



AUDAX

Air-water heat pumps
reversible with inverter single
and three-phase



AUDAX 10 kW



AUDAX 10 kW is the reversible single-phase air-water heat pump with inverter technology for winter and summer air conditioning. Designed especially for the production and distribution of hot and cold heat carrying fluid (system water). They can function independently or coupled with other generators/systems. AUDAX 10 can also be coupled to a separate storage tank unit for the production of DHW. Using the relevant system manager kit, it is always possible to make use of the most convenient energy source, alternating heat pump functioning of the boiler and also the solar heat system.

The inverter technology and the technical features of the machine allow to attain high performance thus consenting to benefits from tax relief in compliance of the provisions of the M.D. 19/02/2007 and s.m.s.¹

AUDAX 10 is ideal for air conditioning in homes, offices, shops and particularly insulated new buildings. It has system side plate heat exchanger + circulation pump as per standard. A range of hydraulic, electrical and electronic kits are available, which allow flexible use in all circumstances.

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AUDAX 10 kW FEATURES

10 kW single-phase inverter air/water heat pump for winter and summer air conditioning. The galvanised steel structure makes the machine particularly suitable for outdoor installation.

Components:

- Twin-Rotary compressor with inverter;
- R410A refrigerant gas;
- External unit air/gas heat exchanger treated with "Blue fin" system: it makes it easier for the dew drops to slide off and reduces corrosion (for example when there is salt water);
- Fan with variable speed managed by the electronic control board;
- Steel plate water/gas heat exchanger with anti-freeze electric resistance (70 W) supplied as per standard;
- Bi-flow electronic throttle valve;
- 4-way inversion valve (reversible functioning with Heat Pump cycle or Cooling cycle);
- IPX4 electrical insulation rating;
- Possibility of outdoor installation in open places;
- System 3 speed pump;
- 5 litre expansion vessel;
- 3 bar safety valve;
- System manometer;
- 7 probes: 4 sensors on the cooling circuit + external probe + inlet and outlet water temperature detection via 2 probes;
- Regulation of the functioning parameters using keys with display of functioning status by means of a 3-digit display;
- Self diagnostics with error codes shown on display;
- Proportional control logic (linked to instant Δt) and integral logic control (linked to temperature variation time).

System solutions:

- "Stand alone" system with AUDAX and integrative resistance;
- Can be coupled to separate storage tank for DHW;
- Can be coupled to the solar heat system;
- Can be coupled to boiler via the System Manager;
- Can be coupled to boiler and the solar heat system via the System Manager.

is available in the model:

- **AUDAX 10 kW**

code 3.021459



EC Declaration Of Conformity.

NOTA BENE:

¹ the M.D. 6 August 2009 establishes - for 55% tax relief - what the energy performance of an ≤ 35 kW air/water heat must be: **COP ≥ 4.1 – EER ≥ 3.8** ; if supplied with speed changer (*inverter*) these values decrease by 5%.

For correct functioning of the AUDAX, free spaces must be left on top of and on all four sides of the machine itself, as indicated in the installation book accompanying the product. The instructions for correct installation must also be followed.



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4 INTELLIGENT INTEGRATED SYSTEMS; NEW CONCEPT, HYBRID SYSTEMS FOR AIR CONDITIONING AND DHW PRODUCTION



4.1 INTEGRATED SYSTEMS AND HEAT REGULATION

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 yields, low energy consumption and reduced pollutant 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 correct functioning of the entire system, Immergas proposes an "intelligent" 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).

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);
- to set the functioning climatic curve to determine the system flow temperature;
- configure the fuel cost (e.g. methane);
- configure the electric energy cost.

The point of economic balance between the condensing boiler and the heat pump is a COP value between 2.3 and 2.5 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 an external T. that fulfils the min COP for economical convenience, the heat pump starts up, and the operating conditions/performance will constantly be monitored. On the contrary, if the environmental conditions are such that the AUDAX coefficient of performance tends towards values that are lower than the min COP for economical convenience, the System Manager turns the boiler on (or the integrative resistance), and not the heat pump.

Every time AUDAX is operating, the Manager enables an additional control, which checks the time it takes for the system to reaching full operation: when a maximum time has been exceeded (settable), the boiler or the integrative electric resistance is activated in order to reach the T.flow with 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 temperature/humidity probe kits set up in the room. Thanks to this intelligent function the System Manager can increase the flow temperature to the radiant panels by about 1-2°C (up to a max T. of 20°C - maximum limit of the heat pump), avoiding the phenomenon of condensation on the surface of the structure. This function can only be

activated when there is a "Zone control" or "Temperature/humidity sensor". 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.

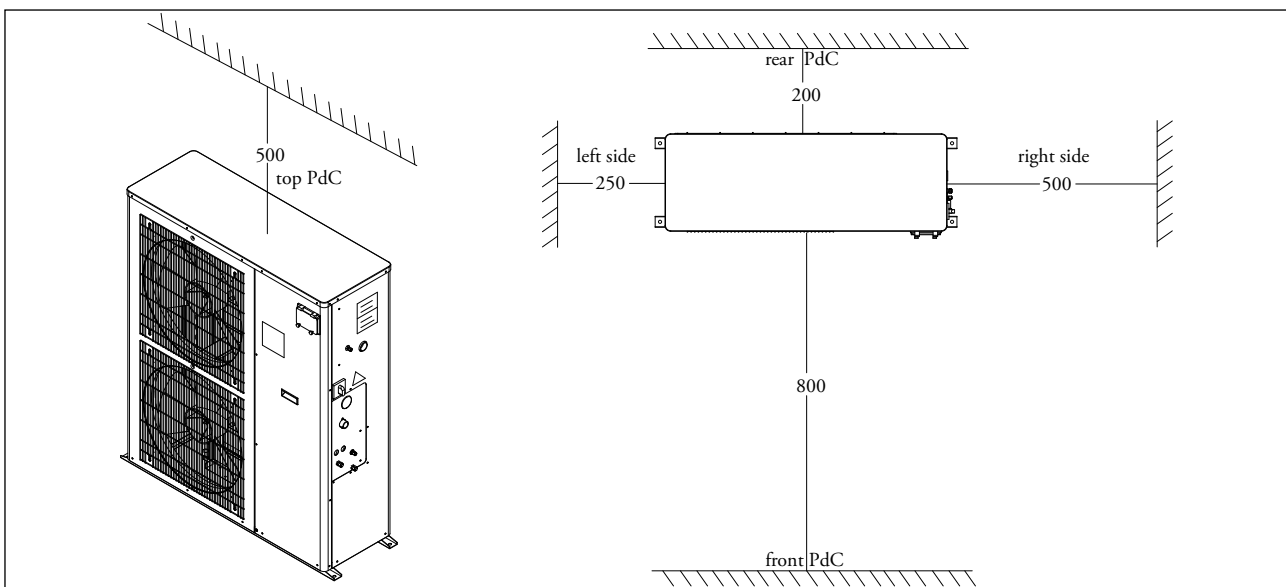
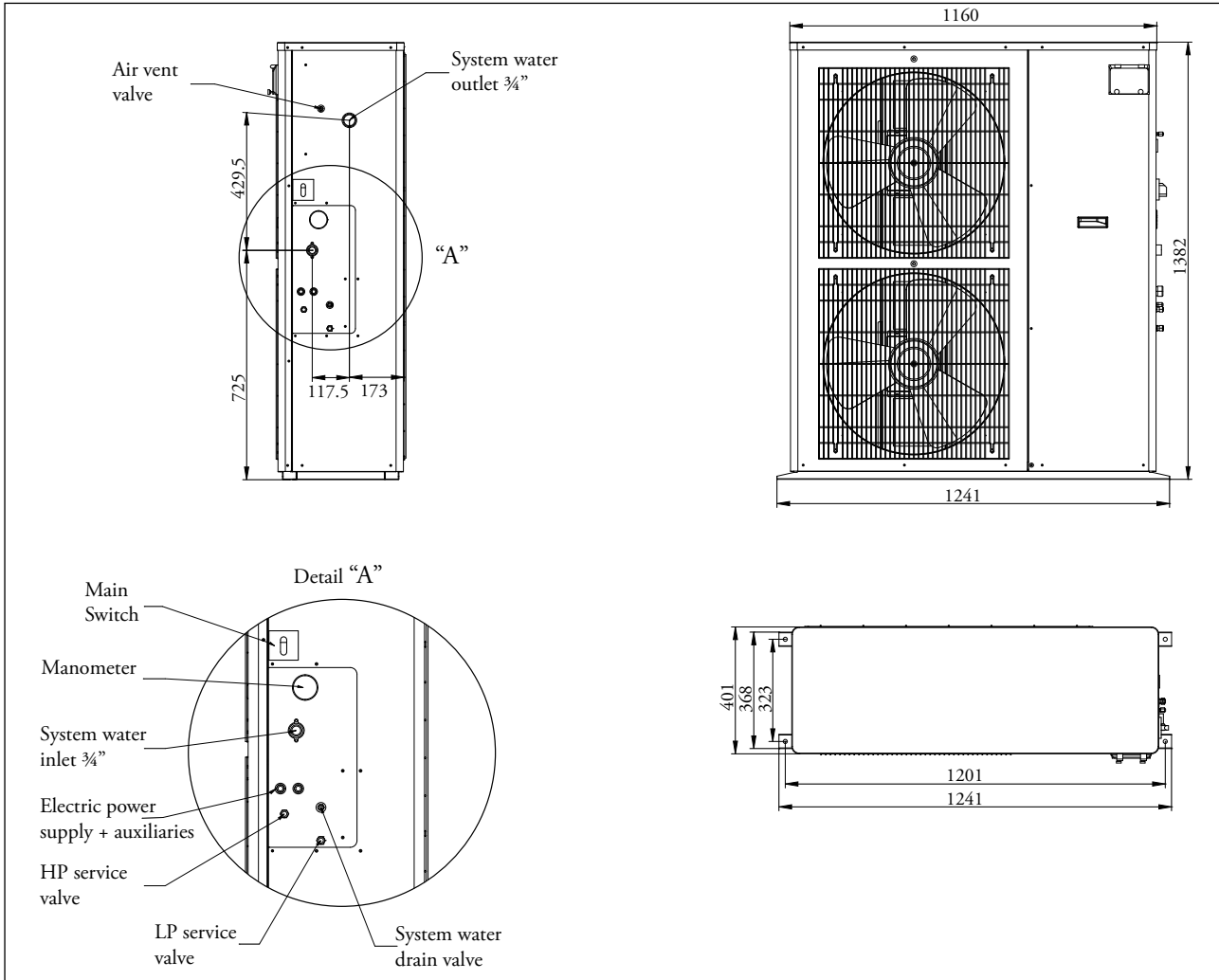
In general, the boiler and heat pump do not operate at the same time (except when a high temperature zone is active).

Functioning in domestic hot water mode: if the temperature set for the dhw is < 50°C the heat pump will come on (always carrying out the afore-mentioned convenience check); if it is > 50°C, on the other hand, the boiler will come on;- if there is no boiler but there is an integrative electrical resistance on the storage tank, the water is brought to 50°C using the heat pump, after which time AUDAX is disabled leaving the resistance to integrate up to the pre-set value.

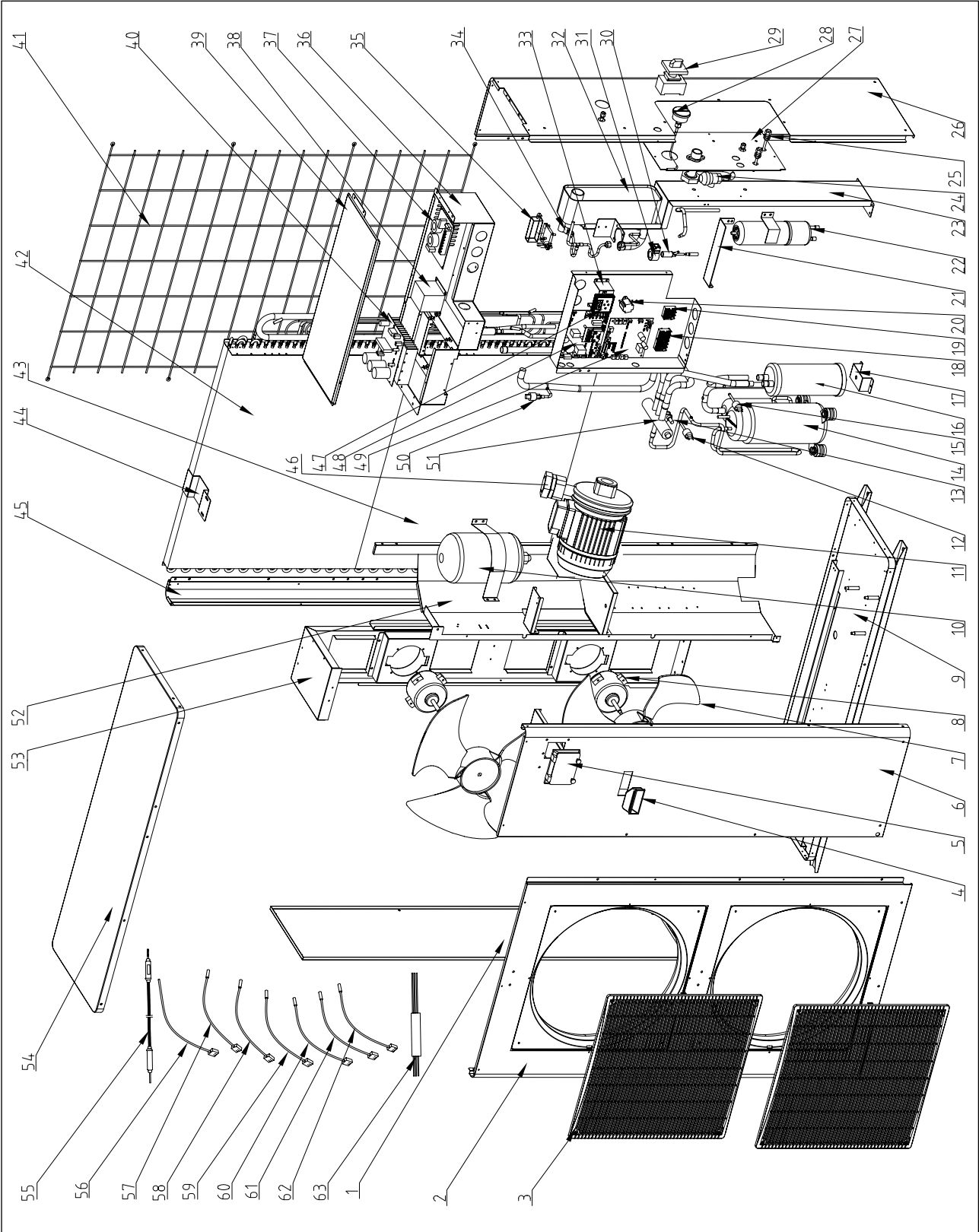
In systems where there is a boiler or an integrative electrical resistance on the storage tank, in addition to the heat pump, it is also possible to enable the anti-legionella function.



6 AUDAX 10 kW DIMENSIONS, CONNECTIONS AND MINIMUM INSTALLATION DISTANCES



9 AUDAX 10 kW MAIN COMPONENTS



KEY:			
1 - AUDAX 10 left side casing			
2 - AUDAX 10 left front casing			
3 - AUDAX 10 fan grid			
4 - AUDAX 10 front casing handle			
5 - AUDAX 6-8-10 Waterproof display lid			
6 - AUDAX 10 right front casing			
7 - AUDAX 10 fan			
8 - AUDAX 10 fan motor			
9 - AUDAX 10 base plate			
10 - AUDAX 10 5l Expansion vessel			
11 - AUDAX 10 circulator pump			
12 - AUDAX 10 high pressure sensor			
13 - AUDAX 10 4-way valve coil			
14 - AUDAX 10 compressor unit			
15 - AUDAX 10 low pressure sensor			
16 - AUDAX 10 liquid separator			
17 - AUDAX 10 liquid separator support plate			
18 - AUDAX 10 terminal board			
19 - AUDAX 6-8-10 4 pole/VRF WNG21 terminal board			
20 - AUDAX 6-8-10 EI/T10EI16A-85 transformer			
21 - AUDAX 10 pump support plate			
22 - AUDAX 10 1 l liquid receiver			
23 - AUDAX 10 right support plate			
24 - AUDAX 6-8-10 3 bar safety valve			
25 - AUDAX 10 gas pressure point			
26 - AUDAX 10 right side casing			
27 - AUDAX 10 Right sides connections plate			
28 - AUDAX 6-8-10 manometer			
29 - AUDAX 10 OT25FT3 switch		(OAT)	
30 - AUDAX 10 Electronic expansion valve			57 - AUDAX 10 OT temperature probe
31 - AUDAX 10 electronic expansion valve coil			58 - AUDAX 10 OCT temperature probe
32 - AUDAX 10 plate heat exchanger			59 - AUDAX 10 IRT temperature probe
33 - AUDAX 10 HMI display support plate			60 - AUDAX 10 ET temperature probe (water inlet)
34 - AUDAX 10 probe connector			61 - AUDAX 10 LT temperature probe (water outlet)
35 - AUDAX 10 differential water pressure switch			62 - AUDAX 10 CTT temperature probe (compressor drain)
36 - AUDAX 10 Circuit boards support plate			63 - AUDAX 10 wiring
37 - AUDAX 10 10kW-DCI4HP filter board			
38 - AUDAX 10 R3003A inductance			
39 - AUDAX 10 boards cover plate			
40 - AUDAX 10 compressor inverter board			
41 - AUDAX 10 rear protection grid			
42 - AUDAX 10 2 row upper coil			
43 - AUDAX 10 2 row lower coil			
44 - AUDAX 10 coil fixing plate			
45 - AUDAX 10 upright			
46 - AUDAX 10 pump connector			
47 - AUDAX 6-8-10 display board			
48 - AUDAX 10 ODU board			
49 - AUDAX 6-8-10 (hydraulic) HYDI board			
50 - AUDAX 6-8-10 high pressure sensor			
51 - AUDAX 10 4-way valve			
52 - AUDAX 10 separation plate			
53 - AUDAX 10 Fan motor support plate			
54 - AUDAX 10 upper lid			
55 - AUDAX 6-8-10 plate heat exchanger anti-freeze resistance wiring			
56 - AUDAX 10 External air temperature probe			



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AUDAX 10 kW TECHNICAL DATA

Central heating circuit		
Power in CH mode with water set at 35°C ⁽¹⁾	kW	10
Power in CH mode with water set at 45°C ⁽²⁾	kW	9.5
CH mode COP with water set at 35°C ⁽¹⁾		4
CH mode COP with water set at 45°C ⁽²⁾		3.20
Min/max heat power with water set at 35°C ⁽¹⁾	kW	2.58 / 11.80
Min/max heat power with water set at 45°C ⁽²⁾	kW	3.43 / 11.48
Electric power absorbed at 35°C/45°C	W	2500 / 2970
Flow temperature range	°C	24 / 55
Cooling circuit		
Power in cooling mode with water set at 18°C ⁽¹⁾	kW	9.8
Power in cooling mode with water set at 7°C ⁽²⁾	kW	9
Cooling mode EER with water set at 18°C ⁽¹⁾		4
Cooling mode EER with water set at 7°C ⁽²⁾		2.90
Min/max cooling capacity with water set at 18°C ⁽¹⁾	kW	2.45 / 14.44
Min/max cooling capacity with water set at 7°C ⁽²⁾	kW	4.40 / 11.00
Electric power absorbed at 18°C/7°C	W	2450 / 3100
Flow temperature range	°C	5 / 20
General data		
System max. working pressure	bar	3
Total head available at system (with 2.000 l/h flow rate)	kPa (m H ₂ O)	83.9 (84.4)
Expansion vessel capacity	l	5
Sound power level	dB(A)	69
Appliance electric protection rating	IP	X4
Electric power supply	V - Hz	230 - 50
Maximum power absorbed	W	3500
Nominal current absorbed (CH/cooling)	A	10.7 / 9.9
Maximum absorbed current from the P.C.B.	A	15
Fuse inserted	A	20
Refrigerant fluid load (R410A)	g	2700
Heat pump weight	kg	167

THE REPORTED DATA REFERS TO THE FOLLOWING CONDITIONS:

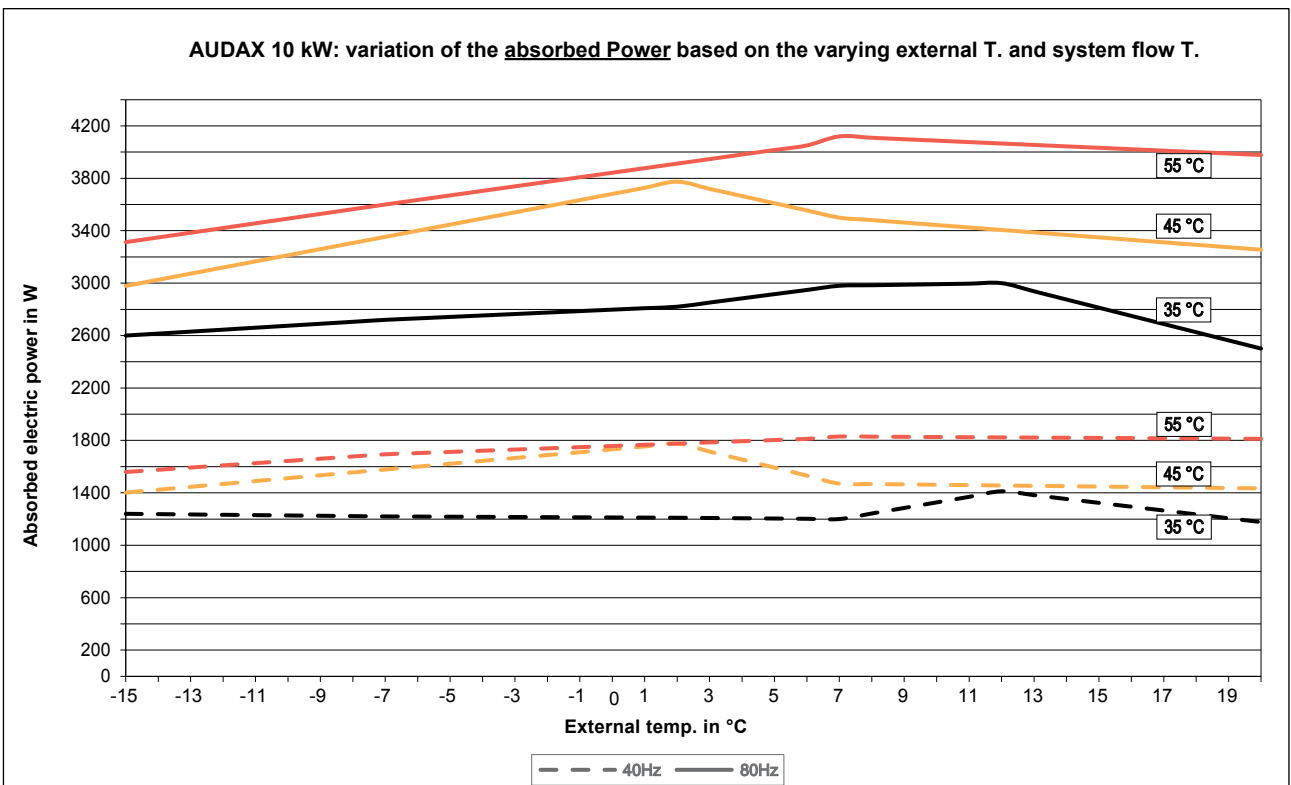
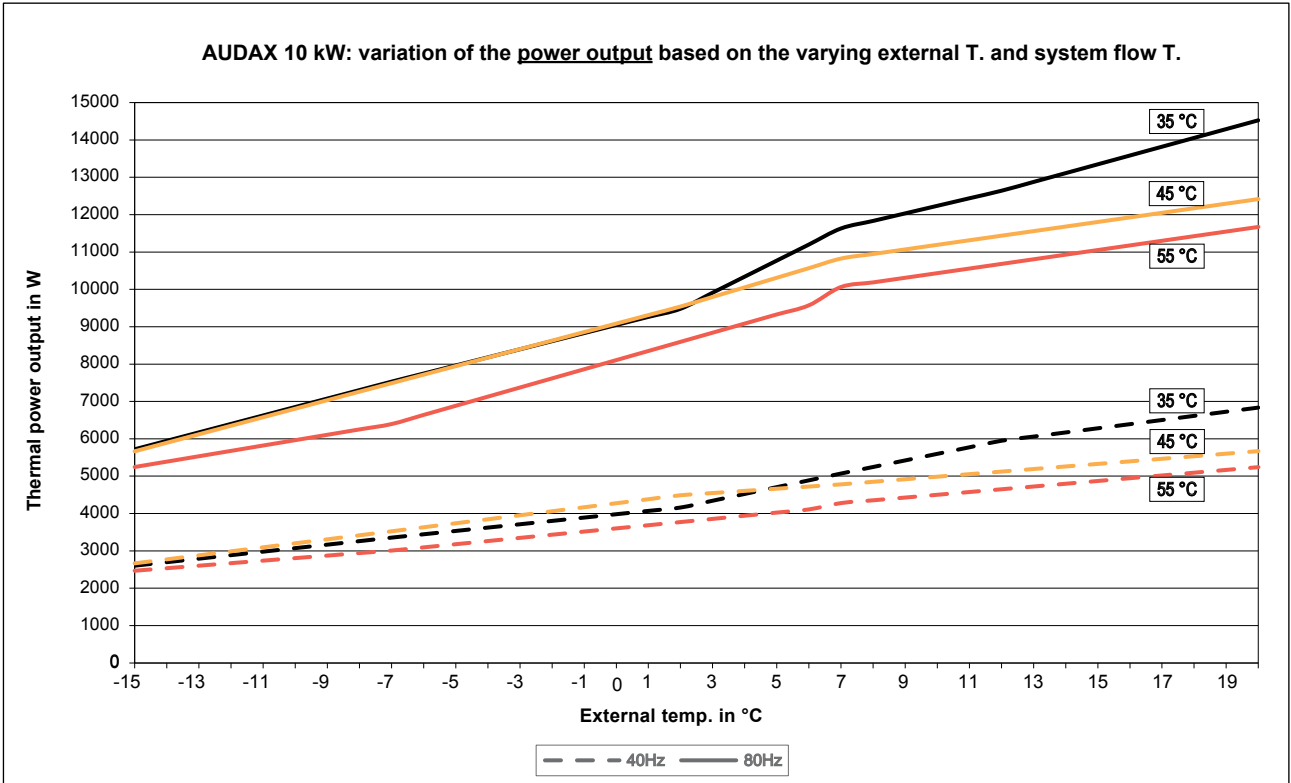
Sound pressure level measured in free field at 1 m from the machine, in compliance with UNI EN ISO 3746/97

ROOM	HEATING PHASE (°C)	COOLING PHASE (°C)
Water TEMP. (F/R) ⁽¹⁾ – AIR (db/wb)	35/30 – 7/6	18/23 – 35/24
Water TEMP. (F/R) ⁽²⁾ – AIR (db/wb)	45/40 – 7/6	7/12 – 35/24

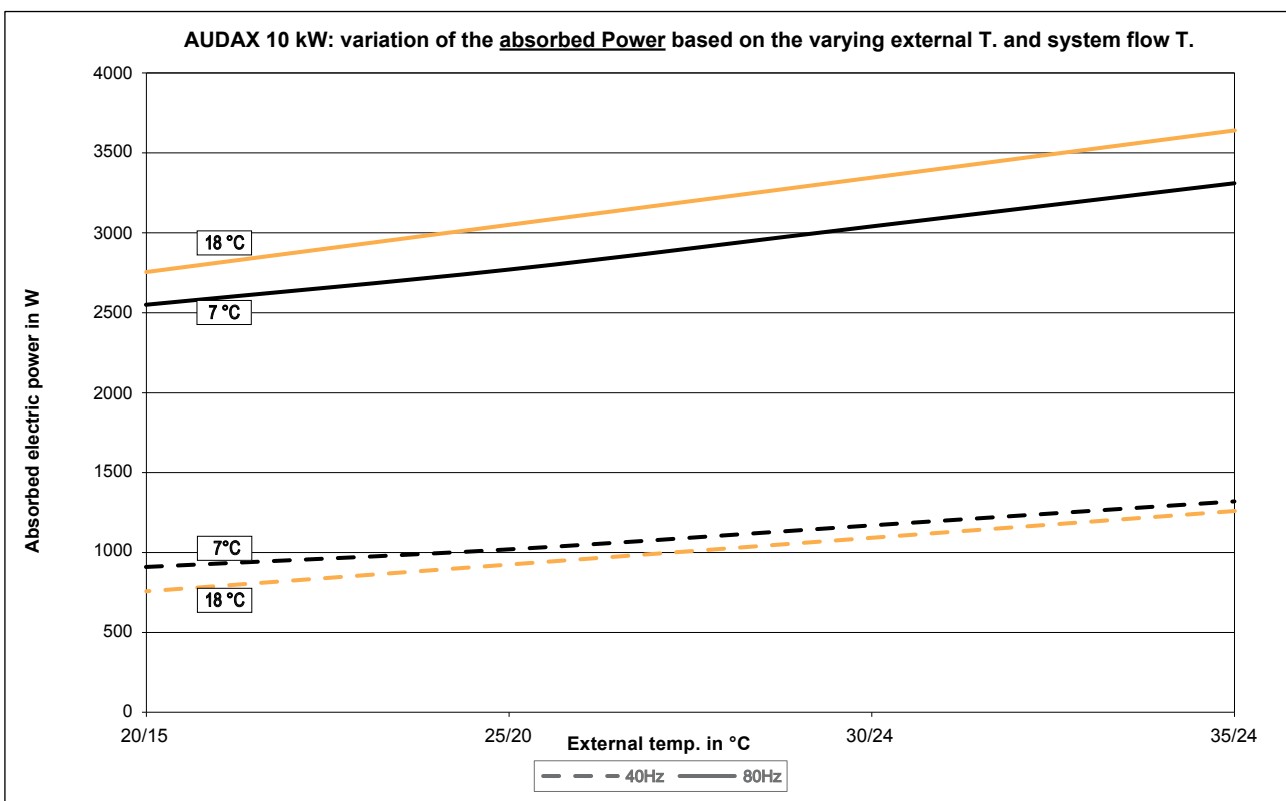
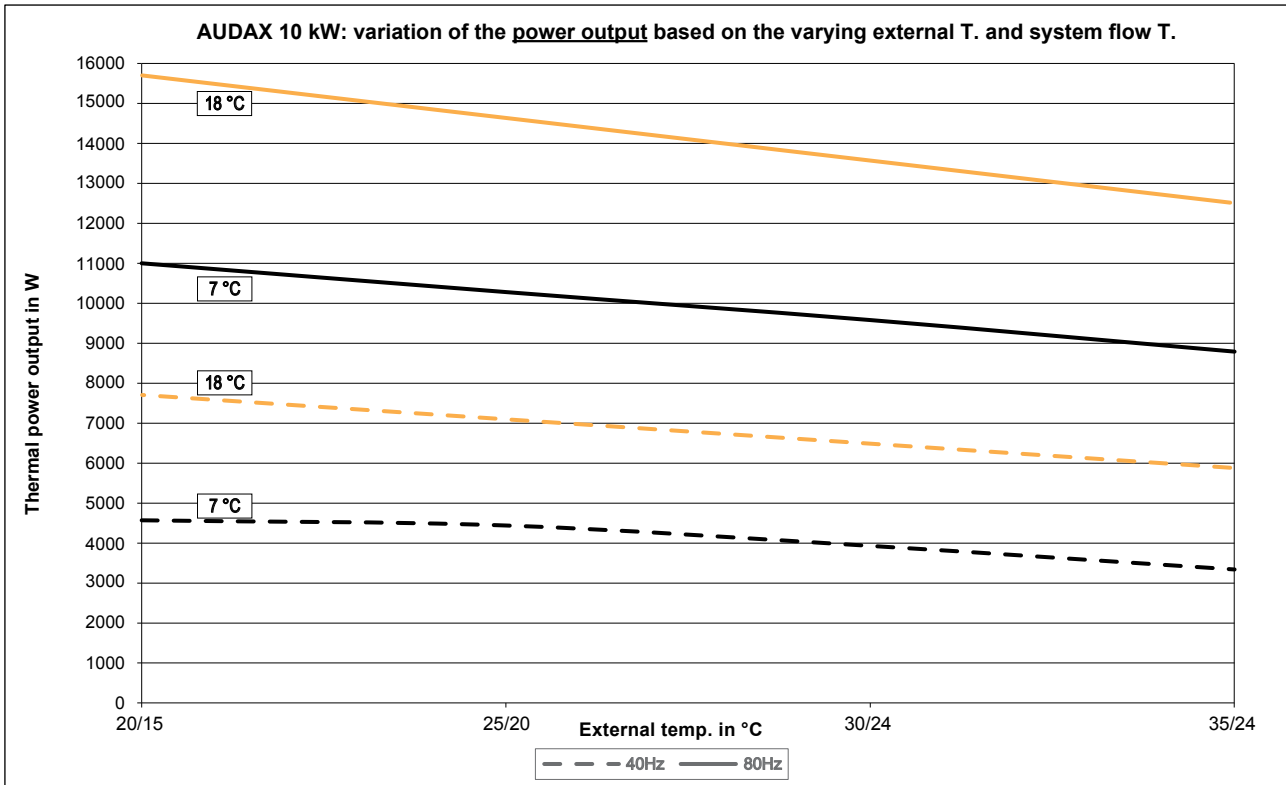


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15.1 VARIATION OF THE AUDAX 10 POWER IN HEATING kW



15.2 VARIATION OF THE AUDAX 10 POWER IN COOLING kW



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15.3

AUDAX 10 kW CIRCULATION PUMP

AUDAX 10 kW is supplied with a built-in circulation pump with 3-position electric speed control. The pump is the single-phase type (230 V - 50 Hz) and is

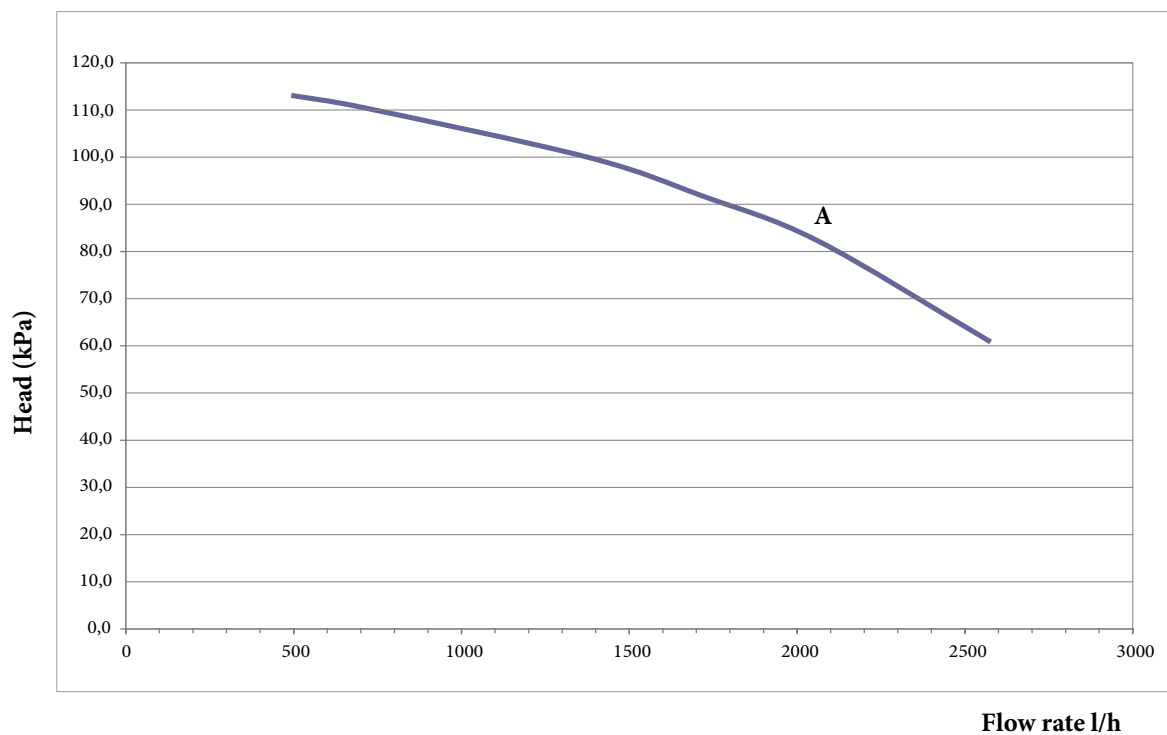
already equipped with condenser. To guarantee optimal heat carrying fluid circulation, it is advised to use the circulation pump at 2nd or 3rd speed.

TECHNICAL NOTE:

In the presence of systems with fan coils (without water side control probe), it is recommended to check the water content in the system, making sure it is not lower than 200 litres.

15.4

PUMP HEAD/FLOW RATE GRAPHICS



A = Flow rate/Head curve available to the system with zone pump at 3rd speed

