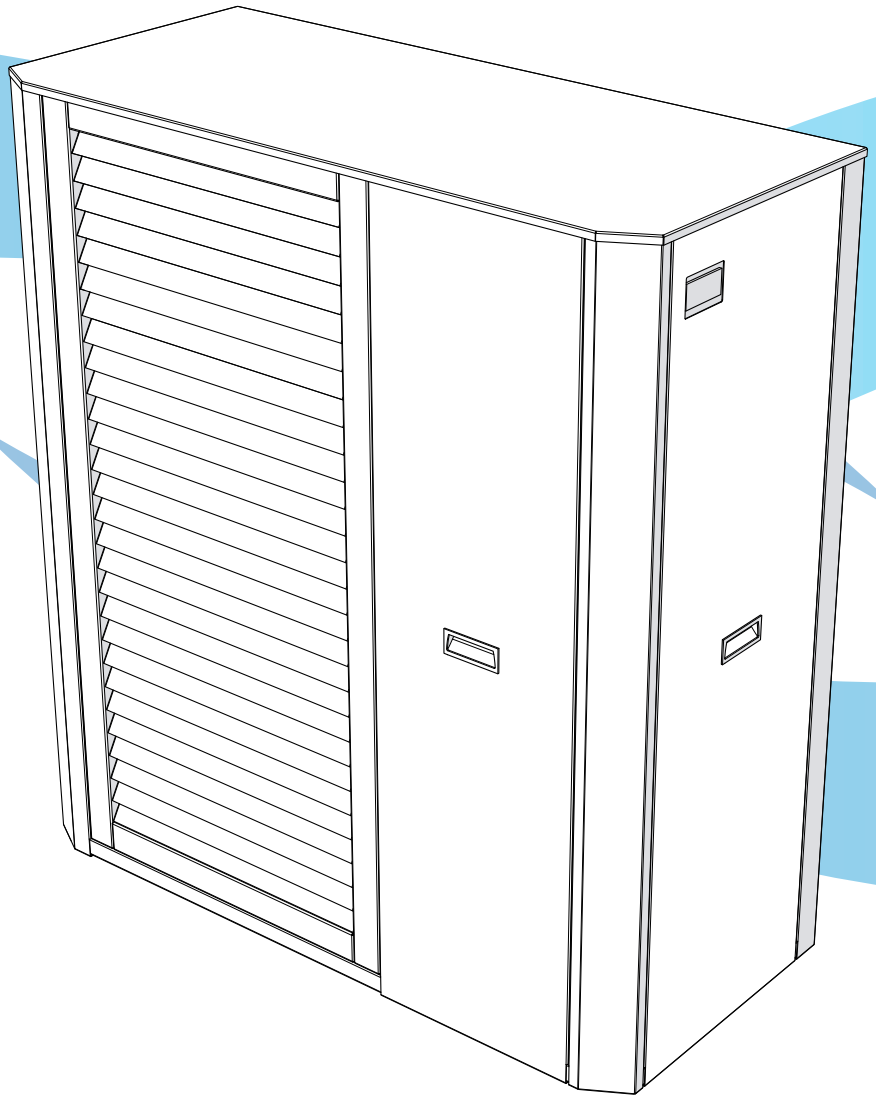
thermics

Use and maintenance manual

DURAN 4T



Reversible heat pump with inverter technology

DURAN

EN-GB *Translation of the Original Instructions*

Rev. 1.1

Dear Customer,
Thank you for choosing a Thermics energie machine, an innovative, modern and quality product that will ensure your well-being, silence operation and safety for a long time.
This instruction manual contains important indications and suggestions that must be observed in order to make the installation and use of the machine as easy as possible.

Thank you again.
Thermics energie

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1 Introduction

1.1 Purpose of the manual

The purpose of this manual is to provide the customer with all the information necessary to use and operate the machine correctly, independently and safely.
The manual contains information on the safety, technical aspects, operation, maintenance and transport of the following machines:

DURAN 4T - Reversible heat pump with inverter technology

Correct use and maintenance contribute to good operation and a longer life cycle of the machine.
For any doubt or further information, please contact your nearest service centre or the manufacturer's after-sales service directly.

1.1.1 Storage

The manual must be kept with care and in the immediate vicinity of the machine, far from liquids and anything else that could compromise its readability, and must be available for consultation at any time.
The manual and the Declaration of Conformity are an integral part of the machine and must therefore accompany it throughout its entire life cycle.
Parts of this documents must not be removed, torn or arbitrarily modified.
If the manual is lost or illegible, request a copy to the Manufacturer.

1.1.2 Updating the manual

The information, descriptions and illustrations contained in this manual reflect the state of the art at the time the machine was placed on the market.
The Manufacturer, in its constant commitment to improve its products and/or for market reasons, reserves the right to make, at any time, modifications to the machines for technical or commercial reasons without prior notice and without legitimising the Purchaser to terminate the contract.
In the event that, due to modifications to the machine installed at the Customer's facility, it is necessary to integrate, modify and/or update the contents of this manual, the Manufacturer shall provide the updated and revised chapters.
It is the responsibility of the user, following the instructions accompanying the updated documentation, to replace all copies held with the updated ones.

1.1.3 Confidentiality

The technical information (texts, drawings and illustrations) contained in this manual is the property of **THERMICS** and must be treated as confidential.
It is strictly forbidden to disclose, reproduce or translate, even partially, this document without the written permission of **THERMICS**.

1.1.4 Recipients

This manual is intended for personnel who carry out the following operations on the machine:

- transport and handling;
- installation;
- use;
- adjustments;
- cleaning;
- maintenance and repair;
- demolition and disposal.

WARNING!
Make sure that operators do not intervene outside their specific areas of competence and responsibility.

IMPORTANT
This manual shall not in any way replace the specific technical training that operators must have previously received on similar machines or that they may attend on this machine under the guidance of qualified personnel.

1.2 Symbols

For the safety of persons and property, a special symbol has been used in this documentation to allow readers to focus on hazardous conditions, warnings or relevant information:

DANGER!
PAY UTMOST ATTENTION TO THE TEXT BLOCKS MARKED WITH THIS SYMBOL.
Danger with risk of injury or death.
Accident prevention regulations for the operator.

WARNING!
Possibility of causing damage to the machine and/or its components.
Pay attention.

IMPORTANT
Warning or note about key functions or useful information about the current operation.

1.2.1 Illustrations

The illustrations in this publication are current as of the date of issue.
In light of continuous technical or commercial updates, components may be mounted on the machine described in this manual, whose external shape may be different from that illustrated. Nevertheless, this does not affect such components' functionality and possibility of adjustment.
In case of doubt, contact the manufacturer directly for any further information.

1.3 General warnings

1.3.1 Allowed use

- Please read this booklet carefully.
- The documentation supplied with the unit must be handed over to the owner who must keep it carefully for future maintenance or servicing.
- The company shall not be liable for any damage to persons, animals or property arising from installation, adjustment and maintenance mistakes, improper use or a partial or superficial reading of the information provided herein; moreover, in view of the constant improvement of the products, the company reserves the right to modify the specified data at any time and without notice and declines all responsibility for any inaccuracies in this booklet, if due to printing or transcription errors.
- The machines are designed for heating and/or cooling water. A different use, not expressly authorised by the manufacturer, is to be considered improper and therefore not allowed.
- The location, hydraulic, cooling and electrical systems must be determined by the system designer considering both the merely technical requirements and any local legislation in force and specific authorisations.
- All works must be carried out by qualified, experienced personnel aware of the relevant regulations in force in the various countries.
- Upon delivery of the goods by the carrier, check the integrity of both the packaging and the units. If there is any damage or missing components, indicate it on the delivery note and forward a formal complaint to the company by fax or registered mail within 8 days from the date of good reception.
- The warranty does not apply if:
  - the personnel authorised by the company does not attend the machine start-up;
  - the above indications are not respected.

1.3.2 Remarks

- Pay particular attention to the use instructions preceded by the words "danger", "warning" or "important" because failure to respect them may lead to damage to the machine and/or people and property.
- The manufacturer declines all responsibility for any damage due to improper use of the machine, partial or superficial reading of the information provided herein.
- The machine must be installed in such a way that maintenance and/or repair operations are possible.
- The machine warranty does not cover the costs for ladders, scaffolding or other lifting systems that may be necessary to carry out works under warranty.
- The manufacturer does not provide drawings or specifications of connection systems.
- Any deviation from the prescriptions contained in this manual must be validated in writing by the manufacturer's technical support.
- For any faults not mentioned in this manual, please contact the Customer Service immediately.

1.3.3 User information

- Keep this manual and the wiring diagram in a place accessible to the operator.
- Make a note of the unit's identification information so you can give it to the service centre if you have to request assistance (see the section "*Machine identification*" in the Technical and Maintenance Manual).
- It is recommended to keep track of the works carried out on the unit to make the troubleshooting activity easier.
- In case of failure or malfunction:
  - check the type of alarm to report it to the service centre;
  - switch off the unit immediately without resetting the alarm;
  - contact an authorised service centre;
  - require the use of original spare parts.
- Ask the installer to be trained on:
  - power on/off;
  - shutting down the machine for long periods;
  - maintenance;
  - what to do/not to do in case of failure.

2 Safety regulations

DANGER!

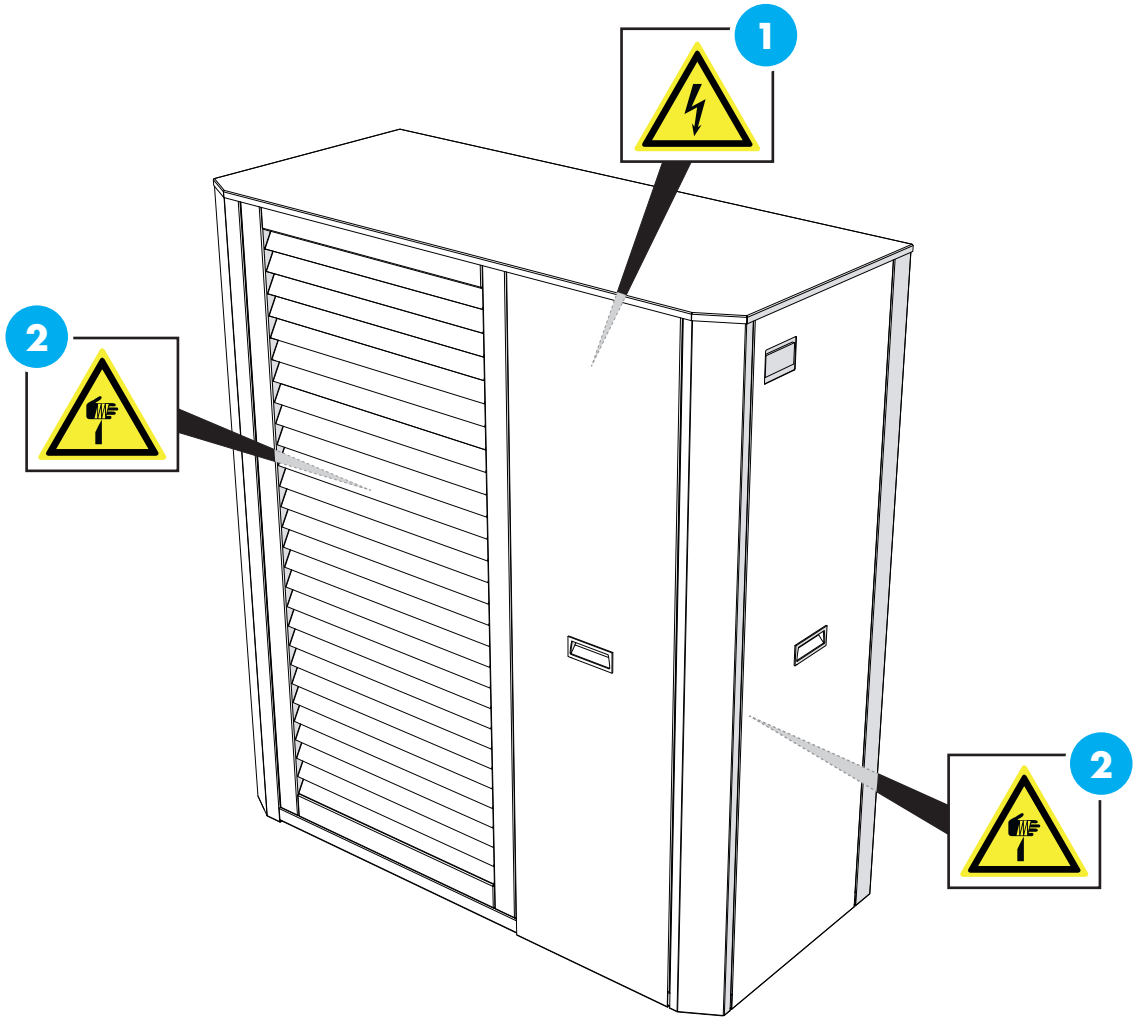
The machine has been designed and built according to appropriate safety standards. Before using the machine, carefully follow all the precautions and instructions provided in the manual to avoid accidents.

2.1 General safety rules

The use of products that use electricity and water involves compliance with certain basic safety rules such as the ones provided below:

- Children and unattended disabled persons are not allowed to use the machine.
- Do not touch the machine if you are barefoot and have wet or damp body parts.
- Any cleaning operation is prohibited without first disconnecting the power supply by turning the main switch of the system to "off".
- It is forbidden to modify the safety or adjustment devices without the authorisation and instructions of the machine manufacturer.
- It is forbidden to pull, disconnect or twist the electrical cables coming out of the machine, even if it is disconnected from the power supply.
- It is forbidden to open the access doors to the internal parts of the machine, if the system has not been switched off by means of the main switch.
- It is forbidden to climb on the machine with your feet, sit and/or lean against any type of object.
- It is forbidden to spray or throw water directly on the machine.
- The packaging material (cardboard, staples, plastic bags, etc.) may not be dispersed or left within the reach of children, as it may be a potential source of danger.
- Observe the safety distances between the machine and other equipment or structures to ensure sufficient access space to the unit for maintenance and/or servicing as indicated in this manual.
- Power supply of the machine: the machine must be powered by means of electrical cables with a section suitable for the power of the unit and the power supply voltage values must correspond to those indicated for the respective machines; all the machines must be connected to earth as per the regulations in force in the various countries.
- The hydraulic connection must be carried out according to the instructions in order to ensure the correct operation of the machine.
- During the cold season, if the machine is not working, empty all the hydraulic circuits of the machine to prevent them from freezing.
- Handle the machine with the utmost care and avoid damaging it.
- Glycol solution: the heat exchangers' antifreeze alarms are set based on the mixture declared at the start-up. Breakages due to inadequate mixing or mixture not maintained over time are not covered by the manufacturer's warranty.
- Installation room: some machine components generate heat during operation.
- The installation room must ensure adequate ventilation and proper dissipation of the heat produced.

2.2 Security pictograms



1 Electricity hazard
2 Sharp object hazard

3 Declaration of conformity

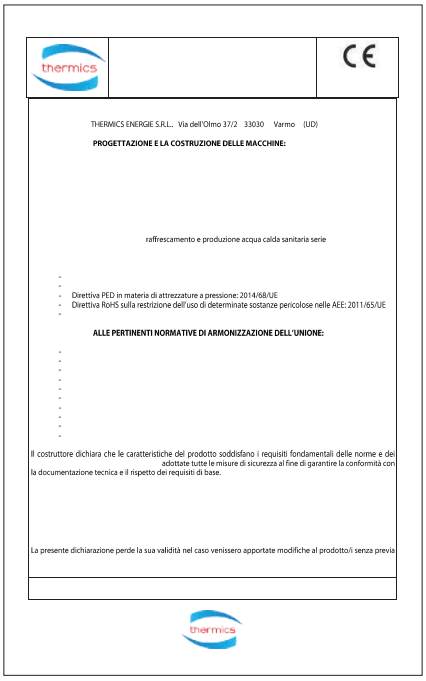
3.1 Standards

The machine complies with the following standards:

- Low Voltage Directive: 2014/35/EU
- Electromagnetic Compatibility Directive EMCD: 2014/30/EU
- The Pressure Equipment Directive PED: 2014/68/EU (module A)
- The RoHS directive on the restriction of the use of certain hazardous substances in EEE: 2011/65/EU
- ErP ecodesign directive: 2009/125/EC

3.2 Declaration of conformity (FAC-Simile)

The EC declaration of conformity, supplied with the machine, is the document by which the Manufacturer certifies, under its own responsibility, to comply with the European Directives, standards and technical specifications (indicated in the declaration itself) necessary for the machine to comply with the essential requirements for marketing and use in the European Union.
The Declaration of Conformity must be considered an integral part of the machine and must accompany the machine until its demolition.
If this document is not delivered with the machine or is lost, request a copy to the Manufacturer.



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CE

THERMICS ENERGIE S.R.L. Via dell'Olmo 37/2 33030 Varmo (UD)

PROGETTAZIONE E LA COSTRUZIONE DELLE MACCHINE:

raffrescamento e produzione acqua calda sanitaria serie

- Direttiva PED in materia di attrezzature a pressione: 2014/68/UE
- Direttiva RoHS sulla restrizione dell'uso di determinate sostanze pericolose nelle AEE: 2011/65/UE

ALLE PERTINENTI NORMATIVE DI ARMONIZZAZIONE DELL'UNIONE:

Il costruttore dichiara che le caratteristiche del prodotto soddisfano i requisiti fondamentali delle norme e del adottate tutte le misure di sicurezza al fine di garantire la conformità con la documentazione tecnica e il rispetto dei requisiti di base.

La presente dichiarazione perde la sua validità nel caso venissero apportate modifiche al prodotto/i senza previa

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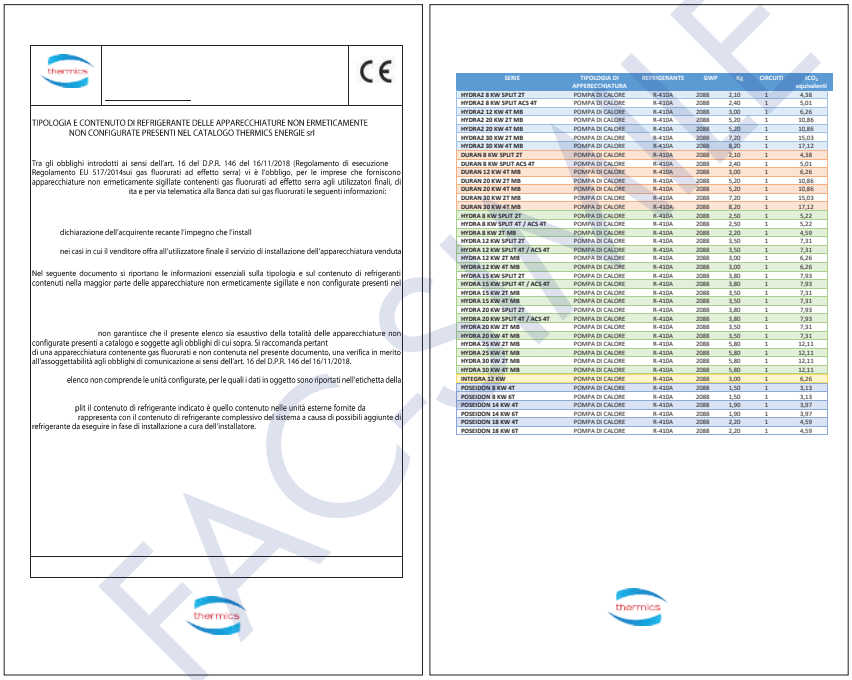
3.2.1 Amount and type of refrigerant in hermetically and non-hermetically sealed equipment

The declaration regarding the amount and type of refrigerant (if present) provides essential information on the type and amount of refrigerant contained in most of the non-hermetically sealed equipment listed in the THERMICS catalogue.
This declaration provides all the information necessary for including the equipment in the fluorinated gases database.



TIPOLOGIA E CONTENUTO DI REFRIGERANTE DELLE APPARECCHIATURE NON ERMETICAMENTE NON CONFIGURATE PRESENTI NEL CATALOGO THERMICS ENERGIE srl

Tra gli obblighi introdotti ai sensi dell'art. 16 del D.P.R. 146 del 16/11/2018 (Regolamento di esecuzione Regolamento EU 517/2014sui gas fluorurati ad effetto serra) vi è l'obbligo, per le imprese che forniscono apparecchiature non ermeticamente sigillate contenenti gas fluorurati ad effetto serra agli utilizzatori finali, di ita e per via telematica alla Banca dati sui gas fluorurati le seguenti informazioni:

dichiarazione dell'acquirente recante l'impegno che l'install

nei casi in cui il venditore offra all'utilizzatore finale il servizio di installazione dell'apparecchiatura venduta

Nel seguente documento si riportano le informazioni essenziali sulla tipologia e sul contenuto di refrigeranti contenuti nella maggior parte delle apparecchiature non ermeticamente sigillate e non configurate presenti nel

non garantisce che il presente elenco sia esaustivo della totalità delle apparecchiature non configurate presenti a catalogo e soggette agli obblighi di cui sopra. Si raccomanda pertant di una apparecchiatura contenente gas fluorurati e non contenuta nel presente documento, una verifica in merito all'assoggettabilità agli obblighi di comunicazione ai sensi dell'art. 16 del D.P.R. 146 del 16/11/2018.

elenco non comprende le unità configurate, per le quali i dati in oggetto sono riportati nell'etichetta della

plit il contenuto di refrigerante indicato è quello contenuto nelle unità esterne fornite da rappresenta con il contenuto di refrigerante complessivo del sistema a causa di possibili aggiunte di refrigerante da eseguire in fase di installazione a cura dell'installatore.

SERIE	TIPOLOGIA DI APPARECCHIATURA	REFRIGERANTE	GWP	Kg	CIRCUITI	tCO_2 equivalenti
HYDRA2 8 KW SPLIT 2T	POMPA DI CALORE	R-410A	2088	2,10	1	4,38
HYDRA2 8 KW SPLIT ACS 4T	POMPA DI CALORE	R-410A	2088	2,40	1	5,01
HYDRA2 12 KW 4T MB	POMPA DI CALORE	R-410A	2088	3,00	1	6,26
HYDRA2 20 KW 2T MB	POMPA DI CALORE	R-410A	2088	5,20	1	10,86
HYDRA2 20 KW 4T MB	POMPA DI CALORE	R-410A	2088	5,20	1	10,86
HYDRA2 30 KW 2T MB	POMPA DI CALORE	R-410A	2088	7,20	1	15,03
HYDRA2 30 KW 4T MB	POMPA DI CALORE	R-410A	2088	8,20	1	17,12
DURAN 8 KW SPLIT 2T	POMPA DI CALORE	R-410A	2088	2,10	1	4,38
DURAN 8 KW SPLIT ACS 4T	POMPA DI CALORE	R-410A	2088	2,40	1	5,01
DURAN 12 KW 4T MB	POMPA DI CALORE	R-410A	2088	3,00	1	6,26
DURAN 20 KW 2T MB	POMPA DI CALORE	R-410A	2088	5,20	1	10,86
DURAN 20 KW 4T MB	POMPA DI CALORE	R-410A	2088	5,20	1	10,86
DURAN 30 KW 2T MB	POMPA DI CALORE	R-410A	2088	7,20	1	15,03
DURAN 30 KW 4T MB	POMPA DI CALORE	R-410A	2088	8,20	1	17,12
HYDRA 8 KW SPLIT 2T	POMPA DI CALORE	R-410A	2088	2,50	1	5,22
HYDRA 8 KW SPLIT 4T / ACS 4T	POMPA DI CALORE	R-410A	2088	2,50	1	5,22
HYDRA 8 KW 2T MB	POMPA DI CALORE	R-410A	2088	2,20	1	4,59
HYDRA 12 KW SPLIT 2T	POMPA DI CALORE	R-410A	2088	3,50	1	7,31
HYDRA 12 KW SPLIT 4T / ACS 4T	POMPA DI CALORE	R-410A	2088	3,50	1	7,31
HYDRA 12 KW 2T MB	POMPA DI CALORE	R-410A	2088	3,00	1	6,26
HYDRA 12 KW 4T MB	POMPA DI CALORE	R-410A	2088	3,00	1	6,26
HYDRA 15 KW SPLIT 2T	POMPA DI CALORE	R-410A	2088	3,80	1	7,93
HYDRA 15 KW SPLIT 4T / ACS 4T	POMPA DI CALORE	R-410A	2088	3,80	1	7,93
HYDRA 15 KW 2T MB	POMPA DI CALORE	R-410A	2088	3,50	1	7,31
HYDRA 15 KW 4T MB	POMPA DI CALORE	R-410A	2088	3,50	1	7,31
HYDRA 20 KW SPLIT 2T	POMPA DI CALORE	R-410A	2088	3,80	1	7,93
HYDRA 20 KW SPLIT 4T / ACS 4T	POMPA DI CALORE	R-410A	2088	3,80	1	7,93
HYDRA 20 KW 2T MB	POMPA DI CALORE	R-410A	2088	3,50	1	7,31
HYDRA 20 KW 4T MB	POMPA DI CALORE	R-410A	2088	3,50	1	7,31
HYDRA 25 KW 2T MB	POMPA DI CALORE	R-410A	2088	5,80	1	12,11
HYDRA 25 KW 4T MB	POMPA DI CALORE	R-410A	2088	5,80	1	12,11
HYDRA 30 KW 2T MB	POMPA DI CALORE	R-410A	2088	5,80	1	12,11
HYDRA 30 KW 4T MB	POMPA DI CALORE	R-410A	2088	5,80	1	12,11
INTEGRA 12 KW	POMPA DI CALORE	R-410A	2088	3,00	1	6,26
POSEIDON 8 KW 4T	POMPA DI CALORE	R-410A	2088	1,50	1	3,13
POSEIDON 8 KW 6T	POMPA DI CALORE	R-410A	2088	1,50	1	3,13
POSEIDON 14 KW 4T	POMPA DI CALORE	R-410A	2088	1,90	1	3,97
POSEIDON 14 KW 6T	POMPA DI CALORE	R-410A	2088	1,90	1	3,97
POSEIDON 18 KW 4T	POMPA DI CALORE	R-410A	2088	2,20	1	4,59
POSEIDON 18 KW 6T	POMPA DI CALORE	R-410A	2088	2,20	1	4,59

4 Machine features

4.1 Range

The DURAN 4T heat pump units are designed for applications using radiant panel heating systems or low temperature applications such as suitably dimensioned fan-coil, thermal ventilation and AHUs for delivery temperatures of 50°C.
All versions are equipped with extremely silent EC axial fans and Twin Rotary inverter compressors that allow the complete power management of each single component. In fact, the compressor, fan and circulators are continuously regulated by a programmed control unit with an internally developed control logic.

AVAILABLE VERSIONS
DURAN 12 kW 4T MB
DURAN 15 kW 4T MB
DURAN 20 kW 4T MB
DURAN 25 kW 4T MB
DURAN 30 kW 4T MB

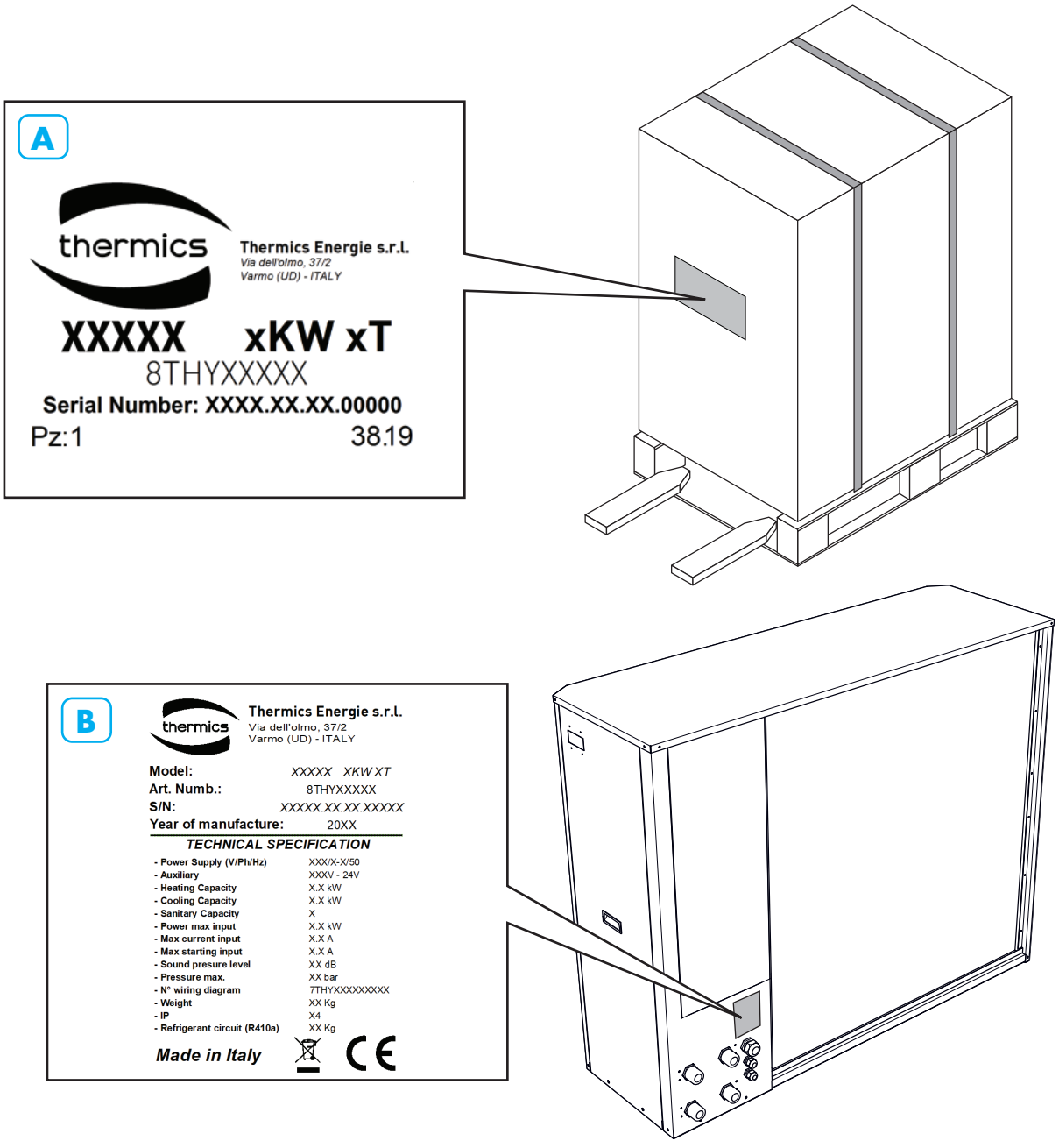
4.2 Machine identification

The equipment is identified by:

- Packing plate (A).
  It provides the equipment identification data.
- Nameplate (B).
  Applied to the machine, it shows the technical and performance data of the equipment. In case of loss or deterioration, request a duplicate to the Technical Customer Service.

DANGER!

The tampering with, removal and deterioration of the identification plates make it difficult to install, maintain the system and request spare parts.



4.3 Machine description

- The structure is made of thick galvanised sheet metal painted with epoxy powders. The panels of the compressor compartment are totally soundproofed by means of a sheet with high soundproofing characteristics. The compressor compartment is accessible via removable front panels.
- All models are equipped with BLDC TWIN ROTARY INVERTER airtight compressors suitable for operation with R410a refrigerant. The compressors are mounted on rubber supports to eliminate vibrations transmitted to the frame and are positioned on a metal damping structure.
- The air side heat exchangers are batteries made up of copper pipes and aluminium fins with hydrophilic treatment.
- The fans are of the axial type with 4-pole motors and wing profile blades.
- The water side heat exchangers are of the AISI 316 steel plate type, covered with a closed-cell anti-condensation mat.
- The heat pumps consist of a cooling circuit made entirely of copper and insulated with expanded closed-cell pipe; the joints are braze-welded with high strength alloy. The circuit is complete with: dehydrator filter, cycle reversing valve, liquid receiver, high pressure switch, high pressure transducer for condensation control and low pressure transducer used both as safety device and for electronic expansion valve control.
- The electronic expansion valve is made of high quality materials (AISI 316L and technopolymers). Thanks to its proportional modulation and its high reliability, it guarantees the ability to stabilise and maintain the operation of the heat pump in a very short time, allowing energy savings.
- The hydraulic circuit is divided into primary system circuit, high temperature circuit for domestic hot water.
- The electrical panel is made of galvanised steel sheet and located in the compressor compartment with a support plate for components. The power circuit is separate from the control circuit and is designed in accordance with EN60204-1.
    - **System:** it includes inverter-controlled circulation pump, expansion vessel, filling port, water discharge and water flow safety device (differential pressure switch).
    - **DHW:** it includes the circulation pump controlled by an inverter managed by a microprocessor.
- Remote controller (optional)

  The control unit consists of CAREL hardware and can be combined with a highly intuitive controller with which all the operating parameters, set points and usage settings can be controlled. The controller allows direct connection to the heating system with or without a storage tank, or more commonly, by connecting the latter to the heating system at two or four points. The storage tank is charged at a set point for DHW and with a heating or cooling curve for heating / cooling circuit.
- Testing

  All units are fully assembled and wired. They are inspected to high standards, undergo leak and vacuum cycle tests, and are filled with an eco-friendly refrigerant. They undergo a complete functional test before being delivered. All units comply with European Directives and have a CE marking and relative certificate of conformity.

4.4 *Operating principle*

The unit operates in a different way according to the season:

The system switches between the various operating modes (within a season) automatically by reading the temperature probes and the programmed set points. Switching times and logics are designed to ensure maximum system efficiency and reliability.

The configuration with domestic hot water production with a diverter valve must be associated with a suitably sized boiler in which to store the high temperature water. The upper part of the boiler must be fitted with a thermowell in which to insert the hot water probe, through which the unit controller monitors whether hot water has to be produced.

4.4.1 Summer operation

The summer operating modes are:

- **Chiller mode:** the unit produces only chilled water for the cooling system.
- Heat pump mode for the production of domestic hot water: if there is no cold load and on request by the domestic hot water probe, the unit heats the water in the domestic hot water storage tank using the finned pack coil as an evaporator. The use of warm outside air as a heat source guarantees extremely high COP levels.

The system switches automatically between the various operating modes according to a priority logic for the production of domestic hot water.

4.4.2 Winter operation

There are three winter operating modes:

- **Heat pump mode for heating:** the unit produces hot water at the system side heat exchanger for heating.Heat pump mode for heating: the unit produces hot water at the system side heat exchanger for heating.
- **Heat pump mode for domestic hot water:** high temperature hot water is produced at the heat exchanger connected to the domestic hot water storage tank.

The system switches automatically between the various operating modes according to a priority logic for the production of domestic hot water.

4.5 Accessories

- Anti-vibration feet with through screw (only for the Outdoor Unit)
- HP1 GOLD system expansion module. An expansion module that connects as a BUS accessory to the existing control unit and allows important and innovative functions to be added that are useful for more complex systems:
  - DPAC: a 0-10V input that regulates the power used by the heat pump according to the instantaneous availability of the solar energy system. This is an extremely innovative logic developed by THERMICS: when the heat pump is set to "ECO" mode, it operates according to the availability of energy and its wide modulation range means that it will avoid drawing electricity from other sources.
  - MIX1: available for the management of a general system mixed unit with 0-10V signal.
  - INFO SEASON: an outlet that alerts the rest of the season change system.
  - HEAT TRANSF: a setting that specifies the logics used for heat transfer through a plate heat exchanger or a secondary transfer boiler.
  - HYBRID: relay activation of heating integration using a second source both on the DHW side and on the heating side.
- HP2 – expansion module for cascade control
- Remote Brain: remote monitoring system via a web interface for checking the operating parameters of the heat pump. Remote Brain is a simple and inexpensive system for monitoring residential installations that allows you to switch on THERMICS heat pumps, control their respective temperatures, monitor their operation and to provide the heating comfort requirements of the home directly from any device, both inside and outside the home. This innovative system means that all the main terminal units for HVAC and the production of domestic hot water are constantly monitored, to enable the heat pump to be used in the most efficient way and to obtain maximum savings in terms of energy and cost. The information is transmitted locally using Wireless technology to Tablets, Smartphones and PCs directly from the ADSL router, which uploads it to a data collection CLOUD. This means that the data is always up to date and can be used at any time and on any device, wherever you are. The system also allows you to report heat pump malfunctions, meaning that trained technicians can take the appropriate action quickly. They will immediately know the reason for the malfunction and be able to restore correct operation of the heat pump rapidly. Remote Brain has an annual charge for maintaining the service and its functions. (see t-Service).
- tSERVICE: is the service dedicated to service centres. tService makes carrying out maintenance faster and more effective with a ready-to-use remote control solution specifically designed for service centres.

4.5.1 tSERVICE

tSERVICE is the service dedicated to service centres. tService makes carrying out maintenance faster and more effective with a ready-to-use remote control solution specifically designed for service centres.

Functions available with tService:

- Reading and writing variables in real time
- Data logging with frequencies up to 5 seconds
- Alarm management with e-mail notification
- Reports and graphs, using up to 300 variables
- Programmable SW update checks

With tService, you can take out a 1-year subscription, or longer if you wish, in order monitor the heat pump at all times.

5 Technical specifications

TECHNICAL SPECIFICATIONS DURAN 4T SIZES			8 MB 4T	12 MB 4T	15 MB 4T	20 MB 4T	25 MB 4T	30 MB 4T
Heating	WINTER OPERATION A7/W35							
	Heat output (3)	100% kW	8,41	12,32	14,87	19,03	24,64	31,88
		66% kW	5,23	7,72	9,77	11,92	16,12	20,86
		33% kW	2,45	3,74	4,67	5,77	7,57	9,80
	Compressor power input for the compressor (3)	100% kW	1,63	2,51	2,93	3,74	4,86	6,34
	Total power input (3)		1,77	2,77	3,27	4,18	5,28	6,76
	C.O.P. (3)		4,75	4,44	4,55	4,55	4,67	4,72
	SYSTEM SIDE							
	Water flow rate	m3/h	1,45	2,12	2,56	3,27	4,24	5,48
	Useful head	mca	4,50	3,00	7,30	6,10	7,40	5,20
	Pump power input	kW	0,06	0,06	0,14	0,14	0,20	0,20
	DHW SIDE							
	Heat output	kW	8,1	11,7	13,9	18,1	23,5	30,4
	Water flow rate	m3/h	1,39	2,01	2,39	3,10	4,04	5,23
	Useful head 2T/4T	mca	3,50	2,7 / 2,7	7,8 / 4,5	6,3 / 2,8	7,6 / 6,9	5,6 / 5,1
	SUMMER OPERATION A7/W35							
	Heat output (4)	100% kW	8,19	11,91	14,27	18,39	23,89	30,92
		66 kW	5,07	7,42	9,41	11,52	15,57	20,16
		33% kW	2,37	3,59	4,54	5,58	7,26	9,39
	Compressor power input for the compressor (4)	100% kW	2,04	3,07	3,60	4,55	6,00	7,82
	Total power input (4)		2,18	3,33	3,94	4,99	6,42	8,24
	C.O.P. (4)		3,75	3,57	3,62	3,69	3,72	3,75
	SYSTEM SIDE							
	Water flow rate	m3/h	1,41	2,05	2,45	3,16	4,11	5,32
	Prevalenza utile	mca	5,50	4,00	7,60	6,10	7,70	5,30

Performance refers to the following conditions:
(1) Cooling: outside air temperature 35°C; in./out. water temperature. 23/18°C
(2) Cooling: outside air temperature 35°C; in./out. water temperature 12/7°C.
(3) Heating: outside air temperature 7°C b.s. 6°C b.u.; in./out. water temp. 30/35°C.
(4) Heating: outside air temperature 7°C b.s. 6°C b.u.; in./out. water temp. 40/45°C.

TECHNICAL SPECIFICATIONS DURAN 4T SIZES			8 MB 4T	12 MB 4T	15 MB 4T	20 MB 4T	25 MB 4T	30 MB 4T
Cooling	SUMMER OPERATION A35/W18							
	Cooling capacity (1)	100% kW	10,76	15,64	18,61	24,15	31,13	40,63
		66% kW	6,82	9,87	12,16	15,24	20,62	26,91
		33% kW	3,26	4,83	5,70	7,58	9,82	12,82
	Compressor power input for the compressor (1)	100% kW	1,83	2,58	3,31	4,14	5,33	6,95
	Total power input (1)		1,97	2,84	3,65	4,58	5,75	7,37
	EER (1)		5,47	5,50	5,10	5,28	5,41	5,51
	SYSTEM SIDE							
	Water flow rate	m3/h	1,85	2,69	3,20	4,15	5,35	6,99
	Useful head	mca	4,00	2,80	5,80	4,90	5,50	3,50
	SUMMER OPERATION A7/W35							
	Cooling capacity (2)	100% kW	7,54	10,90	12,83	16,89	24,07	28,41
		66% kW	4,75	6,85	8,45	10,65	16,15	18,82
		33% kW	2,24	3,32	4,07	5,28	7,59	8,83
	Compressor power input for the compressor (2)	100% kW	1,85	2,81	3,29	4,20	5,47	7,14
	Total power input (2)		1,99	3,07	3,63	4,64	5,89	7,56
	EER (2)		3,79	3,55	3,53	3,64	4,09	3,76
	SYSTEM SIDE							
	Water flow rate	m3/h	1,30	1,89	2,21	2,91	4,14	4,89
	Useful head system	mca	4,3	3,2	9,0	6,5	7,5	6,0
Compressor	Type	Twin Rotary						
	Number		1	1	1	1	1	1
Fan	Number		1	1	1	1	2	2
	Air flow rate	m3/h	4000	5500	7800	8700	10000	13000
	Useful head	Pa	8,00	16,00	25,50	10,00	9,81	4,90
	Power input	kW	0,08	0,20	0,20	0,30	0,22	0,22
Refrigerant	Type	R410a						
	Coolant load	kg	1,90	3,05	6,36	5,20	7,80	7,80
Electrical data	Supply	V/Ph/Hz	230-1-50	230-1-50	400-3-50	400-3-50	400-3-50	400-3-50
Hydraulic connections	Water connections diameter		1"	1"	1"1/4	1"1/4	1"1/2	1"1/2
Noise	Sound power	dB(A)	67	71	69	71	69	71
	Sound power according to EN 12102	dB(A)	48	55	54	55	56	57
	Sound pressure at 10 m	dB(A)	36	40	39	40	41	42
Heating energy efficiency	Scop Avarage - low EN 14825:2012		4,4	4,1	4,4	4,4	4,4	4,5
Dimensions and weight	Length	mm	1135	1135	1537		1907	
	Height	mm	660	1275	1282		1671	
	Depth	mm	545	560	560		660	
	Weight without packing2T/4T	kg	85 / 95	210 / 220	240 / 250	245 / 255	310 / 320	330 / 340
	Weight with packing2T/4T	kg	90 / 100	215 / 225	247 / 257	252 / 262	320 / 330	340 / 350

5.1 Consumptions

MAXIMUM VALUES

		8 MB	12 MB	12 MB	15 MB	15 MB	20 MB	25 MB	30 MB
Electrical power supply	V/Ph/Hz	230-1-50	230-1-50	400-3-50	230-1-50	400-3-50	400-3-50	400-3-50	400-3-50
Compressor	F.L.I. (KW)	3,14	4,50	4,50	5,38	5,38	6,83	8,94	11,65
	F.L.A. (A)	15,00	21,50	7,15	25,70	8,55	10,85	14,20	18,50
	L.R.A. (A)	19,20	32,00	18,50	32,00	18,50	21,10	21,10	21,10
	Cosfi	0,91	0,91	0,91	0,91	0,91	0,91	0,91	0,91
Pdc system pump	F.L.I. (KW)	0,06	0,06	0,06	0,14	0,14	0,14	0,20	0,20
	F.L.A. (A)	0,57	0,57	0,57	1,08	1,08	1,08	1,51	1,51
Pompa acs	F.L.I. (KW)	/	0,06	0,06	0,09	0,09	0,09	0,14	0,14
	F.L.A. (A)	/	0,57	0,57	0,75	0,75	0,70	1,08	1,08
Fan	F.L.I. (KW)	0,30	0,33	0,33	0,33	0,33	0,33	0,50	0,50
	F.L.A. (A)	2,05	2,68	2,68	2,68	2,68	2,68	3,29	3,29
Total	F.L.I. (KW)	3,50	4,95	4,95	5,94	5,94	7,39	9,78	12,49
	F.L.A. (A)	17,63	25,32	10,97	30,21	13,06	15,31	20,08	24,38
	L.R.A. (A)	21,83	35,82	22,32	36,51	23,01	25,56	26,98	26,98

DURAN 4T 8 in Heating mode

	Delivery water T 25 °C			*Delivery water T 30 °C*			*Delivery water T 35 °C*			*Delivery water T 40 °C*			*Delivery water T 45 °C*			*Delivery water T 50 °C*			*Delivery water T 55 °C*		
Outside air T °C	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP
-22	3.52	1.25	2.82	3.52	1.37	2.57	3.52	1.49	2.37	3.52	1.60	2.20	3.52	1.71	2.05	3.50	1.82	1.93	3.47	1.91	1.82
-15	4.40	1.30	3.37	4.39	1.44	3.05	4.39	1.58	2.78	4.38	1.71	2.56	4.37	1.85	2.36	4.36	1.98	2.20	4.33	2.11	2.05
-10	5.14	1.34	3.84	5.13	1.49	3.45	5.11	1.64	3.13	5.09	1.79	2.85	5.07	1.94	2.61	5.05	2.09	2.41	5.02	2.24	2.24
-7	5.65	1.36	4.16	5.62	1.51	3.72	5.59	1.67	3.35	5.57	1.83	3.04	5.54	1.99	2.78	5.50	2.16	2.55	5.46	2.32	2.35
-5	6.01	1.37	4.39	5.97	1.53	3.92	5.94	1.69	3.52	5.90	1.86	3.18	5.86	2.03	2.89	5.82	2.20	2.65	5.77	2.37	2.44
-2	6.59	1.38	4.76	6.54	1.54	4.23	6.49	1.71	3.78	6.43	1.89	3.40	6.38	2.07	3.08	6.33	2.26	2.81	6.27	2.44	2.57
0	7.01	1.39	5.04	6.94	1.56	4.46	6.88	1.73	3.97	6.81	1.91	3.56	6.75	2.10	3.21	6.69	2.29	2.92	6.61	2.48	2.66
2	7.44	1.40	5.33	7.36	1.57	4.70	7.29	1.74	4.18	7.21	1.93	3.73	7.14	2.13	3.36	7.06	2.32	3.04	6.98	2.53	2.76
5	8.15	1.40	5.82	8.04	1.57	5.11	7.94	1.76	4.51	7.85	1.96	4.01	7.75	2.16	3.59	7.65	2.37	3.23	7.55	2.58	2.92
7	8.64	1.40	6.17	8.52	1.58	5.40	8.41	1.77	4.75	8.30	1.97	4.21	8.19	2.18	3.75	8.07	2.40	3.37	7.96	2.62	3.04
10	9.44	1.40	6.76	9.29	1.58	5.89	9.15	1.78	5.15	9.01	1.99	4.54	8.88	2.21	4.03	8.74	2.43	3.59	8.60	2.67	3.23
12	10.00	1.39	7.20	9.83	1.58	6.24	9.67	1.78	5.44	9.52	1.99	4.78	9.37	2.22	4.22	9.21	2.45	3.76	9.05	2.69	3.36
15	10.90	1.37	7.94	10.70	1.56	6.84	10.51	1.77	5.93	10.32	2.00	5.17	10.14	2.23	4.55	9.96	2.48	4.02	9.77	2.73	3.58
20	12.54	1.33	9.43	12.28	1.53	8.03	12.03	1.75	6.88	11.79	1.98	5.94	11.55	2.23	5.17	11.32	2.50	4.53	11.08	2.77	4.00

DURAN 4T 12 in Heating mode

	Delivery water T 25 °C			*Delivery water T 30 °C*			*Delivery water T 35 °C*			*Delivery water T 40 °C*			*Delivery water T 45 °C*			*Delivery water T 50 °C*			*Delivery water T 55 °C*		
Outside air T °C	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP
-22	5.03	1.88	2.68	4.94	1.98	2.50	4.85	2.07	2.34	4.76	2.17	2.20	4.68	2.26	2.07	4.59	2.36	1.94	4.51	2.47	1.82
-15	6.44	2.08	3.09	6.35	2.21	2.87	6.26	2.34	2.68	6.16	2.46	2.50	6.05	2.58	2.34	5.94	2.71	2.20	5.84	2.84	2.06
-10	7.59	2.19	3.47	7.50	2.35	3.19	7.39	2.50	2.95	7.28	2.65	2.74	7.16	2.80	2.56	7.03	2.95	2.38	6.90	3.10	2.23
-7	8.35	2.23	3.75	8.25	2.41	3.42	8.14	2.59	3.14	8.02	2.76	2.91	7.88	2.92	2.70	7.74	3.09	2.51	7.59	3.25	2.34
-5	8.88	2.25	3.95	8.78	2.45	3.59	8.66	2.64	3.28	8.53	2.82	3.02	8.39	3.00	2.80	8.24	3.18	2.59	8.08	3.35	2.41
-2	9.73	2.26	4.30	9.62	2.48	3.87	9.49	2.70	3.52	9.35	2.90	3.22	9.19	3.10	2.96	9.02	3.30	2.73	8.84	3.49	2.53
0	10.33	2.26	4.57	10.21	2.50	4.08	10.07	2.73	3.69	9.92	2.95	3.36	9.75	3.17	3.08	9.57	3.38	2.83	9.37	3.58	2.62
2	10.95	2.25	4.88	10.83	2.51	4.32	10.68	2.75	3.88	10.52	2.99	3.51	10.34	3.22	3.21	10.14	3.45	2.94	9.93	3.67	2.71
5	11.94	2.21	5.41	11.80	2.50	4.73	11.64	2.77	4.20	11.46	3.04	3.77	11.26	3.29	3.42	11.04	3.54	3.12	10.81	3.79	2.85
7	12.63	2.17	5.83	12.49	2.48	5.04	12.32	2.77	4.44	12.12	3.06	3.96	11.91	3.33	3.57	11.67	3.60	3.24	11.42	3.86	2.96
10	13.73	2.08	6.59	13.57	2.43	5.59	13.38	2.75	4.86	13.16	3.07	4.29	12.93	3.37	3.83	12.67	3.67	3.46	12.39	3.95	3.13
12	14.50	2.01	7.20	14.32	2.38	6.02	14.12	2.73	5.18	13.89	3.06	4.53	13.64	3.39	4.03	13.37	3.70	3.61	13.07	4.01	3.26
15	15.71	1.88	8.36	15.52	2.28	6.80	15.29	2.67	5.74	15.04	3.04	4.96	14.77	3.39	4.35	14.46	3.74	3.87	14.14	4.07	3.47
20	17.89	1.58	11.29	17.67	2.05	8.61	17.41	2.50	6.97	17.11	2.93	5.85	16.79	3.34	5.03	16.44	3.74	4.39	16.06	4.13	3.89

DURAN 4T 15 in Heating mode

	Delivery water T 25 °C			Delivery water T 30 °C			Delivery water T 35 °C			Delivery water T 40 °C			Delivery water T 45 °C			Delivery water T 50 °C			Delivery water T 55 °C		
Outside air T °C	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP
-22	5.97	2.35	2.54	5.91	2.55	2.32	5.85	2.74	2.13	5.79	2.94	1.97	5.72	3.12	1.83	5.63	3.29	1.71	5.52	3.45	1.60
-15	7.60	2.45	3.10	7.51	2.67	2.81	7.44	2.90	2.56	7.36	3.13	2.35	7.28	3.36	2.17	7.18	3.58	2.01	7.07	3.79	1.87
-10	8.99	2.52	3.56	8.87	2.76	3.22	8.77	3.01	2.92	8.66	3.26	2.66	8.55	3.52	2.43	8.44	3.77	2.24	8.31	4.02	2.07
-7	9.92	2.56	3.88	9.79	2.80	3.49	9.66	3.06	3.15	9.53	3.33	2.86	9.40	3.60	2.61	9.27	3.88	2.39	9.12	4.15	2.20
-5	10.60	2.58	4.10	10.44	2.83	3.68	10.29	3.10	3.32	10.14	3.38	3.00	10.00	3.66	2.73	9.85	3.95	2.49	9.69	4.23	2.29
-2	11.68	2.62	4.46	11.49	2.87	4.00	11.30	3.15	3.59	11.13	3.44	3.24	10.95	3.74	2.93	10.78	4.05	2.66	10.59	4.35	2.43
0	12.45	2.63	4.73	12.23	2.90	4.22	12.03	3.18	3.78	11.83	3.48	3.40	11.63	3.79	3.07	11.43	4.11	2.78	11.22	4.43	2.53
2	13.26	2.65	5.01	13.02	2.92	4.46	12.79	3.21	3.99	12.56	3.51	3.58	12.34	3.83	3.22	12.12	4.16	2.91	11.89	4.50	2.64
5	14.57	2.67	5.46	14.28	2.94	4.85	14.00	3.24	4.32	13.73	3.56	3.86	13.47	3.89	3.46	13.21	4.24	3.11	12.94	4.60	2.82
7	15.50	2.68	5.79	15.17	2.95	5.14	14.87	3.26	4.56	14.57	3.59	4.06	14.27	3.93	3.63	13.98	4.29	3.26	13.69	4.66	2.94
10	16.98	2.68	6.33	16.60	2.97	5.60	16.24	3.28	4.95	15.89	3.62	4.39	15.55	3.97	3.91	15.21	4.35	3.50	14.87	4.74	3.14
12	18.03	2.68	6.72	17.61	2.97	5.93	17.21	3.29	5.24	16.83	3.63	4.63	16.45	4.00	4.11	16.07	4.39	3.67	15.70	4.79	3.28
15	19.70	2.68	7.37	19.22	2.97	6.48	18.76	3.29	5.70	18.32	3.65	5.02	17.88	4.03	4.44	17.45	4.43	3.94	17.02	4.85	3.51
20	22.76	2.64	8.63	22.17	2.94	7.55	21.60	3.27	6.60	21.04	3.64	5.77	20.50	4.04	5.07	19.96	4.47	4.46	19.43	4.92	3.95

DURAN 4T 20 in Heating mode

	Delivery water T 25 °C			Delivery water T 30 °C			Delivery water T 35 °C			Delivery water T 40 °C			Delivery water T 45 °C			Delivery water T 50 °C			Delivery water T 55 °C		
Outside air T °C	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP
-22	7.73	2.78	2.78	7.64	2.96	2.58	7.55	3.14	2.40	7.45	3.32	2.25	7.35	3.49	2.11	7.24	3.65	1.98	7.11	3.80	1.87
-15	9.85	3.04	3.25	9.75	3.26	2.99	9.65	3.48	2.77	9.54	3.70	2.58	9.43	3.92	2.40	9.30	4.14	2.25	9.16	4.35	2.10
-10	11.62	3.19	3.65	11.50	3.44	3.34	11.37	3.70	3.07	11.24	3.96	2.84	11.10	4.22	2.63	10.95	4.48	2.45	10.78	4.73	2.28
-7	12.80	3.26	3.92	12.66	3.54	3.58	12.51	3.82	3.28	12.36	4.10	3.01	12.20	4.38	2.78	12.03	4.67	2.58	11.84	4.95	2.39
-5	13.64	3.31	4.12	13.48	3.60	3.75	13.32	3.89	3.42	13.15	4.19	3.14	12.97	4.49	2.89	12.78	4.79	2.67	12.57	5.09	2.47
-2	14.98	3.36	4.46	14.79	3.67	4.03	14.60	3.99	3.66	14.40	4.31	3.34	14.19	4.63	3.06	13.97	4.96	2.82	13.74	5.29	2.60
0	15.93	3.38	4.71	15.72	3.71	4.24	15.51	4.04	3.84	15.29	4.38	3.49	15.06	4.72	3.19	14.81	5.07	2.92	14.55	5.41	2.69
2	16.93	3.40	4.98	16.69	3.74	4.46	16.46	4.09	4.02	16.21	4.44	3.65	15.96	4.81	3.32	15.69	5.17	3.03	15.40	5.54	2.78
5	18.52	3.41	5.43	18.24	3.77	4.84	17.96	4.15	4.33	17.68	4.53	3.90	17.38	4.92	3.54	17.07	5.31	3.22	16.75	5.70	2.94
7	19.64	3.40	5.77	19.34	3.78	5.11	19.03	4.17	4.56	18.71	4.57	4.09	18.39	4.98	3.69	18.05	5.39	3.35	17.69	5.81	3.05
10	21.42	3.37	6.35	21.07	3.78	5.58	20.71	4.19	4.94	20.35	4.62	4.40	19.98	5.06	3.95	19.59	5.50	3.56	19.18	5.95	3.23
12	22.68	3.34	6.79	22.30	3.76	5.93	21.90	4.19	5.22	21.50	4.64	4.63	21.09	5.10	4.14	20.67	5.56	3.72	20.23	6.03	3.36
15	24.68	3.27	7.55	24.24	3.72	6.52	23.79	4.18	5.69	23.33	4.65	5.02	22.86	5.14	4.45	22.38	5.63	3.98	21.88	6.13	3.57
20	28.31	3.09	9.17	27.76	3.58	7.76	27.21	4.09	6.66	26.64	4.61	5.78	26.07	5.15	5.06	25.48	5.70	4.47	24.88	6.25	3.98

DURAN 4T 25 in Heating mode

	Delivery water T 25 °C			Delivery water T 30 °C			Delivery water T 35 °C			Delivery water T 40 °C			Delivery water T 45 °C			Delivery water T 50 °C			Delivery water T 55 °C		
Outside air T °C	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP
-22	10.35	3.71	2.79	10.30	4.01	2.57	10.25	4.31	2.38	10.19	4.61	2.21	10.12	4.90	2.07	10.03	5.17	1.94	9.92	5.42	1.83
-15	12.96	3.91	3.32	12.89	4.26	3.03	12.82	4.61	2.78	12.74	4.97	2.56	12.65	5.32	2.38	12.55	5.67	2.21	12.42	6.00	2.07
-10	15.17	4.03	3.77	15.06	4.41	3.41	14.96	4.81	3.11	14.85	5.21	2.85	14.72	5.61	2.62	14.59	6.01	2.43	14.43	6.40	2.25
-7	16.66	4.09	4.08	16.52	4.49	3.67	16.38	4.92	3.33	16.24	5.34	3.04	16.09	5.78	2.79	15.92	6.21	2.57	15.74	6.63	2.37
-5	17.72	4.12	4.30	17.55	4.54	3.87	17.39	4.98	3.49	17.23	5.43	3.17	17.05	5.88	2.90	16.86	6.33	2.66	16.65	6.78	2.46
-2	19.42	4.15	4.68	19.21	4.60	4.18	19.01	5.06	3.75	18.80	5.54	3.39	18.59	6.02	3.09	18.36	6.51	2.82	18.11	7.00	2.59
0	20.63	4.17	4.95	20.39	4.63	4.40	20.16	5.11	3.94	19.92	5.61	3.55	19.67	6.11	3.22	19.41	6.62	2.93	19.13	7.13	2.68
2	21.91	4.17	5.25	21.63	4.65	4.65	21.36	5.15	4.15	21.09	5.66	3.72	20.81	6.19	3.36	20.51	6.72	3.05	20.20	7.26	2.78
5	23.94	4.17	5.75	23.61	4.67	5.06	23.28	5.19	4.48	22.95	5.74	4.00	22.61	6.29	3.59	22.26	6.86	3.24	21.89	7.43	2.94
7	25.39	4.15	6.12	25.01	4.67	5.36	24.64	5.21	4.73	24.27	5.77	4.20	23.89	6.35	3.76	23.49	6.94	3.38	23.08	7.54	3.06
10	27.69	4.10	6.75	27.24	4.65	5.86	26.80	5.22	5.14	26.36	5.81	4.54	25.91	6.42	4.03	25.45	7.05	3.61	24.97	7.68	3.25
12	29.32	4.06	7.23	28.82	4.62	6.24	28.33	5.21	5.44	27.84	5.82	4.78	27.34	6.45	4.24	26.83	7.10	3.78	26.30	7.77	3.39
15	31.90	3.97	8.04	31.33	4.55	6.88	30.75	5.17	5.95	30.18	5.82	5.19	29.60	6.48	4.57	29.01	7.17	4.05	28.40	7.87	3.61
20	36.62	3.75	9.77	35.89	4.38	8.20	35.16	5.04	6.97	34.44	5.74	6.00	33.71	6.46	5.22	32.97	7.21	4.57	32.22	7.98	4.04

DURAN 4T 30 in Heating mode

	Delivery water T 25 °C			Delivery water T 30 °C			Delivery water T 35 °C			Delivery water T 40 °C			Delivery water T 45 °C			Delivery water T 50 °C			Delivery water T 55 °C		
Outside air T °C	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP	kW heating	kW power input	COP
-22	13.38	4.90	2.73	13.31	5.30	2.51	13.24	5.69	2.33	13.17	6.07	2.17	13.07	6.44	2.03	12.96	6.79	1.91	12.81	7.12	1.80
-15	16.75	5.16	3.24	16.66	5.62	2.97	16.57	6.08	2.73	16.47	6.54	2.52	16.36	7.00	2.34	16.22	7.44	2.18	16.06	7.87	2.04
-10	19.61	5.32	3.69	19.48	5.82	3.35	19.34	6.34	3.05	19.20	6.86	2.80	19.04	7.38	2.58	18.87	7.89	2.39	18.67	8.40	2.22
-7	21.54	5.40	3.99	21.36	5.93	3.60	21.18	6.47	3.27	21.00	7.03	2.99	20.81	7.59	2.74	20.60	8.15	2.53	20.36	8.70	2.34
-5	22.91	5.44	4.21	22.70	5.99	3.79	22.49	6.56	3.43	22.28	7.14	3.12	22.06	7.72	2.86	21.82	8.31	2.62	21.55	8.90	2.42
-2	25.11	5.49	4.58	24.85	6.07	4.09	24.59	6.67	3.69	24.32	7.29	3.34	24.05	7.91	3.04	23.75	8.54	2.78	23.43	9.18	2.55
0	26.68	5.51	4.84	26.38	6.11	4.32	26.07	6.73	3.87	25.77	7.38	3.49	25.45	8.03	3.17	25.12	8.69	2.89	24.76	9.35	2.65
2	28.33	5.52	5.13	27.98	6.14	4.56	27.63	6.79	4.07	27.28	7.45	3.66	26.92	8.13	3.31	26.55	8.82	3.01	26.15	9.52	2.75
5	30.97	5.51	5.62	30.55	6.17	4.95	30.12	6.85	4.40	29.70	7.55	3.93	29.26	8.27	3.54	28.81	9.01	3.20	28.34	9.75	2.91
7	32.84	5.49	5.98	32.36	6.17	5.25	31.88	6.87	4.64	31.40	7.60	4.13	30.92	8.35	3.70	30.41	9.12	3.34	29.88	9.89	3.02
10	35.83	5.43	6.59	35.25	6.14	5.74	34.68	6.88	5.04	34.12	7.65	4.46	33.54	8.45	3.97	32.95	9.26	3.56	32.33	10.08	3.21
12	37.93	5.38	7.05	37.30	6.11	6.11	36.66	6.87	5.33	36.03	7.67	4.70	35.39	8.49	4.17	34.73	9.33	3.72	34.05	10.19	3.34
15	41.29	5.26	7.85	40.54	6.03	6.73	39.80	6.83	5.83	39.07	7.66	5.10	38.32	8.53	4.49	37.56	9.42	3.99	36.78	10.33	3.56
20	47.40	4.98	9.51	46.46	5.80	8.01	45.52	6.67	6.83	44.59	7.57	5.89	43.65	8.51	5.13	42.70	9.48	4.50	41.73	10.48	3.98

DURAN 4T 8 in Cooling mode

	Delivery water T 20 °C			Delivery water T 18 °C			Delivery water T 15 °C			Delivery water T 12 °C			Delivery water T 10 °C			Delivery water T 7 °C			Delivery water T 5 °C		
Outside air T °C	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER
20	12.32	1.28	9.62	12.27	1.30	9.44	11.17	1.33	8.37	10.15	1.36	7.45	9.51	1.38	6.91	8.61	1.39	6.19	8.05	1.40	5.76
25	11.83	1.48	7.98	11.78	1.50	7.84	10.72	1.53	6.99	9.74	1.56	6.26	9.13	1.57	5.83	8.26	1.58	5.24	7.72	1.58	4.89
30	11.32	1.70	6.65	11.27	1.73	6.53	10.26	1.75	5.86	9.32	1.77	5.27	8.73	1.77	4.92	7.91	1.78	4.45	7.39	1.78	4.16
35	10.81	1.94	5.56	10.76	1.97	5.47	9.79	1.99	4.93	8.89	1.99	4.46	8.33	2.00	4.18	7.54	1.99	3.79	7.05	1.98	3.55
40	10.29	2.20	4.68	10.23	2.23	4.60	9.31	2.23	4.17	8.46	2.23	3.78	7.92	2.23	3.55	7.17	2.22	3.24	6.70	2.20	3.04
45	9.75	2.47	3.95	9.70	2.50	3.88	8.82	2.50	3.53	8.01	2.48	3.22	7.50	2.47	3.03	6.79	2.45	2.77	6.34	2.43	2.61

DURAN 4T 12 in Cooling mode

	Delivery water T 20 °C			Delivery water T 18 °C			Delivery water T 15 °C			Delivery water T 12 °C			Delivery water T 10 °C			Delivery water T 7 °C			Delivery water T 5 °C		
Outside air T °C	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER
20	18.00	1.35	13.34	17.93	1.40	12.80	16.31	1.62	10.07	14.80	1.80	8.22	13.86	1.90	7.28	12.53	2.03	6.17	11.70	2.10	5.57
25	17.25	1.85	9.32	17.18	1.90	9.04	15.62	2.08	7.52	14.18	2.22	6.38	13.27	2.30	5.77	12.00	2.39	5.02	11.20	2.44	4.60
30	16.50	2.33	7.07	16.42	2.38	6.90	14.93	2.52	5.93	13.54	2.62	5.16	12.68	2.68	4.73	11.46	2.74	4.19	10.70	2.76	3.88
35	15.72	2.80	5.62	15.64	2.84	5.50	14.22	2.94	4.83	12.89	3.01	4.28	12.07	3.04	3.97	10.90	3.07	3.56	10.18	3.07	3.32
40	14.93	3.24	4.60	14.85	3.29	4.52	13.49	3.35	4.03	12.23	3.38	3.61	11.44	3.39	3.37	10.34	3.38	3.05	9.65	3.37	2.87
45	14.12	3.67	3.84	14.04	3.72	3.78	12.75	3.74	3.41	11.55	3.74	3.09	10.81	3.73	2.90	9.76	3.69	2.64	9.10	3.66	2.49

DURAN 4T 15 in Cooling mode

	Delivery water T 20 °C			Delivery water T 18 °C			Delivery water T 15 °C			Delivery water T 12 °C			Delivery water T 10 °C			Delivery water T 7 °C			Delivery water T 5 °C		
Outside air T °C	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER
20	21.55	2.59	8.31	21.46	2.62	8.18	19.49	2.65	7.34	17.65	2.67	6.60	16.50	2.68	6.16	14.88	2.68	5.55	13.87	2.68	5.17
25	20.62	2.89	7.13	20.53	2.92	7.03	18.63	2.95	6.32	16.87	2.97	5.69	15.77	2.97	5.31	14.21	2.97	4.79	13.24	2.96	4.47
30	19.67	3.23	6.10	19.58	3.26	6.00	17.76	3.28	5.41	16.07	3.29	4.88	15.01	3.29	4.56	13.53	3.28	4.12	12.60	3.27	3.85
35	18.71	3.60	5.20	18.61	3.64	5.12	16.87	3.65	4.63	15.26	3.65	4.18	14.25	3.64	3.91	12.83	3.62	3.54	11.94	3.60	3.32
40	17.73	4.00	4.43	17.63	4.04	4.36	15.97	4.04	3.95	14.43	4.03	3.58	13.47	4.01	3.36	12.12	3.98	3.04	11.28	3.95	2.85
45	16.72	4.43	3.77	16.62	4.48	3.71	15.05	4.46	3.37	13.59	4.43	3.06	12.67	4.41	2.87	11.39	4.36	2.61	10.59	4.32	2.45

DURAN 4T 20 in Cooling mode

	Delivery water T 20 °C			*Delivery water T 18 °C*			*Delivery water T 15 °C*			*Delivery water T 12 °C*			*Delivery water T 10 °C*			*Delivery water T 7 °C*			*Delivery water T 5 °C*		
Outside air T °C	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER
20	27.67	2.92	9.46	27.56	2.97	9.27	25.09	3.12	8.05	22.79	3.23	7.06	21.34	3.29	6.49	19.31	3.35	5.76	18.04	3.38	5.34
25	26.56	3.44	7.73	26.45	3.49	7.58	24.07	3.60	6.68	21.86	3.69	5.93	20.47	3.73	5.49	18.52	3.77	4.92	17.31	3.78	4.58
30	25.43	3.97	6.41	25.31	4.02	6.30	23.03	4.10	5.61	20.91	4.16	5.03	19.58	4.18	4.68	17.72	4.20	4.22	16.55	4.19	3.95
35	24.27	4.51	5.38	24.15	4.57	5.29	21.97	4.62	4.75	19.94	4.65	4.29	18.67	4.65	4.01	16.89	4.63	3.64	15.78	4.61	3.42
40	23.08	5.07	4.55	22.96	5.13	4.48	20.88	5.15	4.05	18.95	5.15	3.68	17.74	5.13	3.46	16.04	5.08	3.16	14.99	5.04	2.97
45	21.87	5.64	3.88	21.75	5.70	3.81	19.77	5.69	3.47	17.93	5.65	3.17	16.79	5.62	2.99	15.18	5.54	2.74	14.17	5.47	2.59

DURAN 4T 25 in Cooling mode

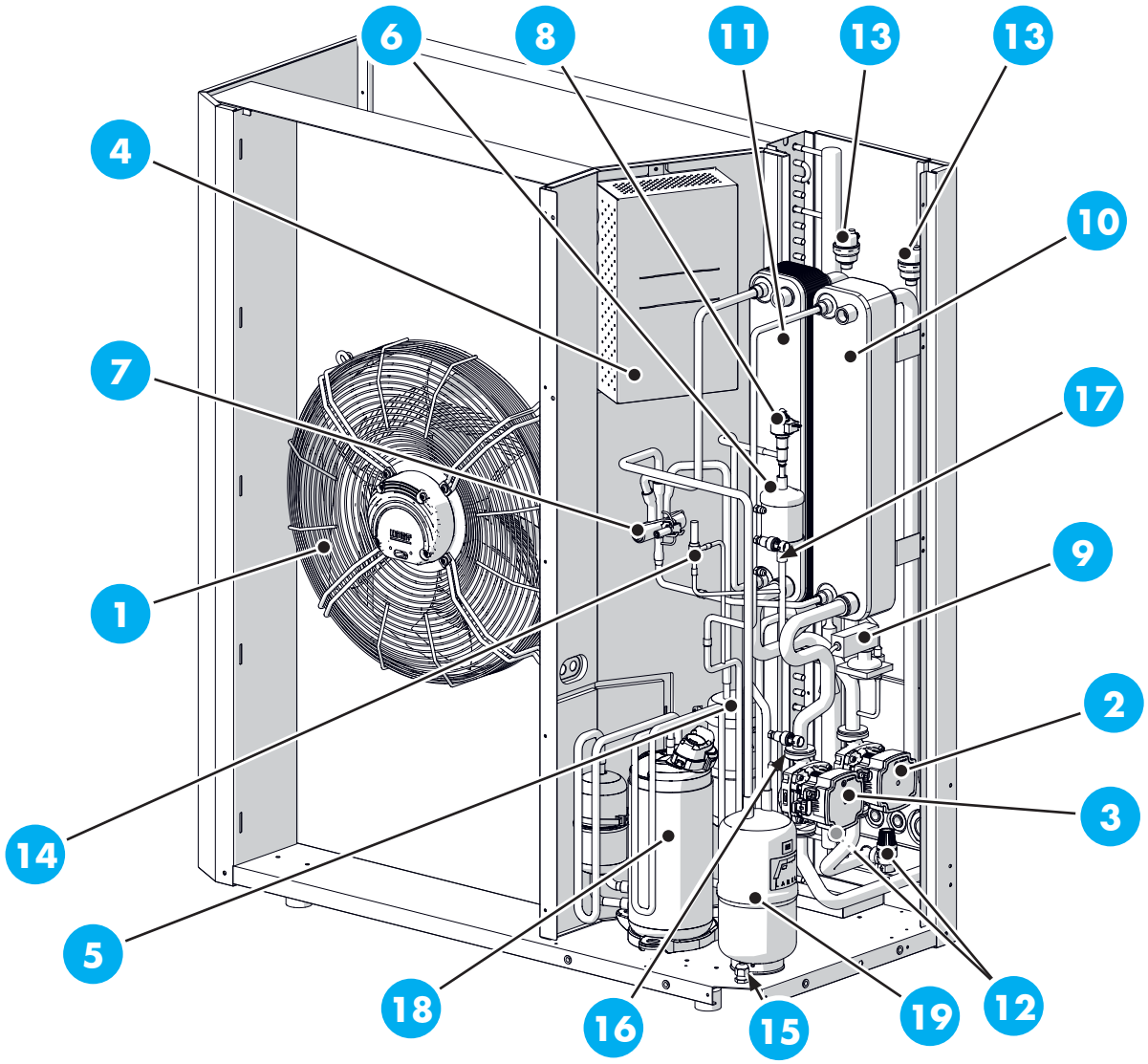
	Delivery water T 20 °C			*Delivery water T 18 °C*			*Delivery water T 15 °C*			*Delivery water T 12 °C*			*Delivery water T 10 °C*			*Delivery water T 7 °C*			*Delivery water T 5 °C*		
Outside air T °C	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER
20	35.73	3.56	10.04	35.59	3.62	9.83	35.59	3.79	9.40	32.39	3.92	8.26	29.42	3.99	7.37	27.55	4.08	6.76	24.93	4.12	6.06
25	34.28	4.20	8.15	34.13	4.27	7.99	34.13	4.41	7.74	31.06	4.52	6.87	28.21	4.57	6.17	26.42	4.63	5.70	23.90	4.65	5.13
30	32.80	4.89	6.71	32.65	4.96	6.58	32.65	5.07	6.44	29.70	5.15	5.77	26.97	5.18	5.20	25.26	5.21	4.84	22.85	5.22	4.38
35	31.29	5.61	5.58	31.13	5.68	5.48	31.13	5.76	5.41	28.32	5.80	4.88	25.70	5.82	4.42	24.07	5.82	4.14	21.77	5.80	3.75
40	29.74	6.35	4.68	29.58	6.43	4.60	29.58	6.47	4.57	26.90	6.49	4.15	24.41	6.48	3.77	22.85	6.44	3.55	20.66	6.41	3.23
45	28.16	7.12	3.95	28.00	7.20	3.89	28.00	7.21	3.88	25.45	7.18	3.54	23.09	7.15	3.23	21.61	7.08	3.05	19.54	7.02	2.78

DURAN 4T 30 in Cooling mode

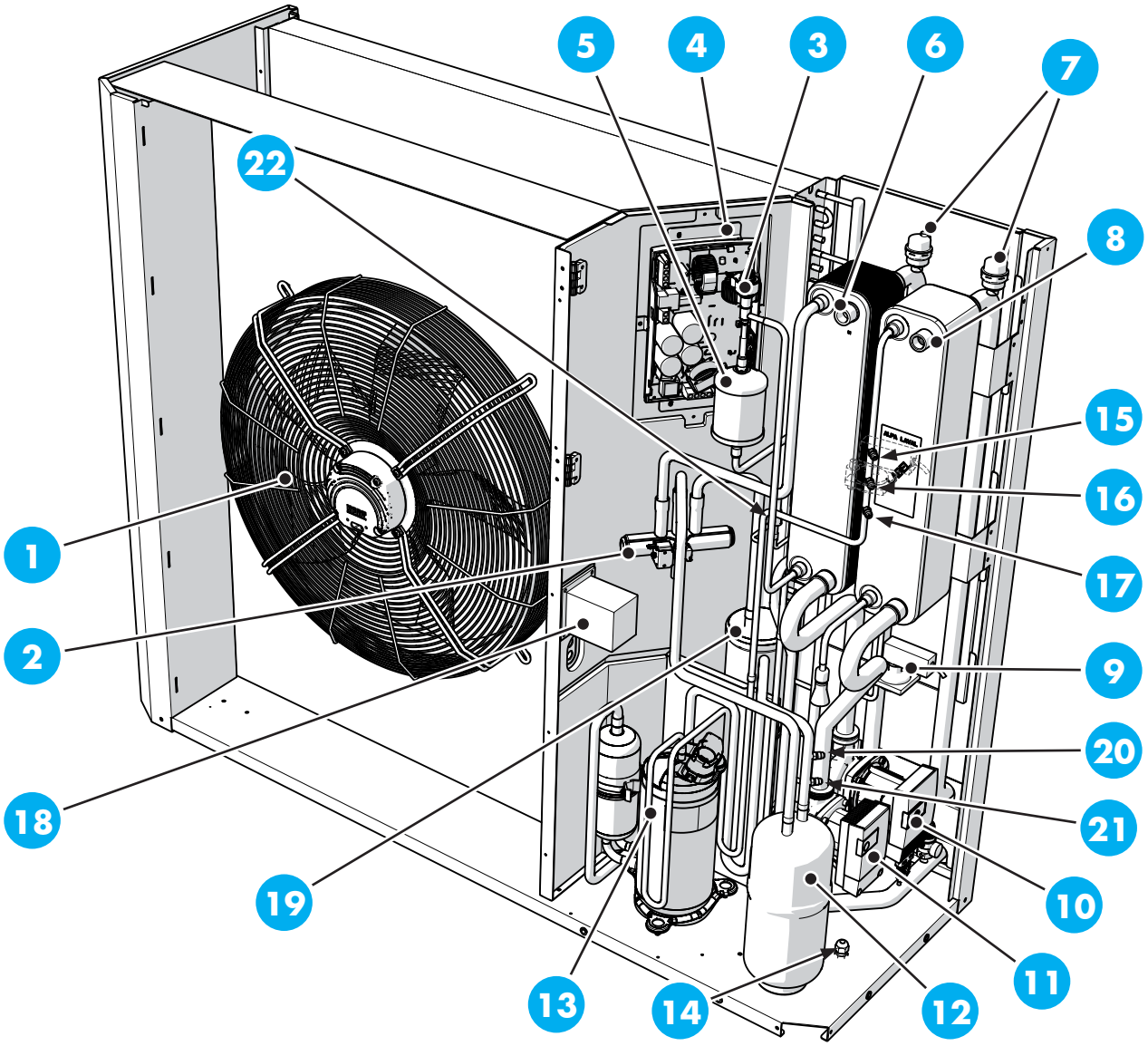
	Delivery water T 20 °C			*Delivery water T 18 °C*			*Delivery water T 15 °C*			*Delivery water T 12 °C*			*Delivery water T 10 °C*			*Delivery water T 7 °C*			*Delivery water T 5 °C*		
Outside air T °C	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER	kW Cooling	kW power input	EER
20	46.63	4.72	9.89	46.44	4.80	9.68	42.27	5.02	8.43	38.39	5.19	7.40	35.96	5.28	6.80	32.54	5.39	6.03	30.40	5.45	5.58
25	44.74	5.56	8.05	44.54	5.65	7.89	40.53	5.83	6.95	36.81	5.97	6.16	34.47	6.04	5.71	31.19	6.12	5.10	29.14	6.15	4.74
30	42.80	6.45	6.63	42.61	6.54	6.51	38.76	6.69	5.79	35.19	6.79	5.18	32.96	6.84	4.82	29.81	6.88	4.34	27.85	6.88	4.05
35	40.83	7.39	5.53	40.63	7.48	5.43	36.95	7.59	4.87	33.54	7.65	4.39	31.41	7.67	4.10	28.41	7.67	3.71	26.53	7.65	3.47
40	38.81	8.36	4.64	38.61	8.46	4.56	35.10	8.52	4.12	31.85	8.54	3.73	29.82	8.53	3.50	26.97	8.48	3.18	25.19	8.43	2.99
45	36.75	9.37	3.92	36.54	9.47	3.86	33.21	9.48	3.50	30.13	9.45	3.19	28.20	9.41	3.00	25.49	9.32	2.74	23.81	9.24	2.58

5.2 Machine components

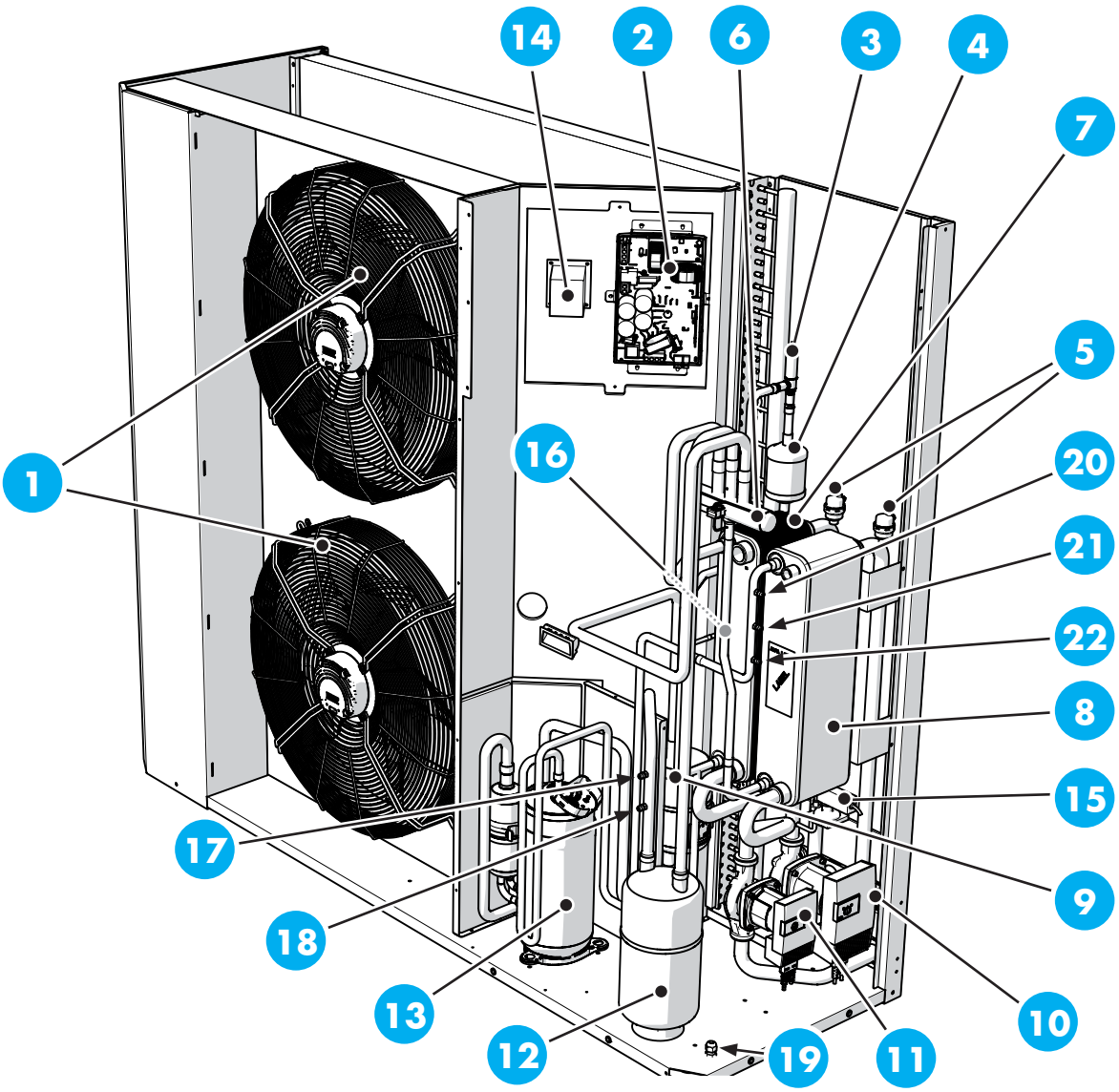
DURAN 12 kW 4T MB



1	Fan	**11**	System heat exchanger
2	System side circulator	**12**	Safety valves
3	High temperature circulator	**13**	Vents
4	Inverter board	**14**	Hot gas injection solenoid valve
5	Liquid receiver	**15**	External sensor
6	Biflow filter	**16**	LP service outlet, HP transducer
7	Cycle reversing valve	**17**	HP transducer, HP service outlet, safety pressure switch
8	Electronic expansion valve	**18**	Compressor
9	Differential pressure switch	**19**	Liquid separator
10	DHW heat exchanger		

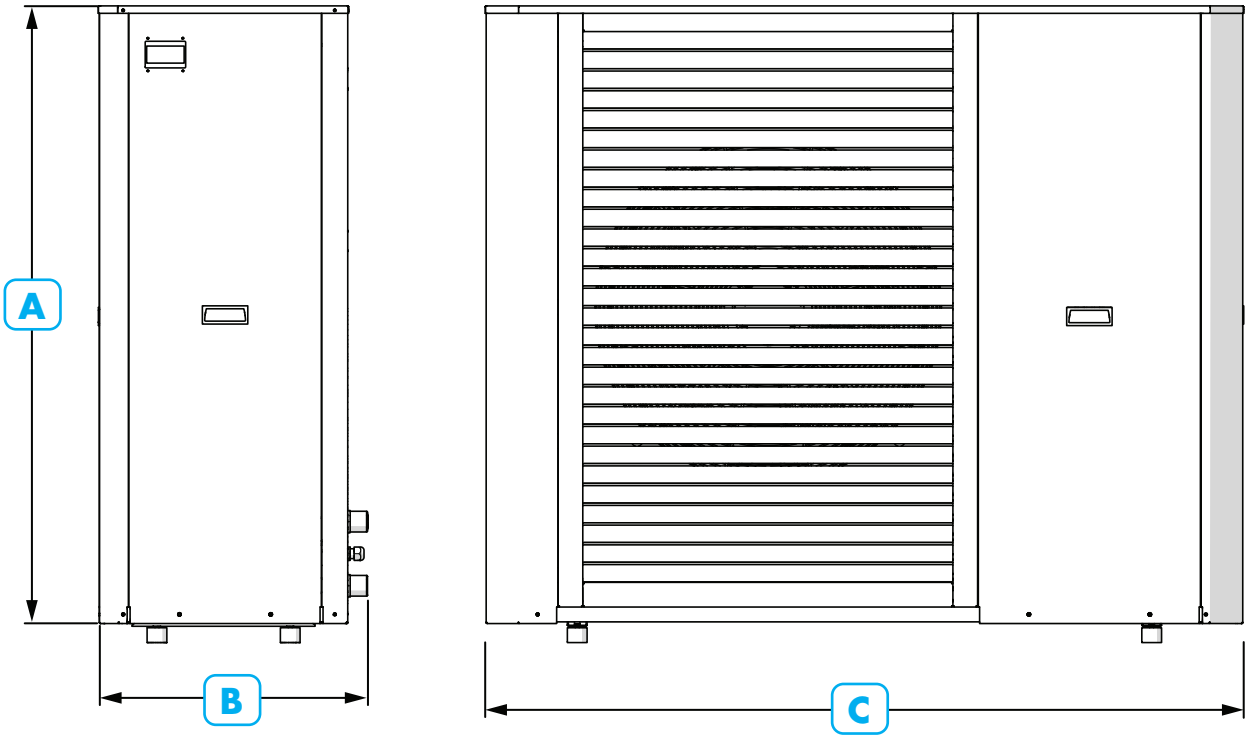


1	Fan	**12**	Liquid separator
2	Cycle reversing valve	**13**	Compressor
3	Electronic expansion valve	**14**	Outdoor air probe
4	Inverter	**15**	Safety pressure switch
5	Biflow filter	**16**	HP transducer
6	System plate heat exchanger	**17**	HP service outlet
7	Air vent	**18**	Reactor
8	DHW plate heat exchanger	**19**	Liquid receiver
9	Differential pressure switch	**20**	LP service outlet
10	System pump	**21**	LP transducer
11	DHW pump	**22**	Hot gas injection solenoid valve



1	Fans	**12**	Liquid separator
2	Inverter	**13**	Compressor
3	Expansion valve	**14**	Reactor
4	Biflow filter	**15**	Differential pressure switch
5	Air vent	**16**	Hot gas injection solenoid valve
6	Cycle reversing valve	**17**	LP service outlet
7	System heat exchanger	**18**	LP transducer
8	DHW heat exchanger	**19**	Outdoor air probe
9	Liquid receiver	**20**	Safety pressure switch
10	System pump	**21**	HP transducer
11	DHW pump	**22**	HP service outlet

5.3 Overall dimensions



OVERALL DIMENSIONS

	A	B	C
DURAN 12 kW 4T MB	1288	545	1135
DURAN 15 kW 4T MB	1290	546	1537
DURAN 20 kW 4T MB	1290	546	1537
DURAN 25 kW 4T MB	1690	646	1907
DURAN 30 kW 4T MB	1690	646	1907

6 Reception and handling

6.1 Handling with packaging

The machine is supplied on wooden pallets protected by cardboard packaging.

WARNING!

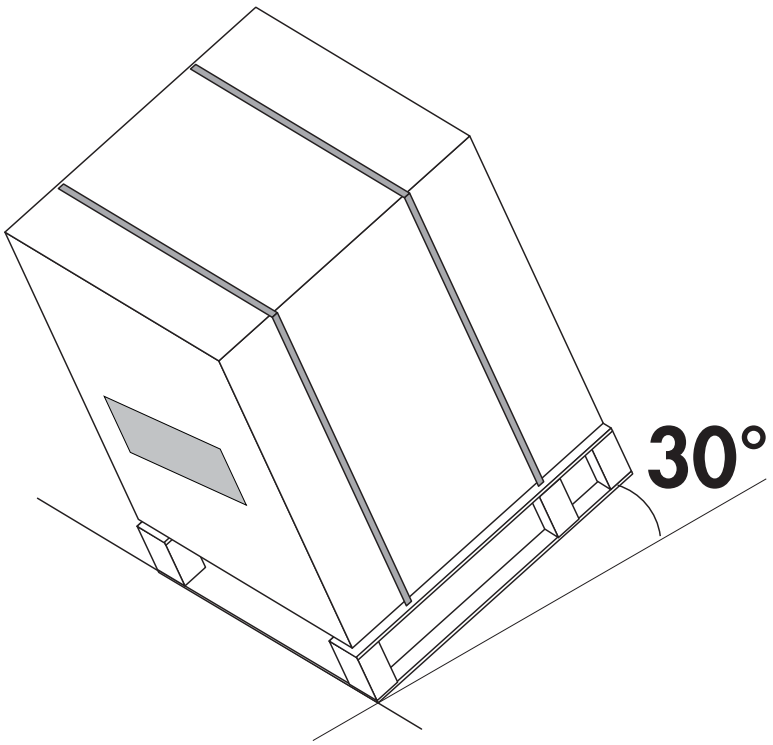
Use spacers to avoid damaging the machine .

WARNING!

The machine is supplied with the vibration dampers already installed; handle the units carefully to avoid damaging them.

WARNING!

During handling, it is forbidden to exceed the maximum permitted inclination of 30°.

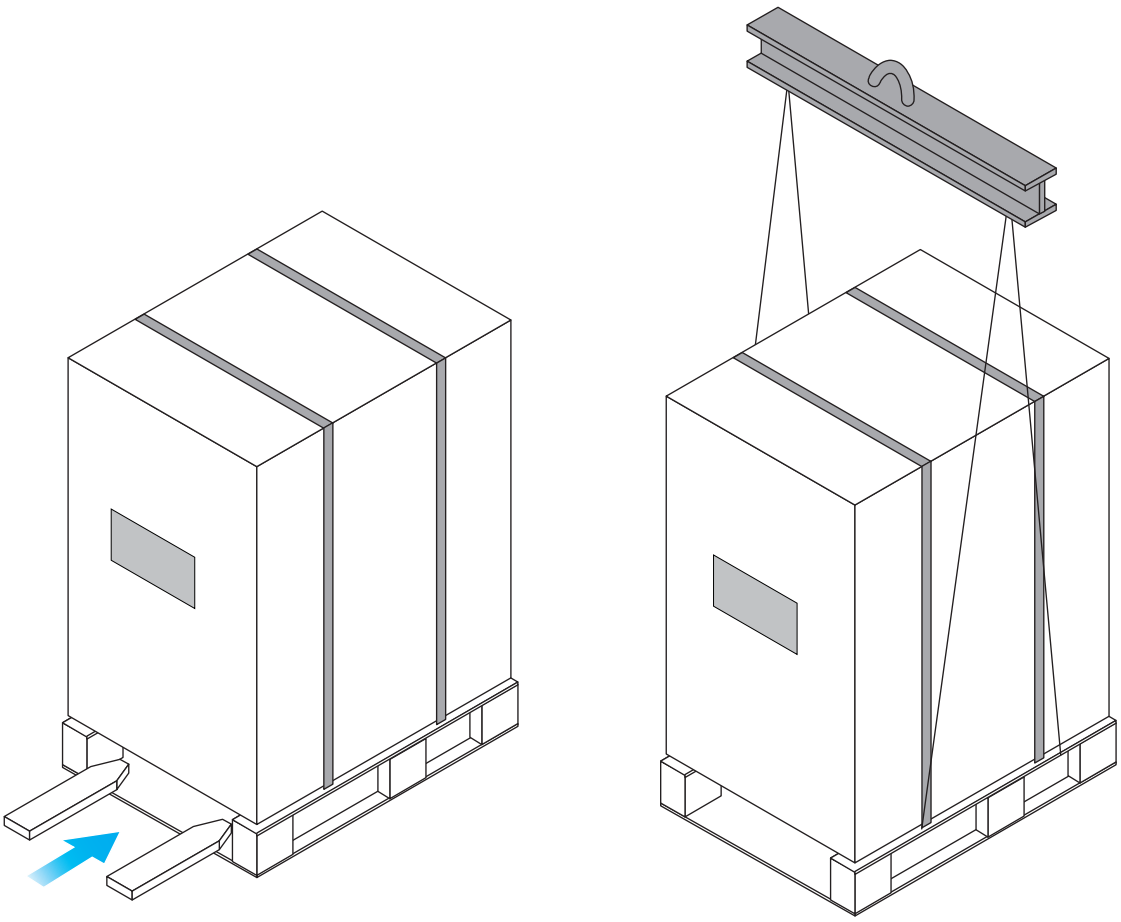


Lifting with forks

- Insert the forks from the side so as not to damage the panels.

Lifting with crane

- Position the lifting belts as shown in the figure.



6.2 Verification of packaging

Before accepting the received goods, please check that:

- the machine has not been damaged during transportation;
- the material delivered corresponds to that indicated on the transport document by comparing the data with the packing plate.

In case of damage or faults:

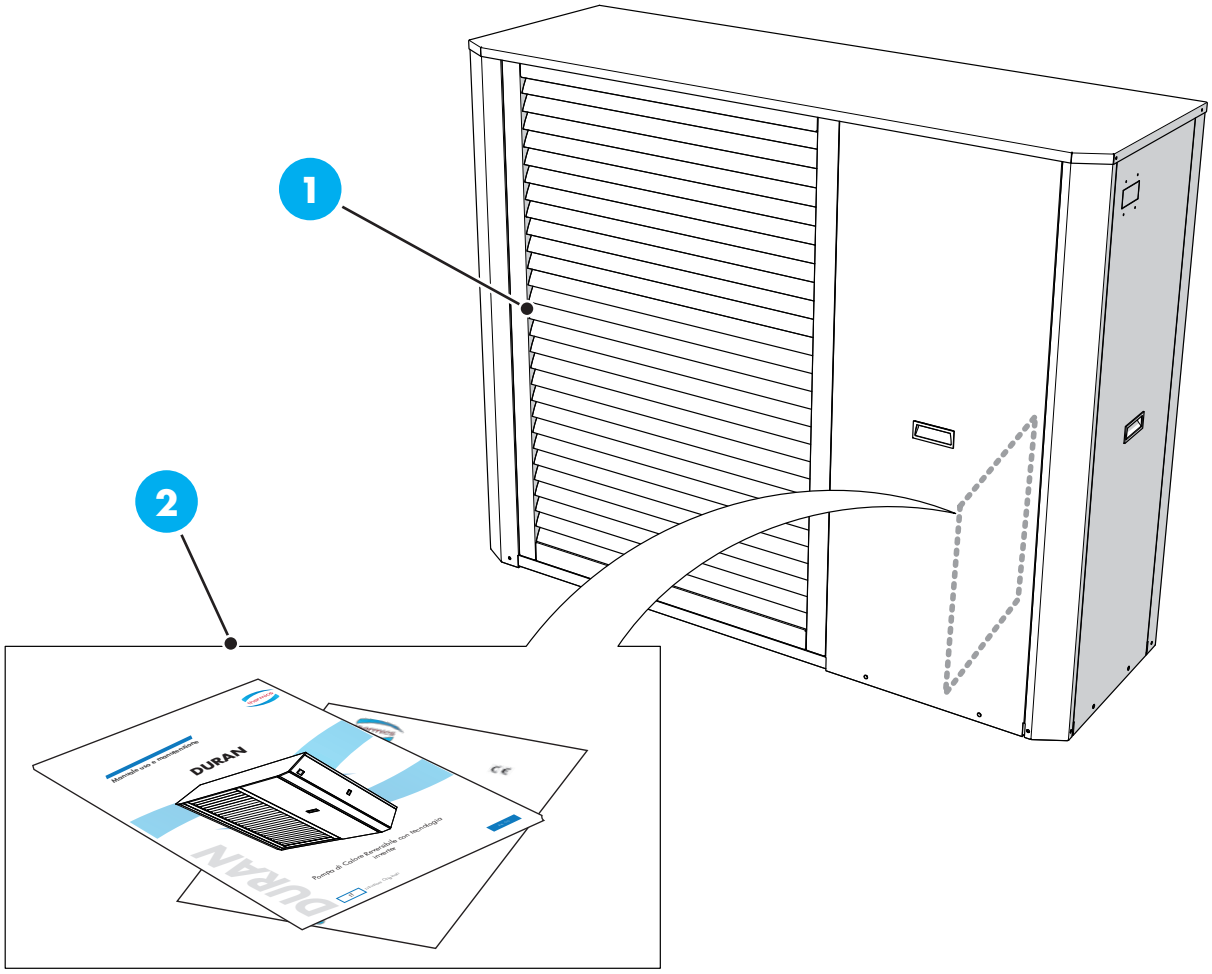
- immediately note down the damage on the transport document and write: "Delivery accepted with reserve due to noticeable missing parts/transport damage";
- complain by sending an PEC e-mail and registered letter with advice of receipt to the carrier and the supplier.

6.3 Packaging content

THE STANDARD SUPPLY INCLUDES:

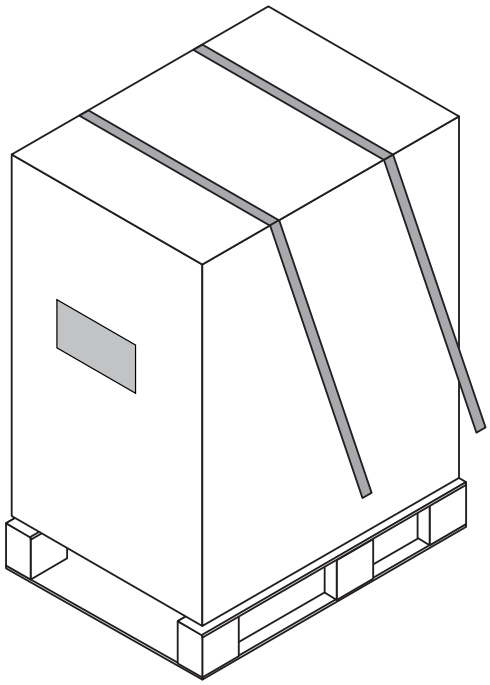
1	Heat pump
2	Technical documentation

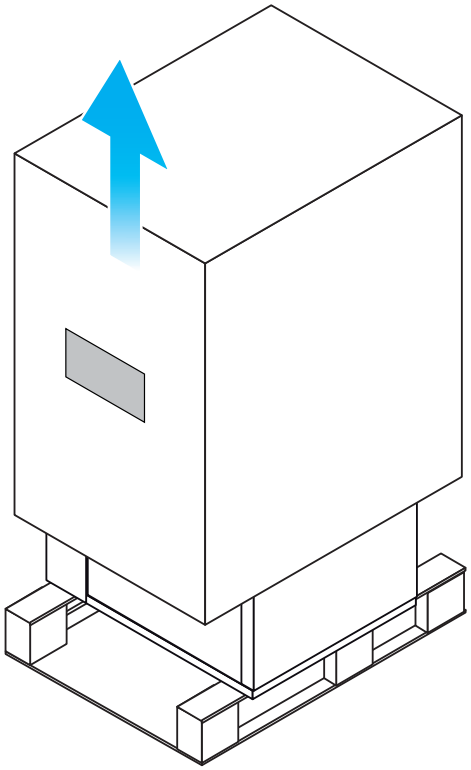
WARNING!
Keep the manual in a dry place, to avoid deterioration, for at least 10 years for future reference.



6.4 Removing the packaging

- Cut the fixing straps.
- Remove the top part by lifting it upwards.
- Remove any protective inserts.
- Remove the transparent film that wraps the machine.



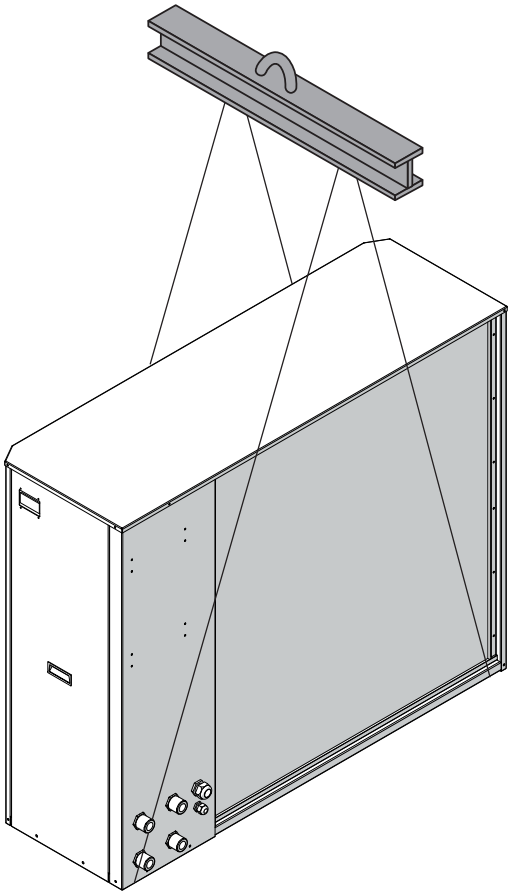


6.5 Handling without packaging

Use handling equipment suitable for the machine weight.

DANGER!
The unit is supplied with the vibration dampers already installed; handle the unit carefully to avoid damaging them.

DANGER!
Use spacers to prevent damage to the unit.



7 Mounting

7.1 Recommended equipment

To install the machine it is advisable to use the following equipment:

- set of cross-head and slotted screwdrivers;
- cutting nippers;
- scissors;
- set of open end wrenches and pipe wrenches;
- ladder;
- hydraulic material for sealing the threads;
- electrical equipment for connections;
- cut-resistant protective gloves.

7.2 System inspection

DANGER!
Current regulations require the heating system to be inspected before commissioning. The inspection must be carried out by a qualified technician.

Fill in the following check list on the installation data:

System

	Description	Notes	Signature	Date
□	Washed system			
□	Vented system			
□	Impurity filter			
□	Cut-off and drain valve			
□	Set filling flow rate			

Electricity

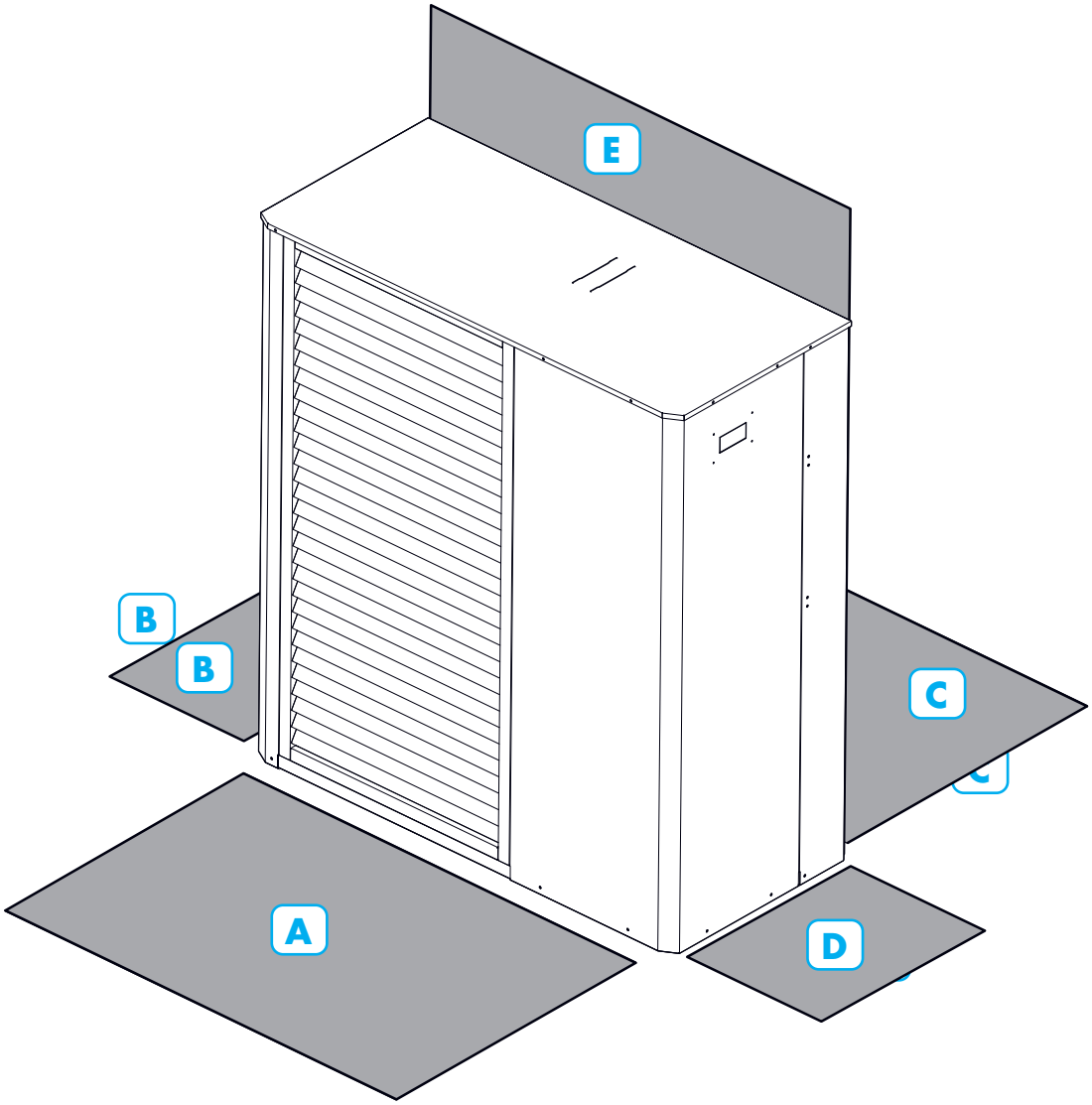
	Description	Notes	Signature	Date
□	Home fuses			
□	Safety switch			
□	Differential switch			
□	Communication cable connected (if any)			
□	Connections			
□	Main voltage			
□	Phase voltage			

Miscellaneous

	Description	Notes	Signature	Date
□	Condensate water pipe			
□	Condensate water pipe insulation, thickness			
□	Cooling pipes according to the procedure indicated (if present).			

7.3 Verification of functional spaces

The installation of the machine must allow specialised and authorised personnel to easily perform maintenance activities while respecting both the safety distances between the units and the other equipment and the technical spaces indicated in the table.



	A	B	C	D	E
DURAN 12 kW 4T MB	2000	500	500	800	300
DURAN 15 kW 4T MB	2000	500	500	1000	300
DURAN 20 kW 4T MB	2000	500	500	1000	300
DURAN 25 kW 4T MB	2500	500	500	1000	300
DURAN 30 kW 4T MB	2500	500	500	1000	300

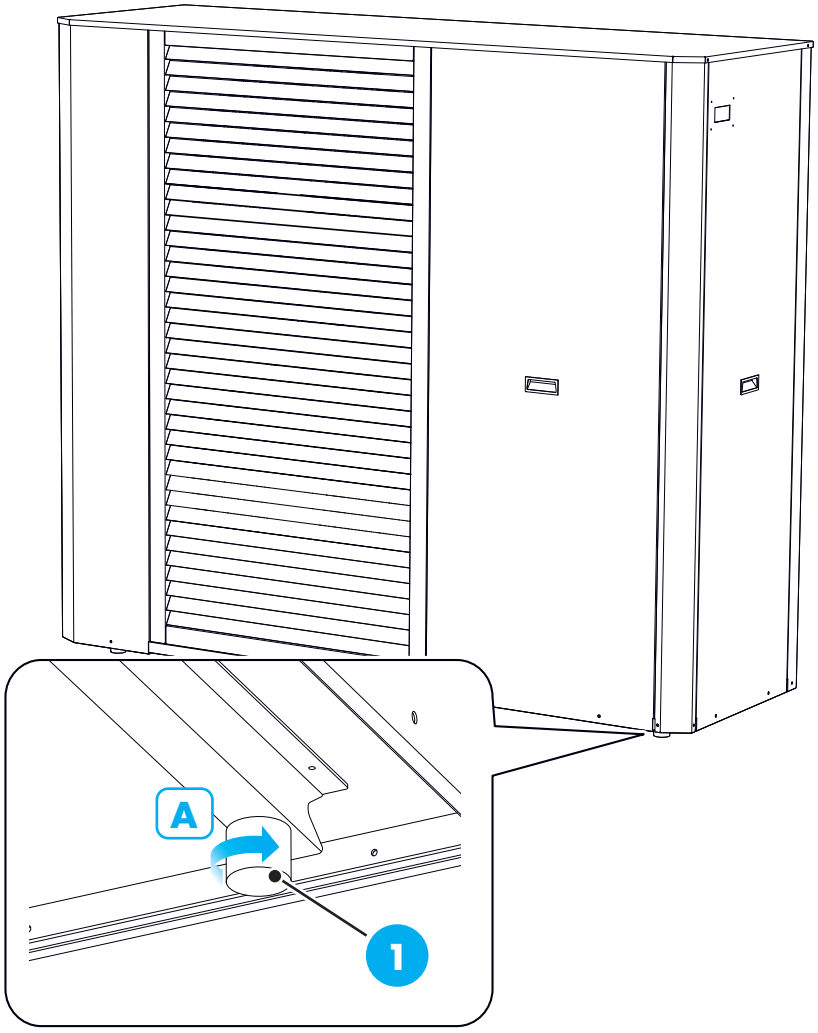
7.4 Unit positioning

The anti-vibration mountings (1) are supplied separately (if requested when placing the order) and must be fitted by the installer.

- To adjust the height of the vibration dampers (1) turn counterclockwise (A) to raise the angle.

DANGER!

Check that the table supports the machine weight.



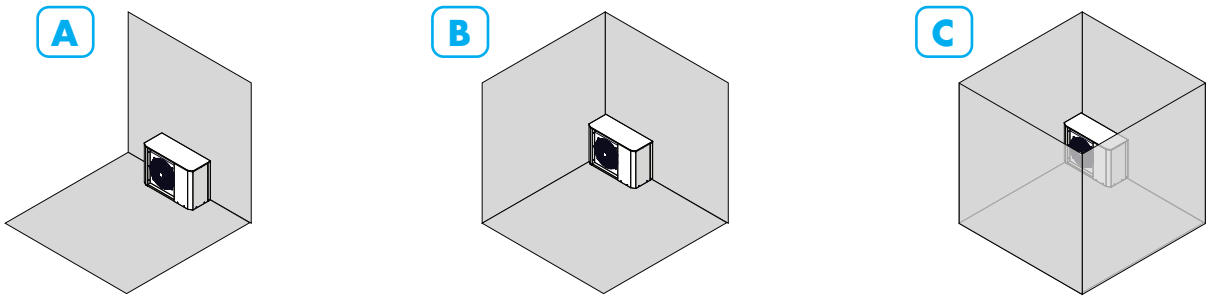
7.5 Noise control

During installation, take into account the effect that the position of the machine will have on the noise emitted. Position the machine as far away from walls as possible. The noise level increases according to the place of installation as illustrated below:

- **A.** Module positioned against a wall: +3 dB(A)
- **B.** Module positioned in a corner: +6 dB(A)
- **C.** Module positioned in a confined indoor space: +9 dB(A)

IMPORTANT

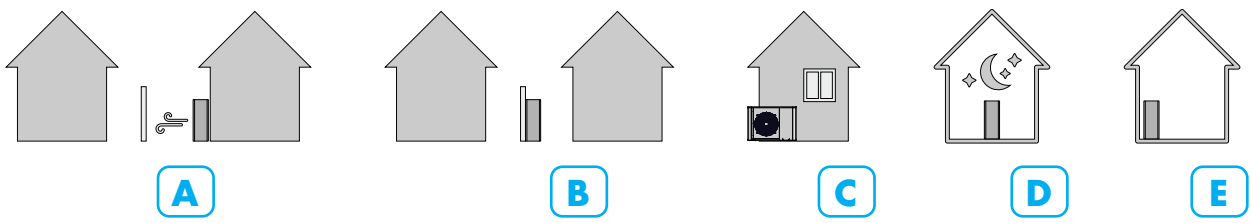
Avoid placing the module near the bedroom area and a terrace.
Do not install the module in front of a wall.



7.6 Where not to install

It is strictly prohibited to install the equipment with the:

- **A.** Ventilation directed towards neighbouring properties
- **B.** Module positioned at the edge of the property
- **C.** Module positioned under a window
- **D.** Module placed near the bedroom area
- **E.** Module installed in front of a wall



7.7 Recommendations and suggestions

In order to limit acoustic disturbances and vibrations, we suggest that you do the following:

- Install the module outdoors on a metal frame or on an inertia base. The weight of this base must be at least twice the weight of the module.
- Use modified bushes or sleeves for passing the refrigerant connections through walls.
- Use flexible and anti-vibration materials for fixing.
- Use vibration-damping devices on coolant connections, such as rings, plates, or elbow joints.
- It is also recommended to use sound absorbing devices such as:
  - wall absorbers to install on the wall behind the module
  - acoustic screen: the surface area of the screen must be larger than the size of the external module and must be positioned as close as possible to it, while still allowing free air circulation The screen must be made of suitable materials, such as soundproofing bricks, concrete blocks covered with sound-absorbing materials or natural screens such as earth.

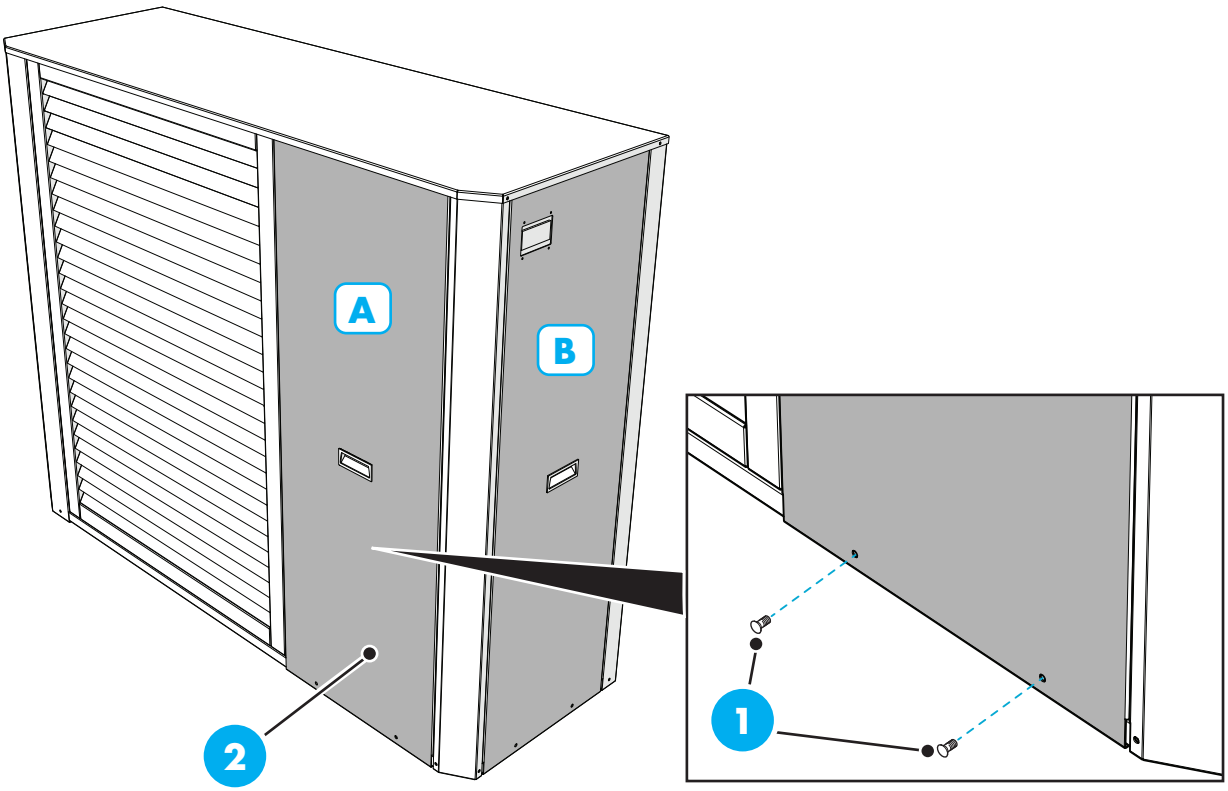
7.8 Access to internal parts

DANGER!
Before removing the side panels, make the hydraulic connections.

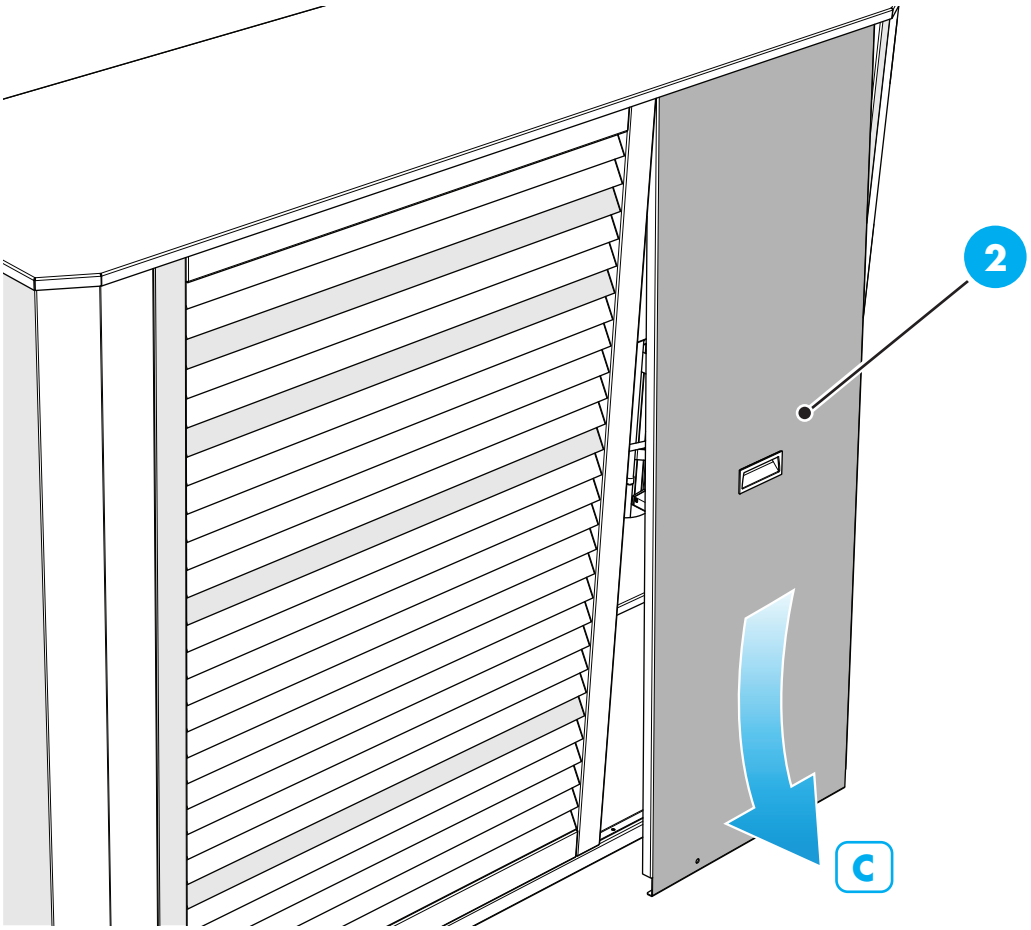
DANGER!
When removing the Control Panel dashboard, pay attention to the connection cable.

To access the internal parts, remove the panel of the concerned area (A-B):

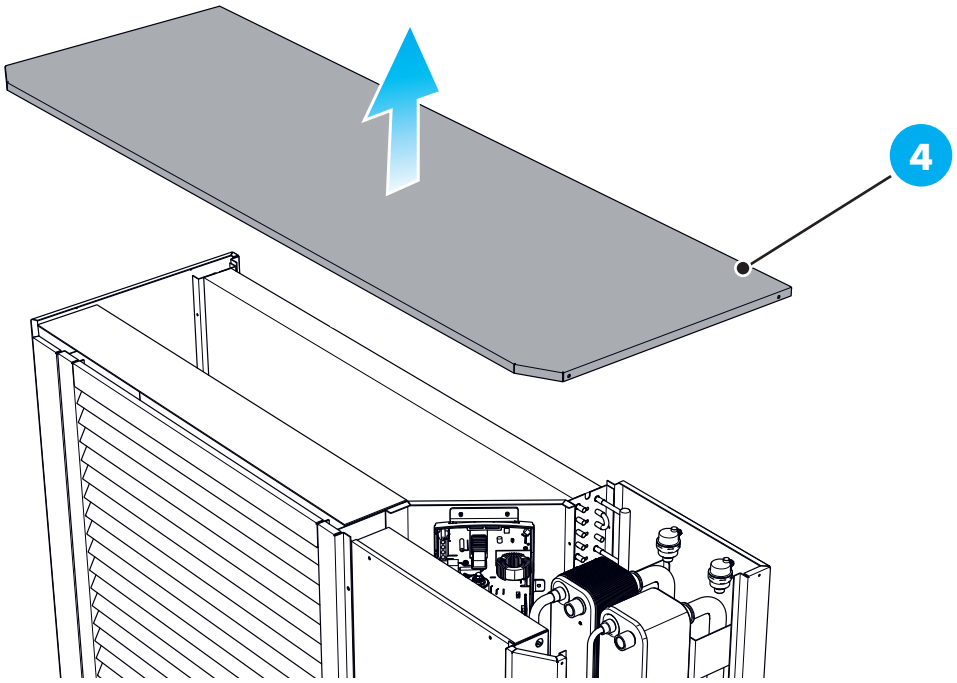
- loosen the screws (1) at the bottom of the panel (2);



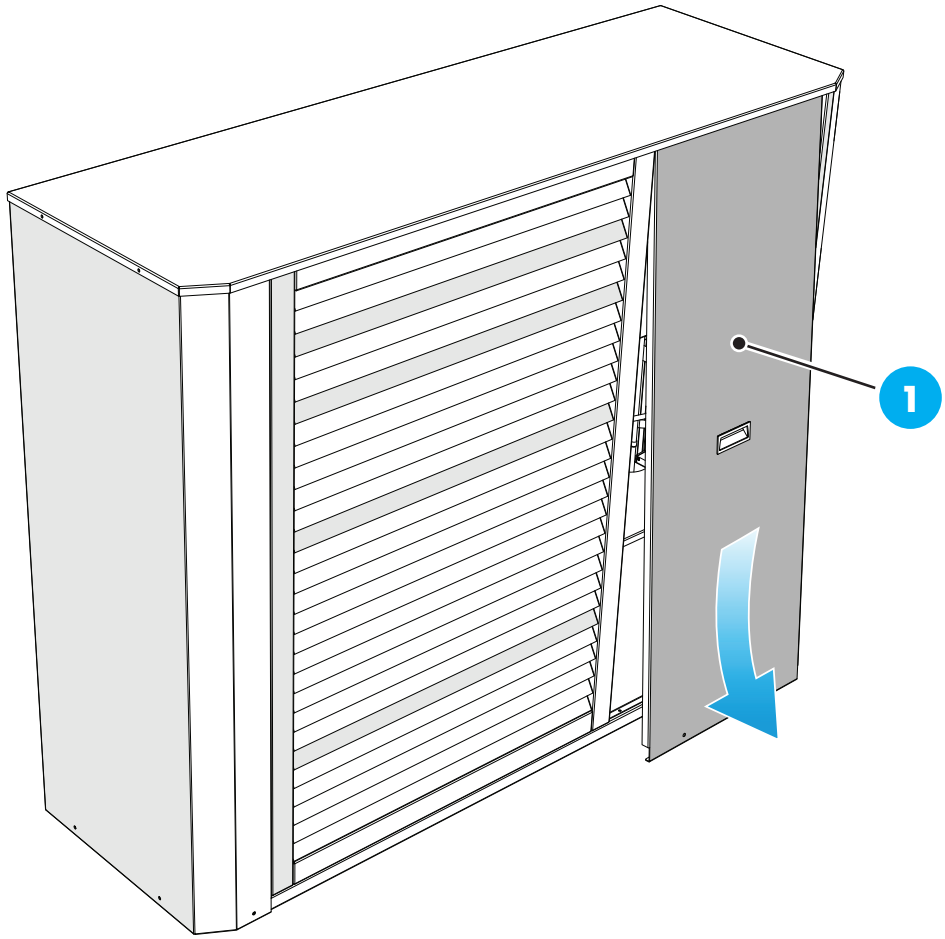
- disengage the panel (2) by sliding it downwards (C);



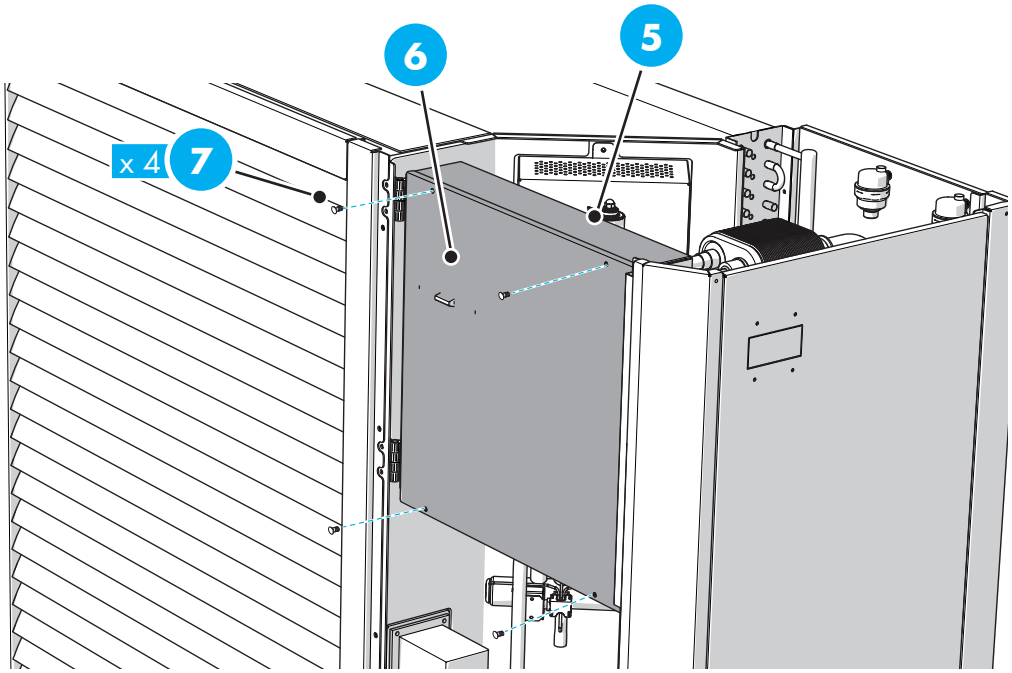
- if necessary, remove the upper panel (4) by loosening its retaining screws;



- once panel (1) has been removed, it is possible to access the electrical panel (5);

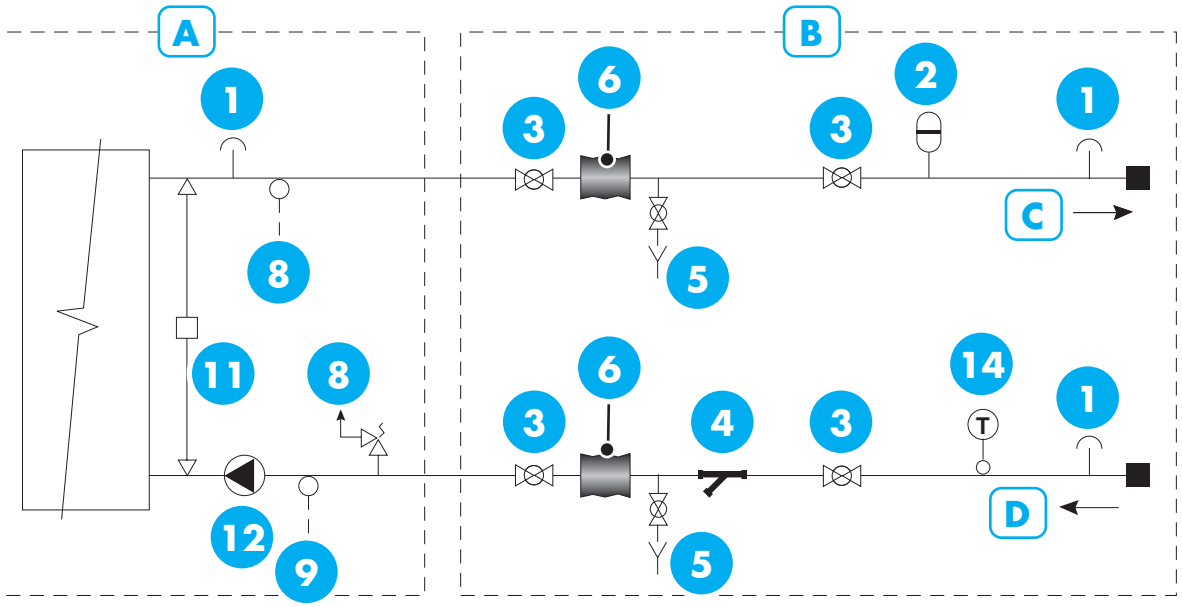


- remove the panel (6) of the electrical panel (5) by loosening the screws (7).

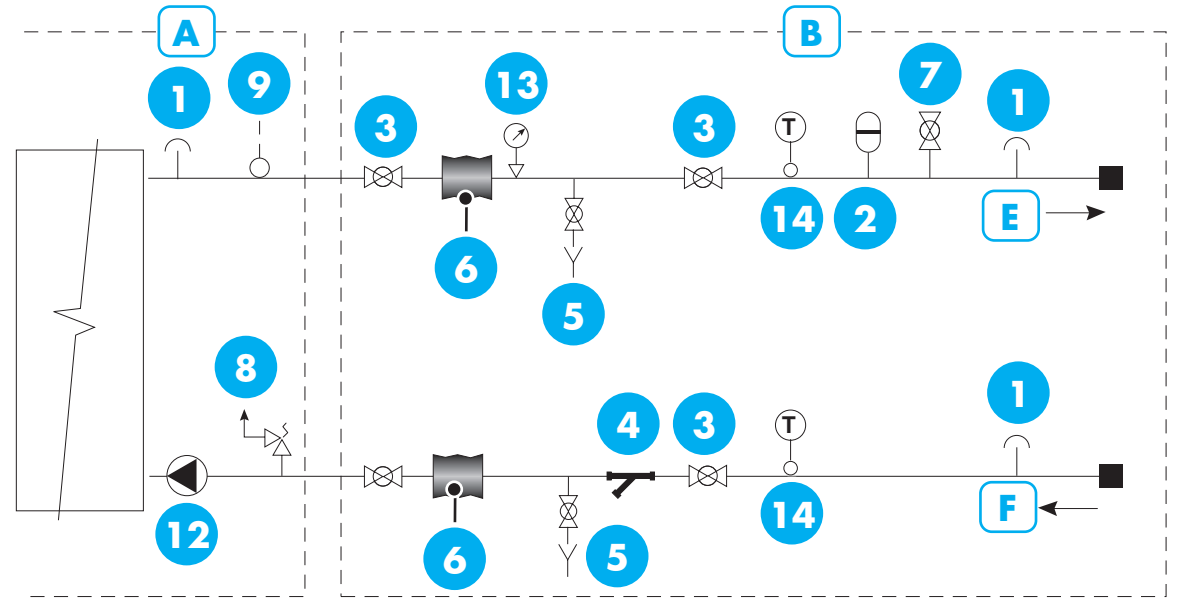


7.9 Hydraulic diagrams

System side hydraulic connections



DHW side hydraulic connections



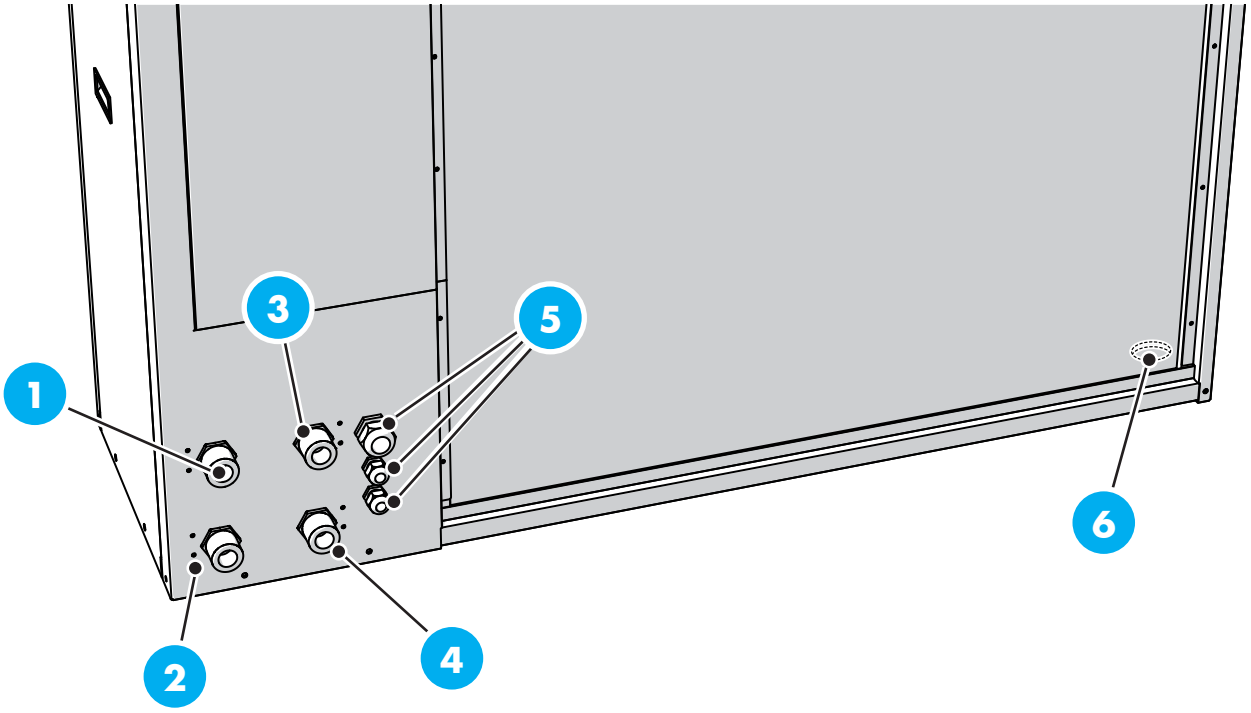
KEY TO HYDRAULIC CONNECTIONS

A	Connections by the manufacturer	**D**	System return line
B	Connections by the installer	**E**	High temperature water outlet for DHW use
C	System flow	**F**	High temperature water inlet for DHW use

KEY TO HYDRAULIC CONNECTIONS

1	Vent valve	**8**	Safety valve
2	Expansion vessel	**9**	Temperature probe
3	Shut-off cock	**10**	Discharge
4	Mesh filter	**11**	Differential pressure switch
5	Drain cock	**12**	Circulation pump
6	Vibration damper	**13**	Pressure gauge
7	Filling cock	**14**	Temperature gauge

7.10 Machine connections



KEY	
1	High temperature flow
2	High temperature return
3	Plant flow
4	Plant return
5	Cable glands
6	Condensate drain

7.10.1 Propylene glycol solution

PROPYLENE GLYCOL SOLUTION

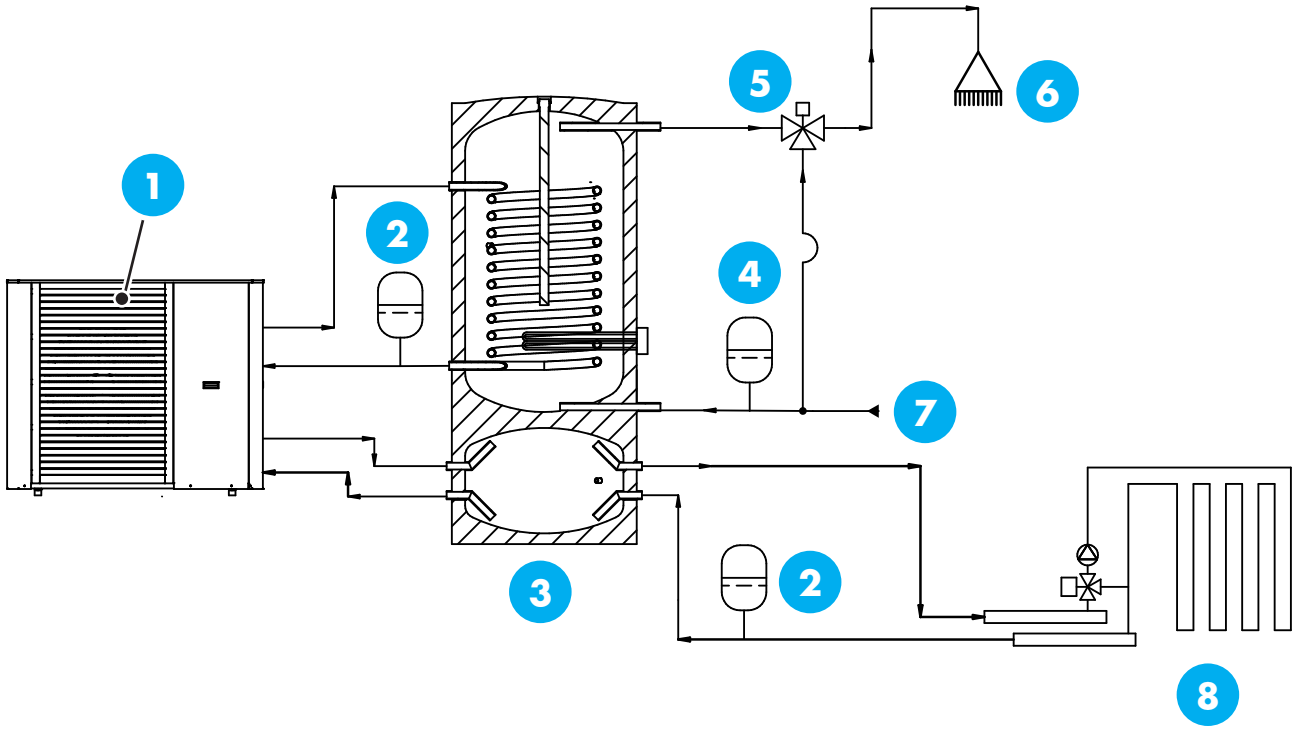
Data	0	-3	-7	-12	-18	-20

PERCENTAGE OF PROPYLENE GLYCOL BY WEIGHT

	0	10%	20%	30%	36%	40%
cPf	1	0.99	0.985	0.98	0.97	0.965
cQ	1	1.02	1.04	1.075	1.11	1.14
cdp	1	1.07	1.11	1.18	1.22	1.24

- **cPf:** Cooling capacity correction factor
- **cQ:** Flow rate correction factor
- **cdp:** Pressure drop correction factor

7.10.2 Example of connection diagram



KEY

1	Hydra2 4-pipe	**5**	Mixer
2	V.E. Heat.	**6**	Utilities
3	Double accumulation DHW + Technical	**7**	Cold water inlet
4	V.E. DHW	**8**	System

7.11 Hydraulic connection

DANGER!
The pipes must be installed in accordance with the prevailing standards and directives.

- The machine can operate at a maximum return temperature of 55°C and at a heat pump outlet temperature of 65°C on the system side.
- The machine is not equipped with hydraulic side cut-off valves. They must be installed to facilitate any future maintenance work.
- The return flow temperature is limited by the return flow sensor.

7.11.1 Water volumes

The water volume required for optimal machine operation (avoiding short operating times and enabling defrosting) varies depending on the machine model.
A minimum available water volume of 8 litres per size number is recommended.
conditions.
For example for DURAN 4T

8 litres x 8 = 64 litres

WARNING!
Pipes must be discharged before the heat pump is connected so that any type of contaminant does not damage the components.

7.11.2 Heating fluid circuit

- Vent the heat pump through the manual valves located on each water circuit. If there is an automatic breather valve, make sure it is operating correctly.
- Install the impurity filter.
- All external pipes shall be thermally insulated with pipe insulation material at least 19 mm thick.
- Install the cut-off and drain valves so that the machine can be emptied in the event of a prolonged power supply interruption.
- The connecting pipes must be provided with shut-off cocks and anti-vibration joints, which have the function of damping vibrations and prevent them from propagating to the system.
- An appropriately sized expansion tank and an additional safety valve (3 bar) must be installed on each water circuit.

7.11.3 Plant pump

The system pump is powered and controlled by the internal control panel.
The machine features an integrated anti-freezing function and therefore must not be switched off in conditions with a risk of freezing.
At temperatures below +2°C the filling pump works periodically to prevent the water from freezing in the primary circuit.
The function also protects against excessive temperatures within the flow circuit.

7.11.4 Water quality - recommendations

In order to maintain the functionality and durability of the internal components as well as the performance of the unit, please follow the recommendations below.

Firstly, you should try to prevent corrosion, which is a complex process that depends on the interaction of the different materials with the various chemicals dissolved in the water.

The standard UNI 8065:1989 specifies the chemical and chemical-physical parameters of water in heating systems for domestic use:

For hot water heating systems, the standards specifies the following characteristics for the water in the circuit.

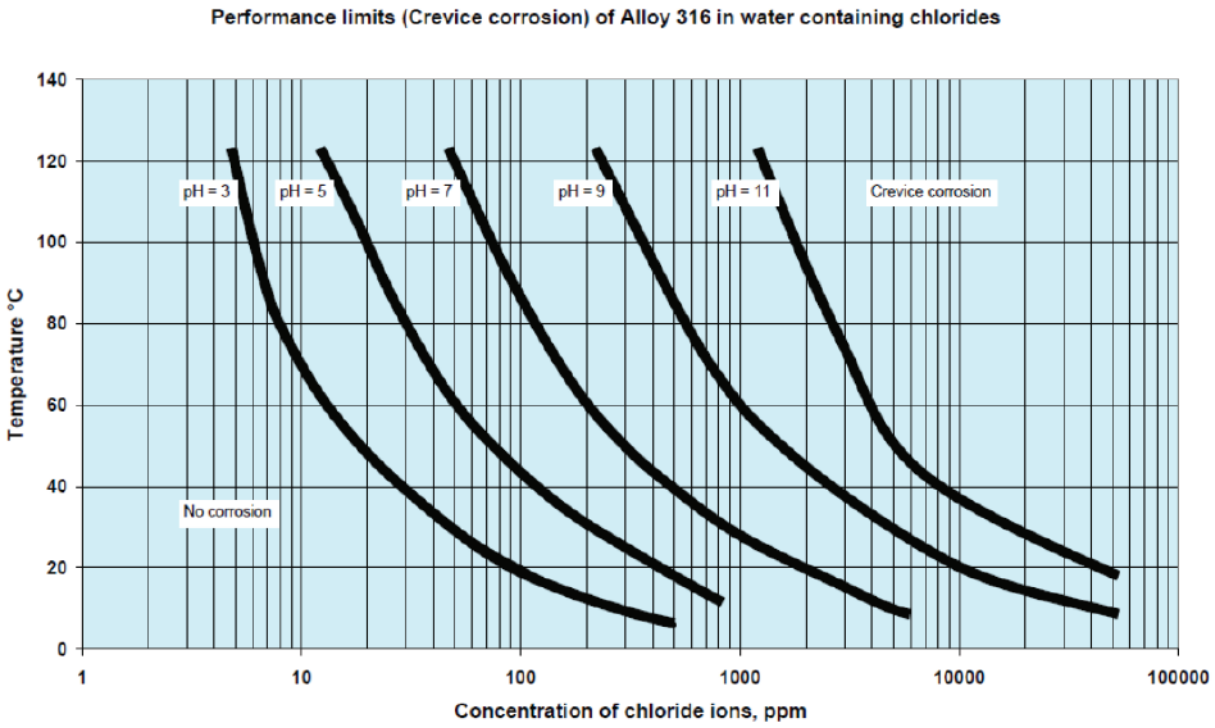
Circuit water characteristics

Appearance	Preferably clear
pH	Higher than 7 (for radiators with aluminium or light alloy elements the pH should also be less than 8)
Conditioners	Present within the concentrations specified by the manufacturer
Iron (as Fe)	<0.5 mg/kg (higher values of iron are due to corrosion that should be eliminated)
Copper (as Cu)	<0.1 mg/kg (higher values of copper are due to corrosion that should be eliminated)

The quality of the water should be periodically checked using the Ryznar (RSI) and Langelier (LSI) indices, which should be within the limits and values indicated below:

- Water temperature (°C)
- Fixed residue (mg/l)
- Ca2+ as CaCO3 (mg/l)
- Alkalinity as CaCO3 (mg/l)

Element/compound/property	*Value/Unit*
pH	7.5 – 9.0
Conductivity	< 500 µS/cm
Hardness	4.5 – 8.5 dH°
Free chlorine	< 1.0 ppm
Ammonia (NH3)	< 0.5 ppm
Sulphate (SO42-)	< 100 ppm
Hydrogen carbonate (HCO3-)	60 – 200 ppm
(HCO3-) / (SO4-2)	> 1.5
(Ca + Mg) / (HCO3-)	> 0.5
Chloride (Cl-)	In accordance with the following graph
Oxygen	< 0.02 mg/l

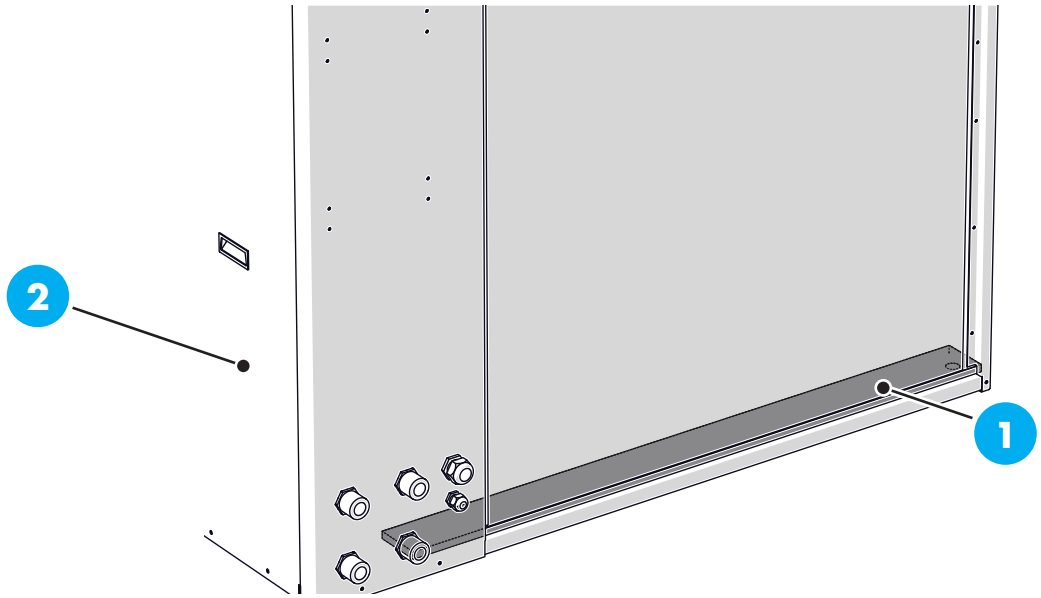


It is also recommended that you follow the guidelines outlined in standard VDI 2035 "Guideline for the prevention of damage in water heating installations" designed to prevent the presence of oxygen in the water.

- Keeping the pH within the limits indicated above prevents the formation of magnetite. It is recommended to use chemical inhibitors suitable for this purpose.
- Magnetite forms because of corrosion that forms due to the action of oxygen in a closed circuit. If it is present in high quantities, it is probably because there is a leak in the circuit that allows it to get in.

7.12 Connecting the condensate drain

The condensate water tank (1) collects and eliminates most of the condensate water produced by the heat pump (2).



WARNING!

For the heat pump to function, the condensate water must be regularly removed and the condensate water drain must be correctly positioned so as not to damage the house. The condensate flow must be checked regularly, especially in the autumn. Perform cleaning when necessary.

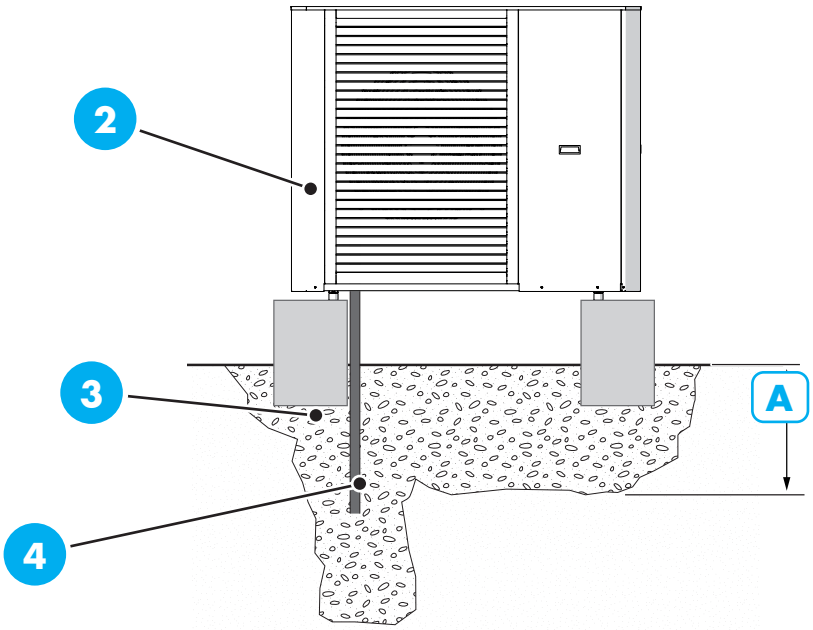
IMPORTANT

The pipe with heating cable for draining the condensate tank is not included.

- Condensate water collected in the tank (up to 50 litres/24 hours) must be conveyed to an appropriate drain by means of a pipe; it is recommended to use the shortest possible external path.
- The pipe section of the pipe subject to frost must be heated by means of the heating cable.
- Direct the tube downwards.
- The condensate pipe outlet must be positioned at a depth or an internal point protected from frost (in accordance with local laws and regulations).
- Use a siphon for installations where air can circulate in the condensate water pipe.
- The insulation must adhere to the lower part of the condensate water tank.

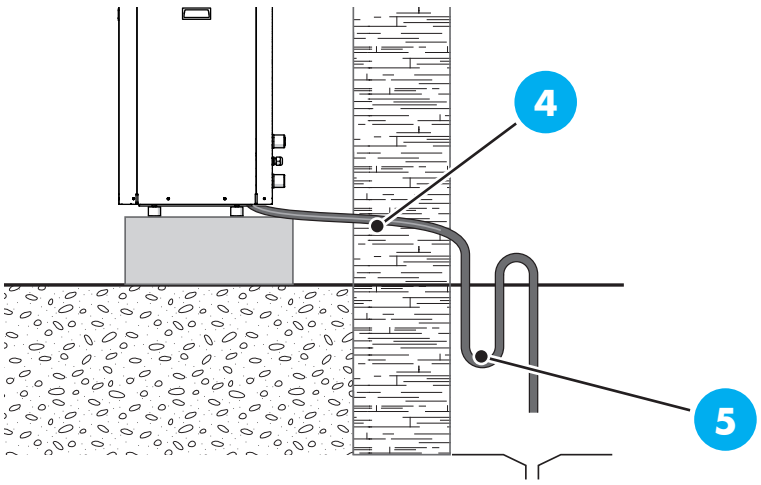
7.12.1 Condensation water diversion

- If the house has a cellar, the stone box (3) must be positioned so that the condensate water does not affect the house. Alternatively, the stone box (3) can be placed directly under the heat pump (2).
- The outlet of the condensate water pipe (4) must be located at a depth protected from frost (A).



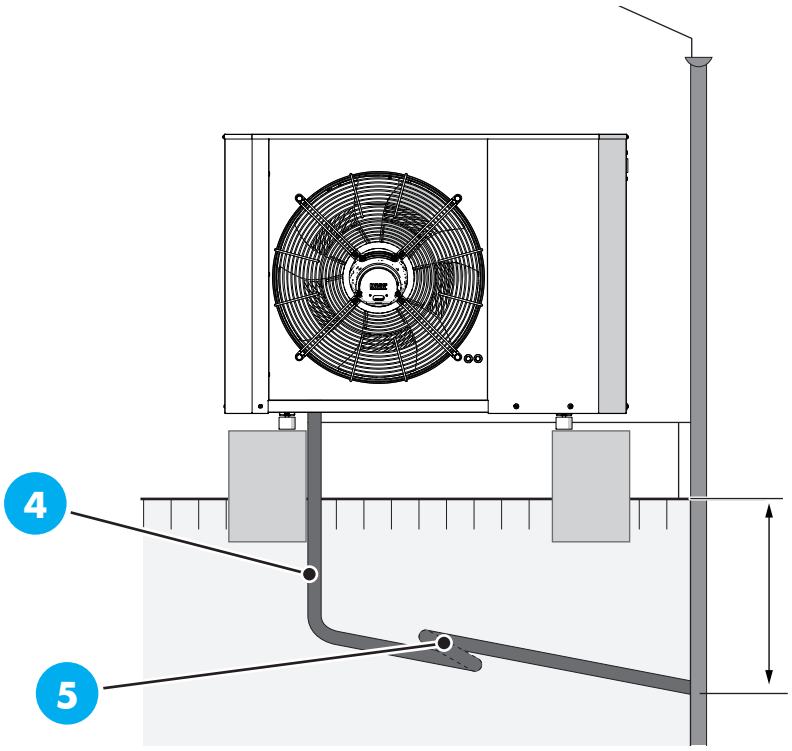
7.12.2 Internal drain

- The condensate water is directed to an internal drain (in accordance with local laws and regulations).
- The condensate water pipe (4) must be equipped with a siphon (5) to prevent air circulation inside the pipe.



7.12.3 Drain into the gutter pipe

- The outlet of the condensate water pipe (4) must be located at a depth protected from frost.
- Direct the tube downwards.
- The condensate water pipe (4) must be equipped with a siphon (5) to prevent air circulation inside the pipe.



7.13 Power supply connection

- Connect the cable to the terminals inside the electrical panel by passing it through the appropriate cable glands located on the lower part of the panel.
- Refer to the attached wiring diagrams for connections.
- In order to correctly size the cross section of the machine power cables, please take into account the data in paragraph "1.5 Consumptions".

DANGER!

The heat pump must not be connected without the permission of the electricity supply company and must be connected under the supervision of a qualified electrician.

DANGER!

The unit does not include a circuit breaker on the input power supply.
The power cable of the heat pump must be connected to a thermal-magnetic circuit breaker with a break gap of at least 3 mm. If the building is equipped with an earthed residual-current circuit breaker, the heat pump must have a separate switch. The earthed residual-current circuit breaker must be a type B device that is sensitive to direct currents and have a rated trip current not exceeding 30 mA. If possible, it should also have the following characteristics:
1. Adjustable trip threshold
2. Adjustable trip delay
3. Be dedicated to the heat pump only.
The input power supply must be 400 V 3 N~ 50 Hz through a power distribution unit with thermal-magnetic protection.
For 230 V~ 50 Hz the input power supply must be 230 V~ 50 Hz through electrical panel with thermal-magnetic protection.

DANGER!

The electrical system and any maintenance work must be carried out under the supervision of a qualified electrician. Switch off the power supply via the circuit breaker before performing any maintenance work. The system and the electrical wiring must be carried out in accordance with the prevailing national regulations.

DANGER!

High-current and signal cables must be routed through separate cable glands.

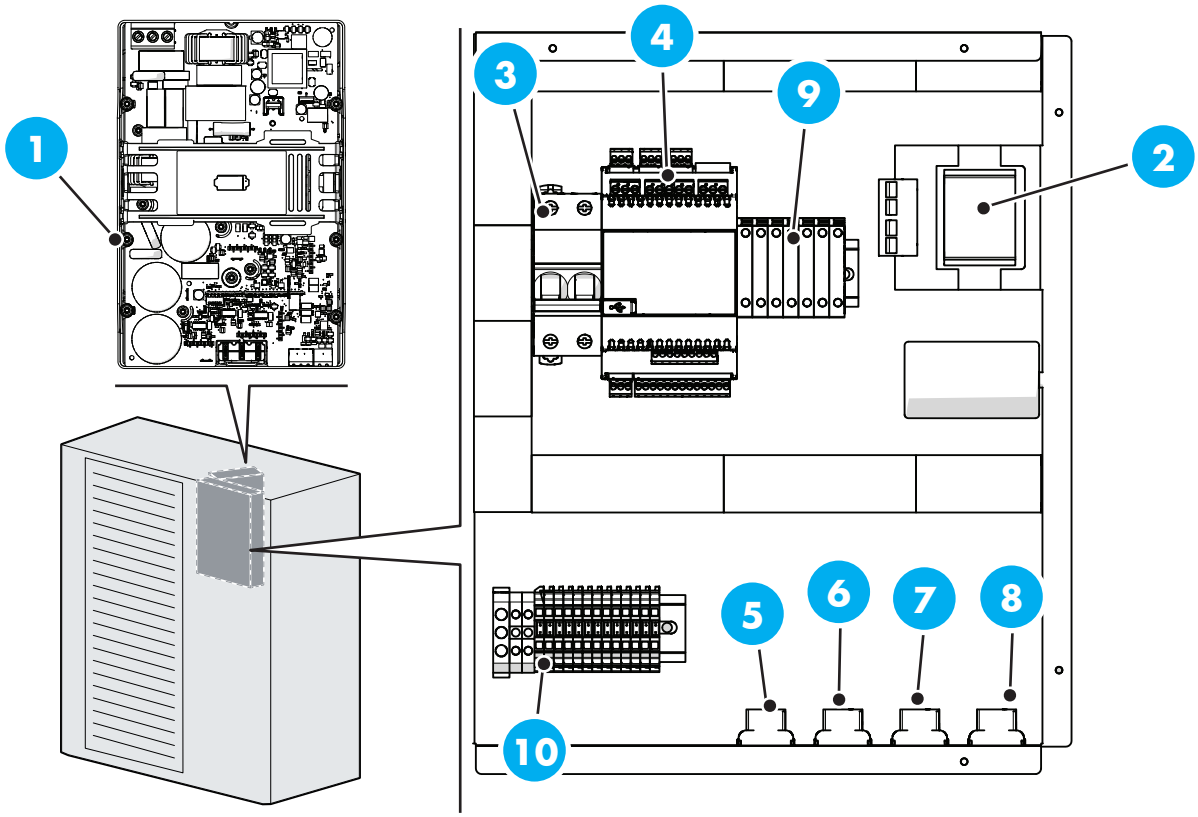
DANGER!

Avoid direct contact with the copper pipes and the compressor.

DANGER!
After about 10 minutes of heat pump operation, make sure that the screws on the power supply terminal block are tightened.

WARNING!
Check the connections, the main voltage and the phase voltage before starting the machine to avoid damage to the electronics of the air/water heat pump.

7.13.1 Duran 12 connections



CONNECTIONS

1	A2 - Compressor inverter	**6**	Connector B
2	TC1	**7**	Connector C
3	QM1- Compressor thermal-magnetic circuit breaker	**8**	Connector D
4	A3	**9**	Fuse terminal blocks (FU1...FU7)
5	Connector A	**10**	User terminal blocks

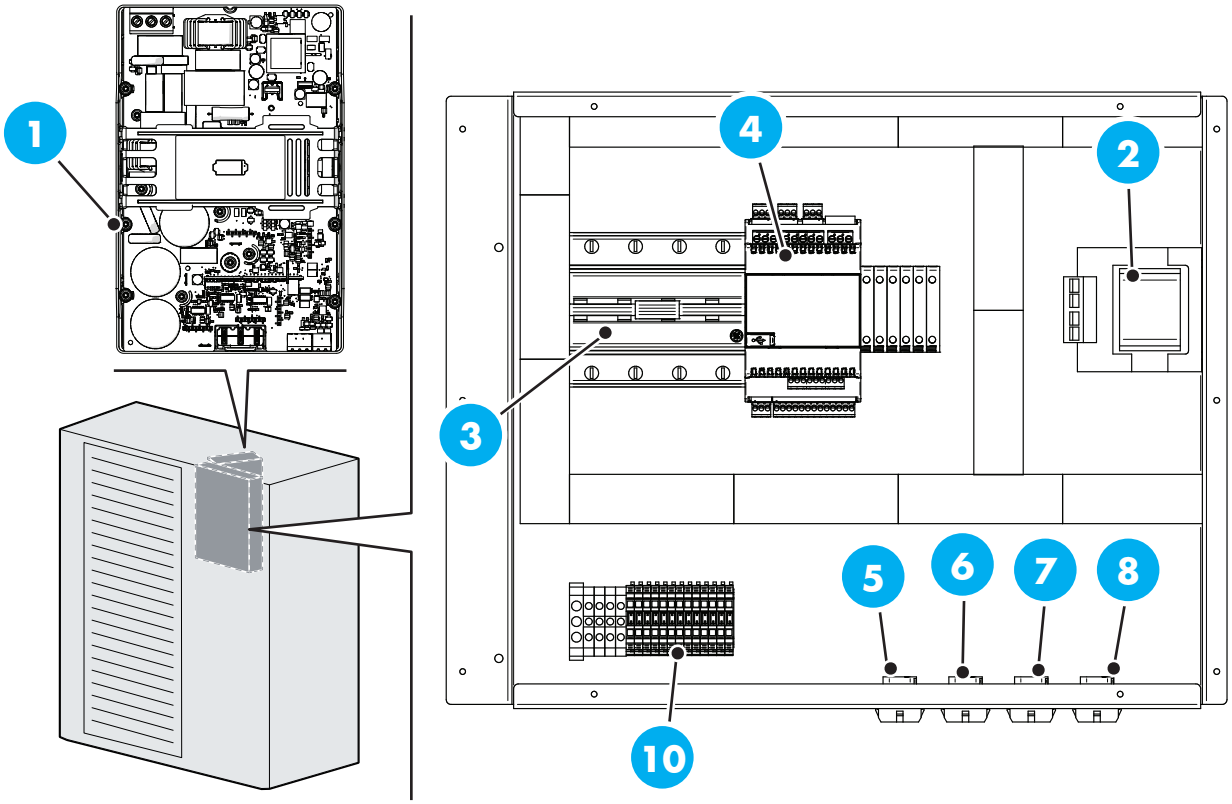
FUSE PROTECTION TERMINAL BLOCK

9	**FU1**	Fan protection fuse
	FU2	Protection fuse for system circuit circulator
	FU3	Protection fuse for High temperature/DHW circuit circulator
	FU4	Auxiliary circuit protection fuse 230 V
	FU5	Auxiliary circuit protection fuse 230 V
	FU6	Auxiliary circuit protection fuse 24 V
	FU7	Auxiliary circuit protection fuse 230 V

USER TERMINAL BLOCK

10	**OP** **L** **N**	Unit power connections
	1	NC: Normally closed contact for alarm signalling
	2	NO: Normally open contact for alarm signalling
	3	C: Contact power supply
	4 **5**	Settable multifunction input.
	6 **7**	Domestic hot water storage probe
	8 **9**	DHW heating element enable
	10 **11**	3-Way valve enable
	12 **13** **14** **15**	Unit display connection (A4)

7.13.2 Connections for Duran 15 - Duran 20 - Duran 25 - Duran 30



CONNECTIONS

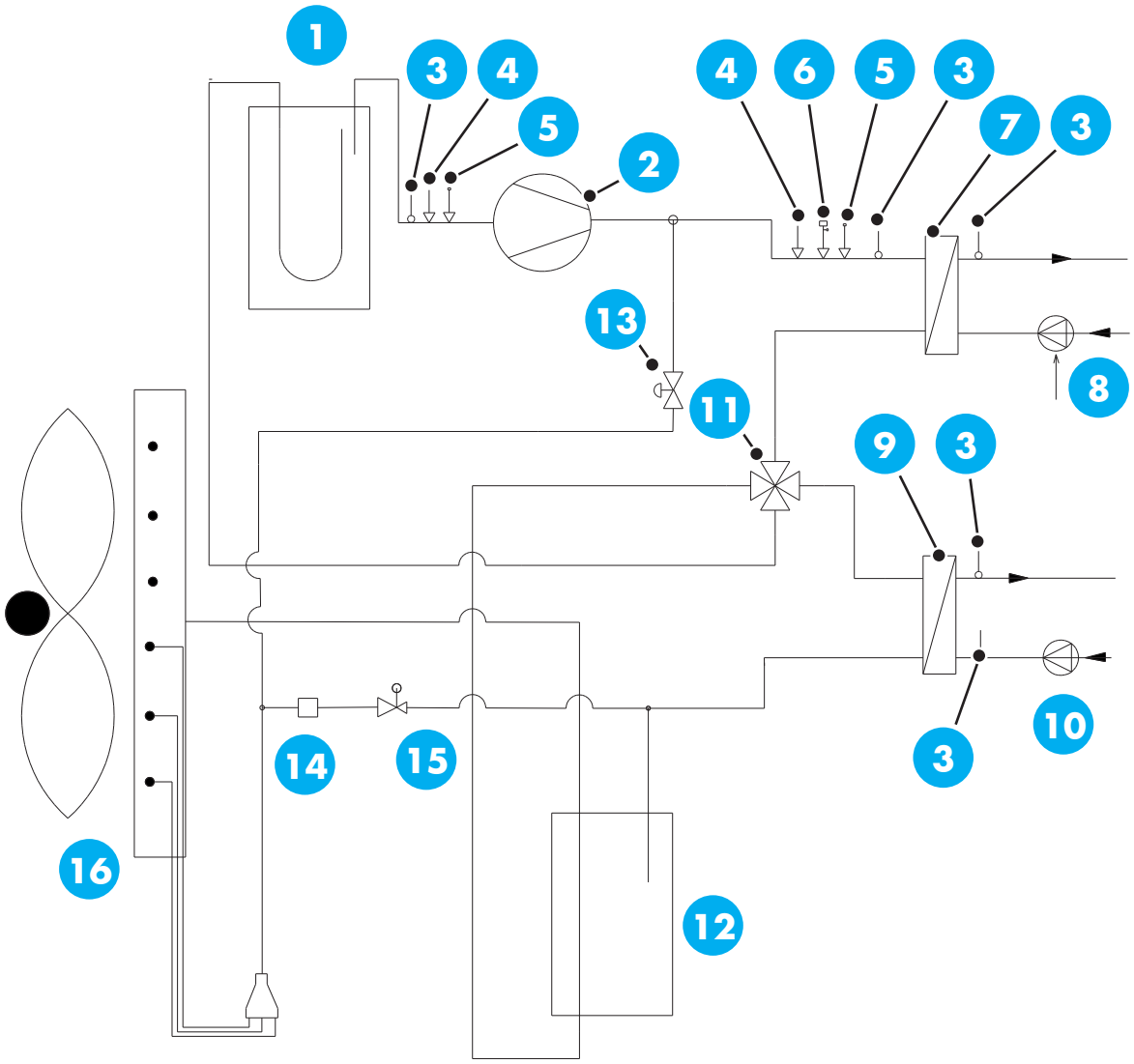
1	A2 - Compressor inverter	**6**	Connector B
2	TC1	**7**	Connector C
3	QM1- Compressor thermal-magnetic circuit breaker	**8**	Connector D
4	A3	**9**	Fuse terminal blocks (FU1...FU7)
5	Connector A	**10**	User terminal blocks

FUSE PROTECTION TERMINAL BLOCK

9	**FU1**	Fan protection fuse
	FU2	Protection fuse for system circuit circulator
	FU3	Protection fuse for High temperature/DHW circuit circulator
	FU4	Auxiliary circuit protection fuse 230 V
	FU5	Auxiliary circuit protection fuse 230 V
	FU6	Auxiliary circuit protection fuse 24 V
	FU7	Auxiliary circuit protection fuse 230 V

10	OP U V W N	Unit power connections
	1	NC: Normally closed contact for alarm signalling
	2	NO: Normally open contact for alarm signalling
	3	C: Contact power supply
	4 5	Settable multifunction input.
	6 7	Domestic hot water storage probe
	8 9 10 11	Unit display connection (A4).

7.14 Duct characteristics



Key

1	Gas separator	**9**	System heat exchanger
2	Compressor	**10**	System circulator
3	Temperature probe	**11**	4-way valve
4	Pressure transducer	**12**	Liquid receiver
5	Filling valve	**13**	Hot gas injection valve
6	High pressure switch	**14**	Dehydrator filter
7	High temperature heat exchanger	**15**	Electronic expansion valve
8	DHW circulator	**16**	Finned heat exchanger

8 Commissioning

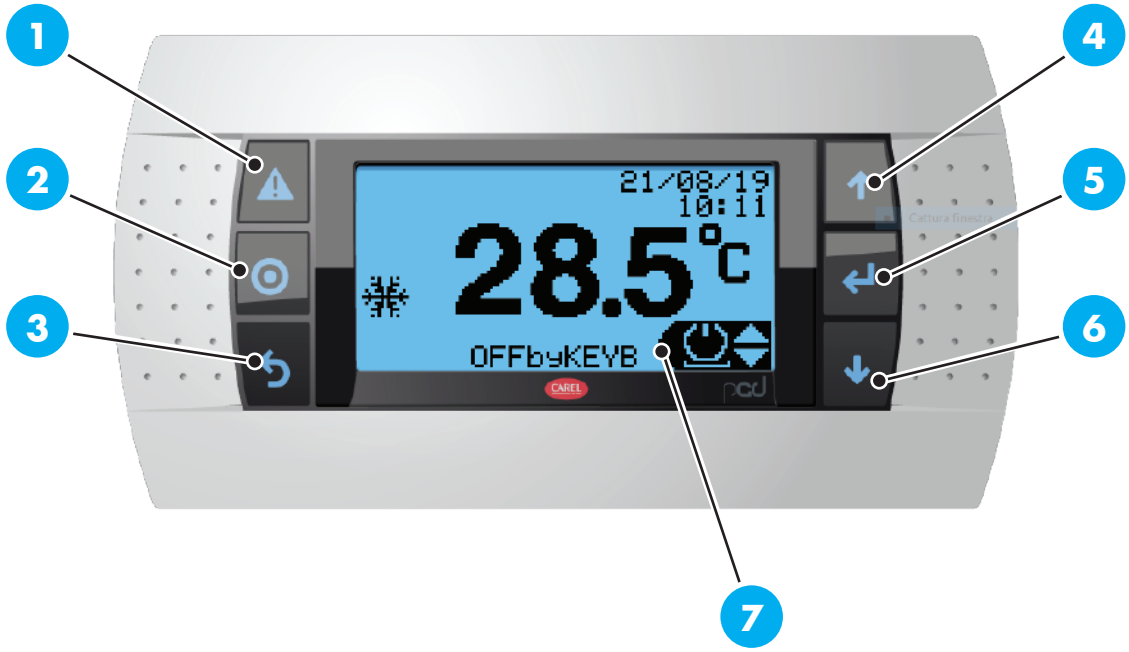
8.1 Preliminary checks

- Check the availability of diagrams and manuals of the installed machine.
- Check the availability of wiring and hydraulic diagrams of the system to which the machine is connected.
- Make sure the machine is placed on a perfectly level surface.
- Make sure that there are suitable condensate drain systems.
- Check the presence of vibration damping joints on the hydraulic pipes between the heat pump and the system.
- Check that the shut-off cocks of the hydraulic circuits are open.
- Check that the hydraulic system has been filled under pressure and vented.
- Check that the electrical and earthing connections are configured in accordance with the prevailing regulations in the machine installation country.
- Make sure that the electrical voltage is within the tolerance limit (± 10%).
- Check that the case coils have been powered for at least 2 hours before starting.

9 Use

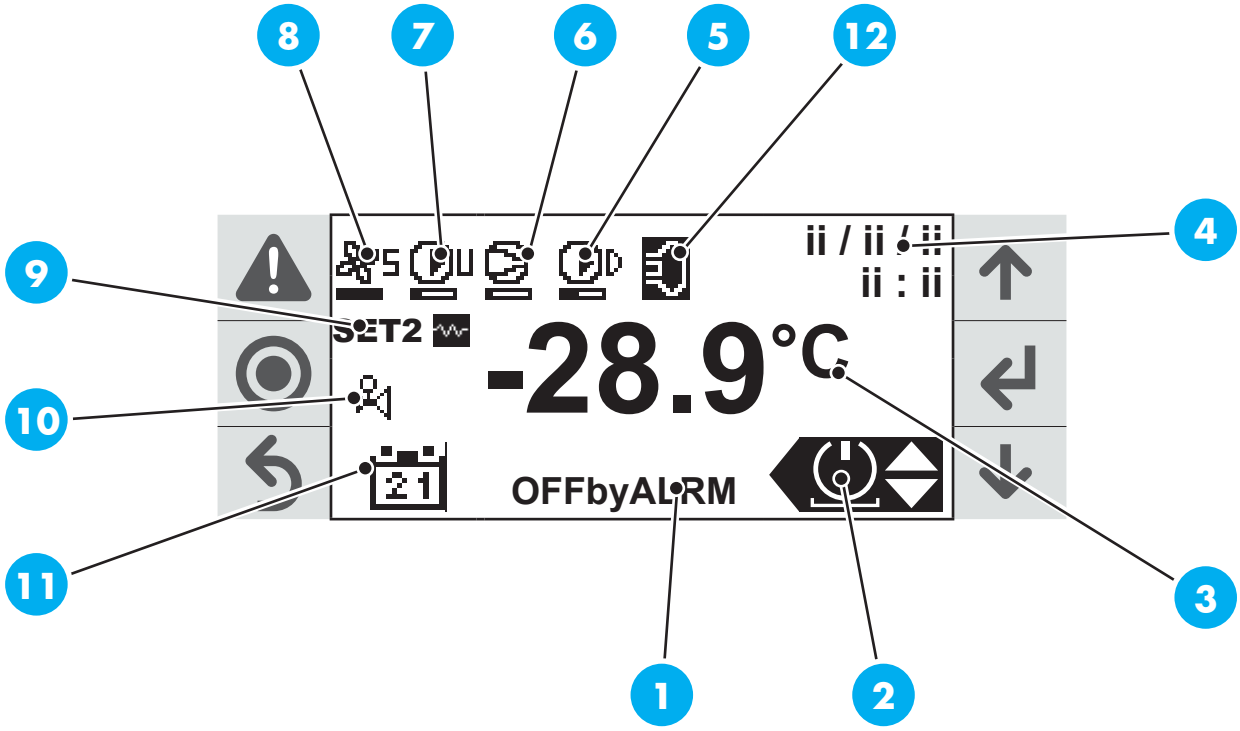
9.1 Control panel

The control panel consists of a display and programming keys.



1	**Alarms**	It illuminates in the presence of alarm states. Press the button to display the type of alarm or to reset it.
2	**Programming**	Allows you to access the programming pages or read the parameters.
3	**ESC**	Allows you to exit the programming pages.
4	**Up arrow**	Moves the blinking cursor to the previous page or increases the value to be changed.
5	**ENTER**	To confirm and enter the parameter to be modified.
6	**Down arrow**	Moves the blinking cursor to the next page or decreases the value to be changed.
7	**Display**	Information display.

9.2 Display



DISPLAY DESCRIPTION

1	Operating information	
2	Shortcut menu	
	Unit ON-OFF menu.	
	Set	Setpoint setting and setpoint 2 activation menu.
	Operating mode change menu: heating, cooling and domestic hot water only.	
	Unit information display.	
3	Reference temperature (DHW or system water inlet).	
	0	Standard display: the standard setpoint is active.
	0	Negative display: setpoint 2 is active.
4	Date and time.	
5	Active compressor with speed bar.	
6	DHW circulator with speed bar.	
7	System circulator with speed bar.	
8	Fan(s) with speed bar.	
9	Setpoint 2 activation and/or Boost coil.	
	SET 2	Setpoint 2 is active and the reference temperature numbers are negative.
		Boost function is active.
		DHW alternative source is active.

	Operating modes (heating, cooling and DHW).	
10		Operation in DHW production mode.
		Operation in system heating mode.
		Operation in system cooling mode.
		Operation in DHW priority in heating mode.
		Operation in DHW priority in cooling mode.
		Defrost function active.
		Drip function active.
		Hot gas defrost valve open.
11	Program active.	
12	System alternative source is active.	

9.2.1 Operating information

FUNCTION	DESCRIPTION
STAND-BY	All the setpoints are met, unit waiting.
OFFbyALRM	Unit OFF due to an active alarm.
OFFbyBMS	Unit OFF from Modbus connection.
OFFbyDI	Unit OFF by remote contact.
OFFbyKEYB	Unit OFF from control panel.
OFFbyChgOvr	Unit OFF for operating mode change.
SEASON CHG.	Season change active.
PLANT REG.	Unit active on system regulation
DEFROST	Defrost status active.
SHUT DOWN	Shut down procedure active.
CYCL. INV.	Cycle inversion after defrosting.
AFREEZE ADV	Advanced antifreeze mode active.
ALARMS	Alarms present with unit ON.
DHW REG.	Unit active on DHW regulation.
DHW SUBST	Replacement function is active during DHW operation
PLANT SUBST	Replacement function is active during system operation.
TEMP FRCOFF	Unit OFF due to temperature too high.

9.3 Access levels

It has 3 consultation and programming levels:

ACCESS LEVELS	
Without password	To start/stop the unit, program the setpoints, activate/deactivate the most common functions, change the season and refer to the active setpoints and the main temperatures detected.
With User password (Default: "2345")	To check the unit's programming, change date and time, activate a time, daily, annual programming and make some simple settings.
With Maintainer password	To read and program the setpoints and check the machine parameters.
With Manufacturer password	To read, program and edit software settings.

9.4 Procedures

9.4.1 Machine start-up

The machine must be started up for the first time by personnel authorised by the manufacturer.

1. Set the QF main differential switch located outside the machine to the OFF position.
2. Set any remote ON/OFF switch to OFF.
3. Remove the front panel first, then the electrical panel.
4. Lift the lever of the compressor's thermal-magnetic circuit breaker.
5. Close the cover of the electrical panel.
6. Place the thermal-magnetic circuit breaker in the electrical panel to ON.
7. Set the QF main differential switch to ON.
8. At this point the control panel will turn on to indicate that the machine is powered.
9. To allow the oil inside the compressor to warm up, select the "OFF" operation on the control panel and wait at least two hours before activating the unit.

9.4.2 Control panel settings

1. Enter your Service password.
2. Set the language of the control panel.
3. Set date and time.
4. Activate the remote contact (if provided) or alternatively select the function of the multifunction input F3.
5. Modify the setpoints according to the type of system.
6. If required, set the parameters of the heating or cooling curve related to the dynamic setpoint (not provided for the DHW setpoint).
7. Select the operating season.
8. Check the correct reading of the BT6 DHW cylinder probe (if present).

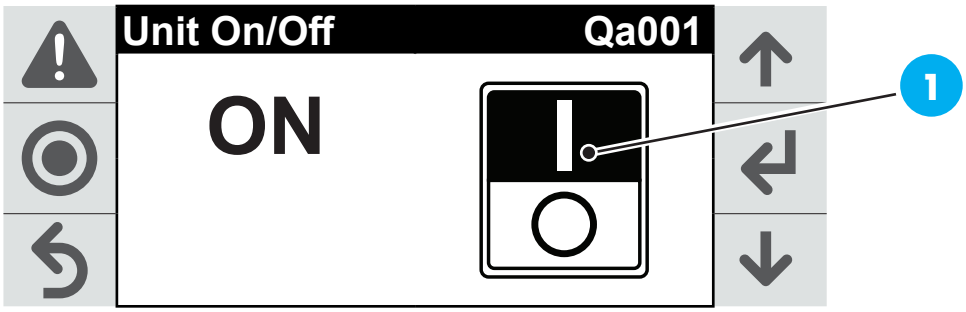
9.4.3 Entering the password

To enter the password:

1. Use the ↑ and ↓ keys to select the first number.
2. Press the ↵ key to confirm the selected number and move on to the next number.
3. Select the next password numbers using the ↑ and ↓ keys and confirm by pressing ↵.

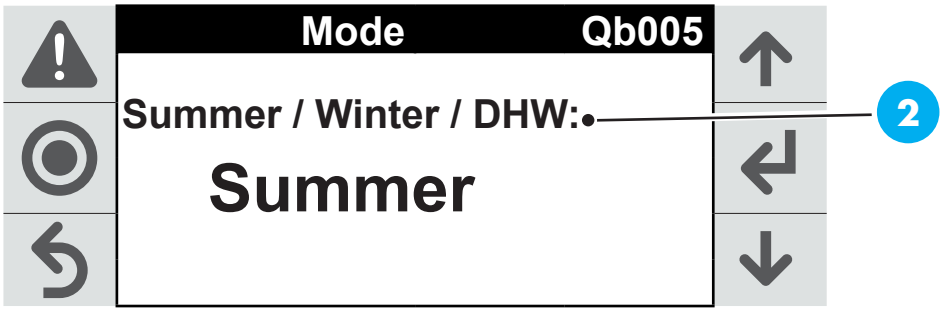
9.4.4 Starting

1. Press the ↑ and ↓ keys to select the ON/OFF menu.
2. Press the ↵ key to select ON (1).
3. Press the ↶ key to return to the main page.
4. Press the ↵ key to move to the "operating mode" menu.
5. Use the ↑ and ↓ keys to select the desired operating mode: summer, winter and DHW only.
6. Confirm by pressing ↵.



9.4.5 Changing the season

1. Press the ↑ and ↓ keys to select the "operation mode" menu.
2. Press the ↵ key.
3. Press the ↵ key again and select the desired operating mode: summer, winter and DHW only (2).

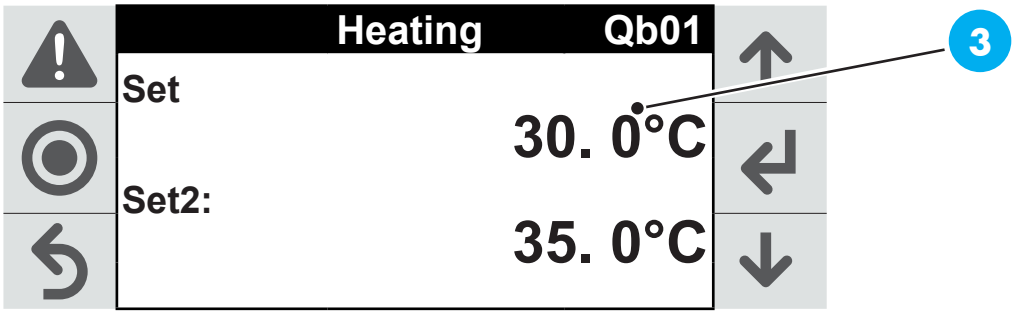


9.4.6 Switching off

1. Press the ↑ and ↓ keys to select the ON/OFF menu.
2. Press the ↵ key.
3. Press the ↑ and ↓ keys to move to OFF.
4. Press ↵ to confirm.

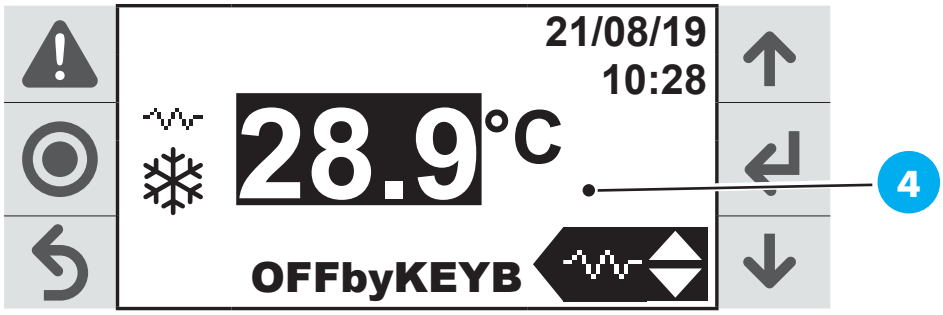
9.4.7 Setting the setpoints

1. Press the ↑ and ↓ keys to select the "setpoint settings" menu.
2. Press ↵ to confirm.
3. The "Qb01"(3) screen displays the winter setpoints "Set" and "Set 2" (the latter is only active if the "Set 2" mode is activated).
4. Press the ↵ key to move the cursor to the first setpoint ("Set").
5. Press the ↑ and ↓ keys to select the desired temperature.
6. Press the ↵ key again to change the "Set 2" setpoint
7. Press the ↵ key again to move the cursor to the screen header line.
8. Press the ↑ and ↓ keys to access pages "Qb02" (domestic hot water), "Qb03" (cooling) and "Qb04" (Set 2 setting).
9. To modify the setpoints of pages Qb02 and Qb03, repeat the operations listed above from point 4 to 8.
10. On page "Qb04" ("Set 2" setting) it is possible to activate/deactivate the "Set 2" mode: moving to the ON/OFF menu, press the ↑ and ↓ keys.



9.4.8 Boost coil activation (optional)

1. Press the ↑ and ↓ keys to select the "coil" menu (4).
2. Press the ↵ key.
3. Press the ↵ key to select ON.



9.4.9 Boost coil deactivation (optional)

1. Press the ↑ and ↓ keys to select the "coil" menu.
2. Press the ↵ key.
3. Press the ↵ key to select ON.

9.4.10 Information menu display

1. Press the ↑ and ↓ keys to select the "coil" menu.
2. Press the ↵ key.

9.4.11 Setting current date and time

1. Press the ◉ key.
2. Enter the user password (see paragraph "1.1.3 Inserimento password").
3. Press the ↵ key to enter the "programming" menu.
4. Press the ↑ and ↓ keys to select "a. Date and Time".
5. Press the ↵ key to enter the "Ha001" menu.
6. Press the ↵ key again to move the cursor to the "date" field display mode.
7. The ↑ and ↓ keys can be used to change the parameter if necessary.
8. Move the cursor back to the "date" field by pressing ↵.
9. Press the ↑ and ↓ keys to change the numerical value of the day.
10. Press the ↵ key to change the month and then the year.

11. Move the cursor back to the "time" field by pressing ↵.
12. Press the ↑ and ↓ keys to change the hour.
13. Press the ↵ key to change the "minutes" field.
14. Press the ↵ key again to move the cursor to the screen header line where you can select other items from the "programming" menu.

9.4.12 Setting the language

1. Press the ◉ key.
2. Enter the user password (see paragraph "1.1.3 Inserimento password").
3. Press the ↵ key to enter the "programming" menu.
4. Press the ↑ and ↓ keys to select "H. Settings".
5. Press ↵ to confirm.
6. Press the ↑ and ↓ keys to select "c. Language".
7. Press the ↵ key to enter the "Language" menu.
8. Press the ↵ key again to move the cursor to the language selection field.
9. Press the ↑ and ↓ keys to change the parameter if necessary.
10. Press the ↵ key to return to the Home screen.

9.4.13 Alarms

In the event of a malfunction, the alarm indication appears on the main screen:

1. Press the ⚠ key to display the alarm.
2. Press the ↩ key to not reset the alarm.
3. Press the ⚠ key to reset the alarm.

9.4.14 Program activation

System program:

1. Press the ◉ key.
2. Enter the user password (see paragraph "1.1.3 Inserimento password").
3. Press the ↵ key to enter the "programming" menu.
4. Press the ↑ and ↓ keys to select "I. Time Program"

Menu "Fc001":

1. Press the ↵ key to enter the "Fc001" menu.
2. Press the ↵ key again to move the cursor to the time program enable parameter for the "Heating/Cooling" circuit.
3. Press the ↑ and ↓ keys to change to "YES": Time, day of the week and date will be displayed. In addition, information about the active time band and the currently active operating mode will be displayed.
4. Press the ↵ key again to move the cursor to the screen header line.
5. Press the ↑ and ↓ keys to continue programming.

Menu "Fc002":

1. Press the ↵ key to enter the "Fc002" menu.
2. Press the ↵ key again to set the daily operation to four different time bands by moving the cursor over the various fields.
3. In the last field of the page it is possible to save the time program: press the ↵ key and change the field entry to "YES" with the ↑ and ↓ keys.

Once you have saved your selection, you can copy the settings to other days of the week:

1. Press the ↵ key to move with the cursor over the indicated field.
2. Press the ↑ and ↓ keys to change the item by selecting the day of the week on which to copy the daily program.
3. Once the program for the "Heating/Cooling" circuit has been completed, move the cursor to the "Header" field.
4. Press the ↵ key and change page with the ↑ and ↓ keys.

Menu "Fc003":

1. On page "Fc003" you can set the special operation to 3 different periods in the year using the as described in the previous points.

Menu "Fc004":

1. On page "Fc004" you can set the special daily operation on 6 different days of the year by moving the cursor over the various fields using the ↵ key.

IMPORTANT

You can set the DHW program (from menu "Fc005" to menu "Fc008") by following the procedures of the system program (menu "Fc001" corresponds to menu "Fc005", "Fc002" to "Fc006", etc.).

9.4.15 Logout

After entering a password (user password or maintainer password) you can exit the programming change status with the "logout" function.

1. Press the ◉ key.
2. Enter the password (see paragraph "1.1.3 Inserimento password").
3. Press the ↵ key to enter the "programming" menu.
4. Press the ↑ and ↓ keys to select "L. Logout".
5. Press the ↵ key. A warning screen will appear.
6. Press the ↵ key again to return to the unit's main screen.

IMPORTANT

Access to a programming function with a password is deactivated after a period of inactivity.

9.4.16 Shutdown for long periods

- Check that the control panel indicates OFF. Check that the remote switch (if any) is OFF.
- Turn off the indoor terminal units by turning the switch on each unit to OFF.
- Close the water cocks.
- Set the QF main differential switch to OFF.

WARNING!

If the temperature drops below zero, there is a danger of frost: the hydraulic system and circuits of the heat pump must be emptied.

WARNING!

When the unit is switched on again, turn the main switch to ON to power the heat pump; then wait for at least 2 hours before switching operation to ON from the Control Panel (the circuits must be filled and vented and, if necessary, with the addition of glycol; refer to the preliminary warnings).

9.5 Parameter list: User menu

REF.	DISPLAY DESCRIPTION	U.M.	DEFAULT	MIN	MAX
Qa001	Unit Power On/Off	-	OFF	OFF	ON
	System heating setpoint				
Qb01	System heating standard setpoint	°C	30.0	10.0	50.0
	System heating setpoint 2	°C	35.5	10.0	50.0
	DHW setpoint				
Qb02	DHW standard setpoint	°C	48.0	10.0	55.0
	DHW setpoint 2	°C	50.0	10.0	55.0
	System Cooling setpoint				
Qb03	System cooling standard setpoint	°C	18.0	10.0	25.0
	System cooling setpoint 2	°C	18.0	10.0	25.0
Qb04	Setpoint 2 activation/deactivation	OFF	-	OFF	ON
Qb05	Operating mode change	-	Winter	Winter, summer, DHW only	
	Temperatures				
Info	Unit inlet water temperature	°C	-	-	-
	Reference setpoint	°C	-	-	-
	DHW temperature	°C	-	-	-
	DHW reference setpoint	°C	-	-	-
	Outdoor air temperature	°C	-	-	-
Qa002	DHW coil activation/deactivation	-	OFF	OFF	ON

9.6 Parameter list: programming menu

9.6.1 Adjustment

REF.	DISPLAY DESCRIPTION	U.M.	DEFAULT	MIN	MAX
	System				
Aa001	System pump operating hours	h	-	0	999999
	Maintenance hour threshold (in thousands)	h	99	0	999
	Reset of system pump hour count	-	-	0	1
	System pump request	%	-	-999.9	999.9
	Inverter system pump manual mode	%	-	0	101
Aa003	Minimum setpoint temperature in cooling mode	°C	10.0	-99.9	999.9
	Maximum setpoint temperature in cooling mode	°C	25.0	(*)	999.9
Aa004	Minimum setpoint temperature in heating mode	°C	10.0	0.0	999.9
	Maximum setpoint temperature in heating mode	°C	50.0	(*)	999.9
Aa005	Water high temperature offset	°C	10.0	0.0	99.9
	High temperature start delay	Min.	45	0	99
	Waiting for high temperature operation	Sec.	180	0	999
Aa006	Water low temperature offset	°C	20.0	0.0	99.9
	Low temperature start delay	Min.	45	0	99
	Waiting for low temperature operation	Sec.	180	0	999
Aa007	Adjustment with system probe (if any)	-	TRUE	0	1
	Adjustment with system probe (if any)	-	TRUE	0	1
	Delay between start PID and operating PID	Sec.	180	0	999
	System IO control warning	-	-	0	1
Aa008	Start adjustment probe (0=Return; 1=Delivery)	-	TRUE	0	1
	Delay between start PID and operating PID	Sec.	180	0	999
	Operation adjustment probe (0=Return; 1=Delivery)	-	TRUE	0	1
	System IO control warning	-	-	0	1

(*) Minimum setpoint temperature in cooling mode.

REF.	DISPLAY DESCRIPTION	U.M.	DEFAULT	MIN	MAX
Aa009	Enabling start PID control	-	-	0	1
	Adjustment water temperature	°C	-	-999.9	999.9
	System adjustment request	%	-	-100.0	100.0
	Start PID proportional band	°C	12.0	0.0	999.9
	Start PID integral time	Sec.	180	0	65535
	Start PID derivative time	Sec.	0	0	99
Aa010	Enabling operation PID control	-	-	0	1
	Adjustment water temperature	°C	-	-999.9	999.9
	System adjustment request	%	-	-100.0	100.0
	Operation PID proportional band	°C	10.0	0.0	999.9
	Operation PID integral time	Sec.	120	0	65535
	Operation PID derivative time	Sec.	3	0	99
Aa011	On request - With unit on - Always on - On request TA	-	0	0	2
Aa012	Start flow alarm delay	Sec.	15	0	999
	Operation flow alarm delay	Sec. ex.	5	0	99
As013	Compressor start delay with system pump ON	Sec.	30	0	999
	System pump stop delay with compressor OFF	Sec.	60	0	999
Aa015	System pump request in case of management with fixed speed	%	100.0	User. UserPmpLimMin	User. UserPmpLimMax
	Inverter system pump minimum limit	%	20.0	0.0	User. UserPmpLimMax
	Inverter system pump minimum limit	%	80.0	User. UserPmpLimM	100.0
Aa016	0: Fixed speed; 1: EVAP/COND; 2: DELTA T (IN- OUT)	-	0	0	2
	Warning of system pump regulation type	-	-	0	1
Aa020	System antifreeze alarm threshold	°C	-0.8	-999.9	999.9
	System antifreeze alarm differential	°C	30.0	0.0	999.9
	Antifreeze alarm delay at 1K below the threshold	Sec.	30	0	999
Aa021	Antifreeze setpoint (with unit off)	°C	4.0	-999.9	999.9
	Antifreeze differential (with unit off)	°C	2.0	0.0	99.9

REF.	DISPLAY DESCRIPTION	U.M.	DEFAULT	MIN	MAX
Aa022	Enabling compressor start by advanced antifreeze request	-	FALSE	0	1
	Advanced antifreeze setpoint (with unit off)	°C	2.0	-999.9	AFreezeSetP
	Advanced antifreeze differential (with unit off)	°C	15.0	0.0	99.9
	Maximum duration of the AFreezeHeat_Adv condition (in minutes)	Min.	30	0	999
	Time interval between two consecutive AFreezeHeat_Adv conditions (in minutes)	Min.	15	0	999
Aa023	Enabling system setpoint compensation function in heating mode	-	FALSE	0	1
	Enabling system setpoint compensation function in cooling mode	-	FALSE	0	1
Aa024	Coordinates for the creation of the heating or cooling curve in chiller mode. X: outdoor temperature; Y: system water temperature	°C		-99.9	X_CH[2]
		°C		Y_CH[2]	99.9
		°C		-99.9	X_CH[3]
		°C		Y_CH[3]	Y_CH[1]
		°C		-99.9	X_CH[4]
		°C		Y_CH[4]	Y_CH[2]
		°C		-99.9	99.9
		°C		-99.9	Y_CH[3]
Aa025	Coordinates for the creation of the heating or cooling curve in Heat pump mode. X: outdoor temperature; Y: system water temperature	°C		-99.9	X_HP[2]
		°C		Y_HP[2]	99.9
		°C		-99.9	X_HP[3]
		°C		Y_HP[3]	Y_HP[1]
		°C		-99.9	X_HP[4]
		°C		Y_HP[4]	Y_HP[2]
		°C		-99.9	99.9
		°C		-99.9	99.9
Aa026	Sniffer function	-	-	-	-
	Enable function	-	FALSE	0	1
	Sniffer function duration	Min.	5	0	999
	Sniffer function delay	Min.	300	0	999
	Sniffer function request	%	20	0	100

REF.	DISPLAY DESCRIPTION	U.M.	DEFAULT	MIN	MAX
	Enable function	No Units	TRUE	0	1
Aa027	Defines the User circulator control type: - TEMP + USER ON: Circulator active with system request active and water temperature close to the setpoint. - ON UNIT ON: Circulator active with Unit ON and water temperature close to the setpoint. - ALWAYS ON UNIT ON: Circulator active with Unit ON - TEMP + UNIT ON: Circulator active with Unit ON and water temperature close to the setpoint."	No Units	0	0	3
	Enable input system request	No Units	TRUE	0	1
Aa028	Distance from the setpoint for enabling the User circulator	°C	3.0	-99.9	99.9
	Reference temperature for activating the user circulator (display only)	°C		-99.9	99.9
	Hysteresis from the reference temperature beyond which the circulator is switched off.	°C	5.0	-99.9	99.9
	If enabled, the circulator is forced to ON.	No Units		0	1
	Enable circulator anti-seize function	No Units		0	1
Aa029	Number of hours since last circulator ON status	h	168.0	1.0	8760.0
	Minutes of operation during the anti-seize function.	min	3.0	1.0	1440.0
	DHW				
Ab001	DHW pump operating hours	h	-	0	999999
	DHW pump maintenance hour threshold (in thousands)	h	99	0	999
	Reset of DHW pump hour count	-	-	-	-
	DHW pump request	-	-	0	1
	Inverter DHW pump manual mode	%	-	-999.9	999.9

REF.	DISPLAY DESCRIPTION	U.M.	DEFAULT	MIN	MAX
Ab003	Enabling DHW start PID control	-	-	0	1
	Adjustment water temperature	°C	-	-999.9	999.9
	DHW regulation request	%	-	-100.0	100.0
	DHW start PID proportional band	-	10.0	0.0	999.9
	DHW start PID integral time	Sec.	150	0	65535
	DHW start PID derivative time	Sec.	0	0	99
Ab005	Minimum temperature setpoint in DHW mode	°C	10.0	-99.9	999.9
	Maximum setpoint temperatures in DHW mode	°C	55.0	LowLimMsk-Set _CH	999.9
Ab006	Enabling DHW setpoint compensation function	-	FALSE	0	1
Ab008	DHW start flow alarm delay	Sec.	15	0	999
	DHW operation flow alarm delay	Sec.	5	0	99
Ab009	0: ON REQUEST- 1:Unit On-2: Always active	-	0	0	2
Ab010	Compressor start delay with DHW pump ON	Sec.	30	0	999
	DHW pump stop delay with compressor OFF	Sec.	60	0	999
Ab011	DHW pump request in case of management with fixed speed	%	100.0	DHW_ PmpLimMin	DHW_ PmpLimMax
	Inverter DHW pump minimum limit	%	20.0	0.0	DHW_ PmpLimMax
	Inverter DHW pump minimum limit	%	100.0	DHW_ PmpLimMin	100.0
Ab012	Type of DHW pump regulation	-	0	0	1
	DHW pump regulation warning	-	-	0	1
Ab014	DHW setpoint offset	°C	20.0	0.0	99.9
	DHW start delay	Min.	45	0	99
	DHW operation delay	Sec.	180	0	999

(**) LowLimMskSetP_ HP
(***) LowLimMskSetP_ DHW
(****) LowLimMskSetP_ CH

REF.	DISPLAY DESCRIPTION	U.M.	DEFAULT	MIN	MAX
	Sniffer function	-	-	-	-
	Enable function	-	FALSE	0	1
Ab015	Sniffer function duration	Min.	5	0	999
	Sniffer function delay	Min.	300	0	999
	Sniffer function request	%	20	0	100
	Setpoint				
	Heating setpoint	°C	35.0	(**)	(**)
Ac001	DHW setpoint	°C	50.0	(***)	(***)
	Cooling setpoint	°C	10.0	(****)	(****)
	Heating setpoint 2	°C	32.5	(**)	(**)
Ac002	DHW setpoint 2	°C	45.0	(***)	(***)
	Cooling setpoint 2	°C	12.0	(****)	(****)
	Eco Heating setpoint	°C	30.0	(**)	(**)
Ac003	Eco DHW setpoint	°C	40.0	(***)	(***)
	Eco cooling setpoint	°C	14.0	(****)	(****)
	Unit info				
Qc001	Requests	-	-	-	-
Qc002	System circuit information	-	-	-	-
Qc003	DHW circuit information	-	-	-	-
Qc005	Cooling circuit information	-	-	-	-
Qc009	Compressor status	-	-	-	-
Qc006	Electronic expansion valve status	-	-	-	-
Qc010	Source information	-	-	-	-
Qc011	Defrosting information	-	-	-	-
Qc018	System supplementary source status				
Qc019	DHW supplementary source status	-	-	-	-
Qc020	System program status	-	-	-	-
Qc021	DHW programme status	-	-	-	-
	Other information after pressing ENTER	-	-	-	-
Qc022	Condenser system circulator status				
Qc023	Evaporator system circulator status				
Qc100	Inverter board status	-	-	-	-
Qc101	Record status	-	-	-	-
Qc102	Software status	-	-	-	-
Qc106	Driver type information	-	-	-	-
Qc110	Hardware information	-	-	-	-
Qc111	Modbus network status	-	-	-	-
Qc112	Unit OFF time information	-	-	-	-

Ref.	Display description	U.M.	Default	Min	Max
Qc113	Unit software information	-	-	-	-

9.6.2 EEV

Menu reserved for maintenance and manufacturer users.

9.6.3 Compressors

Menu reserved for maintenance and manufacturer users.

9.6.4 Coil

Ref.	Display description	U.M.	Default	Min	Max
	Compressor coil	-	-	-	
	Setpoint on:	°C	7.0	-99	99
	Off differential	°C	1.0	-99	99
	Accumulation coil	-	-	-	-
D0001	Setpoint on:	°C	2.0	-99	99
	Off differential	°C	2.0	-99	99
	System coil	-	-	-	-
	Enabled	-	FALSE	0	1
	Off differential	°C	2.0	-99	99
D0010	Enabling DHW coil	-	TRUE	0	1
	DHW coil	-	-	-	-
	Hours of activation	h	0.0	0	999999
D0012	Maintenance check threshold	h	0.0	0	999999
	Operating hour count reset	-	NO	0	1
	Status	-	-	-	-
	Manual activation	-	-	-	-
D0009	Enable function		No Units	0	1
D0010	FALSE: Fixed Days; TRUE: Fixed Period		No Units	0	1

Ref.	Display description	U.M.	Default	Min	Max
D0011	Program start hour	h		0	23
	Program start minute	min		0	59
	Program end hour	h		0	23
	Program end minute	min		0	59
	1 - Monday; 2 -Tuesday; 3 - Wednesday; 4 - Thursday; 5 - Friday; 6 - Saturday; 7 - Sunday	No Units		0	1
	1 - Monday; 2 -Tuesday; 3 - Wednesday; 4 - Thursday; 5 - Friday; 6 - Saturday; 7 - Sunday	No Units		0	1
	1 - Monday; 2 -Tuesday; 3 - Wednesday; 4 - Thursday; 5 - Friday; 6 - Saturday; 7 - Sunday	No Units		0	1
	1 - Monday; 2 -Tuesday; 3 - Wednesday; 4 - Thursday; 5 - Friday; 6 - Saturday; 7 - Sunday	No Units		0	1
	1 - Monday; 2 -Tuesday; 3 - Wednesday; 4 - Thursday; 5 - Friday; 6 - Saturday; 7 - Sunday	No Units		0	1
	1 - Monday; 2 -Tuesday; 3 - Wednesday; 4 - Thursday; 5 - Friday; 6 - Saturday; 7 - Sunday	No Units		0	1
	1 - Monday; 2 -Tuesday; 3 - Wednesday; 4 - Thursday; 5 - Friday; 6 - Saturday; 7 - Sunday	No Units		0	1
D0012	Program start hour	h		0	23
	Program start minute	min		0	59
	Program end hour	h		0	23
	Program end minute	min		0	59
	Days range for the activation of the Anti-legionella function	d		0	99
D0013	Maximum time before the procedure stops and generates an alarm	s		0	99
D0014	Outdoor temperature threshold for activating the function	°C		-999.9	999.9
	Differential to be added to the threshold for deactivating the function.	°C		-999.9	999.9
	Activation delay of the function	s		0	9999
D0015	Outdoor temperature threshold for activating the function	°C		-999.9	999.9
	Differential to be added to the threshold for deactivating the function.	°C		-999.9	999.9
D0016	Offset added to the DHW setpoint for switching off the heating element	No Units	5.0	0.0	100.0
D0017	Enabling the circulator in case of activation by replacement	No Units		0	1

Ref.	Display description	U.M.	Default	Min	Max
	Source				
E0003	Fan management (0=Independent; 1=Common)	-	TRUE	0	1
	Fan operating hours	h	-	0	999999
	Fan maintenance threshold	h	99	0	999
	Fan inverter request	-	-	0	1
	Fan operating hour counter reset	%	-	0.0	100.0
	Fan inverter manual mode	%	-	0	101
E0007	Reference temperature threshold for cold climates		-5.0	-999.9	999.9
	Minimum fan speed in cooling mode		10.0	0.0	100.0
	Fan acceleration in cooling mode		50.0	0.0	100.0
	Fan acceleration time in cooling mode		5	0	300
E0008	Enable silent function		FALSE	0	1
E0013	Fan adjustment mode (0: Fixed setpoint; 1: Outdoor temperature compensation; 2: Envelope modulation)		0	0	2
	Control setpoint configuration type alarm		-	0	1
E0016	Fan setpoint in cooling mode		30.0	-999.9	999.9
E0017	Fan setpoint in heating mode		10.0	-999.9	999.9
E0018	Fan offset setpoint in cooling mode		5.0	0.0	99.9
	Fan start setpoint in cooling mode		45.0	0.0	999.9
	Fan start delay in cooling mode		240	0	999
E0019	Fan offset setpoint in heating mode		3.0	0.0	99.9
E0020	Fan setpoint limit in cooling mode		0.0	0.0	100.0
E0021	Fan setpoint limit in heating mode		30.0	-50.0	50.0
E0022	Fan differential in cooling mode		15.0	0.0	99.9
	Enabling second fan		-	0	1
	Fan differential in cooling mode [%] (percentage of the entire differential)		50.0	0.0	100.0
E0023	Fan differential in heating mode		5.0	0.0	99.9
	Enabling second fan		-	0	1
	Fan differential in heating mode [%] (percentage of the entire differential)		60.0	0.0	100.0
E0024	Inverter fan minimum speed		20.0	0.0	100.0
	Inverter fan maximum speed		100.0	0.0	100.0
	Fan acceleration time		2	0	30

Ref.	Display description	U.M.	Default	Min	Max
	0: None; 1: Temp. Evap.; 2: Outdoor temperature; 3: Evap. Temp. & Press.		1	0	4
E0026	Defrost warning based on evaporation temperature		-	0	1
	Defrost warning based on outdoor temperature		-	0	1
	Hot gas defrosting	-	-	-	-
	Hot gas defrosting setpoint	°C	8.0	-999.9	999.9
	Hot gas defrosting setpont hysteresis	°C	1.0	-999.9	999.9
	Hot gas successful defrosting setpoint	°C	0.0	-999.9	999.9
E0028	Hot gas Defrosting successful defrosting setpont hysteresis	°C	1.0	-999.9	999.9
	Minimum time between two defrosting cycles	Sec.	120	0	9999
	Maximum valve opening time	Sec.	60	0	9999
	Hot gas defrosting				
	Minimum outdoor temperature for hot gas defrosting switchingoff	°C	2.0	-999.9	999.9
	Maximum outdoor temperature for hot gas defrosting switchingoff	°C	10.0	-999.9	999.9
E0029	Minimum temperature setpoint for compressor delivery	°C	35.0	-999.9	999.9
	Minimum temperature setpoint hysteresis for compressor delivery	°C	5.0	-999.9	999.9
	Enabling hot gas defrosting	-	TRUE	0	1
	Start threshold of defrostby inversion	°C	-5.5	-99.9	99.9
	Reverse defrost reset threshold	°C	-3.5	DfrStartThrsh_ EvapTemp	99.9
E0028	Delay threshold of defrostby inversion	Min.	30	0	99
	Maximum threshold for defrost by inversion	°C	52.0	-999.9	999.9
	Defrost start differential	°C	12.0	-99.9	99.9
E0030	Defrost start reset differential	°C	10.0	DfrStartThrsh_ Temp	99.9
	Defrost start delay	Min.	30	0	99
E0031	Page reserved for maintenance users and manufacturer.				
E0032	Page reserved for maintenance users and manufacturer.				
E0033	Page reserved for maintenance users and manufacturer.				
E0034	Page reserved for maintenance users and manufacturer.				
E0035	Page reserved for maintenance users and manufacturer.				
E0036	Page reserved for maintenance users and manufacturer.				
E0037	Page reserved for maintenance users and manufacturer.				

REF.	DISPLAY DESCRIPTION	U.M.	DEFAULT	MIN	MAX
E0038	Page reserved for maintenance users and manufacturer.				
E0039	Page reserved for maintenance users and manufacturer.				
E0040	Page reserved for maintenance users and manufacturer.				
E0044	Page reserved for maintenance users and manufacturer.				
E0045	Page reserved for maintenance users and manufacturer.				

9.6.5 Unit

Menu reserved for maintenance and manufacturer users.

9.6.6 Alarms (Events)

This field is also available after pressing the ⚠ button.

9.6.7 Settings

REF.	DISPLAY DESCRIPTION	U.M.	DEFAULT	MIN	MAX
	Date and Time				
Ha001	Date format (0: DDMMYY; 1: MMDDYY; 2: YYMMDDD)	-	0	0	2
	Day	d	-	1	31
	Month	mont h	-	1	12
	Year	y	-	0	99
	Hour	h	-	0	24
	Minutes	Min.	-	0	59
	Seconds	s	-	0	59
	1 - Monday; 2 -Tuesday; 3 - Wednesday; 4 - Thursday; 5 - Friday; 6 - Saturday; 7 - Sunday	-	-	0	9
Ha002	Time zone	-	38	1	103
	Update time zone	-	-	0	1
	Unit of measure				
	Language				
	Serial ports				
	Change password				
	Initialisation				
	Time program				
Fc001	Enable system time program	-	FALSE	0	1
Fc002	System daily program setting	-	-	-	-
Fc003	System special period program setting	-	-	-	-
Fc004	System special day program setting	-	-	-	-
Fc005	Enable DHW time program	-	FALSE	0	1
Fc006	DHW daily program setting	-	-	-	-
Fc007	DHW special period program setting	-	-	-	-
Fc008	DHW special day program setting	-	-	-	-
	Logout Password				

9.7 Alarms and signals

9.7.1 Alarm indication LEDs

The red LED under the ⚠ button may be:

- Off: no active alarm.
- Flashing: at least one active alarm.
- On: at least one active alarm and the display shows an alarm mask.

9.7.2 Alarm masks

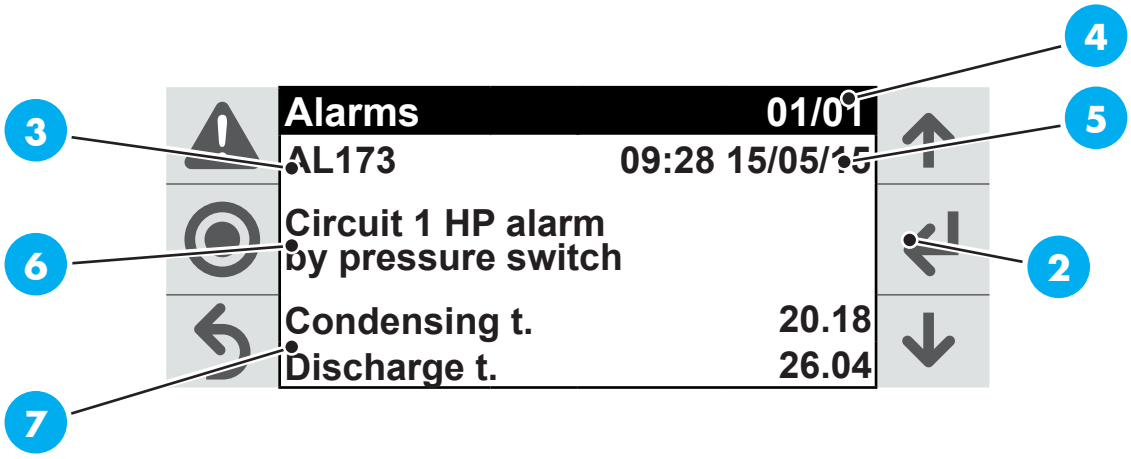
Pressing the ⚠ button can lead to two different cases:

1. No alarm active:
   press the ↵ button for quick access to the "Alarms Log".
2. At least one active alarm:

the mask shows the alarm code (**3**) in ascending order.
Each alarm contains the information necessary to understand the possible causes of the problem:

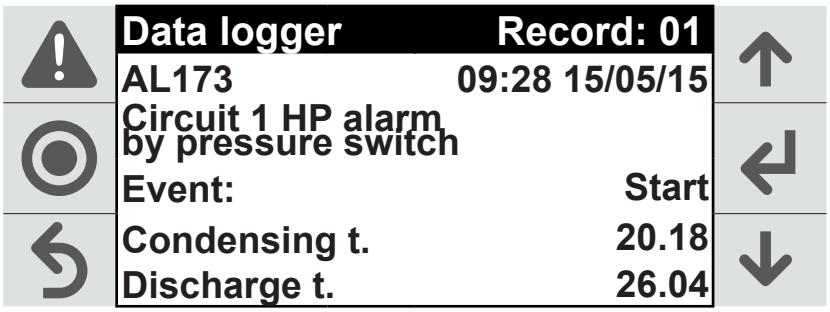
- alarm number / total alarms (**4**);
- alarm code (**3**);
- date and time of alarm activation (**5**);
- alarm description (**6**);
- values of the probes connected to the alarm (**7**).

In each alarm mask, you can enter the "Alarm Log" mask by pressing the ↵ button.



9.8 Alarm Log

From the main menu, by entering the "Alarm history" menu you can access the following alarm log display mask:



The alarm log allows storing the operating status of the software when alarms are triggered.
Each storage is an event that can be displayed among all the events available in the memory. The same information saved in the alarm mask will also be saved in the alarm log.
The maximum number of events that can be stored is 64. When the maximum limit is reached, the last alarm will overwrite the oldest one.
The alarm log can be deleted in the "Initialisation Setting" menu using the specific control.

9.9 Resetting the alarms

The alarms can be reset manually, automatically or automatically after repeated attempts:

- Manual reset: once the cause of the alarm has been eliminated, you first have to reset the buzzer (if present) by pressing the ⚠ button. Press and hold the ⚠ button to reset.
- Automatic reset: when the alarm condition ends, the buzzer is silenced and the alarm reset.
- Automatic reset after repeated attempts: the number of interventions in one hour is checked. If the number of interventions in one hour is lower than the maximum set number, the alarm is reset automatically, otherwise it is necessary to reset it manually.

9.10 Alarm list

CODE	DESCRIPTION	TYPE	EFFECTS
AL000	Unit - Prototype operation alarm	Auto reset	Unit switching off
AL001	Unit - Remote conn. alarm	User reset	Unit switching off
AL002	Unit - Permanent memory writing error	User reset	Information purpose only
AL003	Unit - Memory writing error	User reset	Information purpose only
AL004	Unit - System inlet temperature alarm	Auto reset	System circuit switching off
AL005	Unit - System outlet temperature alarm	Auto reset	System circuit switching off
AL006	Unit - Source inlet probe alarm (if any)	Auto reset	Information purpose only
AL007	Unit - Outdoor temperature probe alarm	Auto reset	Information purpose only
AL008	Unit - System pump overload	User reset	System circuit switching off
AL009	Unit - Source pump overload (if any)	User reset	Unit switching off
AL010	Unit - System pump flow alarm active	Auto reset up to 8 times in one hour	System circuit switching off
AL011	Unit - Source pump flow alarm (if any) active	Auto reset up to 5 times in one hour	Unit switching off
AL012	Unit - System pump unit alarm	User reset	System circuit switching off
AL013	Unit - Source pump unit alarm (if any)	User reset	Unit switching off
AL014	Unit - System pump alarm	Auto reset	Information purpose only
AL015	Unit - Source pump maintenance (if any)	Auto reset	Information purpose only
AL016	Unit - Water high temperature in cooling mode	Auto reset	Information purpose only
AL017	Unit - System water temperature too low	Auto reset	Information purpose only
AL018	Unit - Domestic hot water temperature too low	Auto reset	Information purpose only
AL019	Unit - Antifreeze alarm in advanced mode	Auto reset	Information purposes only and forced start of the unit
AL020	Unit - DHW probe alarm	Auto reset	DHW circuit switching off
AL021	Unit - Source water outlet probe alarm (if any)	Auto reset	Information purpose only
AL022	Unit - User system probe alarm (if any)	Auto reset	System circuit switching off
AL023	Unit - Source generic alarm	Auto reset up to 3 times in one hour	Unit switching off
AL024	Unit - DHW pump maintenance	Auto reset	Information purpose only
AL025	Unit - DHW pump unit alarm	User reset	DHW circuit switching off

Code	Description	Type	Effects
AL026	Unit - DHW circuit flow failure alarm (if any)	Auto reset up to 8 times in one hour	DHW circuit switching off
AL027	Unit - DHW pump overload	User reset	DHW circuit switching off
AL028	Unit - External coil temperature alarm (if any)	Auto reset	Information purpose only
AL029	Unit - System circuit antifreeze alarm in cooling mode	Auto reset	Compressor shutdown and forced start of the system pump
AL030	Unit - System circuit antifreeze alarm in heating mode	Auto reset	Forced start of the system pump
AL031	Unit - Source circuit antifreeze alarm in heating mode (if any)	Auto reset	Compressor shutdown and forced start of the system pump
AL032	Unit - Source circuit antifreeze alarm in cooling mode (if any)	Auto reset	Forced start of the system pump
AL033	Unit - DHW circuit water outlet probe alarm	Auto reset	Information purpose only
AL034	Unit - BMS Offline alarm	Auto reset	BMS offline
AL092	Cooling circuit 1 - Defrost interrupted due to a system alarm	Auto reset	Information purpose only
AL093	Cooling circuit 1 - High pressure sensor alarm	Auto reset	Circuit 1 switching off
AL094	Cooling circuit 1 - Low pressure sensor alarm	Auto reset	Circuit 1 switching off
AL095	Cooling circuit 1 - Discharge temperature probe alarm	Auto reset	Circuit 1 switching off
AL096	Cooling circuit 1 - Suction temperature probe alarm	Auto reset	Circuit 1 switching off
AL097	Cooling circuit 1 - Liquid temperature probe alarm (if any)	Auto reset	Information purpose only
AL098	Cooling circuit 1 Compressor envelope - High compression ratio	Auto reset	Circuit 1 switching off
AL099	Cooling circuit 1 Compressor envelope - High pressure	Auto reset up to 8 times in one hour	Circuit 1 switching off
AL100	Cooling circuit 1 Compressor envelope - High compressor absorption	Auto reset	Circuit 1 switching off
AL101	Cooling circuit 1 Compressor envelope - High suction pressure	Auto reset	Circuit 1 switching off
AL102	Cooling circuit 1 Compressor envelope - Low compression ratio	Auto reset	Circuit 1 switching off
AL103	Cooling circuit 1 Compressor envelope - Low pressure difference	Auto reset	Circuit 1 switching off
AL104	Cooling circuit 1 Compressor envelope - Low discharge pressure	Auto reset	Circuit 1 switching off
AL105	Cooling circuit 1 Compressor envelope - Low suction pressure	Auto reset	Circuit 1 switching off
AL106	Cooling circuit 1 Compressor envelope - High discharge temperature	Auto reset	Circuit 1 switching off

CODE	DESCRIPTION	TYPE	EFFECTS
AL107	Cooling circuit 1 EVD - Low overheating	Auto reset up to 3 times in one hour	Circuit 1 switching off
AL108	Cooling circuit 1 EVD - LOP	Auto reset	Circuit 1 switching off
AL109	Cooling circuit 1 EVD - MOP	Auto reset	Circuit 1 switching off
AL110	Cooling circuit 1 EVD - High condensate temperature	Auto reset	Circuit 1 switching off
AL111	Cooling circuit 1 EVD - Low suction temperature	Auto reset	Circuit 1 switching off
AL112	Cooling circuit 1 EVD - Motor error	User reset	Circuit 1 switching off
AL113	Cooling circuit 1 EVD - Emergency closure	Auto reset	Circuit 1 switching off
AL114	Cooling circuit 1 EVD - Out of range	Auto reset	Circuit 1 switching off
AL115	Cooling circuit 1 EVD - Setting range error	Auto reset	Information purpose only
AL116	Cooling circuit 1 EVD - Offline	Auto reset	Circuit 1 switching off
AL117	Cooling circuit 1 EVD - Low battery	Auto reset	Information purpose only
AL118	Cooling circuit 1 EVD - EEPROM	Auto reset	Information purpose only
AL119	Cooling circuit 1 EVD - Incomplete valve closure	Auto reset	Circuit 1 switching off
AL120	Cooling circuit 1 EVD - Firmware not compatible	Auto reset	Circuit 1 switching off
AL121	Cooling circuit 1 EVD - Configuration error	Auto reset	Circuit 1 switching off
AL122	Cooling circuit 1 Inverter - Offline	Auto reset	Power+ switching off
AL123	Cooling circuit 1 Inverter - Overcurrent	Auto reset	Power+ switching off
AL124	Cooling circuit 1 Inverter - Motor overload	Auto reset	Power+ switching off
AL125	Cooling circuit 1 Inverter - DC Bus overvoltage	Auto reset	Power+ switching off
AL126	Cooling circuit 1 Inverter - DC bus undervoltage	Auto reset	Power+ switching off
AL127	Cooling circuit 1 Inverter - Drive overtemperature	Auto reset	Power+ switching off
AL128	Cooling circuit 1 Inverter - Drive undertemperature	Auto reset	Power+ switching off
AL129	Cooling circuit 1 Inverter - HW overcurrent	Auto reset	Power+ switching off
AL130	Cooling circuit 1 Inverter - Motor PTC overtemperature	Auto reset	Power+ switching off
AL131	Cooling circuit 1 Inverter - Module IGBT error	Auto reset	Power+ switching off
AL132	Cooling circuit 1 Inverter - CPU error	Auto reset	Power+ switching off
AL133	Cooling circuit 1 Inverter - Default parameter (11)	Auto reset	Power+ switching off
AL134	Cooling circuit 1 Inverter - DC bus rippled	Auto reset	Power+ switching off
AL135	Cooling circuit 1 Inverter - Communication error	Auto reset	Power+ switching off
AL136	Cooling circuit 1 Inverter - Drive thermistor error	Auto reset	Power+ switching off
AL137	Cooling circuit 1 Inverter - Autotuning fault error	Auto reset	Power+ switching off
AL138	Cooling circuit 1 Inverter - Drive disabled	Auto reset	Power+ switching off
AL139	Cooling circuit 1 Inverter - Motor timing error	Auto reset	Power+ switching off
AL140	Cooling circuit 1 Inverter - Internal fan error	Auto reset	Power+ switching off
AL141	Cooling circuit 1 Inverter - Speed error	Auto reset	Power+ switching off
AL142	Cooling circuit 1 Inverter - PFC module error	Auto reset	Power+ switching off
AL143	Cooling circuit 1 Inverter - PFC overvoltage	Auto reset	Power+ switching off

CODE	DESCRIPTION	TYPE	EFFECTS
AL144	Cooling circuit 1 Inverter - PFC undervoltage	Auto reset	Power+ switching off
AL145	Cooling circuit 1 Inverter - High pressure alarm	Auto reset	Power+ switching off
AL146	Cooling circuit 1 Inverter - High pressure alarm	Auto reset	Power+ switching off
AL147	Cooling circuit 1 Inverter - Reference voltage error	Auto reset	Power+ switching off
AL148	Cooling circuit 1 Inverter - ADC conversion synchronisation error	Auto reset	Power+ switching off
AL149	Cooling circuit 1 Inverter - HW synchronisation error	Auto reset	Power+ switching off
AL150	Cooling circuit 1 Inverter - Drive overload	Auto reset	Power+ switching off
AL151	Cooling circuit 1 Inverter - Error code (29)	Auto reset	Power+ switching off
AL152	Cooling circuit 1 Inverter - Unexpected restart	Auto reset	Power+ switching off
AL153	Cooling circuit 1 Inverter - Unexpected shutdown	Auto reset	Power+ switching off
AL154	Cooling circuit 1 BLDC - Failed start	Auto reset up to 2 times in one hour	Power+ switching off
AL155	Cooling circuit 1 BLDC - Pressure difference greater than the allowed value at the start	Auto reset	Power+ switching off
AL159	Cooling circuit 1 - Evaporation temperature antifreeze alarm	Auto reset up to 3 times in one hour	Circuit 1 switching off
AL160	Cooling circuit 1 - Compressor 1 maintenance	Auto reset	Information purpose only
AL161	Cooling circuit 1 - Compressor 2 maintenance (if any)	Auto reset	Information purpose only
AL162	Cooling circuit 1 - Condensation temperature alarm	Auto reset	Circuit 1 switching off
AL163	Cooling circuit 1 - Fan 1 maintenance	Auto reset	Information purpose only
AL164	Cooling circuit 1 - Fan 2 maintenance	Auto reset	Information purpose only
AL165	Cooling circuit 1 - Fan 3 maintenance	Auto reset	Information purpose only
AL166	Cooling circuit 1 - Alarm for high pressure detected by the pressure switch	Auto reset up to 8 times in one hour	Circuit 1 switching off
AL167	Cooling circuit 1 - Low pressure detected by the pressure switch (if any)	Auto reset up to 8 times in one hour	Circuit 1 switching off
AL168	Cooling circuit 1 - Compressor 1 overload	User reset	Compressor 1 switching off
AL169	Cooling circuit 1 - Compressor 2 overload	User reset	Compressor 2 switching off
AL170	Cooling circuit 1 - End of forced pump shutdown for maximum time	Auto reset	Information purpose only
AL171	Cooling circuit 1 - Source temperature antifreeze alarm	Auto reset up to 5 times in one hour	Circuit 1 switching off
AL172	Circuit 1 - Suction antifreeze alarm	Auto reset	Circuit 1 switching off
AL190	Cooling circuit 2 - Defrost interrupted due to a system alarm	Auto reset	Information purpose only

Code	Description	Type	Effects
AL191	Cooling circuit 2 - High pressure sensor alarm	Auto reset	Circuit 2 switching off
AL192	Cooling circuit 2 - Low pressure sensor alarm	Auto reset	Circuit 2 switching off
AL193	Cooling circuit 2 - Discharge temperature probe alarm	Auto reset	Circuit 2 switching off
AL194	Cooling circuit 2 - Suction temperature probe alarm	Auto reset	Circuit 2 switching off
AL195	Cooling circuit 2 - Liquid temperature probe alarm (if any)	Auto reset	Information purpose only
AL196	Cooling circuit 2 Compressor envelope - High compression ratio	Auto reset	Circuit 2 switching off
AL197	Cooling circuit 2 Compressor envelope - High pressure	Auto reset up to 8 times in one hour	Circuit 2 switching off
AL198	Cooling circuit 2 Compressor envelope - High compressor absorption	Auto reset	Circuit 2 switching off
AL199	Cooling circuit 2 Compressor envelope - High suction pressure	Auto reset	Circuit 2 switching off
AL200	Cooling circuit 2 Compressor envelope - Low compression ratio	Auto reset	Circuit 2 switching off
AL201	Cooling circuit 2 Compressor envelope - Low pressure difference	Auto reset	Circuit 2 switching off
AL202	Cooling circuit 2 Compressor envelope - Low discharge pressure	Auto reset	Circuit 2 switching off
AL203	Cooling circuit 2 Compressor envelope - Low suction pressure	Auto reset	Circuit 2 switching off
AL204	Cooling circuit 2 Compressor envelope - High discharge temperature	Auto reset	Circuit 2 switching off
AL205	Cooling circuit 2 EVD - Low overheating	Auto reset up to 3 times in one hour	Circuit 2 switching off
AL206	Cooling circuit 2 EVD - LOP	Auto reset	Circuit 2 switching off
AL207	Cooling circuit 2 EVD - MOP	Auto reset	Circuit 2 switching off
AL208	Cooling circuit 2 EVD - High condensate temperature	Auto reset	Circuit 2 switching off
AL209	Cooling circuit 2 EVD - Low suction temperature	Auto reset	Circuit 2 switching off
AL210	Cooling circuit 2 EVD - Motor error	User reset	Circuit 2 switching off
AL211	Cooling circuit 2 EVD - Emergency closure	Auto reset	Circuit 2 switching off
AL212	Cooling circuit 2 EVD - Out of range	Auto reset	Circuit 2 switching off
AL213	Cooling circuit 2 EVD - Setting range error	Auto reset	Information purpose only
AL214	Cooling circuit 2 EVD - Offline	Auto reset	Circuit 2 switching off
AL215	Cooling circuit 2 EVD - Low battery	Auto reset	Information purpose only
AL216	Cooling circuit 2 EVD - EEPROM	Auto reset	Information purpose only
AL217	Cooling circuit 2 EVD - Incomplete valve closure	Auto reset	Circuit 2 switching off
AL218	Cooling circuit 2 EVD - Firmware not compatible	Auto reset	Circuit 2 switching off
AL219	Cooling circuit 2 EVD - Configuration error	Auto reset	Circuit 2 switching off

CODE	DESCRIPTION	TYPE	EFFECTS
AL220	Cooling circuit 2 Inverter - Offline	Auto reset	Power+ switching off
AL221	Cooling circuit 2 Inverter - Overcurrent	Auto reset	Power+ switching off
AL222	Cooling circuit 2 Inverter - Motor overload	Auto reset	Power+ switching off
AL223	Cooling circuit 2 Inverter - DC Bus overvoltage	Auto reset	Power+ switching off
AL224	Cooling circuit 2 Inverter - DC bus undervoltage	Auto reset	Power+ switching off
AL225	Cooling circuit 2 Inverter - Drive overtemperature	Auto reset	Power+ switching off
AL226	Cooling circuit 2 Inverter - Drive undertemperature	Auto reset	Power+ switching off
AL227	Cooling circuit 2 Inverter - HW overcurrent	Auto reset	Power+ switching off
AL228	Cooling circuit 2 Inverter - Motor PTC overtemperature	Auto reset	Power+ switching off
AL229	Cooling circuit 2 Inverter - Module IGBT error	Auto reset	Power+ switching off
AL230	Cooling circuit 2 Inverter - CPU error	Auto reset	Power+ switching off
AL231	Cooling circuit 2 Inverter - Default parameter (11)	Auto reset	Power+ switching off
AL232	Cooling circuit 2 Inverter - DC bus rippled	Auto reset	Power+ switching off
AL233	Cooling circuit 2 Inverter - Communication error	Auto reset	Power+ switching off
AL234	Cooling circuit 2 Inverter - Drive thermistor error	Auto reset	Power+ switching off
AL235	Cooling circuit 2 Inverter - Autotuning fault error	Auto reset	Power+ switching off
AL236	Cooling circuit 2 Inverter - Drive disabled	Auto reset	Power+ switching off
AL237	Cooling circuit 2 Inverter - Motor timing error	Auto reset	Power+ switching off
AL238	Cooling circuit 2 Inverter - Internal fan error	Auto reset	Power+ switching off
AL239	Cooling circuit 2 Inverter - Speed error	Auto reset	Power+ switching off
AL240	Cooling circuit 2 Inverter - PFC module error	Auto reset	Power+ switching off
AL241	Cooling circuit 2 Inverter - PFC overvoltage	Auto reset	Power+ switching off
AL242	Cooling circuit 2 Inverter - PFC undervoltage	Auto reset	Power+ switching off
AL243	Cooling circuit 2 Inverter - High pressure alarm	Auto reset	Power+ switching off
AL244	Cooling circuit 2 Inverter - High pressure alarm	Auto reset	Power+ switching off
AL245	Cooling circuit 2 Inverter - Reference voltage error	Auto reset	Power+ switching off
AL246	Cooling circuit 2 Inverter - ADC conversion synchronisation error	Auto reset	Power+ switching off
AL247	Cooling circuit 2 Inverter - HW synchronisation error	Auto reset	Power+ switching off
AL248	Cooling circuit 2 Inverter - Drive overload	Auto reset	Power+ switching off
AL249	Cooling circuit 2 Inverter - Error code (29)	Auto reset	Power+ switching off
AL250	Cooling circuit 2 Inverter - Unexpected restart	Auto reset	Power+ switching off
AL251	Cooling circuit 2 Inverter - Unexpected shutdown	Auto reset	Power+ switching off
AL252	Cooling circuit 2 BLDC - Failed start	User reset up to 2 times in one hour	Power+ switching off
AL253	Cooling circuit 2 BLDC - Pressure difference greater than the allowed value at the start	Auto reset	Power+ switching off

CODE	DESCRIPTION	TYPE	EFFECTS
AL254	Cooling circuit 2 - Evaporation temperature antifreeze alarm	Auto reset up to 3 times in one hour	Circuit 2 switching off
AL255	Cooling circuit 2 - Compressor 1 maintenance	Auto reset	Information purpose only
AL256	Cooling circuit 2 - Compressor 2 maintenance (if any)	Auto reset	Information purpose only
AL257	Cooling circuit 2 - Condensation temperature alarm	Auto reset	Circuit 2 switching off
AL258	Cooling circuit 2 - Fan 1 maintenance	Auto reset up to 8 times in one hour	Information purpose only
AL259	Cooling circuit 2 - Fan 2 maintenance	Auto reset up to 8 times in one hour	Information purpose only
AL260	Cooling circuit 2 - Fan 3 maintenance	User reset	Information purpose only
AL261	Cooling circuit 2 - Alarm for high pressure detected by the pressure switch	User reset	Circuit 2 switching off
AL262	Cooling circuit 2 - Low pressure detected by the pressure switch (if any)	Auto reset	Circuit 2 switching off
AL263	Cooling circuit 2 - Compressor 1 overload	Auto reset up to 5 times in one hour	Compressor 2 switching off
AL264	Cooling circuit 2 - Compressor 2 overload	Auto reset	Compressor 2 switching off
AL265	Cooling circuit 2 - End of forced pump shutdown for maximum time	Auto reset	Information purpose only
AL266	Cooling circuit 2 - Source temperature antifreeze alarm	Auto reset	Circuit 2 switching off
AL308	Cooling circuit 1 - Safety alarm 101	Auto reset	Cooling circuit 1 Power+ switching off
AL309	Cooling circuit 1 - Safety alarm 102	Auto reset	Cooling circuit 1 Power+ switching off
AL310	Cooling circuit 1 - Safety alarm 103	Auto reset	Cooling circuit 1 Power+ switching off
AL311	Cooling circuit 1 - Safety alarm 104	Auto reset	Cooling circuit 1 Power+ switching off
AL312	Cooling circuit 1 - Safety alarm 105	Auto reset	Cooling circuit 1 Power+ switching off
AL313	Cooling circuit 1 - Safety alarm 106	Auto reset	Cooling circuit 1 Power+ switching off
AL314	Cooling circuit 1 - Safety alarm 107	Auto reset	Cooling circuit 1 Power+ switching off
AL315	Cooling circuit 1 - Safety alarm 108	Auto reset	Cooling circuit 1 Power+ switching off
AL316	Cooling circuit 1 - Safety alarm 109	Auto reset	Cooling circuit 1 Power+ switching off
AL317	Cooling circuit 1 - Safety alarm 110	Auto reset	Cooling circuit 1 Power+ switching off
AL318	Cooling circuit 1 - Safety alarm 111	Auto reset	Cooling circuit 1 Power+ switching off

CODE	DESCRIPTION	TYPE	EFFECTS
AL319	Cooling circuit 1 - Safety alarm 112	Auto reset	Cooling circuit 1 Power+ switching off
AL320	Cooling circuit 1 - Safety alarm 113	Auto reset	Cooling circuit 1 Power+ switching off
AL321	Cooling circuit 1 - Safety alarm 114	Auto reset	Cooling circuit 1 Power+ switching off
AL322	Cooling circuit 1 - Safety alarm 115	Auto reset	Cooling circuit 1 Power+ switching off
AL323	Cooling circuit 1 - Safety alarm 116	Auto reset	Cooling circuit 1 Power+ switching off
AL324	Cooling circuit 1 - Safety alarm 201	Auto reset	Cooling circuit 1 Power+ switching off
AL325	Cooling circuit 1 - Safety alarm 202	Auto reset	Cooling circuit 1 Power+ switching off
AL326	Cooling circuit 1 - Safety alarm 203	Auto reset	Cooling circuit 1 Power+ switching off
AL327	Cooling circuit 1 - Safety alarm 204	Auto reset	Cooling circuit 1 Power+ switching off
AL328	Cooling circuit 1 - Safety alarm 205	Auto reset	Cooling circuit 1 Power+ switching off
AL329	Cooling circuit 1 - Safety alarm 206	Auto reset	Cooling circuit 1 Power+ switching off
AL330	Cooling circuit 1 - Safety alarm 207	Auto reset	Cooling circuit 1 Power+ switching off
AL331	Cooling circuit 1 - Safety alarm 208	Auto reset	Cooling circuit 1 Power+ switching off
AL332	Cooling circuit 1 - Safety alarm 209	Auto reset	Cooling circuit 1 Power+ switching off
AL333	Cooling circuit 1 - Safety alarm 210	Auto reset	Cooling circuit 1 Power+ switching off
AL334	Cooling circuit 1 - Safety alarm 211	Auto reset	Cooling circuit 1 Power+ switching off
AL335	Cooling circuit 1 - Safety alarm 212	Auto reset	Cooling circuit 1 Power+ switching off
AL336	Cooling circuit 1 - Safety alarm 213	Auto reset	Cooling circuit 1 Power+ switching off
AL337	Cooling circuit 1 - Safety alarm 214	Auto reset	Cooling circuit 1 Power+ switching off
AL338	Cooling circuit 1 - Safety alarm 215	Auto reset	Cooling circuit 1 Power+ switching off
AL339	Cooling circuit 1 - Safety alarm 216	Auto reset	Cooling circuit 1 Power+ switching off
AL340	Cooling circuit 2 - Safety alarm 101	Auto reset	Cooling circuit 2 Power+ switching off
AL341	Cooling circuit 2 - Safety alarm 102	Auto reset	Cooling circuit 2 Power+ switching off
AL342	Cooling circuit 2 - Safety alarm 103	Auto reset	Cooling circuit 2 Power+ switching off

CODE	DESCRIPTION	TYPE	EFFECTS
AL343	Cooling circuit 2 - Safety alarm 104	Auto reset	Cooling circuit 2 Power+ switching off
AL344	Cooling circuit 2 - Safety alarm 105	Auto reset	Cooling circuit 2 Power+ switching off
AL345	Cooling circuit 2 - Safety alarm 106	Auto reset	Cooling circuit 2 Power+ switching off
AL346	Cooling circuit 2 - Safety alarm 107	Auto reset	Cooling circuit 2 Power+ switching off
AL347	Cooling circuit 2 - Safety alarm 108	Auto reset	Cooling circuit 2 Power+ switching off
AL348	Cooling circuit 2 - Safety alarm 109	Auto reset	Cooling circuit 2 Power+ switching off
AL349	Cooling circuit 2 - Safety alarm 110	Auto reset	Cooling circuit 2 Power+ switching off
AL350	Cooling circuit 2 - Safety alarm 111	Auto reset	Cooling circuit 2 Power+ switching off
AL351	Cooling circuit 2 - Safety alarm 112	Auto reset	Cooling circuit 2 Power+ switching off
AL352	Cooling circuit 2 - Safety alarm 113	Auto reset	Cooling circuit 2 Power+ switching off
AL353	Cooling circuit 2 - Safety alarm 114	Auto reset	Cooling circuit 2 Power+ switching off
AL354	Cooling circuit 2 - Safety alarm 115	Auto reset	Cooling circuit 2 Power+ switching off
AL355	Cooling circuit 2 - Safety alarm 116	Auto reset	Cooling circuit 2 Power+ switching off
AL356	Cooling circuit 2 - Safety alarm 201	Auto reset	Cooling circuit 2 Power+ switching off
AL357	Cooling circuit 2 - Safety alarm 202	Auto reset	Cooling circuit 2 Power+ switching off
AL358	Cooling circuit 2 - Safety alarm 203	Auto reset	Cooling circuit 2 Power+ switching off
AL359	Cooling circuit 2 - Safety alarm 204	Auto reset	Cooling circuit 2 Power+ switching off
AL360	Cooling circuit 2 - Safety alarm 205	Auto reset	Cooling circuit 2 Power+ switching off
AL361	Cooling circuit 2 - Safety alarm 206	Auto reset	Cooling circuit 2 Power+ switching off
AL362	Cooling circuit 2 - Safety alarm 207	Auto reset	Cooling circuit 2 Power+ switching off
AL363	Cooling circuit 2 - Safety alarm 208	Auto reset	Cooling circuit 2 Power+ switching off
AL364	Cooling circuit 2 - Safety alarm 209	Auto reset	Cooling circuit 2 Power+ switching off
AL365	Cooling circuit 2 - Safety alarm 210	Auto reset	Cooling circuit 2 Power+ switching off
AL366	Cooling circuit 2 - Safety alarm 211	Auto reset	Cooling circuit 2 Power+ switching off

CODE	DESCRIPTION	TYPE	EFFECTS
AL367	Cooling circuit 2 - Safety alarm 212	Auto reset	Cooling circuit 2 Power+ switching off
AL368	Cooling circuit 2 - Safety alarm 213	Auto reset	Cooling circuit 2 Power+ switching off
AL369	Cooling circuit 2 - Safety alarm 214	Auto reset	Cooling circuit 2 Power+ switching off
AL370	Cooling circuit 2 - Safety alarm 215	Auto reset	Cooling circuit 2 Power+ switching off
AL371	Cooling circuit 2 - Safety alarm 216	Auto reset	Cooling circuit 2 Power+ switching off
AL372	Offline expansion	Auto reset	Device resources are not used
AL373	Expansion configuration is incorrect	Auto reset	Device resources are not used
AL375	System supplementary source maintenance time reached	Auto reset	Information purpose only
AL376	DHW supplementary source maintenance time reached	Auto reset	Information purpose only

10 Maintenance

10.1 Preliminary warnings

WARNING!
All ordinary and extraordinary maintenance operations must be carried out by qualified personnel.

DANGER!
It is recommended to disconnect the power supply before carrying out any work on the unit.

WARNING!
It is forbidden to fill the cooling circuits with a refrigerant other than that one specified on the identification plate. Using a different refrigerant can cause serious damage to the compressor.

DANGER!
It is forbidden to use oxygen, acetylene or other flammable or poisonous gases in the cooling circuit as they can cause explosions or intoxications.

WARNING!
It is forbidden to use oils other than those indicated. Using oils other than those indicated may cause serious damage to the compressor.

10.2 Routine maintenance

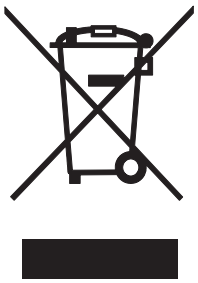
- Maintenance is essential to keep the unit in perfect working order and efficient in terms of energy saving.
- A maintenance plan is recommended, with annual frequency, including the following operations and checks:
  - Filling of water circuit.
  - Presence of air bubbles in the water circuit.
  - Safety device efficiency.
  - Power supply voltage.
  - Power consumption.
  - Tightness of electrical and hydraulic connections.
  - Condition of the thermal-magnetic switch for the protection of the inverter board.
  - Check operating pressures, overheating and undercooling.
  - Compressor coil efficiency (if present).
  - Glycol mixture chemical analysis.
  - Efficiency of circulation pumps.
  - Verification of expansion vessels.
  - Cleaning of water filters.
  - Check of the flow switch operation (if any).
  - Check the sacrificial anode every 6-12 months and replace every 2-3 years.
  - Check the pre-charge pressure of the expansion vessels every 6 months.
  - Check the condition of the heating element.

10.3 Faults, causes and solutions

FAULT	CAUSE	SOLUTION	U/I/A
The heat pump does not start	Lack of voltage	Check for voltage	I
		Check upstream safety systems	U
	Main switch in pos. OFF	Set to ON	U
	Remote switch in OFF position	Set to ON	U
	Control panel in OFF position	Set to ON	U
	Main switch in OFF position	Set to ON	U
	Compressor thermal-magnetic circuit breaker to OFF	Set to ON	I
	Low supply voltage	Check the power supply line	I/A
	Faulty compressor	Replace the component	I/A
Insufficient performance	Lack of refrigerant	Check charge	I
	Incorrect sizing of the equipment	Check	I
	Operation outside the operating conditions recommended by the manufacturer	Check parameters	I
Compressor loud	Part of the cooling circuit in contact with the structure	Check	I
	Return of liquid to the compressor	Check	A
	Unsuitable unit fixing	Check	I
	Power cable with inverted phase	Reverse a phase	I
Noise and vibrations	Contacts with metal bodies	Check	I
	Loose or missing screws	Tighten the screws	I
High compression delivery pressure (over 35 bar)	Fan stopped in summer mode	Check	I
	High system water temperature in winter mode	Check	I
	High DHW circuit temperature	Check	I
	Air in the hydraulic system in winter operation	Vent the air from the circuit	I
	Thermostatic expansion valve failure in heating mode	Check and if necessary replace the component	A
	Insufficient flow to the system heat exchanger in winter operation	Check the pump	I
Low suction pressure (less than 3.5 bar)	Outside temperature below operating limits	Check	I
	Low system inlet water temperature in summer mode	Check	I
	Abnormal fan operation	Check and if necessary replace the component	I/A
	Drain cooling circuit	Check for leaks and refill	I
	Finned heat exchanger clogged or frozen	Check	I/A

FAULT	CAUSE	SOLUTION	U/I/A
High suction pressure (over 15 bar)	High outdoor air temperature	Check	I
	High system inlet water temperature in summer mode	Check	I
	Thermostatic expansion valve failure in cooling mode	Check and if necessary replace the component	A
The compressor stops due to protection device activation	Excessive delivery pressure	Check	A
	Low suction pressure	Check	A
	Low supply voltage	Check	I
	Electrical connections poorly tightened	Check	I
	Operation outside the allowed limits	Check	I
	Poor operation of probes and pressure switches	Replace the component	I/A
	Thermal cut-out tripping	Check supply voltage	A
		Check the electrical insulation of the windings	A
High power consumption	Cooling circuit pressure too high compared to what recommended by the manufacturer	Check the max. absorption expected indicated on the nameplate	I
	Non-compliant voltage	Check supply voltage	I
	Operation outside the allowed limits	Check	I

11 Demolition and disposal



This mark indicates that the product must not be disposed of with other household waste throughout the EU. To avoid any damage to the environment or human health caused by incorrect disposal of electrical and electronic waste (WEEE), please return the device using the appropriate collection systems or by contacting the dealer from whom the product was purchased. For more information please contact your local authority. Illegal disposal of the product by the user entails the application of administrative sanctions provided for by current legislation.

12 Attachments

- Wiring diagram.

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