HEAT PUMPS

TECHNICAL sheet

IMMERGAS

AUDAX AND INTEGRATED SYSTEMS

with reversible inverter mono-phase and three-phase air-water Heat Pumps

MAIN INDEX

1 AUDAX DESCRIPTION

A range of air/water reversible heat pumps with inverter technology. The mono-phase versions are available with AUDAX 6, AUDAX 8, AUDAX 12 and AUDAX 16 models to fulfil central heating and cooling requirements for homes, offices, shops, etc...; while the three-phase versions are available with AUDAX 16, AUDAX 18 and AUDAX 21 models to fulfil central heating and cooling requirements for large domestic systems (newly built large homes such as duplexes, three-unit houses, condominiums), as well as offices, shops, artisan activities, etc..

These appliances are distinguished for their high energy efficiency and contained sound levels. They can be used as a single generator to assist the system, but also inside an integrated system (for example, with a heat pump - boiler - solar heating). They are engineering solutions that can be perfectly integrated with each other, which allow to attain maximum benefit from the various energy production systems on the basis of the respective efficiency parameters.

For the entire system to operate correctly, Immergas offers an "intelligent" system Manager capable of identifying the most economical energy source at a given time and therefore choose the right appliance to activate.

All AUDAX series models are equipped with a system side plate heat exchanger and low energy consumption circulation pump, which facilitate installation. The maximum flow temperature set-point with central heating is 60 °C (57 °C for AUDAX 21), which enables use of radiator systems as well as fan coil or radiant systems.

The entire range complies with the requirements of ErP Directive (2009/125/EC) and ELD (2010/30/EC). Various hydraulic, electric and electronic kits are available, which enable flexible use in all circumstances.

2 AUDAX 6 - 8 - 12 - 16 (SINGLE-PHASE) FEATURES

6 kW, 8 kW, 12 kW and 16 kW mono-phase inverter air/water heat pumps for winter and summer air conditioning. The galvanised steel structure makes the machines particularly suitable for outdoor installation.

Main components:

- Control Panel - standard supply - which enables you to program the machine and also functions as a room temperature/humidity sensor. It also displays the error codes in the event of malfunctions;
- R410A refrigerant gas (pre-loaded in the machine);
- Twin Rotary compressor with hybrid inverter activation in direct current with PAM (Pulse Amplitude Modulation) and PWM (Pulse Width Modulation) logic to offer improved reliability, low energy consumption and vibration-free operation in all operating conditions and acoustic insulation with sound-absorbing materials;
- refrigerant gas/air heat exchanger with hydrophilic treatment on the external coil fins to improve water draining and flowing;
- two-way electronic throttle valve;
- insulated stainless steel plate water/refrigerant gas heat exchanger;
- 4-way inversion valve (reversible functioning with heat pump cycle or cooling cycle);
- variable speed fan with a 3-blade impeller characterised by an innovative profile designed to guarantee better distribution of air and contained sound levels (AUDAX 6 - 8);
- double fan variable speed with a 3-blade impeller characterised by an innovative profile designed to guarantee better distribution of air and contained sound levels (AUDAX 12 - 16);
- system low energy consumption pump and flow switch to ensure there is sufficient water circulation to guarantee correct operation of the hydronic and cooling circuits;
- 2 litre internal expansion vessel (AUDAX 6 - 8);
- 3 litre internal expansion vessel (AUDAX 12 - 16);
- 3 bar system safety valve;
- included and standard supply are the water Y filter 1", vibration-dampening devices, condensate drain fittings and cable clamp to pass electric cables;
- flow and return 1" M hydraulic connections situated at the rear;
- electronic management system equipped with various sensors situated in key positions of the cooling circuit to electronically detect the system's operating status. The system's flow and return water temperature is detected by means of a probes;
- option to pilot a 3-way diverter valve directly from AUDAX for D.H.W. production heating and an external booster pump on the system;
- maximum system water flow temperature up to 60 °C;
- operation up to outdoor air temperature of -20°C in winter and +46°C in summer;
- protection against freezing up to -10°C as a result of periodic activation of the pump and AUDAX cooling circuit (with power supply voltage);
- IPX4 electrical insulation rating.

System solutions:

- "Stand alone" system with AUDAX and integrative resistance;
- can be coupled to a separate storage tank for DHW;
- can be coupled to a boiler via the System manager;
- can be coupled to a boiler and the solar heating system via the System manager.
- can be installed as a set configuration with the System manager.

It is available in the model:

- **AUDAX 6** **code 3.027809**
- **AUDAX 8** **code 3.027810**
- **AUDAX 12** **code 3.027811**
- **AUDAX 16 MONO** **code 3.028238**

EC Declaration Of Conformity.

3 AUDAX 16 - 18 - 21 (THREE-PHASE) FEATURES

16 kW, 18 kW and 21 kW three-phase inverter air/water heat pump for winter and summer air conditioning. The galvanised steel structure makes the machines particularly suitable for outdoor installation.

Main components:

- Control Panel - standard supply - which enables you to program the machine and also functions as a room temperature/humidity sensor. It also displays the error codes in the event of malfunctions;
- R410A refrigerant gas (pre-loaded in the machine);
- Twin Rotary compressor with hybrid inverter activation in direct current with PAM (Pulse Amplitude Modulation) and PWM (Pulse Width Modulation) logic to offer improved reliability, low energy consumption and vibration-free operation in all operating conditions and acoustic insulation with sound-absorbing materials;
- cooling circuit including a compressor and air/gas refrigerant finned coil, two-way electronic throttle valve (2 in the 21 kW version), refrigerant gas/water insulated stainless steel plate heat exchanger, 4-way reversing valve (reversible heat pump cycle or cooling cycle operation);
- double fan variable speed with a 3-blade impeller characterised by an innovative profile designed to guarantee better distribution of air and contained sound levels;
- modulating system low energy consumption pump and flow switch to ensure there is sufficient water circulation to guarantee correct operation of the hydronic and cooling circuits;
- 3 litre internal expansion vessel (16 kW);
- 8 litre internal expansion vessel (18 - 21 kW);
- 3 bar system safety valve;
- included and standard supply are the water Y filter 1”, vibration-dampening devices, condensate drain fittings and cable clamp to pass electric cables;
- flow and return 1” M hydraulic connections situated at the rear;
- electronic management system equipped with various sensors situated in key positions of the cooling circuit to electronically detect the system's operating status. The system's flow and return water temperature is detected by means of a probes;
- option to pilot a 3-way diverter valve directly from AUDAX for D.H.W. production heating and an external booster pump on the system;
- maximum system water flow temperature up to 60 °C (57 °C for AUDAX 21);
- operation up to outdoor air temperature of -20°C in winter and +46°C in summer;
- for AUDAX 16 protection against freezing up to -10°C (with power supply) as a result of periodic activation of the pump and AUDAX cooling circuit;
- for AUDAX TOP 18-21 ErP protection against freezing up to -10°C (with power supply voltage) as a result of periodic activation of the pump and electric resistances;
- IPX4 electrical insulation rating.

System solutions:

- "Stand alone" system with AUDAX and integrative resistance;
- can be coupled to a separate storage tank for DHW;
- can be coupled to a boiler via the System manager;
- can be coupled to a boiler and the solar heating system via the System manager.
- can be installed as a set configuration with the System manager.

It is available in the model:

- **AUDAX 16** **code 3.027812**
- **AUDAX TOP 18 ErP** **code 3.025563**
- **AUDAX TOP 21 ErP** **code 3.026940**

EC Declaration Of Conformity.

AUDAX and Integrated Systems

4 INTEGRATED SYSTEM FOR AIR CONDITIONING AND D.H.W. PRODUCTION

Comprised of a boiler – solar heating – heat pump and possibly photovoltaic – etc, they are the natural evolution of air-conditioning systems: with very high seasonal efficiency, low energy consumption and reduced polluting emissions.
They are engineering solutions that can be perfectly integrated with each other, which allow to attain maximum benefit from the various energy production systems on the basis of the respective efficiency parameters.
For the entire system to operate correctly, Immergas offers a System Manager, able to:
- always make use of the most convenient heat source;
- keep the system performance high in every circumstance;
- control and command the entire system with a unique "brain" (i.e. the System Manager);
- promote heat pump activation with a system that generates electricity from renewable sources.

Basically, the System Manager is a supervisor that can control the entire system.
Amongst other things, the following main operations are necessary:
- to acquire the external temperature (from the external probe, inserted as per standard on the heat pump);
- set central heating side and cooling side (if provided) climatic curve operation to determine the system's flow temperature;
- configure the fuel cost (e.g. methane);
- configure the electric energy cost;
- set the AUDAX minimum integration (cut off) T.

The point of economic balance between the gas boiler and the heat pump is a COP value between 2.4 and 2.6 approximately (approximate value referred to methane); this value changes based on the cost of electrical power and gas, in the location where the system is installed.
With sufficient $T_{outdoor}$ to fulfil min_{COP} economical convenience, or $T_{outdoor}$ is higher than $T_{minimum\ integration\ (cut\ off)}$, the heat pump starts and the performance efficiency conditions are constantly monitored. On the contrary, if the environmental conditions are such that the AUDAX coefficient of performance tends towards lower values than COP_{min} for economical convenience, or outdoorT is less than $minimum_T$ integration (cut off), the system Manager starts the boiler (or integrative resistance). Each time AUDAX is operating, the Manager enables an additional control, which checks the time it takes the system to

AUDAX and Integrated Systems

reach full operation: when a maximum time is exceeded (can be set differently between C.H. and D.H.W.) for the heat pump to reach the flowT, the boiler or integrative electrical resistance is started.
It is also possible to choose the integration operation method (boiler/resistance) between simultaneous or alternative Heat pump.
In all cases where radiant panels are also included for summer cooling, alongside dehumidifiers (see previous picture), the System Manager will also monitor the dew point through the installation of room probes (Immergas). Thanks to this intelligent function the System Manager can increase the flow temperature to the radiant panels by about 1°C (up to a maxT of 18°C - maximum limit of the cooling heat pump), avoiding the phenomenon of condensation on the surface of the structure. This function can only be activated with an Immergas accessory kit that controls humidity. In some cases, for example, the System Manager can turn the heat pump off if the flow temperature to the radiant panels is not sufficiently corrected.
If on the other hand, there is a high temperature zone in the system, in addition to the low temperature one, it will be served exclusively by the boiler through an accordingly configured dedicated expansion connected to the System Manager.

D.H.W: operation: amongst the possible configurations with integrated systems is the option to connect the boiler and AUDAX parallel with the same coil, and use a storage tank probe with one DHW set for the entire storage tank, and set it in the system's Manager. If the system Manager is connected to the boiler on external probe clamps (pre-set models), if the set DHW temperature is < 50°C, the heat pump starts (always checking the aforesaid convenience); however, if it is > 50°C, AUDAX heats up to 50°C, then the boiler starts; if there is no boiler but there is storage tank integrative electrical resistance, the water is brought to 50°C via the heat pump and AUDAX is then disabled, leaving the resistance to integrate to the pre-set value.
In systems where there is a boiler or an integrative electrical resistance on the storage tank, in addition to the heat pump, it is also possible to enable the anti-legionella function.

5 HEAT ADJUSTMENT WITH AUDAX CONTROL PANEL IN STANDALONE APPLICATIONS (SETTING AND LOGIC OPERATION)

The Control panel (standard supply with AUDAX) enables programming of several operating options and relative temperature/humidity control of the system.
For example, the Control panel acquires data regarding outdoor temperature (from the external probe), system flow temperature (regarding the pre-set climatic curve), and also the room's humidity percentage.
The standard Control panel supplied is connected to a specific terminal block on AUDAX, which enables you to program the machine and also functions as a room temperature/humidity sensor. It also displays the error codes in the event of malfunctions.
The room sensor function can be disabled in order to use it only to display the heat pump statuses and leave AUDAX external control management on-off.
The user interface is composed of an LCD display, keys and an encoder central knob.
N.B.: With system Manager applications, the Control Panel (standard) can also function as a room temperature/humidity probe of a system's zone.
Possibility to use the AUDAX Control panels for all zones, up to 4 devices (e.g. if I have 4 AUDAX in set and I want to use all related Control panels as room devices).

Factory set device class: "VI"
Ref. European Commission Notice 2014/C 207/02

5.1 FEATURES

The Control panel (standard) with Stand alone configuration, enables:
- Operation with variable flow temperature according to outdoor temperature (through the standard AUDAX external probe supplied);
- Machine time band operation (C.H and cooling) in Comfort or Economy mode;
- Any operation anomalies with error codes via system self-diagnosis displayed on the screen.

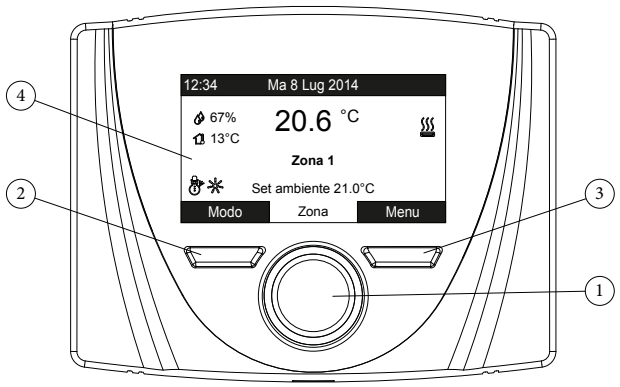
The Control panel also manages the following data:
- External temperature (via external probe as per standard with AUDAX);
- System flow temperature settings (C.H and cooling);
- Instant outlet temperature from the machine;
- Dew temperature;
- No. of machine operating hours.

Please note that AUDAX can:
- Directly pilot one/two 3-way diverter valves for D.H.W. production, and can manage activation of an external booster pump on the system;
- Manage activation of an auxiliary heat source (e.g. electrical resistance);
- Manage and an external alarm that forces machine shutdown;
- Limit the machine's frequency (to reduce noise).

NOTE: With Stand alone applications to manage any dehumidifiers, you can opt for on/off room thermostats + on/off humidistats (connected parallel with AUDAX), with a relay to split the humidistat request and also take it to the dehumidifiers.

TECHNICAL DATA
- Dimensions: 100 x 129 x 37 mm (H x L x D);
- Power Supply: 15 Vdc (directly from the Heat pump terminal block);
- Maximum input: 2 VA;
- 4-pole cable connection (type H03VV-F 5 x 0.75 mm^2), max length 50 m. Use wires having minimum sections of 0.5 mm^2 and maximum 1.5 mm^2;
- Casing protection rating: IP20.

5.2 PROGRAMMING MENU



LEGENDA:

1 - Main parameters switch with button to confirm and save data
2 - Left context button
3 - Right context button
4 - Display

Once the device is powered, it goes into the status prior to switch-off. Press the “Modo” (Mode) (2) button to cyclically select the desired mode amongst those available.
Depending on the system's configuration, the main screen displays various information regarding the system.
Press the “Menu” (3) button to access a list of variables that enable you to customise use of the system.
To browse the menus, which can be accessed by pressing the relative “RH” or “LH” context buttons, scroll through the sub-menus displayed by turning the main switch (1).
Press the said main switch (1) to select the one highlighted.
Therefore, by pressing repeatedly, you can scroll down the menu levels and go back to a previous level by pressing the “Indietro” (Back) context button. To exit the menu completely, press the “Esci” (Exit) button, which will take you back to the initial page of normal operation.
To confirm the parameter change, press the main switch (1).

MAIN MENU	
Menu item	Description
Zone Set Point	Defines the operating parameters to manage the zone
DHW Set point	Defines the operation parameters in domestic circuit mode
Clock and Programs	Defines the date/time and time operating ranges
Information	Display system operating data
Anomalies log	Displays the list of the last 10 anomalies
Service	Password protected menu dedicated to a qualified technician
Language	Defines the control panel operation language

5.3 USER PROGRAMMING MENU

Zone Set Point Menu			
Menu item	Description	Range	Default
Set Central heating comfort	Room temperature in central heating zone Comfort mode	15 ÷ 35 °C	20
Set Central heating economy	Room temperature in central heating zone Economy mode	5 ÷ 25 °C	17
Set central heating flow	Flow temperature in room zone central heating mode	20 ÷ 60°C	40
Central heating flow offset	Offset temperature for central heating zone	- 15 ÷ + 15 °C	0
Set Cooling comfort	Room temperature in cooling zone Comfort mode	15 ÷ 35 °C	25
Set Cooling economy	Room temperature in cooling zone Economy mode	15 ÷ 35 °C	28
Set cooling flow	Flow temperature in room zone cooling mode	4 ÷ 25 °C	8
Cooling flow offset	Offset temperature for cooling zone	-15 ÷ + 15 °C	0

DHW Set point Menu			
Menu item	Description	Range	Default
Set comfort	DHW storage temperature in Comfort phase	30 ÷ 60 °C	50
Set economy	DHW storage temperature in Economy phase	30 ÷ 45 °C	30
Clock and programs menu			
Menu item	Description	Range	Default
Date and time	Current date and time setting		
Time slots	Defines the time range for operation in Comfort and Economy mode		
Zone Program	Time programming for controlled zone		Mon - Fri Cal 1 Sat - Sun Cal 3
DHW Program	DHW operation time programming		Mon - Sun Cal 1
Holiday Program	Defines the period during which the system disables both hot water heating and room central heating and/or cooling functions. At the end of the set days, the previously active functions will be reset.		Disabled

Information Menu	
Menu item	Description
Flow temperature	Instant outlet temperature from the system
Return temperature	Instant inlet temperature to the system
Outside temperature	External temperature detected by the external probe
Calculated set system temperature	Flow temperature requested by the generators
Dew temperature	Dew temperature
DHW temperature	Storage water temperature
Board software version	Heat pump control board software revision
Display software version	Display software revision installed on the control panel
HP hours of operation	Number of operating hours of the heat pump
HP operating mode	Describes the heat pump operation mode

Anomalies Log Menu
Description
Displays the history log of the last 10 anomalies

Assistance Menu			
Menu item	Description	Range	Default
Password protected menu dedicated to a qualified technician			

Language Menu			
Menu item	Description	Range	Default
Language	Defines the control panel operation language	ITA - ENG	ITA

5.4 MAINTENANCE TECHNICIAN PROGRAMMING MENU

Assistance Menu		
Menu item	Description	Range
Zone Definition	Zone system sub-menu settings	-
System definition	Sub-menu to define the devices connected to the system	-
Device configuration	Sub-menu to set the device's configuration	-
Central heating temperature control	Central heating thermoregulation setting sub-menu	-
Cooling temperature control	Cooling thermoregulation setting sub-menu	-
Parameters thermoregulation	Parameters thermoregulation setting sub-menu	-
Electrical	System integration setting sub-menu	-
Heat pump	Heat pump operating parameters sub-menu	-
Manual	Manual operating parameters sub-menu	-
Restore default settings	Allows to reset all parameters with factory values	Yes / No

Assistance Menu -> Zone Definition			
Menu item	Description	Range	Default
Mode	Display the operating mode	- Hot + Cold	-
Room control switch	Enable operation of the supplied control panel if set on “R. Panel”. If “TA” set, the central heating and cooling requests will be made based on the request of an external thermostat.	Remote Pann. /T.A.	R.Panel
Dew point enabling	Enable operation with a humidity probe in the control panel.	Yes / No	No
Mode control	Enables variation of the operating mode (heat / cool) with remote panel set at “Rem.P.” Enables variation of the operating mode (heat / cool) by means of terminal board (see wiring diagram). N.B.: coupled with Magis Victrix always select “External”.	Rem. P. / External	P. Rem.

Assistance Menu -> System definition			
Menu item	Description	Range	Default
External probe	Enables operation with the external probe.	No / HP	No
Enabling DHW	Enables domestic hot water mode	Yes / No	No
Reduction function	Enable HP operation frequency reduction, which is controlled by the said terminal board.	Yes / No	No
Output	Power percentage in reduction mode.	50% ÷ 100%	75%
Pump control	Enable the pump operation with speed set “Max.speeed” or the modulating mode with tracking of the “Modulating” temperature differential.	Max.speed/ Modulating	Modulating
Minimum speed	Value of minimum speed used in modulating operation.	19% ÷ 50%	50%
Maximum speed	Value of maximum speed used in modulating operation.	50% ÷ 100%	100%
Delta T	Temperature delta to be maintained with modulating operation.	2 ÷ 20	5

Assistance Menu -> Device configuration			
Menu item	Description	Range	Default
Heat pump control	Setting "Yes", the default control panel supplied manages the heat pump. Setting "No", the control panel does not control the heat pump and must be coupled with other Immergas systems (for example, TRIO, MAGIS HERCULES, Or System manager). If "No" is set, it displays another item "slave address". **N.B.:** if it is erroneously set to "No", it is still possible to change the selection.	Yes / No	Yes
Slave address	Address to configure according to the zone where the device is installed (e.g.: zone 1 = 41, zone 2 = 42, zone 3 = 43, etc.).	1 ÷ 247	-

Assistance Menu -> Central Heating thermoregulation			
Menu item	Description	Range	Default
Set minimum flow	Without the external probe it defines the minimum flow temperature that can be set by the user. With the external probe present it defines the minimum flow temperature corresponding to operation with maximum external temperature	20 ÷ 45 °C	30°C
Set maximum flow	Without the external probe it defines the maximum flow temperature that can be set by the user. With the external probe present it defines the maximum flow temperature corresponding to operation with minimum external temperature	35 ÷ 60 °C	50 °C
External minimum temperature	With the external probe present it defines at what minimum external temperature the system must operate at the maximum flow temperature	-25 ÷ +15 °C	-5 °C
External maximum temperature	With the external probe present it defines at what maximum external temperature the system must operate at the minimum flow temperature	-5 ÷ +45 °C	20°C

Assistance Menu -> Cooling thermoregulation			
Menu item	Description	Range	Default
Set minimum flow	Without the external probe it defines the minimum flow that can be set by the user. With the external probe present it defines the minimum flow temperature corresponding to operation with maximum external temperature	4 ÷ 20 °C	7 °C
Set maximum flow	Without the external probe it defines the maximum flow that can be set by the user. With the external probe present it defines the maximum flow temperature corresponding to operation with minimum external temperature	10 ÷ 25 °C	12 °C
External minimum temperature	With the external probe present, it defines at what maximum external temperature the system must operate at the minimum flow temperature	20 ÷ 45 °C	20°C
External maximum temperature	With the external probe present, it defines at what minimum external temperature the system must operate at the maximum flow temperature	20 ÷ 45 °C	35 °C

Assistance Menu -> Parameters thermoregulation			
Menu item	Description	Range	
Modulation with room probe	It enables you to set operation of the control panel as modulating on/off. Set "Yes", the flow temperature will be varied depending on the room temperature set. Set "No", the flow temperature will be kept constant until the desired room temperature is reached. **N.B.:** if an outdoor temperature probe is present, the flow temperature will be set depending on the relative functioning curve	Yes / No	Yes
Inertia	It establishes the system reaction speed according to the type of system present. Example: 5 system with little heat inertia 10 system with normal dimensions with radiators 20 system with a lot of heat inertia (e.g. floor-standing system)	1 ÷ 20	10
Anti-freeze enabling	Enables the room antifreeze function	Yes / No	Yes
Room anti-freeze temperature	Allows to set the room temperature for activation of the anti-freeze function	0 ÷ 10 °C	5 °C

Assistance menu -> Integration			
Menu item	Description	Range	Default
Electrical integration	It establishes the type of integration in the system: “Sys.” enables the system integration, “San” the DHW integration, “San+Sys.” enables both integrations	- None - Sys. - N.A. - N.A. - N.A. - DHW - San + Sys.	None
Simultaneous integration temperature	Temperature threshold below which integration is activated and the heat pump maintained on.	-20 ÷ +15 °C	-20 °C
Minimum integration temperature	Temperature threshold below which integration is activated and the heat pump is switched off.	-20 ÷ +15 °C	-20 °C
Central heating integration wait time	Standby to reach the set value before activating integration when outdoor temperature is below the previously set temperature values (minimum integration temperature and simultaneous integration temperature).	5 ÷ 120’	60’
Reset HP counter	Reset the number of operating hours of the heat pump	Yes / No	No

Heat pump menu		
Menu item	Description	Range
Working parameters	Sub-menu for working data	-
Status	Sub-menu for operating state	-
Auxiliary info	Sub-menu with other operating data	-
P.C.B. settings	Sub-menu to configure the P.C.B.	

Heat pump menu -> Working parameters		
Menu item	Description	Range
Flow temperature	Instant outlet temperature from the system	
Return temperature	Instant inlet temperature to the system	
Calculated system temperature set	Flow temperature requested by the generator	
Compressor outlet temperature	Current heat pump compressor temperature	
Compressor intake temperature	Compressor inlet temperature	
Compressor intake sat. temperature	Compressor inlet saturation temperature	
Coolant temperature on exchanger	Coolant temperature inside the plate heat exchanger	
Coil temperature low part	Coil temperature, low side	
Coil temperature high part	Coil temperature, high side	
External Temperature	External room temperature	
HP frequency	Current compressor frequency	
System mode	Indicates the system's operating mode	0=Off 1 = Cooling 2 = Central heating 4 = DHW 6 = Central heating integration 7 = Defrosting 24 = DHW met 100 = Anomaly 101 = Cooling anomaly 102 = Central heating anomaly 104 = DHW anomaly 106 = Integration anomaly 107 = Defrosting anomaly

Heat pump menu -> State		
Menu item	Description	Range
System state	Indicates the current system mode	0 = Off 1 = Wait after ignition 2 = Minimum compressor on time 3 = Minimum compressor off time 4 = delay for mode change 5 = Step 1 compressor 6 = Step 2 compressor 7 = Step 3 compressor 8 = Step 4 compressor 9 = Compressor stop delay 11 - Frequency reduction on 20 = Defrosting 39 = Minimum external temperature for central heating 40 = Maximum external temperature for central heating 41 = Maximum flow/return value in central heating 42 = Low external temperature in central heating 43 = Very high external temperature in central heating 44 = High external temperature (compressor limitation) 45 = Step 1 High temperature protection in central heating 46 = Step 2 High temperature protection in central heating 47 = Step 3 High temperature protection in central heating 48 = Step 4 High temperature protection in central heating 50 = Minimum external temperature for cooling phase 51 = Minimum machine inlet temperature for cooling phase 52 = External temperature <15°C in cooling phase 53 = External temperature >26°C in cooling phase 54 = External temperature >40°C in cooling phase 55 = Low saturation temperature 57 = Step 2 antifreeze protection in cooling 58 = Step 1 antifreeze protection in cooling 61 = External temperature <0°C and flow temperature > 12°C in cooling phase 62 = External temperature <0°C in cooling phase 70 = Protection for lack of flow rate 80 = Protection for oil return 85 = Compressor off from inverter 91 = Central heating integration

Heat pump menu -> State		
Menu item	Description	Range
Integration state	Indicates the operating mode of the part of integration	-1 = integration disabled 0 = Off 1 = Integration on 2 = Integration on 3 = Integration on during defrosting 4 = Integration on for heat pump anomaly 5 = Integration on for low external temperature 12 = Integration off for DHW request 13 = Capacity Limit 50 = Integration not allowed 51 = No CH request 100 = Integration anomaly
DHW state	Indicates the operating mode during DHW request	-1 = DHW disabled 0 = DHW enabled 1 = DHW not active (request for central heating or cooling) 2 = Three-way DHW drive 100 = DHW anomaly
Flow switch	Indicates circulation inside the hydraulic circulator	On/off
On/off input state	Indicates the input state for the on/off control	On/Off
DHW Request	Indicates the presence of a heat request by the DHW storage	On/Off
Reduction function input state	Indicates the input state for the reduction control	On/Off
Anomaly (Current alarm code)	Current anomaly code	
Inverter anomaly	Inverter anomaly code	

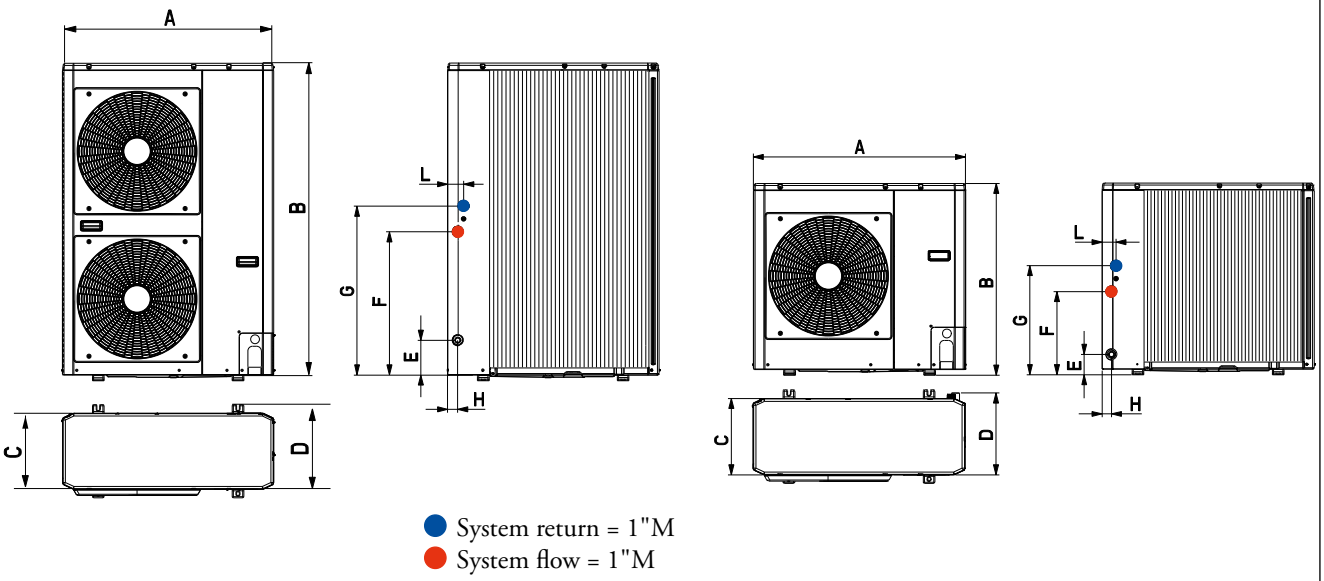
Heat pump menu -> Auxiliary info		
Menu item	Description	Range
Overheating Temperature	Indicates the overheated gas temperature	
Target Overheating Temperature	Indicates the overheated gas required temperature	
Temp. Inverter	Indicates the inverter temperature	
Compressor max. freq	Indicates the maximum frequency that can be reached by the compressor with the present conditions	
Requested frequency	Indicates the frequency requested from the compressor	
Upper fan speed	Indicates the upper fan speed	
Lower fan speed	Indicates the upper fan speed	
Pump speed	Indicates the pump speed	
Water control point	Temperature control set	
Water temperature control	Reference probe for the temperature control set	

Heat pump menu -> P.C.B. settings		
Menu item	Description	Range
Unit Type	It establishes whether the machine is of reversible type	- Cooling - Central heating + Cooling - Central heating
Unit Size	It establishes the Unit power	- 6 - N.A. - 8 - N.A. - N.A. - N.A. - 12 - N.A. - N.A. - N.A. - 16 - 16 MONO - N.A. - 18 - N.A. - N.A. - 21
Power supply integration	It defines the Unit power supply voltage	230Vac - 400Vac

Assistance Menu -> Test maximum press.		
Menu item	Description	Range
Pressure switch test	Test method for high pressure switch. N.B. to run the test, set the value to 1 and wait for the test result	0 = Off 1 = Test required **N.B.** the following states are managed by the machine DO NOT USE 2 = AP Test in progress 3 = AP Test performed correctly 4 = AP Test failed for maximum time reached 5 = AP Test failed for flow switch error 6 = AP Test failed for low water temperature 7 = AP Test failed for inverter error

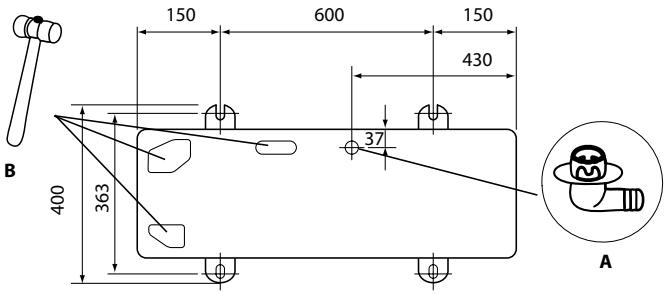
Assistance menu -> Manual			
Menu item	Description	Range	Default
Manual functioning	Forcing of the heat pump operation **N.B.** all controls on the flow and return sensors are disabled with these modes.	0 = Off 1 = Test cooling 2 = Test central heating 3 = Test cooling with ramp 4 = Test central heating with ramp	0
Pump speed	Pump speed forcing	0% ÷100%	0%
Flow switch	Indicates circulation inside the hydraulic circulator	Off/On	
DHW 3-way	Force the output for the DHW 3-way control	Off/On	Off

6 AUDAX 6 - 8 - 12 - 16 DIMENSIONS AND CONNECTIONS



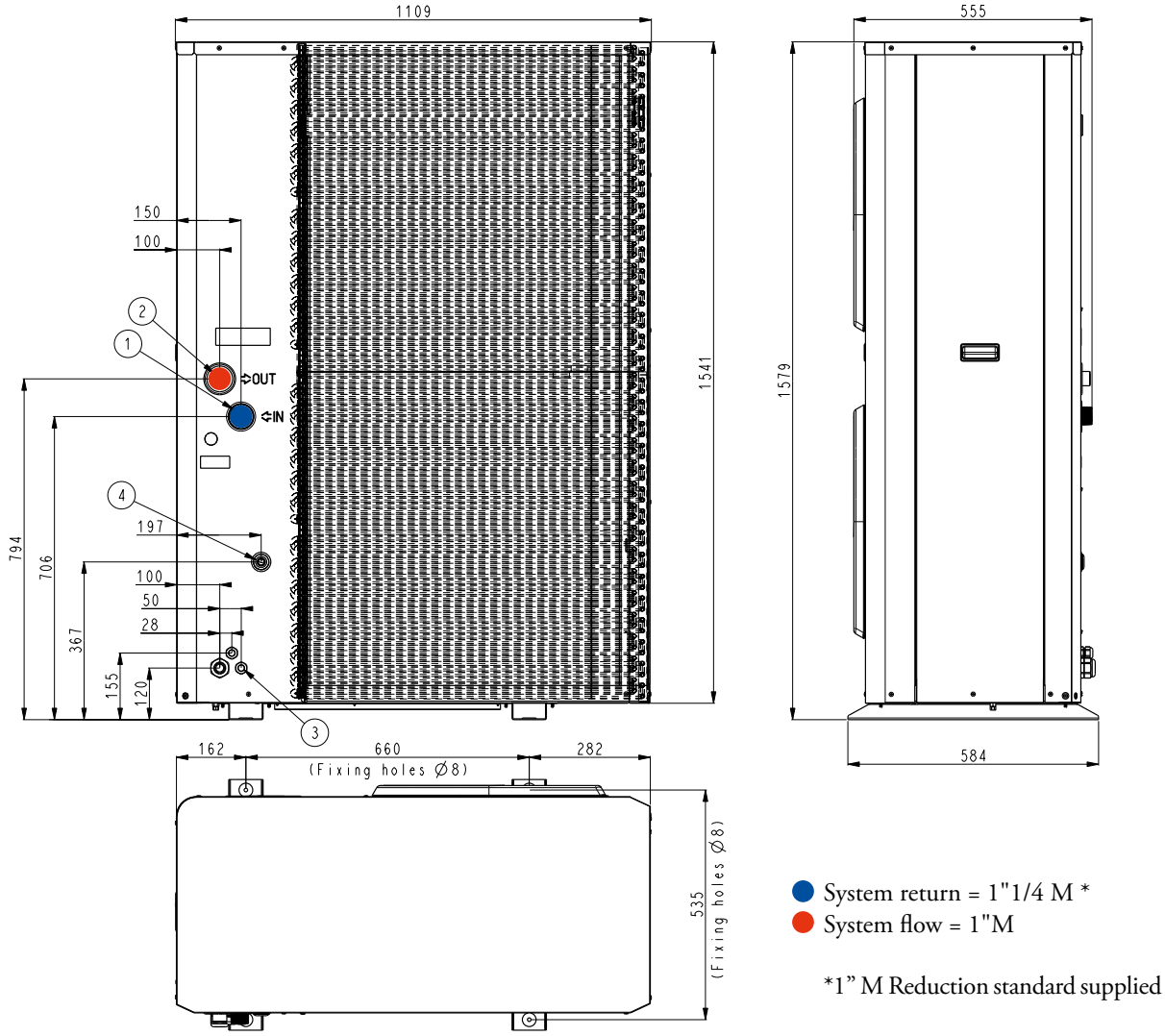
Condensate drain pipe and pre-cut holes in the base. If draining is carried out through the drain pipe, connect the drain fitting (A) supplied, and use the drain pipe (internal diameter: 16 mm) available on the market. In the event of installation in very cold zones or zones subject to heavy snow where the condensate drain pipe can freeze, check the draining capacity of the pipe. Draining capacity increases when the pre-cut holes at the base, which collect condensate, are open (open the pre-cut holes outwards with the aid of a hammer with smooth edges).

N.B.: The figure on the side shows the measurements to use to secure the machine (600 x 363). You must insert the vibration-dampening devices supplied with the product between AUDAX and the support base.



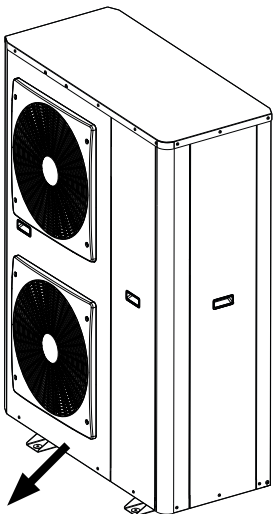
AUDAX	A	B	C	D	E	F	G	H	L	kg
6 kW single-phase	908	821	326	350	87	356	466	40	60	57
8 kW single-phase	908	821	326	350	87	356	466	40	60	69
12 kW single-phase	908	1363	326	350	169	645	744	43	73	115
16 kW single-phase	908	1363	326	350	169	645	744	43	73	121
16 kW three phase	908	1363	326	350	169	645	744	43	73	121

6.1 AUDAX 18 - 21 DIMENSIONS AND CONNECTIONS

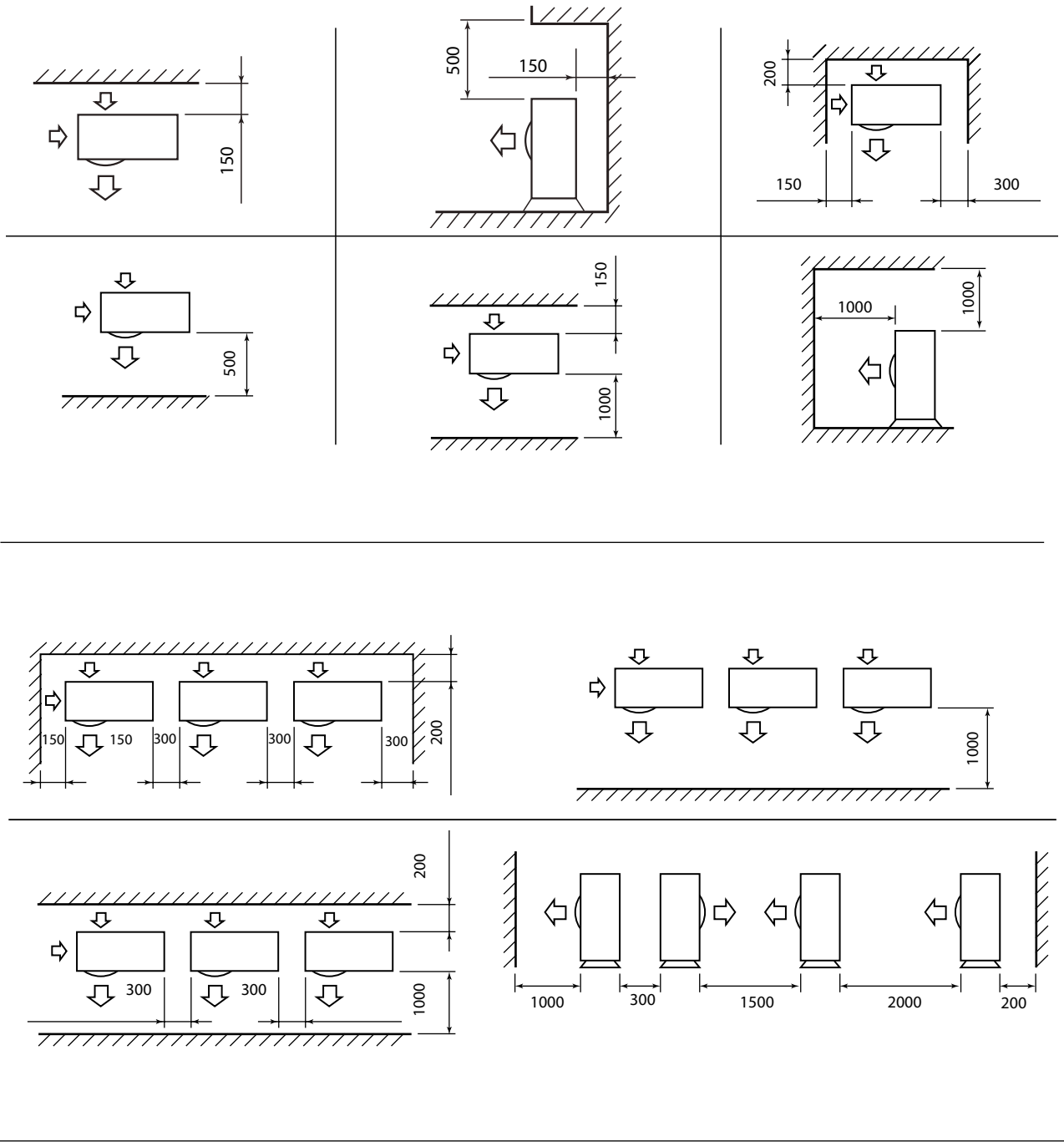


Slots for condensate drain. Any condensate is drained through the slots created under the finned barrier. In the event of installation in very cold zones or zones subject to heavy snow where the condensate can freeze, take the necessary precautions to prevent any frozen zones from causing falls or accidents.

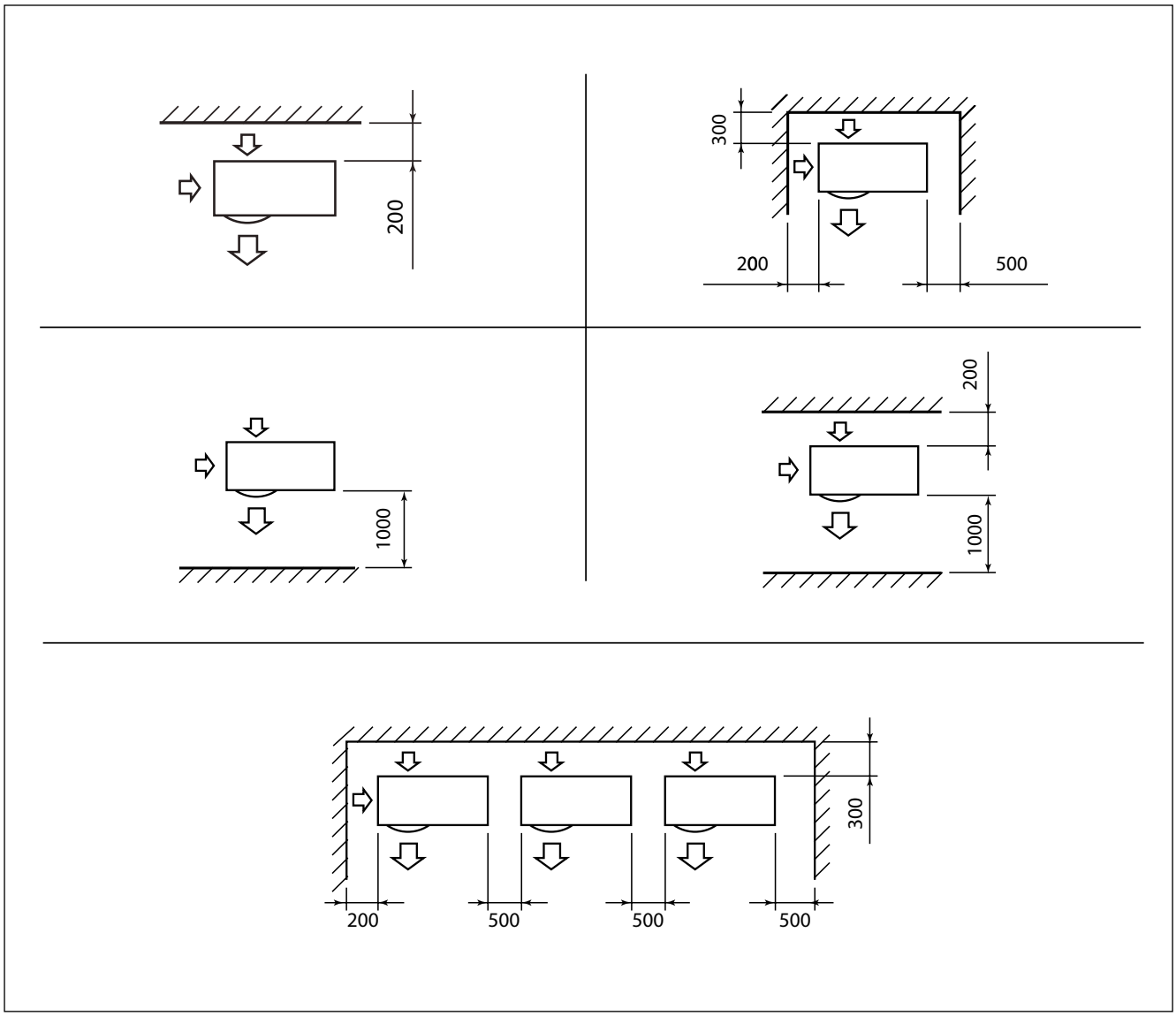
N.B.: The following figure shows the measurements to use to secure the machine (660 x 535). You must insert the vibration-dampening devices supplied with the product between AUDAX 18 - 21 and the support base. Immergas proposes a kit made up of 4 vibration-dampening feet (optional) code 3.027654.



7 AUDAX 6 - 8 - 12 -16 MINIMUM INSTALLATION DISTANCES



7.1 AUDAX 18 - 21 MINIMUM INSTALLATION DISTANCES



Place of installation:

The place of installation is very important and must be established by the system's designer or by a specifically qualified person, and must consider the technical requirements, standards and laws in force.

- The unit must be installed outdoors only;
- It is recommended to avoid:

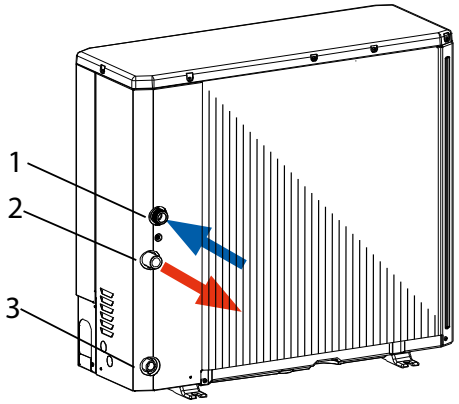
- positioning in basement windows;
- obstacles or barriers that cause recirculation of exhaust air;
- places with aggressive atmospheres;
- limited spaces or anyhow in places where sound levels from the appliance can be enhanced through reverberations or resonance;
- positioning in corners where there is an accumulation of dust, leaves and anything else that can reduce the appliance's efficiency due to blocked passageways;
- prevent exhaust air from the device from coming into the rooms through doors or windows, thus disturbing people;

- The appliances must:

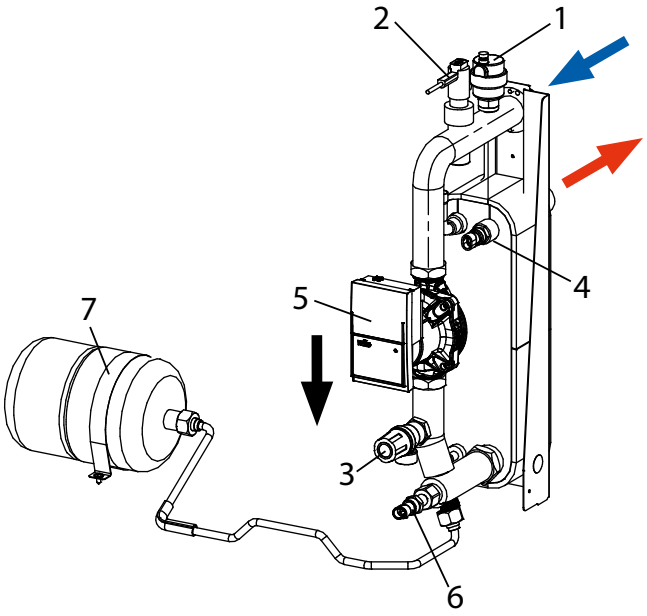
- be placed on a level surface that is able to withstand its weight;
- be placed on a slab that is hard enough and which does not transfer any vibrations to the underlying or adjacent rooms;
- use the vibration-dampening supports supplied with the machine.

- If the unit is installed in zones subject to heavy snow, it will be necessary to raise the machine by at least 200 mm above the normal level reached by the snow, or alternatively use the wall-support bracket (optional).
- If deflectors are present to protect the unit against strong winds, these deflectors must be studied so as to avoid obstructing the normal air circulation.

8 AUDAX 6 - 8 HYDRAULIC CIRCUIT COMPONENTS



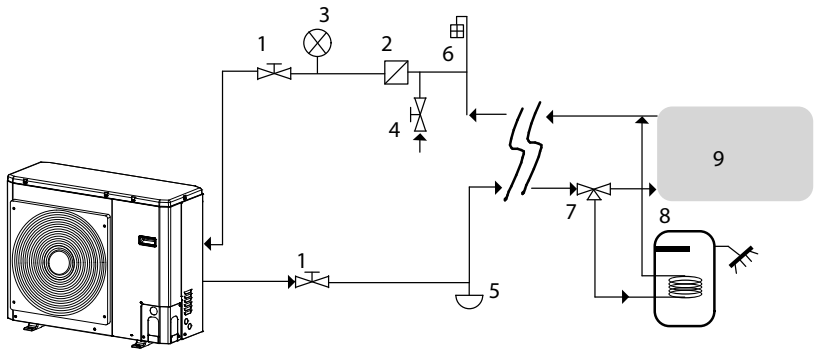
KEY:
1 - System return fitting 1"M
2 - System flow fitting 1"M
3 - Water drain



KEY:
1 - Automatic air vent valve
2 - Flow switch
3 - Safety valve (outlet 1/2')
4 - Flow probe
5 - Circulation pump
6 - Return probe
7 - Expansion vessel

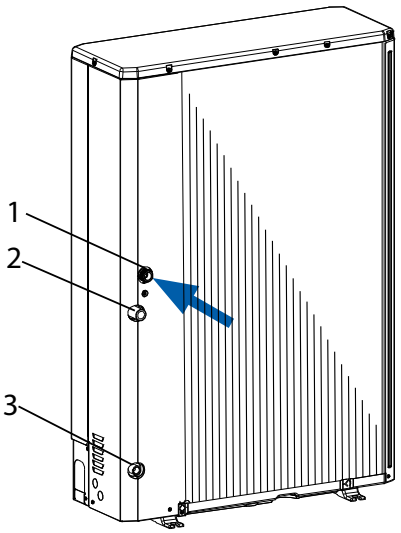
8.1 AUDAX 6 - 8 HYDRAULIC DIAGRAM

The diagram is purely indicative and not limited to the hydraulic circuit
also see the example on page 90-91

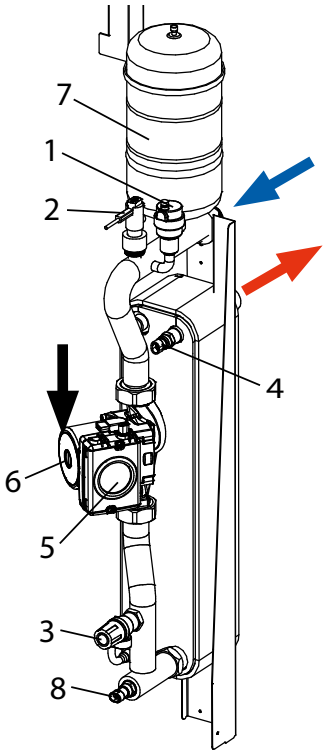


KEY:
1 - Shut-off valve
2 - Water line filters (standard)
3 - Pressure gauge (not supplied - to be provided)
4 - Filling valve (NOT Automatic)
5 - System draining valve (in the lowest points of the circuit)
6 - Air vent valve (in the highest points of the circuit)
7 - 3-way valve
8 - DHW storage tank
9 - Internal utility

8.2 AUDAX 12 - 16 - 16 MONO HYDRAULIC CIRCUIT COMPONENTS



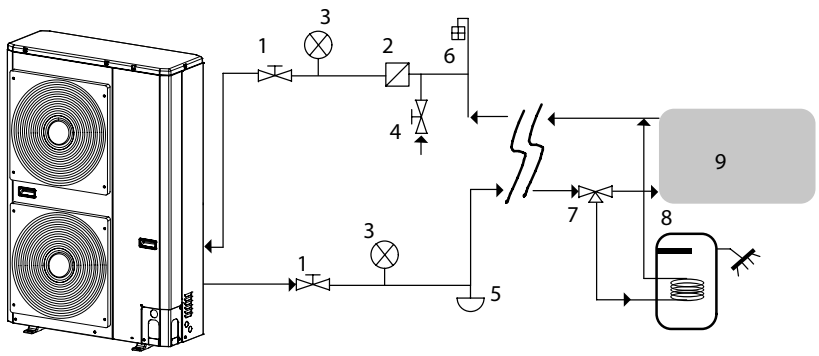
KEY:
1 - System return fitting 1''M
2 - System flow fitting 1''M
3 - Water drain



KEY:
1 - Automatic air vent valve
2 - Flow switch
3 - Safety valve (outlet 1/2')
4 - Flow probe
5 - Circulation pump
6 - Cap to release a seized pump
7 - Expansion vessel
8 - Return probe

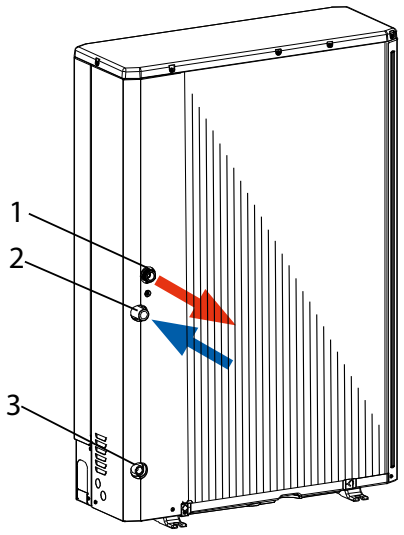
8.3 AUDAX 12 - 16 - 16 MONO HYDRAULIC DIAGRAM

The diagram is purely indicative and not limited to the hydraulic circuit
also see the example on page 90-91



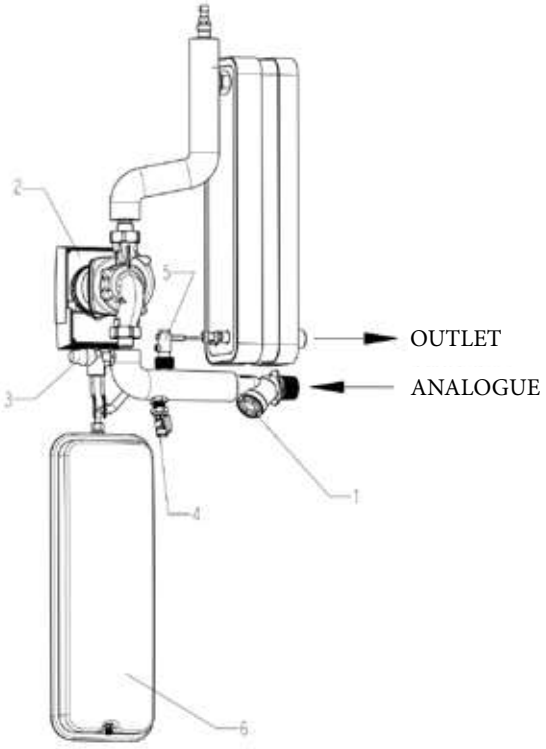
KEY:
1 - Shut-off valve
2 - Water line filters (standard)
3 - Pressure gauge (not supplied - to be provided)
4 - Filling valve (NOT Automatic)
5 - System draining valve (in the lowest points of the circuit)
6 - Air vent valve (in the highest points of the circuit)
7 - 3-way valve
8 - DHW storage tank
9 - Internal utility

8.4 AUDAX 18 - 21 HYDRAULIC CIRCUIT COMPONENTS



KEY:
1 - System flow fitting 1''M
2 - System return fitting 1"1/4 M*
3 - Water drain

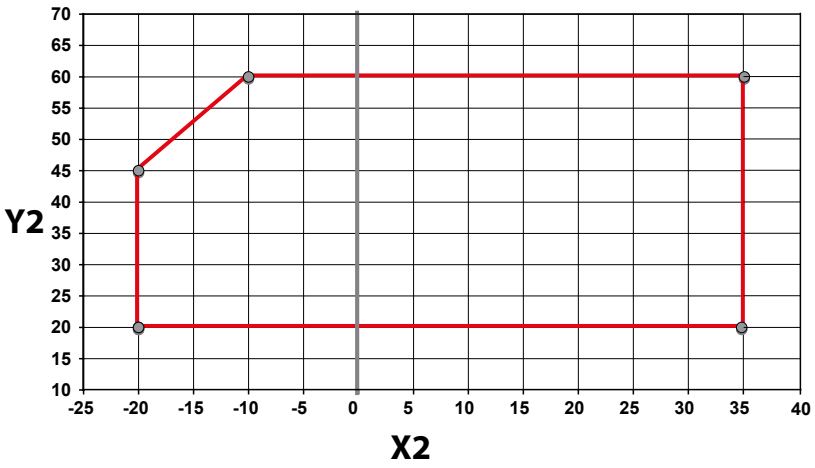
*1”M Reduction standard supplied



KEY:
1 - Mesh filter
2 - Circulation pump
3 - Safety valve
4 - Water drain valve
5 - Blade flow switch
6 - Expansion vessel

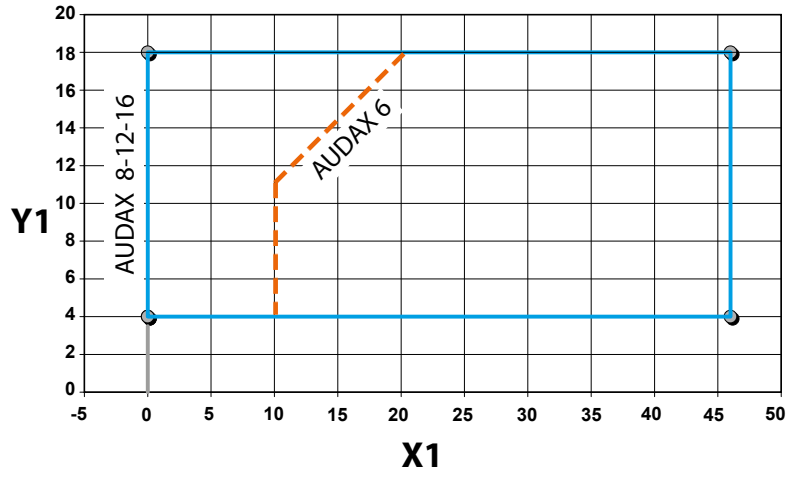
9 AUDAX 6 - 8 - 12 - 16 OPERATING LIMITS AND ANTIFREEZE FUNCTION

Central heating



KEY:
Y2 - Flow water temperature (°C)
X2 - Outdoor air temperature (°C)

Cooling

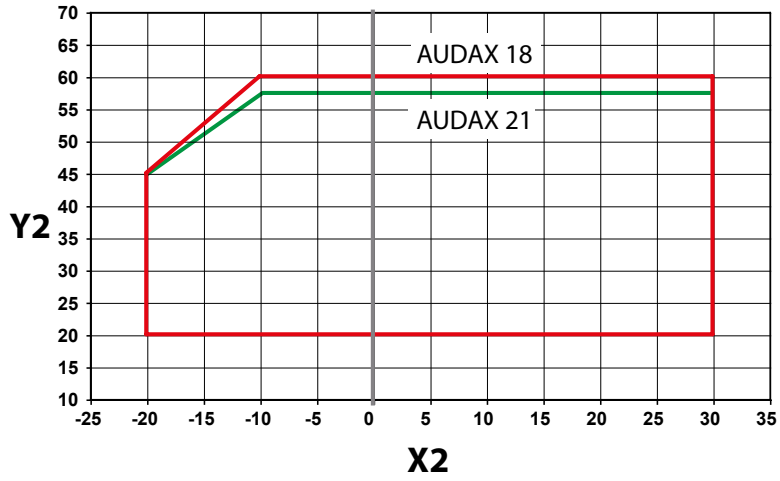


KEY:
Y1 - Flow water temperature (°C)
X1 - Outdoor air temperature (°C)

NOTE: AUDAX is equipped with a antifreeze protection system against up to -10°C (with power supply voltage), as a result of periodic activation of the pump and machine cooling circuit.
If AUDAX is installed in areas having temperatures below 0 °C, it is recommended to provide special antifreeze systems in order to guarantee the machine's integrity, especially the water-gas heat exchanger, when there is a blackout.
For example, insert an appropriate top quality, non-hazardous antifreeze liquid into the heating system. In this case, the instructions of the manufacturer of this liquid must be followed scrupulously regarding the percentage necessary with respect to the minimum temperature at which the system must be kept.
An aqueous solution must be made with potential pollution class of water 2 (EN 1717:2002).
With no supply voltage and if no antifreeze liquid has been inserted, you must drain the water from the machine.
Avoid using automatic filling systems.

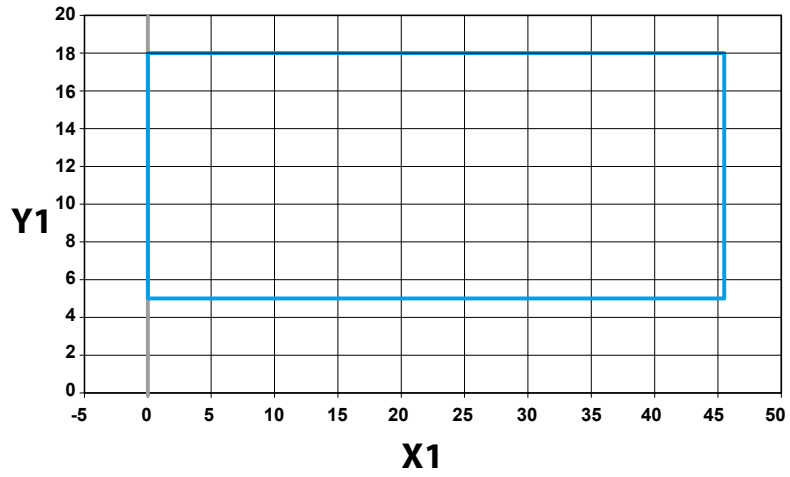
9.1 AUDAX 18 - 21 OPERATING LIMITS AND ANTIFREEZE FUNCTION

Central heating



KEY:
Y2 - Flow water temperature (°C)
X2 - Outdoor air temperature (°C)

Cooling



KEY:
Y1 - Flow water temperature (°C)
X1 - Outdoor air temperature (°C)

NOTE: AUDAX 18-21 is equipped with antifreeze protection comprising an electrical resistance to protect the plate exchanger which is the most critical component with regard to freezing. When the electrical resistance activates so does the pump inside the AUDAX 18-21, in this way, with power supply voltage, the machine is protected up to -10°C.
If AUDAX 18-21 is installed in areas having temperatures below 0 °C, it is recommended to provide special antifreeze systems in order to guarantee the machine's integrity, especially the water-gas heat exchanger, when there is a blackout.
For example, insert an appropriate top quality, non-hazardous antifreeze liquid into the heating system.
In this case, the instructions of the manufacturer of this liquid must be followed scrupulously regarding the percentage necessary with respect to the minimum temperature at which the system must be kept.
An aqueous solution must be made with potential pollution class of water 2 (EN 1717:2002).
With no supply voltage and if no antifreeze liquid has been inserted, you must drain the water from the machine.
Avoid using automatic filling systems.

10 AUDAX 6 TECHNICAL DATA

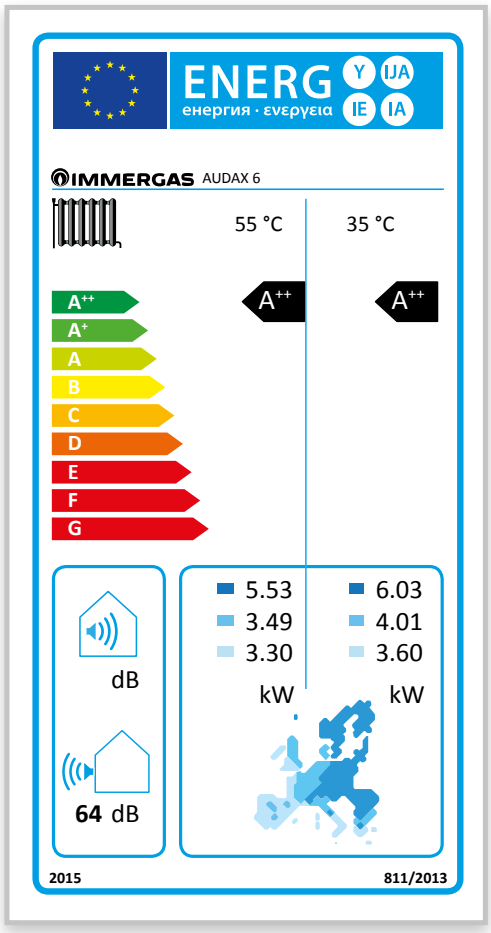
Central heating circuit			
Power in CH mode with water set at 35 °C (1)		kW	5.10
Power in CH mode with water set at 45 °C (2)		kW	4.85
Power in CH mode with water set at 55 °C (3)		kW	4.41
CH mode COP with water set at 35 °C (1)			4.40
CH mode COP with water set at 45 °C (2)			3.40
CH mode COP with water set at 55 °C (3)			2.79
Min/max heat power with water set at 35 °C (1)		kW	0,82 / 5,27
Min/max heat power with water set at 45 °C (2)		kW	0,74 / 4,99
Min/max heat power with water set at 55 °C (3)		kW	0,68 / 4,41
Flow temperature range		°C	20 / 60
Outdoor temp. limits for Heating mode operation		°C	-20 / 35
Cooling circuit			
Power in cooling mode with water set at 18 °C (1)		kW	4.85
Power in cooling mode with water set at 7 °C (2)		kW	4.00
Cooling mode EER with water set at 18 °C (1)			4.35
Cooling mode EER with water set at 7 °C (2)			3.10
Min/max cooling capacity with water set at 18 °C (1)		kW	1,40 / 5,50
Min/max cooling capacity with water set at 7 °C (2)		kW	0,89 / 4,09
Flow temperature range		°C	4 / 18
Outdoor temp. limits for Cooling mode operation		°C	10 / 46
General data			
System max. working pressure		bar	3
Head available on the system (with 1000 l/h flow rate)		kPa (m c.a.)	48 (4,85)
Minimum flow rate (flow switch)		l/h	180
Expansion vessel capacity		litres	2
Water circuit content		litres	1.7
C.H. sound power level		dB(A)	64
Appliance electric protection rating		IP	X4
Electric power supply		V - Hz	230 - 50
Permitted voltage range		V	207 - 253
Maximum power absorbed		W	1800
Maximum current absorbed		A	8
Fuse inserted		A	16
Refrigerant fluid load (R410A)*		g	1100
Heat pump Weight		kg	57

* Hermetically sealed system.

THE REPORTED DATA REFERS TO THE FOLLOWING CONDITIONS (in compliance with EN 14511):		
ROOM	HEATING PHASE (°C)	COOLING PHASE (°C)
Water TEMP. (F/R) (1) - AIR (db/wb)	35/30 - 7/6	18/23 - 35 (bs)
Water TEMP. (F/R) (2) - AIR (db/wb)	45/40 - 7/6	7/12 - 35 (bs)
Water TEMP. (F/R) (3) - AIR (db/wb)	55/47 - 7/6	

AUDAX 6

11 PRODUCT FICHE (REGULATION 811/2013)



AUDAX 6

Low temperature (30/35)

Parameter	Value	Colder zones	Average zones	Hotter zones
Annual energy consumption for the central heating function (Q_{HE})	kWh/year	3769	1747	817
Room central heating seasonal efficiency (η_s)	ηs %	148	186	230
Nominal heat output	kW	6.03	4.01	3.60

Average temperature (47/55)

Parameter	Value	Colder zones	Average zones	Hotter zones
Annual energy consumption for the central heating function (Q_{HE})	kWh/year	5078	2170	1055
Room central heating seasonal efficiency (η_s)	ηs %	100	130	163
Nominal heat output	kW	5.53	3.49	3.30

12 AUDAX 6 "POWER" AND "COP" CENTRAL HEATING

• TOL = -20 °C

Temp. air °C		Output (kW) Nom.	Output (kW) Min.	Output (kW) Max.	COP (EN 14511) Nom.	COP (EN 14511) Min.	COP (EN 14511) Max.
d.b.	**(w.b.)**	**Water flow temperature 35 °C**					
10	(9)	5.54	0.92	5.88	4.66	4.86	4.51
7	(6)	5.10	0.82	5.27	4.40	4.58	4.34
2	(1)	3.61	1.30	3.83	3.79	3.90	3.66
-7	(-8)	3.35	0.64	3.55	3.01	3.19	3.00
-10	(-11)	2.58	0.56	2.80	2.41	2.61	2.39
-15	(-16)	2.26	0.49	2.34	2.14	2.23	2.11
-20	(-21)	1.00	0.42	1.00	1.90	1.91	1.86

d.b.	(w.b.)	Water flow temperature 45 °C					
10	(9)	5.05	0.83	5.36	3.69	3.85	3.60
7	(6)	4.85	0.74	4.99	3.40	3.52	3.34
2	(1)	3.44	1.15	3.62	3.01	2.79	2.93
-7	(-8)	3.17	0.60	3.40	2.65	2.81	2.60
-10	(-11)	2.47	0.52	2.67	2.21	2.39	2.20
-15	(-16)	2.05	0.45	2.10	2.09	2.14	1.94
-20	(-21)	0.78	0.39	0.78	1.98	1.87	1.71

d.b.	(w.b.)	Water flow temperature 55 °C					
10	(9)	4.61	0.76	4.61	2.88	3.01	2.88
7	(6)	4.41	0.68	4.41	2.79	2.95	2.79
2	(1)	3.30	1.09	3.30	2.42	2.63	2.42
-7	(-8)	2.90	0.56	2.96	1.99	2.10	1.95
-10	(-11)	2.39	0.49	2.58	1.91	2.06	1.88
-15	(-16)	--	--	--	--	--	--
-20	(-21)	--	--	--	--	--	--

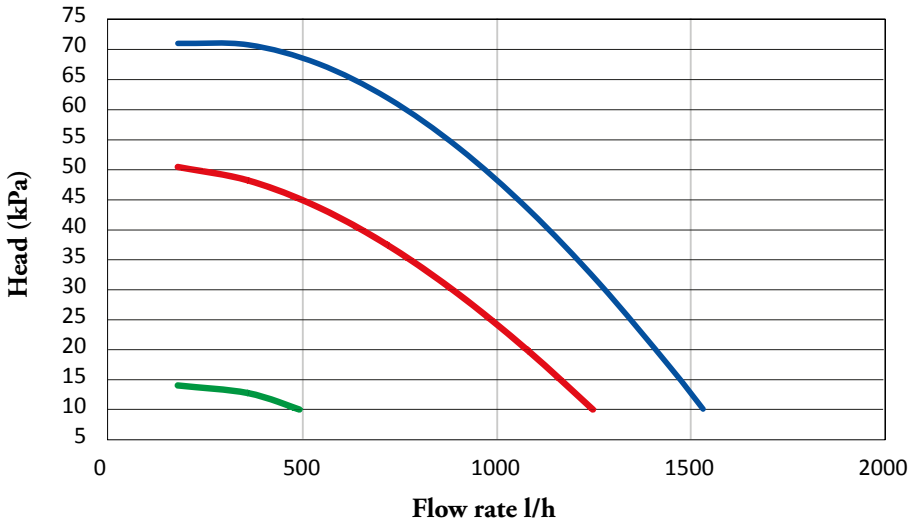
d.b.	(w.b.)	Water flow temperature 60 °C					
10	(9)	4.14	0.73	4.14	2.58	2.74	2.58
7	(6)	3.88	0.65	3.88	2.44	2.66	2.44
2	(1)	3.10	1.00	3.10	2.20	2.56	2.20
-7	(-8)	2.56	0.52	2.82	1.93	2.04	1.89
-10	(-11)	2.33	0.46	2.50	1.86	2.01	1.83
-15	(-16)	--	--	--	--	--	--
-20	(-21)	--	--	--	--	--	--

AUDAX 6

12.1 AUDAX 6 "POWER" AND "EER" COOLING

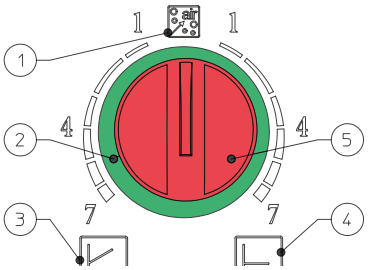
Temp. air °C	Output (kW) Nom.	Output (kW) Min.	Output (kW) Max.	EER (EN 14511) Nom.	EER (EN 14511) Min.	EER (EN 14511) Max.
d.b.	**Water flow temperature 18 °C**					
45	2.85	1.20	2.85	3.33	5.04	3.33
35	4.85	1.40	5.50	4.35	6.89	4.01
25	5.30	1.56	5.30	6.73	9.63	6.73
15	--	--	--	--	--	--
5	--	--	--	--	--	--
d.b.	**Water flow temperature 15 °C**					
45	2.59	1.08	2.59	3.12	4.67	3.12
35	4.48	1.26	5.31	3.89	6.36	3.73
25	3.48	1.41	3.48	6.54	8.46	6.54
15	--	--	--	--	--	--
5	--	--	--	--	--	--
d.b.	**Water flow temperature 10 °C**					
45	2.20	0.87	2.20	2.64	4.06	2.64
35	4.27	1.03	4.39	3.35	5.46	3.25
25	2.71	1.17	2.71	5.21	7.31	5.21
15	1.49	1.49	1.49	8.47	8.47	8.47
5	--	--	--	--	--	--
d.b.	**Water flow temperature 7 °C**					
45	2.13	0.75	2.13	2.14	3.70	2.38
35	4.00	0.89	4.09	3.10	4.92	2.95
25	2.42	1.01	2.42	4.59	6.49	4.59
15	1.34	1.34	1.34	7.50	7.50	7.50
5	--	--	--	--	--	--
d.b.	**Water flow temperature 5 °C**					
45	1.87	0.66	1.87	2.00	3.45	2.00
35	3.69	0.80	3.75	2.81	4.56	2.77
25	2.14	0.91	2.14	4.01	6.07	4.01
15	1.07	1.07	1.07	6.72	6.72	6.72
5	--	--	--	--	--	--

13 AUDAX 6 PUMP HEAD/FLOW RATE GRAPHICS



All curves have been defined in constant pressure mode with minimum, intermediate and maximum speed.

13.1 AUDAX 6 SETTINGS AND PUMP SETTINGS



KEY:

1 - Automatic vent mode operation
2 - Light ring to indicate the operating status
3 - Proportional head operation
4 - Constant head operation
5 - Operating mode selector switch

AUDAX 6 range boilers are supplied with a low power consumption pump with variable speed control.
The circulating pump is equipped with electronic control to set advanced functions.

Constant head (ΔP C) (ref. 4 fig. above) factory setting. The circulator pump maintains the pressure level (head) constant as the system heat demand decreases (flow rate reduction). With these settings, the pump is suitable for all floor systems.

Proportional head (ΔP V) (ref. 3 fig. above). This allows the pressure level (head) to be proportionally reduced as the system heat demand decreases (flow rate reduction). Thanks to this function, the electric power consumption of the circulator pump is reduced further: the energy (power) used by the pump decreases according to the pressure level and flow rate. With this setting, the pump guarantees optimal performance in most heating systems, proving particularly suitable in single-pipe and two-pipe installations.

TECHNICAL NOTE: System minimum water content:
*To facilitate proper execution of the AUDAX heat pump defrost cycles, a minimum water content in the system is required, which must be: **6 l/kW** of the machine's power for any type of system. The flywheel guarantees normal operation of AUDAX with systems divided into zones (with variable water content in circulation). The flywheel also guarantees proper operation with fan coils used for cooling (a condition in which the flow temperature is very low and has significant heat load variations that vary the number of active fan coils). It is also important to check that the dehumidifier line has a minimum of **3 l/kW** of the machine (dehumidifier hydraulic circuit connection).*
***N.B.:** for inertial tanks codes supplied by Immergas, refer to page 107.*

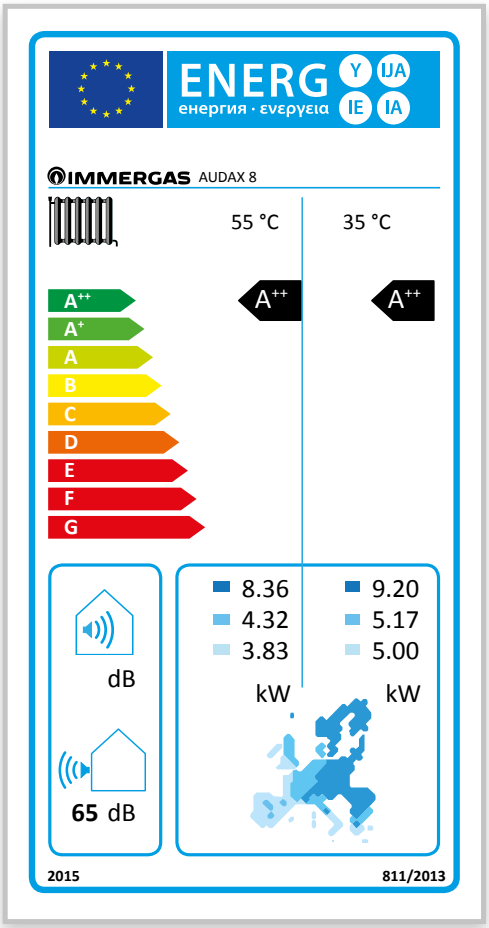
14 AUDAX 8 TECHNICAL DATA

Central heating circuit			
Power in CH mode with water set at 35 °C (1)		kW	7.15
Power in CH mode with water set at 45 °C (2)		kW	6.80
Power in CH mode with water set at 55 °C (3)		kW	6.51
CH mode COP with water set at 35 °C (1)			4.10
CH mode COP with water set at 45 °C (2)			3.20
CH mode COP with water set at 55 °C (3)			2.59
Min/max heat power with water set at 35 °C (1)		kW	1.36 / 8.77
Min/max heat power with water set at 45 °C (2)		kW	1.31 / 7.96
Min/max heat power with water set at 55 °C (3)		kW	1.27 / 7.35
Flow temperature range		°C	20 / 60
Outdoor temp. limits for Heating mode operation		°C	- 20 / 35
Cooling circuit			
Power in cooling mode with water set at 18 °C (1)		kW	8.00
Power in cooling mode with water set at 7 °C (2)		kW	5.55
Cooling mode EER with water set at 18 °C (1)			4.00
Cooling mode EER with water set at 7 °C (2)			3.10
Min/max cooling capacity with water set at 18 °C (1)		kW	0.97 / 8.72
Min/max cooling capacity with water set at 7 °C (2)		kW	0.50 / 5.95
Flow temperature range		°C	4 / 18
Outdoor temp. limits for Cooling mode operation		°C	0 / 46
General data			
System max. working pressure		bar	3
Head available on the system (with 1500 l/h flow rate)		kPa (m c.a.)	48 (4.89)
Minimum flow rate (flow switch)		l/h	420
Expansion vessel capacity		litres	2
Water circuit content		litres	2.3
C.H. sound power level		dB(A)	65
Appliance electric protection rating		IP	X4
Electric power supply		V - Hz	230 - 50
Permitted voltage range		V	207 - 253
Maximum power absorbed		W	3380
Maximum current absorbed		A	15
Fuse inserted		A	20
Refrigerant fluid load (R410A)*		g	1600
Heat pump Weight		kg	69

* Hermetically sealed system.

THE REPORTED DATA REFERS TO THE FOLLOWING CONDITIONS (in compliance with EN 14511):		
ROOM	HEATING PHASE (°C)	COOLING PHASE (°C)
Water TEMP. (F/R) (1) - AIR (db/wb)	35/30 - 7/6	18/23 - 35 (bs)
Water TEMP. (F/R) (2) - AIR (db/wb)	45/40 - 7/6	7/12 - 35 (bs)
Water TEMP. (F/R) (3) - AIR (db/wb)	55/47 - 7/6	

15 PRODUCT FICHE (REGULATION 811/2013)



AUDAX 8

Low temperature (30/35)

Parameter	Value	Colder zones	Average zones	Hotter zones
Annual energy consumption for the central heating function (Q_{HE})	kWh/year	5566	2273	1013
Room central heating seasonal efficiency (η_s)	ηs %	153	184	259
Nominal heat output	kW	9.20	5.17	5.00

Average temperature (47/55)

Parameter	Value	Colder zones	Average zones	Hotter zones
Annual energy consumption for the central heating function (Q_{HE})	kWh/year	6930	2651	1317
Room central heating seasonal efficiency (η_s)	ηs %	111	131	152
Nominal heat output	kW	8.36	4.32	3.83

16 AUDAX 8 "POWER" AND "COP" CENTRAL HEATING

• TOL = -20 °C

Temp. air °C		Output (kW) Nom.	Output (kW) Min.	Output (kW) Max.	COP (EN 14511) Nom.	COP (EN 14511) Min.	COP (EN 14511) Max.
d.b.	**(w.b.)**	**Water flow temperature 35 °C**					
10	(9)	7.38	1.44	8.65	4.35	4.69	3.94
7	(6)	7.15	1.36	8.77	4.10	4.46	3.31
2	(1)	4.90	1.04	5.68	3.57	3.71	3.24
-7	(-8)	4.10	0.94	4.95	3.00	3.21	2.48
-10	(-11)	3.90	0.84	4.66	2.81	2.89	2.34
-15	(-16)	3.89	0.76	3.89	2.29	2.52	2.29
-20	(-21)	1.81	0.68	1.81	1.31	1.87	1.31

d.b.	(w.b.)	Water flow temperature 45 °C					
10	(9)	7.04	1.36	8.36	3.13	3.37	3.21
7	(6)	6.80	1.31	7.96	3.20	3.42	2.83
2	(1)	4.31	1.00	5.53	2.81	2.71	2.56
-7	(-8)	3.83	0.90	4.58	2.33	2.51	2.06
-10	(-11)	3.68	0.81	3.84	2.21	2.26	1.94
-15	(-16)	3.84	0.73	3.84	1.90	2.19	1.90
-20	(-21)	1.69	0.66	1.69	1.66	2.12	1.66

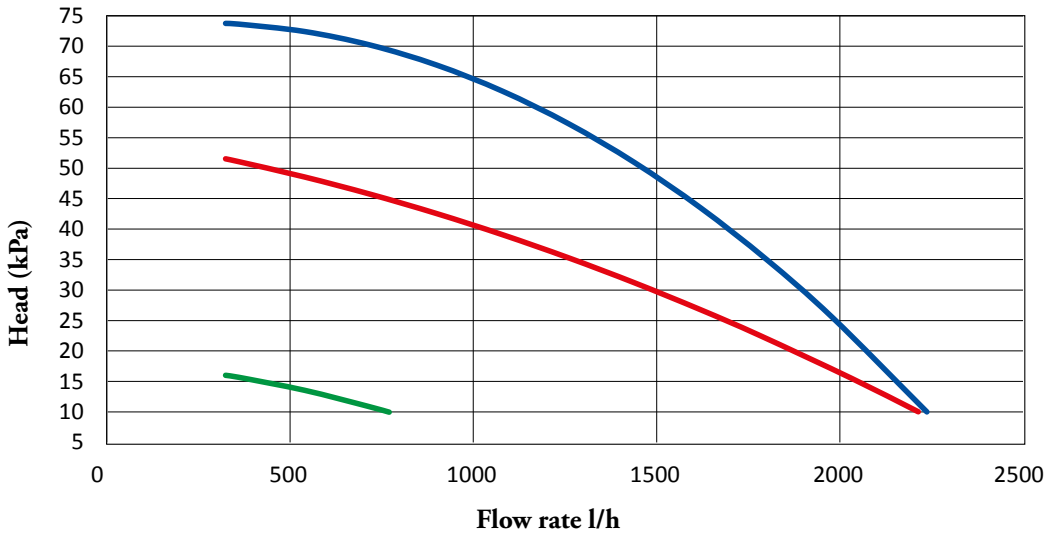
d.b.	(w.b.)	Water flow temperature 55 °C					
10	(9)	6.53	1.30	7.58	2.73	3.01	2.68
7	(6)	6.51	1.27	7.35	2.59	2.80	2.43
2	(1)	3.83	0.97	3.83	2.22	2.44	2.22
-7	(-8)	3.17	0.85	3.17	1.90	2.30	1.86
-10	(-11)	3.05	0.74	3.35	1.80	2.07	1.75
-15	(-16)	--	--	--	--	--	--
-20	(-21)	--	--	--	--	--	--

d.b.	(w.b.)	Water flow temperature 60 °C					
10	(9)	5.96	1.22	5.96	2.26	2.49	2.26
7	(6)	5.16	1.25	5.16	2.15	2.32	2.15
2	(1)	3.56	0.96	3.56	2.07	2.13	2.07
-7	(-8)	2.79	0.81	2.79	1.62	2.05	1.62
-10	(-11)	2.68	0.69	2.68	1.54	1.84	1.54
-15	(-16)	--	--	--	--	--	--
-20	(-21)	--	--	--	--	--	--

16.1 AUDAX 8 "POWER" AND "EER" COOLING

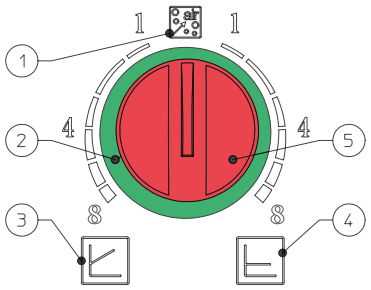
Temp. air °C	Output (kW) Nom.	Output (kW) Min.	Output (kW) Max.	EER (EN 14511) Nom.	EER (EN 14511) Min.	EER (EN 14511) Max.
d.b.	**Water flow temperature 18 °C**					
45	2.31	2.31	2.31	3.53	3.53	3.53
35	8.00	0.97	8.72	4.00	6.24	3.84
25	9.05	1.46	9.71	5.73	12.82	5.48
15	7.74	1.67	7.74	7.80	16.07	7.80
5	8.20	2.85	8.20	10.54	19.58	10.54
d.b.	**Water flow temperature 15 °C**					
45	2.96	0.74	2.96	3.10	4.12	3.10
35	6.99	0.84	7.75	3.77	5.58	3.60
25	7.87	1.05	8.69	5.34	10.71	5.12
15	6.93	1.25	6.93	7.16	14.51	7.16
5	7.39	1.16	7.39	9.69	18.62	9.69
d.b.	**Water flow temperature 10 °C**					
45	2.46	0.55	2.46	2.53	3.28	2.53
35	5.98	0.63	6.70	3.35	4.50	3.18
25	6.79	0.87	6.84	4.71	7.54	4.54
15	6.04	1.06	6.04	6.43	12.38	6.43
5	6.54	1.01	6.54	8.64	17.08	8.64
d.b.	**Water flow temperature 7 °C**					
45	2.23	0.44	2.23	2.28	2.77	2.28
35	5.55	0.50	5.95	3.10	3.85	2.94
25	6.14	0.77	6.78	4.31	5.62	4.16
15	5.59	0.95	5.59	6.15	9.55	6.15
5	6.03	0.93	6.03	7.98	13.34	7.98
d.b.	**Water flow temperature 5 °C**					
45	1.96	0.36	1.96	2.00	2.44	2.00
35	4.86	0.42	5.39	2.93	3.41	2.77
25	5.60	0.59	6.45	3.85	4.25	3.76
15	5.37	0.76	5.37	5.57	7.57	5.57
5	5.44	0.76	5.44	7.59	10.74	7.59

17 AUDAX 8 PUMP HEAD/FLOW RATE GRAPHICS



All curves have been defined in constant pressure mode with minimum, intermediate and maximum speed.

17.1 AUDAX 8 SETTINGS AND PUMP SETTINGS



KEY:

1 - Automatic vent mode operation
2 - Light ring to indicate the operating status
3 - Proportional head operation
4 - Constant head operation
5 - Operating mode selector switch

AUDAX 8 range boilers are supplied with a low power consumption pump with variable speed control.
The circulating pump is equipped with electronic control to set advanced functions.

Constant head (ΔP C) (ref. 4 fig. above) factory setting. The circulator pump maintains the pressure level (head) constant as the system heat demand decreases (flow rate reduction). With these settings, the pump is suitable for all floor systems.

Proportional head (ΔP V) (ref. 3 fig. above). This allows the pressure level (head) to be proportionally reduced as the system heat demand decreases (flow rate reduction). Thanks to this function, the electric power consumption of the circulator pump is reduced further: the energy (power) used by the pump decreases according to the pressure level and flow rate. With this setting, the pump guarantees optimal performance in most heating systems, proving particularly suitable in single-pipe and two-pipe installations.

TECHNICAL NOTE: System minimum water content:
*To facilitate proper execution of the AUDAX heat pump defrost cycles, a minimum water content in the system is required, which must be: **6 l/kW** of the machine's power for any type of system. The flywheel guarantees normal operation of AUDAX with systems divided into zones (with variable water content in circulation). The flywheel also guarantees proper operation with fan coils used for cooling (a condition in which the flow temperature is very low and has significant heat load variations that vary the number of active fan coils). It is also important to check that the dehumidifier line has a minimum of **3 l/kW** of the machine (dehumidifier hydraulic circuit connection).*
***N.B.:** for inertial tanks codes supplied by Immergas, refer to page 107.*

18 AUDAX 12 TECHNICAL DATA

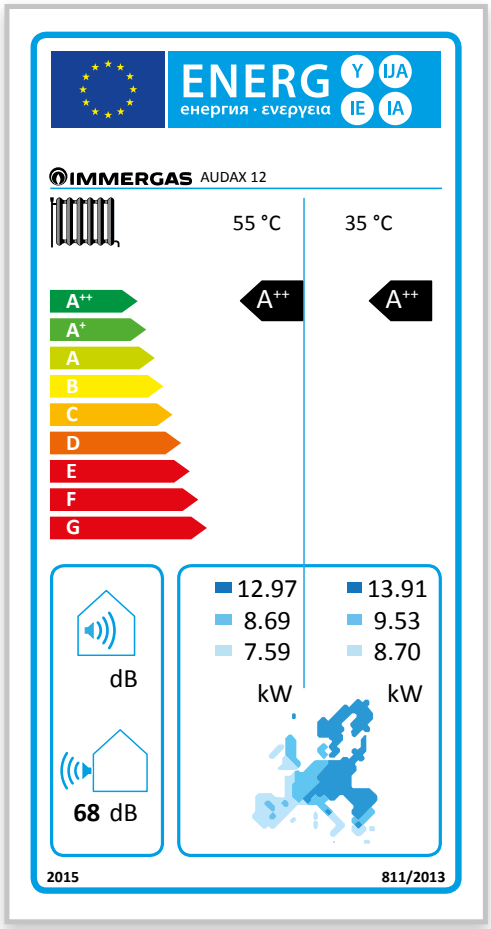
Central heating circuit			
Power in CH mode with water set at 35 °C (1)		kW	11.25
Power in CH mode with water set at 45 °C (2)		kW	11.30
Power in CH mode with water set at 55 °C (3)		kW	9.46
CH mode COP with water set at 35 °C (1)			4.70
CH mode COP with water set at 45 °C (2)			3.60
CH mode COP with water set at 55 °C (3)			2.69
Min/max heat power with water set at 35 °C (1)		kW	3.73 / 13.67
Min/max heat power with water set at 45 °C (2)		kW	3.58 / 12.64
Min/max heat power with water set at 55 °C (3)		kW	3.22 / 11.08
Flow temperature range		°C	20 / 60
Outdoor temp. limits for Heating mode operation		°C	- 20 / 35
Cooling circuit			
Power in cooling mode with water set at 18 °C (1)		kW	13.70
Power in cooling mode with water set at 7 °C (2)		kW	11.20
Cooling mode EER with water set at 18 °C (1)			4.60
Cooling mode EER with water set at 7 °C (2)			3.40
Min/max cooling capacity with water set at 18 °C (1)		kW	4.74 / 18.46
Min/max cooling capacity with water set at 7 °C (2)		kW	2.61 / 13.70
Flow temperature range		°C	4 / 18
Outdoor temp. limits for Cooling mode operation		°C	0 / 46
General data			
System max. working pressure		bar	3
Head available on the system (with 2500 l/h flow rate)		kPa (m c.a.)	60 (6.12)
Minimum flow rate (flow switch)		l/h	600
Expansion vessel capacity		litres	3
Water circuit content		litres	4.4
C.H. sound power level		dB(A)	68
Appliance electric protection rating		IP	X4
Electric power supply		V - Hz	230 - 50
Permitted voltage range		V	207 - 253
Maximum power absorbed		W	4730
Maximum current absorbed		A	21
Fuse inserted		A	32
Refrigerant fluid load (R410A)*		g	2800
Heat pump Weight		kg	115

* Hermetically sealed system.

THE REPORTED DATA REFERS TO THE FOLLOWING CONDITIONS (in compliance with EN 14511):		
ROOM	HEATING PHASE (°C)	COOLING PHASE (°C)
Water TEMP. (F/R) (1) - AIR (db/wb)	35/30 - 7/6	18/23 - 35 (bs)
Water TEMP. (F/R) (2) - AIR (db/wb)	45/40 - 7/6	7/12 - 35 (bs)
Water TEMP. (F/R) (3) - AIR (db/wb)	55/47 - 7/6	

AUDAX 12

19 PRODUCT FICHE (REGULATION 811/2013)



AUDAX 12

Low temperature (30/35)

Parameter	Value	Colder zones	Average zones	Hotter zones
Annual energy consumption for the central heating function (Q_{HE})	kWh/year	9186	4469	1983
Room central heating seasonal efficiency (η_s)	ηs %	140	173	230
Nominal heat output	kW	13.91	9.53	8.70

Average temperature (47/55)

Parameter	Value	Colder zones	Average zones	Hotter zones
Annual energy consumption for the central heating function (Q_{HE})	kWh/year	10922	5349	2423
Room central heating seasonal efficiency (η_s)	ηs %	109	131	164
Nominal heat output	kW	12.97	8.69	7.59

20 AUDAX 12 "POWER" AND "COP" CENTRAL HEATING

• TOL = -20 °C

Temp. air °C		Output (kW) Nom.	Output (kW) Min.	Output (kW) Max.	COP (EN 14511) Nom.	COP (EN 14511) Min.	COP (EN 14511) Max.
d.b.	**(w.b.)**	**Water flow temperature 35 °C**					
10	(9)	12.14	3.87	14.51	4.94	5.30	4.44
7	(6)	11.25	3.73	13.67	4.70	4.90	4.21
2	(1)	8.35	5.22	9.65	3.68	3.92	3.58
-7	(-8)	6.81	2.52	8.50	2.93	2.99	2.80
-10	(-11)	6.16	2.13	7.65	2.40	2.89	2.24
-15	(-16)	2.88	1.92	2.88	1.82	1.91	1.82
-20	(-21)	2.60	1.74	2.60	1.52	1.54	1.52

d.b.	(w.b.)	Water flow temperature 45 °C					
10	(9)	11.37	3.84	13.37	3.85	4.27	3.45
7	(6)	11.30	3.58	12.64	3.60	3.73	3.31
2	(1)	7.53	4.93	9.41	2.96	3.03	2.92
-7	(-8)	6.48	2.37	7.95	2.42	2.44	2.29
-10	(-11)	3.44	1.92	3.44	1.89	1.93	1.89
-15	(-16)	2.73	1.79	2.73	1.52	1.57	1.52
-20	(-21)	2.34	1.60	2.34	1.28	1.29	1.28

d.b.	(w.b.)	Water flow temperature 55 °C					
10	(9)	10.07	3.47	11.70	2.83	2.85	2.43
7	(6)	9.46	3.22	11.08	2.69	2.73	2.46
2	(1)	7.59	5.23	7.47	2.40	2.48	2.21
-7	(-8)	5.70	2.29	7.06	1.82	1.88	1.76
-10	(-11)	2.97	1.85	2.97	1.30	1.29	1.30
-15	(-16)	--	--	--	--	--	--
-20	(-21)	--	--	--	--	--	--

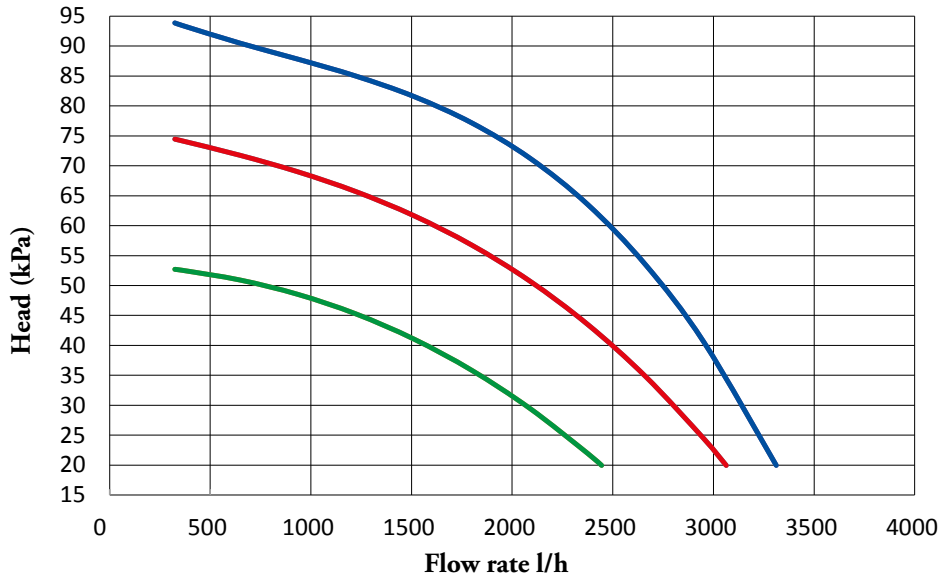
d.b.	(w.b.)	Water flow temperature 60 °C					
10	(9)	8.20	2.89	8.20	2.31	2.33	2.31
7	(6)	8.48	3.10	9.94	2.10	2.12	2.03
2	(1)	5.96	4.87	7.45	2.09	2.14	2.07
-7	(-8)	4.99	2.15	6.30	1.46	1.45	1.45
-10	(-11)	2.44	1.69	2.44	1.10	1.11	1.10
-15	(-16)	--	--	--	--	--	--
-20	(-21)	--	--	--	--	--	--

AUDAX 12

20.1 AUDAX 12 "POWER" AND "EER" COOLING

Temp. air °C	Output (kW) Nom.	Output (kW) Min.	Output (kW) Max.	EER (EN 14511) Nom.	EER (EN 14511) Min.	EER (EN 14511) Max.
d.b.	**Water flow temperature 18 °C**					
45	10.58	5.42	10.58	3.45	3.75	3.45
35	13.70	4.74	18.46	4.60	7.02	3.65
25	16.59	5.41	20.30	5.55	12.18	4.61
15	17.83	5.81	19.90	7.06	16.22	6.34
5	5.99	5.99	5.99	17.96	17.96	17.96
d.b.	**Water flow temperature 15 °C**					
45	9.75	4.82	9.75	3.19	3.15	3.19
35	14.05	4.25	17.24	3.94	5.42	3.46
25	15.49	4.94	18.96	5.21	9.06	4.37
15	16.65	5.37	18.58	6.61	14.09	5.96
5	5.69	5.69	5.69	15.35	15.35	15.35
d.b.	**Water flow temperature 10 °C**					
45	8.47	4.00	8.47	2.74	2.75	2.74
35	12.15	3.21	15.02	3.53	3.62	3.15
25	13.45	3.95	15.47	4.69	6.19	4.22
15	14.48	4.43	15.93	5.95	9.56	5.47
5	15.29	3.18	18.78	9.76	14.29	9.19
d.b.	**Water flow temperature 7 °C**					
45	7.93	3.53	7.93	2.50	2.64	2.50
35	11.20	2.61	13.70	3.40	3.45	2.98
25	12.25	3.38	14.12	4.44	5.18	4.00
15	13.19	3.88	14.09	5.64	8.25	5.33
5	13.92	2.78	17.09	7.12	12.79	6.67
d.b.	**Water flow temperature 5 °C**					
45	6.80	3.05	6.80	2.23	2.30	2.23
35	9.52	2.27	12.88	2.95	3.00	2.89
25	11.51	3.05	13.27	4.30	4.73	3.88
15	12.39	3.57	13.24	5.48	7.78	5.18
5	13.06	2.56	16.02	6.24	12.27	5.48

21 AUDAX 12 PUMP HEAD/FLOW RATE GRAPHICS



All curves have been defined in constant pressure mode with minimum, intermediate and maximum speed.

21.1 AUDAX 12 SETTINGS AND PUMP SETTINGS

AUDAX 12 range boilers are supplied with a low power consumption pump with variable speed control.
The pump's interface enables you to select between 6 pressure levels with 2 types of controls:

- 3 constant pressure (CP) curves
- 3 proportional pressure (PP) curves

Constant pressure curve (CP) default setting. The circulator pump maintains the pressure level (head) constant as the system heat demand decreases (flow rate reduction). With these settings, the pump is suitable for all floor systems.

Proportional pressure curve (PP). This allows the pressure level (head) to be proportionally reduced as the system heat demand decreases (flow rate reduction). Thanks to this function, the electric power consumption of the circulator pump is reduced further: the energy (power) used by the pump decreases according to the pressure level and flow rate. With this setting, the pump guarantees optimal performance in most heating systems, proving particularly suitable in single-pipe and two-pipe installations.

Setting procedure:	
1) Factory setting	Constant pressure curve CP3
2) Press the button for 10 seconds	The pump goes into setting mode - the LED starts flashing
3) Each time it is pressed, the settings change	LED “I”, “II”, and “III” are lit/the control curve and mode change
4) 10 seconds after the button is not pressed	The setting is changed - the pump goes back to operating mode
5) LED “I” or “II” or “III” is still lit	The pump is operating with the selected mode and curve

TECHNICAL NOTE: System minimum water content:
*To facilitate proper execution of the AUDAX heat pump defrost cycles, a minimum water content in the system is required, which must be: **6 l/kW** of the machine's power for any type of system. The flywheel guarantees normal operation of AUDAX with systems divided into zones (with variable water content in circulation). The flywheel also guarantees proper operation with fan coils used for cooling (a condition in which the flow temperature is very low and has significant heat load variations that vary the number of active fan coils). It is also important to check that the dehumidifier line has a minimum of **3 l/kW** of the machine (dehumidifier hydraulic circuit connection).*
***N.B.:** for inertial tanks codes supplied by Immergas, refer to page 107.*

AUDAX 16 MONO

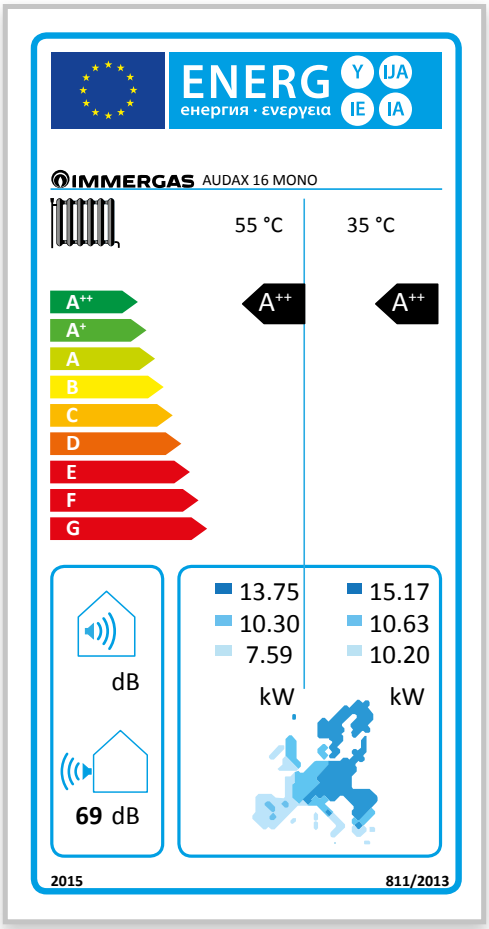
22 AUDAX 16 MONO TECHNICAL DATA

Central heating circuit			
Power in CH mode with water set at 35 °C (1)		kW	15.10
Power in CH mode with water set at 45 °C (2)		kW	13.40
Power in CH mode with water set at 55 °C (3)		kW	13.09
CH mode COP with water set at 35 °C (1)			4.25
CH mode COP with water set at 45 °C (2)			3.40
CH mode COP with water set at 55 °C (3)			2.54
Min/max heat power with water set at 35 °C (1)		kW	3.73 / 15.92
Min/max heat power with water set at 45 °C (2)		kW	3.58 / 15.31
Min/max heat power with water set at 55 °C (3)		kW	3.22 / 14.32
Flow temperature range		°C	20 / 60
Outdoor temp. limits for Heating mode operation		°C	- 20 / 35
Cooling circuit			
Power in cooling mode with water set at 18 °C (1)		kW	16.00
Power in cooling mode with water set at 7 °C (2)		kW	12.80
Cooling mode EER with water set at 18 °C (1)			4.10
Cooling mode EER with water set at 7 °C (2)			3.10
Min/max cooling capacity with water set at 18 °C (1)		kW	4.74 / 18.46
Min/max cooling capacity with water set at 7 °C (2)		kW	2.61 / 13.70
Flow temperature range		°C	4 / 18
Outdoor temp. limits for Cooling mode operation		°C	0 / 46
General data			
System max. working pressure		bar	3
Head available on the system (with 2500 l/h flow rate)		kPa (m c.a.)	60 (6.12)
Minimum flow rate (flow switch)		l/h	600
Expansion vessel capacity		l	3
Water circuit content		l	4.4
C.H. sound power level		dB(A)	69
Appliance electric protection rating		IP	X4
Electric power supply		V - Hz	230 - 50
Permitted voltage range		V	207 - 253
Maximum power absorbed		W	5180
Maximum current absorbed		A	23
Fuse inserted		A	32
Refrigerant fluid load (R410A)*		g	2800
Heat pump Weight		kg	115

* Hermetically sealed system.

THE REPORTED DATA REFERS TO THE FOLLOWING CONDITIONS (in compliance with EN 14511):		
ROOM	HEATING PHASE (°C)	COOLING PHASE (°C)
Water TEMP. (F/R) (1) - AIR (db/wb)	35/30 - 7/6	18/23 - 35 (bs)
Water TEMP. (F/R) (2) - AIR (db/wb)	45/40 - 7/6	7/12 - 35 (bs)
Water TEMP. (F/R) (3) - AIR (db/wb)	55/47 - 7/6	

23 PRODUCT FICHE (REGULATION 811/2013)



AUDAX 16 MONO

Low temperature (30/35)

Parameter	Value	Colder zones	Average zones	Hotter zones
Annual energy consumption for the central heating function (Q_{HE})	kWh/year	10118	4967	2376
Room central heating seasonal efficiency (η_s)	ηs %	138	173	225
Nominal heat output	kW	15.17	10.63	10.20

Average temperature (47/55)

Parameter	Value	Colder zones	Average zones	Hotter zones
Annual energy consumption for the central heating function (Q_{HE})	kWh/year	11771	6159	2539
Room central heating seasonal efficiency (η_s)	ηs %	107	135	156
Nominal heat output	kW	13.75	10.30	7.59

AUDAX 16 MONO

24 AUDAX 16 MONO "POWER" AND "COP" CENTRAL HEATING

• TOL = -20 °C

Temp. air °C		Output (kW) Nom.	Output (kW) Min.	Output (kW) Max.	COP (EN 14511) Nom.	COP (EN 14511) Min.	COP (EN 14511) Max.
d.b.	(w.b.)	Water flow temperature 35 °C					
10	(9)	15.86	4.15	17.23	4.40	5.88	4.25
7	(6)	15.10	3.73	15.92	4.25	4.90	4.16
2	(1)	9.65	5.22	10.42	3.58	3.92	3.47
-7	(-8)	8.50	2.52	9.00	2.82	2.99	2.70
-10	(-11)	7.59	2.13	8.18	2.35	2.89	2.22
-15	(-16)	2.88	1.92	2.88	1.82	1.91	1.82
-20	(-21)	2.60	1.74	2.60	1.52	1.54	1.52

d.b.	(w.b.)	Water flow temperature 45 °C					
10	(9)	14.40	3.84	14.40	3.51	4.27	3.51
7	(6)	13.40	3.58	15.31	3.40	3.73	3.28
2	(1)	9.41	4.93	9.24	2.92	2.97	2.84
-7	(-8)	7.88	2.37	8.40	2.29	2.44	2.20
-10	(-11)	3.44	1.92	3.44	1.89	1.93	1.89
-15	(-16)	2.73	1.79	2.73	1.52	1.57	1.52
-20	(-21)	2.34	1.60	2.34	1.28	1.29	1.28

d.b.	(w.b.)	Water flow temperature 55 °C					
10	(9)	11.81	3.47	11.81	2.93	3.14	2.93
7	(6)	13.09	3.22	14.32	2.54	2.73	2.43
2	(1)	7.47	5.23	7.47	2.21	2.36	2.21
-7	(-8)	6.93	2.29	7.40	1.73	1.88	1.67
-10	(-11)	2.97	1.85	2.97	1.30	1.29	1.30
-15	(-16)	--	--	--	--	--	--
-20	(-21)	--	--	--	--	--	--

d.b.	(w.b.)	Water flow temperature 60 °C					
10	(9)	10.68	2.89	10.68	2.64	2.79	2.64
7	(6)	12.40	3.10	13.62	2.06	2.12	2.01
2	(1)	7.45	4.87	7.45	2.07	2.04	2.07
-7	(-8)	6.27	2.15	6.72	1.44	1.45	1.40
-10	(-11)	2.44	1.69	2.44	1.10	1.11	1.10
-15	(-16)	--	--	--	--	--	--
-20	(-21)	--	--	--	--	--	--

24.1 AUDAX 16 MONO "POWER" AND "EER" COOLING

Temp. air °C	Output (kW) Nom.	Output (kW) Min.	Output (kW) Max.	EER (EN 14511) Nom.	EER (EN 14511) Min.	EER (EN 14511) Max.
d.b.	**Water flow temperature 18 °C**					
45	10.58	5.42	10.58	3.45	3.75	3.45
35	16.00	4.74	18.46	4.10	7.02	3.65
25	19.02	5.41	20.30	4.91	12.18	4.61
15	19.90	5.81	19.90	6.34	18.25	6.34
5	5.99	5.99	5.99	17.96	17.96	17.96
d.b.	**Water flow temperature 15 °C**					
45	9.75	4.82	9.75	3.19	3.15	3.19
35	16.15	4.25	17.24	3.65	5.42	3.46
25	17.77	4.94	18.96	4.65	9.06	4.37
15	18.58	5.37	18.58	5.96	14.09	5.96
5	5.69	5.69	5.69	15.35	15.35	15.35
d.b.	**Water flow temperature 10 °C**					
45	8.47	4.00	8.47	2.74	2.75	2.74
35	14.04	3.21	15.02	3.31	3.62	3.15
25	15.47	3.95	15.47	4.22	6.19	4.22
15	15.93	4.43	15.93	5.47	9.56	5.47
5	17.58	3.18	18.78	9.55	14.29	9.19
d.b.	**Water flow temperature 7 °C**					
45	7.93	3.53	7.93	2.50	2.64	2.50
35	12.80	2.61	13.70	3.10	3.45	2.98
25	14.12	3.38	14.12	4.00	5.18	4.00
15	14.09	3.88	14.09	5.33	8.25	5.33
5	16.00	2.78	17.09	6.75	12.79	6.67
d.b.	**Water flow temperature 5 °C**					
45	6.80	3.05	6.80	2.23	2.30	2.23
35	12.02	2.27	12.88	2.91	3.00	2.89
25	13.27	3.05	13.27	3.88	4.73	3.88
15	13.24	3.57	13.24	5.18	7.78	5.18
5	15.00	2.56	16.02	5.95	12.27	5.48

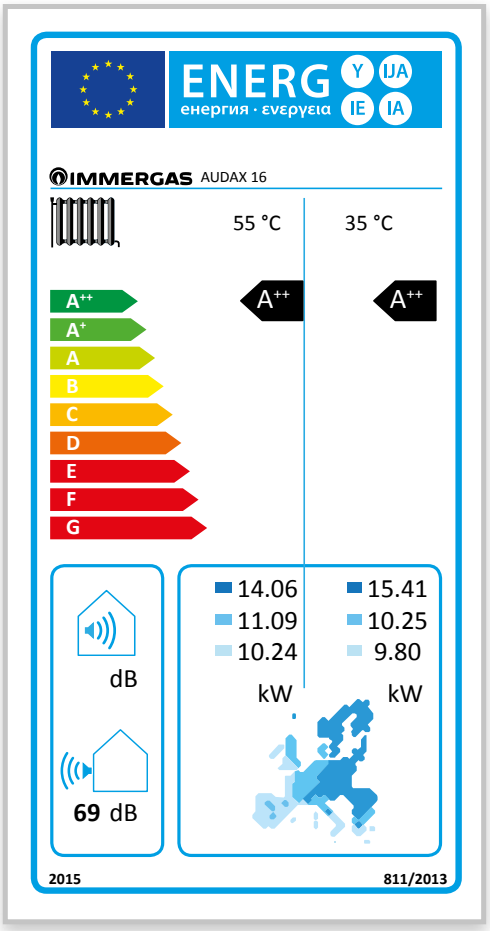
25 AUDAX 16 TECHNICAL DATA

Central heating circuit			
Power in CH mode with water set at 35 °C (1)		kW	15.00
Power in CH mode with water set at 45 °C (2)		kW	13.50
Power in CH mode with water set at 55 °C (3)		kW	13.61
CH mode COP with water set at 35 °C (1)			4.35
CH mode COP with water set at 45 °C (2)			3.50
CH mode COP with water set at 55 °C (3)			2.56
Min/max heat power with water set at 35 °C (1)		kW	3.80 / 16.52
Min/max heat power with water set at 45 °C (2)		kW	3.65 / 15.88
Min/max heat power with water set at 55 °C (3)		kW	3.28 / 14.90
Flow temperature range		°C	20 / 60
Outdoor temp. limits for Heating mode operation		°C	- 20 / 35
Cooling circuit			
Power in cooling mode with water set at 18 °C (1)		kW	17.00
Power in cooling mode with water set at 7 °C (2)		kW	13.00
Cooling mode EER with water set at 18 °C (1)			4.15
Cooling mode EER with water set at 7 °C (2)			3.20
Min/max cooling capacity with water set at 18 °C (1)		kW	4.79 / 18.64
Min/max cooling capacity with water set at 7 °C (2)		kW	2.64 / 13.84
Flow temperature range		°C	4 / 18
Outdoor temp. limits for Cooling mode operation		°C	0 / 46
General data			
System max. working pressure		bar	3
Head available on the system (with 2500 l/h flow rate)		kPa (m c.a.)	60 (6.12)
Minimum flow rate (flow switch)		l/h	600
Expansion vessel capacity		l	3
Water circuit content		l	4.4
C.H. sound power level		dB(A)	69
Appliance electric protection rating		IP	X4
Electric power supply		V - Hz	400 - 50
Permitted voltage range		V	376 - 424
Maximum power absorbed		W	10320
Maximum current absorbed		A	15.2
Fuse inserted		A	20
Refrigerant fluid load (R410A)*		g	3000
Heat pump Weight		kg	121

* Hermetically sealed system.

THE REPORTED DATA REFERS TO THE FOLLOWING CONDITIONS (in compliance with EN 14511):		
ROOM	HEATING PHASE (°C)	COOLING PHASE (°C)
Water TEMP. (F/R) (1) - AIR (db/wb)	35/30 - 7/6	18/23 - 35 (bs)
Water TEMP. (F/R) (2) - AIR (db/wb)	45/40 - 7/6	7/12 - 35 (bs)
Water TEMP. (F/R) (3) - AIR (db/wb)	55/47 - 7/6	

26 PRODUCT FICHE (REGULATION 811/2013)



AUDAX 16

Low temperature (30/35)

Parameter	Value	Colder zones	Average zones	Hotter zones
Annual energy consumption for the central heating function (Q_{HE})	kWh/year	10527	4858	2283
Room central heating seasonal efficiency (η_s)	ηs %	135	171	225
Nominal heat output	kW	15.41	10.25	9.80

Average temperature (47/55)

Parameter	Value	Colder zones	Average zones	Hotter zones
Annual energy consumption for the central heating function (Q_{HE})	kWh/year	11924	6734	3300
Room central heating seasonal efficiency (η_s)	ηs %	108	133	162
Nominal heat output	kW	14.06	11.09	10.24

AUDAX 16

27 AUDAX 16 "POWER" AND "COP" CENTRAL HEATING

• TOL = -20 °C

Temp. air °C		Output (kW) Nom.	Output (kW) Min.	Output (kW) Max.	COP (EN 14511) Nom.	COP (EN 14511) Min.	COP (EN 14511) Max.
d.b.	(w.b.)	Water flow temperature 35 °C					
10	(9)	15.75	4.03	17.15	4.54	5.41	4.44
7	(6)	15.00	3.80	16.52	4.35	4.99	4.27
2	(1)	9.65	5.28	10.40	3.56	4.48	3.37
-7	(-8)	8.72	2.57	9.15	2.90	3.05	2.75
-10	(-11)	7.78	2.24	8.51	2.44	2.95	2.15
-15	(-16)	2.91	1.96	2.91	1.87	1.95	1.87
-20	(-21)	2.65	1.86	2.65	1.55	1.61	1.55

d.b.	(w.b.)	Water flow temperature 45 °C					
10	(9)	15.20	3.92	16.58	3.76	4.36	3.48
7	(6)	13.50	3.65	15.88	3.50	3.80	3.32
2	(1)	8.70	5.32	10.46	2.94	3.17	2.78
-7	(-8)	8.06	2.42	8.60	2.34	2.49	2.24
-10	(-11)	3.53	1.96	3.53	1.94	1.97	1.94
-15	(-16)	2.76	1.83	2.76	1.56	1.60	1.56
-20	(-21)	2.39	1.71	2.39	1.30	1.35	1.30

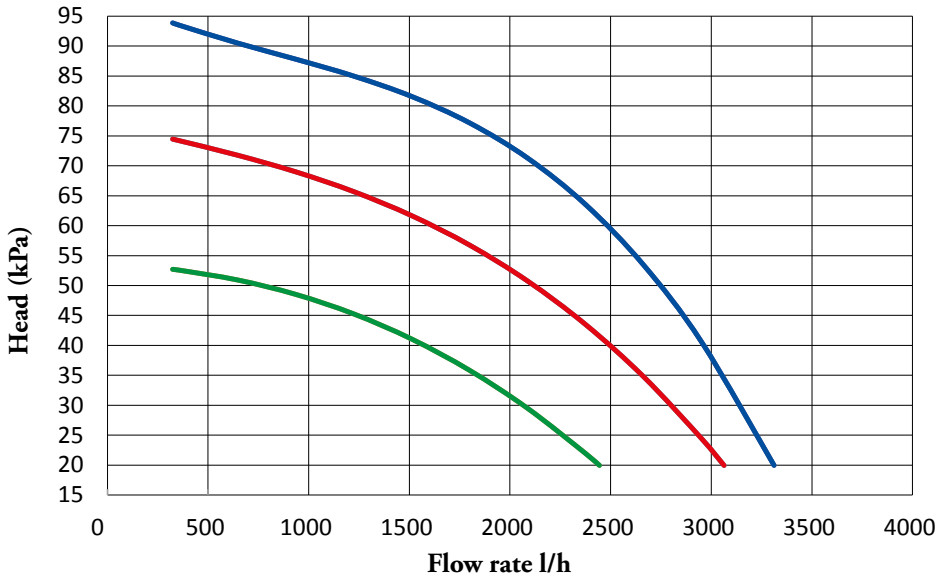
d.b.	(w.b.)	Water flow temperature 55 °C					
10	(9)	14.33	3.61	15.64	2.87	2.91	2.82
7	(6)	13.61	3.28	14.90	2.56	2.76	2.45
2	(1)	8.70	5.62	10.24	2.42	2.54	2.32
-7	(-8)	7.07	2.34	7.55	1.76	1.92	1.70
-10	(-11)	3.03	1.89	3.03	1.32	1.34	1.32
-15	(-16)	--	--	--	--	--	--
-20	(-21)	--	--	--	--	--	--

d.b.	(w.b.)	Water flow temperature 60 °C					
10	(9)	8.61	3.01	8.61	2.37	2.43	2.37
7	(6)	12.90	3.16	14.17	2.10	2.14	2.06
2	(1)	8.26	5.38	9.99	2.20	2.31	2.12
-7	(-8)	6.37	2.20	6.82	1.44	1.47	1.40
-10	(-11)	2.48	1.72	2.48	1.12	1.13	1.12
-15	(-16)	--	--	--	--	--	--
-20	(-21)	--	--	--	--	--	--

27.1 AUDAX 16 "POWER" AND "EER" COOLING

Temp. air °C	Output (kW) Nom.	Output (kW) Min.	Output (kW) Max.	EER (EN 14511) Nom.	EER (EN 14511) Min.	EER (EN 14511) Max.
d.b.	**Water flow temperature 18 °C**					
45	10.68	5.47	10.68	3.48	3.79	3.48
35	17.00	4.79	18.64	4.15	7.09	3.68
25	19.59	5.46	20.50	4.96	12.31	4.66
15	20.10	5.87	20.10	6.40	18.43	6.40
5	6.05	6.05	6.05	18.14	18.14	18.14
d.b.	**Water flow temperature 15 °C**					
45	9.85	4.87	9.85	3.22	3.18	3.22
35	16.63	4.29	17.42	3.76	5.47	3.50
25	18.30	4.99	19.15	4.70	9.15	4.41
15	18.76	5.42	18.76	6.02	14.23	6.02
5	5.86	5.75	5.86	15.50	15.50	15.50
d.b.	**Water flow temperature 10 °C**					
45	8.55	4.04	8.55	2.77	2.77	2.77
35	14.32	3.25	15.17	3.38	3.66	3.18
25	15.78	3.99	15.63	4.26	6.26	4.26
15	16.25	4.47	16.25	5.53	9.66	5.53
5	17.93	3.22	18.97	9.64	14.43	9.28
d.b.	**Water flow temperature 7 °C**					
45	8.00	3.57	8.00	2.52	2.67	2.52
35	13.00	2.64	13.84	3.20	3.48	3.01
25	14.40	3.41	14.26	4.04	5.23	4.04
15	14.37	3.92	14.37	5.39	8.33	5.39
5	16.32	2.80	17.26	6.89	12.92	6.74
d.b.	**Water flow temperature 5 °C**					
45	6.87	3.08	6.87	2.26	2.32	2.26
35	12.14	2.29	13.01	2.94	3.03	2.92
25	13.40	3.09	13.40	3.91	4.78	3.91
15	13.37	3.61	13.37	5.23	7.86	5.23
5	15.15	2.59	16.18	6.01	12.39	5.54

28 AUDAX 16 PUMP HEAD/FLOW RATE GRAPHICS



All curves have been defined in constant pressure mode with minimum, intermediate and maximum speed.

28.1 AUDAX 16 SETTINGS AND PUMP SETTINGS

AUDAX 16 range boilers are supplied with a low power consumption pump with variable speed control.
The pump's interface enables you to select between 6 pressure levels with 2 types of controls:

- 3 constant pressure (CP) curves
- 3 proportional pressure (PP) curves

Constant pressure curve (CP) default setting. The circulator pump maintains the pressure level (head) constant as the system heat demand decreases (flow rate reduction). With these settings, the pump is suitable for all floor systems.

Proportional pressure curve (PP). This allows the pressure level (head) to be proportionally reduced as the system heat demand decreases (flow rate reduction). Thanks to this function, the electric power consumption of the circulator pump is reduced further: the energy (power) used by the pump decreases according to the pressure level and flow rate. With this setting, the pump guarantees optimal performance in most heating systems, proving particularly suitable in single-pipe and two-pipe installations.

Setting procedure:	
1) Factory setting	Constant pressure curve CP3
2) Press the button for 10 seconds	The pump goes into setting mode - the LED starts flashing
3) Each time it is pressed, the settings change	LED “I”, “II”, and “III” are lit/the control curve and mode change
4) 10 seconds after the button is not pressed	The setting is changed - the pump goes back to operating mode
5) LED “I” or “II” or “III” is still lit	The pump is operating with the selected mode and curve

TECHNICAL NOTE: System minimum water content:
To facilitate proper execution of the AUDAX heat pump defrost cycles, a minimum water content in the system is required, which must be: ***6 l/kW*** *of the machine's power for any type of system. The flywheel guarantees normal operation of AUDAX with systems divided into zones (with variable water content in circulation). The flywheel also guarantees proper operation with fan coils used for cooling (a condition in which the flow temperature is very low and has significant heat load variations that vary the number of active fan coils). It is also important to check that the dehumidifier line has a minimum of* ***3 l/kW*** *of the machine (dehumidifier hydraulic circuit connection).*
N.B.: *for inertial tanks codes supplied by Immergas, refer to page 107.*

29 AUDAX 18 TECHNICAL DATA

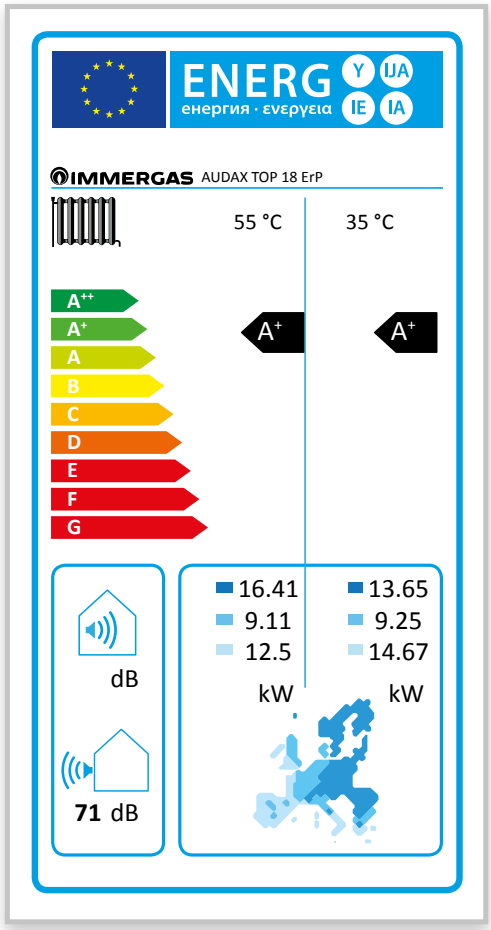
Central heating circuit			
Power in CH mode with water set at 35 °C (1)		kW	17.10
Power in CH mode with water set at 45 °C (2)		kW	16.16
Power in CH mode with water set at 55 °C (3)		kW	15.27
CH mode COP with water set at 35 °C (1)			4.10
CH mode COP with water set at 45 °C (2)			3.40
CH mode COP with water set at 55 °C (3)			2.69
Min/max heat power with water set at 35 °C (1)		kW	3.35 / 24.65
Min/max heat power with water set at 45 °C (2)		kW	3.20 / 23.15
Min/max heat power with water set at 55 °C (3)		kW	3.01 / 18.10
Flow temperature range		°C	20 / 60
Outdoor temp. limits for Heating mode operation		°C	- 20 / 30
Cooling circuit			
Power in cooling mode with water set at 18 °C (1)		kW	19.83
Power in cooling mode with water set at 7 °C (2)		kW	14.88
Cooling mode EER with water set at 18 °C (1)			3.87
Cooling mode EER with water set at 7 °C (2)			3.00
Min/max cooling capacity with water set at 18 °C (1)		kW	4.52 / 21.17
Min/max cooling capacity with water set at 7 °C (2)		kW	3.13 / 15.45
Flow temperature range		°C	5 / 18
Outdoor temp. limits for Cooling mode operation		°C	0 / 46
General data			
System max. working pressure		bar	3
Head available on the system (with 2700 l/h flow rate)		kPa (m c.a.)	84 (8,56)
Minimum flow rate (flow switch)		l/h	1000
Expansion vessel capacity		l	8
C.H. sound power level		dB(A)	71
Appliance electric protection rating		IP	X4
Electric power supply		V - Hz	400 - 50
Permitted voltage range		V	360 - 440
Maximum power absorbed		W	10800
Maximum current absorbed		A	16.7
Fuse inserted		A	25
Refrigerant fluid load (R410A)*		g	8000
Heat pump Weight		kg	190.9

* Hermetically sealed system.

THE REPORTED DATA REFERS TO THE FOLLOWING CONDITIONS (in compliance with EN 14511):		
ROOM	HEATING PHASE (°C)	COOLING PHASE (°C)
Water TEMP. (F/R) (1) - AIR (db/wb)	35/30 - 7/6	18/23 - 35 (bs)
Water TEMP. (F/R) (2) - AIR (db/wb)	45/40 - 7/6	7/12 - 35 (bs)
Water TEMP. (F/R) (3) - AIR (db/wb)	55/47 - 7/6	

AUDAX 18

30	PRODUCT FICHE (REGULATION 811/2013)



AUDAX 18

Low temperature (30/35)

Parameter	Value	Colder zones	Average zones	Hotter zones
Annual energy consumption for the central heating function (Q_{HE})	kWh/year	10390	5169	3425
Room central heating seasonal efficiency (η_s)	ηs %	121	144	225
Nominal heat output	kW	13.65	9.25	14.67

Average temperature (47/55)

Parameter	Value	Colder zones	Average zones	Hotter zones
Annual energy consumption for the central heating function (Q_{HE})	kWh/year	13894	6260	4383
Room central heating seasonal efficiency (η_s)	ηs %	108	118	149
Nominal heat output	kW	16.41	9.11	12.50

31 AUDAX 18 "POWER" AND "COP" CENTRAL HEATING

• TOL = -20 °C

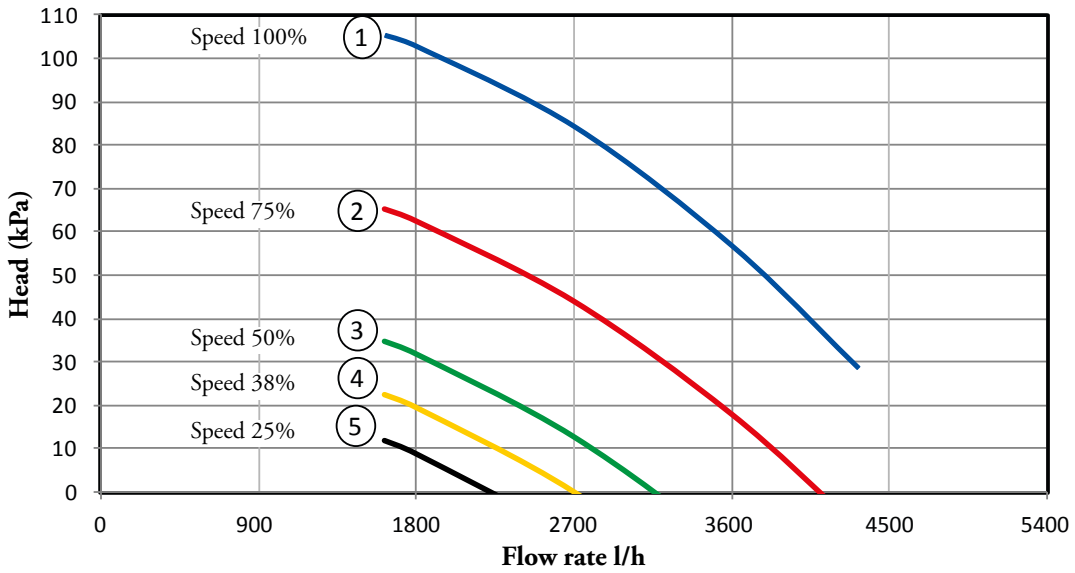
Temp. air °C		Output (kW) Nom.	Output (kW) Min.	Output (kW) Max.	COP (EN 14511) Nom.	COP (EN 14511) Min.	COP (EN 14511) Max.
d.b.	**(w.b.)**	**Water flow temperature 35 °C**					
10	(9)	17.27	3.73	24.83	4.13	5.50	3.47
7	(6)	17.10	3.35	24.65	4.10	3.93	3.53
2	(1)	12.72	5.50	18.04	3.05	3.22	2.53
-7	(-8)	5.86	3.44	8.46	2.41	2.26	2.11
-10	(-11)	5.40	3.46	5.51	2.28	2.11	2.25
-15	(-16)	4.14	3.01	4.15	2.11	1.91	2.09
-20	(-21)	3.52	2.51	3.58	1.89	1.70	1.89
d.b.	**(w.b.)**	**Water flow temperature 45 °C**					
10	(9)	16.25	3.54	24.49	3.33	3.69	2.89
7	(6)	16.16	3.20	23.15	3.40	2.73	2.88
2	(1)	12.03	5.17	17.31	2.50	3.02	2.09
-7	(-8)	7.47	3.27	10.92	2.19	1.83	1.92
-10	(-11)	6.94	4.42	7.14	2.10	1.73	2.08
-15	(-16)	5.29	3.80	5.33	1.92	1.57	1.92
-20	(-21)	4.57	3.29	4.61	1.76	1.44	1.76
d.b.	**(w.b.)**	**Water flow temperature 55 °C**					
10	(9)	15.35	3.34	18.64	2.75	2.75	2.75
7	(6)	15.27	3.01	18.10	2.69	2.07	2.68
2	(1)	11.43	4.94	13.20	2.10	2.41	1.95
-7	(-8)	7.15	3.10	8.45	1.87	1.52	1.79
-10	(-11)	6.62	4.15	6.80	1.78	1.43	1.77
-15	(-16)	--	--	--	--	--	--
-20	(-21)	--	--	--	--	--	--
d.b.	**(w.b.)**	**Water flow temperature 60 °C**					
10	(9)	14.69	3.32	15.66	2.49	2.48	2.44
7	(6)	14.74	2.77	15.30	2.58	1.71	2.57
2	(1)	11.07	4.78	11.37	1.92	2.17	1.90
-7	(-8)	6.95	3.07	7.06	1.72	1.41	1.69
-10	(-11)	6.45	4.18	6.58	1.65	1.36	1.63
-15	(-16)	--	--	--	--	--	--
-20	(-21)	--	--	--	--	--	--

AUDAX 18

31.1 AUDAX 18 "POWER" AND "EER" COOLING

Temp. air °C	Output (kW) Nom.	Output (kW) Min.	Output (kW) Max.	EER (EN 14511) Nom.	EER (EN 14511) Min.	EER (EN 14511) Max.
d.b.	**Water flow temperature 18 °C**					
45	18.10	5.79	18.13	2.99	1.95	2.99
35	19.83	4.52	21.17	3.87	3.67	3.65
25	21.04	6.84	21.46	4.94	7.45	4.93
15	21.54	6.94	21.55	5.26	8.88	5.26
10	21.68	8.92	21.69	5.98	7.50	5.98
d.b.	**Water flow temperature 15 °C**					
45	16.30	5.30	16.33	2.75	1.80	2.75
35	18.82	4.11	19.51	3.51	3.23	3.39
25	19.37	6.00	19.37	4.66	5.19	4.66
15	19.94	6.81	19.94	5.05	8.84	5.05
10	20.13	8.29	20.13	5.79	7.30	5.79
d.b.	**Water flow temperature 10 °C**					
45	14.03	4.55	14.05	2.50	1.57	2.50
35	16.26	3.48	16.88	3.20	2.64	3.10
25	16.74	5.14	16.74	4.20	4.34	4.20
15	17.39	6.06	17.39	4.67	8.92	4.66
10	17.63	7.77	17.63	5.44	7.20	5.44
d.b.	**Water flow temperature 7 °C**					
45	12.80	4.14	12.82	2.35	1.45	2.35
35	14.88	3.13	15.45	3.00	2.36	2.93
25	15.31	9.40	15.31	3.93	4.47	3.93
15	15.97	10.31	15.98	4.43	6.07	4.43
10	16.25	13.84	16.25	5.20	4.98	5.20
d.b.	**Water flow temperature 5 °C**					
45	11.99	3.87	12.01	2.25	1.38	2.25
35	13.97	2.91	14.52	2.89	2.19	2.82
25	14.16	8.78	14.16	3.67	4.18	3.67
15	15.06	9.65	15.06	4.26	5.48	4.26
10	15.34	13.05	15.34	5.04	4.72	5.04

32 AUDAX 18 PUMP HEAD/FLOW RATE GRAPHICS



All curves have been defined in constant pressure mode with various speeds.

32.1 AUDAX 18 SETTINGS AND PUMP SETTINGS

AUDAX 18 range boilers are supplied with a low power consumption pump with variable speed control and settable according to the following settings.

Assistance Menu -> System definition			
Menu item	Description	Range	Default
Pump control	Enable the pump operation with speed set "Max.speeed" or the modulating mode with tracking of the "Modulating" temperature differential.	Max.speed/ Modulating	Modulating
Minimum speed	Value of minimum speed used in modulating operation.	19% ÷ 50%	50%
Maximum speed	Value of maximum speed used in modulating operation.	50% ÷ 100%	100%
Delta T	Temperature delta to be maintained with modulating operation.	2 ÷ 20	5

TECHNICAL NOTE: System minimum water content:

*To facilitate proper execution of the AUDAX heat pump defrost cycles, a minimum water content in the system is required, which must be: **6 l/kW** of the machine's power for any type of system. The flywheel guarantees normal operation of AUDAX with systems divided into zones (with variable water content in circulation). The flywheel also guarantees proper operation with fan coils used for cooling (a condition in which the flow temperature is very low and has significant heat load variations that vary the number of active fan coils). It is also important to check that the dehumidifier line has a minimum of **3 l/kW** of the machine (dehumidifier hydraulic circuit connection).*

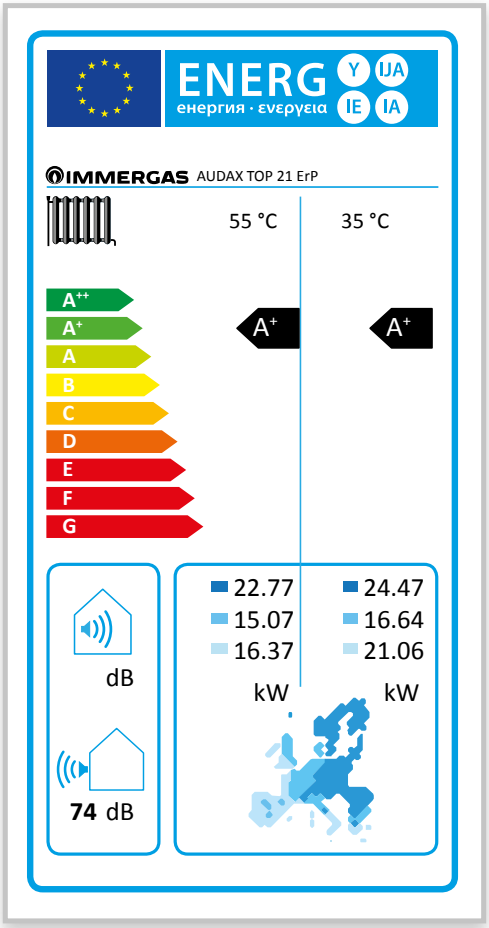
33 AUDAX 21 TECHNICAL DATA

Central heating circuit			
Power in CH mode with water set at 35 °C (1)		kW	21.00
Power in CH mode with water set at 45 °C (2)		kW	19.97
Power in CH mode with water set at 55 °C (3)		kW	19.07
CH mode COP with water set at 35 °C (1)			4.10
CH mode COP with water set at 45 °C (2)			3.30
CH mode COP with water set at 55 °C (3)			2.50
Min/max heat power with water set at 35 °C (1)		kW	8.90 / 30.45
Min/max heat power with water set at 45 °C (2)		kW	8.48 / 29.59
Min/max heat power with water set at 55 °C (3)		kW	7.89 / 23.24
Flow temperature range		°C	20 / 57
Outdoor temp. limits for Heating mode operation		°C	- 20 / 30
Cooling circuit			
Power in cooling mode with water set at 18 °C (1)		kW	25.80
Power in cooling mode with water set at 7 °C (2)		kW	18.58
Cooling mode EER with water set at 18 °C (1)			3.80
Cooling mode EER with water set at 7 °C (2)			3.10
Min/max cooling capacity with water set at 18 °C (1)		kW	11.97 / 30.67
Min/max cooling capacity with water set at 7 °C (2)		kW	8.67/23.08
Flow temperature range		°C	5 / 18
Outdoor temp. limits for Cooling mode operation		°C	0 / 46
General data			
System max. working pressure		bar	3
Head available on the system (with 2700 l/h flow rate)		kPa (m c.a.)	85 (8.65)
Minimum flow rate (flow switch)		l/h	1000
Expansion vessel capacity		l	8
C.H. sound power level		dB(A)	74
Appliance electric protection rating		IP	X4
Electric power supply		V - Hz	400 - 50
Permitted voltage range		V	360 - 440
Maximum power absorbed		W	12400
Maximum current absorbed		A	19.1
Fuse inserted		A	25
Refrigerant fluid load (R410A)*		g	8000
Heat pump Weight		kg	199.4

* Hermetically sealed system.

THE REPORTED DATA REFERS TO THE FOLLOWING CONDITIONS (in compliance with EN 14511):		
ROOM	HEATING PHASE (°C)	COOLING PHASE (°C)
Water TEMP. (F/R) (1) - AIR (db/wb)	35/30 - 7/6	18/23 - 35 (bs)
Water TEMP. (F/R) (2) - AIR (db/wb)	45/40 - 7/6	7/12 - 35 (bs)
Water TEMP. (F/R) (3) - AIR (db/wb)	55/47 - 7/6	

34 PRODUCT FICHE (REGULATION 811/2013)



AUDAX 21

Low temperature (30/35)

Parameter	Value	Colder zones	Average zones	Hotter zones
Annual energy consumption for the central heating function (Q_{HE})	kWh/year	19152	9625	5764
Room central heating seasonal efficiency (η_s)	ηs %	117	139	192
Nominal heat output	kW	24.47	16.64	21.06

Average temperature (47/55)

Parameter	Value	Colder zones	Average zones	Hotter zones
Annual energy consumption for the central heating function (Q_{HE})	kWh/year	22602	10889	5983
Room central heating seasonal efficiency (η_s)	ηs %	92	111	143
Nominal heat output	kW	22.77	15.07	16.37

35 AUDAX 21 "POWER" AND "COP" CENTRAL HEATING

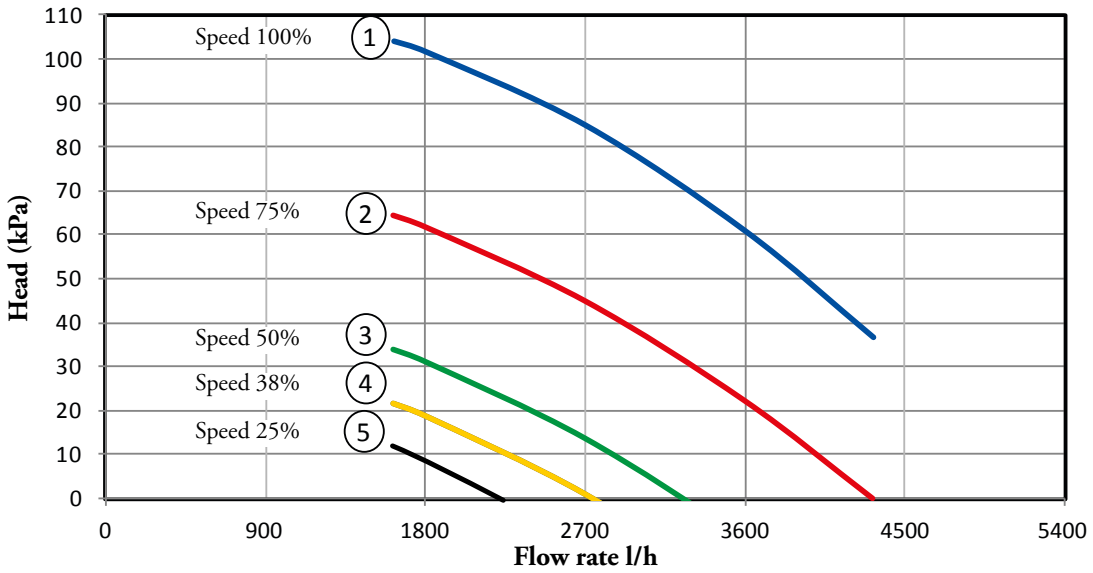
• TOL = -20 °C

Temp. air °C		Output (kW) Nom.	Output (kW) Min.	Output (kW) Max.	COP (EN 14511) Nom.	COP (EN 14511) Min.	COP (EN 14511) Max.
d.b.	(w.b.)	Water flow temperature 35 °C					
10	(9)	22.88	10.33	32.72	4.48	3.80	3.62
7	(6)	21.00	8.90	30.45	4.10	4.37	3.43
2	(1)	15.62	7.27	22.79	2.90	3.08	2.47
-7	(-8)	10.39	6.96	15.31	2.51	2.59	2.22
-10	(-11)	9.56	6.36	10.30	2.37	2.41	2.35
-15	(-16)	7.57	5.40	7.58	2.15	2.13	2.15
-20	(-21)	6.32	4.49	6.40	1.93	1.87	1.92
d.b.	(w.b.)	Water flow temperature 45 °C					
10	(9)	21.71	9.72	31.49	3.59	2.86	2.99
7	(6)	19.97	8.48	29.59	3.30	3.37	2.61
2	(1)	14.83	6.84	21.67	2.34	2.41	2.03
-7	(-8)	9.74	6.47	14.70	1.99	2.02	1.80
-10	(-11)	8.94	5.88	9.66	1.89	1.89	1.87
-15	(-16)	7.00	4.96	7.01	1.71	1.68	1.71
-20	(-21)	5.84	4.06	5.85	1.54	1.49	1.54
d.b.	(w.b.)	Water flow temperature 55 °C					
10	(9)	20.47	9.06	24.92	2.92	2.21	2.73
7	(6)	19.07	7.89	23.24	2.50	2.63	2.36
2	(1)	13.70	6.37	17.02	1.90	1.91	1.83
-7	(-8)	9.03	5.95	11.28	1.60	1.60	1.55
-10	(-11)	8.24	5.37	8.98	1.52	1.50	1.52
-15	(-16)	--	--	--	--	--	--
-20	(-21)	--	--	--	--	--	--

35.1 AUDAX 21 "POWER" AND "EER" COOLING

Temp. air °C	Output (kW) Nom.	Output (kW) Min.	Output (kW) Max.	EER (EN 14511) Nom.	EER (EN 14511) Min.	EER (EN 14511) Max.
d.b.	**Water flow temperature 18 °C**					
45	21.38	9.38	23.08	2.83	3.03	2.77
35	25.81	11.97	30.67	3.80	4.24	3.05
25	27.70	10.52	32.63	4.79	5.57	3,85
15	29.16	9.71	35.50	5.79	5.30	4.92
10	28.87	19.85	35.49	5.67	5.92	5.01
d.b.	**Water flow temperature 15 °C**					
45	19.76	8.62	21.34	2.70	2.83	2.65
35	23.40	11.00	28.49	3.36	3.91	2.95
25	25.65	9.60	30.32	4.59	4.99	3.74
15	26.75	9.30	32.59	5.40	5.76	4.65
10	26.91	18.43	32.59	5.56	5.63	4.72
d.b.	**Water flow temperature 10 °C**					
45	17.21	7.45	18.60	2.47	2.51	2.43
35	20.43	9.50	25.03	3.09	3.42	2.77
25	22.45	8.23	26.69	4.23	4.22	3.53
15	22.83	7.91	28.12	4.64	4.60	4.19
10	23.27	16.18	28.40	4.95	5.13	4.35
d.b.	**Water flow temperature 7 °C**					
45	15.79	6.79	17.07	2.34	2.33	2.30
35	18.58	8.67	23.08	3.10	3.33	2.65
25	20.65	14.38	24.63	4.02	4.27	3.40
15	21.12	13.24	25.69	4.49	3.26	3.93
10	21.57	14.90	25.83	4.83	4.83	4.02
d.b.	**Water flow temperature 5 °C**					
45	14.86	6.37	16.08	2.25	2.21	2.22
35	17.70	8.14	21.82	2.96	3.14	2.57
25	19.50	13.54	32.31	3.87	4.06	3.30
15	20.02	12.51	24.01	4.38	3.12	3.69
10	20.47	14.08	23.95	4.73	4.63	3.68

36 AUDAX 21 PUMP HEAD/FLOW RATE GRAPHICS



All curves have been defined in constant pressure mode with various speeds.

36.1 AUDAX 21 SETTINGS AND PUMP SETTINGS

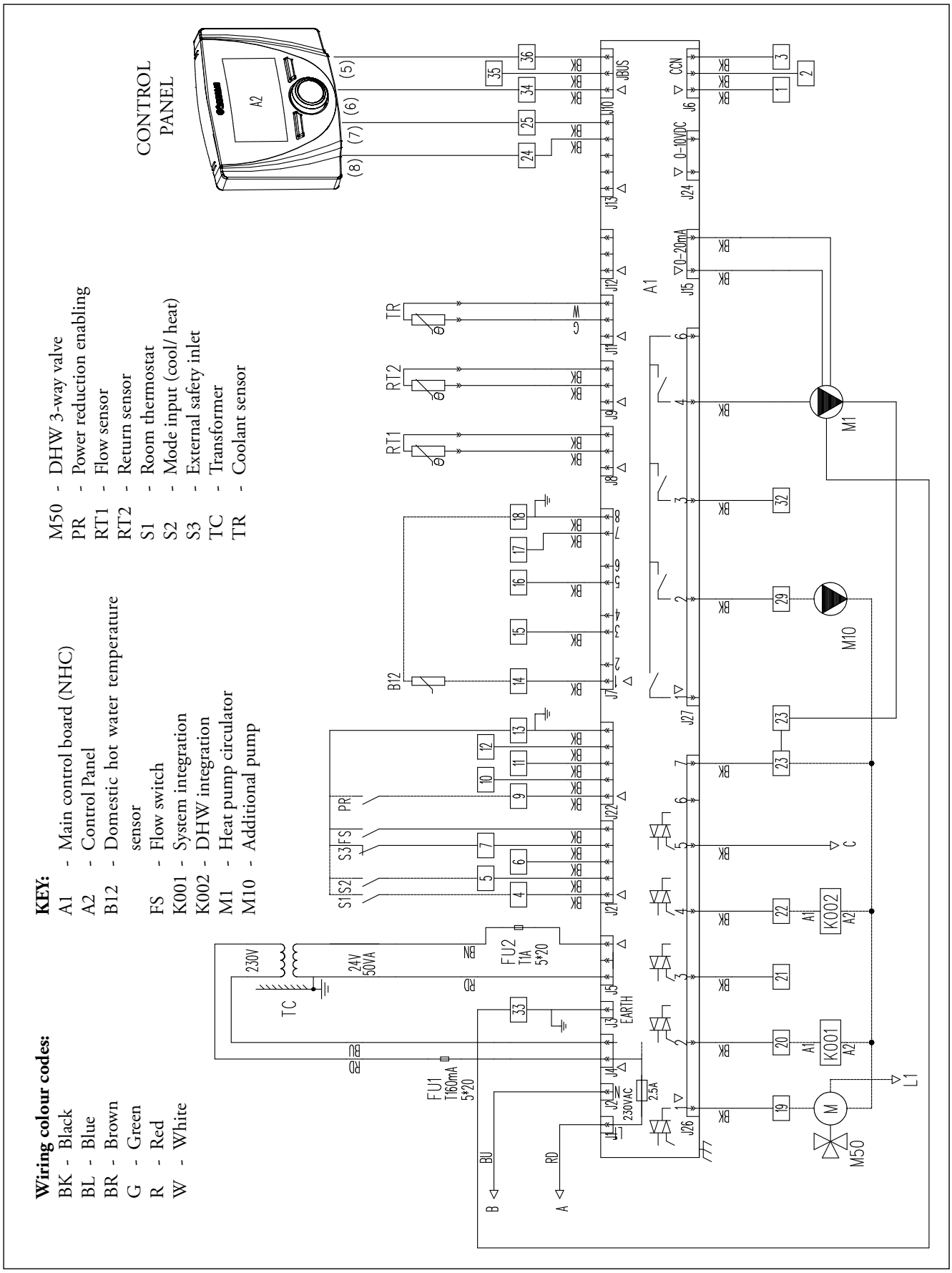
AUDAX 21 range boilers are supplied with a low power consumption pump with variable speed control and settable according to the following settings.

Assistance Menu -> System definition			
Menu item	Description	Range	Default
Pump control	Enable the pump operation with speed set "Max.speeed" or the modulating mode with tracking of the "Modulating" temperature differential.	Max.speed/ Modulating	Modulating
Minimum speed	Value of minimum speed used in modulating operation.	19% ÷ 50%	50%
Maximum speed	Value of maximum speed used in modulating operation.	50% ÷ 100%	100%
Delta T	Temperature delta to be maintained with modulating operation.	2 ÷ 20	5

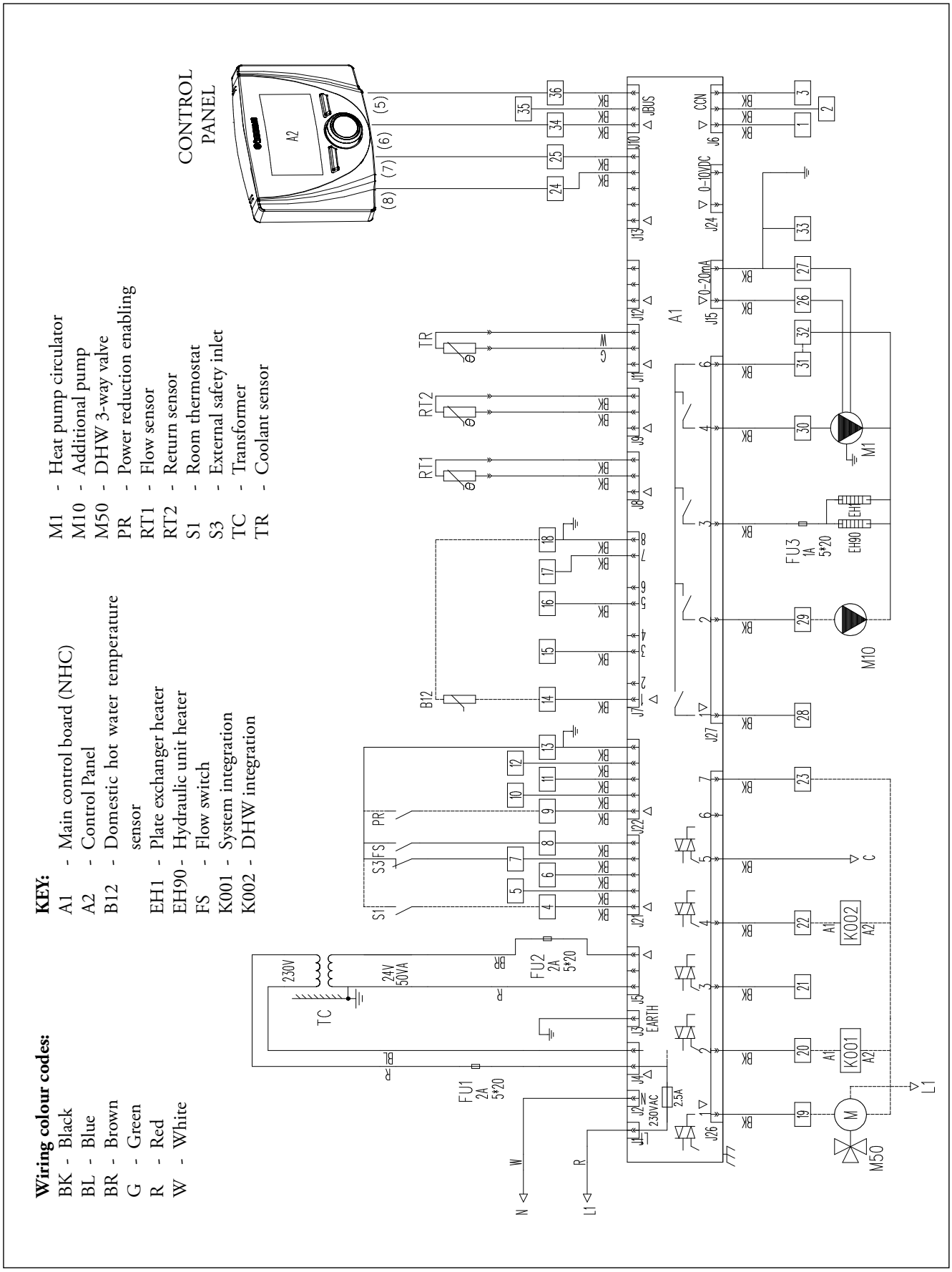
TECHNICAL NOTE: System minimum water content:

To facilitate proper execution of the AUDAX heat pump defrost cycles, a minimum water content in the system is required, which must be: ***6 l/kW*** *of the machine's power for any type of system. The flywheel guarantees normal operation of AUDAX with systems divided into zones (with variable water content in circulation). The flywheel also guarantees proper operation with fan coils used for cooling (a condition in which the flow temperature is very low and has significant heat load variations that vary the number of active fan coils). It is also important to check that the dehumidifier line has a minimum of* ***3 l/kW*** *of the machine (dehumidifier hydraulic circuit connection).*

37 AUDAX 6 - 8 - 12 - 16 CONTROL DIAGRAM



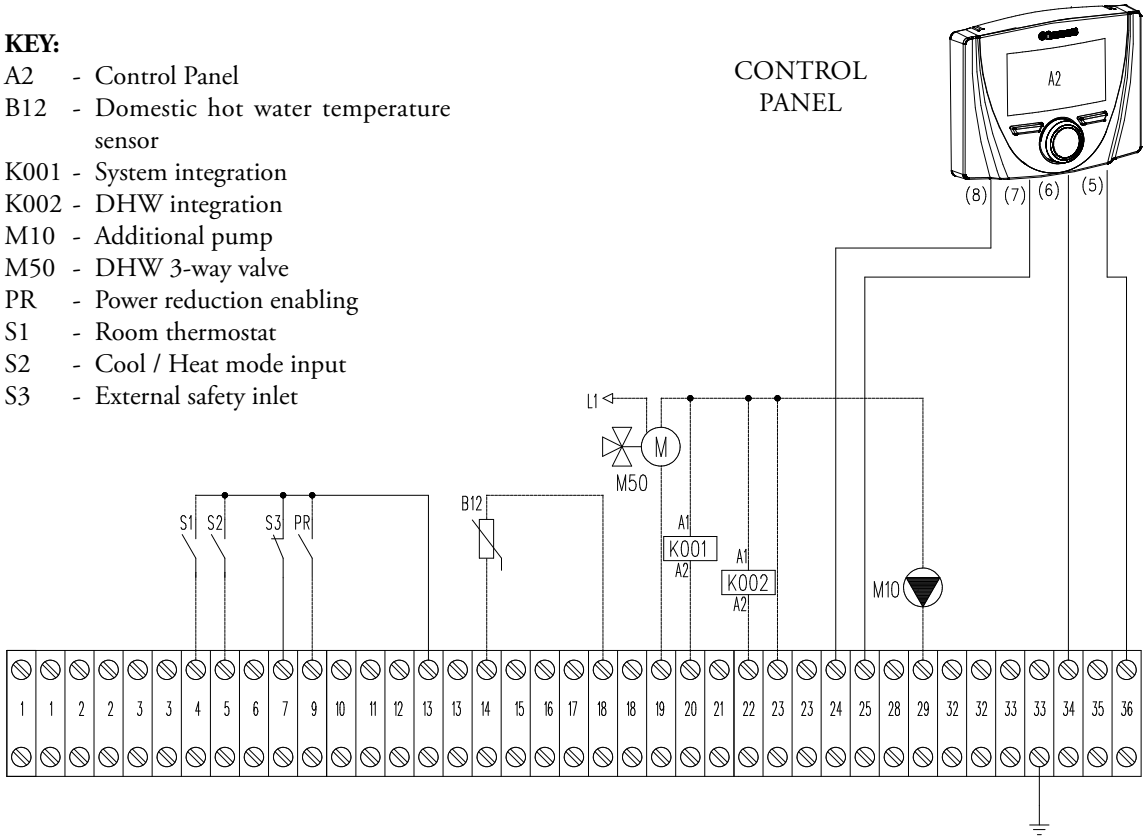
38 AUDAX 18-21 CONTROL DIAGRAM



39 AUDAX TOP 6 - 8 -12 - 16 TERMINAL BLOCK ELECTRICAL CONNECTIONS

KEY:

A2 - Control Panel
B12 - Domestic hot water temperature sensor
K001 - System integration
K002 - DHW integration
M10 - Additional pump
M50 - DHW 3-way valve
PR - Power reduction enabling
S1 - Room thermostat
S2 - Cool / Heat mode input
S3 - External safety inlet



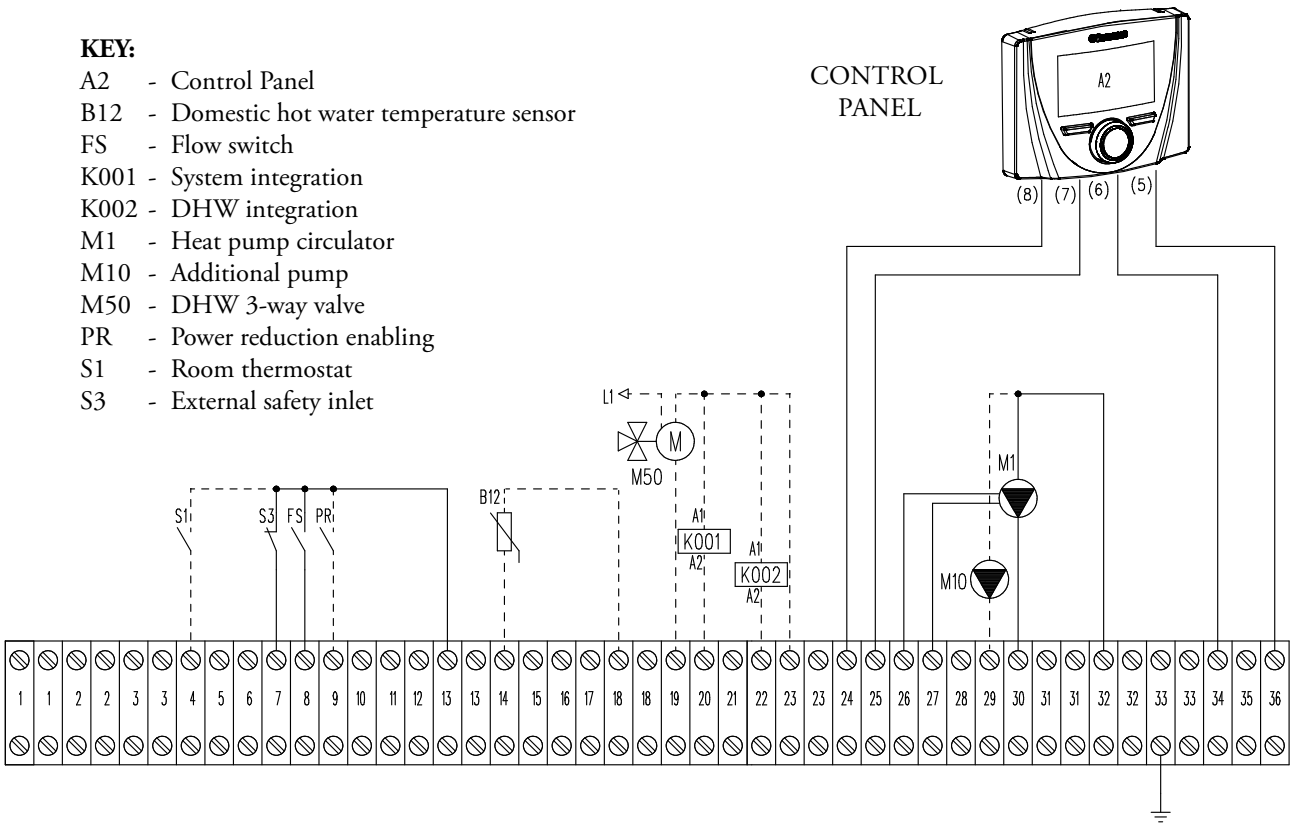
N.B.: With system Manager applications, the Control Panel (standard) can also function as a room temperature/humidity probe of a system's zone. Refer to the chapter with regard to examples of application diagrams on pages 88 to 103 for the electrical connections.

AUDAX 6 - 8 - 12 - 16 TERMINAL BLOCK PIN				
Description		PIN	Signal	Limits
M10	Additional / booster pump	29 - 23	Output, Relay Contact	1 ph ~ 230V, 2A
M50	DHW 3-way valve	19 - 23 - L1	Output 230Vac (23-L1: Supply voltage, 19: signal)	1 ph ~ 230V, 2A
K001	System Integration (electrical resistance control)	20 - 23	Output, Relay Control	1 ph ~ 230V
K002	DHW Integration (electrical resistance control)	22 - 23	Output, Relay Control	1 ph ~ 230V
B12	D.H.W. request probe	14 - 18	NTC Probe 10 kohm 25 °C	- -
PR	Compressor Maximum Frequency Reduction	9 - 13	Input (contacts quality switch >25mA@12V)	N.A.
S1	Room thermostat (On = closed)	4 - 13	Input (contacts quality switch >25mA@12V)	N.A.
S2	Cool / heat mode input	5 - 13	Closed central heating / C.H. potential-free contact	N.A.
S3	External safety inlet	7 - 13	Input (contacts quality switch >25mA@12V)	N.C.

40 AUDAX TOP 18 - 21 TERMINAL BLOCK ELECTRICAL CONNECTIONS

KEY:

A2 - Control Panel
B12 - Domestic hot water temperature sensor
FS - Flow switch
K001 - System integration
K002 - DHW integration
M1 - Heat pump circulator
M10 - Additional pump
M50 - DHW 3-way valve
PR - Power reduction enabling
S1 - Room thermostat
S3 - External safety inlet



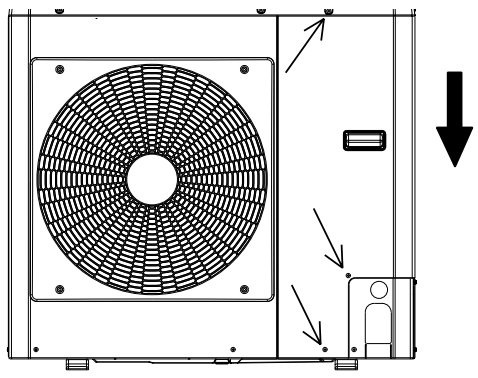
N.B.: With system Manager applications, the Control Panel (standard) can also function as a room temperature/humidity probe of a system's zone. Refer to the chapter with regard to examples of application diagrams on pages 88 to 103 for the electrical connections.

AUDAX 18 - 21 TERMINAL BLOCK PIN				
Description		PIN	Signal	Limits
M1	Heat pump Internal circulator	30 - 32	Output, Relay Contact	1 ph ~ 230V, 2A
M1	Internal circulator modulation control	26 - 27	PWM Control	- -
M10	Additional / booster pump	29 - 32	Output, Relay Contact	1 ph ~ 230V, 2A
M50	DHW 3-way valve	19 - 23 - L1	Output 230Vac (23-L1: Supply voltage, 19: signal)	1 ph ~ 230V, 2A
K001	System Integration (electrical resistance control)	20 - 23	Output, Relay Control	1 ph ~ 230V
K002	DHW Integration (electrical resistance control)	22 - 23	Output, Relay Control	1 ph ~ 230V
B12	D.H.W. request probe	14 - 18	NTC Probe 10 kohm 25 °C	- -
FS	Flow switch	8 - 13	Input (contacts quality switch >25mA@12V)	N.A.
PR	Compressor Maximum Frequency Reduction	9 - 13	Input (contacts quality switch >25mA@12V)	N.A.
S1	Room thermostat (On = closed)	4 - 13	Input (contacts quality switch >25mA@12V)	N.A.
S3	External safety inlet	7 - 13	Input (contacts quality switch >25mA@12V)	N.C.

41 ELECTRIC CONNECTION CABLES FEATURES

Audax 6 - 8 - 12 - 16 (Mono-phase)					
Unit		6 kW	8 kW	12 kW	16 kW
Power supply	V - ph - Hz	230 - 1 - 50			
Permitted voltage range	V	207 ÷ 253			
Maximum power absorbed	kW	1.80	3.38	4.73	5.18
Maximum current absorbed	A	8	15	21	23
Supply voltage fuses		gG Type	gG Type	gG Type	gG Type
	A	16	20	32	32
Supply voltage cable section	mm^2 (per phase)	3G x 2.5 mm^2	3G x 2.5 mm^2	3G x 4 mm^2	3G x 4 mm^2
Supply voltage cable Max. section	mm^2 (per phase)	3G x 4 mm^2			
Supply voltage cable type		H07RN-F			
Maximum length	m	80			
External pump circulation maximum current	A	2			
Use H03VV-F 5x0.75 mm^2 cables to connect the Control Panel					

AUDAX 16 - 18 - 21 (Three-phase)				
Unit		16 kW	18 kW	21 kW
Power supply	V - ph - Hz	400 - 3 +N - 50		
Permitted voltage range	V	376 ÷ 424	360 ÷ 440	360 ÷ 440
Maximum power absorbed	kW	10.32	10.80	12.40
Maximum current absorbed	A	15.2	16.7	19.1
Supply voltage fuses		gG Type	gG Type	gG Type
	A	20	25	25
Supply voltage cable section	mm^2 (per phase)	5G x 2.5 mm^2	5G x 4 mm^2	5G x 4 mm^2
Supply voltage cable Max. section	mm^2 (per phase)	5G x 6 mm^2		
Supply voltage cable type		H07RN-F		
Maximum length	m	80		
External pump circulation maximum current	A	2		
Use H03VV-F 5x0.75 mm^2 cables to connect the Control Panel				



Remove the panel (refer to the fig. on the side) to see the electrical components on the front. The electrical supply voltage cables can be inserted in the holes set up. You must clamp the electrical cables using group cable ties in order to prevent them from touching the compressor and hot pipes.
The unit can be controlled and set by means of:
• Control panel (standard).
• Switches or thermostats (not supplied).
Refer to the figure above for electrical connections.
N.B.: the quality of the contacts must be higher than 25mA @ 12V. You are always required to install a circuit breaker switch.

AUDAX and Integrated Systems

42 SYSTEM MANAGER

It is an electronic controller with microprocessor, realised with the objective of being a "unique manager" for integrated systems. Thanks to this innovative supervisor, it is possible to establish and activate the most convenient heat source depending on functional, environmental and "economic" parameters.
In fact, to control everything, the System manager must acquire the data relative to the external temperature (from the external probe) and the system flow temperature (relative to the pre-set climatic curve),after having configured the fuel cost parameter (e.g. methane gas) and that of the electric energy.
Designed to enhance climatic comfort, it allows you to set different climatic curves for each zone, both for hot and cold.
The user interface is made up from an LCD with matrix and a 6-key membrane keyboard.
Installation takes place on a guide for electric components from control board.

42.1 TECHNICAL FEATURES

Using the system manager (integrated with the relative expansion kits) it is possible to control:

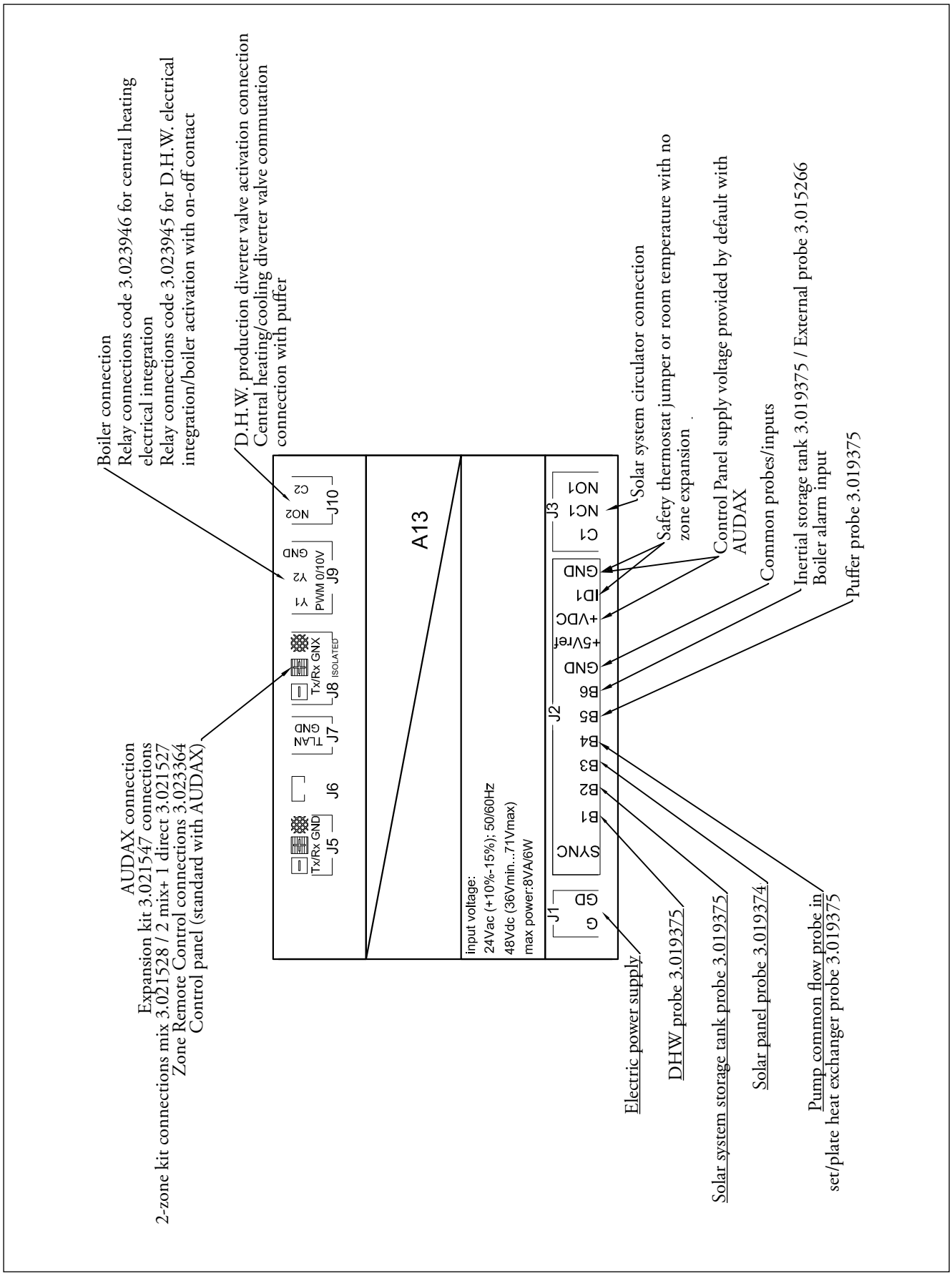
- up to 4 AUDAX heat pumps in set configuration;
- Immergas boiler;
- storage tank for D.H.W. production (the D.H.W. temperature is managed by the NTC probe);
- room C.H. storage tank (the temperature inside the tank is managed by the NTC probe);
- up to 2 solar circulation units for systems with manifolds arranged on different slopes;
- temperature probes (NTC - PT1000);
- on-off request dry contact;
- integrative electric resistance for DHW;
- integrative electric resistance for heat system;
- variable flow temperature of the heat pump and the boiler (using the required models), depending on the external temperature (a climatic curve is pre-selected);
- 4 expansion boards to manage the air conditioning system (3 of which for any mixed/not mixed zones and one used exclusively in the high temp. zone that operates independently, connected to the boiler circuit);
- up to 3 humidity-temp. sensors or 4 Zone remote controls;
- up to 3 dehumidifiers.
- 1 expansion board for the additional functions, namely:
  - hot/cold switch-over on distinct systems (for example systems with radiant panel heating and fan-coil cooling);
  - recirculation pump management for DHW;
  - acquisition of a signal from a system that generates electrical energy (e.g. photovoltaic system);
  - signal acquisition by a biomass system;
  - management of a pump downstream of the plate heat exchanger;
  - management of a pump for thermal discharge;
  - management of a remote activation or domotics remote control system via telephone dialer;

On the other hand, in terms of the main settings that can/must be carried out, the System Manager allows you to acquire or programme:

- outdoor temperature (with a probe already installed on AUDAX);
- system flow temperature;
- storage tank temperature (even through 2-3 probes, 1 of which refers to the solar-heated part of the boiler);
- by means of self-diagnosis, detection and display of error codes in the event of anomalies;
- date and time;
- differentiated selection and programming for each individual zone;
- programming the time periods for DHW production;
- anti-legionella program (in a system where there is a boiler or integrative resistance on the storage tank, in addition to the Heat pump);
- cost of combustion (Methane or LPG);
- cost of the electric energy;
- management of the heat/cooling sources.

• System manager **code 3.021522**

43 SYSTEM MANAGER ELECTRICAL CONNECTIONS



AUDAX and Integrated Systems

NOTE:
Electrical connection between the system Manager and the boilers (except models: range VICTRIX TT ErP, VICTRIX kW TT, VICTRIX MAIOR TT, VICTRIX EXA, VICTRIX SUPERIOR ErP, VICTRIX ZEUS SUPERIOR ErP, ARES CONDENSING ErP, HERCULES MINI ErP, HERCULES CONDENSING ErP, HERCULES CONDENSING ABT ErP and HERCULES SOLAR 200 ErP), must be carried out via electronic relay (abbreviation EMR 12 Vdc code 3.023945);

- the electrical connection between the System Manager and the 2, 4 or 6 kW system integrative resistance kit must be set up using a solid state electronic relay (abbreviation SSR 6 Vdc code 3.023946).

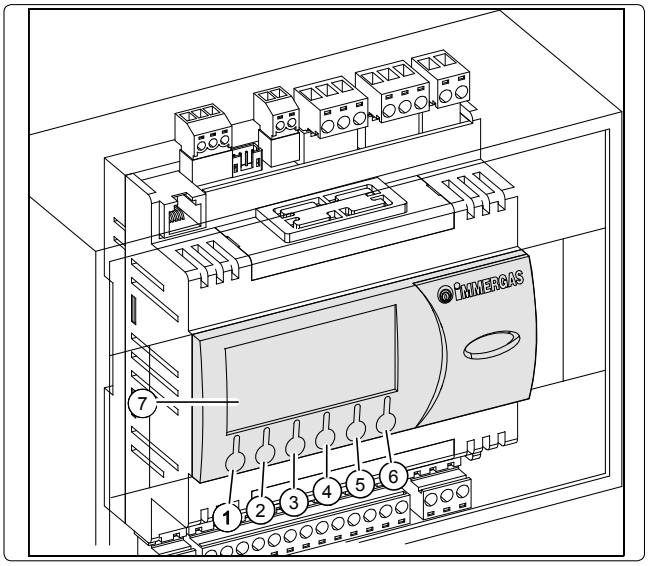
43.1 TECHNICAL DATA

The System manager can be powered exclusively via transformer or relevant generator:
- direct power supply: 48 Vdc (36 Vmin…72 Vmax.)
- alternating power supply: 24 Vac +10/-15 %, 50/60 Hz

The device has the following features:
- user interface via LCD with matrix
- membrane keyboard with 6 keys
- installation on DIN guide for electric components from control board
- dimensions: L 105 x H 110 x D 60

Operating conditions	-10° T 60 °C, 90% RH non-condensing
Degree of protection	IP40 only on front panel
Class depending on protection against electric shock	to be integrated on Class I and/or II equipment
Period of electric stress of the isolating parts	long
Type of disconnection or micro switching	micro switching
Category of resistance to heat and fire	Category D (UL94-V0)
Immunity against surges	Category II
Ageing features (functioning hours)	80.000
No.° of automatic operation handling cycles	100,000 (EN 60730-1); 30,000 (UL 873)
Class and structure of the software	Class A
Surge immunity category	Category III (IEC EN 61000-4-5)

44 DESCRIPTION AND CONTROLS OF SPECIAL FUNCTIONS



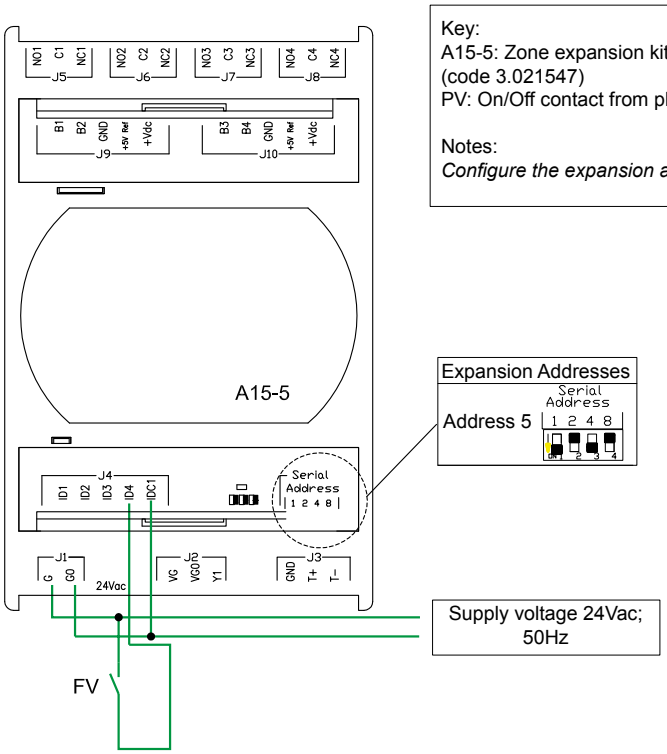
This **button (1)** allows you to change the operating mode of the system, specifically: Summer (only DHW and solar heating), Summer with cooling, Winter, Party (all zones are set in Comfort mode), Standby (all requests are disabled: room antifreeze protection < 5°C only remains active, if Immergas room probe is installed).
This **button (2)** allows you to access the submenus: Selection, Programming, Info, Alarms log, Assistance.
This **button (3)** allows you to move back from a current menu to the previous one.
These **buttons (4 and 5)** allow you to scroll through the menus on the screen cyclically or to increase or decrease the value of the various parameters.
The **button (6)** enables you to change the displayed data.

- winter - room central heating and DHW production functions are enabled;
- summer - DHW production only is enabled;
- comfort temperature is active;
- AUTO operating with automatic program;
- operating with manual program;
- operating with holiday timer program;
- operation with energy savings programme;
- symbol indicating anomaly;
- request for central heating in room in progress;
- request for DHW in progress;
- DHW heating and cooling program;
- operating in “Party” mode;
- request to heat or cool room;
- solar panel operation in progress;
- system in Stand-by;
- request for cooling in room in progress;
- dehumidifier with cooled air;
- dehumidifier with neutral air;

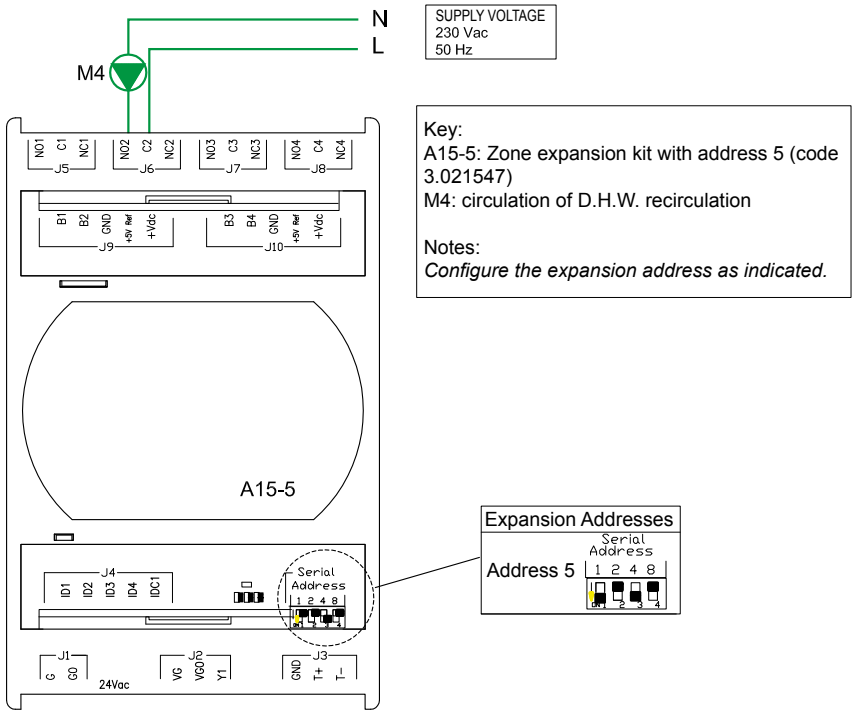
DISPLAY (7) description:
The system Manager is equipped with several important functions and application options:
• Set climatic curves for each zone, both for hot and cold; maximum temperature of 85 °C, which can be selected for all zones;
• Identify each zone independently: only hot, hot/cold, hot/cold with dehumidifier and dew point calculation, cold only, cold only with dehumidifier and dew point calculation. The said dew point calculation function can also be enabled/disabled if dehumidifier management is disabled (e.g. with another dehumidifier system managed independently);
• Set the Tminimum integration (cut off) or COP calculation to use the heat pump;
• Optimise the flow temperature to the system by means of probes situated on the secondary booster circuit (e.g. with a hydraulic manifold);
• Optimise the flow temperature to the system by means of probes situated on the hot and cold thermal flywheel / inertial storage tank;
• Management of an external probe in case AUDAX is installed in unfavourable conditions to detect the outdoor temperature;
• In the event of boiler integration, it is also possible to keep AUDAX permanently active if COP is advantageous. The Manager must be connected to the boiler via the external probe clamps (range models VICTRIX TT ErP, VICTRIX kW TT, VICTRIX MAIOR TT, VICTRIX EXA, VICTRIX SUPERIOR ErP and all models with SUPERIOR electronics - refer to the list in the previous page);
• DHW production boiler management via the heat pump as opposed to the solar system (AUDAX connected to the lower coil, boiler connected to the upper coil), in order to obtain renewable source coverage on DHW;
• Input on expansion address “5” to force activation of AUDAX with the FV system, which generates electricity (refer to the diagram on the next page). By using an inverter/electronic device that supplies a signal when FV production exceeds a set value, a contact closes on expansion address "5", which:
→Immediately brings the DHW storage tank to 50 °C, disabling any programmed DHW time bands;
→The minimum COP functional convenience is reset and Tminimum integration brought to -15 °C, thus removing integration from the boiler; the only thing that remains active is the maximum time for the system to be fully operational, beyond which the boiler is activated in order to guarantee climatic comfort;
→If a puffer system is configured in the menu, it is heated up to 55 °C, even without request from the system; also in this case, the only thing to remain active is the maximum time for the system to be fully operational.
• Input on expansion address “4” to disable the generators (e.g. boiler or electrical resistance remain on Standby) when a thermoflue operates;
• Possibility to have a remote-domotic management on the Manager with digital signals or communication protocol;
• Possibility to have an activation via telephone dialler;

44.1 EXAMPLES OF EXPANSIONS WITH ADDRESS "4" AND "5" FOR AUXILIARIES

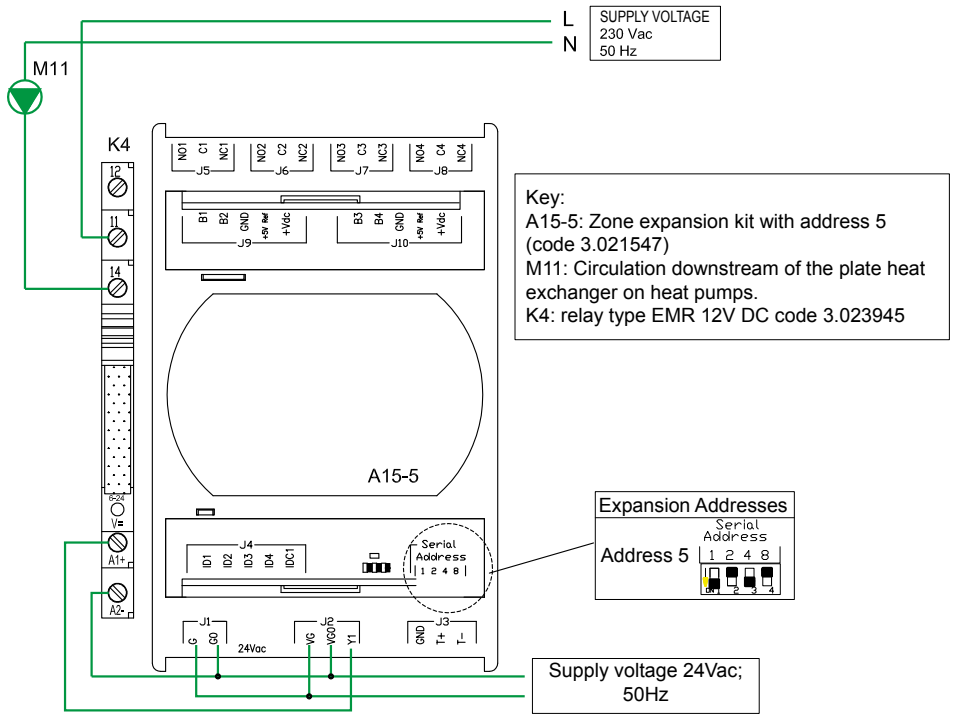
Photovoltaic contact management



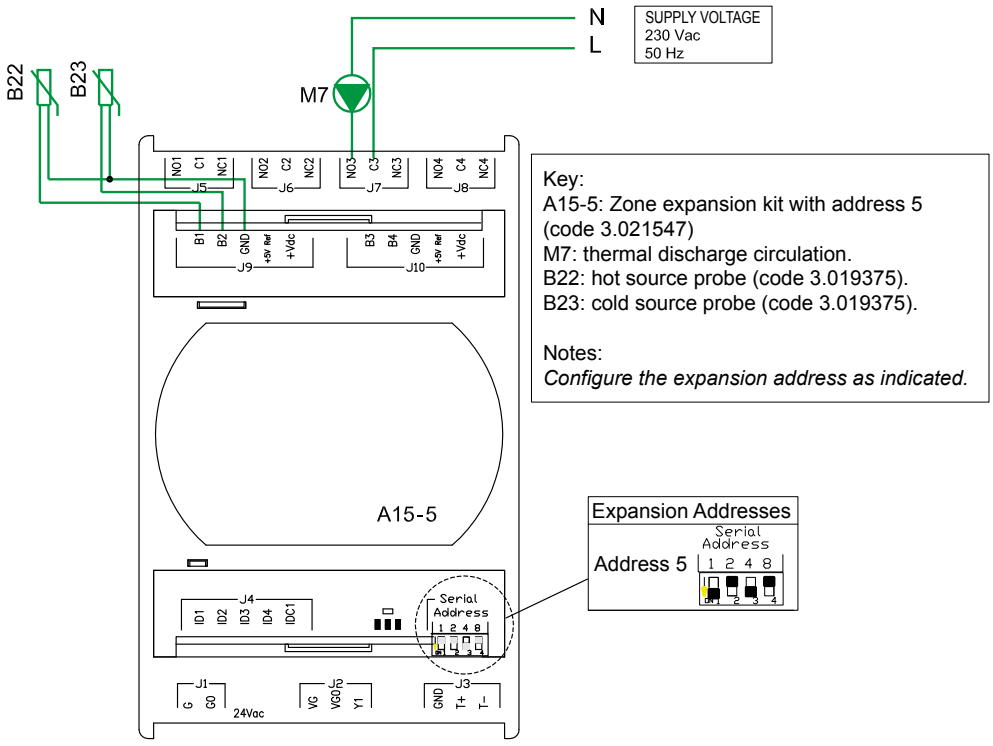
DHW recirculation pump management



Pump management downstream of the plate heat exchanger

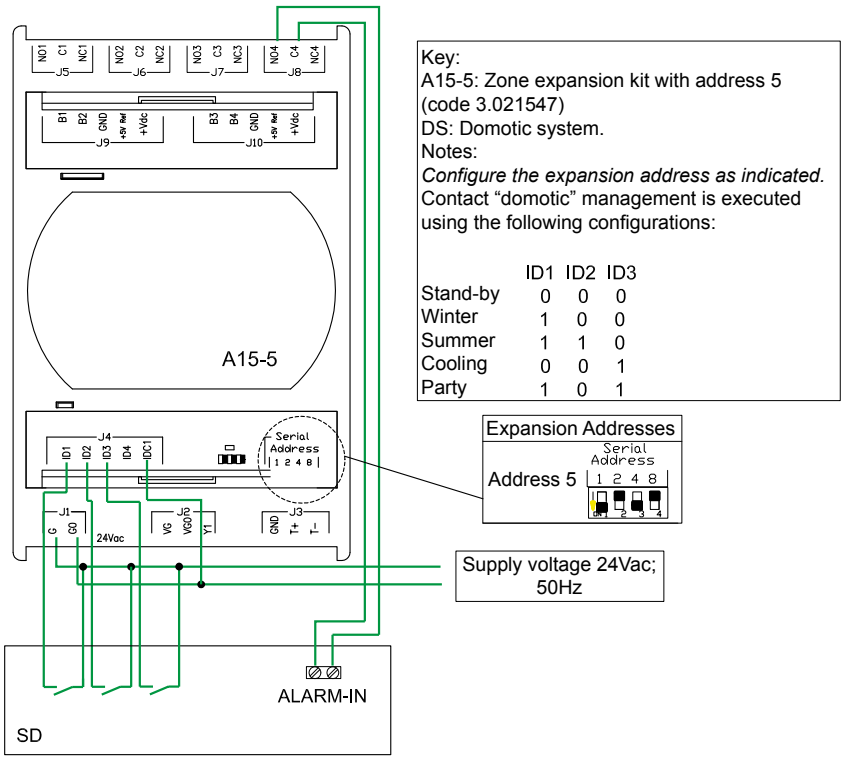


Pump management for thermal discharge



AUDAX and Integrated Systems

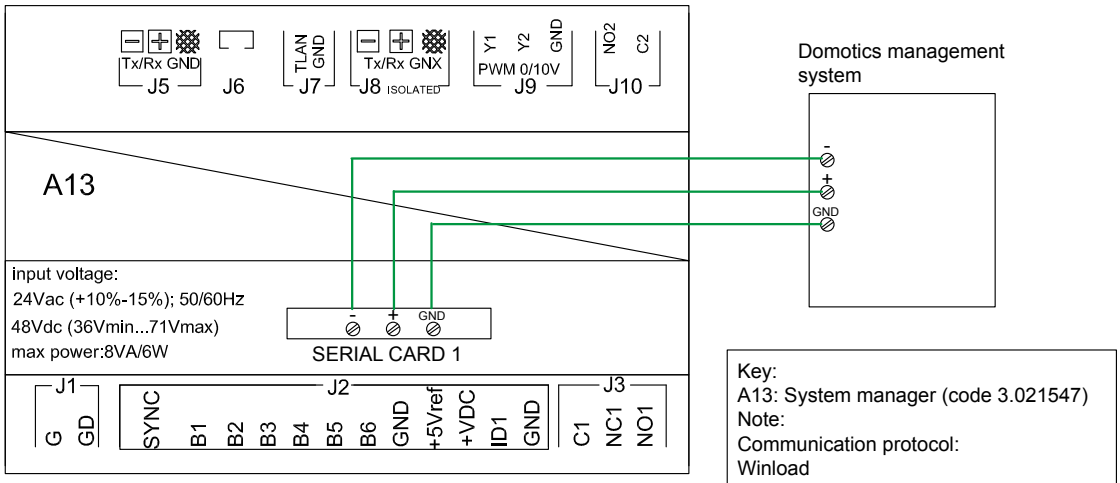
Contact management from domotic system



Key:
A15-5: Zone expansion kit with address 5 (code 3.021547)
DS: Domotic system.
Notes:
Configure the expansion address as indicated.
Contact "domotic" management is executed using the following configurations:

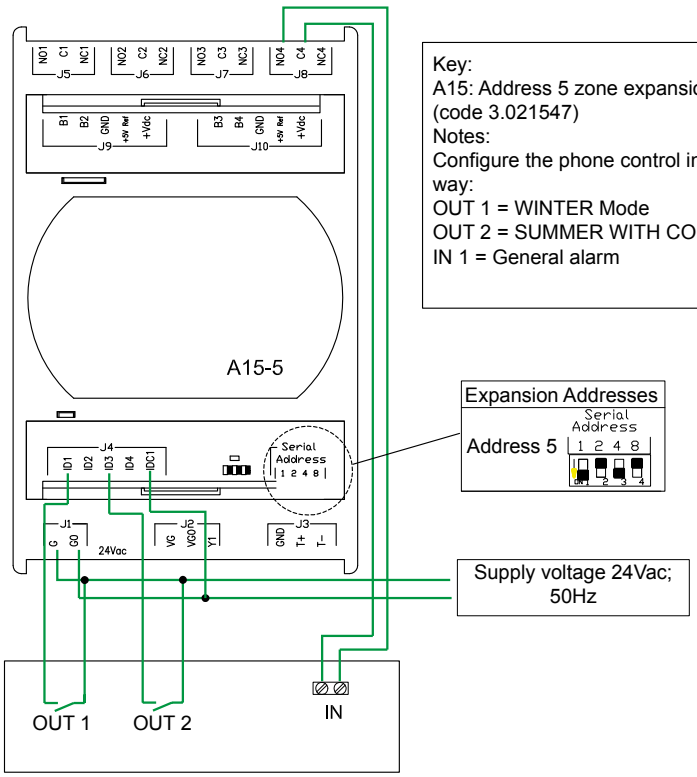
	ID1	ID2	ID3
Stand-by	0	0	0
Winter	1	0	0
Summer	1	1	0
Cooling	0	0	1
Party	1	0	1

Domotic system management with communication protocol



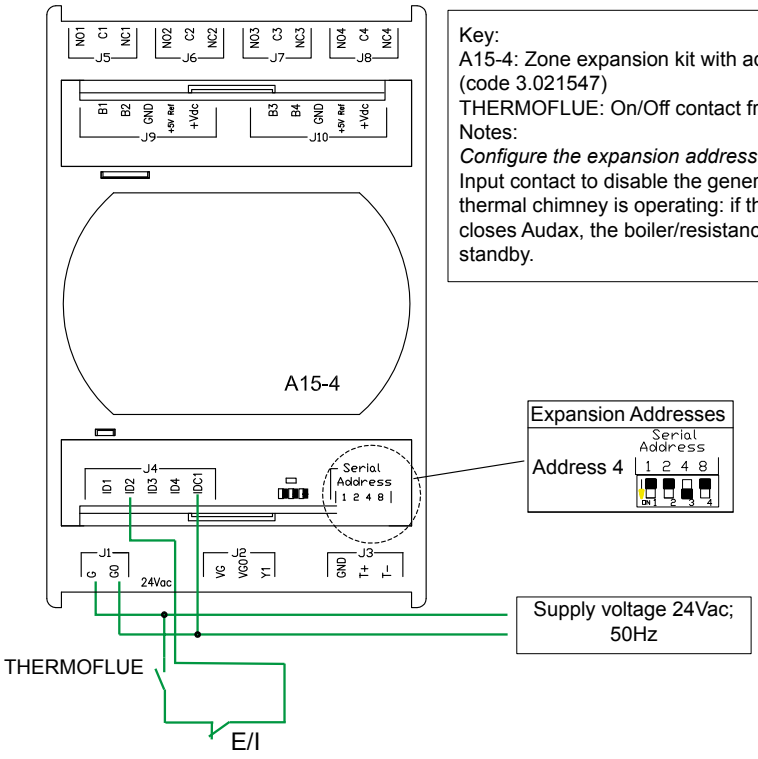
Key:
A13: System manager (code 3.021547)
Note:
Communication protocol:
Winload
Carel
Modbus

Telephone activator management



Key:
A15: Address 5 zone expansion kit (code 3.021547)
Notes:
Configure the phone control in the following way:
OUT 1 = WINTER Mode
OUT 2 = SUMMER WITH COOLING Mode
IN 1 = General alarm

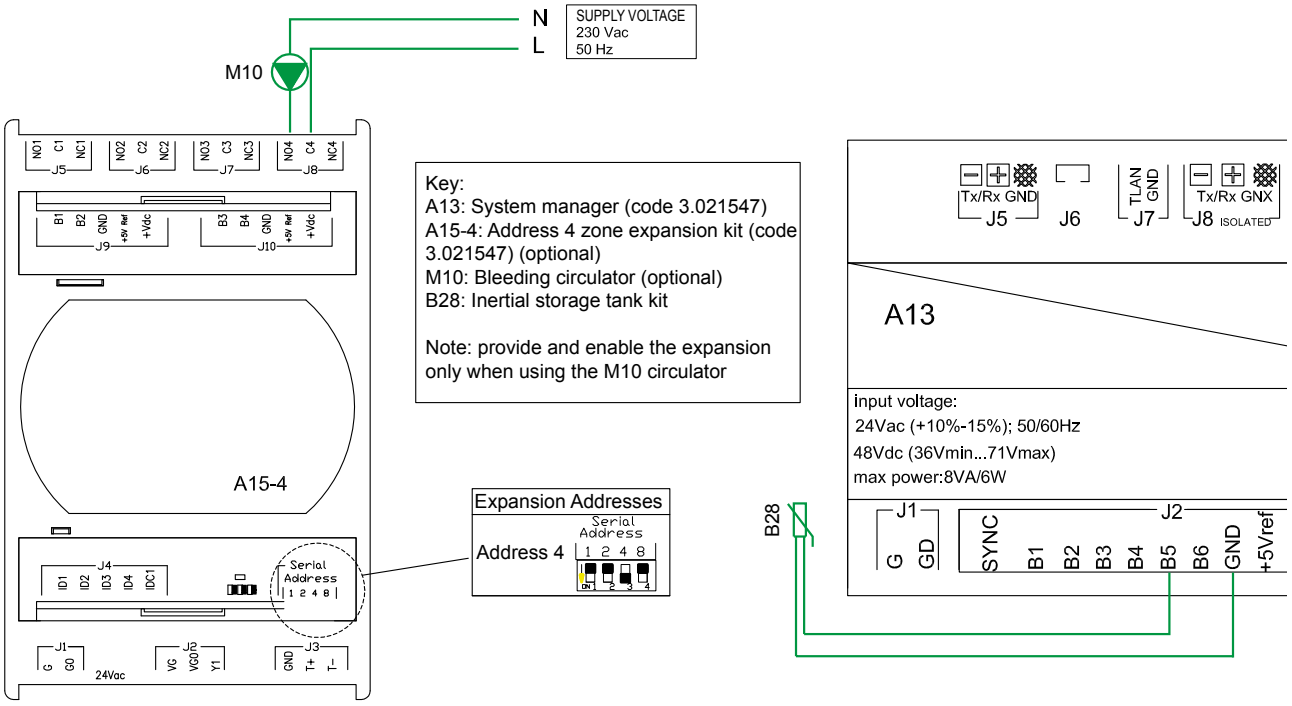
Thermoflue contact management



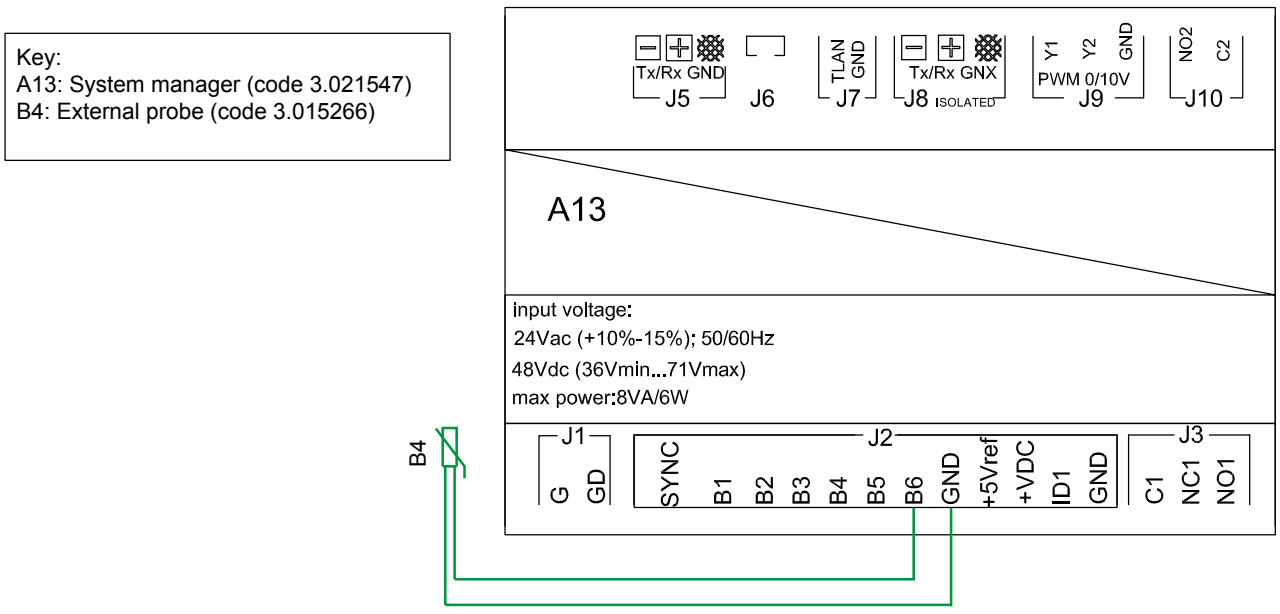
Key:
A15-4: Zone expansion kit with address 4 (code 3.021547)
THERMOFLUE: On/Off contact from thermoflue.
Notes:
Configure the expansion address as indicated.
Input contact to disable the generators when a thermal chimney is operating: if the contact closes Audax, the boiler/resistance remain on standby.

AUDAX and Integrated Systems

Inertial storage tank temperature control and possible bleeding circulator



External probe management



45 ZONE REMOTE CONTROL

It is an electronic device equipped with a back-lit display to control and adjust the room's temperature and humidity. Connection to the system Manager is on the same BUS connection as AUDAX and temperature-humidity probes.
It programs the relative room heat adjustment.
It can be applied to the wall using the supplied screws and plugs.
The kit must be powered at 230 Vac.

• OPTIONAL **code 3.023364**

46 ROOM TEMPERATURE/HUMIDITY SENSOR

It is a room temperature and humidity probe, to be applied to the wall.
Differently to the zone remote control kit, in this case, the settings of all room parameters take place on the System Manager.
The kit must be connected directly to the expansion board for zone management.
The kit must be powered at 24 Vac.

• OPTIONAL **code 3.021524**

47 EXPANSION BOARD FOR ZONE MANAGEMENT

This component must be powered at 24 Vac and is mainly used for system zone management; in particular n°1 expansion kit must be used for each zone. The expansion kit manages pump, mixing valve and the dehumidifier of the same zone, acquiring the room request (temperature and humidity) for a determined zone. The following can be connected to this kit:
- the room temperature - humidity sensor;
- an on-off type request contact.

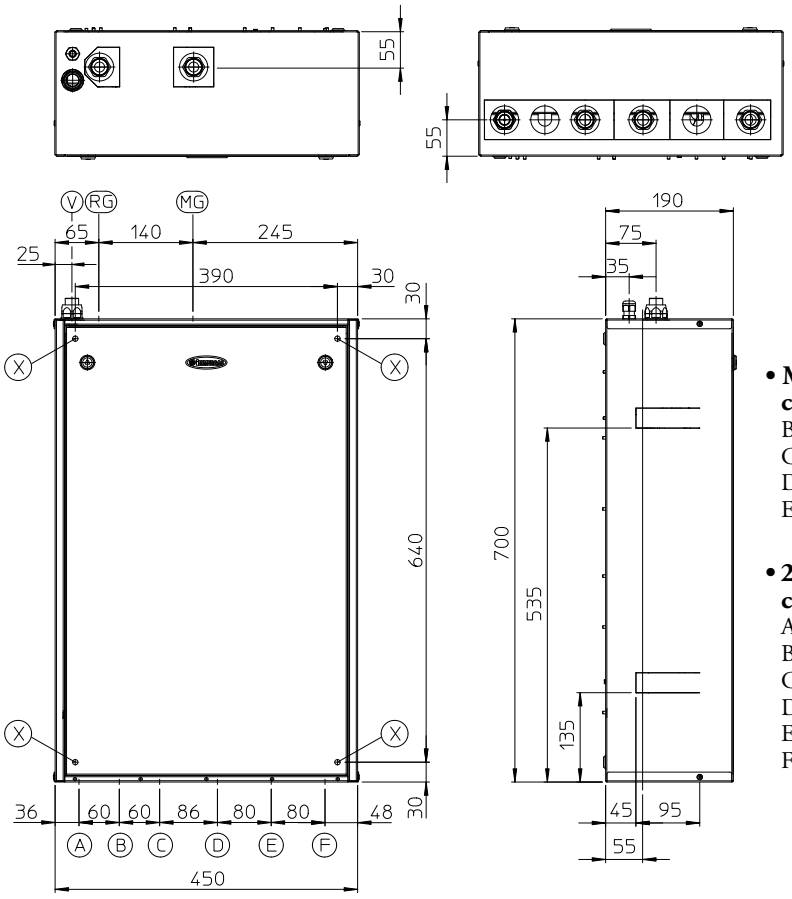
Installation takes place on a DIN guide for electric components from control board. **This board is envisioned as per standard in the 2 kits for zone systems** (see the following page).

• OPTIONAL **code 3.021547**

48 KIT FOR DISTRIBUTION TO THE SYSTEM

Two pre-packaged systems called: "**2 mixed zones kit**" and "**2 mixed zones and 1 direct zone kit**". They are comprised of 2 separate hydraulic manifolds (flow/return) + by-pass, thermometers to read the temperatures, motorised mixing valves, low energy consumption electro pumps and expansion boards for electric management.
The pumps included in the kit are distinguished for being very elastic, also thanks to the 7 operating curves that can be pre-set.
All parts are already assembled and ready for operation exclusively in combination with the System Manager. With the aid of the expansions the 2 kits are governed by the System Manager during the central heating and cooling phases.
Acquisition of the outdoor temperature from system Manager enables you to select independent flow temperature curves for each of the 2 or 3 zones of the system (both with C.H. and cooling).
Inserting these kits into the technological system enhance overall comfort and energy savings.

48.1 DIMENSIONS AND CONNECTIONS



Height (mm)	Width (mm)	Depth (mm)
700	450	190

KEY:
AR - Appliance return (G 3/4")
AF - Appliance flow (G 3/4")
V - Electrical connection
X - Holes for wall-mounted installation of the kit

- **MIXED ZONES 2 KIT code 3.021528**
  B - Zone 1 return (G 3/4")
  C - Zone 2 return (G 3/4")
  D - Zone 1 flow (G 3/4")
  E - Zone 2 flow (G 3/4")

- **2 MIXED ZONES AND 1 DIRECT ZONE KIT code 3.021527**
  A - Zone 3 return (G 3/4")
  B - Zone 1 return (G 3/4")
  C - Zone 2 return (G 3/4")
  D - Zone 1 flow (G 3/4")
  E - Zone 2 flow (G 3/4")
  F - Zone 3 flow (G 3/4")

48.2 TECHNICAL DATA

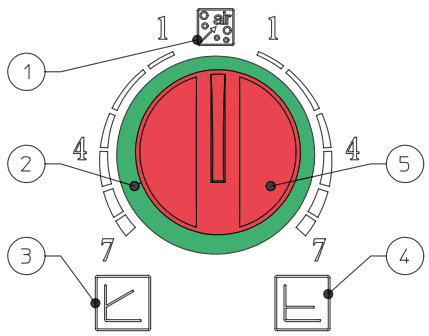
		Mixed zones 2 kit	2 mixed zones and 1 direct zone kit
Maximum nominal pressure	bar	3	3
Maximum operating pressure	°C	90*	90*
Low temperature circuit minimum set point regulation temperature	°C	25	25
Low temperature circuit maximum set point regulation temperature	°C	50/85*	50/85*
Water content in device	litres	1.5	1.9
Total head available in non-mixed zone with 1000 l/h flow rate (max.)	kPa (m c.a.)	--	43 (4.30)
Total head available in mixed zone (mixing valve closed) with 1000 l/h flow rate (max.)	kPa (m c.a.)	54.50 (5.50)	54.50 (5.50)
Empty device weight	kg	21.1	23.1
Full device weight	kg	22.6	25.0
Electrical connection	V/Hz	230/50	230/50
Maximum input	A	0.9	1.2
Installed electric power	W	105	150
Power in stand-by	W	9.5	9.5
Electric plant protection	-	IPX4D	IPX4D
Maximum distance between kit - heat pump or boiler (hydraulic side)	m	15	15

* = temperature can only be reached in combination with a boiler.

48.3 CIRCULATION PUMP SETTINGS AND CONFIGURATIONS

The kits are supplied with circulating pumps fitted with speed regulator. These settings are suitable for most systems.
For proper operation one must select the most suitable type of operation for the system and select a speed between 2 and 7.
- Program constant head (ΔP C). The circulator pump maintains the pressure level (head) constant as the system heat demand decreases (flow rate reduction). With these settings, the circulator pump is suitable for all floor systems where all the circuits must be balanced for the same drop in head. One can select the operating level from minimum to maximum by turning the selector switch clockwise in the relative power scale (refer to the drawing below).

- Program proportional head (ΔP V) . This allows the pressure level (head) to be proportionally reduced as the system heat demand decreases (flow rate reduction). Thanks to this function, the electric power consumption of the circulator pump is reduced further: the energy (power) used by the pump decreases according to the pressure level and flow rate. With this setting, the pump guarantees optimal performance in most heating systems, proving particularly suitable in single-pipe and two-pipe installations. Any noise originating from the water flow in the pipes, valves and radiators is eliminated by reducing the head. One can select the operating level from minimum to maximum by turning the selector switch anticlockwise on the relative power scale (refer to the drawing below).



KEY:
1 - Automatic vent mode operation
2 - Light ring to indicate the operating status
3 - Proportional head operation
4 - Constant head operation
5 - Operating mode selector switch

48.4 GRAPHS OF CIRCULATION PUMP FLOW RATE-ABSORPTION-HEAD

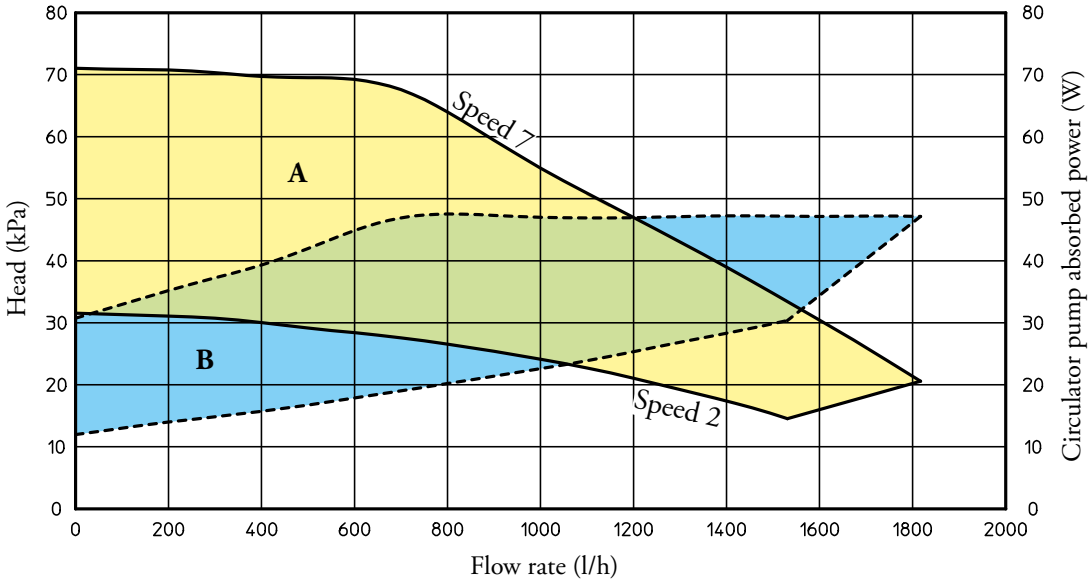
The kit contains an electronic low consumption circulation pump, whose flow rate/head features are shown in the graph below.

All pumps in the kit are suitable for operation with heat and cold carrying fluid.

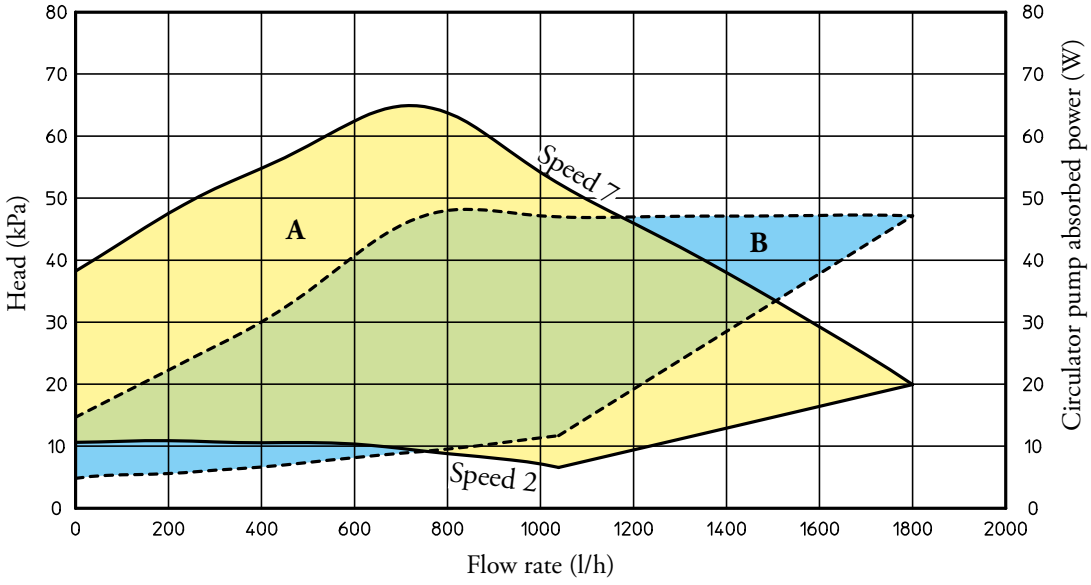
ZONE MIXED WITH A CLOSED MIXING VALVE

WILO YONOS PARA RS 15-7 RKA CM 130

Constant head (ΔP C).



Proportional head (ΔP V).



EEI ≤ 0.20

KEY:

A = Head available at speed 2 ÷ 7

B = Power absorbed by the system pump (dotted area)

48.5 GRAPHS OF CIRCULATION PUMP FLOW RATE-ABSORPTION-HEAD

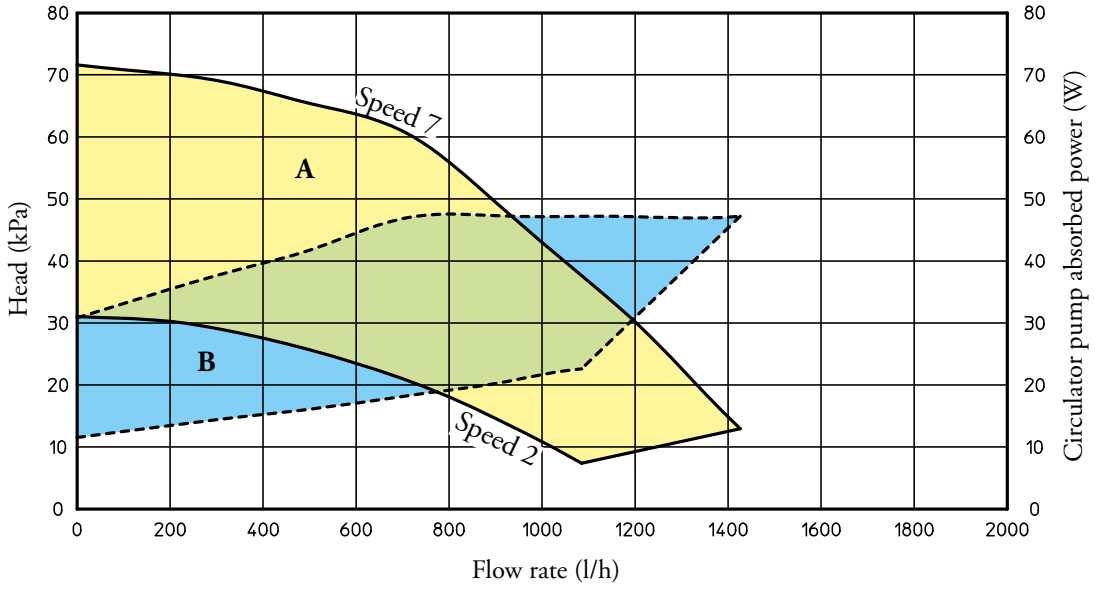
The kit contains an electronic low consumption circulation pump, whose flow rate/head features are shown in the graph below.

All pumps in the kit are suitable for operation with heat and cold carrying fluid.

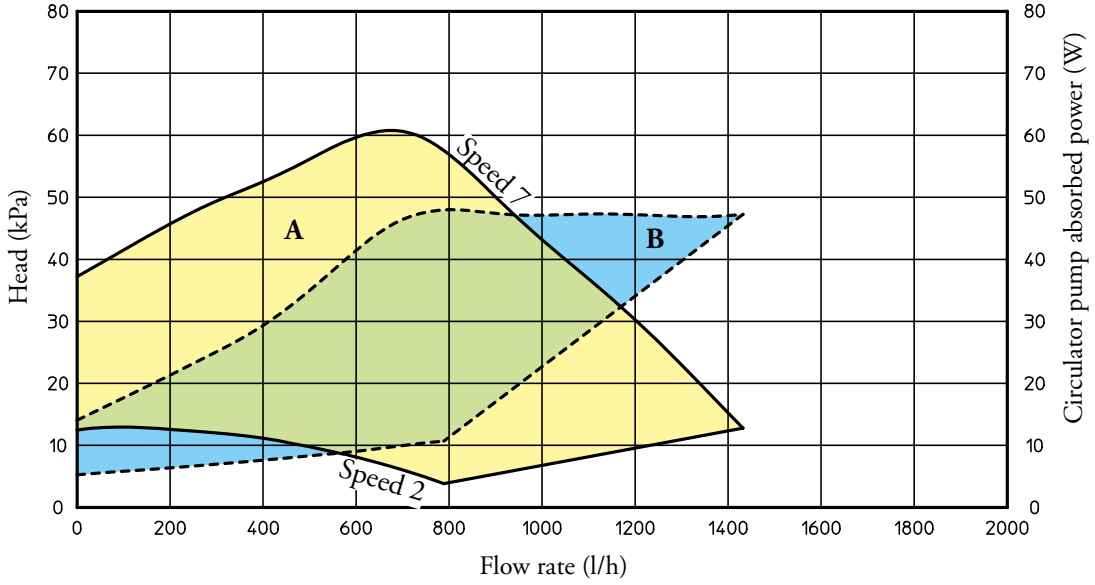
ZONE MIXED WITH AN OPEN MIXING VALVE AND DIRECT ZONE

WILO YONOS PARA RS 15-7 RKA CM 130

Constant head (ΔP C).



Proportional head (ΔP V).



EEI ≤ 0.20

KEY:

A = Head available at speed 2 ÷ 7

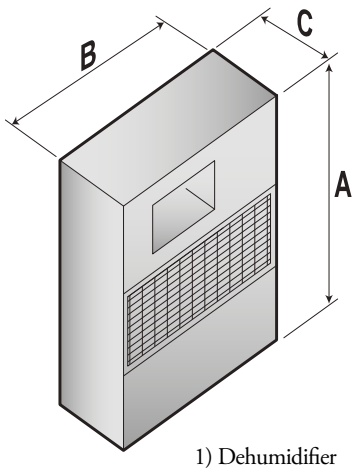
B = Power absorbed by the system pump (dotted area)

49 DEHUMIDIFIER

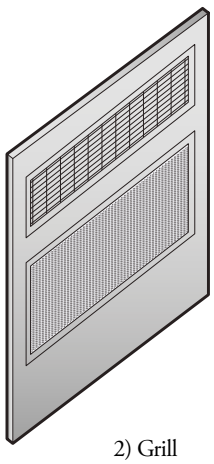
Designed to be coupled to cooling plants with radiant panels, the dehumidifier allows to keep the percentage of relative humidity in the room within the comfort values, preventing the possible formation of condensate on the walls.
The dehumidifier, which is designed to be installed vertically on the wall (recessed), has pre- and post-cooling coils.
These components allow excellent control of the air temperature and humidity.
However, it can function without the aid of pre and post cooling water coils, thus allowing to dehumidify when the cooling system is off, typical of mid-season.
In compliance with European Directives, it has EC Declaration of Conformity.

Dehumidification can take place:
- with **neutral air**: without variation of the air temperature, dehumidifies internal rooms;
- with **cooled air**: contributes to cooling the rooms, as well as reducing the internal relative humidity.

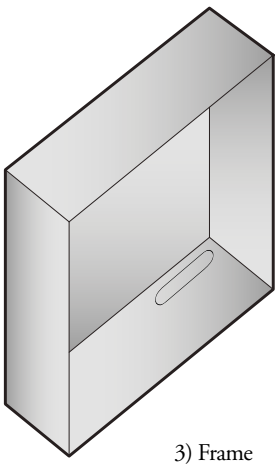
49.1 DIMENSIONS AND CONNECTIONS



1) Dehumidifier

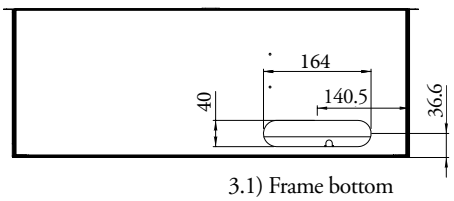


2) Grill



3) Frame

Model	A (mm)	B (mm)	C (mm)
1	680	545	221
2	750	660	20
3	703	605	228



3.1) Frame bottom

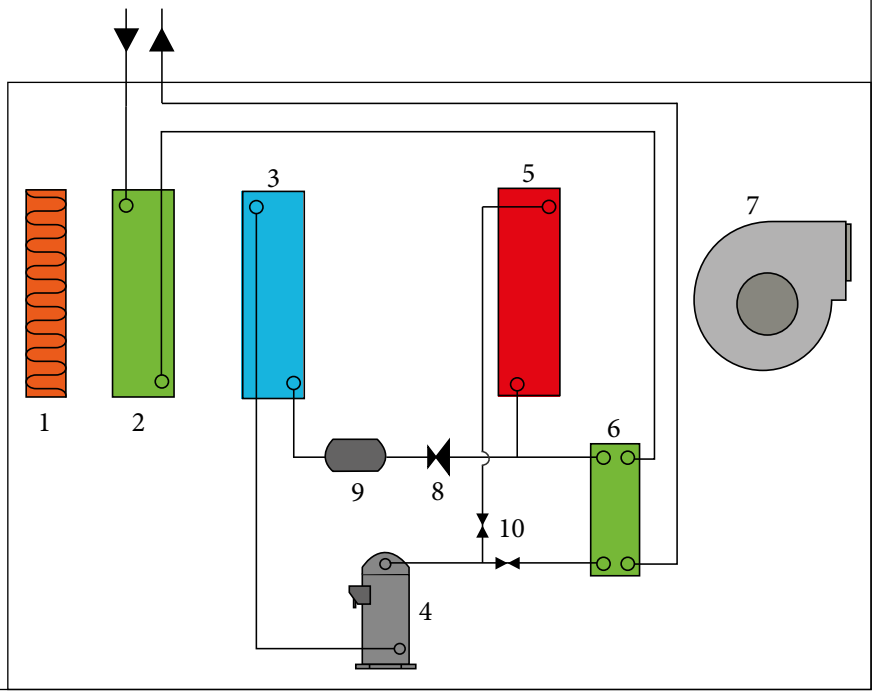
• **DEHUMIDIFIER** **code 3.021529**
(frame and grid to be purchased separately)

Connect the F–R (female) 1/2" fittings of the dehumidifier to the cooling system, using the measurements in fig. 3.1

49.2 OPERATING PRINCIPLE

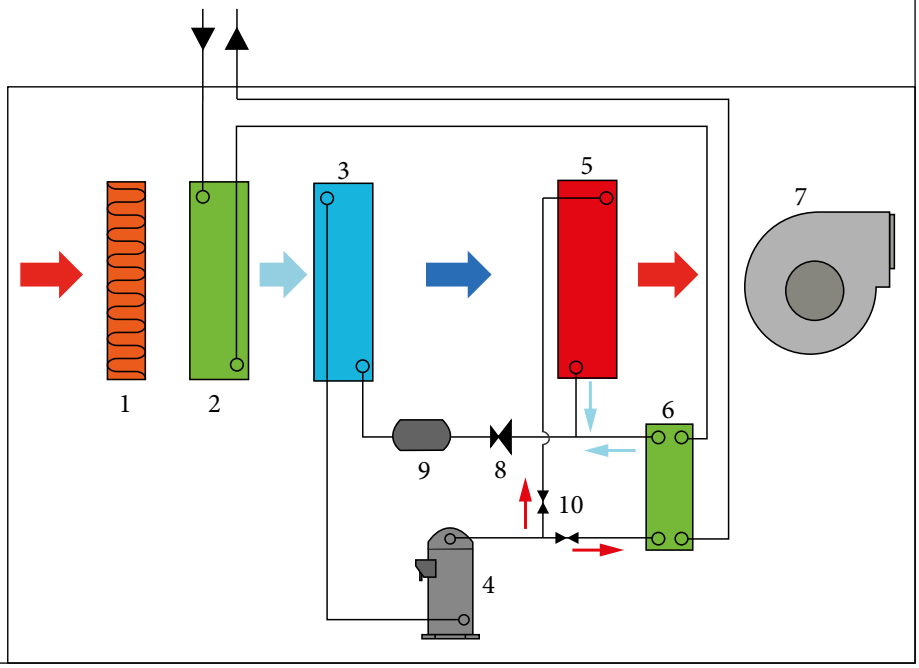
The **humid air** is taken from the room through the fan (7) and made to pass through the filter (1) and the pre-cooling water coil (2), where the air itself is cooled and taken to a condition near to the saturation curve. It then passes through the evaporating coil (3) where air is further cooled and dehumidified.

KEY:
1 - Air filter
2 - Pre-cooling coil
3 - Evaporator
4 - Compressor
5 - Condenser
6 - Post-cooling coil
7 - Fan
8 - Throttle valve
9 - Dryer filter
10 -Cut-off valve



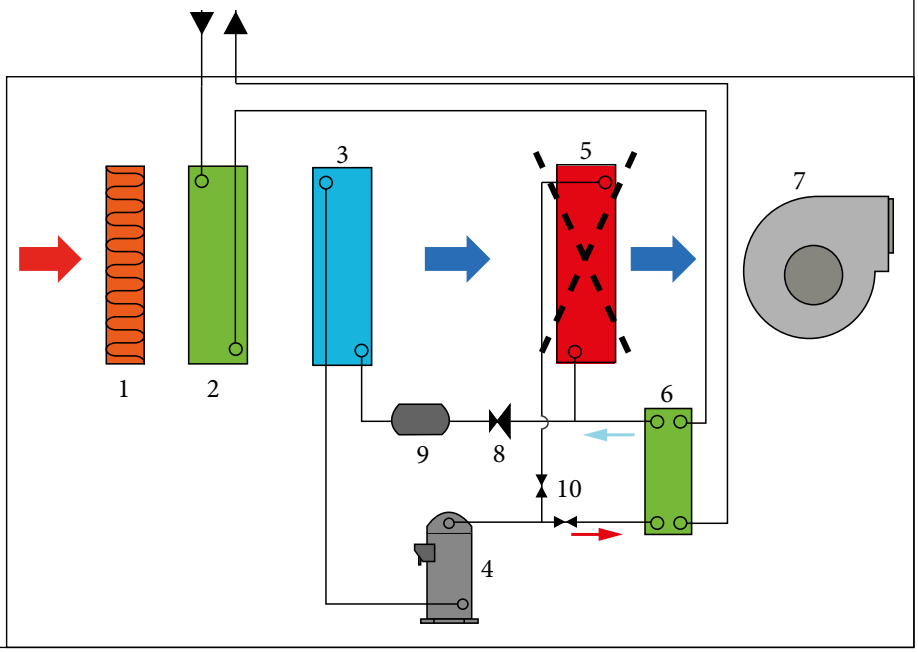
Dehumidification mode with <u>neutral air</u>

The cooling circuit works by partially condensing in water through the heat exchanger (6) and partially in air through the heat exchanger (5); accordingly air post-heating is performed and this air is sent into the room in thermally neutral conditions.

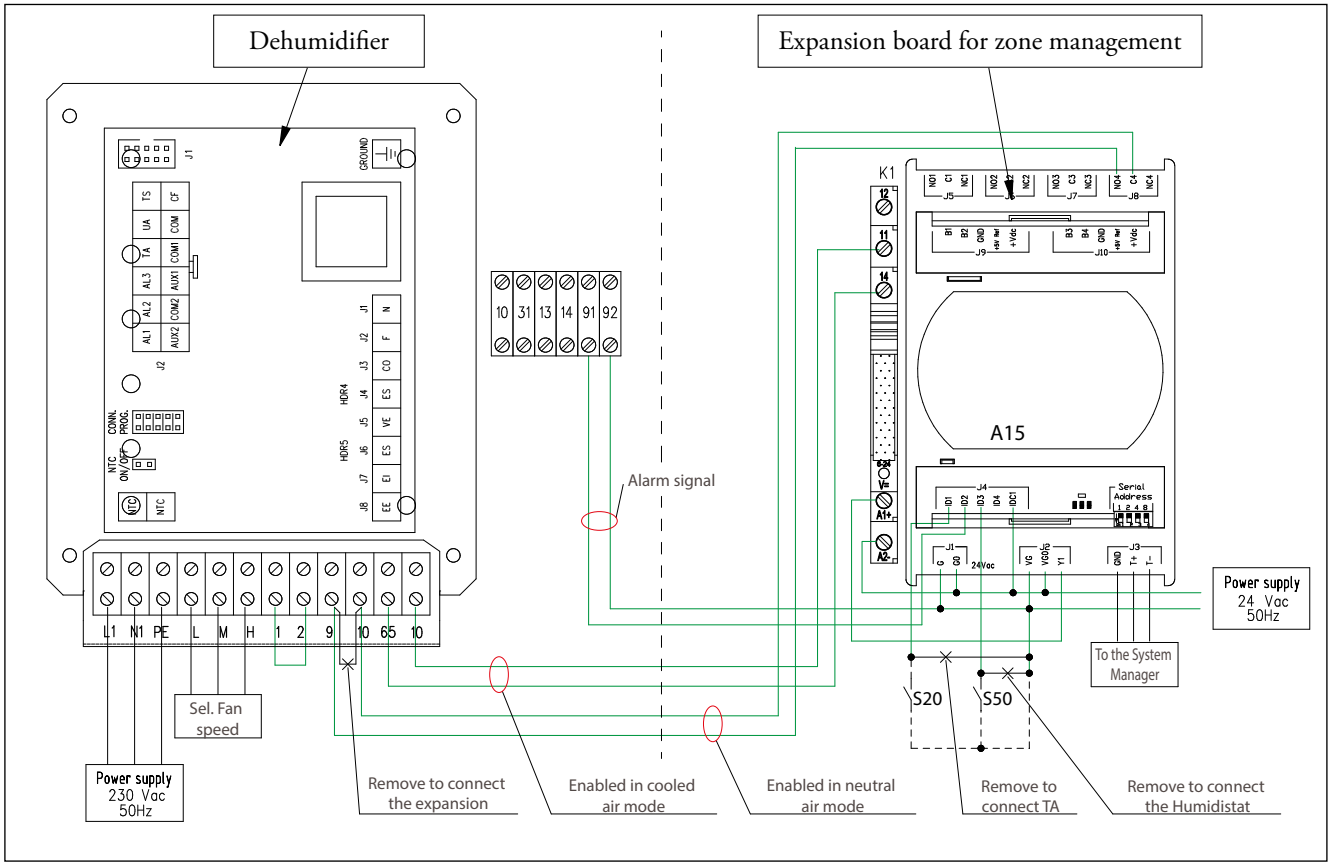


Dehumidification mode with <u>cooled air</u>

I this case, the cooling circuit performs 100% of condensation in water via exchanger (6). The condenser (5) is cut-off via the valve (10) and the air sent into the room is the same - cooled and dehumidified - at evaporator outlet (3)



49.3 DEHUMIDIFIER LAYOUT AND WIRING DIAGRAMS (WITH SYSTEM MANAGER AND EXPANSION)



49.4 TECHNICAL DATA

Coolant		R134a
Humidity removed in neutral air condition (1)	litres/24h	20.1
Cooling capacity (1)	W	1250
Nominal water input	l/h	150
Head losses	kPa	7.8
Water supply temperature operating field	°C	15 - 25
work humidity field	%	40 - 90
Air flow rate	m^3/h	250
Fan useful static head (maximum speed)	Pa	43
Sound pressure (3)	dB(A)	35
Sound power	dB(A)	43
Power absorbed (1)	W	340
Power supply	V/Ph/Hz	230/1~/50
Maximum power absorbed (2)	W	450
Nominal current absorbed (1)	A	2.5
Maximum current absorbed (2)	A	2.8
Hydraulic F-R connections		1/2"F
Weight	kg	38

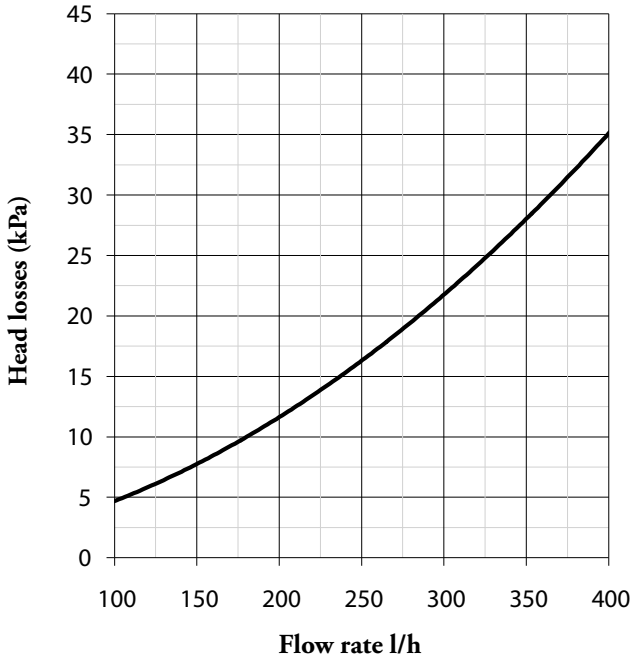
The data given refer to the following conditions:

1) Room temperature 26 °C; relative humidity 65% with coil inlet water temperature of 15 °C.

2) Room temperature 35 °C; relative humidity 80%.

3) Sound pressure level measured in free field at 1 m from the machine, in compliance with UNI EN ISO 3746/97

49.5 HEAD LOSS OF THE HYDRAULIC CIRCUIT



50 INTRODUCTION WITH COMMENTARY TO INTEGRATED SYSTEMS: MAIN APPLICATIONS

51-51.1 Diagram with AUDAX and system distribution kit + DHW solar heating + System manager

Description of winter functioning:

- Central heating mode <u>active</u> → 1 or more temperature/humidity sensors activate winter mode consent; the System Manager, according to the outdoor temperature detected and system's climatic curve and room temperature set for the various zones, activates AUDAX and (if COP is too low or if the temperature is not reached within the set time), the system's electrical resistance (via parameters that can be set with alternative or simultaneous operation).

- Domestic hot water phase → The System Manager, in addition operating the solar system, continuously monitors the set DHW temperature (probe located in the top part of the storage tank), enabling AUDAX and (if necessary) the electric resistance of the storage tank. The System manager will activate the integrative electric resistance of the storage tank only on request of the anti-legionella function and on reaching temperatures over 50 °C or if time required for making operational that is too long is considered.

NOTE: In this diagram the thermal flywheel is excluded from DHW (Domestic hot water) operation, thanks to the insertion of a three-way valve.
This avoids, in the summer, having to heat and cool the inertial storage tank when switching from DHW (Domestic hot water) to cooling.

52-52.1 Diagram with AUDAX + Control panel (standard for room control) + DHW solar pack

Description of winter functioning:

- Central heating mode <u>active</u> → Control panel (standard) activates AUDAX in winter mode.
Two different management options are possible to activate integrative electrical resistance, which are based on the outdoor temperature:

1) Switching the heat pump off and activating the auxiliary source (electrical resistance), if the outdoor temperature is below the value set in the parameter (example - 15 °C);
2) Both the heat pump and electrical resistance are simultaneously activated if the outdoor temperature is between the 2 values set in the parameter (e.g. between 0 °C and - 15 °C).

- DHW mode → when there is request for DHW, the system integrative resistance switches off and the 3-way valves divert onto the storage tank. AUDAX goes to the max temp. of 60 °C (compatible with the operating limits). The domestic hot water temperature is set on the solar control unit; if the set "setting" is greater than 50 °C, AUDAX heats the domestic hot water to 50 °C, the integrative resistance then switches on and the heat pump switches off.

NOTE: In this diagram the thermal flywheel is excluded from DHW (Domestic hot water) operation, thanks to the insertion of a three-way valve.
This avoids, in the summer, having to heat and cool the inertial storage tank when switching from DHW (Domestic hot water) to cooling.

53-53.1 Diagram with AUDAX (air conditioning only) + boiler Plus + system distribution kit + solar heating for DHW + System manager

Description of winter functioning:

- Central heating mode <u>active</u> → 1 or more zone Controls activate winter mode consent; the system Manager, according to the outdoor temperature detected and the room temperature set above the pre-set climatic curve, activates AUDAX or the boiler according to the COP calculated (if > the minimum economical convenience value - use of AUDAX is approved), or according to Tminimum integration (cut off) set in the System Manager.
Remember that also times for making the system operational can vary the boiler insertion mode.

- Domestic hot water mode → this system was designed to privilege DHW operation of the boiler only, obviously in addition to the solar heating system (governed by the System Manager). During the summer cooling phase,the inversion of the AUDAX functioning cycle is also prevented (from chiller to heat pump).

54-54.1 Diagram with AUDAX + boiler + 1 high temperature zone and system distribution kit + solar heating for DHW + System Manager

Description of winter functioning:

- Heating phase active → with respect to the previous layout, this system lets us have a simultaneous functioning variable of 1 high temperature zone and 2 low temperature zones. Substantially, we will have 3 cases:

1) boiler serving a high temperature zone and AUDAX serving a low temperature zone.
2) boiler serving a high temperature zone and low temperature zone.
3) AUDAX serving low temperature zones only.

These functioning modes are managed via appropriate positioning of the 2 x 2-way solenoid valves.

- DHW mode → if the Manager is connected to a boiler on the external probe clamps (refer to the list of provided models on page 69), the Heat Pump is activated if COP > COPmin / Toutdoor > Tminimum integration. At this point, if the set DHW is < 50 °C, AUDAX is active; however, if the set DHW is > 50 °C, AUDAX will heat water until it reaches 50 °C and then lets the boiler complete heating until the set value.

55-55.1 Diagram with AUDAX + boiler PLUS + system distributor kit + storage tank unit for DHW + System manager

Description of winter functioning:

- Central heating mode active → the Control panel and temperature/humidity sensor manage air conditioning of the 2 macro-environments. Based on the outdoor temperature and room temperature detected and according to the set climatic curve, the System Manager activates AUDAX or the boiler COP calculated (if > minimum economical convenience value, use of AUDAX is approved), or according to Tminimum integration (cut off) set in the System Manager.

- DHW mode → with this integrated system, the only source of renewable energy for DHW production is guaranteed from the heat pump. By means of the 3-way solenoid valve commutation between the system and storage tank, AUDAX is connected to the lower coil in the storage tank, thus guaranteeing central heating of a large amount of DHW (e.g: approximately 40 °C - in both winter and summer). Integration is guaranteed by the boiler, which is connected to both coils independently.

56-56.1 Diagram with AUDAX (Summer/Winter air conditioning only) + boiler with storage tank integrated + DHW solar heating, separate central heating and cooling system + System manager

Description of winter functioning:

- Heating phase active → 1 or more room thermostats, that act on the thermoelectric heads of the radiant system, enable a request in winter phase to the System Manager; this, in turn, based on the various parameters it is reading at that moment, enables AUDAX or the boiler if the calculated COP is lower than the minimum value of economical convenience.
Through expansion "5", the System Manager controls the diverter valves, which commute with mode change (central heating/cooling).

Description of summer functioning:

- Cooling mode active → 1 or more room thermostats, by acting on the fan-coils, enable a request in summer mode to the System Manager, which, in turn enables the heat pump.

- Domestic hot water mode → In this specific case, domestic hot water production is managed by the boiler; the solar heating system, which is connected directly to the boiler, is also managed by the electronics of HERCULES SOLAR 200 CONDENSING ErP. **NOTE:** in this diagram, the Control Panel (standard with AUDAX) is not used.

57-57.1 Diagram with AUDAX in cascade (air conditioning only) + high-power boiler + thermal flywheel and mixed zone + solar heating for D.H.W. production + System manager

Description of winter and summer operation:

- Heating/Cooling phase active →1 or more room thermostats, by acting on the apartment counters, enable a request to the expansion board that manages the upright column (mixed zone); the expansion board, in turn, sends the signal to the System Manager. Through an expansion probe built into the storage tank, the Manager controls the temperature of the thermal flywheel in hot and cold.
Activation of the system (AUDAX rather than a gas generator) is, by standard, delegated by request from the thermostats and then the System Manager, which assesses the economic convenience or compares Toutdoor with Tminimum integration (cut off).
- Domestic hot water mode→ this system was designed to privilege DHW operation of the boiler only, obviously in addition to the solar heating system (governed by the System Manager along with the recirculation pump, through expansion "5").
NOTE: in this diagram, the Control panel (standard with AUDAX) is not used.

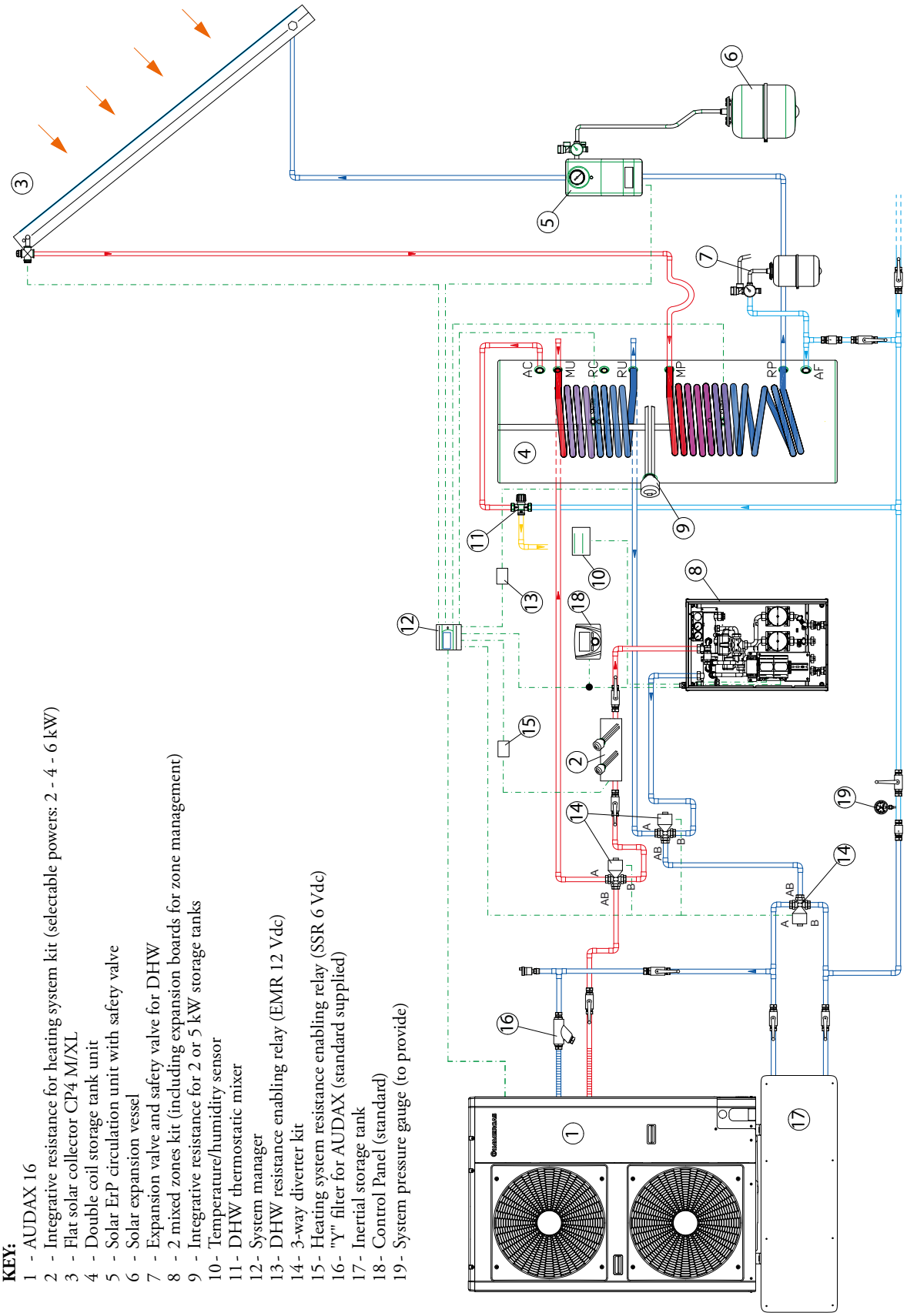
58-58.1 Diagram with AUDAX + boiler + system distribution kit + solar heating for DHW production and C.H. + System manager

Description of winter and summer operation:

- Heating/cooling phase active → the request from a room activates a central heating/cooling request via expansion in the hydraulic distribution kit, which, in turn, is connected via BUS to the system Manager. In the event of a cooling request via the diverter valve, the heat pump sends cooling fluid directly to the distribution kit. However, if central heating request is made, the distribution kit draws hot fluid from the combined storage tank.
Through expansion "4" the System Manager also governs the 2 3-way valves that direct the hot fluid coming from the heat pump or from the boiler towards the storage tank, based on the requests from probes "B13" and "B2".

- Domestic hot water phase → The System manager controls the DHW temperature via the “B2” probe; the set point to be reached in “B2” is related to the required DHW temperature, +10°C. The System manager activates AUDAX to bring the temperature in “B2” up to 50°C, beyond this threshold it will activate the integrative generator (in this case the boiler).

51 HYDRAULIC DIAGRAM: AUDAX and 2 low temperature zones + solar heating for DHW + System manager



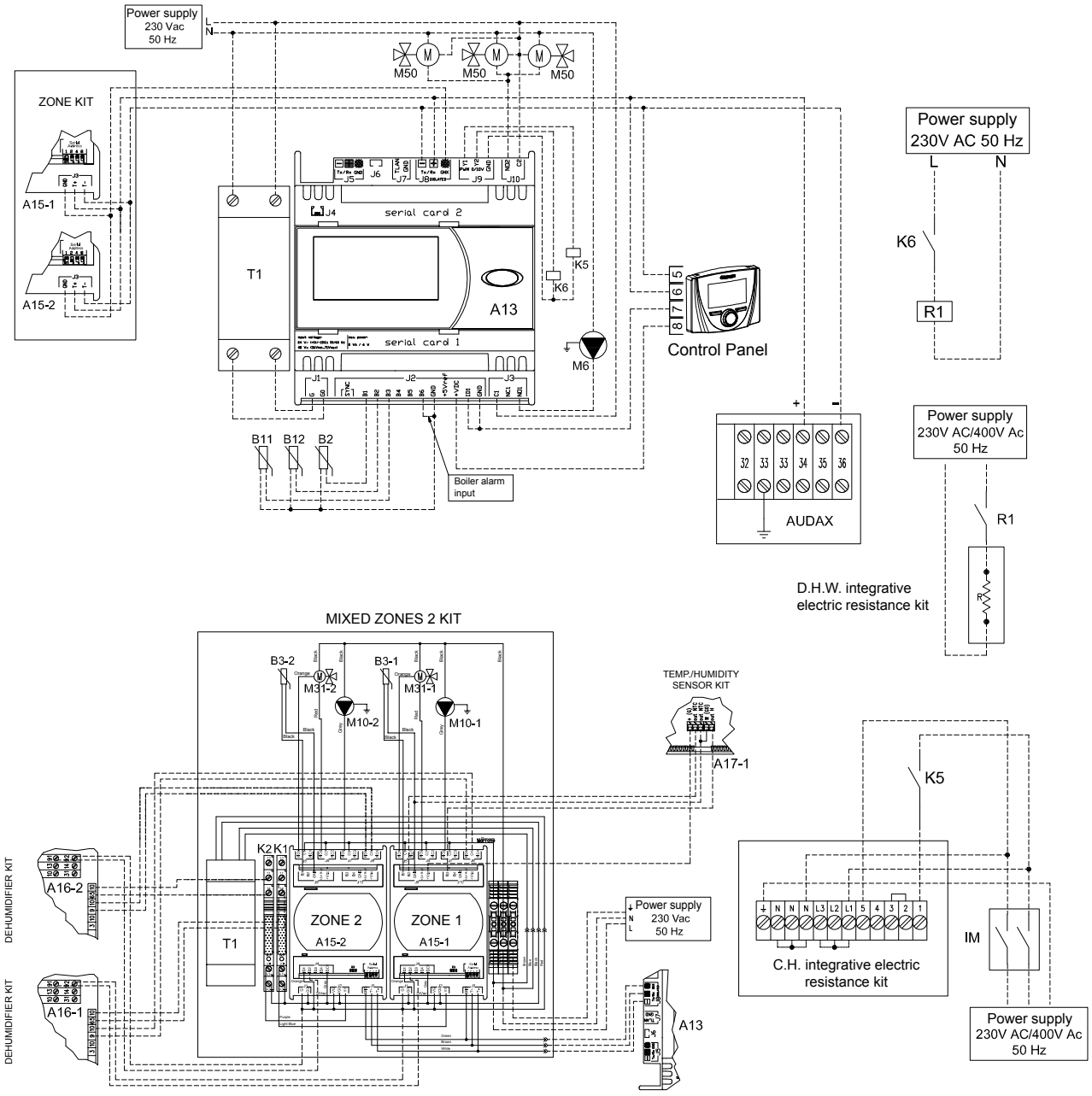
KEY:

1 - AUDAX 16
2 - Integrative resistance for heating system kit (selectable powers: 2 - 4 - 6 kW)
3 - Flat solar collector CP4 M/XL
4 - Double coil storage tank unit
5 - Solar ErP circulation unit with safety valve
6 - Solar expansion vessel
7 - Expansion valve and safety valve for DHW
8 - 2 mixed zones kit (including expansion boards for zone management)
9 - Integrative resistance for 2 or 5 kW storage tanks
10 - Temperature/humidity sensor
11 - DHW thermostatic mixer
12 - System manager
13 - DHW resistance enabling relay (EMR 12 Vdc)
14 - 3-way diverter kit
15 - Heating system resistance enabling relay (SSR 6 Vdc)
16 - "Y" filter for AUDAX (standard supplied)
17 - Inertial storage tank
18 - Control Panel (standard)
19 - System pressure gauge (to provide)

NOTE: This diagram is an example. It is also required to convey the heat pump's condensate drain.
In order to guarantee proper Heat pump operation (also with antifreeze), each system must consider inserting a bypass to guarantee a minimum flow rate (see the technical data table according to the machine). In this diagram, the bypass is already installed in the zones kit (8).

AUDAX and Integrated Systems

51.1 WIRING DIAGRAM: AUDAX and 2 low temperature zones + solar heating for DHW + System manager

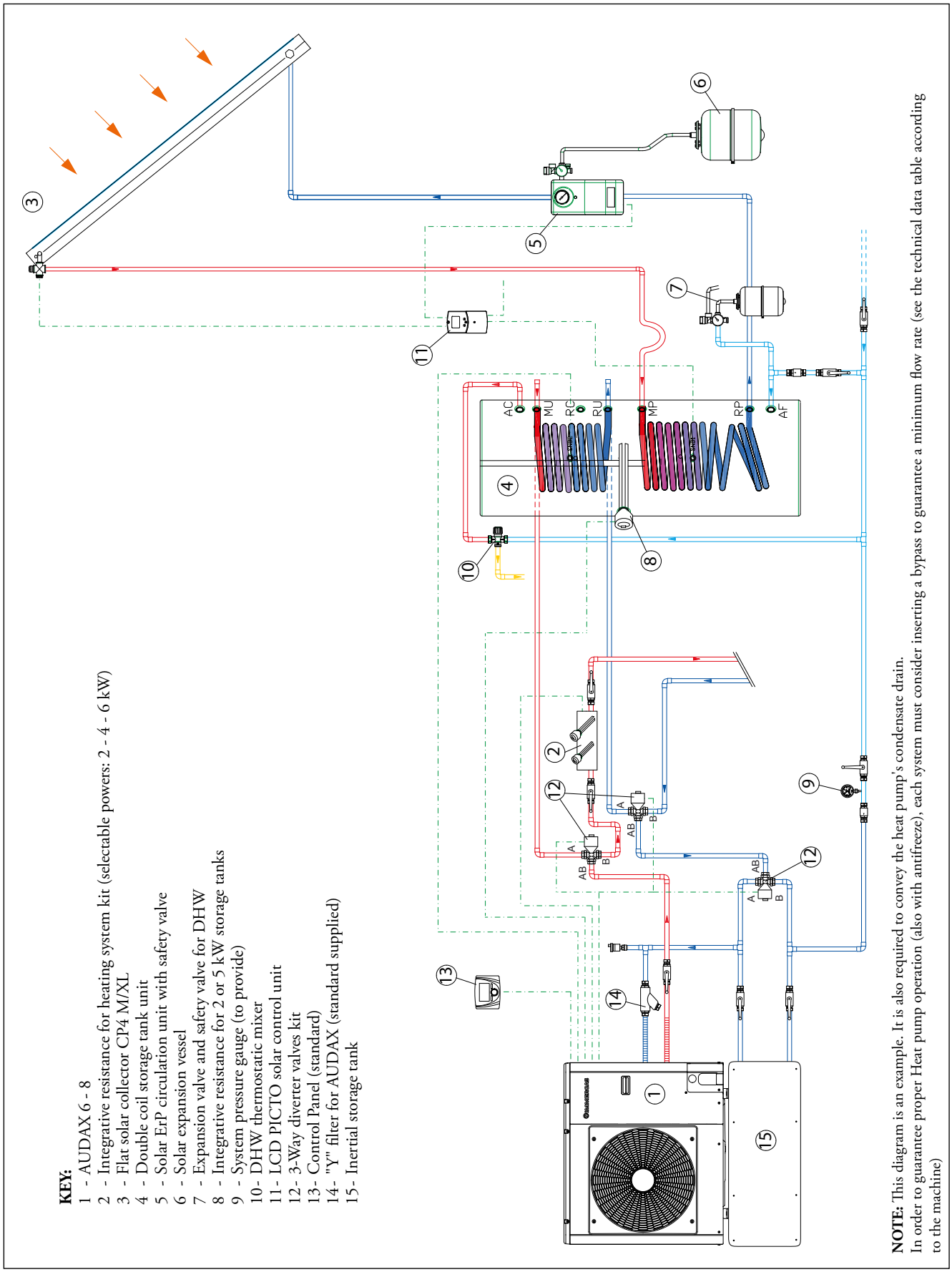


KEY:

A13 - System manager
A15-1 - Expansion zone 1 L.T.
A15-2 - Expansion zone 2 L.T.
B2 - Storage tank upper part temp. probe (NTC)
B11 - Solar collector temp. probe (PT1000)
B12 - Storage tank lower part temp. probe (NTC)
IM - Circuit breaker switch
K5 - System integrative resistance enabling relay (abbreviation SSR 6 Vdc code: 3.023946)
K6 - DHW integrative resistance enabling relay (abbreviation EMR 12 Vdc code: 3.023945)
M6 - Solar ErP circulation group
M50 - DHW priority 3-way valve
T1 - 24 Vac transformer (not supplied with the System Manager - standard with the distribution kit)
A16-1 - Zone 1 dehumidifier (possible)
A16-2 - Zone 2 dehumidifier (possible)
A17-1 - Zone 1 temperature/humidity sensor
B3-1 - Zone 1 flow temperature probe
B3-2 - Zone 2 flow temperature probe
K1 - Zone 1 cooling enabling
K2 - Zone 2 cooling enabling
R1 - DHW resistance enabling relay
M10-1 - Zone 1 circulator pump
M10-2 - Zone 2 circulator pump
M31-1 - Mixer zone 1
M31-2 - Mixer zone 2

NOTE: With this setting, the Control Panel (standard supply with AUDAX) is used as a room probe in the mixed zone 2.

52 HYDRAULIC DIAGRAM: AUDAX + Control Panel (standard) for room control + solar pack for DHW



KEY:
1 - AUDAX 6 - 8
2 - Integrative resistance for heating system kit (selectable powers: 2 - 4 - 6 kW)
3 - Flat solar collector CP4 M/XL
4 - Double coil storage tank unit
5 - Solar ErP circulation unit with safety valve
6 - Solar expansion vessel
7 - Expansion valve and safety valve for DHW
8 - Integrative resistance for 2 or 5 kW storage tanks
9 - System pressure gauge (to provide)
10- DHW thermostatic mixer
11- LCD PICTO solar control unit
12- 3-Way diverter valves kit
13- Control Panel (standard)
14- "Y" filter for AUDAX (standard supplied)
15- Inertial storage tank

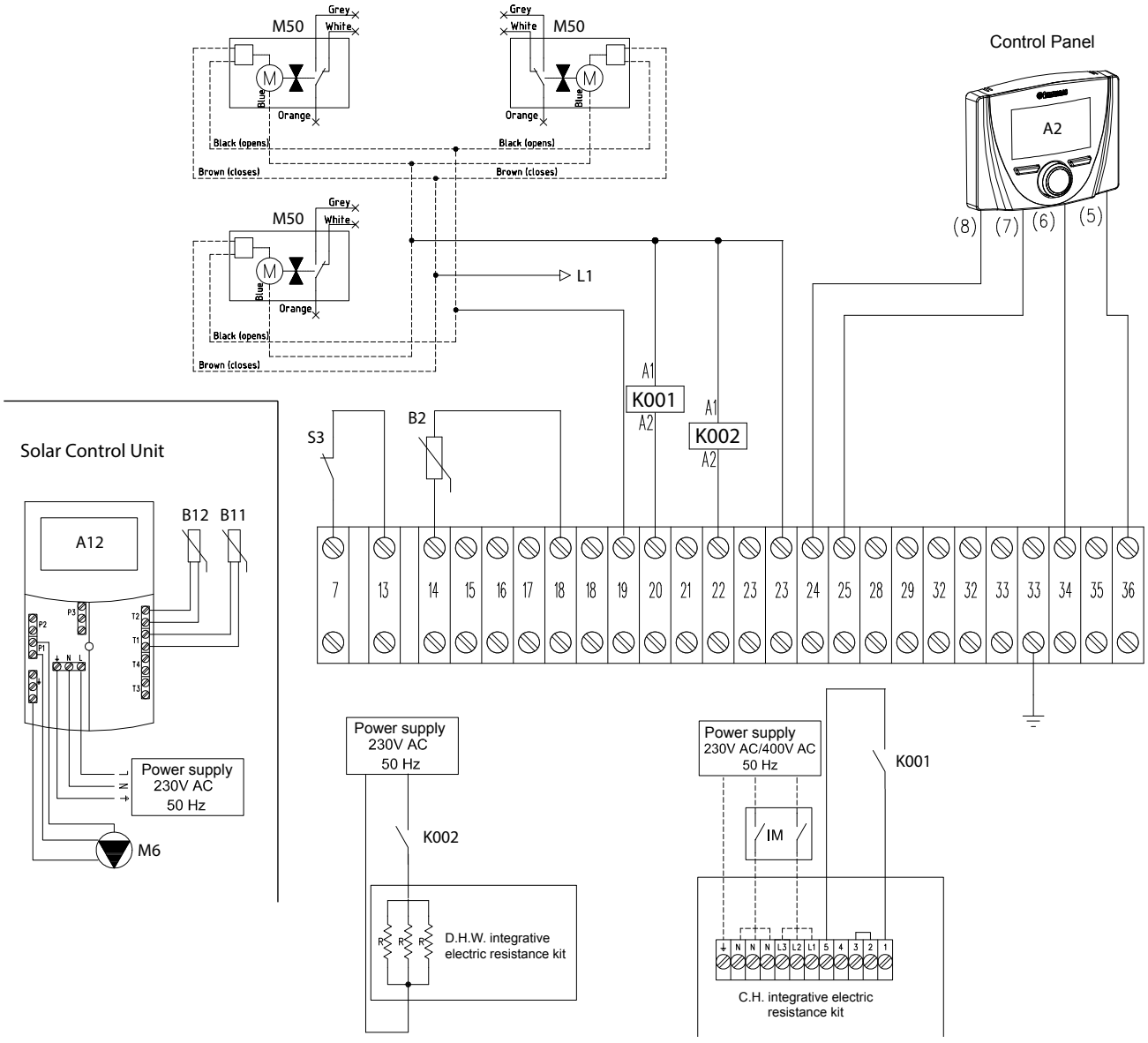
NOTE: This diagram is an example. It is also required to convey the heat pump's condensate drain.
In order to guarantee proper Heat pump operation (also with antifreeze), each system must consider inserting a bypass to guarantee a minimum flow rate (see the technical data table according to the machine)

52.1 WIRING DIAGRAM: AUDAX + Control Panel (standard) for room control + solar pack for DHW

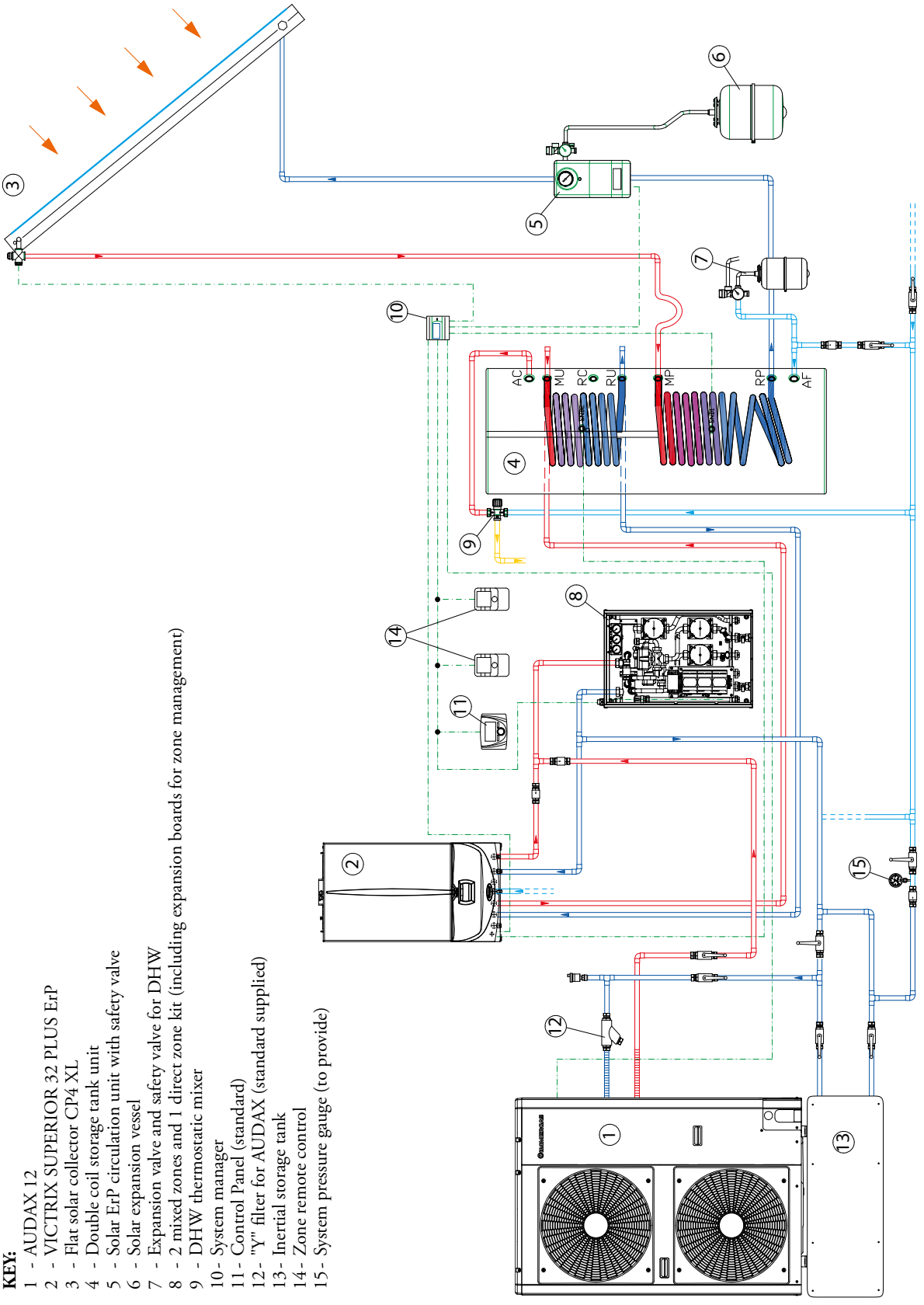
KEY:

A2 - Control Panel
A12 - LCD Picto solar control unit (set SYST. 5)
B2 - Storage tank upper part temp. probe (NTC)
B12 - Storage tank lower part temp. probe (NTC)
B11 - Solar collector temp. probe (PT1000)
IM - Circuit breaker switch
K001 - System integration relay (electrical resistance control)
K002 - DHW integration relay (electrical resistance control)
M6 - Solar ErP circulation group
M50 - DHW priority 3-way deviator valve
S3 - External safety inlet

NOTE: With this setting, the Control Panel (standard supply with AUDAX) is used as a room probe system.



53 HYDRAULIC DIAGRAM: AUDAX (air conditioning only) + boiler PLUS + 2 zones at low temperature and 1 direct zone + solar heating for DHW + System manager



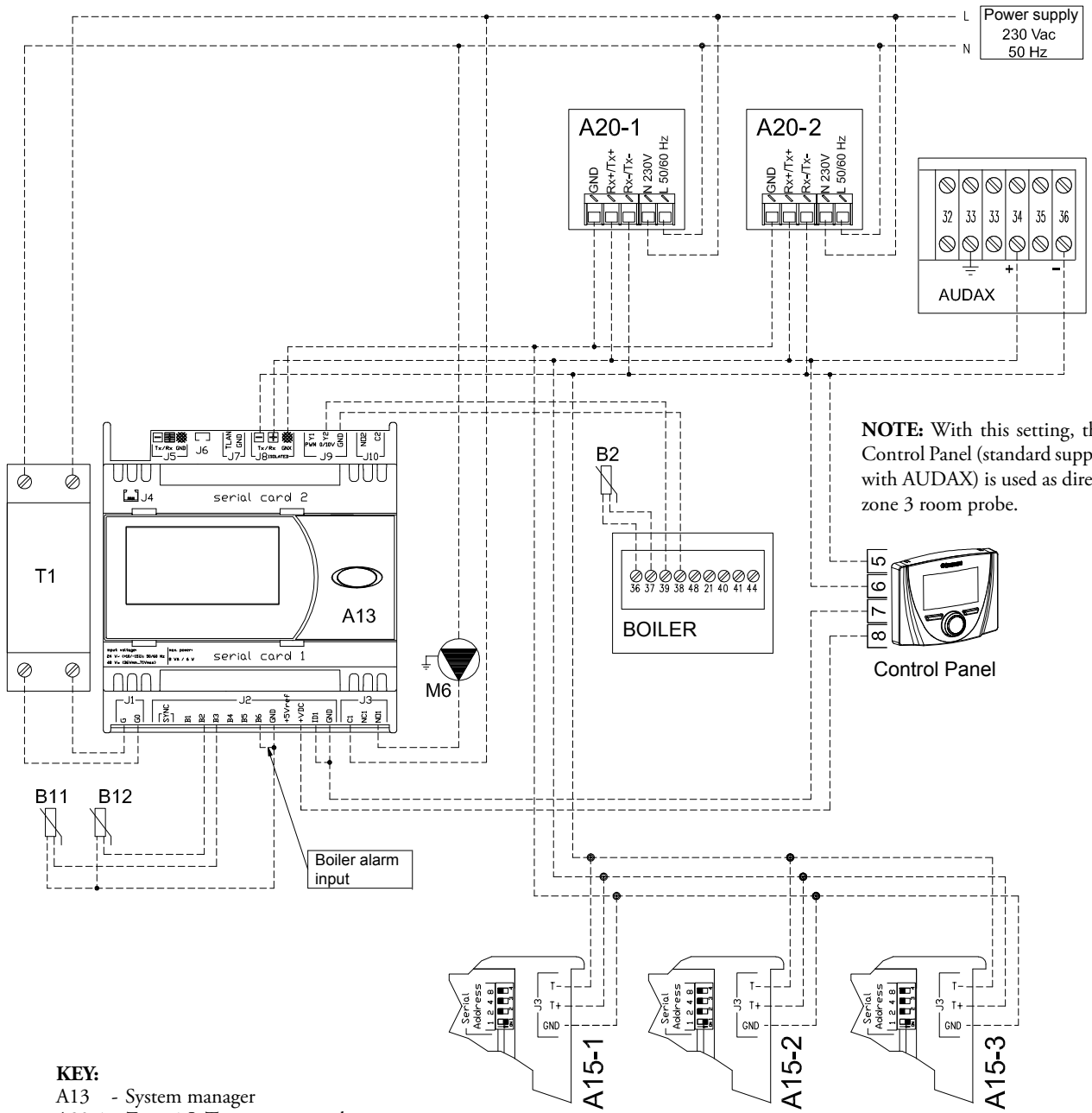
KEY:

1 - AUDAX 12
2 - VICTRIX SUPERIOR 32 PLUS ErP
3 - Flat solar collector CP4 XL
4 - Double coil storage tank unit
5 - Solar ErP circulation unit with safety valve
6 - Solar expansion vessel
7 - Expansion valve and safety valve for DHW
8 - 2 mixed zones and 1 direct zone kit (including expansion boards for zone management)
9 - DHW thermostatic mixer
10 - System manager
11 - Control Panel (standard)
12 - "Y" filter for AUDAX (standard supplied)
13 - Inertial storage tank
14 - Zone remote control
15 - System pressure gauge (to provide)

NOTE: This diagram is an example. It is also required to convey the condensate drain of the heat pump and boiler.
In order to guarantee proper heat pump operation (also with antifreeze), each system must consider inserting a bypass to guarantee a minimum flow rate (see the technical data table according to the machine). In this diagram, the bypass is already installed in the zones kit (8).

AUDAX and Integrated Systems

53.1 WIRING DIAGRAM: AUDAX (air conditioning only) + boiler PLUS + 2 zones at low temperature and 1 direct zone + solar heating for DHW + System manager

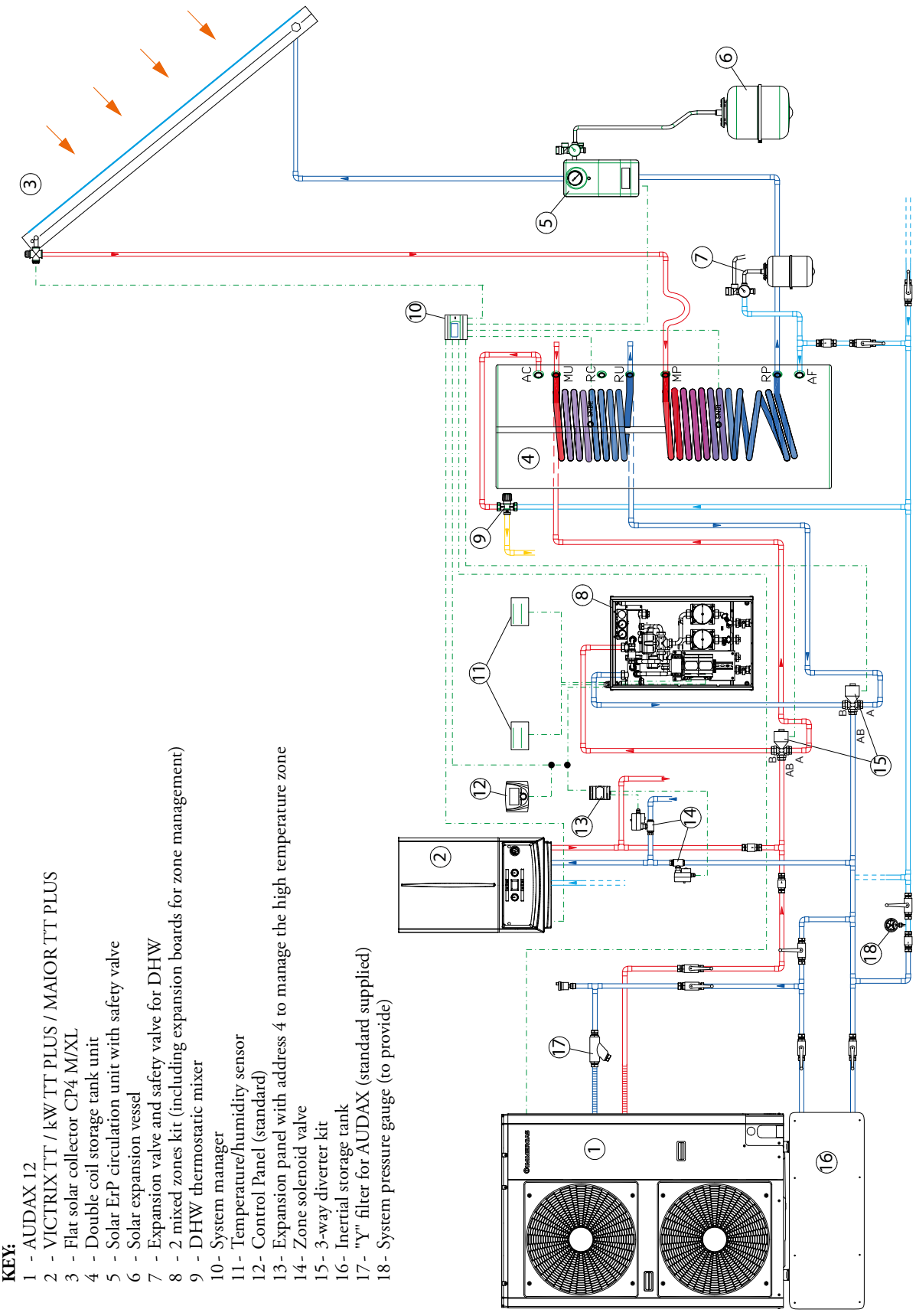


NOTE: With this setting, the Control Panel (standard supply with AUDAX) is used as direct zone 3 room probe.

KEY:

A13 - System manager
A20-1 - Zone 1 L.T. remote control
A20-2 - Zone 2 L.T. remote control
A15-1 - Expansion zone 1 L.T.
A15-2 - Expansion zone 2 L.T.
A15-3 - Direct L.T. zone 3 expansion
B2 - Storage tank upper part temp. probe (NTC)
B11 - Solar collector temp. probe (PT1000)
B12 - Storage tank lower part temp. probe (NTC)
M6 - Solar ErP circulation group
T1 - 24 Vac transformer (not supplied with the System manager)

54 HYDRAULIC DIAGRAM: AUDAX + boiler with 1 high temperature zone + 2 low temperature zones + solar heating for D.H.W. PRODUCTION + System manager

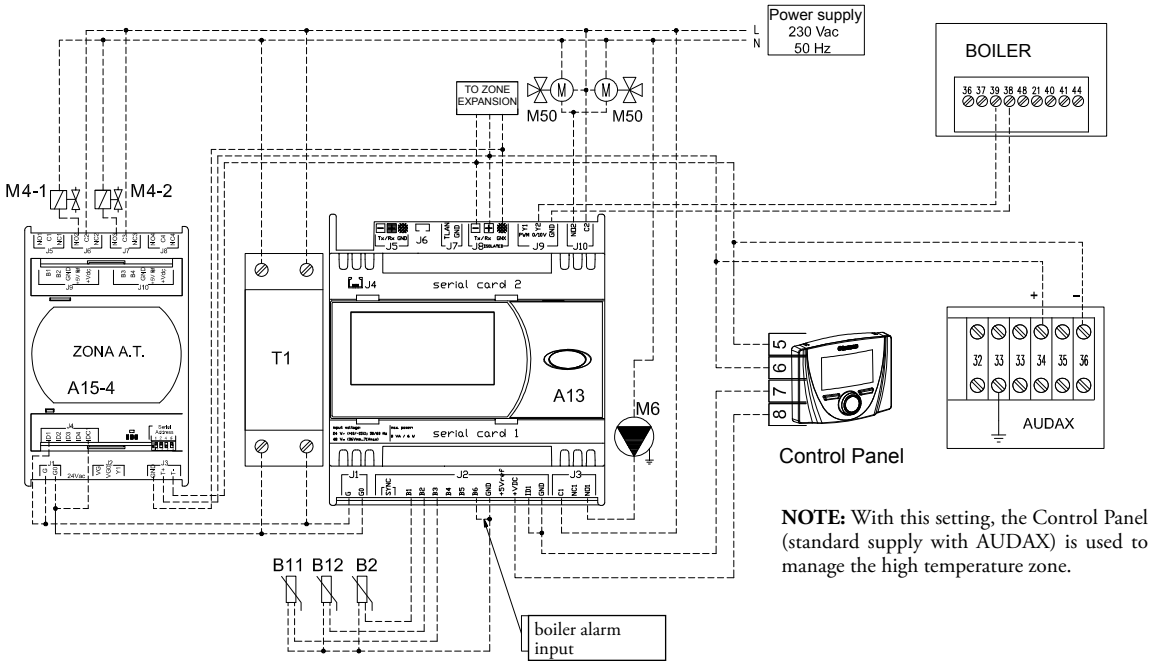


KEY:

1 - AUDAX 12
2 - VICTRIX TT / kW TT PLUS / MAIOR TT PLUS
3 - Flat solar collector CP4 M/XL
4 - Double coil storage tank unit
5 - Solar ErP circulation unit with safety valve
6 - Solar expansion vessel
7 - Expansion valve and safety valve for DHW
8 - 2 mixed zones kit (including expansion boards for zone management)
9 - DHW thermostatic mixer
10- System manager
11- Temperature/humidity sensor
12- Control Panel (standard)
13- Expansion panel with address 4 to manage the high temperature zone
14- Zone solenoid valve
15- 3-way diverter kit
16- Inertial storage tank
17- "Y" filter for AUDAX (standard supplied)
18- System pressure gauge (to provide)

NOTE: This diagram is an example. It is also required to convey the condensate drain of the heat pump and boiler.
In order to guarantee proper heat pump operation (also with antifreeze), each system must consider inserting a bypass to guarantee a minimum flow rate (see the technical data table according to the machine). In this diagram, the bypass is already installed in the zones kit (8).

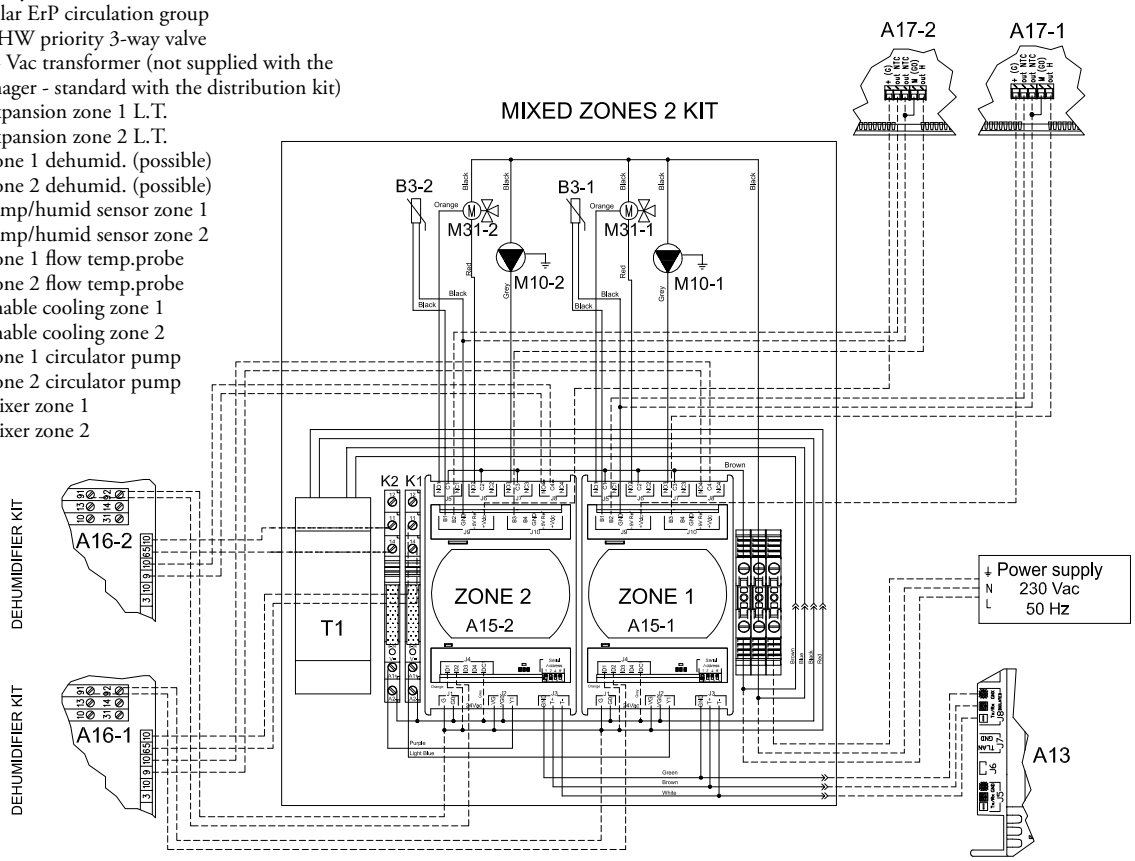
54.1 WIRING DIAGRAM: AUDAX + boiler with 1 high temperature zone + 2 low temperature zones + solar heating for DHW + System manager



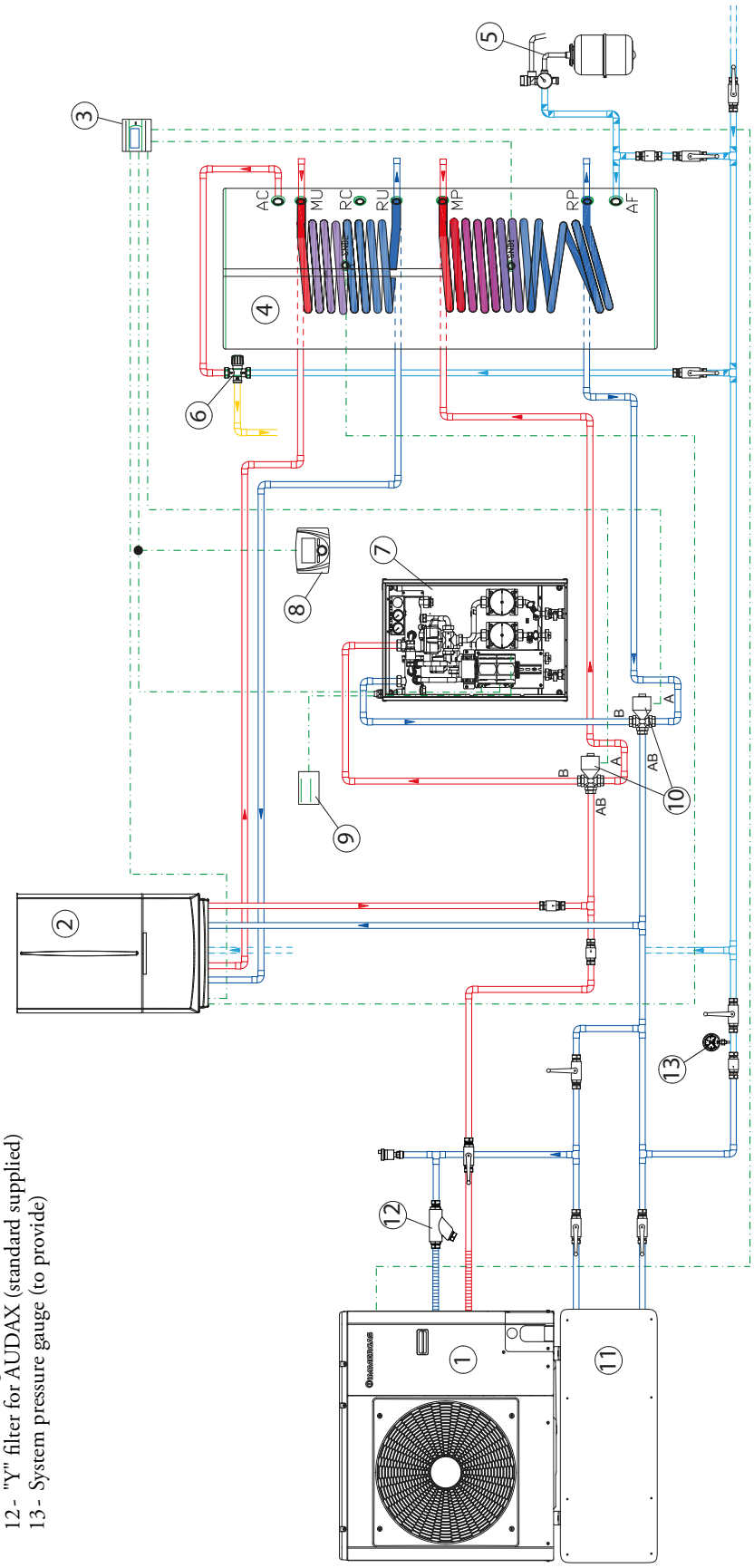
NOTE: With this setting, the Control Panel (standard supply with AUDAX) is used to manage the high temperature zone.

KEY:

A13 - System manager
A15-4 - H.T. zone expansion
B2 - Storage tank upper part temp. probe (NTC)
B11 - Solar collector temp. probe (PT1000)
B12 - Storage tank lower part temp. probe (NTC)
M4-1 - 2-way H.T zone valve
M4-2 - 2-way low + DHW zone valve
M6 - Solar ErP circulation group
M50 - DHW priority 3-way valve
T1 - 24 Vac transformer (not supplied with the System Manager - standard with the distribution kit)
A15-1 - Expansion zone 1 L.T.
A15-2 - Expansion zone 2 L.T.
A16-1 - Zone 1 dehumid. (possible)
A16-2 - Zone 2 dehumid. (possible)
A17-1 - Temp/humid sensor zone 1
A17-2 - Temp/humid sensor zone 2
B3-1 - Zone 1 flow temp.probe
B3-2 - Zone 2 flow temp.probe
K1 - Enable cooling zone 1
K2 - Enable cooling zone 2
M10-1 - Zone 1 circulator pump
M10-2 - Zone 2 circulator pump
M31-1 - Mixer zone 1
M31-2 - Mixer zone 2



55 HYDRAULIC DIAGRAM: AUDAX + boiler PLUS and 2 low temperature zones + Storage tank unit for D.H.W. production + System manager

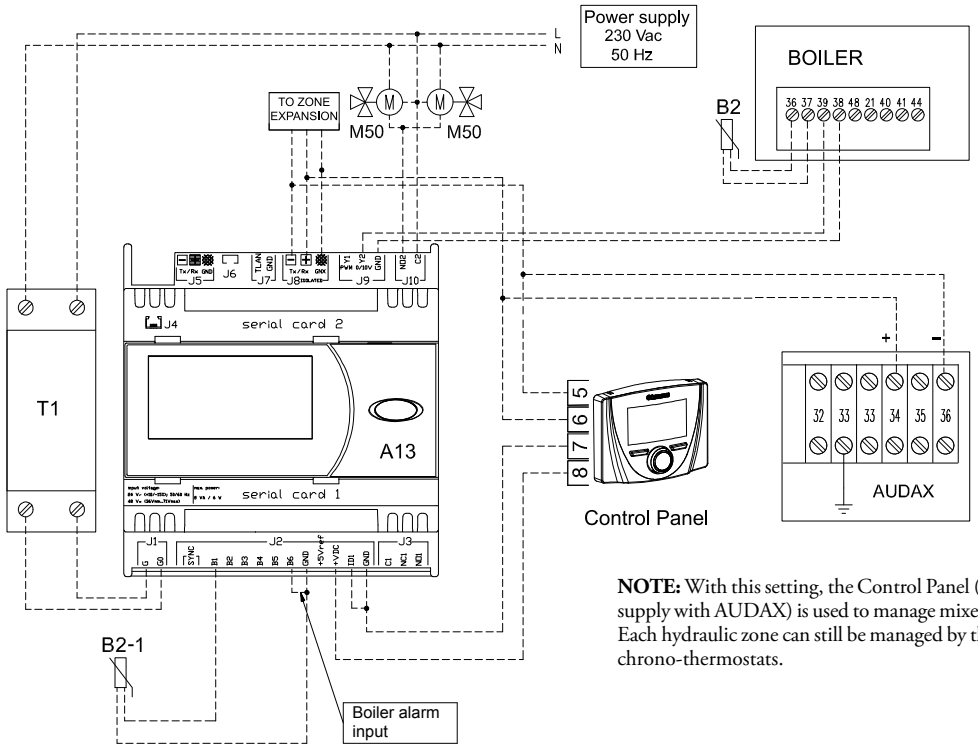


KEY:

1 - AUDAX 6 - 8
2 - VICTRIX kW TT PLUS / MAIOR TT PLUS
3 - System manager
4 - Double coil storage tank unit
5 - Expansion valve and safety valve for DHW
6 - DHW thermostatic mixer
7 - 2 mixed zones kit (including expansion boards for zone management)
8 - Control Panel (standard)
9 - Temperature/humidity sensor
10 - 3-way diverter kit
11 - Inertial storage tank
12 - "Y" filter for AUDAX (standard supplied)
13 - System pressure gauge (to provide)

NOTE: This diagram is an example. It is also required to convey the condensate drain of the heat pump and boiler.
In order to guarantee proper heat pump operation (also with antifreeze), each system must consider inserting a bypass to guarantee a minimum flow rate (see the technical data table according to the machine). In this diagram, the bypass is already installed in the zones kit (7).

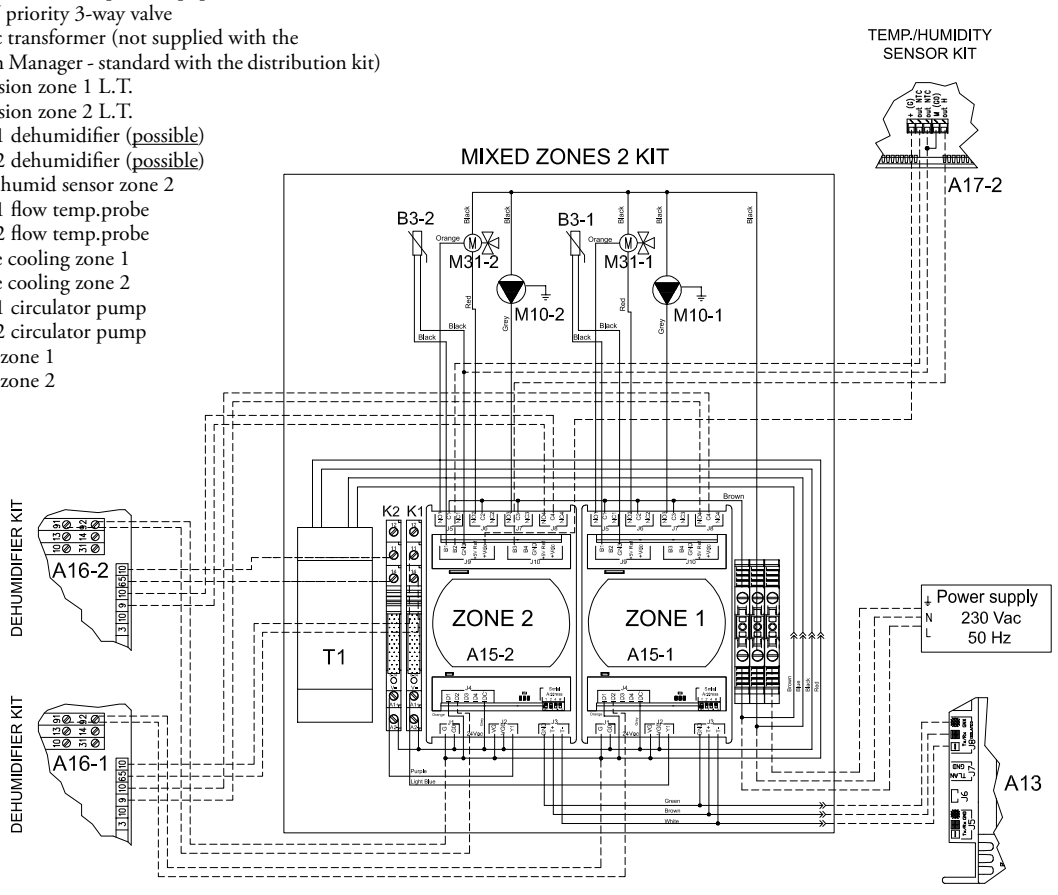
55.1 WIRING DIAGRAM: AUDAX + boiler PLUS and 2 low temperature zones + Storage tank unit for D.H.W. production + System manager



NOTE: With this setting, the Control Panel (standard supply with AUDAX) is used to manage mixed zone 1. Each hydraulic zone can still be managed by the on-off chrono-thermostats.

KEY:

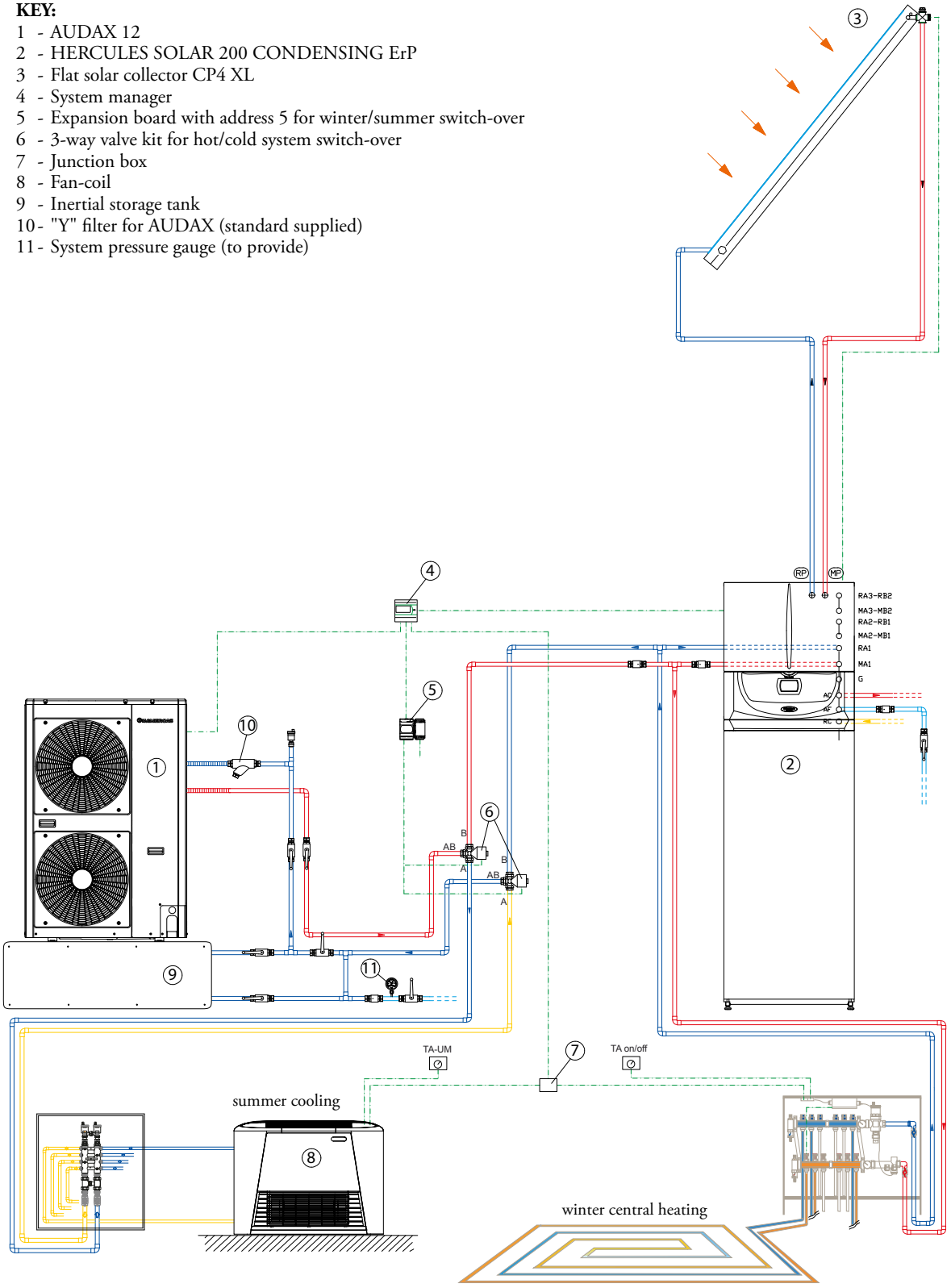
A13 - System manager
B2 - Storage tank upper part temp. probe (NTC)
B2-1 - Storage tank lower part temp. probe (NTC)
M50 - DHW priority 3-way valve
T1 - 24 Vac transformer (not supplied with the System Manager - standard with the distribution kit)
A15-1 - Expansion zone 1 L.T.
A15-2 - Expansion zone 2 L.T.
A16-1 - Zone 1 dehumidifier (possible)
A16-2 - Zone 2 dehumidifier (possible)
A17-2 - Temp/humid sensor zone 2
B3-1 - Zone 1 flow temp.probe
B3-2 - Zone 2 flow temp.probe
K1 - Enable cooling zone 1
K2 - Enable cooling zone 2
M10-1 - Zone 1 circulator pump
M10-2 - Zone 2 circulator pump
M31-1 - Mixer zone 1
M31-2 - Mixer zone 2



56 HYDRAULIC DIAGRAM: AUDAX (air cond.only) + boiler with built-in storage tank + DHW solar heating, separate central heating/cooling system + System manager

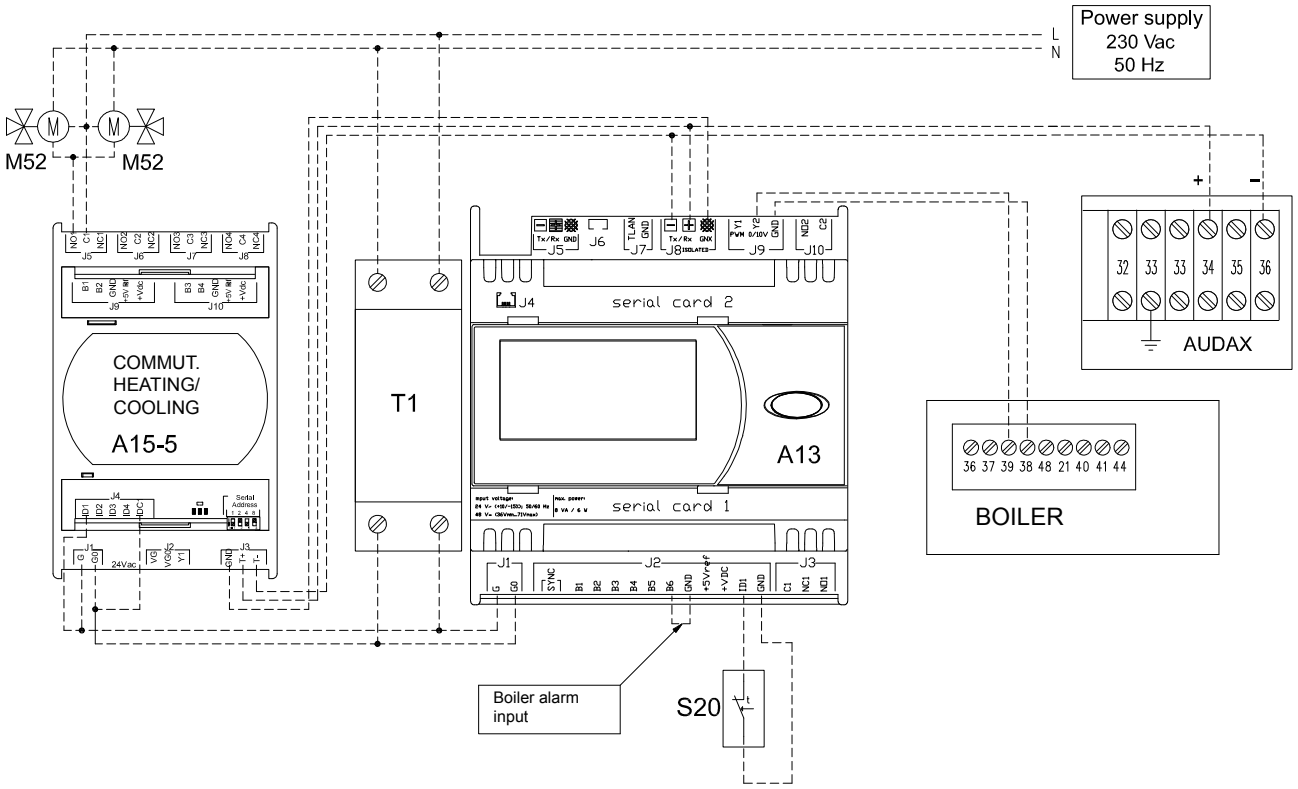
KEY:

1 - AUDAX 12
2 - HERCULES SOLAR 200 CONDENSING ErP
3 - Flat solar collector CP4 XL
4 - System manager
5 - Expansion board with address 5 for winter/summer switch-over
6 - 3-way valve kit for hot/cold system switch-over
7 - Junction box
8 - Fan-coil
9 - Inertial storage tank
10 - "Y" filter for AUDAX (standard supplied)
11 - System pressure gauge (to provide)



NOTE: This diagram is an example. It is also required to convey the condensate drain of the heat pump and boiler.
In order to guarantee proper Heat pump operation (also with antifreeze), each system must consider inserting a bypass to guarantee a minimum flow rate (see the technical data table according to the machine)

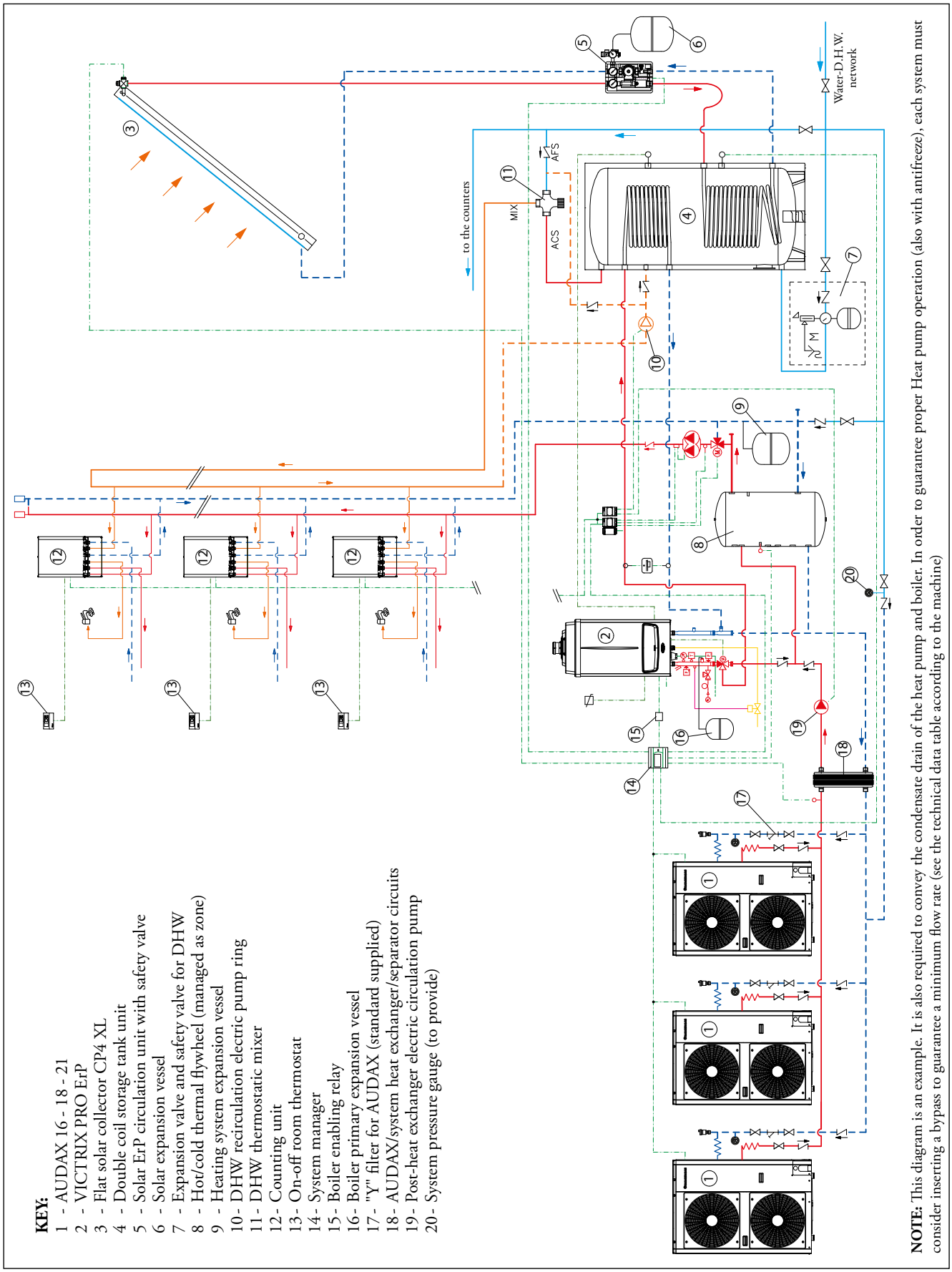
56.1 WIRING DIAGRAM: AUDAX (air cond.only) + boiler with built-in storage tank + DHW solar heating, separate central heating/cooling system + System manager



KEY:
A13 - System manager
A15-5 - Expansion for summer/winter circuits
S20 - Room thermostat/on-off request contacts
M52 - 3-way summer/winter switch-over valve
T1 - 24 Vac transformer (not supplied with the System Manager)

NOTE: With this setting, the Control Panel (standard with AUDAX) is not used.

57 HYDRAULIC DIAGRAM: AUDAX in cascade (air conditioning only) + high power boiler + thermal flywheel and mixed zone + solar heating for D.H.W. production + System manager

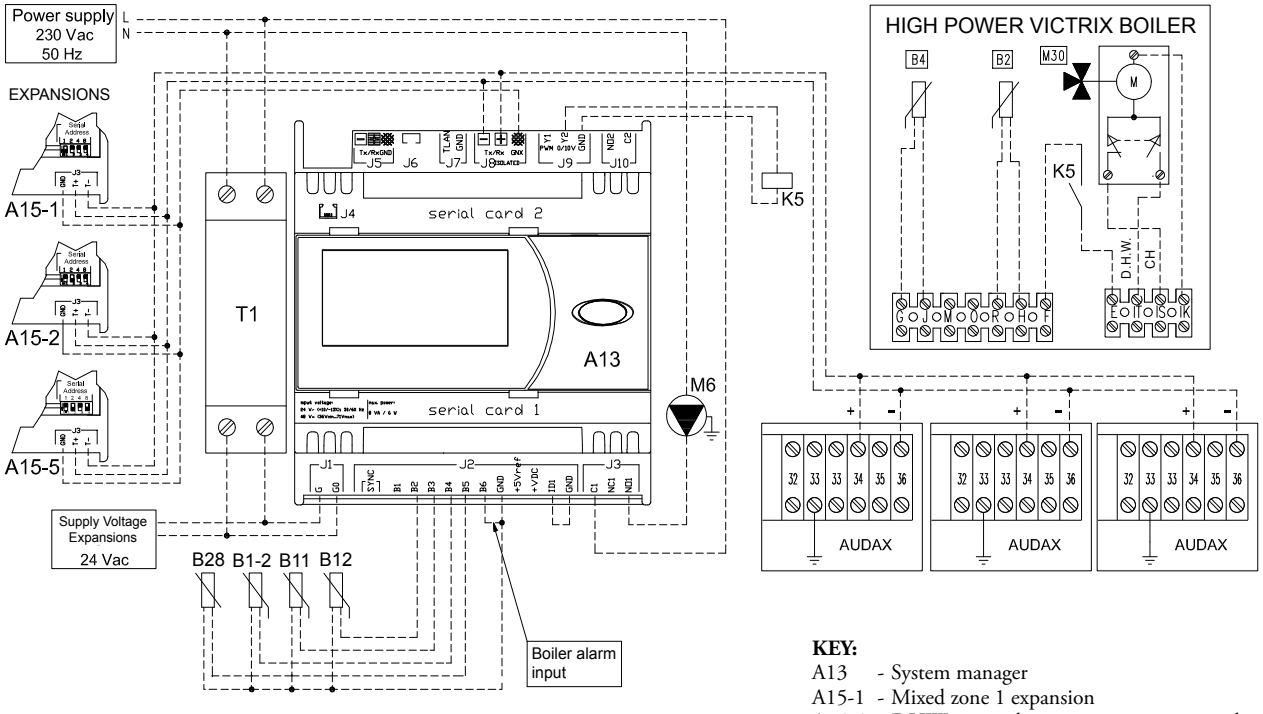


KEY:

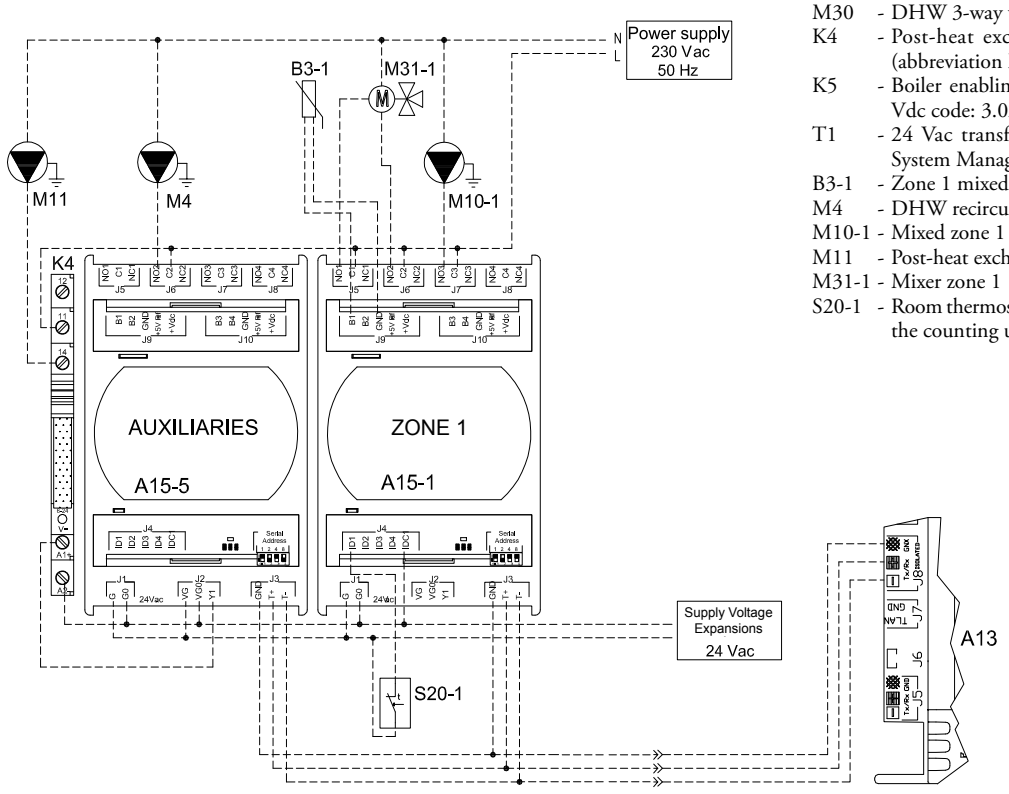
1 - AUDAX 16 - 18 - 21
2 - VICTRIX PRO ErP
3 - Flat solar collector CP4 XL
4 - Double coil storage tank unit
5 - Solar ErP circulation unit with safety valve
6 - Solar expansion vessel
7 - Expansion valve and safety valve for DHW
8 - Hot/cold thermal flywheel (managed as zone)
9 - Heating system expansion vessel
10 - DHW recirculation electric pump ring
11 - DHW thermostatic mixer
12 - Counting unit
13 - On-off room thermostat
14 - System manager
15 - Boiler enabling relay
16 - Boiler primary expansion vessel
17 - "Y" filter for AUDAX (standard supplied)
18 - AUDAX/system heat exchanger/separator circuits
19 - Post-heat exchanger electric circulation pump
20 - System pressure gauge (to provide)

NOTE: This diagram is an example. It is also required to convey the condensate drain of the heat pump and boiler. In order to guarantee proper Heat pump operation (also with antifreeze), each system must consider inserting a bypass to guarantee a minimum flow rate (see the technical data table according to the machine)

57.1 WIRING DIAGRAM: AUDAX in cascade (air conditioning only) + high power boiler + thermal flywheel and mixed zone + solar heating for D.H.W. production + System manager



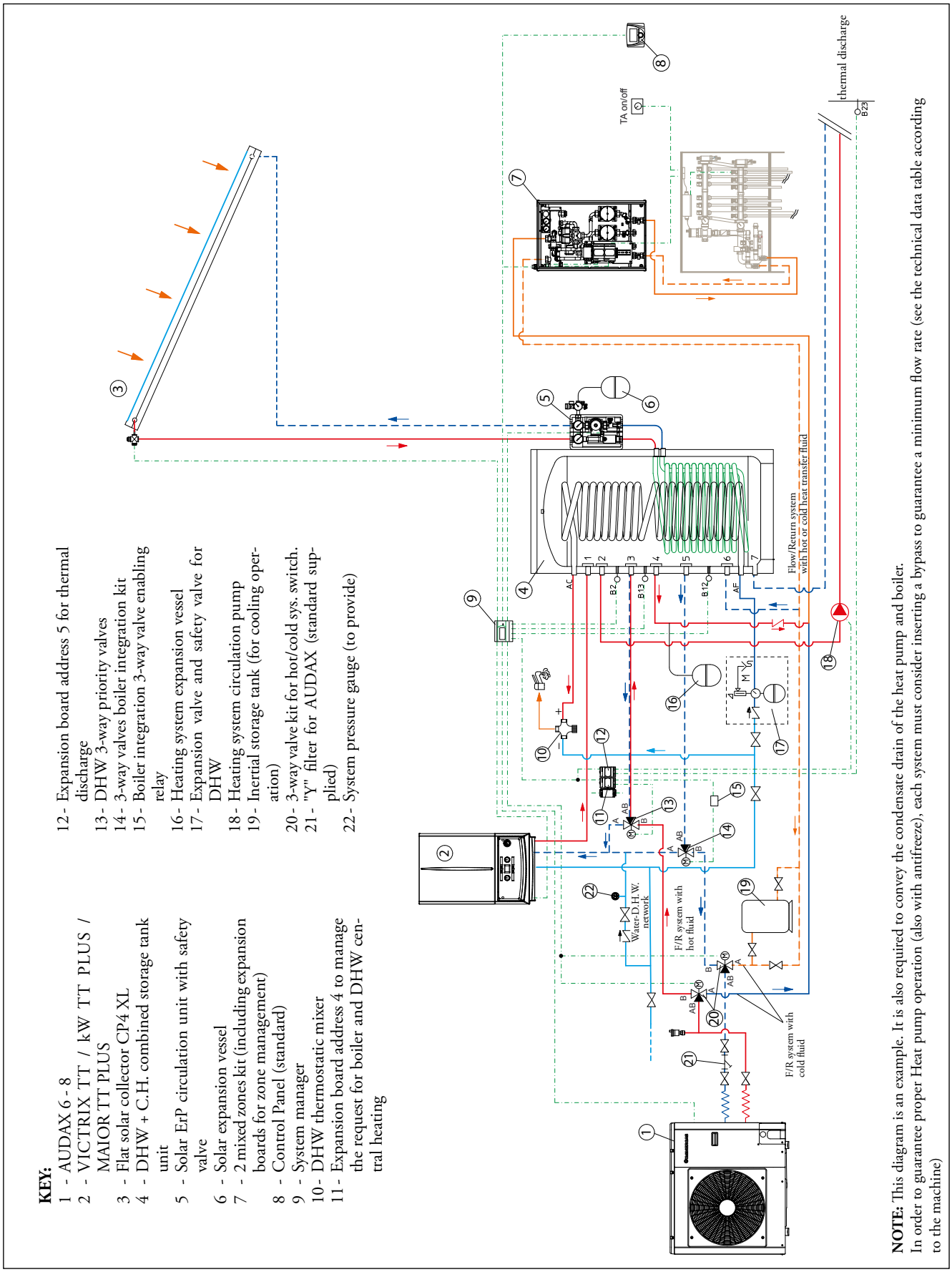
NOTE: With this setting, the Control Panel (standard with AUDAX) is not used.



KEY:

A13 - System manager
A15-1 - Mixed zone 1 expansion
A15-5 - DHW recirculation expansion + post-heat exchanger booster
B1-2 - AUDAX flow temp. probe (NTC)
B2 - Storage tank upper part temp. probe (PTC)
B4 - Boiler external probe
B11 - Solar collector temp. probe (PT1000)
B12 - Storage tank lower part temp. probe (NTC)
B28 - Thermal flywheel temp. probe
M6 - Solar ErP circulation group
M30 - DHW 3-way valve kit
K4 - Post-heat exchanger pump enabling relay (abbreviation EMR 12 Vdc code: 3.023945)
K5 - Boiler enabling relay (abbreviation EMR 12 Vdc code: 3.023945)
T1 - 24 Vac transformer (not supplied with the System Manager)
B3-1 - Zone 1 mixed flow temp.probe
M4 - DHW recirculation pump
M10-1 - Mixed zone 1 circulation pump
M11 - Post-heat exchanger booster pump
M31-1 - Mixer zone 1
S20-1 - Room thermostats or request dry contacts from the counting unit

58 HYDRAULIC DIAGRAM: AUDAX + boiler and 2 low temperature zones + solar heating for DHW and C.H. + System manager

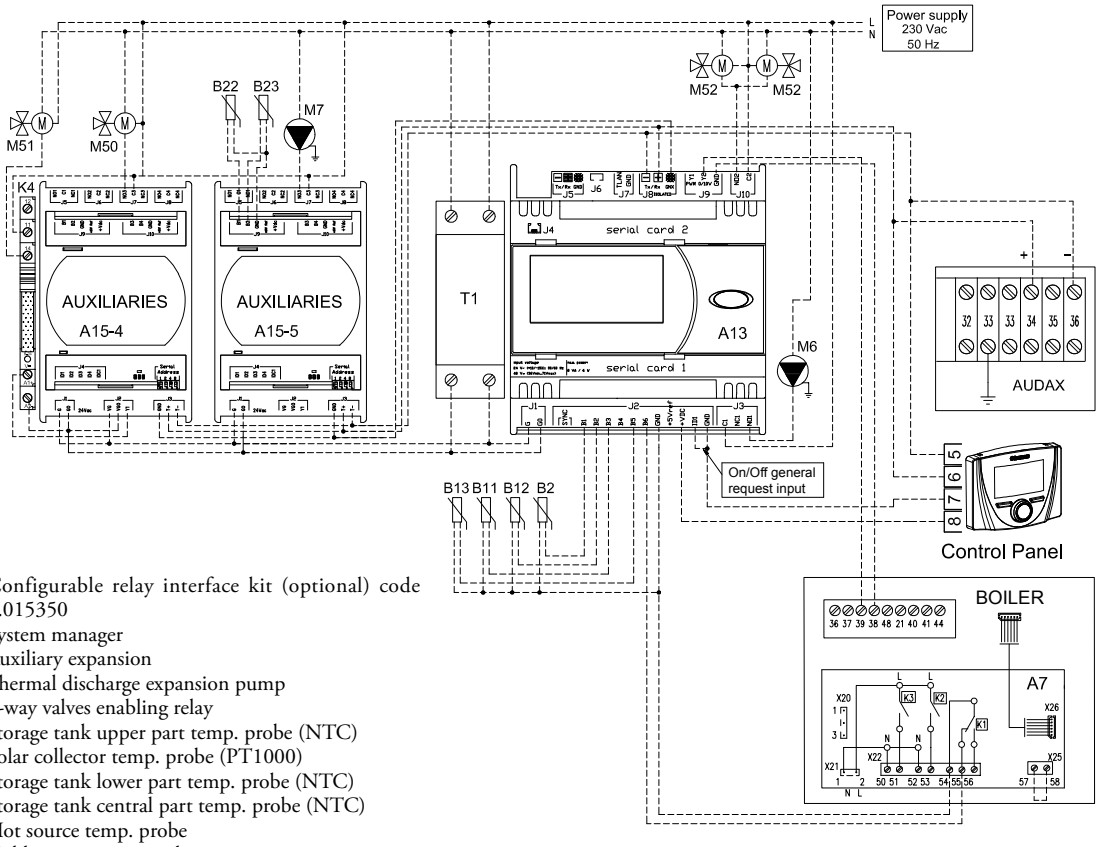


KEY:

1 - AUDAX 6 - 8
2 - VICTRIX TT / kW TT PLUS / MAIOR TT PLUS
3 - Flat solar collector CP4 XL
4 - DHW + C.H. combined storage tank unit
5 - Solar ErP circulation unit with safety valve
6 - Solar expansion vessel
7 - 2 mixed zones kit (including expansion boards for zone management)
8 - Control Panel (standard)
9 - System manager
10 - DHW thermostatic mixer
11 - Expansion board address 4 to manage the request for boiler and DHW central heating
12 - Expansion board address 5 for thermal discharge
13 - DHW 3-way priority valves
14 - 3-way valves boiler integration kit
15 - Boiler integration 3-way valve enabling relay
16 - Heating system expansion vessel
17 - Expansion valve and safety valve for DHW
18 - Heating system circulation pump
19 - Inertial storage tank (for cooling operation)
20 - 3-way valve kit for hot/cold sys. switch.
21 - "Y" filter for AUDAX (standard supplied)
22 - System pressure gauge (to provide)

NOTE: This diagram is an example. It is also required to convey the condensate drain of the heat pump and boiler.
In order to guarantee proper Heat pump operation (also with antifreeze), each system must consider inserting a bypass to guarantee a minimum flow rate (see the technical data table according to the machine)

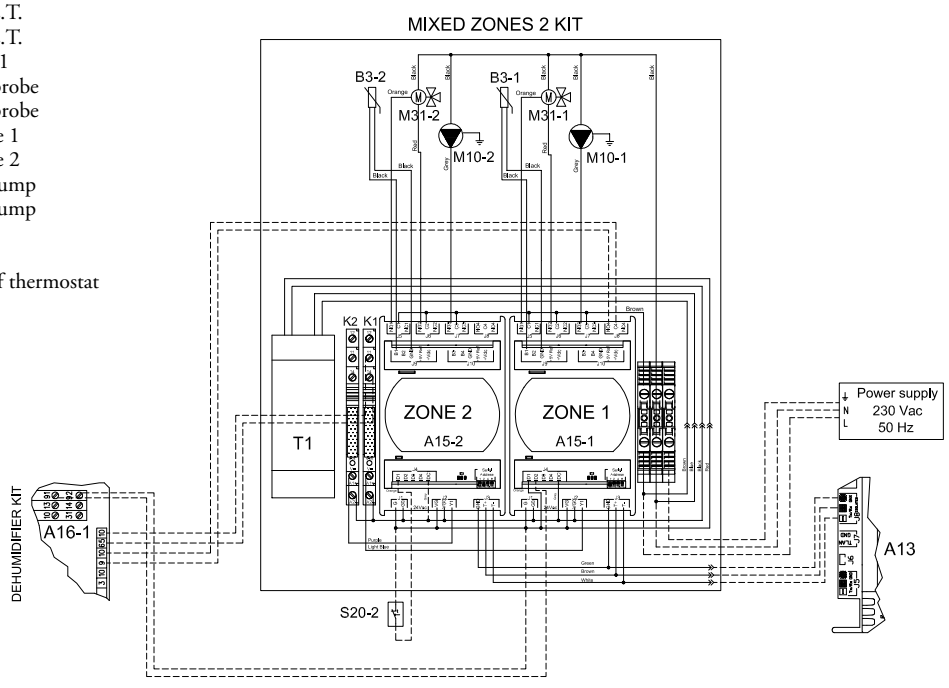
58.1 WIRING DIAGRAM: AUDAX + boiler and 2 low temperature zones + solar heating for DHW and C.H. + System manager



KEY:

A7 - Configurable relay interface kit (optional) code 3.015350
A13 - System manager
A15-4 - Auxiliary expansion
A15-5 - Thermal discharge expansion pump
K4 - 3-way valves enabling relay
B2 - Storage tank upper part temp. probe (NTC)
B11 - Solar collector temp. probe (PT1000)
B12 - Storage tank lower part temp. probe (NTC)
B13 - Storage tank central part temp. probe (NTC)
B22 - Hot source temp. probe
B23 - Cold source temp. probe
M6 - Solar ErP circulation group
M7 - Heating system circulation pump
M50 - DHW integration 3-way valve
M51 - Boiler integration 3-way valve
M52 - 3-way summer/winter switch-over valve
T1 - 24 Vac transformer (not supplied with the System Manager - standard with the distribution kit)
A15-1 - Expansion zone 1 L.T.
A15-2 - Expansion zone 2 L.T.
A16-1 - Dehumidifier zone 1
B3-1 - Zone 1 flow temp.probe
B3-2 - Zone 2 flow temp.probe
K1 - Enable cooling zone 1
K2 - Enable cooling zone 2
M10-1 - Zone 1 circulator pump
M10-2 - Zone 2 circulator pump
M31-1 - Mixer zone 1
M31-2 - Mixer zone 2
S20-2 - Zone 2 room on/off thermostat

NOTE: With this setting, the Control Panel (standard supply with AUDAX) is used to manage mixed zone 1. Set relay K3 to 3-2. The relay issues a signal that the boiler is blocked and automatically activates the heat pump.



59 TEMPERATURE CONTROL OPTIONALS

System manager kit device class VI* or VIII code 3.021522 	**Zone remote control kit** device class V or VI* code 3.023364 
Temperature and humidity sensor kit device class V or VI* code 3.021524 	**Humidistat kit** (operates on the Dehumidifier according to the humidity detected in the room and according to what is set on the device) code 3.023302 
CRONO 7 (weekly digital chrono-thermostat) device class IV* or VII code 3.021622 	**CRONO 7 WIRELESS** device class IV* or VII code 3.021624 
External probe kit (to be connected directly to the system manager) code 3.015266	

NOTE: Certain heat adjustment devices can have different classes according to the settings that can be changed.

* Factory set device class.

REF. European Commission Notice 2014/C 207/02

6.2. Contribution to temperature controls of seasonal space heating energy efficiency of packages of space heaters, temperature control and solar devices or of packages of combination heaters, temperature control and solar devices.

Class No.	I	II	III	IV	V	VI	VII	VIII
% Value	1	2	1.5	2	3	4	3.5	5

AUDAX and Integrated Systems

59.1 OTHER HYDRAULIC AND INSTALLATION OPTIONALS

Integrative resistance kit enabling relay kit heating system (SSR 6 Vdc)
code 3.023946

Relay kit to enable the DHW integrative resistance kit for boilers managed with an on-off contact or for dehumidifier cooling request (EMR 12 Vdc)
code 3.023945

Integrative resistance kit for heat system
(selectable power: 2 - 4 - 6 kW)
(selectable power supply: 230/400 Vac)
code 3.021525

2 kW integrative resistance kit for INOXSTOR 200-300-500 and UB 550/750
code 3.020861

5 kW integrative resistance kit for 1000-1500 litre boilers and UB 750
code 3.020862

Mixed zones 2 kit
(wall-hung or recessed)
code 3.021528

2 mixed zones and 1 direct zone kit
(wall-hung or recessed for mixed systems)
code 3.021527
(both kits have expansion boards for zone management, 24 Vac transformer and temperature probes)

Wall installation brackets kit for AUDAX 6 and 8
code 3.022154

Dehumidifier kit
code 3.021529

Cut-off cocks kit with 1" steel anti-vibration flexible hoses
code 3.025954

Dehumidifier frame kit
code 3.022146

Flow grid and dehumidifier return kit
code 3.022147

AUDAX and Integrated Systems

Expansion kit to manage zone or for auxiliaries
code 3.021547

Contact NTC probe kit for storage tank
(also used to read the temperature
flow temperature in the zones of the system)
code 3.019375

Probe kit for solar collector temperature
(coupled with the System manager)
code 3.019374

3-way valve kit with 1" connections
(used for DHW priority or system diverter)
code 3.020632

Low temperature safety kit for low temperature systems and system distribution kit
code 3.013794

12 litre system expansion vessel kit
code 3.011679

Condensate antifreeze heating cable KIT
(can only be used for AUDAX 6 - 8 - 12 - 16)
code 3.027385

25-litre horizontal inertial storage tank kit
code 3.027842

75-litre horizontal inertial storage tank kit
code 3.027843

100-litre horizontal inertial storage tank kit
code 3.027844

200-litre horizontal inertial storage tank kit
code 3.027845

75 litre vertical inertial storage tank
(can be installed wall-hung vertically or on floor)
code 3.027288

Bracket kit for wall mounting
Inertial storage tank
(for wall-mounted installation)
code 3.027290

50 litre vertical inertial storage tank
code 3.027539

50 litre recessed inertial storage kit
code 3.027709

EXCLUSIVE OPTIONAL FOR AUDAX 18 - 21

Vibration-dampening kit
(can be used for STAND ALONE installations)
code 3.027654

60 MAIN INERTIAL STORAGE TANK TECHNICAL FEATURES

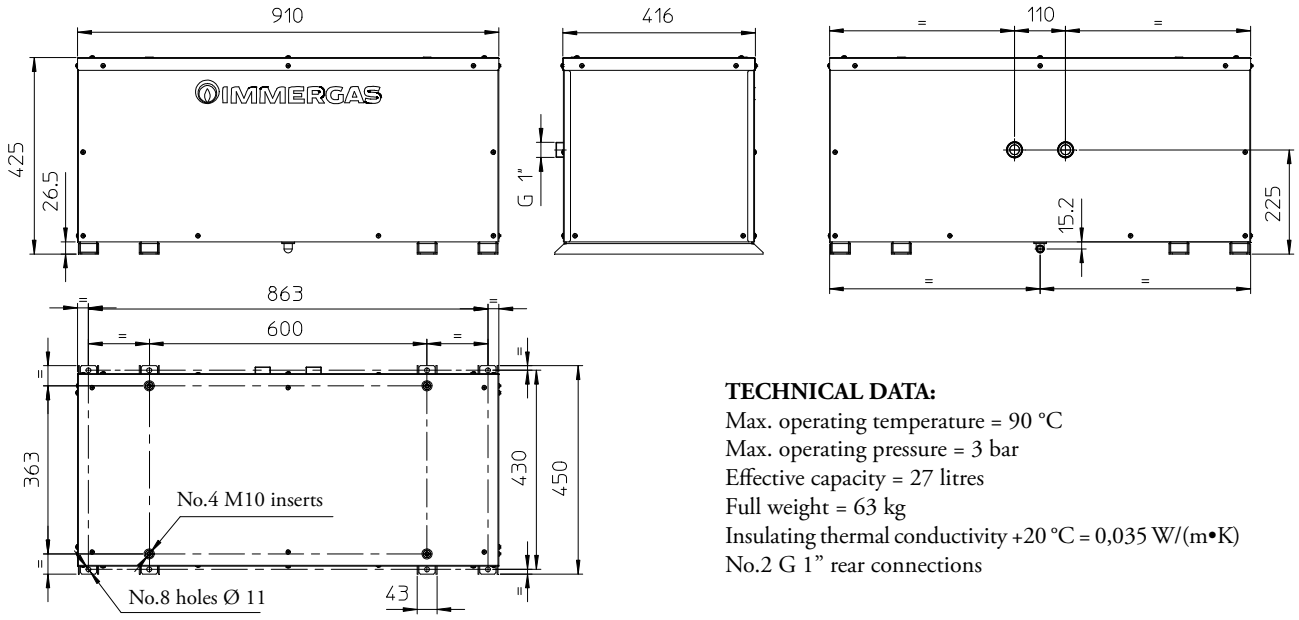
Minimum water content is mainly important to provide proper execution of AUDAX heat pump defrosting cycles.
In this regard, the minimum amount of water must be 6 l/kW of the machine's power for any type of system.

It is also important to check that the dehumidifier line has a minimum of **3 l/kW** of the machine (dehumidifier hydraulic circuit connection reference).
The flywheel naturally also guarantees normal operation of AUDAX with systems divided into zones (therefore, with variable water content in circulation).
Improved operation with the thermal flywheel is obtained, for example, with fan coils used in cooling mode (a condition in which the flow temperature is very low and significant heat load changes vary according to the number of active fan coils).

MAIN FEATURES:
- The horizontal inertial storage tanks are provided with set-ups to support and fix the AUDAX (excluding AUDAX 18 - 21) through M10 threaded holes (in correspondence with the support feet of the same AUDAX);
- The frame of the horizontal inertial storage tanks and of the 50-litre vertical storage tank has been treated with the cataphoresis process and is painted in the same colour as AUDAX;
- All storage tanks in the inertial storage tanks are made of stainless steel, the horizontal inertial tanks are fully insulated in polystyrene with a minimum thickness of 25 mm (thicker in some points of the storage tank), the 50-litre inertial storage tanks (vertical and recessed) are fully insulated with 40 mm K-FLEX ST;
- The vertical and horizontal inertial storage tanks are supplied with vibration-dampening devices (to place between thermal flywheel and support surface);
- An earthing securing device is installed;
- The inertial storage tanks are equipped by default with a filling/draining connection and relative cock.

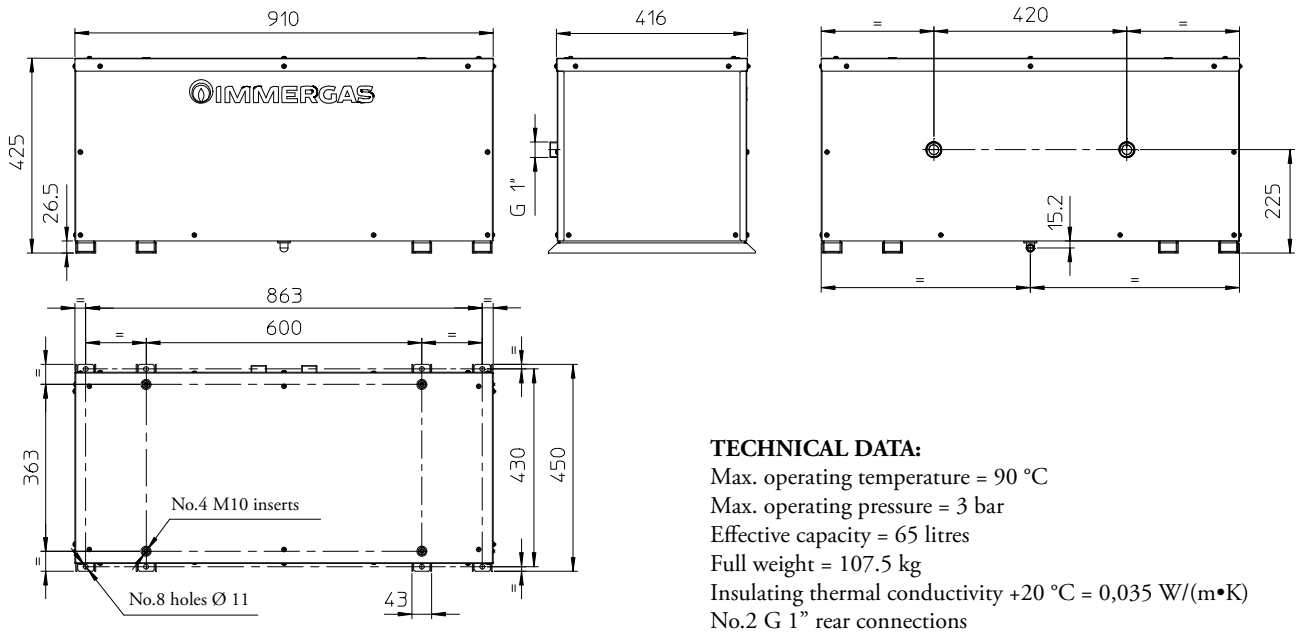
NOTE: Any check valves must be provided separately.

60.1 25-LITRE HORIZONTAL INERTIAL STORAGE TANK (CodE 3.027842)



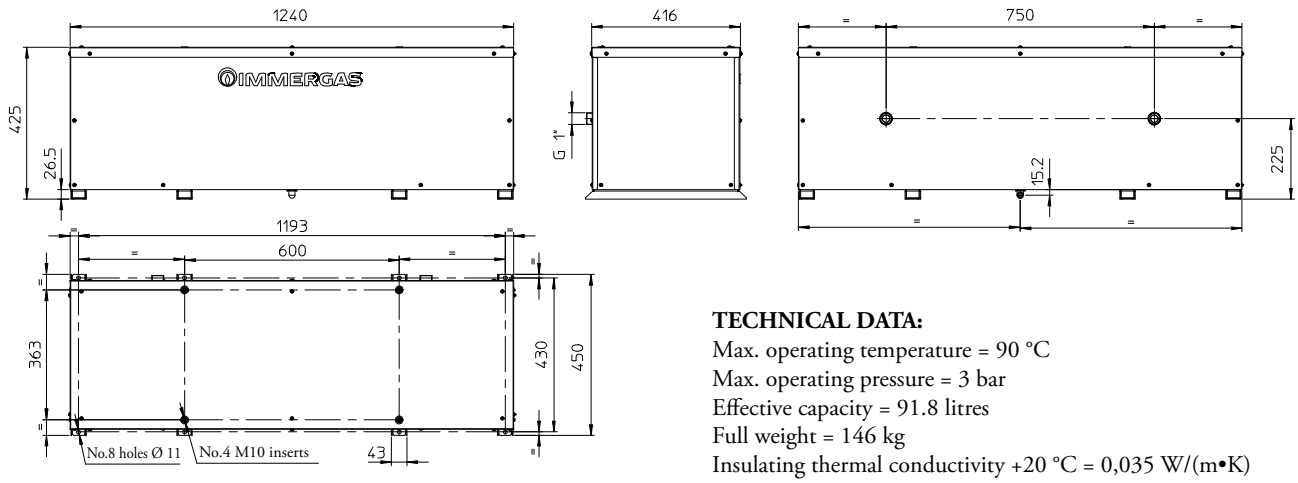
TECHNICAL DATA:
Max. operating temperature = 90 °C
Max. operating pressure = 3 bar
Effective capacity = 27 litres
Full weight = 63 kg
Insulating thermal conductivity +20 °C = 0,035 W/(m•K)
No.2 G 1" rear connections

60.2 75-LITRE HORIZONTAL INERTIAL STORAGE TANK (CodE 3.027843)



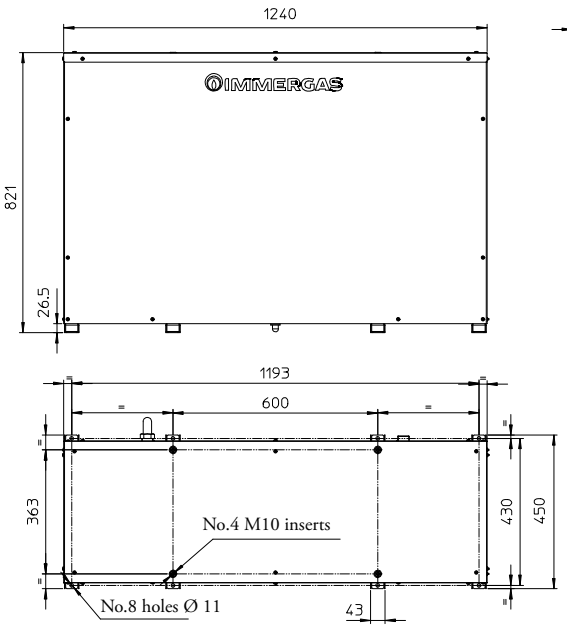
TECHNICAL DATA:
Max. operating temperature = 90 °C
Max. operating pressure = 3 bar
Effective capacity = 65 litres
Full weight = 107.5 kg
Insulating thermal conductivity +20 °C = 0,035 W/(m•K)
No.2 G 1" rear connections

60.3 100-LITRE HORIZONTAL INERTIAL STORAGE TANK (CodE 3.027844)



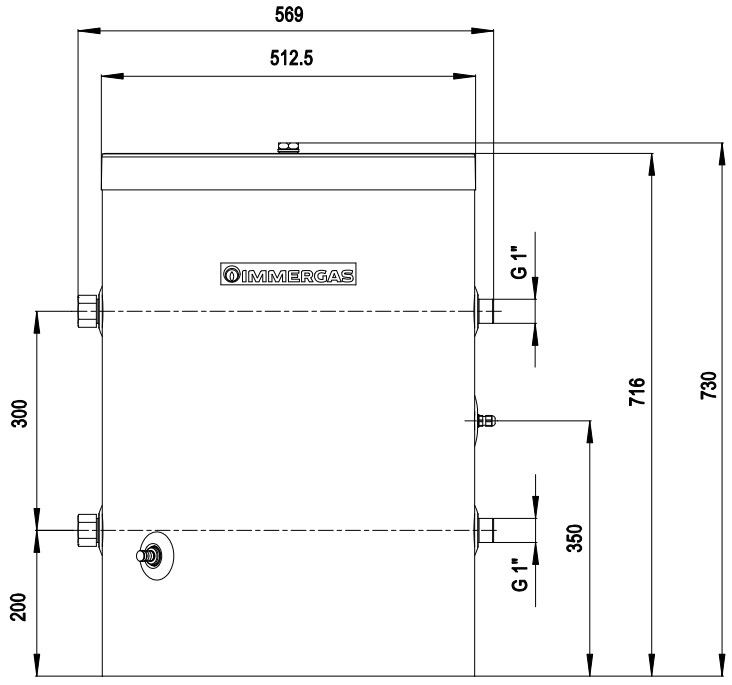
TECHNICAL DATA:
Max. operating temperature = 90 °C
Max. operating pressure = 3 bar
Effective capacity = 91.8 litres
Full weight = 146 kg
Insulating thermal conductivity +20 °C = 0,035 W/(m•K)
No.2 G 1" rear connections

60.4 200-LITRE HORIZONTAL INERTIAL STORAGE TANK (CodE 3.027845)



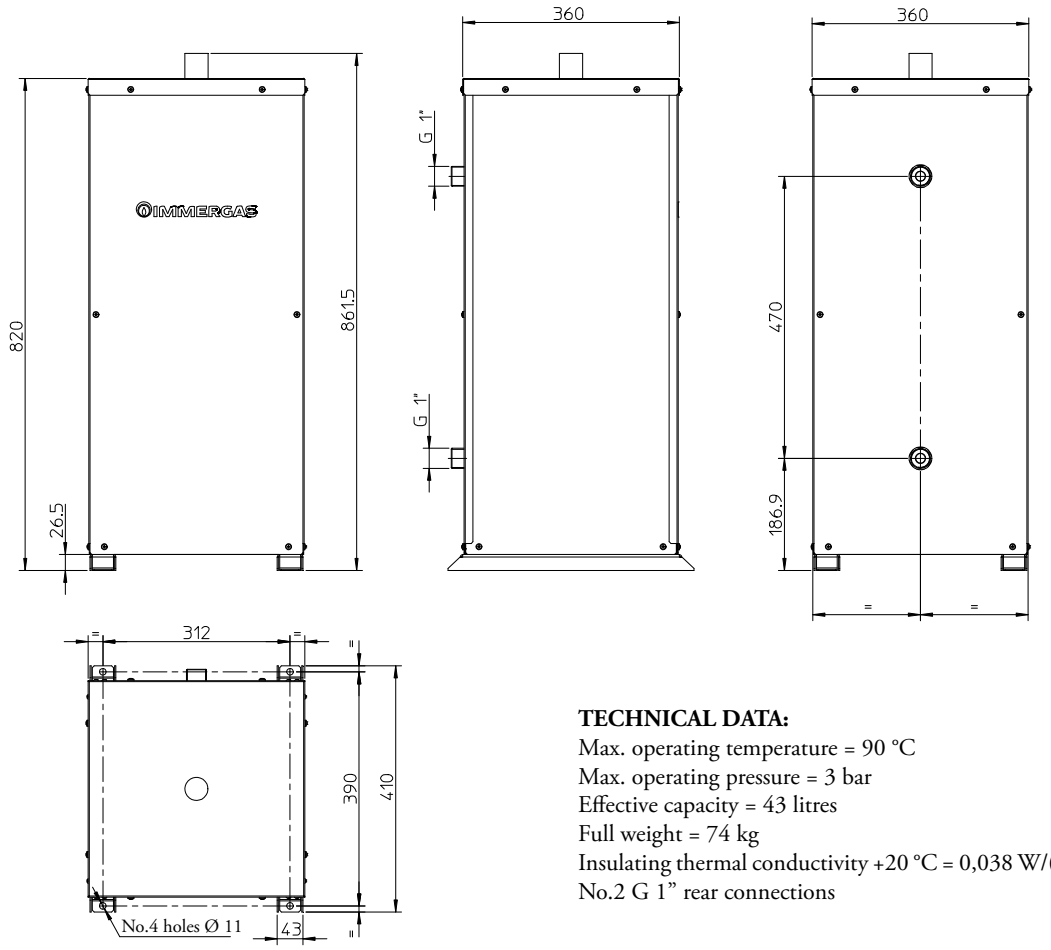
TECHNICAL DATA:
Max. operating temperature = 90 °C
Max. operating pressure = 3 bar
Effective capacity = 184 litres
Full weight = 291 kg
Insulating thermal conductivity +20 °C = 0,035 W/(m•K)
No.4 G 1" rear connections (2 of which connected by copper pipe, as shown)

60.5 75-LITRE INERTIAL STORAGE TANK (CodE 3.027288)

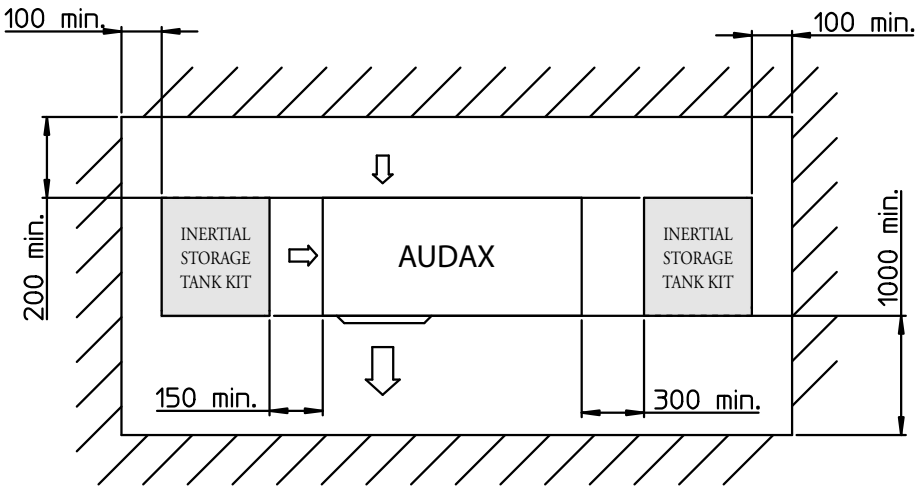


TECHNICAL DATA:
Max. operating temperature = 90 °C
Max. operating pressure = 3 bar
Effective capacity = 77 litres
Full weight = 95 kg
Insulating thermal conductivity +20 °C = 0,038 W/(m•K)
No.4 G 1" side connections

60.6 50 LITRE VERTICAL INERTIAL STORAGE TANK (CodE 3.027539)

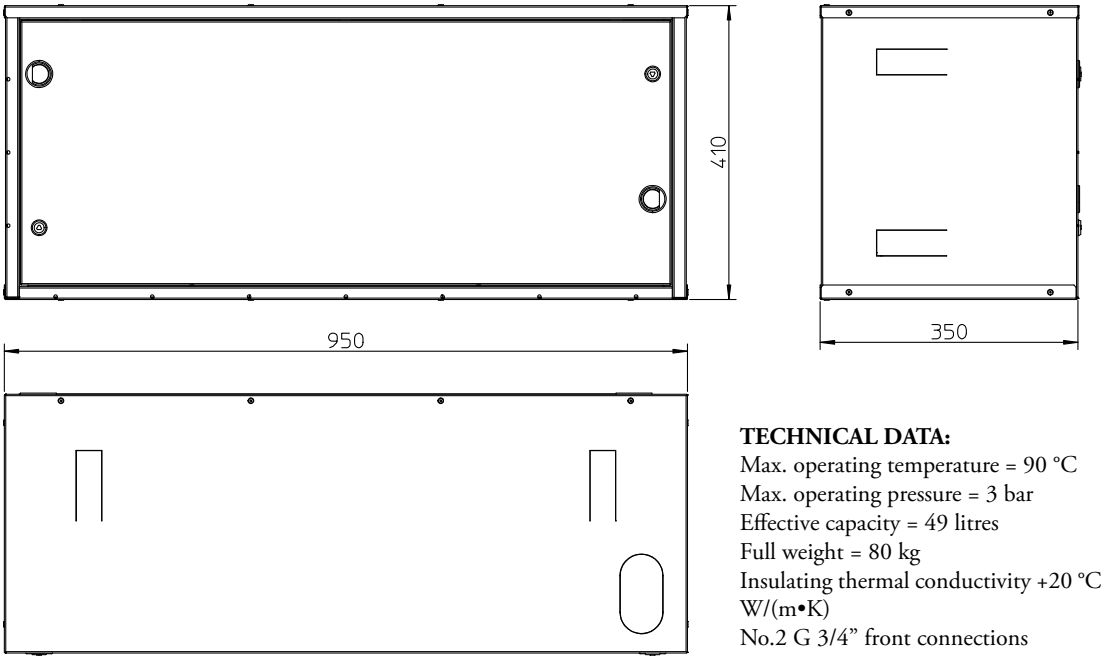


TECHNICAL DATA:
Max. operating temperature = 90 °C
Max. operating pressure = 3 bar
Effective capacity = 43 litres
Full weight = 74 kg
Insulating thermal conductivity +20 °C = 0,038 W/(m•K)
No.2 G 1" rear connections



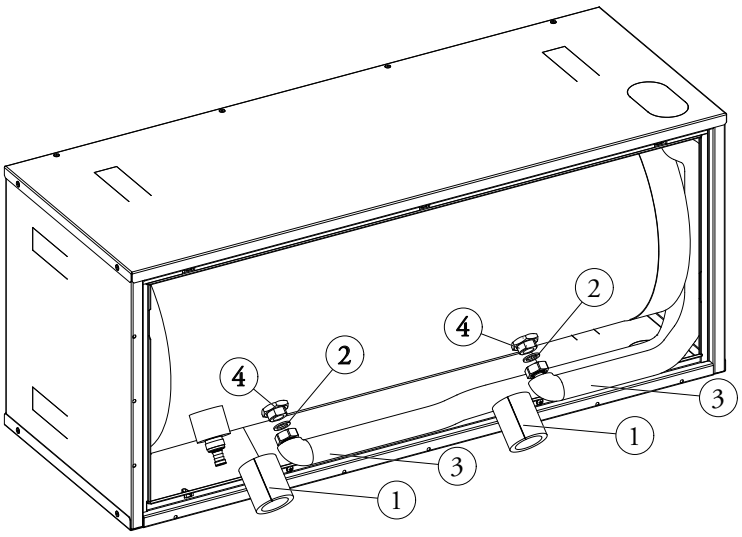
NOTE: For more information on the minimum installation distances to be applied, refer to the instruction manual of the dedicated heat pump model.

60.7 50-LITRE RECESSEDINERTIAL STORAGE TANK (CodE 3.027709)



TECHNICAL DATA:
Max. operating temperature = 90 °C
Max. operating pressure = 3 bar
Effective capacity = 49 litres
Full weight = 80 kg
Insulating thermal conductivity +20 °C = 0,038 W/(m•K)
No.2 G 3/4" front connections

NOTE: Particularly suitable for applications with TRIO systems in SOLAR CONTAINER



KEY:
1 - Insulation
2 - Gaskets
3 - Flexible connection hoses (to be insulated before installation)
4 - 3/4" G-fittings

Fit the insulated connection hoses supplied, inserting the special gaskets (2).
Install the insulation sleeves (1) on the terminal fittings of the hydraulic connections.

IMMERGAS

EU DECLARATION OF CONFORMITY

(N. 770518)

(3.027809) - AUDAX 6
(3.027810) - AUDAX 8
(3.027811) - AUDAX 12
(3.027812) - AUDAX 16
(3.028238) - AUDAX 16

Name and address of the manufacturer or of its legal representative:

IMMERGAS S.p.A. via Cisa Ligure 95, 42041 Brescello RE Italy

This declaration of conformity is issued under the exclusive responsibility of the manufacturer.

Object of the declaration:

AIR/WATER HEAT PUMP

The purpose of the above declaration complies with the relevant Union harmonisation legislation:

EC DIRECTIVE ELECTROMAGNETIC COMPATIBILITY 2014/30/UE;
EC DIRECTIVE RoHS 2011/65/EU;
EC MACHINERY DIRECTIVE 2009/42/EC;
LABELING EU 2017/1369;
REG. EU 813/2013;
EC ECODESIGN DIRECTIVE 2009/125/EC;
REG. EU 811/2013;
REG. EU 327/2011

Reference to the relevant harmonised standards or references to the other technical specifications in relation to which conformity is declared:

EN 55014-1/2006; +A2:2011 - EN 55014-2:1997; +A2:2008
EN 61000-3-2:2014; EN 61000-3-3:2013; EN 61000-3-11:2000; EN 61000-3-12:2011
EN 60335-1:2012
EN 60335-2-40:2003;+A13:2012
EN 50581:2012 - EN 14825:2013 -

Signed in the name and on behalf of: IMMERGAS S.p.A.

Brescello, 18/05/2018

Vice President Alessandro CARRA

IMMERGAS SPA
Via Cisa Ligure, 95
42041 BRESCELLO (RE)
Partita IVA 00932830359

IMMERGAS

EU DECLARATION OF CONFORMITY

(N. 430317)

(3.025557) - AUDAX TOP 6 ErP
(3.025558) - AUDAX TOP 8 ErP
(3.025560) - AUDAX TOP 12 ErP
(3.025562) - AUDAX TOP 16 ErP
(3.025563) - AUDAX TOP 18 ErP
(3.026940) - AUDAX TOP 21 ErP

Name and address of the manufacturer or of its legal representative:

IMMERGAS S.p.A. via Cisa Ligure 95, 42041 Brescello RE Italy

This declaration of conformity is issued under the exclusive responsibility of the manufacturer.

Object of the declaration:

AIR/WATER HEAT PUMP

The purpose of the above declaration complies with the relevant Union harmonisation legislation:

EC DIRECTIVE ELECTROMAGNETIC COMPATIBILITY 2014/30/UE;
EC DIRECTIVE LOW VOLTAGE 2014/35/UE;
EC DIRECTIVE RoHS 2011/65/EU;
EC MACHINERY DIRECTIVE 2009/42/EC;
EC PED DIRECTIVE 2014/68/EU;
REG. EU 813/2013;
EC ECODESIGN DIRECTIVE 2009/125/EC;
REG. EU 811/2013;
REG. EU 327/2011

Reference to the relevant harmonised standards or references to the other technical specifications in relation to which conformity is declared:

EN 55014-1/2006; +A1:2009; +A2:2011 - EN 55014-2:1997; +A1:2001; +A2:2008
EN 61000-3-2/2006; +A1:2009; +A2:2009 - EN 61000-3-3:2008
EN 61000-6-1:2007 - EN 61000-6-3:2007/A1:2011
EN 60335-1:2002; +A11:2004;+A1:2004;+A12:2006;+A2:2006;+A13:2008;A14:2010;+A15:2011
EN 60335-2-40:2003;+A11:2004;+A12:2005;+A1:2006;+A2:2009
EN 62233:2008 - EN 50581:2012 - EN 14825:2013 - EN 378-2:2008+A2:2012

Signed in the name and on behalf of: IMMERGAS S.p.A.

Brescello, 02/05/2016

R&D Management Guareschi Mauro

IMMERGAS S.p.A.
Direzione Ricerca & Sviluppo
Mauro Guareschi

IMMERGAS S.p.A. single member - Via Cisa ligure, 95 - 42041 Brescello (RE) Italy - Share Cap. Euros 7,251,348 fully paid up - Business Reg. of RE no. 150292
VAT No. and Tax Code 00932830359 - Tel. (+39) 0522 689011 r.a. - Fax (+39) 0522: General & Administrative Man. 680397 - Sales Dept. Italy 689102 - Foreign Sales Dept. 689178
Research and Development 680720 - Assistance 680726 - Orders and Shipments 680290 - Purchasing Department 680828 - Spare Parts Warehouse 680808 immergas.com

During the useful life of the products, performance is affected by external factors, e.g. the hardness of the DHW, atmospheric agents, deposits in the system and so on.
The declared data refers to new products that are correctly installed and used in accordance with applicable regulations.
N.B.: correct periodic maintenance is highly recommended.

NOTE: Depending on the specific design and installation conditions, the diagrams and drawings provided in this documentation can require further integration or modifications, according to that envisioned by the Standards and technical regulations in force and applicable (as an example, Collection R - edition 2009 is stated). It is the professional's responsibility to identify the provisions applicable, to evaluate the compatibility with these case by case and the necessity of any changes to drawings and elaborations.

Immergas TOOLBOX
The App designed by Immergas for professionals

Disponibile su App Store | Disponibile su Google play | Disponibile su Windows Store

immergas.com

To request further specific details, sector Professionals can also use the following e-mail address:
consulenza@immergas.com

Immergas S.p.A.
42041 Brescello (RE) - Italy
Tel. 0522.689011
Fax 0522.680617

IMMERGAS
UNI EN ISO 9001:2008 CERTIFIED QUALITY SYSTEM

Design, manufacture and after-sales assistance of gas boilers, gas water heaters and relative accessories