is given by the sum of the power absorbed by the compressors and by the fans
(3) External air temperature 7°C DB, 6°C WB; condenser input-output temperature 40-45°C
(4) External air temperature 35°C; input water-evaporator output temperature 12-7°C
(5) External air temperature 35°C; input water-evaporator output temperature 23-18°C

Technical data ENERGYCAL AW PRO AT

UNIT SIZE			52	62	72	82	92
Compressor							
Type			Scroll	Scroll	Scroll	Scroll	Scroll
Quantity		n°	2	2	2	2	2
Refrigerant circuits		n°	1	1	1	1	1
Capacity steps		%	0-50-100%	0-50-100%	0-50-100%	0-50-100%	0-50-100%
Total oil charge		Kg	3,8	6,8	6,8	6,8	6,8
Total refrigerant charge		Kg	14,0	18,0	19,0	23,0	25,0
Fans							
Type			Axial	Axial	Axial	Axial	Axial
Quantity		n°	1	1	1	1	1
Air flow		m³/s	4,722	5,139	5,139	5,833	5,833
Air flow		m³/h	17000	18500	18500	21000	21000
User side exchanger							
Type			Plate	Plate	Plate	Plate	Plate
Quantity		n°	1	1	1	1	1
Water content		l	5,2	6,5	7,8	9,1	10,4
Water flow rate (A7;W35)	(1)	l/h	6948	8461	9475	11694	12794
Pressure drop Water (A7;W35)		kPa	30	33	31	35	34
Hydraulic module							
Pump model			P1	P1	P1	P1	P1
Useful pump head		kPa	167	160	159	146	142
Noise							
Sound power level	(2)	dB(A)	83	83	84	85	85
Noise pressure level	(3)	dB(A)	55	55	56	57	57
Noise LN (Low Noise) version							
Sound power level	(2)	dB(A)	81	81	82	83	83
Noise pressure level	(3)	dB(A)	53	53	54	55	55
Noise SLN (Super Low Noise) version							
Sound power level	(2)	dB(A)	78	78	79	-	-
Noise pressure level	(3)	dB(A)	50	50	51	-	-
Dimensions and weight standard unit							
Height		mm	1403	1403	1403	1403	1403
Length		mm	1791	1791	1791	1791	1791
Depth		mm	2390	2390	2390	2390	2390
Weight		kg	575	592	602	620	631

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PRO AT**

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STANDARD UNIT
TECHNICAL DATA

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(1) External air temperature 7°C DB, 6°C WB; condenser input-output temperature 30-35°C

(2) Lw: sound power values in free field calculated in compliance with ISO 3744. Chiller working conditions (A35;W7)

(3) Lp: Sound pressure levels refer to 10 meters from unit in free field compliant to ISO 3744. Chiller working conditions (A35;W7)

Electrical data ENERGYCAL AW PRO AT

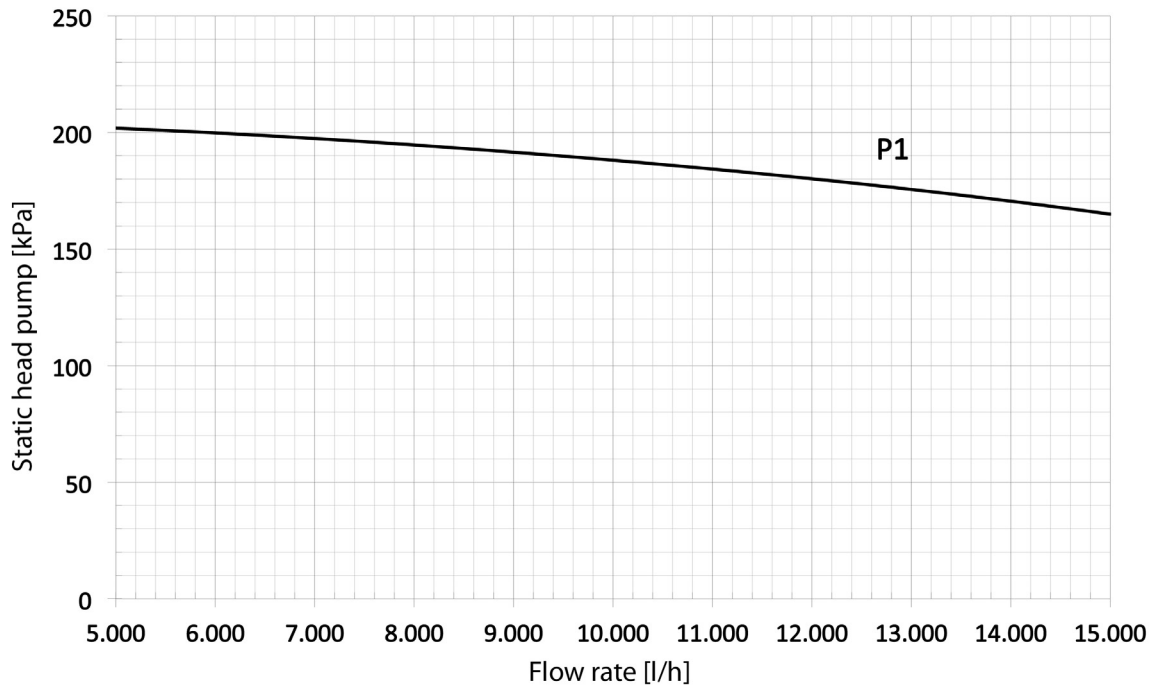
UNIT SIZE			50	60	70	80	90
Maximum absorbed power	(1)	kW	20,2	23,8	27,7	32,4	38,1
Maximum absorbed power with pump	(1)	kW	21,6	25,2	29,1	33,8	39,5
Maximum absorbed current	(2)	A	35,9	41,1	45,9	55,9	74,7
Maximum absorbed current with pump	(2)	A	38,6	43,8	48,6	58,6	77,4
Maximum current at peak	(3)	A	121	151	143	170	213
Maximum current at peak with soft-starter	(3)	A	81	101	96	114	143
Maximum current at peak with pump	(3)	A	124	153	146	173	216
Maximum current at peak with pump and soft-starter		A	83	103	98	116	145
Fan nominal power		kW	1,7	1,7	1,7	1,7	1,7
Fan nominal current		A	3,9	3,9	3,9	3,9	3,9
Pump motor nominal power		kW	1,4	1,4	1,4	1,4	1,4
Pump motor nominal current		A	2,7	2,7	2,7	2,7	2,7
Electric power supply		V/ph/Hz	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50
Optional power supply		V/ph/Hz	230/1~/50	230/1~/50	230/1~/50	230/1~/50	230/1~/50

1) Electric power that must be available from the electric network for the unit to work.

(2) Current at which the units' internal protections intervene. It is the maximum current absorbed by the unit. This value must never be exceeded and must be taken into account when sizing the line and the relative protection devices (see the wiring diagram supplied with the units).

(3) The values between brackets refer to the ST version units with the maximum number of pumps available (with or without storage tank).

PUMP DIAGRAMS ENERGYCAL AW PRO AT



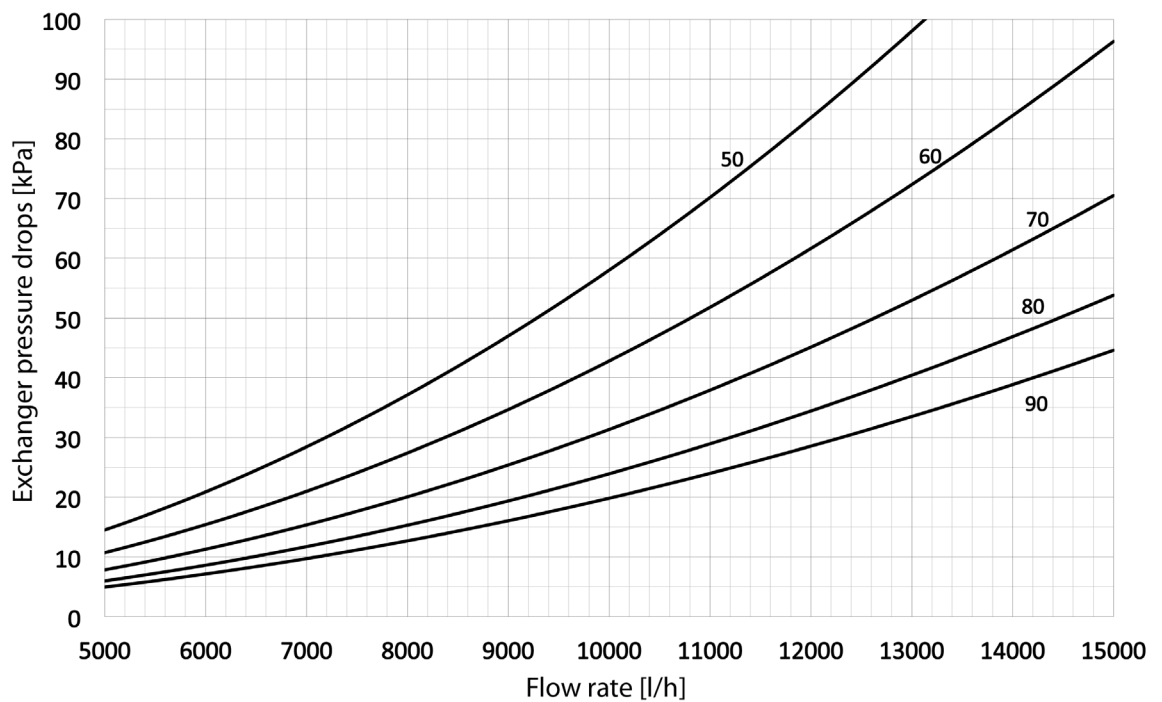
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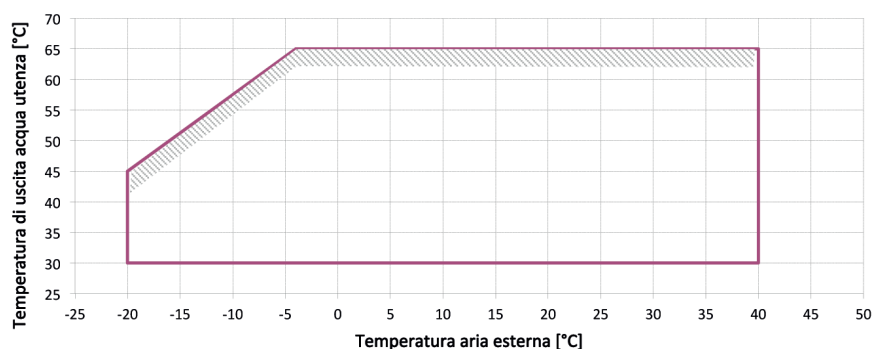
EXCHANGER
DATA

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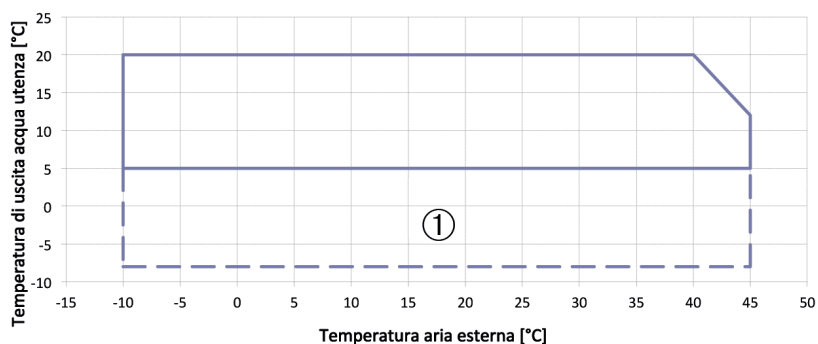
EXCHANGER DIAGRAMS PRESSURE DROPS ENERGYCAL AW PRO AT



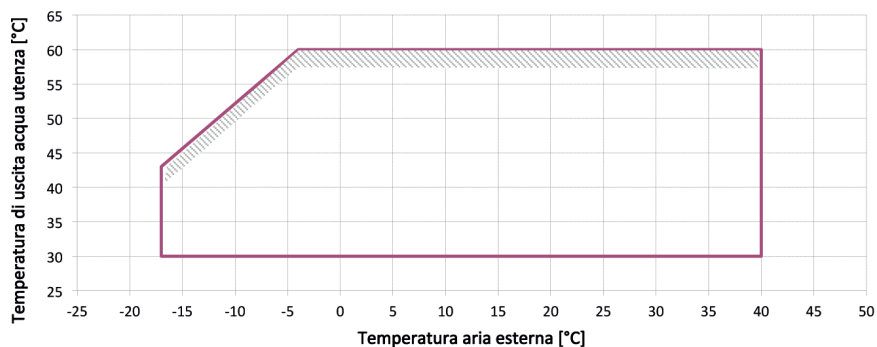
HEATING



COOLING



RECOVERY



Notes

- > The thermal gradient to the utility side exchanger must be between 3°C and 6°C
- > ①: the unit can only operate in this area with evaporator side glycol water
- > heating mode: Inlet water temperature cannot be lower than 25°C
- > When the unit works out of the operating limits pay attention to the allarms caused from incorrect working conditions



The unit can work within this operating limits for a limited time

Noise levels ENERGYCAL AW PRO AT

UNIT SIZE	Standard Version		/LN Version		/SLN Version	
	Totale [dB(A)]		Totale [dB(A)]		Totale [dB(A)]	
	Lw	Lp	Lw	Lp	Lw	Lp
50	83	55	81	53	78	50
60	83	55	81	53	78	50
70	84	56	82	54	79	51
80	85	57	83	55	-	-
90	85	57	83	55	-	-

Lw: sound power values in free field calculated in compliance with ISO 3744. Chiller working conditions (A35;W7)

Lp: sound pressure levels detected at 10 m from the fan side unit, not channelled in free field, in compliance with ISO 3744. Chiller working conditions (A35;W7)

DESCRIPTION /LN VERSION

The unit is provided with the following accessories:

- > Insulated Compressor box with low sound emission

DESCRIPTION /SLN VERSION

The unit is provided with the following accessories:

- > Insulated Compressor box with low sound emission .
- > Oversized condensing coils
- > EC Fan (Electronic type with High efficiency performance)
- > FANS with LOW NOISE setting

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NOISE
LEVELS

COOLING CAPACITY ENERGYCAL AW PRO AT

MODEL	To	External air temperature [°C]									
	[°C]	25		30		35		40		43	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
50	5	36,6	10	36	11,2	35,5	12,6	34,8	14,2	34,5	15,2
	6	37,7	10,1	37,1	11,3	36,5	12,7	35,9	14,3	35,5	15,4
	7	38,6	10,1	38	11,3	37,4	12,8	36,8	14,4	36,4	15,5
	8	39,6	10,2	39	11,4	38,3	12,9	37,6	14,5	37,3	15,6
	9	40,6	10,3	39,9	11,5	39,2	13	38,5	14,7	38,2	15,8
	10	41,6	10,3	40,9	11,6	40,1	13,1	39,4	14,8	39,1	15,9
	12	43,6	10,5	42,8	11,8	42	13,3	41,3	15	40,9	16,2
	14	45,7	10,6	44,9	11,9	44	13,5	43,2	15,3	42,8	16,5
	16	47,9	10,8	47	12,1	46	13,7	45,2	15,5	*	*
	18	50,2	10,9	49,1	12,3	48,1	13,9	47,3	15,8	*	*
60	5	42,4	11,5	41,5	12,9	40,6	14,6	39,6	16,6	39	17,9
	6	43,7	11,5	42,8	13	41,8	14,7	40,7	16,7	40,1	18
	7	44,8	11,6	43,8	13,1	42,8	14,8	41,7	16,8	41,1	18,1
	8	46	11,6	44,9	13,2	43,8	14,9	42,7	16,9	42,1	18,3
	9	47,1	11,7	46	13,2	44,9	15	43,7	17	43,1	18,4
	10	48,3	11,7	47,1	13,3	45,9	15,1	44,7	17,2	44,1	18,5
	12	50,7	11,8	49,4	13,4	48,1	15,3	46,8	17,4	46,1	18,8
	14	53,2	11,9	51,7	13,6	50,3	15,5	49	17,6	48,2	19,1
	16	55,7	12	54,1	13,7	52,6	15,6	51,2	17,8	*	*
	18	58,4	12,1	56,6	13,8	54,9	15,8	53,5	18,1	*	*
70	5	52,7	14,1	51,6	16	50,5	18	49,3	20,4	48,6	22,1
	6	54,3	14,2	53,1	16	51,9	18,2	50,7	20,6	50,1	22,2
	7	55,6	14,3	54,4	16,1	53,2	18,3	52	20,7	51,3	22,4
	8	57	14,3	55,7	16,2	54,5	18,4	53,2	20,9	52,5	22,6
	9	58,4	14,4	57,1	16,3	55,8	18,5	54,5	21	53,7	22,7
	10	60,2	14,5	58,5	16,4	57,1	18,6	55,8	21,2	55	22,9
	12	62,9	14,6	61,3	16,6	59,7	18,9	58,4	21,5	57,6	23,2
	14	65,9	14,7	64,2	16,7	62,5	19,1	61,1	21,7	60,2	23,5
	16	69,1	14,8	67,2	16,9	65,4	19,3	63,8	22	*	*
	18	72,4	14,9	70,3	17,1	68,3	19,5	66,7	22,3	*	*
80	5	60,3	16,2	59,1	18,2	57,8	20,5	56,2	23,2	55,2	25
	6	62,2	16,3	60,9	18,3	59,5	20,7	57,9	23,4	57	25,2
	7	63,8	16,3	62,4	18,4	61	20,8	59,4	23,6	58,4	25,4
	8	65,4	16,4	64	18,5	62,5	21	60,8	23,8	59,9	25,6
	9	67,1	16,5	65,6	18,7	64	21,1	62,3	23,9	61,3	25,8
	10	68,7	16,6	67,2	18,8	65,6	21,2	63,8	24,1	62,8	26
	12	72,2	16,8	70,5	19	68,7	21,5	66,9	24,4	65,8	26,4
	14	75,8	16,9	73,9	19,2	71,9	21,8	70,1	24,8	68,9	26,8
	16	79,5	17,1	77,4	19,4	75,3	22,1	73,3	25,1	*	*
	18	83,3	17,2	81	19,6	78,7	22,3	76,6	25,5	*	*
90	5	68,8	18,5	67,5	20,8	65,9	23,5	64,1	26,6	63	28,7
	6	71	18,6	69,5	21	67,9	23,7	66,1	26,8	65	28,9
	7	72,8	18,7	71,3	21,1	69,6	23,8	67,7	27	66,6	29,1
	8	74,7	18,8	73	21,2	71,3	24	69,4	27,2	68,3	29,3
	9	76,5	18,9	74,8	21,4	73	24,2	71,1	27,4	69,9	29,6
	10	78,5	19	76,7	21,5	74,8	24,3	72,8	27,6	71,6	29,8
	12	82,4	19,2	80,4	21,7	78,4	24,6	76,3	28	75,1	30,2
	14	86,5	19,4	84,3	22	82,1	25	79,9	28,4	78,6	30,7
	16	90,7	19,5	88,3	22,2	85,9	25,3	83,6	28,8	*	*
	18	95,1	19,7	92,4	22,4	89,8	25,6	87,4	29,2	*	*

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COOLING
AND
HEATING
CAPACITY

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To: evaporator outgoing water temperature [°C]

kWf : cooling capacity [kW]

kWe: electrical power absorbed. Sum of the absorption of the compressor, fan section, the pump power for the internal pressure drops [kW]

The technical documentation can be improved all the times. Viessmann can update, time by time, all technical data in order to improve all necessary information for the customer.

HEATING CAPACITY ENERGYCAL AW PRO AT

MODEL	Ta	RH	Water temperature at condenser inlet / outlet [°C]									
	[°C]	%	30/35		35/40		40/45		45/50		50/55	
			kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe
50	-15	90	25,9	9,6	26,3	10,7	26,8	12	27,2	13,4	*	*
	-12	90	27,8	9,7	28,3	10,8	28,8	12,1	29,4	13,5	30,1	15,2
	-10	90	29	9,7	29,6	10,8	30,2	12,2	30,9	13,6	31,7	15,3
	-7	90	30,9	9,7	31,5	10,9	32,2	12,2	33	13,8	33,9	15,5
	-5	80	31,9	9,7	32,6	10,9	33,3	12,3	34,1	13,8	35,1	15,6
	-2	80	33,9	9,7	34,6	10,9	35,3	12,3	36,2	13,9	37,3	15,7
	0	80	35,3	9,7	36	11	36,7	12,4	37,7	14	38,8	15,8
	2	80	36,7	9,7	37,3	11	38	12,4	39	14	40,2	15,8
	5	80	38,8	9,7	39,4	11	40,2	12,4	41,2	14	42,4	15,9
	7	80	40,4	9,7	40,9	11	41,7	12,4	42,6	14,1	43,9	15,9
	10	70	42	9,7	42,5	11	43,2	12,4	44,2	14,1	45,4	16
	12	70	43,6	9,7	44	10,9	44,7	12,4	45,7	14,1	46,9	16
	15	70	46,1	9,7	46,5	10,9	47,1	12,4	48	14,1	49,3	16
	20	70	50,6	9,6	50,8	10,9	51,2	12,3	52,1	14	53,3	16
60	-15	90	31,3	11,7	31,5	13,1	31,6	14,7	31,6	16,7	*	*
	-12	90	33,6	11,7	34	13,1	34,3	14,8	34,5	16,7	34,5	19
	-10	90	35,2	11,7	35,6	13,2	36	14,8	36,4	16,8	36,5	19
	-7	90	37,5	11,7	38,1	13,2	38,6	14,9	39,1	16,8	39,5	19,1
	-5	80	38,8	11,7	39,4	13,2	39,9	14,9	40,5	16,8	41	19,1
	-2	80	41,3	11,7	41,8	13,2	42,4	14,9	43,1	16,8	43,8	19,1
	0	80	43	11,7	43,6	13,2	44,2	14,9	44,9	16,8	45,6	19,1
	2	80	44,6	11,6	45,2	13,1	45,8	14,8	46,6	16,8	47,4	19,1
	5	80	47,3	11,6	47,8	13,1	48,4	14,8	49,2	16,8	50,1	19,1
	7	80	49,2	11,5	49,6	13	50,2	14,8	51	16,8	51,9	19,1
	10	70	51,2	11,4	51,6	13	52,1	14,7	52,9	16,7	53,8	19
	12	70	53,2	11,4	53,5	12,9	53,9	14,7	54,7	16,7	55,6	19
	15	70	56,3	11,2	56,5	12,8	56,8	14,5	57,5	16,6	58,3	18,9
	20	70	62	11	61,8	12,5	61,9	14,3	62,4	16,4	63,1	18,7
70	-15	90	35	13,5	35,3	15,2	35,4	17,1	35,4	19,3	*	*
	-12	90	37,6	13,6	38	15,2	38,4	17,2	38,7	19,4	38,8	22
	-10	90	39,3	13,6	39,9	15,3	40,4	17,2	40,8	19,4	41,1	22
	-7	90	42	13,6	42,6	15,3	43,2	17,2	43,9	19,5	44,4	22,1
	-5	80	43,4	13,6	44,1	15,3	44,7	17,2	45,4	19,5	46,1	22,1
	-2	80	46,2	13,6	46,8	15,3	47,6	17,2	48,4	19,5	49,3	22,1
	0	80	48,1	13,5	48,8	15,2	49,5	17,2	50,4	19,5	51,4	22,1
	2	80	49,9	13,5	50,6	15,2	51,3	17,2	52,3	19,5	53,4	22,1
	5	80	53	13,4	53,6	15,1	54,3	17,1	55,3	19,5	56,4	22,1
	7	80	55,1	13,3	55,6	15,1	56,3	17,1	57,3	19,4	58,5	22,1
	10	70	57,3	13,2	57,8	15	58,4	17	59,4	19,4	60,6	22
	12	70	59,6	13,1	59,9	14,9	60,5	17	61,4	19,3	62,7	22
	15	70	63,1	13	63,3	14,8	63,7	16,8	64,6	19,2	65,8	21,9
	20	70	69,4	12,7	69,3	14,5	69,4	16,6	70,1	19	71,2	21,7

HEATING CAPACITY ENERGYCAL AW PRO AT

MODEL	Ta	RH	Water temperature at condenser inlet / outlet [°C]									
	[°C]	%	30/35		35/40		40/45		45/50		50/55	
			kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe
80	-15	90	43,2	16,1	43,5	18	43,5	20,3	43,4	23	*	*
	-12	90	46,5	16,1	47	18,1	47,3	20,4	47,5	23,1	47,4	26,2
	-10	90	48,7	16,1	49,3	18,1	49,8	20,4	50,1	23,1	50,3	26,2
	-7	90	52	16,1	52,7	18,2	53,4	20,5	54	23,2	54,5	26,3
	-5	80	53,7	16,1	54,5	18,2	55,2	20,5	56	23,2	56,6	26,4
	-2	80	57,1	16,1	57,9	18,2	58,8	20,5	59,7	23,2	60,6	26,4
	0	80	59,5	16,1	60,3	18,1	61,2	20,5	62,2	23,2	63,2	26,4
	2	80	61,7	16	62,5	18,1	63,4	20,5	64,5	23,2	65,6	26,4
	5	80	65,5	15,9	66,2	18	67,1	20,4	68,2	23,2	69,4	26,4
	7	80	68	15,9	68,7	18	69,5	20,4	70,6	23,2	71,9	26,3
	10	70	70,8	15,8	71,3	17,9	72,1	20,3	73,2	23,1	74,5	26,3
	12	70	73,4	15,7	73,9	17,8	74,6	20,2	75,7	23	77	26,2
	15	70	77,7	15,5	78	17,7	78,5	20,1	79,5	22,9	80,8	26,1
	20	70	85,4	15,2	85,2	17,3	85,5	19,8	86,2	22,7	87,4	25,9
90	-15	90	47,3	17,7	47,6	19,8	47,7	22,3	47,5	25,3	*	*
	-12	90	50,9	17,7	51,4	19,9	51,8	22,4	52	25,4	51,9	28,8
	-10	90	53,3	17,8	53,9	19,9	54,5	22,5	54,9	25,5	55,1	28,9
	-7	90	56,9	17,8	57,7	20	58,4	22,5	59,1	25,5	59,6	29
	-5	80	58,8	17,8	59,6	20	60,4	22,6	61,2	25,5	61,9	29
	-2	80	62,5	17,7	63,4	20	64,3	22,6	65,3	25,6	66,2	29
	0	80	65,1	17,7	66	19,9	66,9	22,6	68	25,6	69,1	29
	2	80	67,6	17,6	68,4	19,9	69,4	22,5	70,5	25,6	71,7	29
	5	80	71,6	17,5	72,4	19,8	73,3	22,5	74,5	25,5	75,8	29
	7	80	74,4	17,4	75,1	19,8	76	22,4	77,2	25,5	78,6	29
	10	70	77,4	17,3	78	19,7	78,8	22,3	80	25,4	81,4	28,9
	12	70	80,4	17,2	80,8	19,6	81,6	22,3	82,7	25,3	84,1	28,9
	15	70	85	17,1	85,3	19,4	85,9	22,1	86,9	25,2	88,3	28,7
	20	70	93,4	16,7	93,2	19,1	93,5	21,8	94,2	24,9	95,4	28,5

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COOLING
AND
HEATING
CAPACITY

33

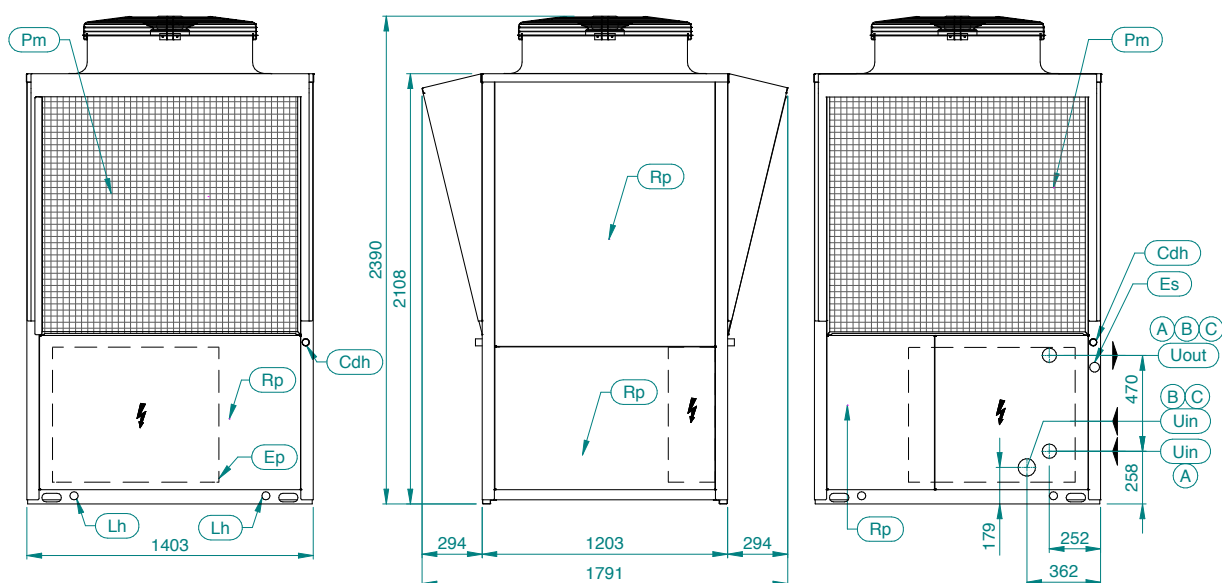
Ta: evaporator intake air temperature dry bulb [°C]

kWt: Heating capacity [kW]

RH: evaporator intake air relative humidity [%]

kWe: electrical power absorbed. Sum of the absorption of the compressor, fan section, the pump power for the internal pressure drops [kW]

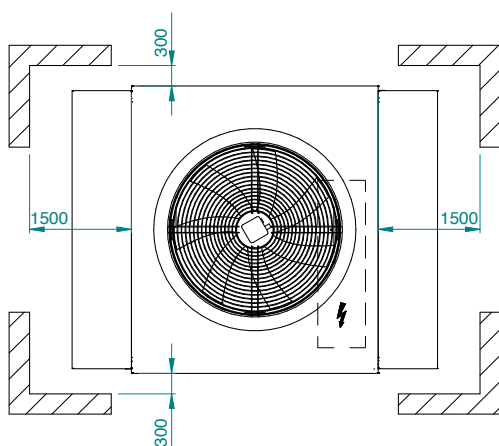
The technical documentation can be improved all the times. Viessmann can update, time by time, all technical data in order to improve all necessary information for the customer.



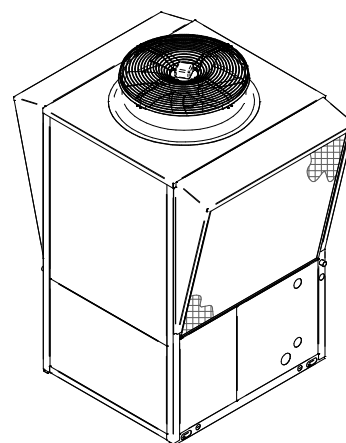
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DIMENSIONAL
DRAWING

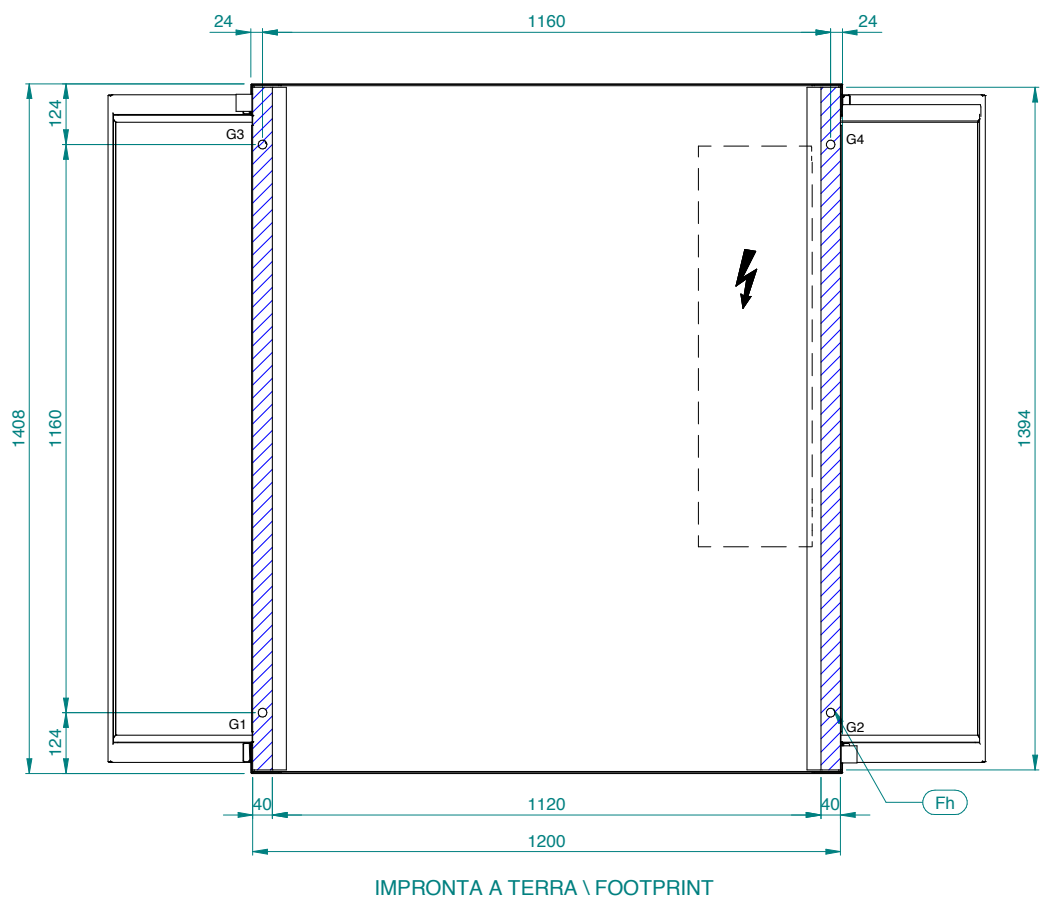


SPAZI DI INSTALLAZIONE / CLEARANCES



36

Ep	QUADRO ELETTRICO ELECTRICAL PANEL	Rp	PANNELLO ASPORTABILE REMOVABLE PANEL	CONNESSIONI IDRAULICHE / HYDRAULIC CONNECTIONS		
Es	INGRESSO ALIMENTAZIONE ELETTRICA ELECTRICAL SUPPLY INLET	Cdh	SCARICO CONDENZA CONDENSATE DRAIN	A	MODELLO STANDARD	STANDARD MODEL
Lh	FORI DI SOLLEVAMENTO LIFTING HOLES	Uin	INGRESSO ACQUA UTILIZZO USER WATER INLET	B	MODELLO 1P (1 pompa) 1P MODEL (1 pump)	
Pm	GRIGLIE DI PROTEZIONE PROTECTIVE METAL MESH	Uout	USCITA ACQUA UTILIZZO USER WATER OUTLET	C	MODELLO 2P (2 pompe) 2P MODEL (2 pumps)	
*	OPZIONALE OPTIONAL			DIMENSIONI / DIMENSIONS		
				LUNGHEZZA WIDTH	PROFONDITA' DEPTH	ALTEZZA HEIGHT
				1403	1791	2390



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DIMENSIONAL
DRAWING

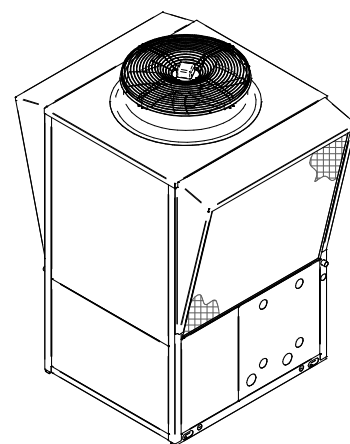
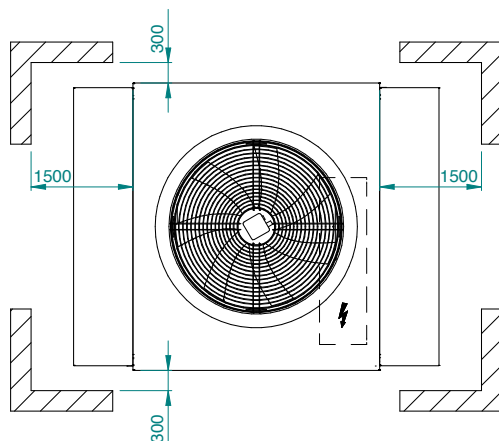
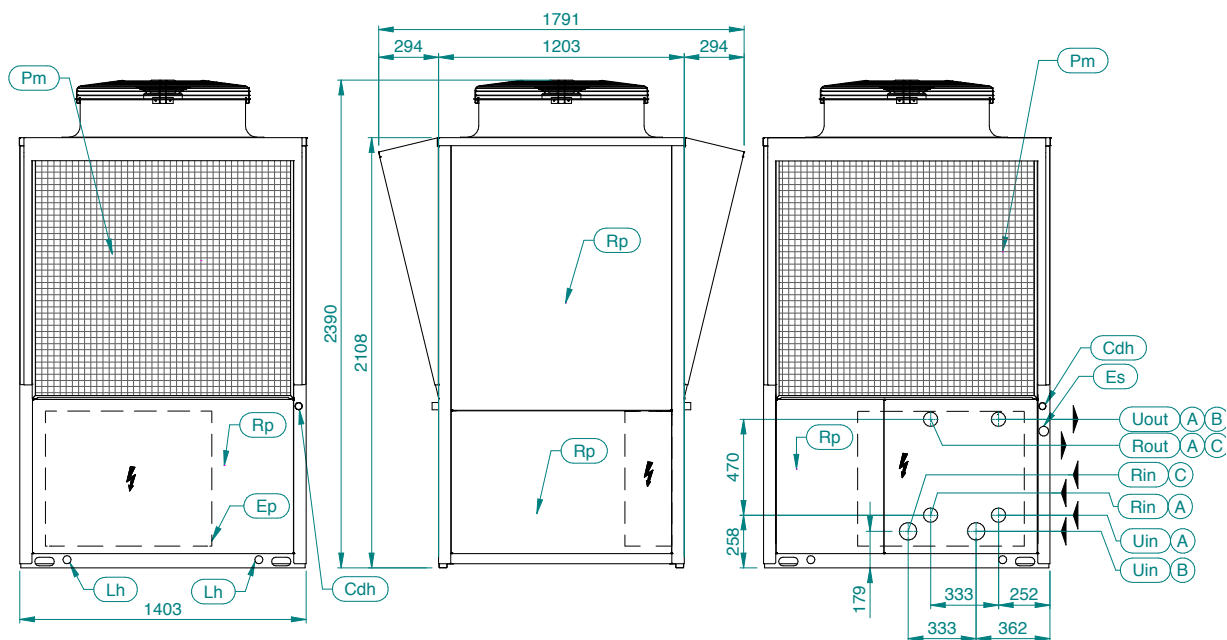
37

Fh	FORI DI FISSAGGIO	Ø18
	FIXING HOLES	
G..	PUNTI DI APPOGGIO ANTIVIBRANTI	
	VIBRATION DAMPER FOOT HOLDS	

MODELLO MODEL	G1 (kg)	G2 (kg)	G3 (kg)	G4 (kg)
50	158	164	152	111
60	163	169	157	114
70	165	171	159	116
80	170	176	164	120
90	173	179	167	122

MODELLO MODEL	PESO WEIGHT (kg)	PESO IN FUNZIONE OPERATING WEIGHT (kg)
50	582	585
60	599	602
70	609	612
80	627	630
90	638	641
Δ PESO Δ WEIGHT	MOD. 1P	20
Δ PESO Δ WEIGHT	MOD. 2P	40

ENERGYCAL AW PRO AT /DWS 50 - 60 - 70 - 80 - 90



SPAZI DI INSTALLAZIONE / CLEARANCES

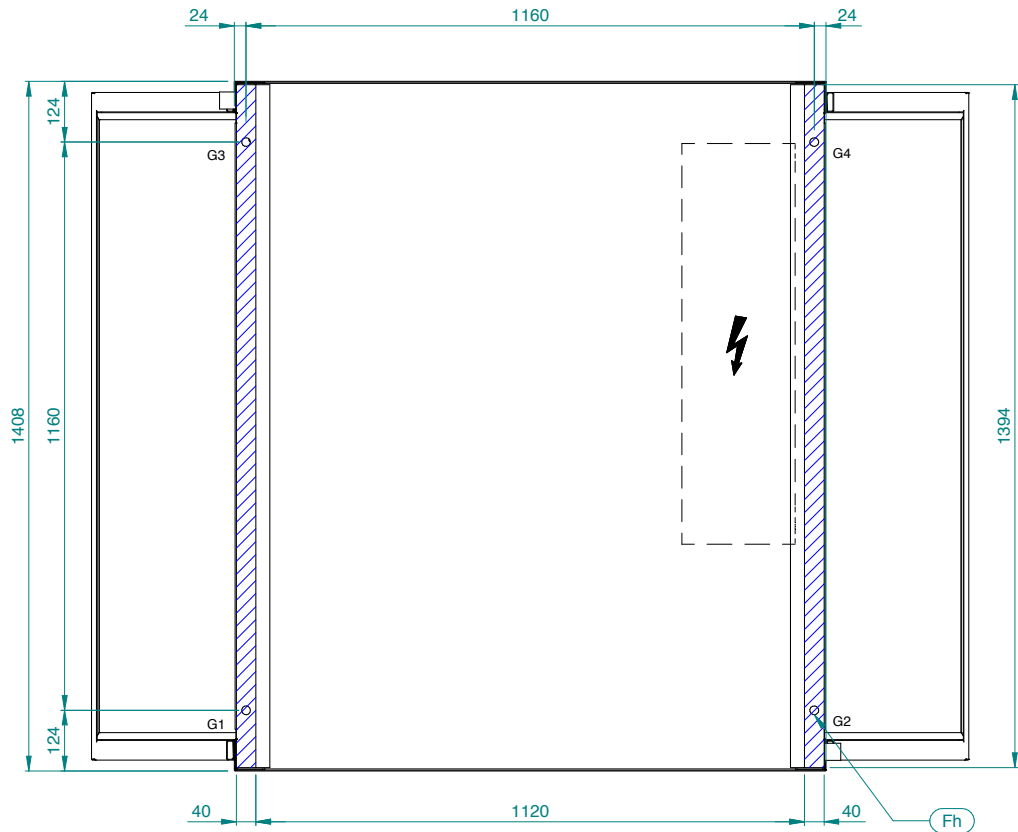
40

Ep	QUADRO ELETTRICO ELECTRICAL PANEL	Cdh	SCARICO CONDENSE VERSIONE HP CONDENSATE DRAIN HP VERSION	ø35	CONNESSIONI IDRAULICHE / HYDRAULIC CONNECTIONS		
Es	INGRESSO ALIMENTAZIONE ELETTRICA ELECTRICAL SUPPLY INLET	Uin	INGRESSO ACQUA UTILIZZO USER WATER INLET	1" 1/2 BSPM (A) 2" BSPM (B)	A	MODELLO STANDARD	STANDARD MODEL
Lh	FORI DI SOLLEVAMENTO LIFTING HOLES	Uout	USCITA ACQUA UTILIZZO USER WATER OUTLET	1" 1/2 BSPM	B	MODELLO 1P - 2P (1-2 pompe) 1P - 2P MODEL (1-2 pump/s)	
Pm	GRIGLIE DI PROTEZIONE PROTECTIVE METAL MESH	Rin	INGRESSO ACQUA RECUPERO RECOVERY WATER INLET	1" 1/2 BSPM (A) 2" BSPM (C)	C	MODELLO 1R (1p recup.) 1R MODEL (1p recov.)	
Rp	PANNELLO ASPORTABILE REMOVABLE PANEL	Rout	USCITA ACQUA RECUPERO RECOVERY WATER OUTLET	1" 1/2 BSPM	DIMENSIONI / DIMENSIONS		
					LUNGHEZZA WIDTH	PROFONDITA' DEPTH	ALTEZZA HEIGHT
					1403	1791	2390

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ENERGYCAL AW
PRO AT

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DIMENSIONAL
DRAWING



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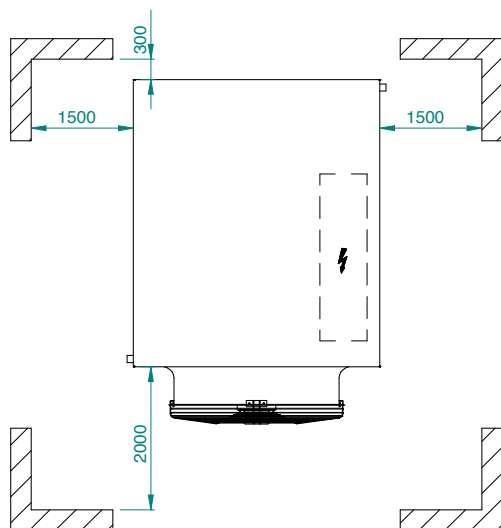
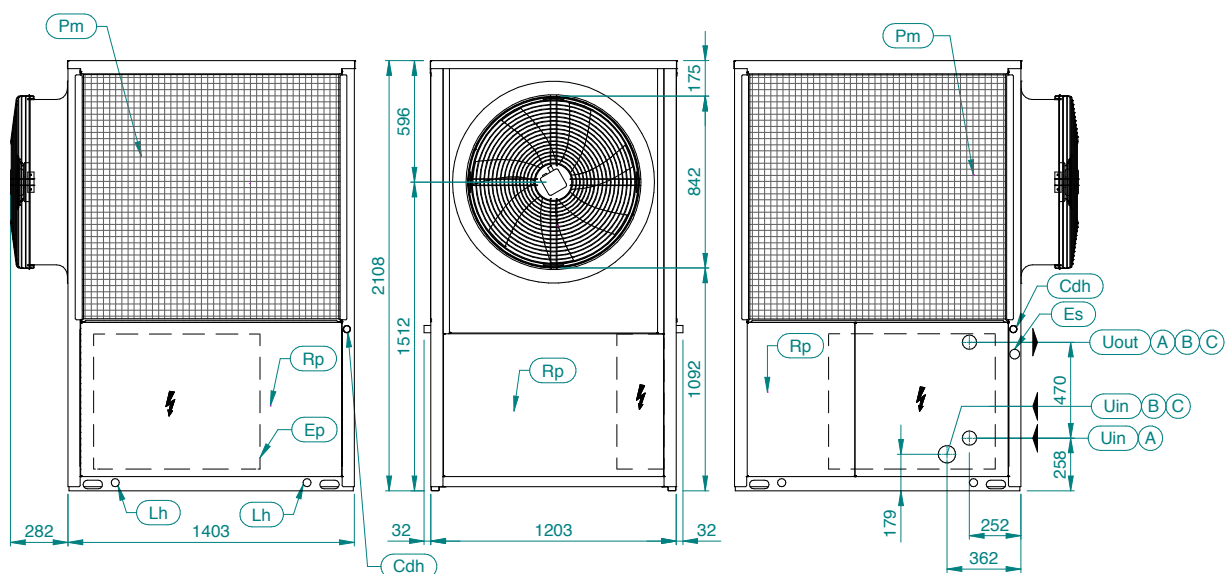
Fh	FORI DI FISSAGGIO	Ø18
	FIXING HOLES	
G..	PUNTI DI APPOGGIO ANTIVIBRANTI	
	VIBRATION DAMPER FOOT HOLDS	

MODELLO MODEL	G1 (kg)	G2 (kg)	G3 (kg)	G4 (kg)
50	158	164	152	111
60	163	169	157	114
70	165	171	159	116
80	170	176	164	119
90	173	179	167	122

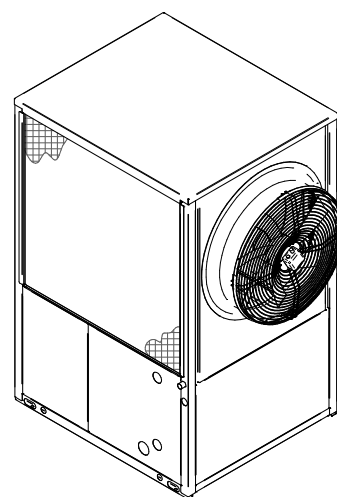
MODELLO MODEL	PESO WEIGHT (kg)	PESO IN FUNZIONE OPERATING WEIGHT (kg)
50	582	585
60	599	602
70	609	612
80	627	630
90	638	641
Δ PESO Δ WEIGHT	MOD. 1P	20
Δ PESO Δ WEIGHT	MOD. 2P	40
Δ PESO Δ WEIGHT	MOD. 1R	17

ENERGYCAL AW PRO AT

/OD 50 - 60 - 70 - 80 - 90



SPAZI DI INSTALLAZIONE / CLEARANCES



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ENERGYCAL AW
PRO AT

8

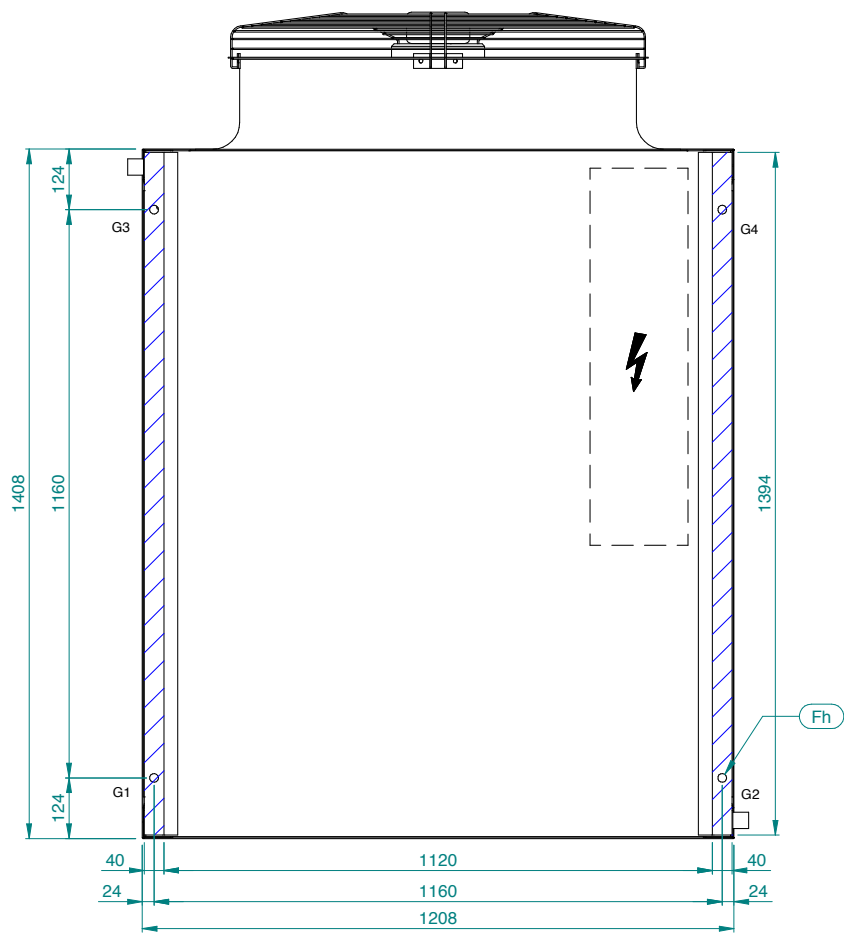
DIMENSIONAL
DRAWING

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Ep	QUADRO ELETTRICO ELECTRICAL PANEL
Es	INGRESSO ALIMENTAZIONE ELETTRICA ELECTRICAL SUPPLY INLET
Lh	FORI DI SOLLEVAMENTO LIFTING HOLES
Pm	GRIGLIE DI PROTEZIONE PROTECTIVE METAL MESH
*	OPZIONALE OPTIONAL

Rp	PANNELLO ASPORTABILE REMOVABLE PANEL
Cdh	SCARICO CONDENZA VERSIONE HP CONDENSATE DRAIN HP VERSION
Uin	INGRESSO ACQUA UTILIZZO USER WATER INLET
Uout	USCITA ACQUA UTILIZZO USER WATER OUTLET

CONNESSIONI IDRAULICHE / HYDRAULIC CONNECTIONS		
A	MODELLO STANDARD	STANDARD MODEL
B	MODELLO 1P	1P MODEL
C	MODELLO 2P	2P MODEL
DIMENSIONI / DIMENSIONS		
LUNGHEZZA WIDTH	PROFONDITA' DEPTH	ALTEZZA HEIGHT
1685	1203	2108



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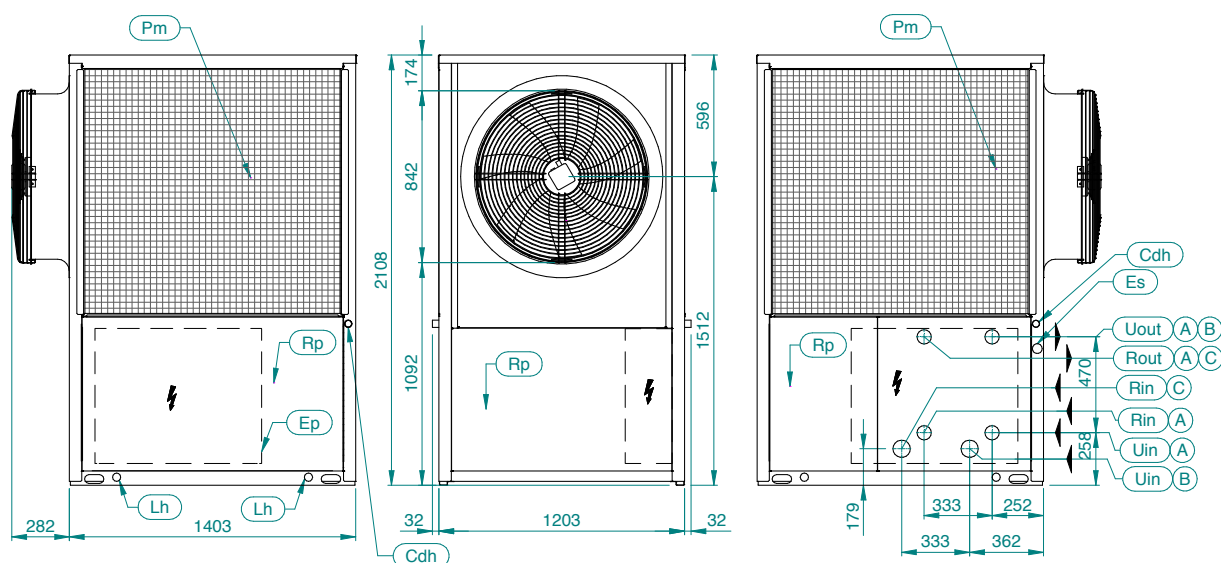
Fh	FORI DI FISSAGGIO	Ø18
	FIXING HOLES	
G..	PUNTI DI APOGGIO ANTIVIBRANTI	
	VIBRATION DAMPER FOOT HOLDS	

	G1 (kg)	G2 (kg)	G3 (kg)	G4 (kg)
50	131	137	185	135
60	136	142	180	138
70	137	144	182	138
80	143	149	177	143
90	146	153	180	145

MODELLO MODEL	PESO WEIGHT (kg)	PESO IN FUNZIONE OPERATING WEIGHT (kg)
50	582	585
60	599	602
70	609	612
80	627	630
90	638	641
Δ PESO Δ WEIGHT	MOD. 1P	20
Δ PESO Δ WEIGHT	MOD. 2P	40

ENERGYCAL AW PRO AT

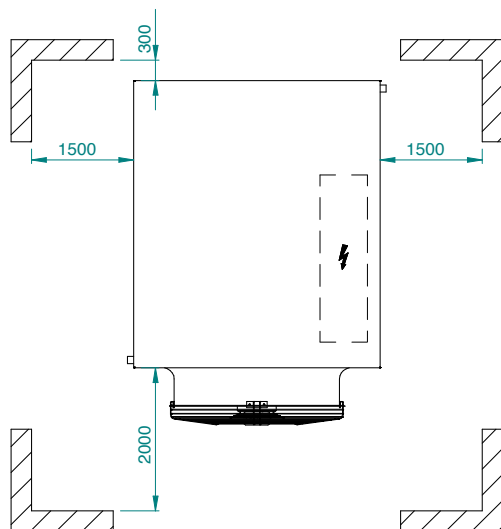
/DWS /OD 50 - 60 - 70 - 80 - 90



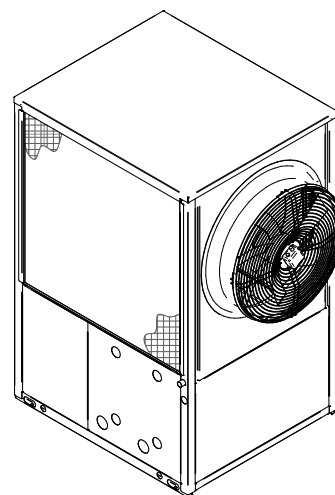
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ENERGYCAL AW
PRO AT

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DIMENSIONAL
DRAWING



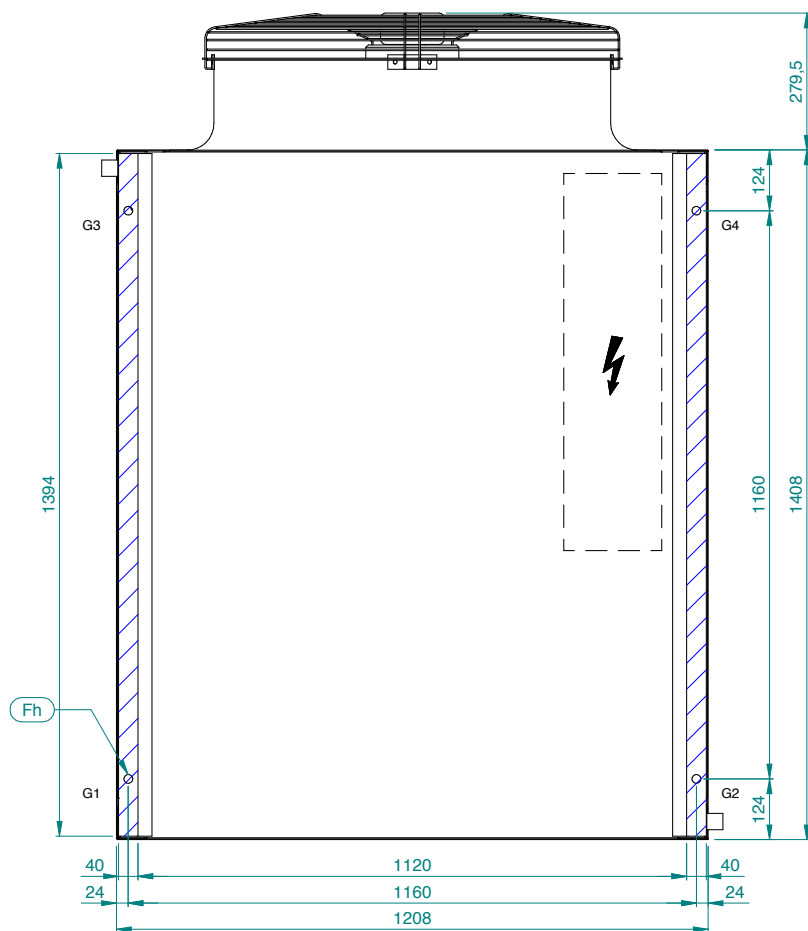
SPAZI DI INSTALLAZIONE / CLEARANCES



48

Ep	QUADRO ELETTRICO ELECTRICAL PANEL	Cdh	SCARICO CONDENSE VERSIONE HP CONDENSATE DRAIN HP VERSION	ø35
Es	INGRESSO ALIMENTAZIONE ELETTRICA ELECTRICAL SUPPLY INLET	Uin	INGRESSO ACQUA UTILIZZO USER WATER INLET	1" 1/2 BSPM (A) 2" BSPM (B)
Lh	FORI DI SOLLEVAMENTO LIFTING HOLES	Uout	USCITA ACQUA UTILIZZO USER WATER OUTLET	1" 1/2 BSPM
Pm	GRIGLIE DI PROTEZIONE PROTECTIVE METAL MESH	Rin	INGRESSO ACQUA RECUPERO RECOVERY WATER INLET	1" 1/2 BSPM (A) 2" BSPM (C)
Rp	PANNELLO ASPORTABILE REMOVABLE PANEL	Rout	USCITA ACQUA RECUPERO RECOVERY WATER OUTLET	1" 1/2 BSPM

CONNESSIONI IDRAULICHE / HYDRAULIC CONNECTIONS		
A	MODELLO STANDARD	STANDARD MODEL
B	MODELLO 1P - 2P	1P - 2P MODEL
C	MODELLO 1R	1R MODEL
DIMENSIONI / DIMENSIONS		
LUNGHEZZA WIDTH	PROFONDITA' DEPTH	ALTEZZA HEIGHT
1685	1203	2108



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Fh	FORI DI FISSAGGIO	Ø18
	FIXING HOLES	
G..	PUNTI DI APPOGGIO ANTIVIBRANTI	
	VIBRATION DAMPER FOOT HOLDS	

MODELLO MODEL	G1 (kg)	G2 (kg)	G3 (kg)	G4 (kg)
50	138	144	172	131
60	143	149	177	134
70	145	151	179	136
80	150	156	184	140
90	153	159	187	142

MODELLO MODEL	PESO WEIGHT (kg)	PESO IN FUNZIONE OPERATING WEIGHT (kg)
52	582	585
62	599	602
72	609	612
82	627	630
92	638	641
Δ PESO Δ WEIGHT	MOD. 1P	20
Δ PESO Δ WEIGHT	MOD. 2P	20
Δ PESO Δ WEIGHT	MOD. 1R	17

