

ATTENTION: The connection of this radiator to a central heating system should be carried out by a suitably competent person who is familiar with current regulations.

**READ THIS GUIDE BEFORE
STARTING INSTALLATION**

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1 General

1.1 About these instructions

These instructions ensure the safe and efficient handling of this equipment. These instructions form an integral part of the equipment and have to be kept in the direct vicinity of the equipment and available to personnel at all times.

All personnel must have carefully read through these instructions prior to commencing all work on the equipment. A fundamental prerequisite for safe working is compliance with all the stated safety instructions and other instructions contained in this manual.

In addition all local occupational health and safety at work regulations apply, as do general safety provisions governing the use of the equipment.

Illustrations in this guide are intended to provide a basic understanding and may differ from the actual model.

Ongoing tests and further developments may result in small variations between the unit supplied and the instructions.

1.2 Explanation of Symbols



DANGER!

This combination of symbol and signal word indicates an immediately dangerous situation caused by electrical power, which will cause death or serious injury if not avoided.



WARNING!

This combination of symbol and signal word indicates a possible hazardous situation.



IMPORTANT NOTE!

It represents a potentially hazardous situation, which could lead to damage to property or for a measure to optimise workflows.



IMPORTANT NOTE!

This symbol highlights useful hints, recommendations and information for efficient and trouble-free operation.



2 Safety

This section provides an overview of all important safety aspects to ensure optimum protection of personnel as well as safe and trouble-free operation. In addition to the safety instructions in these operating instructions, the valid safety, accident prevention and environmental protection regulations must be observed for the area of use of the unit. It is the duty of the operator to ensure that instructions relating to maintenance (e.g. relating to hygiene) are complied with.

2.1 Correct use

The units are only intended to be used for heating and cooling air in frost-free and dry rooms. Within the room, the unit needs to be connected to the building's heating/cooling/ventilation system and to the building's waste water and power network. The operating limits and limits of use described in Chapter 2.2 [▶ 6] must be observed.

Intended use of the unit also includes adherence to these instructions.

Information in accordance with EN60335-1

- ▶ This unit can be used by children aged 8 years or more and also by people with reduced physical, sensory or mental capabilities or a lack of experience and knowledge, if they are supervised or have been instructed in the safe use of the unit and the resulting dangers. Do not allow children to play with the unit. Do not allow children to clean and maintain the unit without supervision.
- ▶ The unit is not intended for operation above 2,000 m.a. s.l.
- ▶ This unit is not intended for permanent connection to the drinking water supply system.
- ▶ This unit is intended for being accessible to the general public.

Any use beyond or other than the stated intended use is considered as misuse.

Any change to the unit or use of non-original spare parts will cause the expiry of the warranty and the manufacturer's liability.

2.2 Limits of operation and use

Limits of operation		
Min./max. water temperature	°C	5-80
Min./max. air intake temperature	°C	6-40
Min./max. air humidity	%	20-60
Min. operating pressure	bar/kPa	-
Max. operating pressure	bar/kPa	16/1600
Min./max. glycol percentage	%	25-50

Tab. 1: Limits of operation

Operating voltage	230 V/ 50/60 Hz
Power/current consumption	On the typeplate

Tab. 2: Operating voltage

We would refer to VDI-2035 Sheets 1 & 2, DIN EN 14336 and DIN EN 14868 with regard to the properties of the medium used to protect the equipment. The following values provide further guidance.

The water used should be free of contamination, such as suspended substances and reactive substances.

Water quality		
pH value (at 20 °C)		8-9
Conductivity (at 20 °C)	µS/cm	< 700
Oxygen content (O ₂)	mg/l	< 0.1
Hardness	°dH	4-8.5
Sulphur ions		not measurable
Sodium ions (Na ⁺)	mg/l	< 100
Iron ions (Fe ²⁺)	mg/l	< 0.1
Manganese ions (Mn ²⁺)	mg/l	<0.05
Ammonia ions (NH ₄ ⁺)	mg/l	< 0.1
Chlorine ions (Cl)	mg/l	< 100
CO ₂		< 50
Sulfate ions (SO ₄ ²⁻)	mg/l	< 50
Nitrite ions (NO ₂ ⁻)	mg/l	< 50
Nitrate ions (NO ₃ ⁻)	mg/l	< 50

Tab. 3: Water quality

**Danger of frost in cooling mode!**

There is a risk of the heat exchanger freezing when used in unheated rooms.

- ▶ Make sure that the unit is equipped with a frost protection sensor and/or thermostat in this case.

**IMPORTANT NOTE!****Warning of misuse!**

In the event of misuse, as itemised below, there is a danger of limited or failing operation of the unit. Ensure that the airflow can circulate freely.

- ▶ Never operate the unit in humid areas, such as swimming pools, wet areas etc.
- ▶ Never operate the unit in rooms with an explosive atmosphere.
- ▶ Never operate the unit in aggressive or corrosive atmospheres (e.g. sea air).
- ▶ Never operate the unit above electrical equipment (such as switch cabinets, computers or other electrical units, or contacts that are not drip-proof).
- ▶ Never use the unit as a construction site heater.
- ▶ Never operate the unit in areas with a high dust content.

**IMPORTANT NOTE!****Energy losses due to misuse!**

Operating the unit with open windows (or other room openings) can result in significant energy losses.

- ▶ Heating and cooling modes (particularly when operating different units) need to be coordinated with each other.

2.3 Risk from electrocution!

**DANGER!****Risk of fatal injury from electrocution!**

Contact with live parts will lead to fatal injury from electrocution. Damage to the insulation or individual components can lead to a fatal injury.

- ▶ Only permit qualified electricians to work on the electrical system.
- ▶ Immediately disconnect the system from the power supply and repair it in the event of damage to the insulation.
- ▶ Keep live parts away from moisture. This can cause a short circuit.
- ▶ Properly earth the unit.



2.4 Personnel requirements - Qualifications

Expertise

The installation of this product requires specialist heating, cooling, ventilation, installation and electrical knowledge. As this knowledge is normally acquired through vocational training in one of the above fields, it is not dealt with further here.

Damage caused by improper installation is the responsibility of the operator or installer. Installers of these units should have adequate knowledge of the following based on their qualifications

- ▶ Safety and accident prevention regulations
- ▶ Guidelines and recognised technical regulations, i.e. Association of German Electricians (VDE), DIN and EN standards.

The installation, operation and maintenance of this unit must comply with the applicable laws, standards, provisions and regulations in the respective country and the current state of the art.

2.5 Personal Protective Equipment

Personal protective equipment is used to protect people from impaired safety and health when working with the unit. The applicable accident prevention regulations at the place of use apply in all cases.

Personnel have to wear personal protective equipment during maintenance and troubleshooting on and with the unit.

3 Transport, storage and packaging

3.1 General transport instructions

Check on delivery for completeness and transport damage.

Proceed as follows in the event of visible damage:

- ▶ Do not accept delivery or only accept with reservations.
- ▶ Record any transport damage on the transportation documents or on the transport company's delivery note.
- ▶ Submit a complaint to the freight forwarder.



IMPORTANT NOTE!

Warranty claims can only be made within the applicable period for complaints.



IMPORTANT NOTE!

2 people are needed to transport the unit. Wear personal protective clothing when transporting the unit. Only lift the unit on both sides and not by the pipes / valves.



IMPORTANT NOTE!

Material damage caused by incorrect transport!

Units being transported can drop or topple over if transported wrongly. This can cause serious material damage.

- ▶ Proceed carefully when unloading the equipment on delivery and when transporting it on site and note the symbols and instructions on the packaging.
- ▶ Only use the holding points provided.
- ▶ Only remove packaging shortly before assembling the unit.

3.2 Scope of delivery



IMPORTANT NOTE!

Check the scope of delivery!

- ▶ Check the delivery for damage.
- ▶ Check that the articles and type numbers are correct.
- ▶ Is the delivery and number of items delivered correct?

3.3 Storage

Store packaging under the following conditions:

- ▶ Do not store outdoors.
- ▶ Store in a dry and dust-free place.
- ▶ Store in a frost-free place.
- ▶ Do not expose to aggressive media.
- ▶ Protect from direct sunlight.
- ▶ Avoid mechanical vibrations and shocks.



IMPORTANT NOTE!

Under certain circumstances, packages can carry storage instructions that exceed the requirements listed here. Comply with these instructions accordingly.

3.4 Packaging

Handling packaging materials



IMPORTANT NOTE!

Dispose of packaging materials in line with the applicable statutory requirements and local regulations.



IMPORTANT NOTE!

The packaging is also use to protect the product from site dust and dirt. Only remove packaging shortly before assembling the unit.



4 Technical data

Unit	Planair		
Size	1	2	3
Width [mm]	780	1030	1220
Height [mm]	618	618	618
Depth [mm]	141	141	141
Weight of basic unit [kg]	17	19.7	21.8
Air volume flow [m³/h]	110 - 246	160 - 369	189 - 502
Power consumption [W]	7.3 - 19.5	11.0 - 33.0	13.7 - 34.8
Water content [l]	0.8	1.2	1.5
Heat output [W] ⁹	784 - 1429	1171 - 2215	1450 - 2850
Cooling output [W] ²	629 - 1219	998 - 1974	1209 - 2485
Sound power level [dB(A)]	28 - 48	28 - 48	28 - 48

Tab. 4: Technical data, Planair

⁹ at LPHW 45/40°C, $t_{l1} = 20^{\circ}\text{C}$

² at CHW 7/12°C, $t_{l1} = 27^{\circ}\text{C}$, 48% relative humidity

5 Construction and function

5.1 Overview

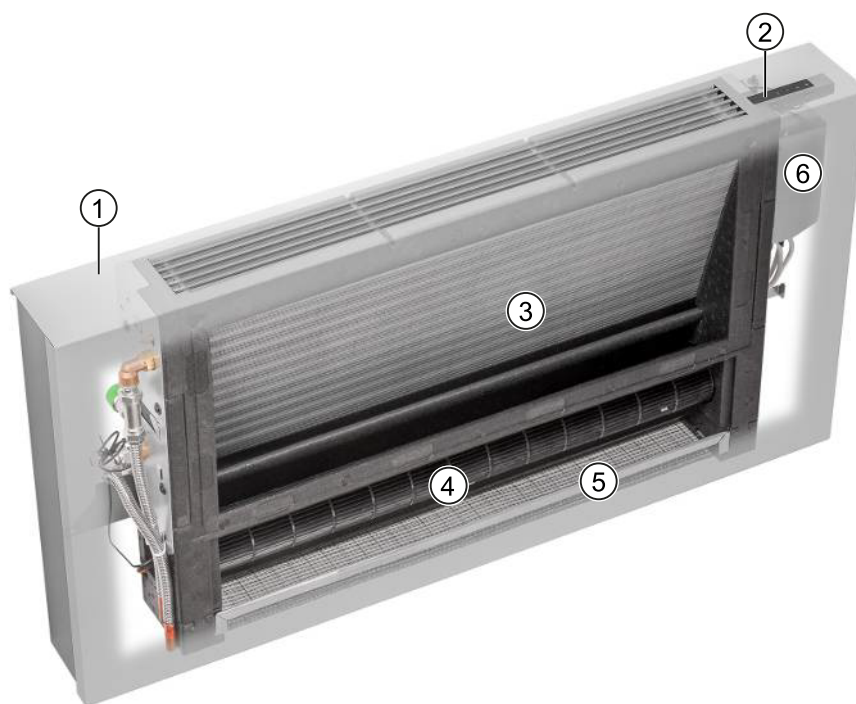


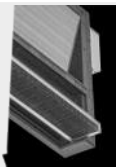
Fig. 1: Planair at a glance

1	Casing	2	Operating unit
3	Heat exchanger	4	Tangential fan
5	Filter	6	Electrical junction box

5.2 Brief description

Planair are fan-assisted and wall-mounted convectors/heaters for heating and cooling. The units silently air condition rooms and their multiple connection options make them suitable for use in new as well as existing buildings.

5.3 Wear parts list

Figure	Article	Properties	For use with	Art. no.
	Spare filter with frame	1x	Planair	Model 1: 129011010000
				Size 2: 129011020000
				Size 3: 129011030000

6 Installation and wiring

6.1 Definition of the connection side

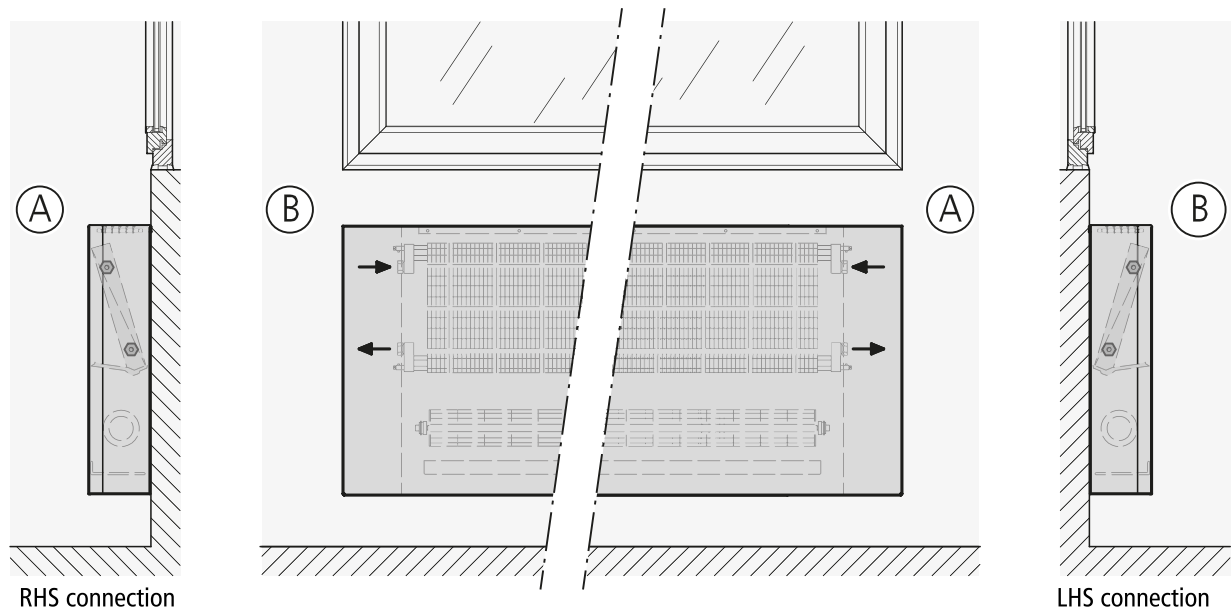


Fig. 2: Definition of the Planair connection side

6.2 Requirements governing the installation site

Only install and assemble the unit if the following conditions are met:

- ▶ Ensure that the unit is securely suspended.
- ▶ Ensure that the airflow can circulate freely.
- ▶ Provide adequate space for appropriately sized flow and return water connections on site (Connection to the pipe network [▶ 21]).
- ▶ There is a power supply on site (Maximum electrical rating values [▶ 29]).
- ▶ If need be, provide a condensation connection with a sufficient gradient on site.

6.3 Minimum clearances

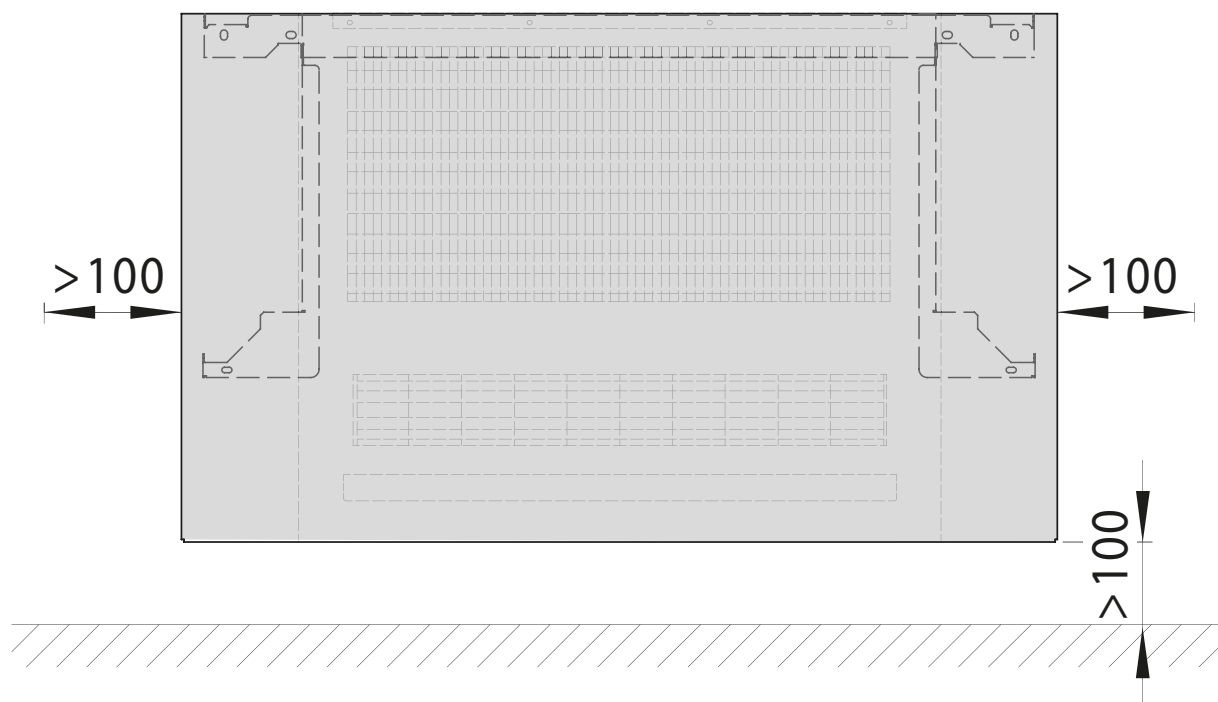


Fig. 3: Planair minimum clearances

This area needs to be kept as free as possible to ensure that the air can flow freely out of the air outlet grille. Window sills should be a minimum of 10 cm from the air outlet and should not protrude more than 12 cm into the room. It could affect the air flow if these distances cannot be achieved.

6.4 Installation

2 people are needed to install the unit.



CAUTION!

Risk of injury from sharp metal housing!

The inner metal of the casing can have sharp edges.

- Wear suitable protective gloves.



IMPORTANT NOTE!

Horizontal installation of units!

When installing the units, ensure that they are completely horizontal to ensure proper operation.



IMPORTANT NOTE!

Avoid draughts!

Consider the occupied zone when installing/suspending the units. Do not expose people to the direct air flow. Position the unit accordingly and adjust the air outlet if required.

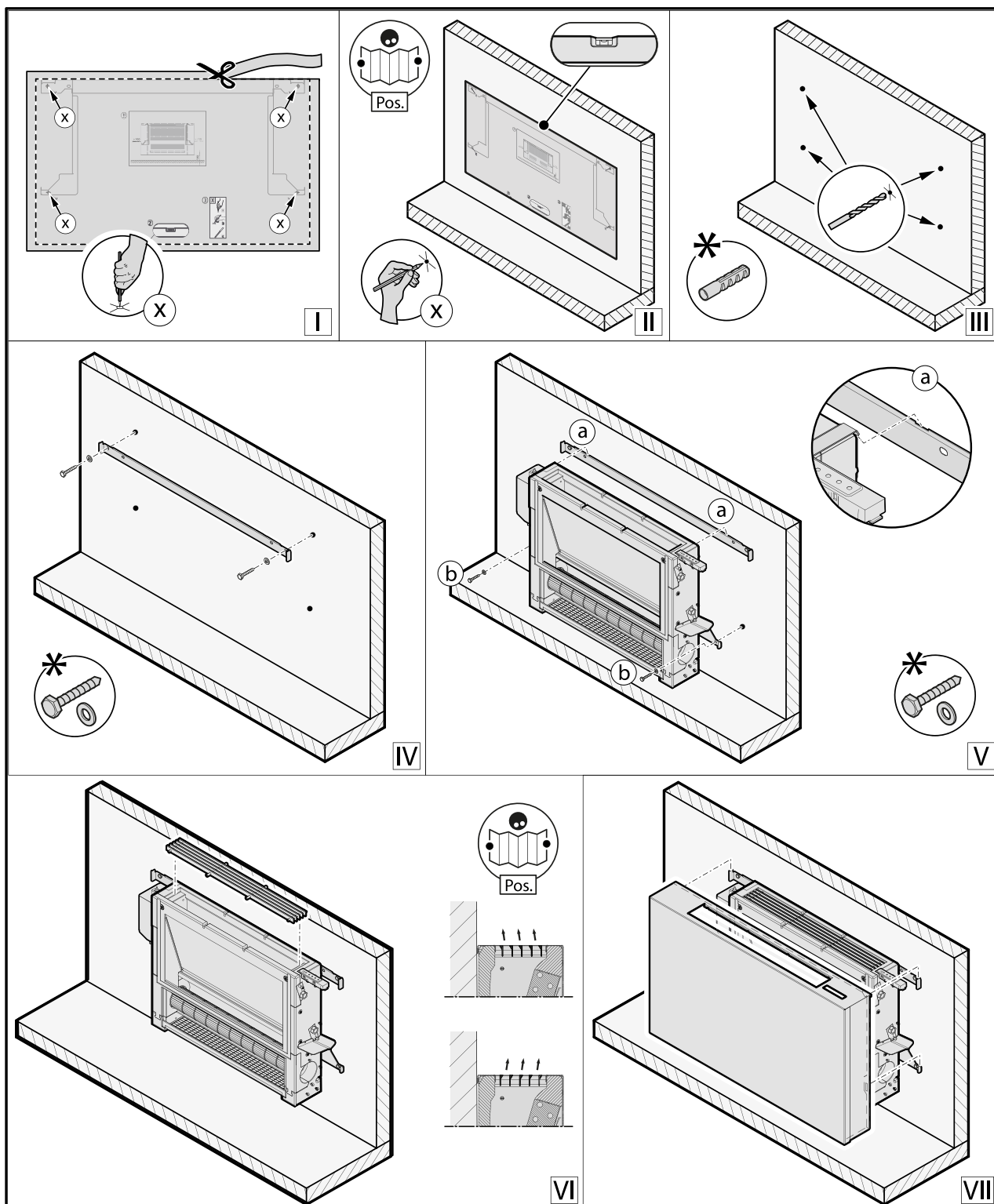


IMPORTANT NOTE!

Sound insulation

Provide for sound isolation between the Planair and the adjacent building if required.

6.4.1 Installing the unit



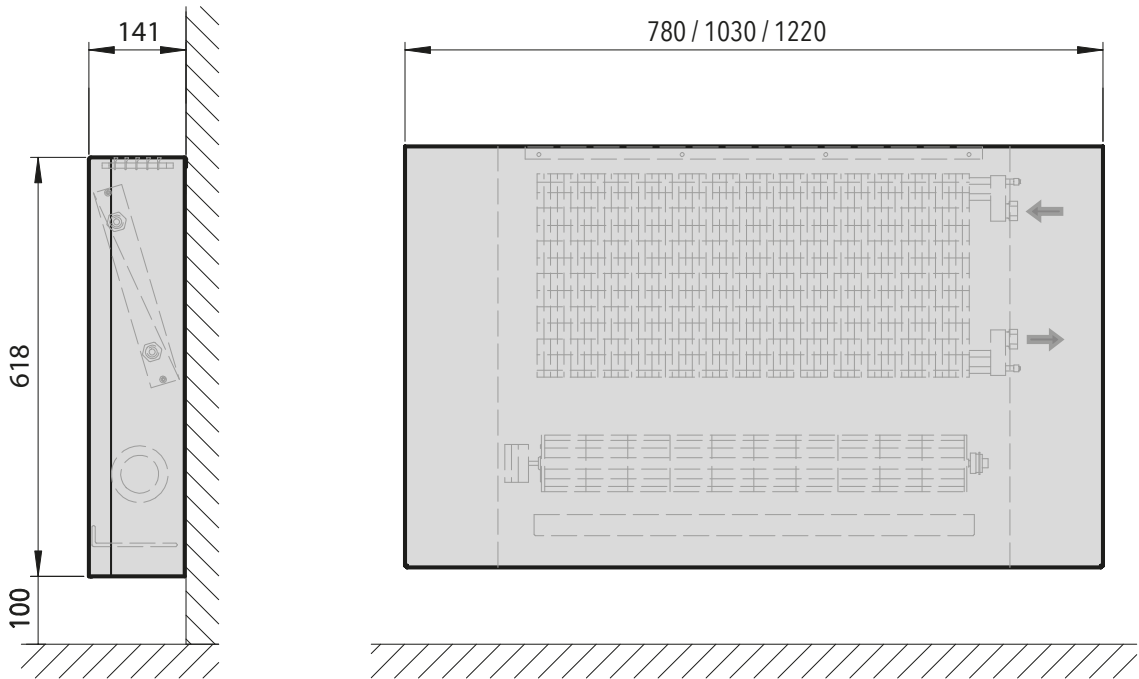
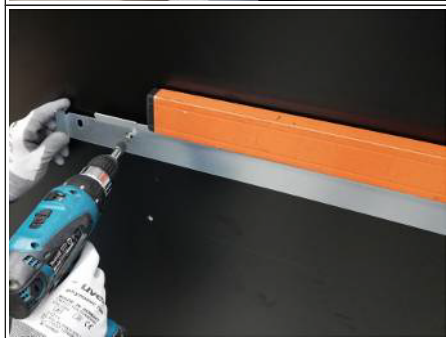
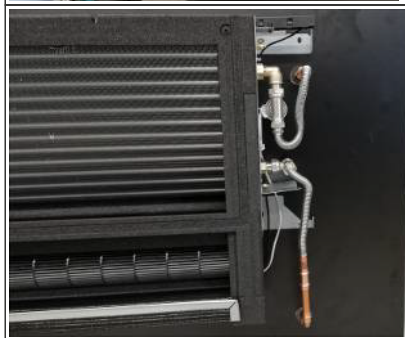


Fig. 4: Planair dimensions

6.4.2 Replacing heaters / conversion

	▶ Loosen the thermostatic valve and return shut-off valve.
	▶ Remove the heater and dismantle the existing fitting from the wall.
	▶ Position the fixing rail for Planair, level and fix in place.
	▶ Prepare the existing pipework for water-side connection.
	▶ Suspend the functional unit and make sure that it is seated correctly in the recesses.

	► Fix and secure the suspended functional unit on the wall.
	► Connect the water-side lines. ► (Electrical connection on the opposite side of the unit)
	► Connect the functional unit's earthing cable to the casing.
	► Attach the casing.

6.5 Installation

Actuator with 'First Open' function

- When delivered, the actuator is normally open in a de-energised state, thanks to the First Open function. This enables heating mode to run even if the electric wiring is not yet completed.
- When subsequently commissioned and with the application of power (for longer than 6 minutes), the First Open function is automatically unlocked so that the actuator becomes fully operational.

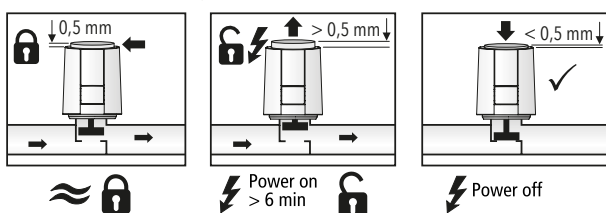


Fig. 5: "First Open" function

The valve adapter range ensures the actuator can be perfectly adapted to almost all valve bodies and heating manifolds on the market. Once the cable has been inserted, the OEM actuator 5 is simply attached by inserting it into the manually pre-installed valve adapter.

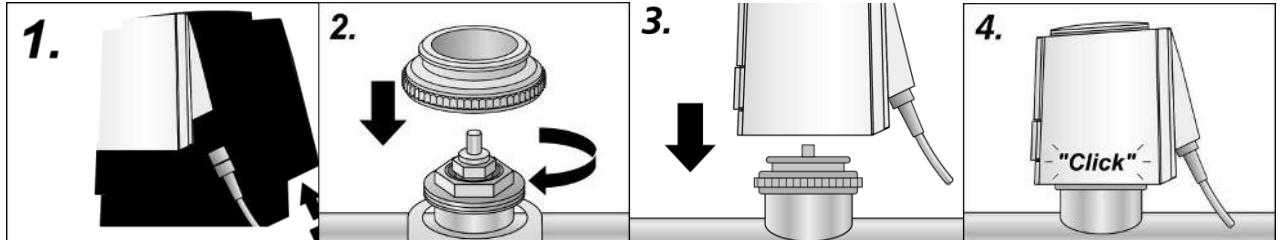


Fig. 6: Installation with valve adapter

1	Connect the cable to the actuator.
2	Manually screw the adapter onto the valve.
3	Manually position the OEM actuator vertically on the valve adapter.
4	Manually pressing vertically down on the OEM actuator audibly engages it on the valve adapter.

The OEM actuator should ideally be installed vertically or horizontally. Special circumstances (e.g. dirty water) can reduce the service life when installed "overhead".

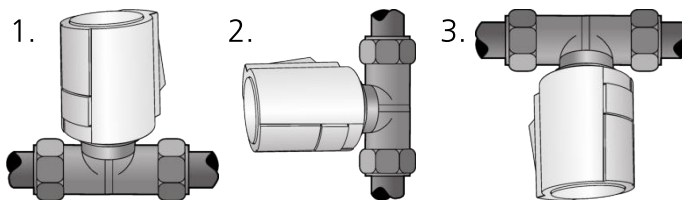


Fig. 7: Installation position

1	Vertical installation position
2	Horizontal installation position
3	"Overhead" installation position

6.5.1 Connection to the pipe network

The flow and return connections are located as standard on the left or right side of the unit, seen from the front panel.

Route the pipework so that no mechanical stresses are transferred to the heat exchanger and to ensure that the unit can be accessed with ease for maintenance and repair work. Proceed as follows when connecting up the unit's hydraulic pipework:

- ▶ Shut off the heating/cooling medium and prevent it from being opened accidentally before connecting to on-site pipework and making the hydraulic connections on the basic unit, as there is a danger of scalding from escaping heating medium!
- ▶ With cooling units there is a danger to the user from cold temperatures and a danger to the environment from the use of glycol. Put in place appropriate safety measures.
- ▶ Remove protective caps from the supply and return.
- ▶ With cooling mode, route the pipework and valves directly over the side condensate tray (accessory) to drain any condensate produced on the pipes during cooling mode into the tray.
- ▶ Seal and tighten the connections. Prevent the connection nuts from shearing and twisting.
- ▶ When connecting the unit to the on-site pipework, make sure that you use a suitable tool to hold the water connections of the unit in place!
- ▶ Make sure that the pipework can be vented.
- ▶ Use appropriate insulating material, and impermeable insulating material for cooling units.
- ▶ Tighten all threaded connections once the pipes have been fitted and check that they are not under any tension.

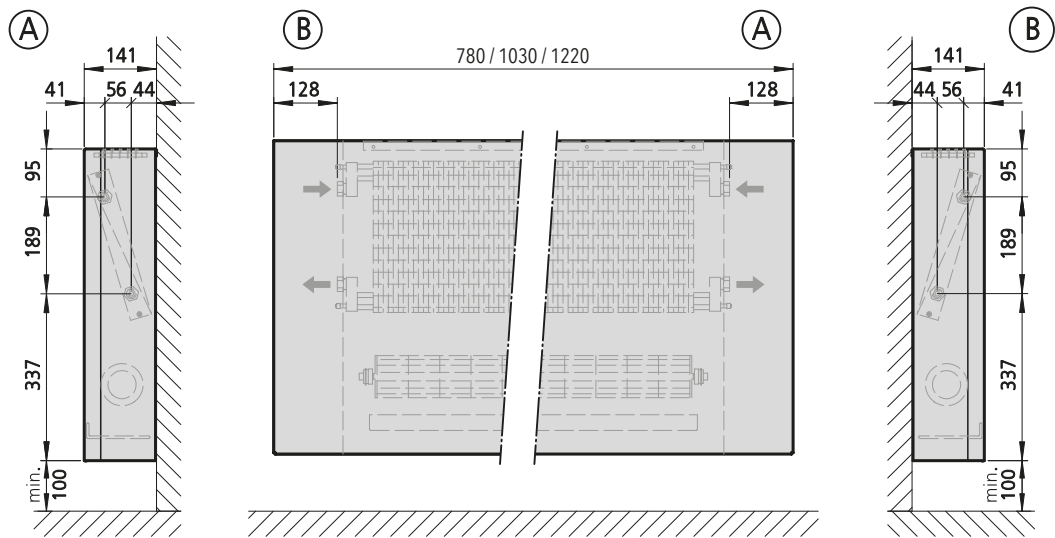
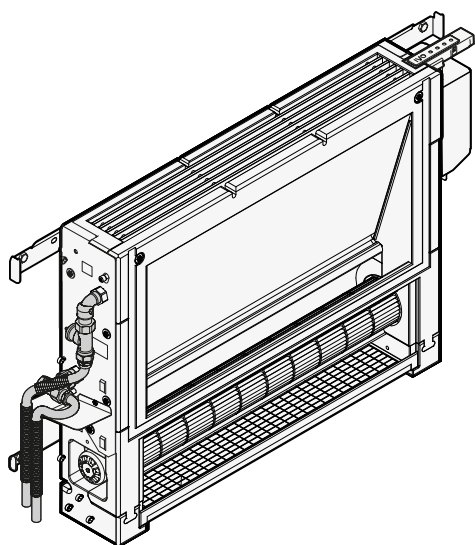


Fig. 8: Planair connection dimensions

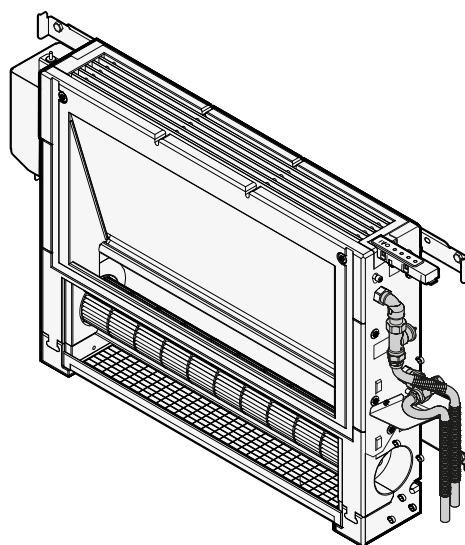
A	RHS connection	B	LHS connection
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6.5.2 Overview of valve kits

Valve kits				
	Pre-adjustable thermostatic valve	2-pipe, includes pre-settable valve, angled return shut-off valve, with 2x stainless steel corrugated pipes, 1/2" connection on left, KVS value 1.7 m³/h	Planair, DN 15	129012100201
		2-pipe, includes pre-settable valve, angled return shut-off valve, with 2x stainless steel corrugated pipes, 1/2" connection on right, KVS value 1.7 m³/h	Planair, DN 15	129012200201
	Differential pressure-independent thermostatic valve	2-pipe, includes pre-settable valve, angled return shut-off valve, with 2x stainless steel corrugated pipes, 1/2" connection on left	Planair, cooling flow volume (min./max.) 35 – 420 l/h, DN 15	129012100202
		2-pipe, includes pre-settable valve, angled return shut-off valve, with 2x stainless steel corrugated pipes, 1/2" connection on right	Planair, cooling flow volume (min./max.) 35 – 420 l/h, DN 15	129012200202



Valve kit, LHS connection



Valve kit, RHS connection

6.5.3 Condensation connection

6.5.3.1 Condensation drain with natural gradient

Optional "Cooling accessory kit, connection on left and right"

Figure	Article	Properties	For use with	Art. no.
	Cooling accessory kit	Accessory kit for cooling with condensate for condensate drainage with a natural gradient, consisting of valve condensate tray, plug, drain elbow and double nipple with 16 mm hose connection, LHS connection, supplied separately	All models (connection on left)	129013100000
	Cooling accessory kit	Accessory kit for cooling with condensate for condensate drainage with a natural gradient, consisting of valve condensate tray, plug, drain elbow and double nipple with 16 mm hose connection, RHS connection, supplied separately	All models (connection on right)	129013200000

Installation of the accessory kit

- ▶ Fit the valve condensate tray below the valves.
- ▶ Attach the plug on the one side of the condensate tray.
- ▶ Attach the silicone bend with the long leg into the condensate tray on the other side.
- ▶ Insert the plastic double nipple into the short leg.
- ▶ Connect up the drain hose (Ø16 mm) on site.

6.5.3.2 Condensate drainage using a condensate pump (accessory)



The water is drawn off by the condensate pump and discharged along a hose (supplied loose) connected on the pressure side. Depending on conditions on site, the water can be discharged into drainage lines, possibly with a trap connection.

In the event of a fault with the condensate drain, the water level will continue to rise until the float switch triggers an alarm contact. The contact can be analysed by external signalling devices.

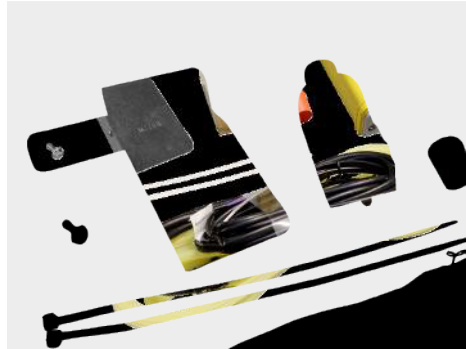
We recommend automatically terminating cooling mode, possibly with a shut-off valve, if the alarm contact is triggered to prevent the condensate tray from overflowing.

Condensate drain

- ▶ Ensure that drainage of condensate from the condensate pump runs along a natural gradient with an adequate cross-section (minimum 6 mm). Increase the cross-section with longer condensate lines.
- ▶ Check whether the condensate line needs to be insulated to prevent the build-up of condensate along the line.
- ▶ Do not use a rigid transition to the on-site condensate drain, as this will lengthen the pump's pressure hose. We would recommend a free overflow into a trap.

Installation, cabling of the condensate pump (accessory)

The condensate pump needs a 230 V/50 Hz power supply. It can be connected via the terminals of the Planair. Depending on the control version, the alarm contact can be connected to auxiliary terminals or directly to the circuit board. Appropriate cables are provided.

Figure	Article	Description	Article no.
	Condensate pump set (supplied separately)	Condensate pump for cooling below the dew point, for the discharge of condensate produced, 50 - 60 Hz, consisting of valve condensate tray, plug, condensate pump and condensate pump accessories, 12 W, IP class IP 44, LHS connection, supplied separately	129013110000
	Condensate pump set (supplied separately)	Condensate pump for cooling below the dew point, for the discharge of condensate produced, 50 - 60 Hz, consisting of valve condensate tray, plug, condensate pump and condensate pump accessories, 12 W, IP class IP 44, RHS connection, supplied separately	129013210000

Tab. 5: Condensate accessories

Condensate pump connection work

- ▶ Supply power and wire alarm contact (separate cable with plug) as per the wiring diagram.
- ▶ Connect the hose to the condensate drain (separate). Direction of flow: refer to the arrow on the side of the housing

Technical data	
Maximum flow volume	42 l/hour (11 gph)
Maximum delivery height	20 m (65.60 ft.)
Maximum horizontal delivery volume	100 m (330 ft.) at 0 m delivery height and 0 m suction height
Noise level	20 dB(A) at 1 m DIN EN ISO 3741:2011 / DIN EN ISO 3744:2010
Voltage	100 ~ 240 V AC 50/60 Hz with automatic universal power input detection
Output	8 W at maximum operation at 110 V
Alarm relay	7-amp contacts with integrated replaceable 6.3 A fuse 5 × 20 mm
Weight	1,000 g (2.2 lb.)
Discharge star pipe	6.25 mm I.D. (1/4") × 1 m (3.3 ft.)
IP class	Fully cast, IP 44
Operating temperature	Ambient 5°C to 40°C (41°F to 104°F) / water 5°C to 40°C (41°F to 104°F)
Conformity	Conforms to UL: 778 and certified to CSA C22.2 #68

Tab. 6: Technical data for condensate pump

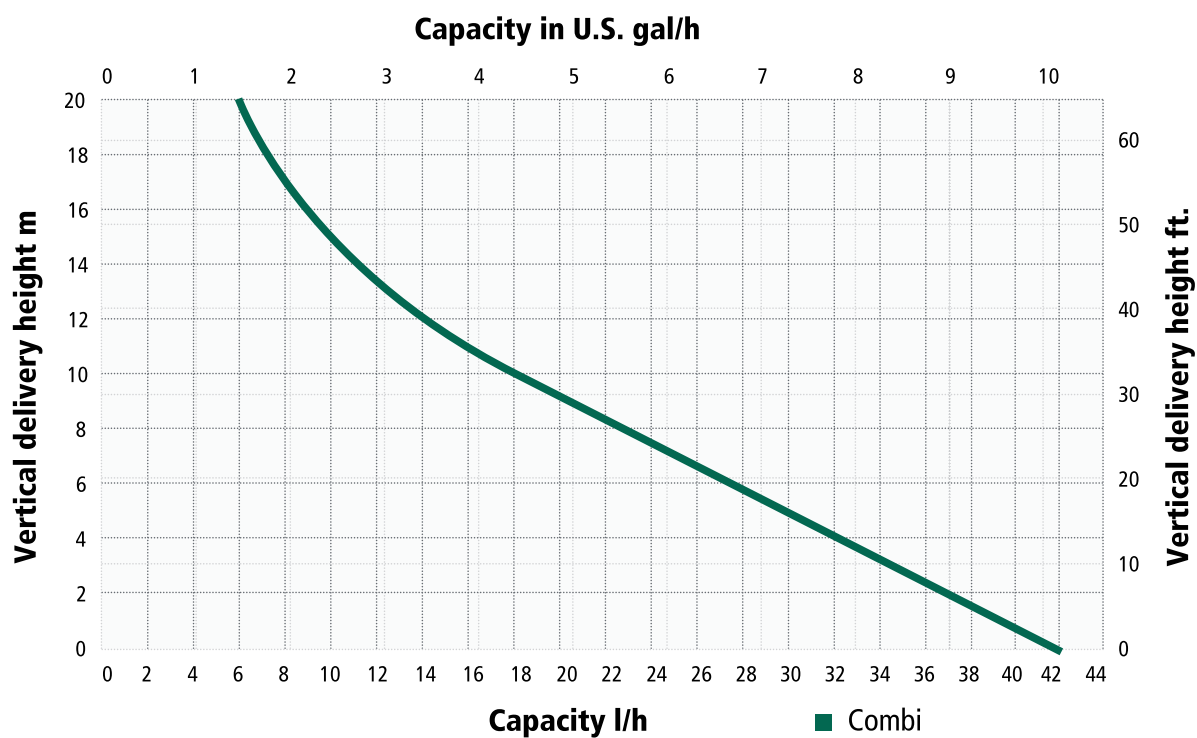
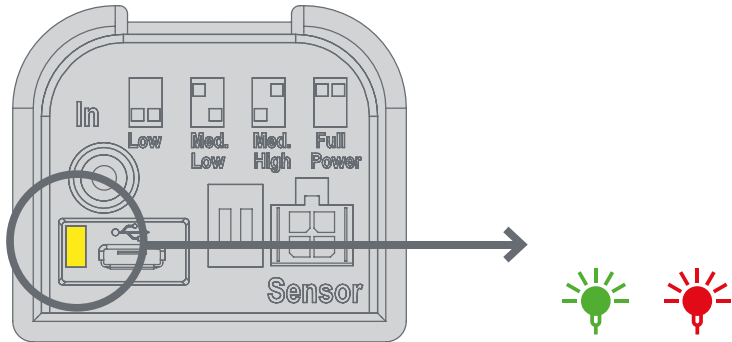


Fig. 9: Capacity diagram

Condensate pump alarm messages

LED alarm relay signals



LED alarm relay operating table

Starting sequence			
		(normally closed)	(normally open)
Pump status	Condensate level	Standard mode	Peripheral mode
Not driven	N/A	NC  COM	NC  COM
Driven	Below the alarm stage	NC  COM	NC  COM
Driven	Alarm activated	NC  COM	NC  COM

LED displays in operation

No energy		The pump is incorrectly wired or there is no input voltage. The problem with the A/C system or alarm is incorrectly wired.
Start LED sequence (standard mode)		The alternating Red/Green flashes only 5x, then stops and changes to Standby mode.
Start LED sequence (peripheral mode)		The alternating Red/Green flashes only 5x, then stops and changes to Standby mode.
Standby mode - Wait for water		Continuously flashes green.
Water pumps		Mono-coloured green. Runs in low, middle-low, middle-high or high power, normal operation.
High-water mode		Red flashing, running above the high water level.
Alarm mode - Relax activated		Red. The pump cannot keep up with the water feed. To prevent the water from overflowing, disconnect the power supply to the air conditioning system until the water level has gone down.
Reconfigure code		The pump features 3 extra-long running cycles and reconfigures the DIP switches for more capacity.

7 Electrical connection

7.1 Maximum electrical rating values

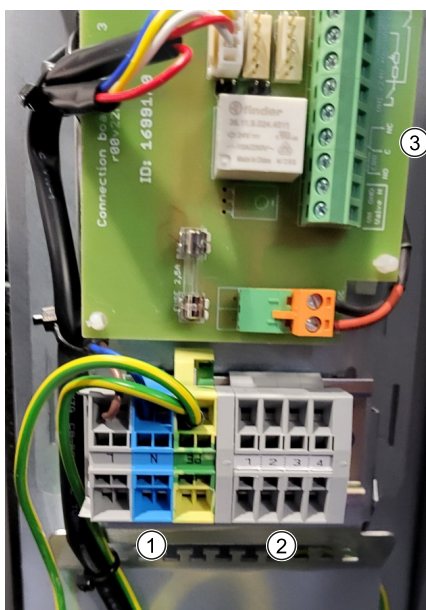
Size	Nominal voltage [V $\overline{~}$]	Mains frequency [Hz]	Nominal power [W]	Nominal current [A]	Ri analogue input [K Ω]	IP class	Protection class
1	230	50	19.5	0.16	100	IP21	I
2	230	50	27.3	0.23	100	IP21	I
3	230	50	34.8	0.30	100	IP21	I

Tab. 7: Maximum electrical rating values PowerKon LT

7.2 Electromechanical connection, 230 V (*00)

Circuit description (*00)

- Factory-fitted actuators are wired to the terminals.
- The appropriate terminals are available for valve actuators or a condensate pump.
- The EC fans used can be continuously variably controlled by a 0-10 V DC signal. The “intelligent” motor electronics detects any possible motor malfunction and automatically switches off the fan.



X1: Mains power connection (L, N, PE)

X2: Terminals (for condensate alarm or actuator 230 V etc.)

X3: 24 V DC fan and actuator connecting terminals

General Information

Information on cable laying:

The following information on cable types and cable laying must be observed in compliance with VDE 0100.

The installation, operation and maintenance of these devices must comply with the country-specific applicable laws, standards, regulations and directives.

Without *: NYM-J. The required number of cores incl. protective conductor is indicated on the cable. Cross sections are not indicated, as the cable length is included in the calculation of the cross section.

*): Shielded cable, J-Y(ST)Y 0.8mm. Lay separately from power lines.

**): Shielded cable stranded in pairs, e.g. UNITRONIC® BUS LD 2x2x0.22, UNITRONIC® BUS LD 3x2x0.22. Install separately from power lines.

- If other cable types are used, they must be at least equivalent.

- The connection terminals on the device are suitable for a maximum wire cross-section of 2.5 mm², the mains plug for max. 4.0 mm².

- When using residual current circuit breakers, these must be at least mixed frequency sensitive (type F). For the design of the rated residual current, the specifications from DIN VDE 0100 Parts 400 and 500 must be observed.

- For the design of the on-site mains supply and fuse protection (C16A, max. 10 devices), the electrical data in the table below must be observed.

- Lines for data or bus signals are shown with shield connected at one end. Lines for analog signals are shown with the shield not connected. Due to structural or local conditions and depending on the type and level of interference, which can be caused by magnetic and/or electric fields in high and/or low frequency ranges, among other things, a different connection of the shield (connected at both ends or not connected) may be necessary. This must be checked by the customer and, if necessary, carried out deviating from the specifications in the documentation!

Electromechanical:

- Cable length between room thermostat and temperature sensor or switching contact: max. 50 m.

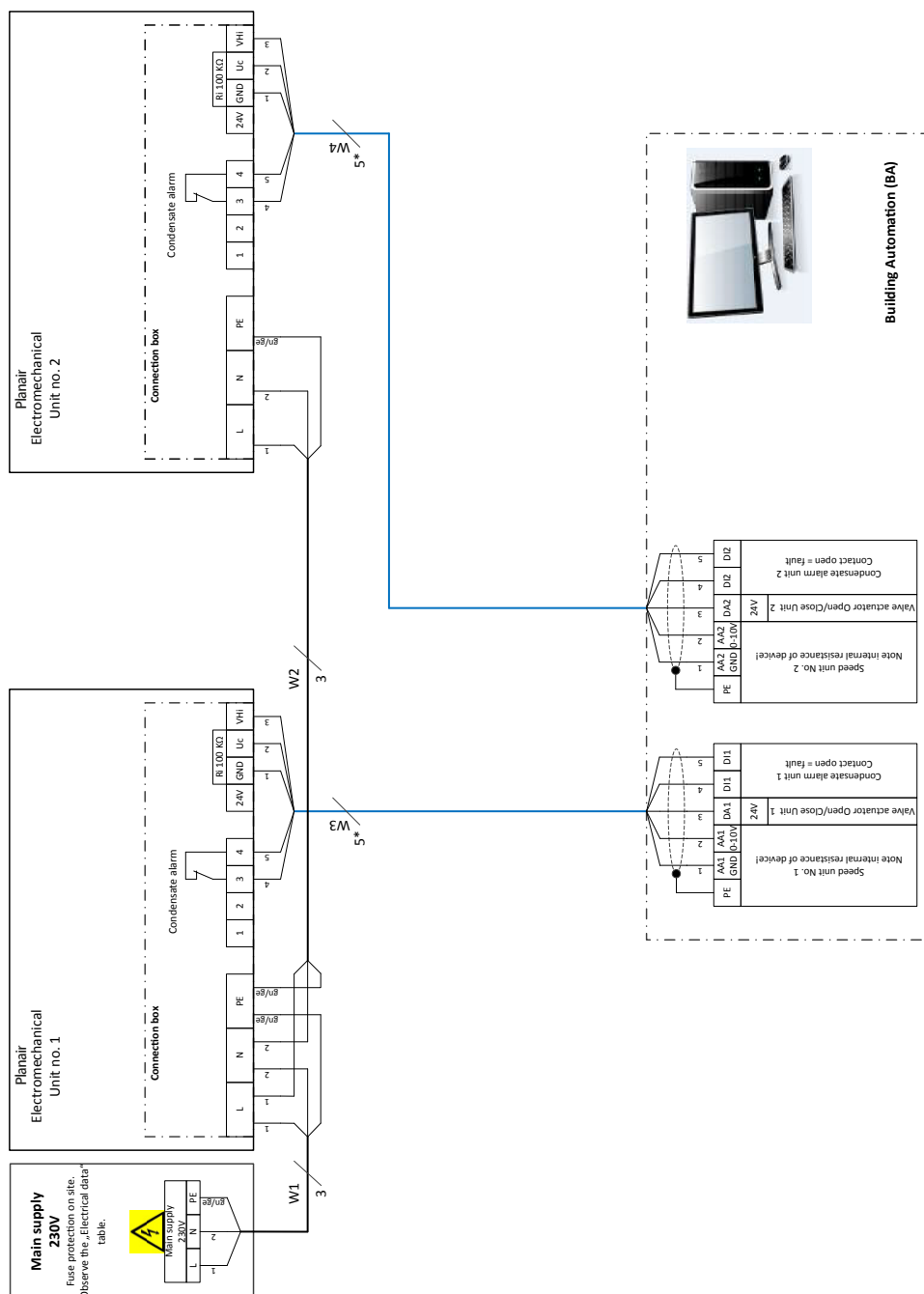
Display control:

- Maximum number of units in parallel: 30.

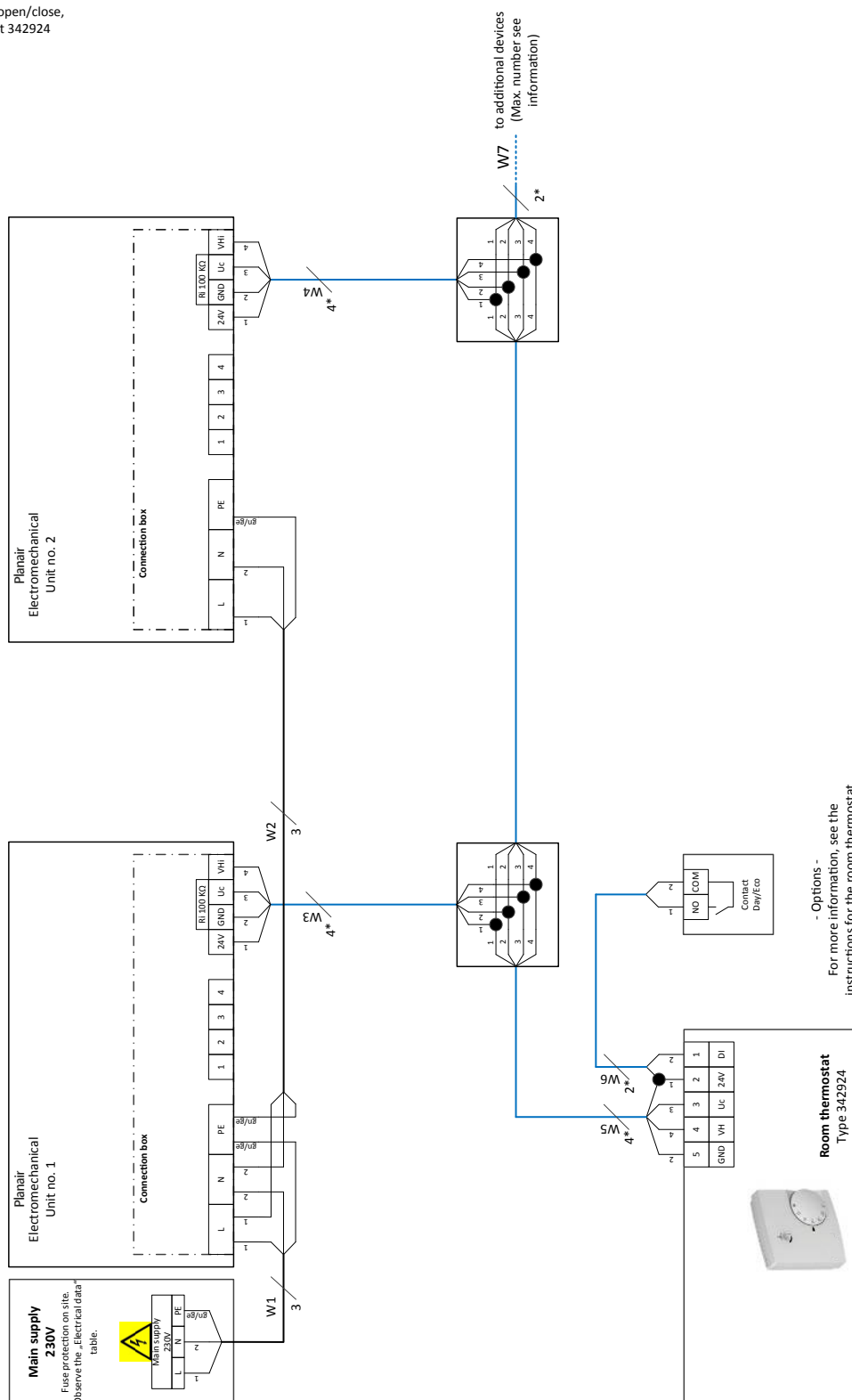
- BUS cable length from unit 1 to unit 30: maximum 150 m.

- A terminating resistor (120 Ohm) must be set at the first and last participant of a line. Use jumpers 2 and 3 on the control board for this. Jumper closed = terminating resistor set. Before setting the terminating resistor, the control unit must be disconnected from the power supply.

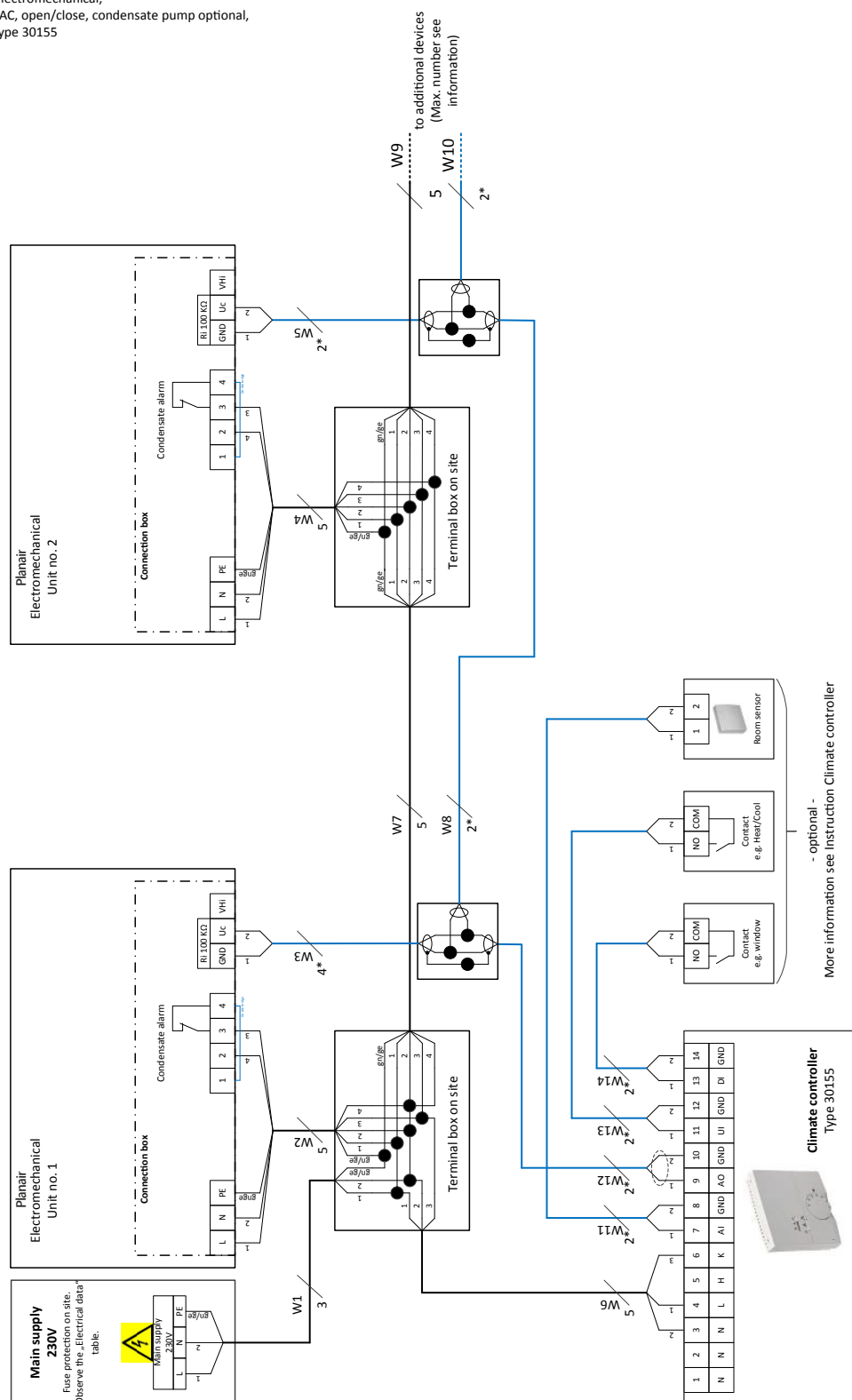
Planair, 2-wire, electromechanical,
valve drive 24V, open/close, condensate pump optional,
Control via GA



Planair, 2-wire
valve drive 24V, open/close,
Room thermostat 342924



Planair, 2-pipe, electromechanical,
valve drive 230VAC, open/close, condensate pump optional,
Air conditioner type 30155



7.3 Connection of thermostatic head control (*N1)

Circuit description (*N1)

- ▶ Units with thermostatic head control are fully wired and supplied ex-works with all electrical components and a connection cable with a standard European plug.
- ▶ The speed of the EC fans used is controlled by "intelligent" control via a 0-10 V DC signal.
- ▶ The temperature is set using a conventional heater thermostat.
- ▶ Optionally, 3 level fan stages can be selected using a rocker switch.

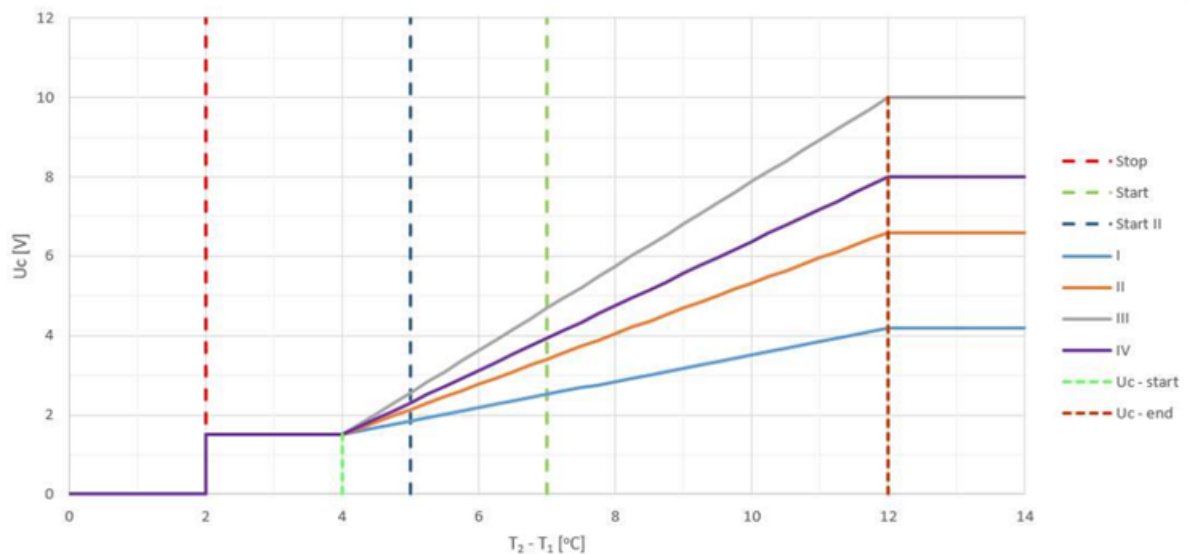


Fig. 10: Control curves

*IV: DIP 1 = 0, DIP 2 = 1 (max. 8 V at stage 3)

DIP1	DIP2	Factory setting	DIP switch function
0	0		Test mode
1	0		Switching-on point 5°C (default = 7°C)
0	1		Max. 8 V at stage 3
1	1	X	Normal mode

Tab. 8: DIP switch settings

Status	Flash code	Cause	Priority	Behaviour
Standby	Duration	Unit switched on	5.	
Control active	Flashing 1 sec.	Standard mode + EC motor active	4.	
EC motor fault	Fast flashing 1x	EC motor fault	3.	EC motor off
Fault sensor 1	Fast flashing 2x	TS1 not connected	2.	EC motor off
Fault sensor 2	Fast flashing 3x	TS2 not connected	1.	EC motor off

Tab. 9: LED status messages

7.4 Connection display control (*N2)

Circuit description (*N2)

- Units with display control are fully wired and supplied ex-works with all electrical components and a connection cable with a Schuko plug.

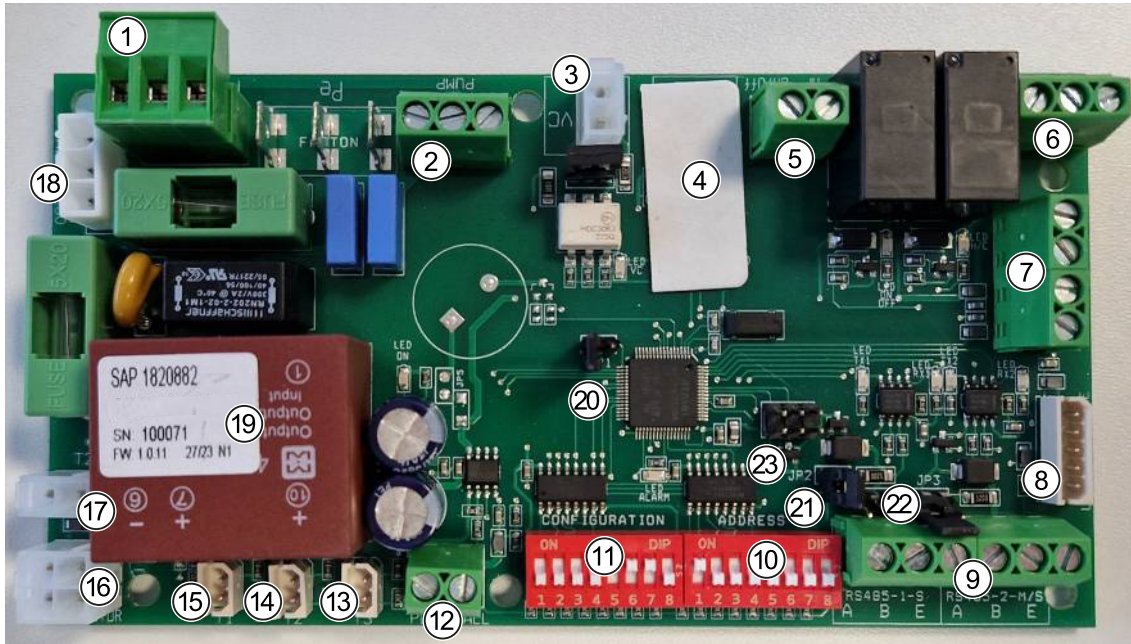


Fig. 11: Control board SAP1820881

1	Power supply 230 V AV/50 Hz	2	Condensate pump power supply 230 V AC
3	Cooling or heating/cooling actuator 230 V AC ON/OFF (2-pipe)	4	Heating actuator 230 V AC ON/OFF (4-pipe)
5	Heat pump ON/OFF contact	6	Heating/cooling heat pump contact
7	ON/OFF digital input (Windows) (bridge inserted at factory)	8	Display connection (+12 V, 0, 2, 1)
9	Master / Slave interface (1-Slave, 2-Master/Slave)	10	DIP switch addressing
11	Unit configuration DIP switch	12	Condensate pump alarm contact connection (bridge inserted at factory)
13	Temperature sensor T3 (temperature in the heat exchanger)	14	Temperature sensor T2 (supply temperature)
15	Temperature sensor T1 (intake temperature)	16	EC motor connection
17	24 V DC power unit connection	18	Power unit or 230 V AC motor connection
19	PCB type label a. SN = serial number b. FW = firmware c. 27/23 = production date (CW 27, year 2023)	20	Jumper 1 (rinsing function)
21	Jumper 2 (terminating resistor -1)	22	Jumper 3 (terminating resistor -2)
23	Programming interface		

DIP	FUNCTION	ON	OFF	DEFAULT
1	System	4-pipe	2-pipe	OFF
2	Heating valve output	-	Heating	OFF
3	Not in use	-	-	OFF
4	Not in use	-	-	OFF
5	Cooling fan operation	ON/OFF according to room temperature	Fan permanently on	OFF
6	Heating fan operation	ON/OFF according to room temperature	Fan permanently on	OFF
7	Fan switch-off delay	No delay	3 minutes	OFF
8	Master / Slave	Master	Slave	OFF

Tab. 10: DIP switch

¹ DIP switch changes only become active after a voltage reset.

Jumper no.	FUNCTION	OPEN	CLOSED	DEFAULT
JP1	Rinsing function: Fan is actuated at minimum speed when the setpoint is reached. $T_{on} = 1$ minute $T_{off} = 9$ minutes	Active	Not active	Open
JP2	Terminating resistor 1 120 Ω	Not active	Active	Open
JP3	Terminating resistor 2 120 Ω	Not active	Active	Open

Tab. 11: Jumper

Temperature sensor

The purpose of the air intake sensor T1 is to determine the air intake or room temperature by measuring the temperature at the air intake. The fan is activated with 2 V every 9 minutes for one minute to circulate air round the unit.



Fig. 12: Temperature sensor

T2 clip-on temperature / changeover sensor

The T2 clip-on temperature / changeover sensor determines the water temperature for the switch-over between heating and cooling mode. The straight-through valve is opened for 10 minutes every 60 minutes to enable the water temperature to be measured correctly. Switching between heating and cooling mode can be done automatically using the clip-on temperature sensor, or can be set using the "Mode" parameter on the display.



Fig. 13: Clip-on temperature sensor

Parameter 23 is used to define the function of the clip-on temperature sensor.

Parameter	Description	Setting	Standard
23	T2 temperature sensor function	0 = T2 connected 1 = T2 not connected, cooling only 2 = T2 not connected, heating only	2

Parameters 24 and 25 define the limit temperatures for cooling and heating mode.

Parameter	Description	Setting	Standard
24	T2 limit temperature cooling mode	Cooling mode when the water temperature is < 20 °C	200
25	T2 limit temperature heating mode	Heating mode when the water temperature is < 28 °C	280

T3 heat exchanger sensor

The T3 heat exchanger sensor determines the temperature of the heat exchanger. The temperature must be within the application limits (4 – 75 °C) to switch on the fan.

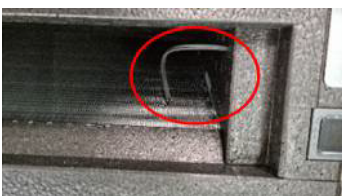


Fig. 14: Heat exchanger sensor

Parameters 26, 27, 28, 29 define the limit temperatures to activate the fan in cooling and heating mode.

Parameter	Description	Setting	Standard
26	T3 fan OFF limit temperature heating mode	Fan is off when T3 is < 26 °C	260
27	T3 fan ON limit temperature heating mode	Fan is on when T3 is > 28 °C	280
28	T3 fan OFF limit temperature cooling mode	Fan is off when T3 is > 24 °C	240
29	T3 fan ON limit temperature cooling mode	Fan is on when T3 is < 23 °C	230

Tab. 12: Heat exchanger sensor parameters



Optional heat pump contacts

When automatically switching between heating and cooling both contacts are switched off, as in this case the unit determines its operating mode based on the water temperature of the heat pump.

► **Heat pump On/Off contact:**

In manual heating or cooling mode, the unit can decide the behaviour of the heat pump. As soon as the unit is switched on, the relay is energised and the contact is closed. A maximum of 250 V AC/ 5 A can be applied to the contact.

► **Heating/cooling heat pump contact:**

In manual heating or cooling mode, the unit can decide the behaviour of the heat pump. The relay is not energised when the unit is in heating mode. The relay is energised when the unit is in cooling mode. The contact is a changeover contact (N, NO, NC) to which a maximum of 250 V AC/ 5 A can be applied.

Master / Slave:

A master can operate up to 30 slaves. The master/slave setting is defined using dip switch 8 on the PCB. The "Address" dip switch can be used to set the address for the respective unit.

The following information is transmitted from the master board to the slave board:

- On/Off
- Operating mode (heating, cooling, automatic)
- Fan speed (F1, F2, F3, Automatic)
- Target temperature

Refer to the following installation plan for information on cabling.

General Information

Information on cable laying:

The following information on cable types and cable laying must be observed in compliance with VDE 0100.

The installation, operation and maintenance of these devices must comply with the country-specific applicable laws, standards, regulations and directives.

Without *: NYM-J. The required number of cores incl. protective conductor is indicated on the cable. Cross sections are not indicated, as the cable length is included in the calculation of the cross section.

*): Shielded cable, J-Y(ST)Y 0.8mm. Lay separately from power lines.

**): Shielded cable stranded in pairs, e.g. UNITRONIC® BUS LD 2x2x0.22, UNITRONIC® BUS LD 3x2x0.22. Install separately from power lines.

- If other cable types are used, they must be at least equivalent.

- The connection terminals on the device are suitable for a maximum wire cross-section of 2.5 mm², the mains plug for max. 4.0 mm².

- When using residual current circuit breakers, these must be at least mixed frequency sensitive (type F). For the design of the rated residual current, the specifications from DIN VDE 0100 Parts 400 and 500 must be observed.

- For the design of the on-site mains supply and fuse protection (C16A, max. 10 devices), the electrical data in the table below must be observed.

- Lines for data or bus signals are shown with shield connected at one end. Lines for analog signals are shown with the shield not connected. Due to structural or local conditions and depending on the type and level of interference, which can be caused by magnetic and/or electric fields in high and/or low frequency ranges, among other things, a different connection of the shield (connected at both ends or not connected) may be necessary. This must be checked by the customer and, if necessary, carried out deviating from the specifications in the documentation!

Electromechanical:

- Cable length between room thermostat and temperature sensor or switching contact: max. 50 m.

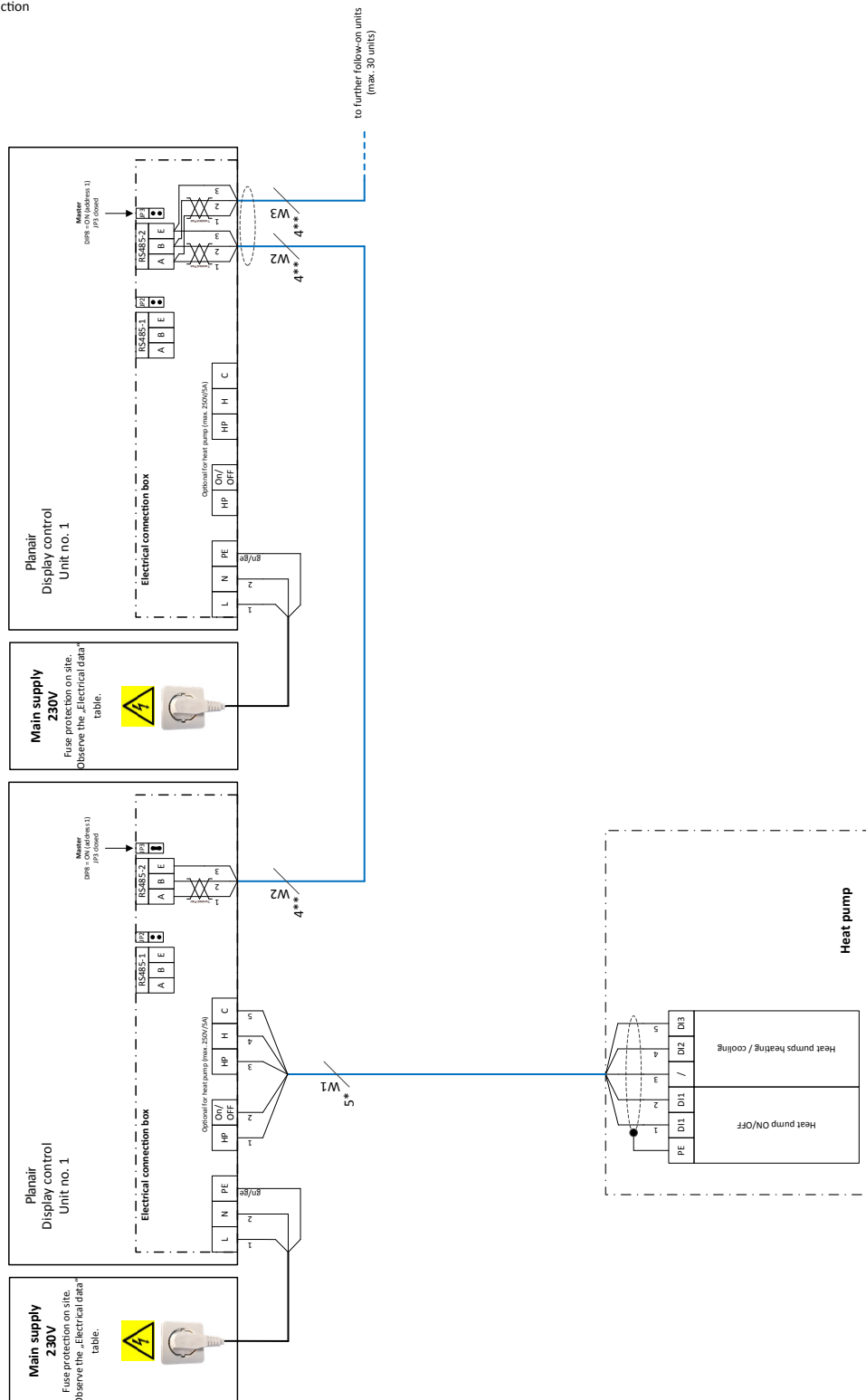
Display control:

- Maximum number of units in parallel: 30.

- BUS cable length from unit 1 to unit 30: maximum 150 m.

- A terminating resistor (120 Ohm) must be set at the first and last participant of a line. Use jumpers 2 and 3 on the control board for this. Jumper closed = terminating resistor set. Before setting the terminating resistor, the control unit must be disconnected from the power supply.

Planair, 2-pipe, display control,
valve drive 230VAC, open/close, condensate pump optional,
Master-Slave function





8 Pre-commissioning checks

When commissioning the device for the first time, ensure that all the necessary requirements are met so that the device can function safely and in accordance with its intended use.

Structural tests

- ▶ Check that the unit is securely standing and fixed.
- ▶ Check the horizontal installation/suspension of the unit.
- ▶ Check the completeness and correct seating of all filters (dirt side).
- ▶ Check whether all components are properly fitted.
- ▶ Check whether all dirt, such as packaging or site dirt, has been removed.

Electrical tests

- ▶ Check whether all lines have been properly laid.
- ▶ Check whether all lines have the necessary cross-section.
- ▶ Are all wires connected in accordance with the electric wiring diagrams?
- ▶ Is the earth wire connected and wired throughout?
- ▶ Check all external electrical connections and terminal connections are fixed in place and tighten if necessary.
- ▶ Check whether DIP switches have been correctly set in accordance with the wiring diagram.

Water-side checks

- ▶ Check whether all supply and drainage lines have been properly connected.
- ▶ Fill pipes and unit with water and bleed.
- ▶ Check whether all bleed screws are closed.
- ▶ Check leak tightness (pressure test and visual inspection).
- ▶ Check whether the parts carrying water have been flushed through.
- ▶ Check whether any shut-off valves fitted on site are open.
- ▶ Check whether any electrically actuated shut-off valves have been properly connected.
- ▶ Check whether all valves and actuators are working properly (note permitted mounting position).

Air-side checks

- ▶ Check whether there is unimpeded flow at the air inlet and outlet.
- ▶ Check whether the air inlet filter is fitted and dirt-free.

Condensation water connection

- ▶ Check whether the condensation tray is free of building rubble.
- ▶ Check the condensation drain and operation of the alarm signal on the condensation pump.
- ▶ Check whether the cooling valve switches off in the event of an alarm signal.
- ▶ Check whether the unit is connected leak-free to the on-site condensation connection.
- ▶ Check whether the waste water lines are clean and have a sufficient gradient.
- ▶ Check whether the condensation pump has a working power supply.

9 Operation

9.1 Operation of electromechanical control

	Room thermostat, type 30155 ▶ Electronic room thermostat with 3-stage automatic function for 2- and 4-pipe applications, surface-mounted wall installation on a flush-mounted box in visually unobtrusive design ▶ simple operation using a large rotary dial for temperature setting with mechanical range limitation of the temperature setpoint, operating mode selector switch, Standby, Manual fan, Automatic fan, 3-stage switch for pre-selecting the fan speed when the operating mode selector switch is in the "Manual fan" position ▶ option for external room sensor connection ▶ control input for heating/cooling changeover with 2-pipe applications ▶ digital input can be set to Comfort/ECO or ON/OFF switchover ▶ For use with Planair, max. units.
	Room thermostat type 194000342924 ▶ Electronic room thermostat with infinitely variable speed adjustment, surface-mounted on in-wall box with visually unobtrusive design ▶ With thermal return, room temperature setting and speed pre-setting with rotary knobs ▶ Internal temperature sensor NTC ▶ Digital input for Day/Eco changeover ▶ Parallel operation of max. units is possible

Fig. 15: Room thermostat, type 30155

Fig. 16: Room thermostat type 194000342924

9.2 Display control

9.2.1 Touch operation

9.2.1.1 Touch display

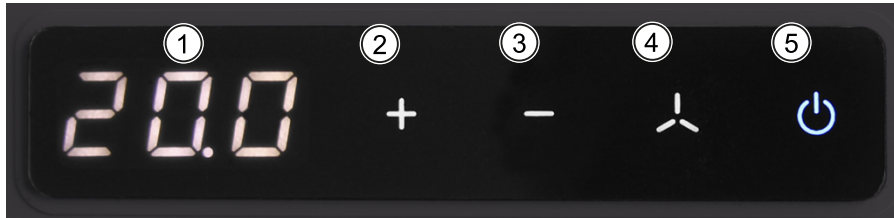


Fig. 17: Touch display

1	3-digit display (target or actual temperature, parameters, alarms etc.)	2	+ button (press to set the target temperature or scroll through parameters)
3	- button (press to set the target temperature or scroll through parameters)	4	Fan button (fan stage selection – F1, F2, F3, Auto)
5	On / Off button (press to switch the unit On/Off, exit the parameter menu, display heating/cooling (red/blue))		

9.2.1.2 On/Off button

Functions

- ▶ The On/Off button  switches the unit on and off. The display starts when the power is switched on. It will display "---" from left to right for approximately 10 seconds. "Off" is the default setting the first time the unit is switched on. After the initial power-on, the last operating status is saved. After a power failure, the unit returns to its previous state. The room frost protection is active when the unit is "Off". If the room temperature drops to < 8°C, the heating/cooling valve opens and the fan starts at stage 1.

LED display	Meaning	Unit status
LED off	Unit OFF	Unit OFF
LED lights up blue	Cooling mode active	Cooling mode
LED lights up red	Heating mode active	Heating mode
LED flashes red 1 sec. ON – 1 sec. OFF	Parameter menu	Current mode frozen
LED flashes white during automatic mode	T2 water temperature T < 20° cooling T > 28° heating	Operating mode not defined The LED lights up red or blue as soon as the correct water temperature has been reached.

Tab. 13: LED ON/OFF button

9.2.1.3 Fan button

Repeatedly pressing the fan button  switches between F1, F2, F3, Auto or, in advanced mode, between F1, F2, F3, Silent, Auto.

Stage 1 is the default setting the first time the unit is switched on. After a power failure, the unit returns to its previous state. Silent mode = fan runs with minimum voltage (1.2 V DC).

9.2.1.4 Temperature setting

Adjusts the target temperature +/- 0.5K  in the parameter menu to scroll between the parameters and parameter values.

9.2.1.5 7-segment display

The 7-segment display  is off when the unit is switched off.

Fan settings F1, F2, F3, SIL, AUT (each for 1 second)

9.2.1.6 Parameter level

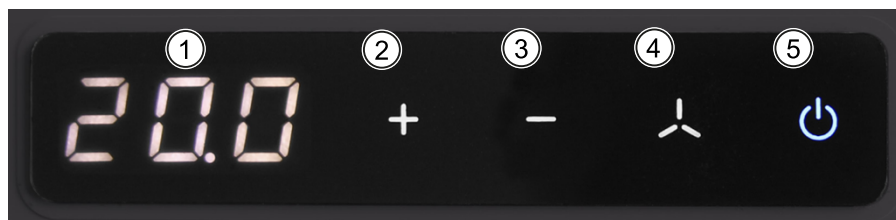


Fig. 18: Touch display

1	P xx = parameter xx L yy = parameter yy	2	Scroll through and change the parameters
3	Scroll through and change the parameters	4	Select the parameter and confirm the new value
5	Exit (press for 4 seconds)		

User parameters

Parameter	Description	Setting	Standard
Brt	Display brightness	On-Off ^{*1}	Off
Mod	Operating mode	Aut-HEA-COO	HEA
C-F	Celsius or Fahrenheit	C-F	C
ESC	Exit menu	Yes-No	Yes
PAS	Password for advanced access	-99-999 ^{*2}	0

^{*1} Off = display is automatically switched off 30 seconds after the last operation.

^{*2} Password = 22

Access:

- ▶ Press and hold down + & fan button for a minimum of 10 seconds. "---" is displayed for 3 seconds.
- ▶ Press and hold the fan button for at least 5 seconds while "---" is displayed. The On/Off button then flashes white and "brt" (the first parameter) is displayed.

Advanced parameter level

Access: Select the user parameter "PAS", enter the password (22) and confirm with the Fan button.

Parameter	Description	Setting	Standard
F.rt	Filter run-time	Read only	#
F.rS	Filter reset	Yes-No	No
S.F.H.	Set Filter Hours (in h) ⁽²⁾	0-4 x 1000 (step 0.5)	0
E.Mo	Extended mode	Yes-No	No
S-r.	Target temperature or room temperature display	Set-roo	Set
Sen	Display of temperature values T1-T3	Read only T1, T2, T3	T1
oFs	Room temperature offset (T1 offset)	-12...+12 (step 0.5)	0
Adr	Address	R/W	Adr#
t.rt	Unit runtime	Read only	#
ESC	Escape (exit menu)	Yes-No	Yes

(2) When the filter runtime has elapsed, the FIL display flashes 5x every 30 seconds to indicate that the filter needs to be checked. The message then needs to be reset using the F.rS parameter.

Parameter	Description	Setting	Standard
1	Temperature sensor T1	0...40 °C, air intake temperature sensor	x
2	Temperature sensor T2	-20...89 °C, flow temperature sensor	x
3	Temperature sensor T3	-20...89 °C, heat exchanger sensor	x
4	Fan speed	0...100% activation feedback	x
5	Operating mode	1 = Cooling / 2 = Heating / 3 = Automatic	2
6	Fan	0 = Automatic / 1 = Min / 2 = Med / 3 = Max / 4 = Silent	1
7	Temperature setpoint	0.5 K increment	210
8	Min. temperature setpoint	Lower limit temperature setpoint 10...30 °C	10 °C
9	Max. temperature setpoint	Upper limit temperature setpoint 10...30 °C	30 °C
10	Cooling dead zone	0...5 °C	5 °C
11	Heating dead zone	0...5 °C	5 °C
12	Setpoint temperature offset	-12...12 °C	0 °C
13	Proportional band, fan cooling mode	2...10 °C (1/10)	4 °C
14	Min. fan speed cooling mode	10...100% limit in automatic mode (1/1)	20%
15	Max. fan speed cooling mode	10...100% limit in automatic mode (1/1)	65%
16	Proportional band, fan heating mode	2...10 °C (1/10)	4 °C
17	Min. fan speed heating mode	10...100% limit in automatic mode (1/1)	20%
18	Max. fan speed heating mode	10...100% limit in automatic mode (1/1)	65%
19	Fan speed stage 1	10...xxx% (1/1)	38%
20	Fan speed stage 2	10...xxx% (1/1)	56%
21	Fan speed stage 3	10...100% (1/1)	100%
22	ON/OFF delay input	0...120 min. (1/1)	5 min.
23	T2 temperature sensor function	0 = T2 connected / 1 = T2 not connected, cooling only / 2 = T2 not connected, heating only	2
24	T2 limit temperature cooling mode	7...30 °C, cooling mode, when water temperature / <20 °C (1/10)	20 °C

Parameter	Description	Setting	Standard
25	T2 limit temperature heating mode	20...45 °C, heating mode, when water temperature / >28 °C (1/10)	28 °C
26	T3 fan OFF limit temperature heating mode	10...45 °C / fan is off when T3 <28 °C (1/10)	26 °C
27	T3 fan ON limit temperature heating mode	10...40 °C / fan is on when T3 >32 °C (1/10)	28 °C
28	T3 fan OFF limit temperature cooling mode	20...45 °C / fan is off when T3 >24 °C	24 °C
29	T3 fan ON limit temperature cooling mode	20...40 °C / fan is on when T3 <23 °C	23 °C
30	Not Used		
31	Not Used		
32	Not Used		
33	Not Used		
34	Not Used		
35	Not Used		
36	Not Used	10...30 °C	240
37	Not Used	10...30 °C	210
38	Not Used	0 = Automatic / 1 = Min / 2 = Med / 3 = Max	2
39	Not Used		
40	Not Used		
41	Not Used		
42	Not Used		
43	T3 low water temperature alarm	0...10 °C / T3 < 4 °C (1/10)	40
44	T3 high water temperature alarm	40...89 °C / T3 > 75 °C (1/10)	750
45	Eco setpoint heating mode	10...30 °C (1/10)	150
46	Eco setpoint cooling mode	10...30 °C (1/10)	280
47	Not Used		
48	DIP 1	0=Off, 1=On	X
49	DIP 2	0=Off, 1=On	X
50	DIP 3	0=Off, 1=On	X
51	DIP 4	0=Off, 1=On	X
52	DIP 5	0=Off, 1=On	X
53	DIP 6	0=Off, 1=On	X
54	DIP 7	0=Off, 1=On	X
55	DIP 8	0=Off, 1=On	X
56	Fan fault message status	0=Contact closed, no alarm / 1=Contact open, alarm	X
57	Alarm contact status (condensate pump)	0=Contact closed, no alarm / 1=Contact open, alarm	X
58	JP1 status	0=Contact closed, not active / 1=Contact open, active	X
59	Contact On/Off status	0=Contact closed, not active / 1=Contact open, active / Polarity can be changed using P74	X
60	Not Used		X
61	Cooling valve output (VC)	0=Off, 1=On	X
62	Heating valve output (VH)	0=Off, 1=On	X
63	Fan output stage 1	0 = Output not active, 1 = Output active	X
64	Fan output stage 2	0 = Output not active, 1 = Output active	X

Parameter	Description	Setting	Standard
65	Fan output stage 3	0 = Output not active, 1 = Output active	X
66	Unit status ON / OFF	0 = Unit Off, 1 = Unit On	1
67	Lock ON / OFF button	0 = Button not locked, 1 = Button locked	0
68	Lock button mode	0 = Button not locked, 1 = Button locked	0
69	Lock +/- button	0 = Button not locked, 1 = Button locked	0
70	Lock fan button	0 = Button not locked, 1 = Button locked	0
71	Buzzer	0 = Off, 1 = On	0
72	Restore factory settings	1 = Reset	0
73	Unit type	0 = Standard, 1 = Special	0
74	Contact polarity On / Off	0 = Normally closed (NC), 1 = Normally open (NO)	0
75	Contact On/Off status	0 = Not active, 1 = Active	0
76	Contact input On/Off	0 = Activated, 1 = Deactivated	0
77	Eco mode	0 = Eco mode Off, 1 = Eco mode On	0
78	Touch display brightness	0 = Off (30 sec.), 1 = On	0
79	Celsius or Fahrenheit	0 = Celsius, 1 = Fahrenheit	0
80	Filter run-time	0...999 h (*10)	0
81	Filter reset	1 = Reset	0
82	Filter maintenance	0...500 h (*10)	0
83	Extended mode	0 = OFF, 1 = ON	0
84	Temperature display	0 = Set temperature, 1 = Room temperature	0
85	Unit identification	10 = PowerKon LT	10
86	Modbus address	/	0
87	Address set?	0 = No, 1 = Yes	0
88	Total run-time	/	0

Tab. 14: Parameter list

9.2.1.7 Alarm message

Code	Description	Red LED	Unit status
AL1	Contact On / Off	1x flashing	"REM" and "OFF" is displayed alternately and the control stops after the set delay time (P22), default 5 min.
AL2	Condensate alarm	2x flashing	Control stops, all outputs to OFF.
AL3	EC fan fault alarm	3x flashing	Control stops, all outputs to OFF.
AL4	T3 < 4 °C, T3 > 75 °C	4x flashing	Valve closes, fan runs at min. speed.
AL5	Error T1	5x flashing	Control stops, all outputs to OFF.
AL6	Error T2	6x flashing	Control stops, all outputs to OFF.
AL7	Error T3	7x flashing	Control stops, all outputs to OFF.
AL9	Room frost protection	9x flashing	Valve opens, fan runs at min. speed, no display, heat pump output to OFF.

Tab. 15: Alarm messages

10 Maintenance

10.1 Securing against reconnection



DANGER!

Risk of death by unauthorised or uncontrolled restart!

Unauthorised or uncontrolled restarting of the equipment can result in serious injury or death.

- Before restarting, ensure that all safety devices are fitted and working properly and that there is no hazard to humans.

Always follow the procedure described below to prevent accidental restart:

1. de-energise.
2. Prevent accidental re-connection.
3. Check that the equipment is de-energised.
4. Cover and cordon off adjacent live parts.

10.2 Maintenance Schedule:

The sections below describe maintenance work needed for the proper and trouble-free operation of the equipment.

If there are signs of increased wear during regular checks, shorten the required maintenance intervals to the actual wear and tear. Contact the manufacturer with any questions about maintenance work and intervals.

Interval	Maintenance task	Personnel
As required	Regular visual checks and acoustic checks for damage, dirt and function.	User
quarterly	Check filter for dirt, clean and change filter when needed.	User
every six months	Clean unit components (heat exchanger, condensate tray, condensate pump, float switch).	User
every six months	Check water-side connections, valves and fittings for dirt, leak-tightness and function.	User
every six months	Check the electrical wiring.	Qualified personnel
every six months	Clean components/surfaces that come into contact with air.	Qualified personnel
quarterly	Check the heat exchanger for dirt, damage, corrosion and leak-tightness. Carefully vacuum the heat exchanger if dirty.	User
quarterly	Check the condensation tray, float switch and drain connection for dirt, damage and leak-tightness. Remove any condensation deposits that have accumulated.	User
every six months	Check the dewpoint sensor for dirt and correct operation. Replace the sensor, if necessary.	User

10.3 Maintenance work

10.3.1 Clean the inside of the unit

Check all elements that come into contact with air (internal surfaces of the unit, outlet elements etc.) for dirt or deposits during maintenance and use a commercially available product to remove.



- ▶ Remove the casing upwards.
- ▶ When refitting, make sure that the side recesses are sitting correctly on the wall bracket.

10.3.2 Replacing the filter.



CAUTION!

Risk of injury from sharp metal housing!

The inner metal of the casing can have sharp edges.

- ▶ Wear suitable protective gloves.



- ▶ Vacuum the filter from below.



- ▶ Replace the filter if there is a high level of dirt.

10.3.3 Cleaning the condensate tray



- Clean the condensate tray.

10.3.4 Cleaning the valve condensation tray



- Clean the valve condensate tray.



11 Faults

The following chapter describes possible causes of faults and the work needed to rectify them. Should faults occur frequently, shorten the maintenance intervals in line with the actual loading on the unit.

Contact the manufacturer with any faults that cannot be rectified using the following information.

Behaviour in the event of faults

The following applies:

1. Immediately switch off the unit with faults that pose an immediate danger to persons or property!
2. Determine the cause of the fault!
3. Switch off the unit and prevent it from being reconnected if rectifying the fault requires work in the hazard area. Immediately advise a supervisor on site about the fault.
4. Either rectify the fault yourself or have it repaired by authorised personnel, depending on the nature of the fault.

The Fault table [► 51] provides information on who is authorised to rectify and remedy faults.



11.1 Fault table

Fault	Possible cause	Remedy
No function.	No power supply.	Check voltage, switch on repair switch. Replace fuse.
System water leakage	Heat exchanger defect.	Replace heat exchanger if necessary.
	Hydraulic connection not correct.	Check flow and return, retighten if necessary.
Water leakage condensate	Drains of the condensate tray clogged.	Clean condensate drains and check for sufficient slope.
	Cold water pipe not properly insulated.	Check insulation.
	Condensate drain not properly installed.	Check the function of the condensate pump. Check condensate drain, clean if necessary.
	Air-conducting accessory components not properly insulated.	Check insulation.
Unit not heating or cooling sufficiently (LPHW/CHW)	Fan is not switched on.	Switch on fan at controller.
	Air volume is too low.	Set a higher speed.
	Filter is dirty.	Replace filter.
	No heating or cooling medium.	Switch on heating and/or cooling system, switch on circulation pump, vent unit/system.
	Valves not operating.	Replace faulty valves.
	Water volume too low.	Check pump output, check hydraulics.
	Setpoint temperature on the controller set too low/high.	Adjust temperature setting on the controller.
	Operating unit with integral sensor and/or external sensor is exposed to direct sunlight or positioned over a heat source.	Place operating unit with integral sensor and/or external sensor in a suitable position.
	Air cannot blow out or in freely.	Remove obstacles at the air outlet/air inlet.
	Heat exchanger dirty.	Clean heat exchanger.
	Air in the heat exchanger.	Vent heat exchanger.
Unit too loud	Speed too high.	Set a lower speed, if possible.
	Air inlet/outlet opening is obstructed.	Free air ducts.
	Filter dirty.	Replace filter.
	Rotating parts unbalanced	Clean and/or replace impeller. Please make sure that no balancing clips are removed during cleaning.
	Fan dirty.	Clean dirt from fan.
	Heat exchanger dirty.	Clean dirt from Heat exchanger.

11.2 Start-up after rectification of fault

After correction of the fault, carry out the following steps for recommissioning:

1. Make sure that all maintenance covers and access openings are sealed.
2. Switch off the unit.
3. Acknowledge the fault on the controller, if necessary.

