Combi Unit Genius

Controlled Residential Ventilation with Heat Recovery, Heating, Hot Water Generation, Cooling

CE

Installation, Operation and Maintenance Instructions
for qualified installers

systemair

Table of Contents

1 General Information

1.1 List of Information

DANGER

Imminent danger

Failure to comply with this warning leads directly to death or to serious bodily harm.

WARNING

Potential danger

Failure to comply with this warning leads directly to death or to serious bodily harm.

CAUTION

Hazard with low risk

Non-compliance with the warning notice will result in slight to moderate bodily injuries.

WARNING

Hazard with risk of damage to property

Non-compliance with the warning notice will lead to damage to property.

NOTE

Useful information and instructions

1.1.1 Safety Symbols

General symbol for danger

Risk of burns!

Electrical voltage!

1.1.2 Presentation of Handling Instructions

Handling instruction

✓ Handling prerequisite

☞ Carry out this operation

☞ (further actions if required)

Handling instruction with defined sequence

1. Carry out this operation
2. Carry out this operation
3. (further actions if required)

1.2 Notes on the Documentation

WARNING

Risks due to misuse

These operating instructions describe the safe use of the combi unit.

› Read the operating instructions carefully!

› Keep the operating instructions near the combi unit. They must be permanently available at the place of use.

1.3 Using the Systemair-Cloud

Confirming the Systemair-Cloud enables Systemair having access to your controller and its settings. It goes without saying that we do this only after request/permission of the unit user.

Systemair-Cloud provides qualified support (malfunctions, incorrect settings, software errors etc.) in an easy and quick way which also saves costs and waiting time.

NOTE

Modifications of the software settings can influence the energy consumption and effectivity of the unit.

1.4 Heat Pump Special Rate/Utility Lock

Before unit installation, consult the utility company for your suitable rate.

1.5 Notes on Planning and Installation

Systemair is happy to do all the planning and project engineering for you, e.g.

- Determination of the air quantities using the building plans
- Configuration of the system using modern CAD software
- Quote generation with a list of specifications and the associated prices
- Creation of assembly plans
- Delivery of the system components to the building site
- Support during assembly, commissioning and maintenance

1.5.1 Professional Planning

Observe the following during planning and electrical installation:

- Increased air volume flow during heating or cooling operation. This results in a larger supply air duct system. High air velocities and noise development can be avoided.
- Air tightness and insulation of the supply air ducts require increased specifications.
- PTC elements are required in most cases.
- Room controllers are obligatory.
- An additional duct system for secondary air is necessary.

1.5.2 Professional installation

- ☞ Choose the insulation of the supply air ducts within the shell (warm area) so that the air volume provides the heating performance in each supply air room.
- ☞ Isolate supply air ducts in cold areas with an insulation of min. 50 mm.
- ☞ Ensure air tightness of the system to minimize heat loss.
- ☞ Use silencers for all unit connections.
- ☞ Make sure the installation is diffusion resistant, to prevent condensation forming during cooling.

NOTE

To ensure a proper system operation, the installation must be carried out according to the state of the art.

1.5.3 Service provided by Systemair

If the system is installed according to plan, Systemair will provide a warranty for the function.

For this, the following points are critical:

- The system was planned by Systemair.
- The system was installed and commissioned as planned.
- Only Systemair products were installed.

2 Important Safety Information

2.1 Safety Notes

Observe the following safety instructions:

- Any work on the unit and first commissioning must be carried out by an expert technician.
- The expert technician is responsible for installation and first commissioning according to the applicable rules and regulations.
- Operate the unit only completely installed and with all safety devices.
- Check the filter regularly for contaminations.
- Never readjust the room supply and extract air valves. They will be adjusted during commissioning.
- Never modify the internal electrics and control.
- Operate the combi unit permanently with frost protection.
- As well as the fresh and exhaust air pipes, all the supply air pipes must be insulated so they are airtight.
  This prevents heat losses during heating as well as condensation during cooling operation.
- For very cold external temperatures, a preheater for the heat pump (accessories) is needed to ensure operational reliability.
  Systemair offers the heater as an option and also incorporates it in the plan, so that it is possible to retrofit it if required.
- Do not use the ventilation system while the floor screed is drying, because damage to the ventilation unit may occur due to the formation of excessive condensation. Any operation during the building phase must be excluded to prevent contamination of the duct network and the unit.
- If commissioned in winter, the first heating-through of the building must be performed by the builder/client on-site.
- Reheating elements are absolutely necessary for low-energy houses (for covering peak loads), as well as standard energy-efficient houses. The use of reheating elements (accessories) is recommended for all house standards (activated for "defrost" mode-comfort, emergency function).

WARNING

Electric shock

Electrics and electronics can become a lethal danger through ingress of liquids.

» The device shall not be exposed to dripping or splashing!

WARNING

Burning hazard

Risk of scalds with water temperatures higher than 43 °C.

» Do not open the hot water storage tank!

WARNING

Impacts and crushing

The ventilation module is not fixed to the base module with bolts. At a gradient of more than 30°, the ventilation unit can tip and fall down.

» Do not tilt the unit more than max. 30° from the vertical position!

» Wear a helmet!

2.2 Personnel

2.2.1 Personnel for Installation, Commissioning, Maintenance, Cleaning and Remedying Faults

This instruction manual contains information about installation, commissioning, maintenance, cleaning and remedying faults.

It is addressed to the expert technician.

In order to ensure a proper function observe the following information:

- ☞ Carry out any work only according to the service manual.
- ☞ Carry out any work only according to the actual standards and regulations.
- ☞ Instruct the operator in function, operation and maintenance of the combi unit.
- ☞ Inform the operator of possible hazards during the operation of the unit.

2.2.2 Operation Personnel

The combi unit can be operated by untrained personnel. Information to this can be found in the operation manual.

2.3 Intended Use

The unit is a complete system with heat recovery for central ventilation, hot water supply and heating. The intended use of the unit are domestic areas and can be safely operated by not trained persons. The unit can also be applied in non domestic areas e.g. small companies with similarly use.

The combi-unit is designed for use in passive houses, lowest-/low-energy houses, and, in some cases, in standard energy-efficient houses. The maximum heating load is 6 kW. A heating load of ≤ 5 kW is required. The air volume for residential ventilation is limited.

From this result the following reference values for the application limits:

- Lowest-energy house (Energy Efficient House 40): max. 200 m^2 living area
- Low-energy house (Energy Efficient House 55): max. 180 m^2 living area
- Standard Energy Efficient House (according to EnEV 2016, formerly Energy Efficient House 70): max. 140 m^2 living area
- Furthermore, the building needs to be appropriately airtight. Recommended value: < 0.6 1/h

As soon as the application limit is approached for the relevant house standard, detailed consideration is required and the manufacturer must be consulted. For example, this could require a heating demand calculation / heating load calculation, as well as evidence of the airtightness of the building (blower-door test).

If a wood-burning stove is planned, this must be independent of the room air and DIBt-certified. This means pressure monitoring is generally not necessary and a shutdown of the system can be excluded. This is the only way to ensure the unit functions perfectly. If pressure monitoring is required, this must be implemented thermally. The "oven function" enables heat to be transported around the entire house through the duct network. Parallel operation of a fireplace and ventilation system must generally be agreed with the responsible district chimney sweep.

- It is possible to limit both the heat pump performance and the secondary air volumetric flow, for example, for small residential units or passive houses. However, the manufacturer must be consulted.
- At least one room controller (accessories) is required. We recommend one controller per supply air room.

If larger houses/residential units (at a correspondingly lower heating load, e.g. for passive houses) are to be equipped with the Genius combi-unit, there is an option to use stronger fans to ensure the required air exchange. Please get in touch with Systemair early on in the planning phase).

2.4 Handing over to the Customer

Handing over of the combi unit to the customer as follows:

- ☞ Describe the functions of the combi unit.
- ☞ Hand out all documentation for safe keeping.
- ☞ Instruct the customer with the help of the user manual.
- ☞ Indicate possible hazards.
- ☞ Point out maintenance and maintenance intervals.

2.5 CE-Marking

The CE marking proves that the combi unit ***Genius*** meets all basic requirements:

- Electromagnetic Compatibility (EMC) Directive 2014/30/EC;
- Machinery Directive 2006/42/EC;

see EC Declaration of Conformity in the appendix.

2.6 Warranty

The warranty for the combi unit ***Genius*** determines itself after the contractual definitions, our offers as well as in supplement to our general terms and conditions. Warranty claims assume that the combi unit ***Genius*** is correctly connected and operated according to the data sheets and is also maintained when required.

The commercial and industrial use of the combi unit ***Genius*** to produce process heat is excluded. Information for the technician concerning permissible operating conditions can be found in the chapters installation or maintenance instructions.

3 Delivery and Accessories

☞ **Check the delivery for any possible damages.**

3.1 Delivery Contents

⚠ WARNING

Danger of impacts and crushing due to falling or tipping ventilation unit!

The ventilation module is only resting (not fixed in place) on top of the base and heat pump module. At a gradient of >30° from the vertical position, the ventilation unit can tip, slip and fall down.

» Secure the Genius against tipping!

» Do not tilt the Genius more than max. 30° from the vertical position!

» Wear a protective helmet during transport!

» Use only suitable handling equipment!

» Ensure that unauthorised personnel do not linger nearby during transport!

The combi unit ***Genius*** consists of 3 modules. Systemair delivers the combi unit as a complete unit.

1. The **basic module**: It contains the drinking water tank, the electrical cabinet and the hydraulic connections.
2. The **heat pump module**: The heat pump module includes the complete pre-installed cooling circuit. The cooling circuit also contains the heat exchangers for heating and cooling operation. The module can be pushed into the basic module and easily connected.
3. The **ventilation module**: It contains all components for controlled residential ventilation as well as the secondary air fan for heating and cooling.

NOTE

Heat pump module and ventilation module are included for delivery. They can be removed if necessary (see „6.4.1 Disassembly“ page 19).

3.2 Accessories (not included in the delivery)

3.2.1 Accessories (required)

Room controller type RC-CDO

PTC elements (required in many cases)

Condensate drain with siphon

Cold water safety group with safety valve and backflow preventer

Field system fuse protection: residual current circuit breaker 30 mA

3.2.2 Optional extra - Accessories

Circulation system

A hot water circulation is not recommended for energetic reasons. If a hot water circulation is necessary due to unfavourable ducting, it must be carried out according to the standards (see „13.2.3 Hot water generation“ page 102)

Geothermal heat exchanger

The temperature in the earth is almost constant throughout the year. Thus, the heat exchanger is suitable to pre-heat cold outdoor air in winter. Warm summer air can be cooled down before entering the interior rooms.

- Air-to-air geothermal heat exchanger

The air to air geothermal heat exchanger should be connected to the outdoor air of the heat pump to ensure higher energy efficiency. A combined connection to the ventilation unit is not possible due to a varying supply air intake of the heat pump. This results partially in high volumetric flows and a proper controlled residential ventilation operation can not be ensured.

- Brine-to-air heat exchanger

A brine to air heat exchanger is an alternative. Both supply air intakes can be connected together due to the separated systems. Ensure that the specifications of the brine to air heat exchanger is adapted to the heat pump (air flow rate).

4 Description of the System

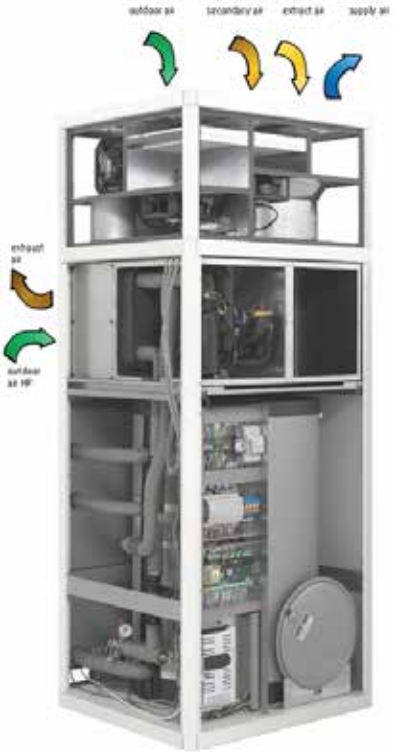
The Combi Unit ***Genius*** realizes the complete building services for energy efficient buildings without water-based heating system.

Modern buildings are planned with thicker envelopes. Thus, a mechanical ventilation is more and more necessary. New buildings as well as renovated buildings have higher insulation standards with less heating loads. Consequently, conventional heating systems are often over-dimensioned.

Systemair provides with the Combi Unit ***Genius*** a new designed heating system based on heating and cooling via ventilation ducts. This can be achieved by temporarily increasing the volumetric flow in combination with an air-air/air-water-heat pump. This heat pump also provides warm water.

Furthermore, planning and design of the building equipment can be minimized.

4.1 The Combi Unit Genius in Detail



Ventilation module

- Rotating heat exchanger with humidity recovery
- Heating and cooling through supply air ducts of the ventilation system

Heat pump module

- Reversible air to air and air to water heat pump for heating, cooling and hot water
- Steplessly controlled compressor to modulate the power exactly to the need of heating and cooling energy

Hot water module

- 150 litres storage tank for hot water
- Hot water production parallel to heating and cooling
- Electric heater with 3 kW power

Figure 1: ***Genius*** *in detail*

4.1.1 Heat Pump/Cooling Circuit

A steplessly controlled air-air heat pump heats in winter and cools in summer. The heat pump adjusts its performance according to the requirements. This guarantees an energy efficient operation. Additional air is removed from the living area via a separate duct system and led back after treatment (heating or cooling) to living and sleeping areas. This is a pure air heating/cooling system. The extract system remains unaffected. An odour or mass transfer from the extract air rooms into the supply air is excluded.

The hot water generation with a 150 litres drinking water tank is ensured by an additional plate heat exchanger. This ensures hot water comfort because water treatment works during all operating modes. The water will be heated or cooled to the desired temperature on demand.

4.1.2 Controlled Residential Ventilation

A controlled residential ventilation with heat recovery is integrated in the unit. It provides a balanced, pleasant indoor climate year-round, ensures constantly fresh air into the living rooms and transfers used air to the outside. At heat recovery, heat is transferred from the extract air to the supply air, thus remaining in the building.

The rotating heat exchanger is used for heat recovery in the Combi Unit ***Genius***:

Due to the rotation of the heat exchanger, supply and extract air flow through in one revolution alternately by the cells. Thus the heat storage wheel transfers the heat of the extract air by rotation to the supply air. In summer, the principle works in reverse by the cooler extract air precools the warmer supply air. A rotating heat exchanger recovers not only heat but also humidity. At low outdoor temperatures, the condensation of the extract air is transferred to the supply air, so that it is humidified. In summer, the room humidity will be transported from the interior to the exterior.

4.2 Operation in Combination with Room Air Independent Fireplaces (Furnace Function)

NOTE

This function must be activated and deactivated manually.

The steps correspond to the following powers of the secondary air fan:

- Step 1 60%
- Step 2 80%
- Step 3 100%

The combi unit Genius can be used in combination with **room air independent fireplaces**. Since the combi unit ensures the complete heating function, it must not be switched off. This is only possible with a room air independent version.

In a combined operation of a ventilation system with an air-ventilated fireplace it must be avoided that exhaust of the fire place can get in the room due to a formation of a negative pressure. This can be realized either through mutual operation (ventilation system switches off when operating the fireplace) or by a pressure-controlled mode (ventilation system switches off when a predetermined negative pressure is exceeded, which is monitored by a differential pressure device).

NOTE

Since the combi unit also ensures the complete heating function any shutdown must be excluded.

A room air independent fireplace equally distributes the heat of the fireplace in the house by the secondary air operation of the system. This represents a classic example for secondary air heating with a tiled stove.

The heat of the fireplace is distributed through the secondary and the following supply air duct system. Thus, the heat pump runs correspondingly less. In the best of case not at all as long as the fireplace is in operation. The heat is selectively discharged by the step operation. An overheating of the living area can be additionally avoided.

If the heat pump receives an additional heating demand, the secondary air fan switches to controlled operation. The fan runs parallel to the heat pump. After the heat pump is switched off, the fan returns to the set step of the furnace operation.

NOTE

To avoid complications when combining controlled residential ventilation systems and fireplaces (firewood or pellets), it is essential to agree with the district master chimney sweep.

For wood stoves, two types must be distinguished: room air dependent and room air independent. An room air independent wood stove (declared by the manufacturer) is only accepted when having an approval. If not, the chimney sweep must consider it as room air dependent. In this case the parameter ***Add. Frost Protection*** must be set to ***Off*** (see „Rotor settings“ page 73).

If a safety device is required, the controller is preconfigured - see “Wiring Diagram”.

4.3 Technical Data

NOTE

If larger houses/residential units (at a correspondingly lower heating load, e.g. for passive houses) are to be equipped with the Genius combi-unit, there is an option to use stronger fans to ensure the required air exchange. Please get in touch with Systemair early on in the planning phase).

Genius	Unit	Data
Performance data		
max. heating capacity	kW	6
max. cooling capacity	kW	4
Power PTC elements (Accessories)	W	each 500
Power heating rod	kW	3
Coefficient of performance for A7/L40		3.3
Coefficient of performance for A2/L40		2.9
Coefficient of performance for A-7/L40		2.3
Electrical data		
Max. power input supply and extract air fan	W	80 (standard version) 170 (version L)
Max. power input secondary air fan	W	170
Max. input power compressor	W	1800
max. power input fans module ventilation	W	each 80
max. power input fan module heat pump	W	170
Power input storage charge pump	W	6 ... 28
Supply voltage	V	230
Frequency	Hz	50
Protection class		IPX2
Ventilation		
Filter class outdoor air		F7
Filter class extract air		G4
Filter class secondary air		G4
Air flow rate (standard operation)	m^3/h	180 (standard version) 230 (version L)
max. air flow heating/cooling (secondary air)	m^3/h	550 (standard version) 600 (version L)
Fresh air heat recovery	%	up to 85
Dimensions / Weight		
Width	mm	865
Height	mm	2070
Depth	mm	750
Weight ventilation module	kg	75
Weight heat pump module	kg	60
Weight basic module/hot water	kg	170
Total weight, empty	kg	305
Total weight, filled	kg	460
Fittings		

*Table 1: Technical Data combi unit **Genius***

Genius	Unit	Data
Cold water		1" male
Hot water		1" male
Circulation		3/4" male
Condensate		hose connection 15 mm (5 pcs.)
Safety valve		3/4" male
Outdoor air ventilation		DN 160
Outdoor air heating pump		DN 250
Extract air		DN 160
Supply air		DN 200
Secondary air		DN 200
Exhaust air ventilation / heat pump		DN 250
Other		
Refrigerant		R410A
Filling quantity refrigerant	kg	1.4
Storage content	l	150
Expansion tank	l	6
Safety valve storage charging circuit	bar	3

*Table 1: Technical Data combi unit **Genius***

4.4 Name Plate

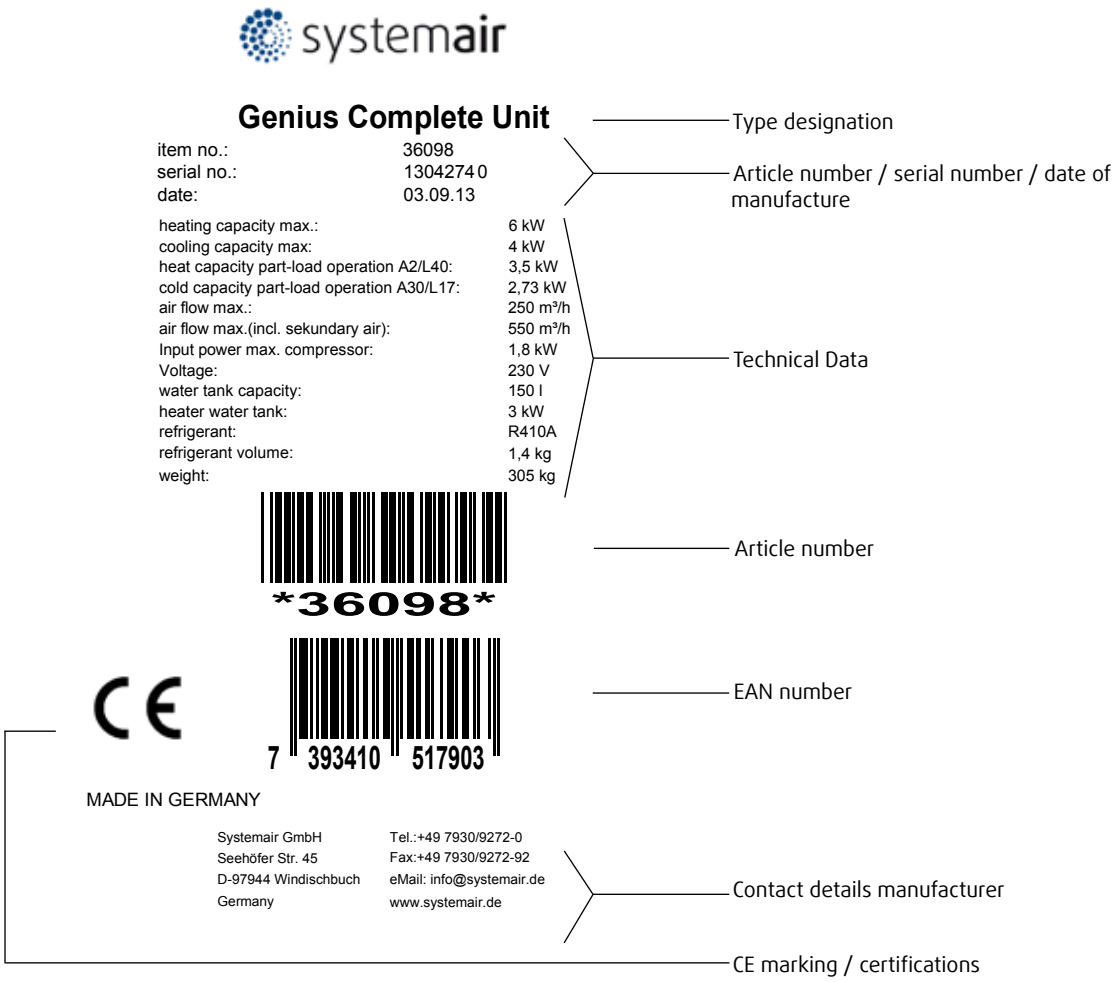


Figure 2: Name plate

5 Transport and Storage

Systemair delivers the combi unit with the basic/hot water, heat pump and ventilation module as a complete unit.

WARNING

Impacts and crushing

The ventilation module is not fixed to the base module with bolts. At a gradient of >30° from the vertical position, the ventilation unit can tip, slip and fall down.

» Do not tilt the unit more than max. 30° from the vertical position!

» Secure the combi unit against tipping!

» Wear a protective helmet during transport!

WARNING

Damage to the combi-unit!

The ventilation module is only resting (not fixed in place) on top of the base and heat pump module.

» Transport the units in the packaging and mounted on the pallet (if possible)!

» Transport the unit with the help of several persons!

» Use only suitable handling equipment.

» Position the unit only on a level ground!

WARNING

Damage to the hydraulic connections!

The hydraulic connections can tear.

» Do not transport the combi unit by the hydraulic connections.

Transportation notes

☞ Loosen the combi unit for transport only from the pallet if the conditions make it appropriate!

☞ Transport the combi unit in the original packaging, upright and without water content.

☞ The combi unit can be tilted for a short period of time up to 30° for transport through doors, stairs etc.

Storage

☞ Store the combi unit in the original packaging, upright and without water content.

Storage location: On a dry, frost-free place and on a flat surface.

6 Assembly

6.1 Safety Information

WARNING

Risk of injury and risk of damage to the combi unit!

The ventilation module is only placed on the basic / heat pump module and can slide out and cause injury.

» Secure the combi unit against tipping!

» Install the combi unit only on a level ground!

6.2 Location Dimensions

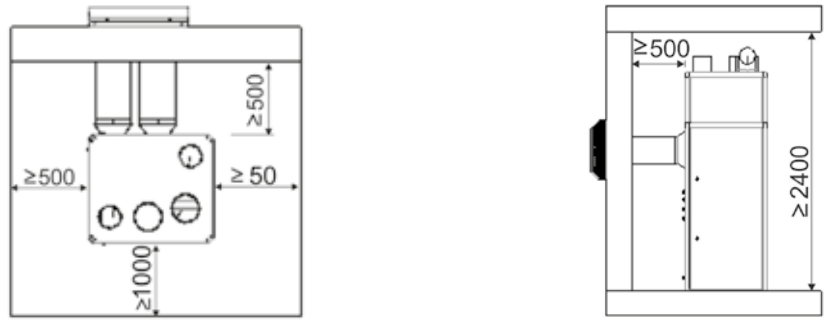


Figure 3: Minimum distances

NOTE

The indicated distances are minimum distances.

☞ Ensure the minimum distances for maintenance and service.

6.3 Preparation

The Combi Unit ***Genius*** is very compact. The unit is placed on teflon sliders ensuring sound insulation and easy positioning. Adjustable feet are not used to avoid rocking due to balance point shifting.

6.3.1 Installation Place

NOTE

Ensure a professional noise reduction of the unit.

☞ Use suitable sound insulation mats.

☞ Install the unit in a frost-free room on a load-bearing floor. The floor must be horizontal, level, solid and durable.

☞ Place the unit only on a floating screed when this is done properly.

☞ Also take the weight of the device including the content of the water tank into account.

☞ Align the unit exactly to ensure a safe condensate drain.

☞ Level the combi unit, if necessary place e.g. sound insulation strips under the unit.

RECOMMENDATION

☞ Install the complete heating/cooling unit not directly below, above or next to living rooms or bedrooms.

If the room conditions require disassembly of the combi unit see „6.4.1 Disassembly“ page 19.

6.4 Location

6.4.1 Disassembly

Disassemble the modules only if the combi unit can not be transported as a complete unit to the installation place. The total height incl. pallet is approx. 2.20m.

TIP

Dismount previously the 4 side panels of the ventilation module.

- ☞ Remove the front and rear panel from the hinges.
- ☞ Unscrew the side panels from inside.

Remove ventilation module

The ventilation module is only placed on the basic / heat pump module and can slide out due to tilting.

WARNING

Risk due to falling parts!

The side panels of the basic module are locked with hasps but not fixed. They can fall down after loosening the screws.

» Hold the panels during loosening and put it down to the floor.

- ☞ Remove the left side panel of the basic module (access to the plug).
- ☞ Hold the side panel and remove it.
- ☞ Disconnect the 3 plug connectors in the upper part.
- ☞ Remove the module.
- ☞ Lead the plugs through the cover opening.

Pull out the heat pump module

The heat pump module is connected to the storage unit by 2 detachable, flat sealing connections 1". The heat pump module is connected to the control cabinet with 4 plugs.

- ☞ Unscrew both doors.

Caution: First empty the pipes.

- ☞ Disconnect the two connections below the heat pump module.
- ☞ Disconnect the plug below the heat pump module on the left side.
- ☞ Disconnect the expansion valve plug connection on the board. For precise information please refer to the electric wiring diagram.
- ☞ Loosen screws M6 on the front of the left and right guide rails with an allen key.

The support of the heat pump module is lowered by approx. 1.5 cm.

- ☞ Pull out the lowered module.

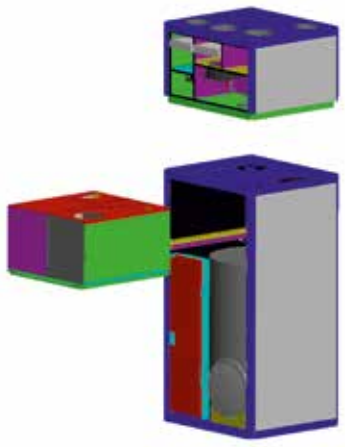


Figure 4: Disassembly

6.4.2 Assembly

☞ **Follow the assembly steps at the installation place in reverse order of disassembly.**

6.5 Connections

6.5.1 Hydraulic Connections Storage Tank

All connections are lead through the rear side of the combi unit (ready-to-connect). The used electronic controlled high efficiency pump provides charging of the storage tank on demand.

Remove panels

The rear and right side panel are fixed to the unit and can not be removed.

WARNING

Risk of impact or crushing due to falling parts!

The panels are not fixed. They can fall down after loosening the screws.

» Hold the panels during loosening and put it down to the floor.

☞ Loosen the front and the side panel to install the unit.

☞ Hold the panels tight and remove them.

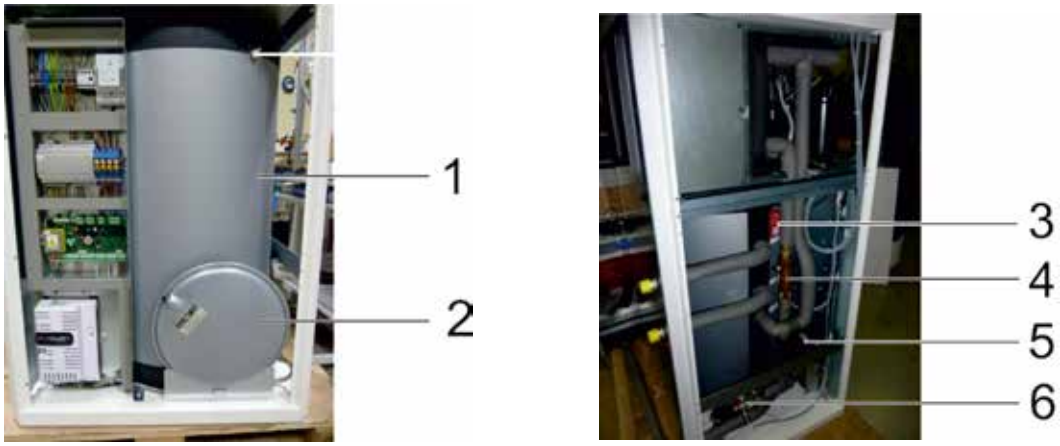


Figure 5: Hydraulic connections

1 150 litres drinking water tank

2 6 litres expansion tank

3 Heating safety valve 3 bar

4 Heating rod 3 kW, single phase

5 High efficiency pump

6 Fill and drain valve with ½" hose connection

NOTE

Ensure a professional noise reduction of the domestic water installation.

Rear side connections

Connections for hot and cold water as well as circulation and condensate drain are lead out through the rear side of the module (see fig. Figure 6).

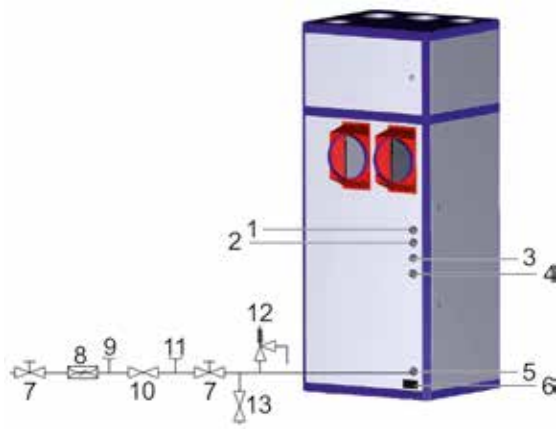


Figure 6: Rear side connections with cold water safety group

Rear side connections:

1 Safety valve outlet heating circuit 3/4" male
2 Hot water 1“ male
3 Circulation 3/4“ male
4 Condensate drainage
5 Cold water 1“ male
6 Cable entry

Cold water safety group:

7 Shut off valve
8 Pressure reducing valve
9 Check valve
10 Backflow preventer
11 Pressure gauge connector
12 Membrane safety valve, valving pressure 6 bar
13 Drain valve

Field installation (connections see Fig. Figure 6)

- ☞ Required field installation: Cold water safety group with safety valve and backflow preventer.

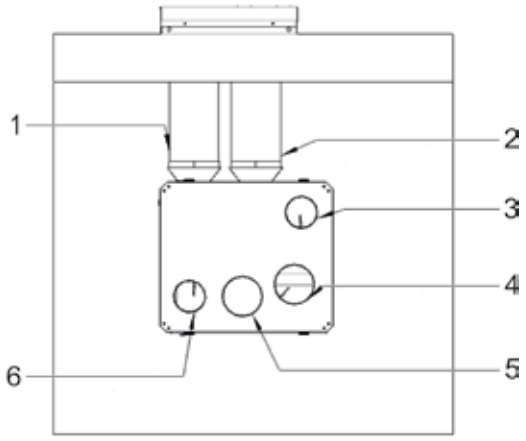
The safety valve must drain freely. The safety valve and the condensate drain must be connected to the sewage water via a siphon.

- ☞ Connect the circulation connection to the circulation system.
- ☞ **or** cap the circulation connection, if no circulation system will be installed.
- ☞ Start with the filling procedure after all connections are made (see „7.2 Fill and Vent“ page 25)

6.5.2 Connection Storage Tank - Heat Pump

see „6.4 Location“ page 19

6.5.3 Air Ducts Heat Pump / Ventilation Unit



1 Ø 250 Heat pump outdoor air
2 Ø 250 Heat pump/exhaust air
3 Ø 160 Extract air
4 Ø 200 Supply air
5 Ø 200 Secondary air
6 Ø 160 Outdoor air
7 Combi grid (see "Facade Installation")

Figure 7: Connection Storage Tank - Heat Pump

Connections decoupling

- ☞ Decouple the following connections with flexible silencers:
  - at the four upper ventilation connections,
  - at the rear outlets of the heat pump.

Pipe isolation

- ☞ Use an isolation of min. 50-60 mm:
  - the outdoor air ducts of the ventilation unit,
  - the pipes of the heat pump.

Install the facade connections

- ☞ Install the heat pump connections at the facade with the Systemair combi grid. (see Figure 7)
  or
- ☞ Ensure a minimum connection distance of 2,5 m.

TIP

- ☞ Install a pre-filter into the outdoor air intake of the heat pump (see Figure 7; pos. 1) to protect the fan and the heat exchanger.

6.5.4 Condensate Connection / Droplet Pipe

Condensate connection

Depending on the season and weather conditions, increased condensation occurs during cooling of air in the evaporator, e.g. during defrost and cooling operation. Any condensation forming is collected by condensation hoses below the heat pump module in the relevant chambers and guided individually to a collection tank. This tank must be filled to make a hydraulic seal, so that each hose stands in water.

Outlet pipe safety valve

(see fig. Figure 6, pos. 4)

In case of an overpressure in the closed system, the safety valve releases at 3 bar. Water escapes via a field installed outlet pipe.

6.6 Electrical Connection

WARNING

Danger electrical voltage!

» The electrical connection is only permitted when carried out by trained electrician or trained and qualified personnel.
» The electrical connection should be done in accordance with the valid regulations.
» Prevent water from entering the electrical cabinet.
» Observe the 5 Security Rules!

Connect the electrical connection and control cables

NOTE

☞ Install a heating emergency switch to enable a complete shut-down of the unit.
☞ Check if there is a special rate for the heat pump (forced shut-down by the electric utility company) or not. The installation must be carried out in regard of this fact. See wiring diagrams in the appendix

The terminals are arranged in the upper part of the electrical cabinet.

☞ Protect the unit with a residual current circuit breaker (30 mA).
☞ Remove the left side and the front panel to access to the electrical cabinet.
☞ Remove the cover of the electrical cabinet.
☞ Lead the electrical connections and the control cables through the opening to the electrical distribution board in the front of the unit (see. Figure 6, pos. 6).
☞ Lead the cables into the top of the electrical cabinet.

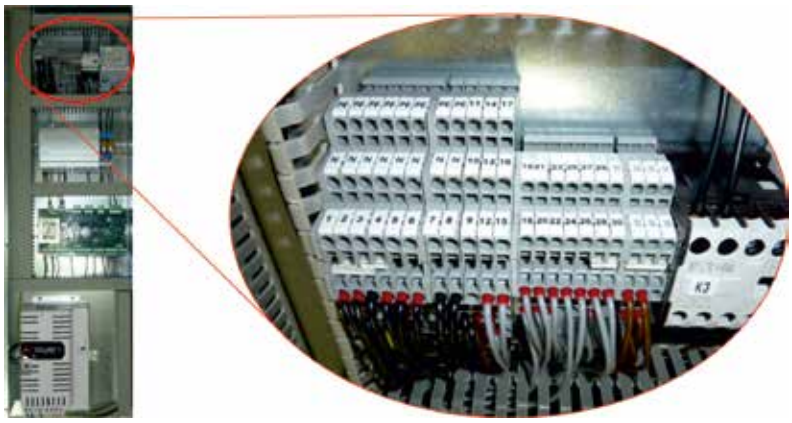


Figure 8: Electrical connections

NOTE

More detailed description can be found in the electrical data of the wiring diagram (see appendix).

6.6.1 Connection Heat pump to the Controller

The electrical connections of the heat pump module and cabinet are factory pre-wired and provide ready to plug with 4 connectors. 3 connections are led out of the heat pump module and electrical cabinet and assembled in the hydraulic unit. The plug connection of the expansion valve must be disconnected directly on the board, e.g. need to be separated for service work.

The terminal assignment can be found in the wiring diagram (see appendix).

6.6.2 Connection Ventilation Module to Controller

The connection of the ventilation module is done by three plug connectors. The plug connectors are located on the left side in the upper part of the basic module. They are already connected (see „6.4 Location“ page 19).

The terminal assignment can be found in the wiring diagram (see appendix).

6.6.3 Room Controller

The room controllers of the type RC-CDO are supplied as accessories and include a separate installation instructions. The shown wiring diagrams are valid for all functions of the controller. The electrical connection of the room controller is documented in the appendix (required for the air heating system).

6.6.4 Display

The delivered display is ready to plug.

- ☞ The display can be fixed by the enclosed magnet (e.g. to the rear side).
- ☞ The display also can be wall-mounted (preferable the installation room).

6.6.5 PTC Elements

The PTC elements (if required) are controlled by the individual room controller and switched with a relay. The electrical connection of the PTC elements is documented in the appendix (required for the air heating system).

NOTE

- ☞ The electrical installation of the PTC elements must be carried out by the client!

6.6.6 Internet Connection

The unit can be controlled via internet. The controller of the Combi Unit Genius provides a TCP/IP connection (see appendix/electrical connection diagram).

- ☞ Connect the ***TCP/IP*** interface of the controller N1 with a network cable directly to the internet connection/router.

6.7 Connection Air Duct System

(see „1.5.1 Professional Planning“ page 6)

7 Commissioning

7.1 First Commissioning

NOTE

Prevent dirt from entering the ducts and the unit.

☞ Do not commission the unit until all work has been completed.

7.1.1 Commissioning of the Heating during the cold Season

Due to the limited heating capacity of the system, which is designed for the operation of a low-energy house, the building / residential unit must be heated during the cold season by the customer before the combi unit is taken into operation.

1. Heat the building/residential unit.
2. Start the combi unit.

» The heating time will be significantly reduced.

7.2 Fill and Vent

7.2.1 Remove Panels

WARNING

Risk of impact or crushing due to falling parts!

The panels are not fixed. They can fall down after loosening the screws.

Hold the panels during loosening and put it down to the floor.

☞ Loosen the front and the side panel.

☞ Hold the panels tight and remove them.

7.2.2 Filling Drinking Water Tank

☞ Open the cold water inlet pipe of the tank.

☞ Fill the drinking water tank.

☞ Open a tap at the highest tapping point until the water is free from bubbles.

☞ Close the tap at the highest tapping point after filling.

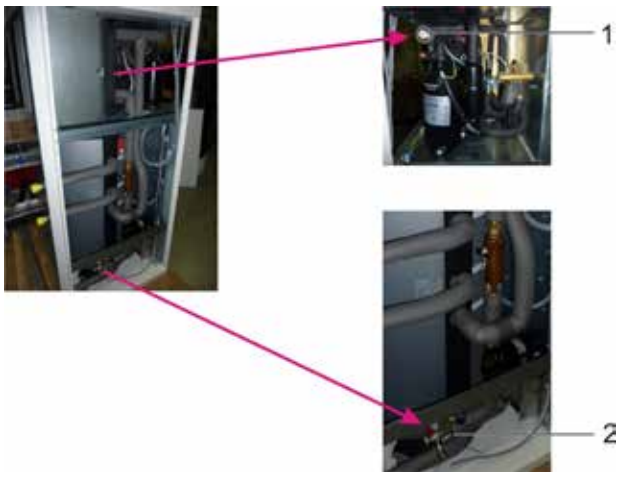
☞ Close the tap after filling.

7.2.3 Connecting Pipes (fill/flush storage charging circuit)

NOTE

First commissioning:

Ensure sufficient flushing and venting during first commissioning.



1 Air vent storage charging circuit
2 Fill and drain valve with ½" hose connection

Figure 9: Fill and vent storage charging circuit

Fill and vent storage charging circuit

Recommended unit pressure: 1.5 bar

- ☞ Unscrew the left cover of the heat pump module.
- ☞ Remove the cover forward.
- ☞ Activate the vent valve of the heat pump module (1).
- ☞ Connect the fill and drain valve (3) with a hose to the water network.
- ☞ Open the fill and drain valve and flush the hydraulic circuit bubble-free.

7.2.4 Fill the Tank for the Hydraulic Seal

- ☞ Fill the collection tank for the condensate hoses with a hydraulic seal.

Figure 10: Fill the collection tank

7.2.5 Start Unit

The unit can be started after installation and commissioning of the combi unit.

- ☞ Mount and screw all panels.
- ☞ Start the unit.

7.3 Internet Connection

The controller is preconfigured for Internet access. It is connected to the TCP/IP interface with the router via a network cable. Subsequently, the router will automatically issue an IP address to the controller. This must be read out from the router settings.

7.3.1 Log on

- ☞ Start internet browser
- ☞ Enter the IP address to the command line.
  The log on screen will be displayed.
- ☞ Save the log on page to the favourites and rename it if required.

7.3.2 Passwords

Delivery setting

User level: ***guest***

Service level: ***operator***

7.3.3 Settings

7.3.3.1 Define Room Addresses

Establish a connection from the controller to the building service centre to activate the room controller. First visit the website to define the room addresses in "Settings, activate supply air rooms".

- ☞ Log on to the website.
- ☞ Define the room addresses with ***Settings room addresses***.

Types and addresses can be found at the rear side of the room controller (inside). The following example shows the address composition.

(see „10.8.1.6 Activate Supply Air Rooms/Room Controller“ page 77)

Example RC-CDO149.039

RC-CDO Sensor type

149

039 ModBus address (relevant address for the network connection)

Settings

Activate supply air rooms	
Number of rooms	6
Room 1	
Modbus room address (ELA)	197
Room 2	
Modbus room address (ELA)	39
Room 3	
Modbus room address (ELA)	147
Room 4	
Modbus room address (ELA)	82
Room 5	
Modbus room address (ELA)	237
Room 6	
Modbus room address (ELA)	200

Sort rooms according to their relevance

RECOMMENDATION

Sort the room order according to the relevance, e.g.:
Room 1 = Living room,
Room 2 = Bedroom,
Room 3 = Child room,
...,
Room 6 = Corridor,
This order will be applied to all website pages. Thus, it is clearly arranged.

The network connection is established after a moment.

Enter addresses and room numbers

NOTE

Observe the correct order!

1. Enter the addresses.
2. Set the room number (factory setting: 0).

Therefore, the error message ***Communication error room x*** can be avoided during ***Alarm status***.
If the error message still appears, it must be confirmed (see „8.1.4 Confirm Faults / Procedure“ page 32).

- ☞ Enter the number of rooms or zones in the ***Settings*** on the website (=room sensors).
- ☞ Enter the associated address.
- » The program compares the entered data with the room sensors.

NOTE

The same settings can be carried out via display.

7.3.3.2 Settings and Adjustment of the Air Volume Flows

The regulation of the volume flows must be done by a specialist. It is based on the data of the nominal air volume of controlled residential ventilation. These were calculated by Systemair or an external planner.

The supply air inlets must be suitable for the distribution of large amounts of air during heating and cooling. This is assured by the greater number of valves at appropriate duct dimensions (exact planning required).

NOTE

Switch off the heat pump manually before adjusting the valves. The regulation of the valve is only possible when the heat pump and consequently the secondary air fan does not start.

» Log on to the website with your service password.
» Switch off the heat pump via ***Manual/Auto***.

Manual/Auto

Heat pump	
Status	Off
Control output	0 %

See also the control description.

7.3.3.3 Fan Speed Settings

The settings of the fan speed to balance the ventilation system by the website can be done in two ways:

- **manually by *Manual/Auto* - current**
- **by the *Settings* - speed percentage.**

Fan speed settings with *Manual/Auto* (current)

Supply air fan	
Status	Manual
Control output	5.0 V
Extract air fan	
Status	Manual
Control output	5.0 V

☞ Reset the setting ***Manual*** in ***Manual/Auto*** back to ***Auto*** after the adjustment.

Fan speed settings with *Settings* (speed percentage)

Speed	
Supply air fan	
Speed at intense ventilation	65 %
Speed at nominal ventilation	50 %
Speed at reduced ventilation	35 %
Speed at hum. protect. ventilation...	15 %
Speed at night cooling	85 %
Extract air fan	
Speed at intense ventilation	65 %
Speed at nominal ventilation	50 %
Speed at reduced ventilation	35 %
Speed at hum. protect. ventilation...	15 %
Speed at night cooling	85 %

The fans are controlled by 0 and 10 V (= 0 to 100 %).

☞ Accept the ***speed values*** after the adjustment.
☞ Reset the setting ***Manual*** in ***Manual/Auto*** back to ***Auto***.

7.3.3.4 Setting the Maximum Power

This function is only needed if, due to a very low heating/cooling load, the unit/duct network was not configured according to the maximum possible power/air quantity.

In this case, the maximum speed of the secondary air fan and, automatically with it the maximum heating/cooling power (not the power for hot water production) must be limited: according to the specifications of the planer/the configuration by Systemair.

Secondary air fan	
Parallel offset speed	100 %
Min. speed	60 %
Max. speed setback operation	90 %
Power limitation	
Activate	No
WP max.	100 %

NOTE

These parameters should normally not be changed.

☞ Use this function only after consulting a specialist company or specialised personnel!

8 Maintenance / Remedying Faults

8.1 Alarm Status

Faults are indicated and attributed on the page ***Alarm Status***. The alarms are subdivided into different priority levels.

Genius

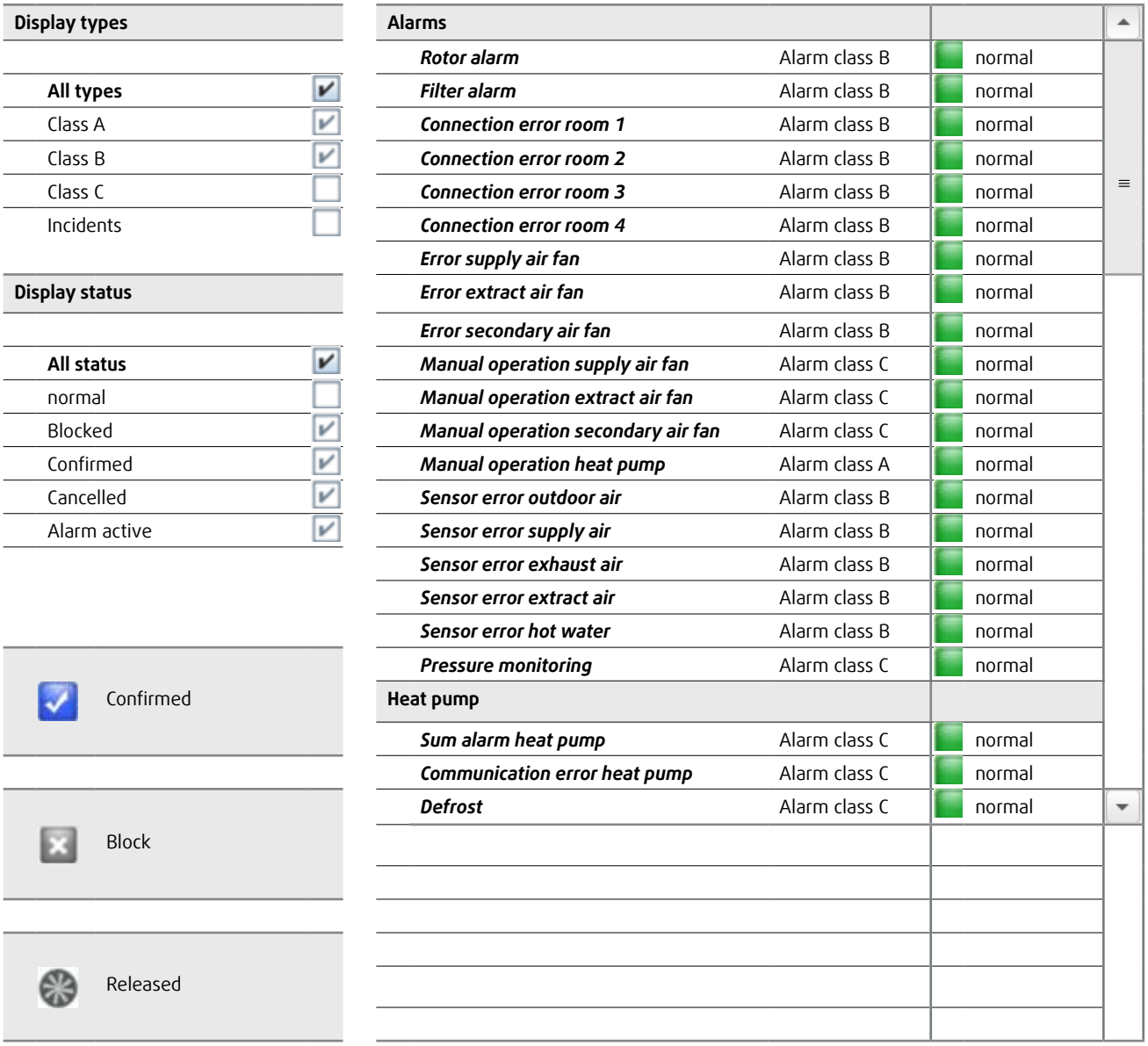


Figure 11: page ***Alarm status***

8.1.1 Alarm Types

Alarm type	Removal of the alarm cause	Confirm	Reset	Automatic restart
Class A	Yes	Yes	Yes	Yes
Class B	Yes	Yes	Yes	Yes
Class C	Yes	No	Yes	Yes

A and B alarms will activate alarm outputs. Some B alarms do not influence the unit function (e.g. Filter Alarm).
Class C alarms do not activate the alarm outputs.
Class C alarms will be removed from the alarm list when the alarm input is reset also when not confirmed.

8.1.2 Display

This function limits the display content. **Preset**: Display all types.

RECOMMENDATION

Keep the setting ***Show all types and status***.

Display types		
All types	☑	The alarm types to display can be selected with this field.
Class A	☑	
Class B	☑	
Class C	☐	
Incidents	☐	
Display status		
All status	☑	The alarm status to display can be selected with this field.
normal	☐	
Blocked	☑	
Confirmed	☑	
Cancelled	☑	
Alarm active	☑	

8.1.3 Alarms

Alarms are saved in a list. They can only be displayed on the display of the combi unit ***Genius***. You will find more information about alarms in section „8.1.4.3 Description of the most important Alarms“ page 34

8.1.4 Confirm Faults / Procedure

NOTE

The exact definition of the heat pump alarms at ***Alarm status*** in combination with the instructions of the external heat pump control ensures fast location of the source of the fault in the cooling circuit and its correction.

If a fault occurs on the system, it can be cleared as follows:

Remedy a fault:

1. Select the specific message
2. Click the symbol ***Confirm***.

The alarm must be confirmed manually to stop indicating it.

Remedying faults: A , B and C alarms

- ☞ Fix the alarm or let it be fixed by a service technician.
- ☞ Select the alarm.
- ☞ Click the symbol ***Confirm***.
- ☞ Select the sum alarm.
- ☞ Click the symbol ***Confirm***.

The alarm and the sum alarm must be confirmed manually one after another to stop indicating.

If more alarms are active in the same time, the need to be confirmed one after another.

☞ Check the complete alarm list in case of an alarm and confirm all active alarms.

NOTE

If multiple error messages are activated in parallel, this does not necessarily mean that the system has a fatal error. One error can trip several messages at the same time.

Meaning of the symbols:

☑	Confirmed	Click the symbol Confirmed to confirm the alarm.	
☒	Block	Click the symbol Blocked to block the alarm.	Only possible in the service level.
☐	Released	Click the symbol Released to release the alarm.	Only possible in the service level.

NOTE

There are some error messages which need to be confirmed several times.
An ***Alarm*** can first switch to ***Cancellation*** before it resets to ***Normal mode***.

8.1.4.1 Confirm or Block Alarms

NOTE

Blocking of alarms can cause uncontrollable malfunctions.

☞ Use this function only in exceptional cases and after consulting a specialist company or specialised personnel! This is only possible in the service level as well as the release of blocked alarms.

Confirmed alarms	Confirmed alarms will remain on the alarm list until the alarm input signal resets.
Blocked alarms	Blocked alarms remain on the alarm list until the alarm has reset and the block has been removed. New alarms of the same type will not be activated as long as the block remains.

8.1.4.2 Inform Specialist Company

WARNING

Risk of property damage!

A-alarms or faults that occur after confirmation repeatedly, indicate a default which can only be eliminated by a specialist company!

» Inform specialist company in both cases!

8.1.4.3 Description of the most important Alarms

NOTE

If the sum alarm heat pump triggers, one or more errors occur in the cooling circuit which are displayed in the following list.

These errors are considered separately in the separate technical manual of the external control.

Sum alarm HP: A-Alarm

Meaning:

Heating and cooling operation as well as hot water generation are blocked with A-alarms and also partly with B-alarms. The ventilation module is still working.

In addition, sum alarm will also be activated mostly for heat pump errors. The exact description of the alarm is shown in the list. If it is a C-alarm which automatically resets itself, the heat pump starts again.

Remedying faults

- ☞ Fix the alarm or let it be fixed by a service technician.
- ☞ Select the alarm.
- ☞ Click the symbol ***Confirm***.
- ☞ Select the ***Sum alarm***.
- ☞ Click the symbol ***Confirm***.

NOTE

The alarm and the sum alarm must be confirmed manually one after another to stop indicating.

Rotor alarm: B-Alarm

Meaning:

The rotor is out of function. No heat recovery.

Unit characteristics in winter

The heat pump is still working and controls the room temperature to the setpoint. The setpoint is set to an average room temperature of 19 °C. This setpoint can be changed in the service level.

Unit characteristics in summer

The heat pump is still working for hot water generation.

Remedying faults

- ☞ Fix the alarm or let it be fixed by a service technician. See chapter „9 Service“ for further information.
- ☞ Select the alarm.
- ☞ Click the symbol ***Confirm***.

or

- ☞ Block the alarm in the service level.

⚠ WARNING

Risk of injury and risk of damage to the combi unit!

- ☞ The blocking of alarms may only be carried out by service personnel

NOTE

Fault unremedied.

Error supply / extract air fan: B-Alarm

Meaning:

If one fan indicates an error, the other fan will also stop. This avoids positive/negative pressure in the rooms.

Controlled residential ventilation is out of service. Heating and cooling operation remains active with decreased performance. Hot water generation remains fully functional.

Remedying faults

- ☞ Fix the alarm or let it be fixed by a service technician.
- ☞ Select the alarm.
- ☞ Click the symbol ***Confirm***.

Error secondary air fan B-Alarm

Meaning:

Ventilation and hot water generation remains active. The medium air of the heat pump is no longer transported for heating/cooling with this alarm. This also triggers a high/low pressure alarm of the heat pump.

Remedying faults

- ☞ Fix the alarm or let it be fixed by a service technician.
- ☞ Select the alarm.
- ☞ Click the symbol ***Confirm***.

Filter alarm: B-Alarm

Meaning:

Reset filter life value reached (see Settings).

NOTE

All functions of the combi unit remain active during this alarm.

Remedying faults

- ☞ Change the filter. New filters can be obtained from Systemair.
- ☞ Reset filter life (see ***Settings***).
- ☞ Select the alarm.
- ☞ Click the symbol ***Confirm***.

Communication error room: B-Alarm

Meaning:

Communication error between room controller and the corresponding room. However, the unit function remains functional.

Remedying faults

- ☞ Fix the alarm or let it be fixed by a service technician.
- ☞ Select the alarm.
- ☞ Click the symbol ***Confirm***.

Manual operation: C-Alarm

The fans can be controlled manually, but only from the Service level.

Sensor error: B-Alarm

The unit operation continues after blocking of the alarm.

Pressure monitoring: C-Alarm

An external safety feature has been triggered due to an underpressure (wood-burning stove etc.). The system is locked. It will unlock by itself after a monitoring period.

See also „4.2 Operation in Combination with Room Air Independent Fireplaces (Furnace Function)“ page 13.

8.2 Ventilation Module

8.2.1 Filter Change and Wheel Cleaning

WARNING

Danger of injury from rotating fans!

Rotating fans can cause very severe injuries.

» Disconnected the unit completely from the power supply before opening!

NOTE

Filters can not be cleaned.

» Change the filter
a) if the filter life is reached,
b) if the behaviour of the combi unit indicates a contaminated filter.

» The filter life depends on the air pollution at the installation place, but it must not exceed 12 months (see Settings, Filter Alarm and Alarm Status, Filter Alarm).

» New filters can be obtained from Systemair.

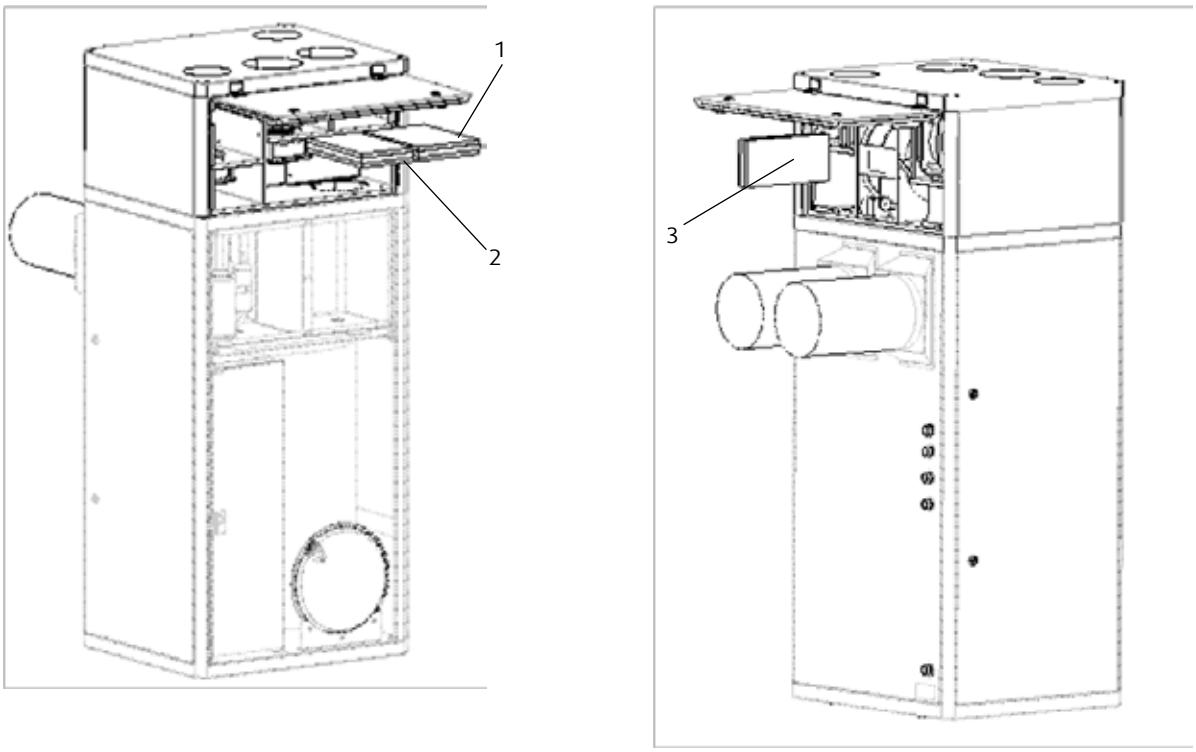


Figure 12: Change filter

Legend

1	Secondary air filter
2	Supply air filter
3	Extract air filter

8.2.1.1 Change Filter

(see „Figure 12: Change filter“)

WARNING

Danger of injury from rotating fans!

Rotating fans can cause very severe injuries.

» Disconnected the unit completely from the power supply before opening!

✓ Precondition: The combi unit is disconnected from the power supply.

☞ Open the shutter of the ventilation module.

☞ Pull out the filters 1, 2 and 3.

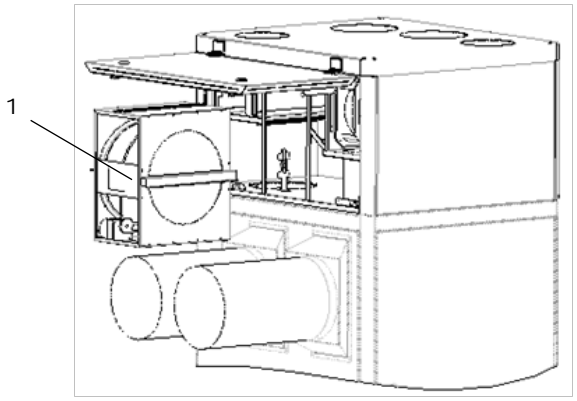
☞ Insert the new filter.

NOTE

Respect the air flow direction (arrow on the filter).

☞ Always check the rotating heat exchanger for contamination (dust) during filter change.

8.2.1.2 Check and Clean Rotating Heat Exchanger



Legend

1 Heat exchanger unit

Figure 13: Check and clean rotating heat exchanger

✓ Precondition: The combi unit is disconnected from the power supply.

☞ Disconnect the two plugs of the rotor unit.

☞ Pull out the complete heat exchanger unit.

WARNING

Danger electrical voltage!

Humidity inside the drive motor of the heat exchanger can cause a short circuit.

» Do not expose the drive motor to humidity!

☞ Blow the heat exchanger out or rinse it with hot mild suds.

☞ Do not use any cleaning detergents.

☞ Insert the heat exchanger unit.

☞ Connect the two plugs.

☞ Close the cover.

☞ Connect the Combi Unit Genius to the electrical power supply.

Reset Filter Change and confirm.

- ☞ Reset filter life (see ***Settings***).
- ☞ Select the alarm.
- ☞ Click the symbol ***Confirm***.

8.3 Heat Pump Module

A refrigerant circuit maintenance is not necessary. Due to weather-related influences, the evaporator fins must be checked from time to time.

- ☞ Check the evaporator depending on installation place and suction height of the working air (recommended once a year).
- ☞ Check the evaporator for contaminations (once a year).
- ☞ Clean the condenser fins when contaminated.

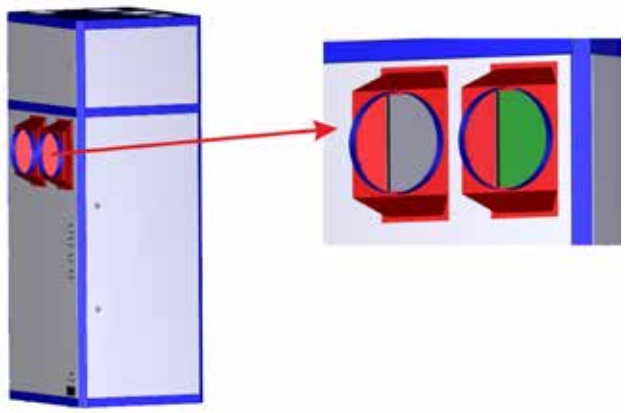


Figure 14: Condenser fins

Condenser cleaning

⚠ WARNING

Danger electrical voltage!

» During cleaning, the entire unit must be disconnected from the mains!

» Observe the 5 Security Rules!

- ☞ Disconnect the both rear-sided air intake and outlet ducts from the unit.
- ☞ If necessary, clean the evaporator on the right intake in dry state, preferably with compressed air (caution against possible contamination in the room).

Check and maintenance of the condensate drain

Check and maintenance interval: once a year

Condensate drain hoses are located below the individual air chambers in the heat pump module to drain condensate from the evaporator in heating or cooling mode.

There are 5 condensate drains in all, which are provided with hoses:

- 2 connections each in the intake and discharge chamber of the working air, inlet and outlet chamber of the secondary air,
- 1 connection in the chamber of the cooling circuit.

The condensate hoses are each mounted below the individual chambers by means of hose clamps.

⚠ WARNING

Risk due to falling parts!

The panels are not fixed. They can fall down after loosening the screws.

› Hold the panels during loosening and put it down to the floor.

- ☞ Remove the left and front panel.

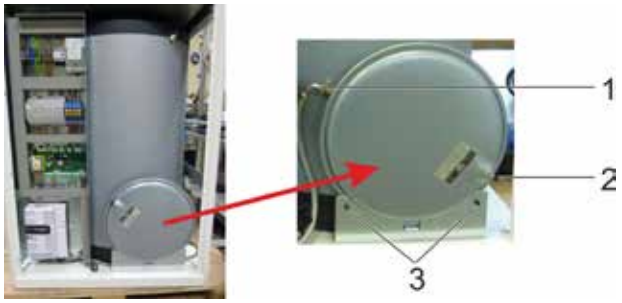
- ☞ Unlock the two fasteners at the side panel.
- ☞ Remove the side panel.
- ☞ Check the condensate hoses for proper fixation and for dirt.

Condensate hose cleaning

- ☞ Loosen the hose clamps on the heat pump module to remove clogged or heavily contaminated condensate hoses.
- ☞ Clean the condensate hoses.
- ☞ Attach the condensate hose with the hose clamps on the heat pump module.

8.4 Hot Water Module

8.4.1 Membrane Expansion Tank



1 Flexible hose connection

2 Filling valve

3 Expansion tank support

Figure 15: Membrane expansion tank

Check the primary pressure of the expansion tank.

- ↻ Factory setting primary pressure: 1 bar.
- ☞ Remove the protection cap from the filling valve.
- ☞ Depressurise the water-bearing side by the fill and drain valve.
- ☞ Check the pressure of the expansion tank with a pressure gauge.
- ☞ Fill the connecting pipes as described in section „7.2.3 Connecting Pipes (fill/flush storage charging circuit)“ page 25.

In case of a fault

- ☞ Disconnect the flex pipe connection in unpressurised state (1)
- ☞ Open the bracket of the expansion tank (3).
- ☞ Change the diaphragm expansion tank.

8.4.2 Sacrificial Anode

Inspection interval: every 2 years

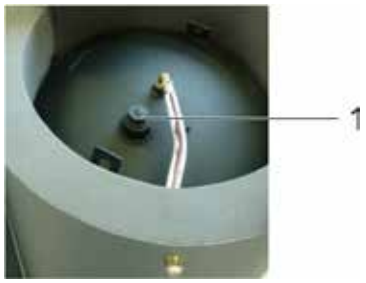


Figure 16: Sacrificial anode (1)

The glassed domestic hot water tank is equipped with a magnesium anode to prevent corrosion.

Inspection of the sacrificial anode

Make sure the sacrificial anode is free from defects.

WARNING

Danger electrical voltage!

» The entire unit must be disconnected from the mains during check and replacement!

» Observe the 5 Security Rules!

The condition of the sacrificial anode can be verified by a protective current measurement with an amperemeter.

Procedure:

☞ Remove the front and the left panel to access to the storage tank.

☞ Lift the black tank cover

☞ Remove the black tank cover and the sealing.

Access to the anode connection 1 ¼".

☞ Disconnect the potential equalisation cable from the tank.

☞ Connect an amperemeter between anode and tank.

With a protective current of < 0.3 mA, the anode must be removed, checked for erosion and replaced if necessary!

☞ If the sacrificial anode is highly corroded and nearly disintegrated, change the anode.

(Sacrificial anode change see ***Service***)

9 Service

WARNING

Danger electrical voltage!

» Let only qualified personnel carry out service work .
» The entire unit must be disconnected from the mains before service work!
» Observe the 5 Security Rules!

9.1 Ventilation Module

9.1.1 Rotor Alarm

The rotor is out of function. No heat recovery.

9.1.1.1 Unit Characteristics in Winter

The heat pump is still working. The setpoint is set automatically to an average room temperature of 19 °C.

Change setpoint

☞ Change setpoint in ***Settings***.

Return to normal operation

☞ Return to normal operation by:
– a) Fault remedying and confirming the message

or

– b) block the alarm. Caution: The alarm remains active.

9.1.1.2 Unit Characteristics in Summer

The heat pump is only working for hot water generation. Return to normal operation.

9.1.1.3 Clear Rotor Alarm

☞ Block the alarm.
☞ Open the rear cover.

Behaviour: Rotor turns? Monitoring fault.

☞ Replace the monitoring unit.

Behaviour: V-belt broken?

☞ Replace the v-belt.

Behaviour: Rotor does not turn, v-belt ok? Motor defect.

☞ Replace the motor.

9.1.2 Fans

The fans are ready to plug.

The three fans of the ventilation module have an operating monitoring. In case of an error, an alarm will be displayed.

For control reasons, the two fans for supply and extract air are linked with an additional interlock in case of fan failure. If one fan signals a fault, the other also switches off to avoid positive or negative pressure.

NOTE

Observe the following during a replacement:
Both fans have an alarm, even if only one is defective.

9.1.3 Sensors

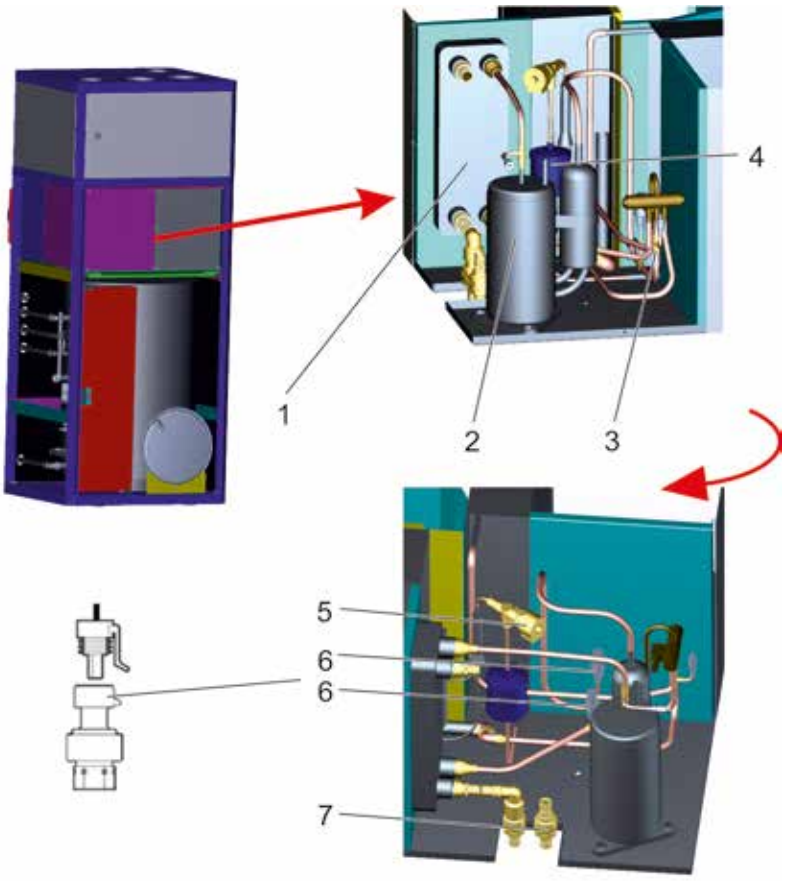
Defective sensors must be completely replaced.
(Refer to the wiring diagram in the appendix and section „10.5 Alarm Status“ page 55.)

9.2 Heat Pump Module / Components

The refrigerant circuit of the heat pump module is a closed system. It uses the security refrigerant R410a as heat transfer medium.

The heat pump is ready for operation, so that no work must be carried out on the refrigeration circuit. The controller automatically takes over the activation of the heat pump as well as the control of the domestic hot water temperature.

☞ Loosen the side panel on the left side and at the front to open the heat pump housing for service and to vent the plate heat exchanger.



1 Plate heat exchanger
2 Compressor
3 4-way reverse cycle valve
4 Filter drier
5 Expansion valve
6 High and low pressure sensors
7 Hydraulic connection

Figure 17: Heat pump module / components

9.2.1 High and Low Pressure Sensors

Check / Change

WARNING

Danger electrical voltage!

» The entire unit must be disconnected from the mains before service work!

» Observe the 5 Security Rules!

☞ Disconnect the plug connection.

☞ Dismount the sensor bottom part.

The sensor base is connected by means of a Schrader valve to the refrigeration system. It can be removed without draining the refrigerant circuit.

9.2.2 Expansion Valve

The electronic expansion valve controls the superheat in the refrigerant circuit. Opening or closing of the valve controls the temperature intake in combination with the respective power control of the compressor.

9.2.3 Temperature Sensors

NTC sensors are used to measure the operating temperatures such as suction and hot gas in the refrigeration circuit. These are designed as contact sensor for the ducts.

T [°C]	R [kΩ]	T [°C]	R [kΩ]
-20	16.538	+30	1.825
-15	12.838	+35	1.510
-10	10.051	+40	1.256
-5	7.931	+45	1.056
0	6.306	+50	0.891
+5	5.040	+55	0.751
+15	4.056	+60	0,636
+20	2.674	+65	0.534
+25	2.200		

Table 2: Temperature/Resistance

9.2.4 4-way Reverse Cycle Valve

The 4-way reverse cycle valve switches the refrigeration circuit between heating, cooling and defrosting. The valve is soldered in the refrigeration circuit. It is controlled by a screwed magnetic coil.

9.2.5 Refrigerant Filter Drier

The soldered bi-directional filter drier protects the refrigeration system.

9.2.6 Membrane Expansion Tank

see „8.4.1 Membrane Expansion Tank“ page 40.

9.2.7 Sacrificial Anode

To replace the sacrificial anode, the heat pump module must be removed and the water must be drained from the tank by one third.

Pull out the heat pump module

- ☞ Loosen the two inlet and outlet nozzles on the rear side of the unit.
- ☞ Depressurize the connection pipes.
- ☞ Disconnect the two connections below the heat pump module.
- ☞ Disconnect the plug below the heat pump module on the left side.
- ☞ Disconnect the expansion valve plug connection on the board. For precise information please refer to the electric wiring diagram in the appendix.
- ☞ Loosen screws M6 on the front of the left and right guide rails with an allen key.
- » The support of the heat pump module is lowered by approx. 1.5 cm.
- ☞ Pull out the lowered module.

Drain water

- ☞ Close the cold water supply.
- ☞ Connect a hose to the drain valve.
- ☞ Open a water tapping point during the drain procedure to prevent negative pressure.
- ☞ Drain the water of the tank by one third (about 50 litres).

Change sacrificial anode

- ☞ Unscrew the sacrificial anode an replace it by a new one.
- ☞ Install the heat pump module in reverse order.
- ☞ Fill the tank completely.

9.2.8 Electric Heating Rod

The hydraulic circuit is equipped with an electric heating rod of 3 kW. To protect the heating element against overheating, a safety temperature limiter (STL) is mounted on the component. Tripping of the STL interrupts the power supply and cuts off the electric heating rod.

Check

- ☞ The STL has triggered when the black splint pin of the STL sticks out.

Suppression

- ☞ Push the splint pin in to clear the STL fault.

NOTE

More detailed information about the electrical wiring, refer to the wiring diagram chapter „16 Appendix“ page 106.

9.3 Control

9.3.1 External Heat Pump Control

In addition to these instructions, you can also download a technical manual from the Internet (www.systemair.com). This gives a description of the separate heat pump circuit board and its parameters. These parameters are factory set and can only be adjusted with an additional control unit.

☞ Inform the Systemair service or a Systemair service partner in case of an emergency service.

9.3.2 Central Building Services Unit Control

9.3.2.1 General

The building service centre "Genius" can preferably be adjusted by a notebook/PC or by the Systemair App (Android phone). This provides a perfect overview of all user functions and parameters (self-explanatory). The control of the system by a control unit with a four line display is also possible.

9.3.2.2 Smart Home/Bus Connection/Building Control System

The control of the central building services unit can be incorporated in a building control system / smart home system. Communication takes place via the Modbus protocol.

If a different fieldbus is being used for building automation, a gateway is needed which is "modbus-slave over TCP/IP"-compatible. Systemair will provide the Modbus list required for this.

10 Operation/Control via Internet/App

⚠ WARNING

Damage due to operator error

Operator errors could result in personal injury and/or property damage.

» Ensure that children never operate the unit unsupervised or play with it.

» Ensure that only persons have access which are capable of the appropriate use of the unit!

NOTE

Parameters which can be set are highlighted with blue letters. The formatting of the settings is done by the program.

Examples:

Enter 2.8. as starting point for holiday 2 - the program converts to 2 Aug.

Or enter 47 as setpoint - the program converts to 47 °C.

10.1 General Information

During commissioning, the controller is established. The access is normally established via an IP address.

If you use the cloud feature (see „1.3 Using the Systemair-Cloud“ page 6), only the visual representation changes, the operation remains the same.

10.1.1 Access

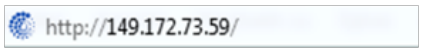


Figure 18: Access

Figure 19: **Log on** *screen*

10.2 Access - Log on

NOTE

- All parameters can also be set by the display (see „11 Control via Display“ page 87).

10.2.1 Log on User Level

- ☞ Open the app on your smartphone or open the application on your PC.
- ☞ Enter "guest" in the field ***Password*** for user level.
- ☞ Select ***Save password***.
- ☞ ***Click log on***
- » The ***Genius*** overview screen will be displayed.

You are in the user level.

10.2.2 Logging into the Service level (only for specialist personnel!)

- ☞ Log on with the service password.
- » You are in the service level and you have access to the control.

10.3 Service Level Settings

The service level consists of the following pages (tabs):

- Overview: Here you see the most important setpoint and actual values of your combi unit.
- Actual value / Setpoint: Here you can see important values (black values) or set values (blue values)
- Alarm status: You can see an overview of all faults and alarms. You also can confirm or troubleshoot alarms here. (see „8.1 Alarm Status“ page 31).
- Input/Output: This tab shows the analogue and digital inputs and outputs as well as the main parameters of the heat pump.
- Time program: Here you set the timer programs (heating / cooling / ventilation, hot water).
- Settings: Here you can see and adjust the setpoints and actual values for air volume control, hot water, night cooling, filter alarm and room definitions.
- Manual/Auto: Manual control of the fans, heat pump and PTC elements of the individual rooms.

10.3.1 Overview

The page ***Overview*** opens after log on. It shows the most important status of the control.

Outdoor climate	
Outdoor temperature	19.6 %C
Room control	
Room 1	Living room
Status 1	Active
Actual value temperature	21.5 °C
Setpoint value temperature	21.0 °C
Room 2	Bedroom
Status 1	Active
Actual value temperature	20.9 °C
Setpoint value temperature	21.0 °C
Unit	
Status	Rotor operation
Fan stage	normal
Hot water temperature	45 °C
Alarm	
important alarms	no alarm
other alarms	no alarm

Figure 20: **Overview** *page*

10.4 Actual Value / Setpoint

The most important settings and reading out values.

Genius

Temperatures		**Room 1**	Living room
Outdoor temperature	3.8 °C	***Status***	Active
Supply air temperature	37.0 °C	***PTC element***	blocked
Extract air temperature	22.7 °C	***Actual value temperature***	21.8 °C
Hot water temperature	44.9 °C	***Setpoint value temperature***	20.0 °C
Unit		***PTC output***	0 %
Status	HP heating	**Room 2**	Bedroom
Ventilation day-time operation	normal	***Status***	Active
Ventilation setback operation	normal	***PTC element***	blocked
Actual ventilation stage	normal	***Actual value temperature***	21.8 °C
Actual room temperature	21.6 °C	***Setpoint value temperature***	20.0 °C
Setpoint temperature (+ Hyst.)	21.9 °C	***PTC output***	0 %
Room setpoint	21.5 °C	**Room 3**	Lea
Furnace operation	Off	***Status***	Active
Manual cooling	No	***PTC element***	blocked
Manual time	60 min	***Actual value temperature***	21.3 °C
Heating	Fixed setp.	***Setpoint value temperature***	21.0 °C
Cooling	Outdoortemp. managed	***PTC output***	0 %
Setpoint cooling curve		**Room 4**	Jan
Room setpoint at (32)	26 °C	***Status***	Active
Room setpoint at (30)	25 °C	***PTC element***	blocked
Room setpoint at (28)	24 °C	***Actual value temperature***	21.7 °C
Room setpoint at (26)	23 °C	***Setpoint value temperature***	21.0 °C
Offset (-3 up to +3)	0 °C	***PTC output***	0 %
Hot water		**Room 5**	Office
Setpoint	45 °C	***Status***	Active
Setpoint holiday	30 °C	***PTC element***	blocked
Fast charge hot water	No	***Actual value temperature***	22.6 °C
Legionella mode	No	***Setpoint value temperature***	20.0 °C
Emergency operation HW	No	***PTC output***	0 %
		Room 6	Entrance/Corridor
		Status	Active

*Figure 21: Page **Actual value/setpoint value***

Temperatures

This field shows the actual temperature values of the different sensors.

Temperatures	
Outdoor temperature	3.8 °C
Supply air temperature	37.0 °C
Extract air temperature	22.7 °C
Hot water temperature	44.9 °C

10.4.1 Unit

Unit	
Status	Rotor operation
Ventilation day-time operation	normal
Ventilation setback operation	normal
Actual ventilation stage	normal
Actual room temperature	20.6 °C
Setpoint value temperature	20.6 °C

10.4.1.1 Status Display

Off	The unit is ready, no demand.
Rotor operation	Passive heat and cooling recovery, but no active heat or cooling demand.
Holiday Mode	see ***Time program***
Heating.	
Cooling.	
Setback operation	The unit is in night setback mode.
Night cooling	Passive cooling active, see ***Settings***
Hot water generation	Heat pump active, the unit generates hot water. If the unit is in heating or cooling operation in parallel, this status remains in priority.
Legionella mode	see ***Hot water***
HP Defrost	The heat pump (HP) in reverse operation, the heat pump heat exchanger will be defrosted. Normal operation is temporarily interrupted. The PTC elements are driven with low power during defrost to avoid drafts.
Rotor Defrost	Fan speed automatically changes. Additional rotating heat exchanger protection. This is done only for a certain period at extremely low outside temperatures.
Emergency operation	The unit heats in emergency operation with PTCs. Hot water is generated by the integrated electric heating rod. Both must be activated (see „10.4.2 Hot Water“ page 53 and „10.4.3 PTC Reheating Elements“ page 53).
Rotor alarm	(see „8.1 Alarm Status“ page 31).
Heat pump alarm	A heat pump error has been occurred. Emergency operation can be activated. (see „8.1 Alarm Status“ page 31).
Switch-off point	For extremely low external temperatures, the heat pump will switch off for a certain period (see "Settings").

10.4.1.2 Setting the Ventilation Stage

Set ***Ventilation day-time operation*** and ***Ventilation setback operation***.

Unit	
Status	Hot water generation
Ventilation day-time operation	normal
Ventilation setback operation	
Actual ventilation stage	
Actual room temperature	
Setpoint value temperature	
Setpoint supply air temperature	

Humidity protection
Off
normal
Party
Minimal

Humidity protection Use the function ***Humidity protection*** only in case of longer absence (see ***Time program/Holiday***).

WARNING

Building fabric humidity protection!

☞ ***Do no use during long absence and high humidity load (e.g. plants) the ventilation for humidity protection, use the next higher stage.***

Reduced ventilation stage Use this function in case of longer absence, optionally in the night.

Intensive ventilation (party mode) This function temporarily discharges peak loads. This function is reset automatically after one hour.

Off Switching off must be ensured for safety reasons. It can be used for manual ventilation (e.g. summer).

10.4.1.3 Setpoint Temperature Display

Shows the actual (room) temperature after which the unit is controlled for both heating and cooling operation. In the factory settings, the control system is set to a fixed value for heating. For cooling the value is dependent on the external temperature. In this setting, the values are visible as curves, or otherwise as the relevant mode for heating or cooling (see „10.8 Settings“ page 62).

Actual room temperature	21.4 °C
Setpoint value temperature	21.5 °C
Setpoint heating curve	
Room setpoint at (-15)	23 °C
Room setpoint at (-5)	22 °C
Room setpoint at (5)	21 °C
Room setpoint at (15)	20 °C
Offset (-3 up to +3)	1 °C
Setpoint cooling curve	
Room setpoint at (32)	26 °C
Room setpoint at (30)	25 °C
Room setpoint at (28)	24 °C
Room setpoint at (26)	23 °C
Offset (-3 up to +3)	0 °C

10.4.2 Hot Water

Hot water	
Setpoint	45 °C
Setpoint holiday	30 °C
Fast charge hot water	No
Legionella mode	No
Emergency operation HW	No
Setpoint emergency operation	40 °C

Hot water settings

Setpoint

Adjustment range: ***30 °C ... 55 °C***
Default setting: ***45 °C***

RECOMMENDATION: Keep the default settings. This will ensure a high performance coefficient of the heat pump. The hot water generation starts 1 °C below the setpoint and stops 2 °C above (adjustable in the service level). When set to ≥ 52 °C, the electric heating rod is switched from 53 °C to reach the setpoint.

Setpoint holiday

Adjustment range: *30 °C ... 40 °C*
Default setting: *30 °C*

RECOMMENDATION: Keep the default settings (see ***Setpoint***)

Fast charge hot water

Settings: *Yes / No*
Default setting: *No*

This function ensures hot water comfort in special situations, e.g. for two bath tub fillings in quick succession. After activating this function, the electric heating rod is switched on in parallel with the heat pump.

To avoid operating errors, the function is only available during hot water demand. It automatically turns off after hot water generation.

Legionella mode

Settings: *Yes / No*
Default setting: *No*

If the legionella mode is activated, the drinking water is once heated to 60 °C in the night of Sunday to Monday (once a week).

Emergency operation HW

Settings: *Yes / No*
Default setting: *No*

In case of failure of the heat pump, the user can generate hot water with the electric heating rod. The function can only be activated manually and during heat pump alarm to avoid operating errors. Once the fault is removed, the function will be reset.

Setpoint emergency operation

Adjustment range: *30 °C ... 50 °C*
Default setting: *40 °C*

During the fault, as little electrical power as possible will be consumed at 40 °C . However, comfort remains active.

10.4.3 PTC Reheating Elements

PTC	
PTC function	Off
Emergency operation	No
Setpoint emergency operation	18 °C

PTC function

Settings: *On / Off*
Default setting: *Off*

In the default setting, the PTC function is deactivated.

NOTE

Neither an individual room temperature control nor reheating after the PTC start delay time is possible after switching off the PTC function, see service, settings.

During cooling circuit defrost, the elements will also be activated when switched off.

Emergency operation	You can maintain a reduced, temporary heating operation during a heat pump failure. The function can only be activated manually and during heat pump alarm to avoid operating errors.
Settings: ***Yes / No***	
Default setting: ***No***	The emergency operation is fully functional even when the PTC function is switched off.
Setpoint emergency operation	The emergency operation of the heating function is ensured by the electric heating elements (PTC). This function can only be switched on manually with an active heat pump alarm. Once the fault is removed, the function will be reset.
Adjustment range: ***18 °C ... 22 °C***	
Default setting: ***18 °C***	The new emergency operation setpoint is valid independently of the setpoint temperature in normal operation, see **Unit**.

NOTE

If PTC elements are not used (e.g. passive house), the corresponding parameters will have no function.

10.4.4 Furnace Function - Operation in Combination with Room Air Independent Fireplaces

In this constellation, the heating fan can be manually controlled even without heating demand of the heat pump.

WARNING

Poisoning by exhaust fumes!

In parallel operation of a ventilation system and an air-ventilated fireplace, negative pressure can lead exhaust gases into the rooms.

» Install and operate the Combi Unit Genius only together with an **air-ventilated fireplace** according to DIN 18897-1:2005!

NOTE

The furnace operation may only be switched on and off manually.

The combi unit assumes the complete heating function. A shutdown must therefore be avoided.

Furnace operation	***Status***	Note
Off		
Step 1	Capacity 60 %	Steps 1, 2 and 3 ***switch to*** **Off** ***automatically after two hours.***
Step 2	Capacity 80 %	
Step 3	Capacity 100 %	

10.4.5 Room Temperatures

Room 1	Living room
Status	Active
PTC element	blocked
Actual value temperature	22.5 °C
Setpoint value temperature	22.0 °C
PTC output	0 %
Display illumination standby	10 %
Display illumination normal	30 %

Settings room controller **Settings: *Active / Inactive*** **Default setting: *Active***	You can set the setpoint temperature of each room for a specific area. Depending on the heating mode you have selected, the unit setpoint is determined by these values (see ***Settings***). The specific room controller copies the set value as well as it copies the new value to the website (according to the settings). Each room controller can be switched off manually (see section ***Room controller***). Then, the status of the room changes to ***inactive*** and the setpoint temperatures of the unit are to recalculate if necessary.
PTC element **Settings: *blocked / normal***	PTC element is a simple status display (***blocked, active***). The electric heating elements are only switched on when the ***heat pump*** is switched on (heat pump priority circuit) and after a delay (adjustable in ***Settings***). (Exception: individual room temperature control, see ***Settings***)
PTC output	The PTC demand indicates the current demand, independent from an ***active*** or ***normal*** element. The PTC displays only appear in the heating mode.
Display Illumination	After a certain period, the room controller will switch to standby mode. The intensity of the display illumination is adjustable.
Window contact	If the function "Window contact" is activated in the ***Settings*** (see page 79 and 80), the current status will also appear.

NOTE

In some operating modes, the average room temperature of all active rooms is determined as actual value and compared with the setpoint (see ***Settings*** and ***Actual value / Setpoint***, ***Setpoint Temperature***).

The setpoint temperatures set on the room controllers are only significant in that, after the PTC start delay time has elapsed (if PTC function activated under "Settings"; default setting 45min., can be adjusted in the Service level), the reheating elements will start in those rooms where the actual temperature is below the setpoint temperature.

Therefore, the setpoint temperatures of the room controllers must be set realistically for all control modes.

10.5 Alarm Status

Description of the ***Alarm status*** see chapter „8 Maintenance / Remedying Faults“ page 31.

10.6 Input/Output

Genius

Heat pump	
Status	On
Heating/Cooling	Heating
Capacity requirement	90 %
Defrost	Off
Temp. air heat exchanger	21.1 °C
Temp. suction gas	21.6 °C
Cond. Temp.	22.0 °C
Temp. hot gas	27.0 °C
Zone hot gas	90.0 °C
Status hot gas	OK
Cond. pressure	14.2 bar
Evaporator pressure	14.1 bar
Differential pressure	0.1 bar
Requested capacity comp.	0 %
Actual capacity comp.	0 %
Actual speed comp.	0 U/s
Status envelope curve	27
Alarm countdown	180 s
Pressure ratio	1
Low pressure countdown	60 s
Extern. Fan	0 %
Compressor	Off
4-way valve	On
Overheating	5 K
Valve status	3
Valve status	0 stp
Valve status	0 %

Analogue inputs	
AE1, outdoor temperature	7.1 °C
AE2, supply air temperature	23.4 °C
AE 4, extract air temperature	22.0 °C
UAE1, hot water temperature	44.6 °C
UAE2, Supply air fan monitoring	10 V
UAE3, Extract air fan monitoring	10 V
UAE4, Secondary air fan monitoring	10 V
Digital inputs	
DE1, EVU status	On
DE2, Pressure monitoring alarm	Off
DE3, PV	Off
DE4, Rotor operation	On
Analogue outputs	
AA1, supply air fan control	6.0 V
AA2, extract air fan control	5.5 V
AA3, secondary air fan control	0.0 V
AA4, Preheater.	0.0 V
Digital outputs	
DA1,	Off
DA2,	Off
DA3,	Off
DA4, rotor On/Off	On
DA5, sum alarm	Off
DA6, storage charge pump	Off
DA7, heating rod HW	Off

*Figure 22: Page **Input/Output***

10.6.1 Heat Pump

You can read the most important actual heat pump status. This is very useful during an error analysis. The parameters of the cooling circuit can only be read and if possible adjusted with the external control, see „9.3.1 External Heat Pump Control“ page 46.

10.6.2 Analogue Inputs

The analogue inputs show the temperatures of the various sensors as well as the operating signal / mutual fan monitoring.

Analogue inputs		Temperature
AE1	***Outdoor temperature***	7.1 °C
AE2	***Supply air temperature***	23.4 °C
AE4	***Extract air temperature***	22.0 °C
UAE1	***Hot water temperature***	44.6 °C
UAE2	***Supply air fan monitoring***	10 V
UAE3	***Extract air fan monitoring***	10 V
UAE4	***Secondary air fan monitoring***	10 V

UA 2 ... 4	Relevant for the fan monitoring (see "8.1.4 Confirm Faults / Procedure" page 57). 10 V: failure-free operation 0 V: triggers an alarm

10.6.3 Digital Inputs

Digital inputs show operating signals.

Digital inputs		
DE1	***EVU status***	On
DE2	***Pressure monitoring alarm***	Off
DE3	***PV***	Off
DE4	***Rotor operation***	Off

DE1 EVU	Set to ***Off***, as long as the forced shutdown of the utility company is active. see “Service manual/Wiring Diagram”.
DE2 Pressure monitoring	If there is a fireplace and pressure monitoring (provided on-site by the client) is required, it is connected here. see “Service manual/Wiring Diagram”.

WARNING

Scalding

Risk of scalds with water temperatures higher than 43 °C.

» The client must provide protection against scalding!

DE3 PV	If this input receives a signal from an inverter of a photovoltaic system, the hot water will be heated to a temperature of 60°C using an electric heating rod.
DE4, rotor operation On/Off	Changes during rotor operation steadily from ***Off*** to ***On***. This is not an error, but is caused by the rotor monitoring.

10.6.4 Analogue Outputs

The fans operate with 0 ... 10 V. The actual performance can be derived by these outputs.
Example: 5 volts correspond 50 % power, 7 volts correspond 70 %.

Analogue outputs		Voltage
AA1	***Supply air fan control***	6.0 V
AA2	***Extract air fan control***	5.5 V
AA3	***Secondary air fan control***	0.0 V
AA4	***preheater***	0.0 V

10.6.5 Digital Outputs

Actual components status (On/Off).

Digital outputs		Temperature
DA1		Off
DA2		Off
DA3		Off
DA4	***Rotor On/Off***	On
DA5	***Sum alarm***	Off
DA6	***Storage charge pump***	Off
DA7	***Heating rod HW***	Off

DA1 Relay heat pump operation	see ***Settings***
DA2 Change-over	After the switch-off point has been reached (see ***Settings***), the signal switches.It can be used as a switch for a second heat source.
DA3 Bypass cooling	This output enables a passive cooling of a room. During commissioning, this room must be defined as Room 2. If the current temperature of this room is higher than the predefined setpoint, this output will switch. This triggers a relay which switches on a fan (to be installed by the client on-site). The fan transports cool external air into the room via a bypass pipe.

10.7 Time Program

Genius

General				
Minute	28			
Hour	11			
Day	6			
Month	November			
Weekday	Tuesday			
autom. summer/winter change	Yes			
Heating/Cooling/Ventilation	Start	Stop	Start	Stop
Monday	00:00	24:00	00:00	00:00
Tuesday	00:00	24:00	00:00	00:00
Wednesday	00:00	24:00	00:00	00:00
Thursday	00:00	24:00	00:00	00:00
Friday	00:00	24:00	00:00	00:00
Saturday	00:00	24:00	00:00	00:00
Sunday	00:00	24:00	00:00	00:00
Holiday	00:00	24:00	00:00	00:00
Heating/Cooling/Ventilation	Start	Stop	Start	Stop
Monday	00:00	24:00	00:00	00:00
Tuesday	00:00	24:00	00:00	00:00
Wednesday	00:00	24:00	00:00	00:00
Thursday	00:00	24:00	00:00	00:00
Friday	00:00	24:00	00:00	00:00
Saturday	00:00	24:00	00:00	00:00
Sunday	00:00	24:00	00:00	00:00
Holiday	00:00	24:00	00:00	00:00

Holiday	Starting point	End point
Holiday 1	1 Jan	1 Jan
Holiday 2	1 Jan	1 Jan
Holiday 3	1 Jan	1 Jan
Holiday 4	1 Jan	1 Jan
Holiday 5	1 Jan	1 Jan
Holiday 6	1 Jan	1 Jan
Holiday 7	1 Jan	1 Jan
Holiday 8	1 Jan	1 Jan
Holiday 9	1 Jan	1 Jan
Holiday 10	1 Jan	1 Jan
Holiday 11	1 Jan	1 Jan
Holiday 12	1 Jan	1 Jan
Holiday 13	1 Jan	1 Jan
Holiday 14	1 Jan	1 Jan
Holiday 15	1 Jan	1 Jan
Holiday 16	1 Jan	1 Jan
Holiday 17	1 Jan	1 Jan
Holiday 18	1 Jan	1 Jan
Holiday 19	1 Jan	1 Jan
Holiday 20	1 Jan	1 Jan
Holiday 21	1 Jan	1 Jan

*Figure 23: Page **Time program***

10.7.1 Time

The clock will be set automatically. If required, the clock can also be set manually.

General	
Minute	47
Hour	15
Day	12
Month	July
Weekday	Thursday
autom. summer/winter change	Yes

10.7.2 Time Program

10.7.2.1 Normal Operation

Heating/Cooling/Ventilation	Start	Stop	Start	Stop
Monday	00:00	24:00	00:00	00:00
Tuesday	00:00	24:00	00:00	00:00
Wednesday	00:00	24:00	00:00	00:00
Thursday	00:00	24:00	00:00	00:00
Friday	00:00	24:00	00:00	00:00
Saturday	00:00	24:00	00:00	00:00
Sunday	00:00	24:00	00:00	00:00
Holiday	00:00	24:00	00:00	00:00
Hot Water	**Start**	**Stop**	**Start**	**Stop**
Monday	00:00	24:00	00:00	00:00
Tuesday	00:00	24:00	00:00	00:00
Wednesday	00:00	24:00	00:00	00:00
Thursday	00:00	24:00	00:00	00:00
Friday	00:00	24:00	00:00	00:00
Saturday	00:00	24:00	00:00	00:00
Sunday	00:00	24:00	00:00	00:00
Holiday	00:00	24:00	00:00	00:00

Both time programs, Heating/Cooling/Ventilation and Hot water, use each two adjustable time slots for every week day. Depending on the settings, the corresponding function runs within the time slots in normal operation. Outside these time slots, the unit is in setback operation.

NOTE

When using a circulation pump, it must be externally controlled (see „13.2.3 Hot Water Generation“ page 102).

10.7.2.2 Setback Operation

Setback type and value are different.

Ventilation	The ventilation stage can be set on page ***Actual Value/Setpoint***.
Heating	The setback temperature can be set on page ***Settings***.
Cooling	Cooling is switched off during setback.
Hot water generation	Hot water generation is switched off during setback.
Time program	The time program "Hot water" is only available if the ***Setting Individual*** has been selected in the settings specified for the ***Time program***. If ***Automatic*** is selected, the time program runs in the background and depends on the heating or cooling program (winter/summer), with the difference that the hot water starts for comfort reasons an hour before the normal operation of heating/cooling. (see ***Settings***, ***Hot water***, ***Preset time program***)

10.7.3 Holiday Program

Holiday	*Starting point*	*End point*
Holiday 1	2 Aug	21 Aug
Holiday 2	1 Jan	1 Jan
Holiday 3	1 Jan	1 Jan
...	...	...
Holiday 21	1 Jan	1 Jan

The unit capacity is reduced to a minimum during the set holiday times.

Ventilation	Humidity protection (min. air volume flow to protect the residential unit).
Heating	Average room temperature 18 °C, adjustable (frost protection, avoids cooling down of the residential unit, see ***Settings***).
Cooling	Cooling is switched off for energy saving.
Hot water generation	The min. hot water temperature of 30 °C (adjustable in Actual/Setpoint) remains guaranteed.
Legionella mode	If activated, the legionella mode remains active. This mode can be activated or deactivated on page ***Actual/Setpoint***.

10.8 Settings

Genius

Room temperature control	
Heating/Cooling	Auto
Cooling active when outdoor temp. >	26 °C
Heating active when outdoor temp. <	20 °C
Cooling	
Control mode	Outdoortemp.comp.
Heating	
Control mode	Fixed setp.
Reference room	3
Night setback room difference	0 °C
Temperature holiday mode	18 °C
Temperature rotor alarm	19 °C
Control parameters	
Room controller	
Actual value	21.7 °C
Setpoint	21.8 °C
Control output	43 °C
P-band	3 °C
I-time	20 s
Sup.air temp.con	
Actual value	37.3 °C
Setpoint	42.6 °C
Control output	100 %
P-band	20 °C
I-time	100 s
min. supply air temp.	16.5 °C
Supply air control type	Automatic
Max. Sup.air temp.man.	40.0 °C
Max. Sup.air temp.auto	
Setpoint at (-15)	48 °C
Setpoint at (-5)	44 °C
Setpoint at (5)	40 °C

Heat pump	
ModBus address	1
Activate supply air rooms	
Number of rooms	6
Room 1	
Modbus room address (ELA)	197
Room 2	
Modbus room address (ELA)	39
Room 3	
Modbus room address (ELA)	147
Room 4	
Modbus room address (ELA)	82
Room 5	
Modbus room address (ELA)	237
Room 6	
Modbus room address (ELA)	200
Default settings rooms	
Room 1	
Room sensor	internal
Setpoint room temperature	20.0 °C
Temperature rise +	3 °C
Temperature setback -	3 °C
P-band	3 °C
I-time	20 s
Room designation	Living room
Room 2	
Room sensor	internal
Setpoint room temperature	20.0 °C
Temperature rise +	3 °C
Temperature setback -	3 °C
P-band	3 °C
I-time	20 s
Room designation	Bedroom

Figure 24: Page ***Settings 1***

Genius

Extract air fan	
Speed at intense ventilation	70 %
Speed at nominal ventilation	60 %
Speed at reduced ventilation	35 %
Speed at hum. protect. ventilation...	15 %
Speed at night cooling	85 %
Secondary air fan	
Parallel offset speed	100 %
Min. speed	60 %
max. speed	90 %
Power limitation	
Activate	No
WP max.	100 %
Rotor	
Cooling recovery default value	2 °C
Stop rotor default value	2 °C
Defrost. level	3
add. frost protection	On
Hot Water	
Start charge pump if HW temp. < S...	1 °C
Stop charge pump if HW temp. > S...	2 °C
Extended running pump	150 s
Default value time program	Automatic
PTC	
PTC function	Off
PTC start delay	45 min
PTC defrost power HP	20 %
Switch-off point	-20 °C
Setpoint preheater	-10 °C
P-Gain preheater	2
Night cooling	
Night cooling activated	No
Activated at outdoor temperature	22 °C
Max. outdoor temp. night	18 °C
Min. outdoor temp. night	5 °C
min. room temperature	20 °C
Filter alarm	
Reset filter life	No
Number of months for filter change	12
Number of months since last filter change	1
e-mail	
Alarms via e-mail	No
e-mail address	
Sender name	Systemair
Re:	Alarm Genius

I-time	20 s
Room designation	Bedroom
Room 3	
Room sensor	internal
Setpoint room temperature	20.0 °C
Temperature rise +	3 °C
Temperature setback -	3 °C
P-band	3 °C
I-time	20 s
Room designation	Lea
Room 4	
Room sensor	internal
Setpoint room temperature	20.0 °C
Temperature rise +	3 °C
Temperature setback -	3 °C
P-band	3 °C
I-time	20 s
Room designation	Jan
Room 5	
Room sensor	internal
Setpoint room temperature	20.0 °C
Temperature rise +	3 °C
Temperature setback -	3 °C
P-band	3 °C
I-time	20 s
Room designation	Office
Room 6	
Room sensor	internal
Setpoint room temperature	20.0 °C
Temperature rise +	3 °C
Temperature setback -	3 °C
P-band	3 °C
I-time	20 s
Room designation	Entrance/Corridor

Figure 25: Page ***Settings 2***

10.8.1 Room Temperature Control

Room temperature control	
Heating/Cooling	Auto
Cooling active when outdoor temp. >	26 °C
Heating active when outdoor temp. <	20 °C
Cooling	
Control mode	Outdoortemp. managed
Heating	
Control mode	Fixed setp.
Reference room	1
Setback operation room difference	0 °C
Temperature holiday mode	18 °C
Temperature rotor alarm	19 °C
Control parameters	
Room controller	
Actual value	21.7 °C
Setpoint	21.8 °C
Control output	43 °C
P-band	3 °C
I-time	20 s
Sup.air temp.con	
Actual value	32.3 °C
Setpoint	42.6 °C
Control output	100 %
P-band	70 °C
I-time	30 s
min. supply air temp.	16.5 °C
Supply air control type	Automatic
Max. Sup.air temp.man.	40.0 °C
Max. Sup.air temp.auto	
Setpoint at (-15)	48 °C
Setpoint at (-5)	44 °C
Setpoint at (5)	40 °C
Setpoint at (15)	36 °C
Offset (-5 up to +5)	0 °C
HP starts with a request >	30 %
Start hyst.	0.3 °C
Stop hyst.	0.4 °C

10.8.1.1 Operation Mode

Heating/Cooling	Auto
Cooling active when outdoor temp. >	Winter operation
Heating active when outdoor temp. <	Summer operation
Heating/Cooling	
Cooling active when outdoor temp. >	26 °C
Heating active when outdoor temp. <	20 °C

Heating/Cooling

Settings: *Winter operation, Summer operation* and ***Automatic***

Factory settings and recommendation: *Auto*(matic operation).

Cooling active when outdoor temp. >	26 °C
Heating active when outdoor temp. <	18 °C

Automatic operation:

Active heating and cooling function

Adjustment range:

Heating: 10 ... 23°C, cooling: 23 ... 34°C

Factory settings outdoor temperature:

18°C and ***26°C***.

The (active) heating and cooling function of the heat pump is switched off between these two temperature values. The (passive) heat or cooling recovery by the rotating heat exchanger is maintained. These values are adjustable. For further information about individual settings, see „13 Comfort and Energy Efficiency“ page 100.

Within this neutral zone (20 ... 26°C) the unit remains in ***Heating mode*** with the corresponding setpoint values.

Cooling: Type of the room temperature controlled control

Control mode

Settings: *Outdoortemp.comp. / Fixed value*

Default setting: *Outdoortemp. managed*

An individual room temperature control is not possible during cooling mode. The setpoint is defined as an average room temperature. It is either depending on the outdoor temperature (***Outdoortemp.comp.***) or determined by a ***Fixed value***. The associated value is the average room temperature of all rooms. Depending on choice, the values will be displayed on page ***Actual/Setpoint***.

NOTE

The setpoints of the room controllers are not relevant in the cooling mode. However, they are automatically increased as soon as the cooling mode is active.

Cooling	
Room temperature value	Outdoortemp.comp.

Outdoortemp. comp.

Fixed setp.

Outdoortemp.comp.

Setpoint cooling curve	
Room setpoint at (32)	26 °C
Room setpoint at (30)	25 °C
Room setpoint at (28)	24 °C
Room setpoint at (26)	23 °C
Offset (-3 up to +3)	0 °C
Setpoint value temperature	26 °C
Offset value	0 °C
Offset value	-1 °C
Setpoint value temperature	25 °C

Room setpoint depending on outdoor temperature

		Room setpoint depending on actual outdoor temperature		
Start outdoor temp.	**Room setpoint at 26 °C**	**28 °C**	**30 °C**	**32 °C**
26* °C	23	24	25	26

* Outdoor temp. 26 °C = start point cooling, basic setting

Offset (the temperature curve)

Offset

Adjustment range: *-3 °C ... +3 °C*

Default setting: *0 °C*

The curve (see above) will be displayed on the ***Actual Value/Setpoint*** page. An offset is possible there.

Example: The average room temperature setpoint changes from 25 °C to 24 °C with an outdoor temperature of 30 °C and an offset of -1 °C.

The curve values of the outdoor temperature remain below ***Actual setpoint/setpoint*** constant also after an offset. The room setpoint changes visibly.

Room setpoint as a *fixed value*

Room setpoint

Adjustment range: 22 °C - 28 °C

Factory settings Room setpoint cooling *26 °C*

After selecting this parameter, the value appears 26°C below the ***Actual value/setpoint, Unit, Room setpoint cooling***.

Unit	
Status	. tion. tion.
tion. tion. tion.	tion. tion. tion.
Room setpoint cooling	26.0 °C

Heating: Type of the room temperature controlled control

NOTE

Average temperature as an actual value

In some operating modes, the average room temperature of all active rooms is determined as actual value and compared with the setpoint (see ***Settings*** and ***Actual value / Setpoint***, ***Setpoint Temperature***).

Significance of the setpoint temperatures defined on the room controllers

The reheating elements start in those rooms where the actual temperature is below the setpoint temperature after the PTC start delay (default: 45 min.).

Setting realistic setpoints

The setpoint temperatures of the room controllers must be set realistically for all control modes.

Room temperature value

Default setting: *Setpoint = Fixed value*

Heating	
Room temperature value	Outdoortemp. managed
	Setpoint = Fixed value
	Individual room temperature control
	Reference room
	Setpoint reference room
	Setpoint = Average room temp.
	Outdoortemp. managed

Individual room temperature control
Setpoint = Setpoint reference room

The temperature of individual rooms can be controlled during heating mode. Based on the setpoint temperature, the heat pump controls the temperature of a selected room. Set the number of the room in the row ***Reference room***. The rooms with a higher setpoint are brought to the higher temperature level by means of PTCs. This means that every room can be controlled individually.

The PTC start delay is out of function.

When selecting the individual room temperature control, the PTC function must be activated.

This mode can also be used to incorporate extract air rooms, e.g. bathrooms, into the control system if, for example, electrical heating mats and room controllers are installed there.

NOTE

For this type of control, please take special care that realistic setpoints are set on the room controllers, in order to avoid unintended activation of the electrical heating elements.

Control to an equal room temperature

This control type enables an equal temperature level in the residential unit.

Set the average room temperature of all rooms as a setpoint or by an adjustable fixed value.

Control depends on the outdoor temperature

The average room temperature setpoint is determined depending on the outdoor temperature. The associated value is the average room temperature of all rooms. Both values are displayed on the page ***Actual value/Setpoint*** as a curve.

Setpoint reference room

The combi-unit controls the temperature of a selected room according to the setpoint and actual temperature.

Set the number of the room in the subsequent row "Reference room".

In contrast to individual room temperature control, here it is the PTC start delay which is relevant.

Furthermore, the PTC function does not need to be activated.

Room setpoint depending on outdoor temperature

A gradual increase of the setpoint temperature with decreasing outdoor temperature compensates the influence of the lower surface temperatures of room walls and windows to comfort.

Setpoint heating curve	
Setpoint at (-15)	23 °C
Setpoint at (-5)	22 °C
Setpoint at (5)	21 °C
Setpoint at (15)	20 °C
Offset value	-1 °C

Offset (the temperature curve)

Offset

Adjustment range: ***-3 °C ... +3 °C***

Default setting: ***0 °C***

The curve will be displayed on the ***Actual Value/Setpoint*** page. Offset manually from -3 °C up to +3 °C.

Example: The average room temperature setpoint changes from 21 °C to 20 °C with an offset of -1 °C.

The curve values remain below ***Actual setpoint/Setpoint*** constant also after an offset. The room setpoint changes visibly.

Heating: Setback temperature

Setback temperature

Adjustment range: ***0 °C ... 10 °C***

Default setting: ***0 °C***

This parameter defines the room temperature setpoint decrease during offset in heating mode (see „10.7.2 Time Program“ page 60).

Example:

Setpoint temperature 21 °C

Night setback 2 °C

(Setback) Setpoint temperature 19 °C

Heating	
...	...
Night setback room difference	2 °C

NOTE

A night setback can be recommended for the ***Outdoor compensated room setpoint offset***, because an automatic setpoint increase can be avoided or compensated.

Heating: Holiday program

Holiday program

Adjustment range: ***16 °C ... 20 °C***

Default setting: ***18 °C***

The average room temperature will be maintained to the setpoint value during the holiday program (see Time Program).

Heating	
...	...
Temperature holiday mode	18 °C

TIP

Do not regulate the residential unit temperature below 18 °C due to energetic reasons.

Heating: Setpoint after rotor alarm

Setpoint after rotor alarm

Adjustment range: ***18 °C ... 22 °C***

Default setting: ***19 °C***

The passive heat recovery is deactivated after rotor alarm (see section 8.1). Thus, the efficiency of the combi unit is negatively affected. Therefore, the (average) room temperature setpoint is forced to reset during the alarm. The unit returns to the previous set mode

- after alarm remedy and confirmation;
- after alarm block without remedying faults.

Heating	
...	...
Temperature rotor alarm	19 °C

NOTE

Blocking of alarms can cause uncontrollable malfunctions.

☞ Use this function only in exceptional cases and after consulting specialised personnel.

Control parameters

Control parameters	
Room controller	
Actual value	21.5 °C
Setpoint	21.8 °C
Control output	43 °C
P-band	3 °C
I-time	20 s
Sup.air temp.con	
Actual value	37.1 °C
Setpoint	43.0 °C
Control output	100 %
P-band	70 °C
I-time	30 s
min. supply air temp.	16.5 °C
Supply air control type	Automatic
Max. Sup.air temp.man.	40.0 °C
Max. Sup.air temp.auto	
Setpoint at (-15)	48 °C
Setpoint at (-5)	44 °C
Setpoint at (5)	40 °C
Setpoint at (15)	36 °C
Offset (-5 up to +5)	0°C
HP starts with a request >	30 %

- Proportional band (P-Band), Integral time (I-Time)

The room controller directly affects the supply air temperature controller.

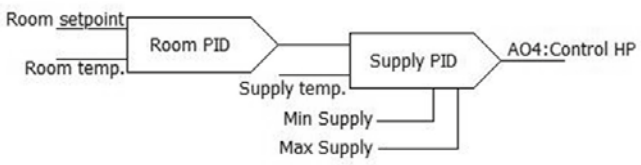


Figure 26: PID controller

NOTE

The PID controllers are preset and need normally no adjustment. Changes (if required) may only be carried out by qualified personnel.

Control output:

50 %: no heating or cooling demand

50 ... 100 %: heating demand 0 ... 100 %

50 ... 0 %: cooling demand 0 ... 100 %

- Heating: min. supply air temperature

min. supply air temperature

Adjustment range: 8 °C ... 20 °C

Default setting: 16.5 °C

Recommendation:

Keep the default settings. The factory settings ensure highest possible performance and highest comfort.

NOTE

If the min. supply air temperature is undershot during heat pump standstill in winter, the PTC elements will be activated to min. power to avoid draughts (PTC function ***On***). In this case, a setpoint decrease can be recommended.

Heating	
...	...
Min. Supply air temperature	16.5 °C

- Heating: max. supply air temperature

max. supply air temperature

Settings: *Manually / Automatic*

Default setting: *Automatic*

This parameter enables limiting the maximum supply air temperature during heating operation. It has significant influence on the unit performance coefficient. The lower the temperature is set, the higher the efficiency is. However, the efficiency depends on different factors (e.g. outdoor temperature, building standard) and can not be generalized. The ***maximum supply air temperature*** is limited to 52 °C to avoid dust carbonization.

(see „13 Comfort and Energy Efficiency“ page 100)

Setting Manually
Factory settings 40°C

Heating	
...	...
Supply air type Control	Manually
Max. supply air temp. manually	40 °C
Max. Supply air temperature Auto	

This parameter enables the user to set the maximum supply air temperature individually.
The maximum supply air temperature must be increased step by step in winter (depending on outdoor temperature).

Automatic **setting**

max. supply air temperature *automatically*	
Setpoint at (-15)	48 °C
Setpoint at (-5)	44 °C
Setpoint at (5)	40 °C
Setpoint at (15)	36 °C
Parallel offset	0 °C

TIP

The higher the efficiency standard of the house, the lower the values can be set.
Manual operation (default setting 40°C) may be appropriate, depending on user behaviour.

Offset (the temperature curve)

Offset

Adjustment range: ***-5 °C ... +5 °C***
Default setting: ***0 °C***

- Heat pump start

Start hyst.: HP starts with a request	30 %	☞ The value is not adjustable.

- Start/Stop hyst.

Start hyst.	0.3 °C
Stop hyst.	0.4 °C

Start/Stop hyst.

Default setting: 0.3 °C, 0.4 °C
The factory settings can be changed. A value of 0.2 °C should not be undershot.

This parameter prevents heat pump cycles and enables longer operation and longer standstill times. This extends the unit lifetime.

The hysteresis is visibly taken into account on the setpoint.

Setpoint temperature (+Hyst.)	21.3 °C
Setpoint room heating	21.0 °C

Speed

Speed	
Supply air fan	
Speed at intense ventilation	70 °C
Speed at nominal ventilation	50 °C
Speed at reduced ventilation	35 °C
Speed at hum. protect. ventilation.	15 °C
Speed at night cooling	85 °C
Extract air fan	
Speed at intense ventilation	70 °C
Speed at nominal ventilation	50 °C
Speed at reduced ventilation	35 °C
Speed at hum. protect. ventilation.	15 °C
Speed at night cooling	85 °C
Secondary air fan	
Parallel offset speed	100 %
Min. speed	60 %
max. speed	90 %
Power limitation	
Activate	No
WP max.	100 %

(see „7 Commissioning“ and „10.8.1.3 Night cooling“)
The speed values are generally set once during commissioning within this menu.

Secondary air fan	Delivery setting	Adjustment range	
Parallel offset speed	100 %	70 ... 100 %	limits the max. speed of the secondary air fan
Min. speed	60 %	50 ... 70 %	
max. speed	90 %	60 ... 100 %	max. speed durign night setback
Power limitation			
Activate	No	If this is set to **Yes**, the power of the heat pump and secondary air fan will be limited	
WP max.	100 %	50 ... 100 %	

NOTE

The power of the system may only be limited in exceptional cases (e.g. very low heating/cooling load)

☞ Please discuss this limitation with the service company (see „7 Commissioning“ page 25).

Rotor settings

Rotor	
Cooling recovery default value	2 °C
Stop rotor default value	2 °C
Defrost. level	3
add. frost protection	On

The rotating heat exchanger can have the following operating states:

Heat recovery	The rotor starts as soon as the room temperature drops below setpoint temperature.
Cooling recovery	The rotor starts as soon as the room temperature exceeds the setpoint temperature by 2 °C (adjustable) and the outdoor temperature is higher than the extract air temperature (≈ room temperature).
Summer operation	The rotor stops as soon as the room temperature exceeds the setpoint temperature by 3 °C and the outdoor temperature is lower than the extract air temperature.
additional frost protection	Do not to change this value.

- Defrost. level

This parameter should normally not be changed!

Although the rotary heat exchanger requires no frost protection, since condensate is transferred to the supply air by the rotating storage mass, the control has an additional function. Defrost: The fan speed is automatically changed in order to protect the rotary heat transfer. This is only done at very low outdoor temperatures and for a certain period of time.

Within the defrost function five levels are defined and divided into humidity levels which prevail in the residential unit / in the house.

Level 1	Dry area (e.g. storehouse with less personnel)
Level 2	Office building
Level 3 (Factory setting)	Houses/residential units with normal air humidity
Level 4	Houses/residential units with high air humidity
Level 5	Buildings with very high humidity

- additional frost protection

NOTE

The function ***Defrost level*** is active when the ***Additional Frost Protection*** is set to ***On***.

WARNING

Poisoning by exhaust fumes!

In parallel operation of a ventilation system and an air-ventilated fireplace, negative pressure can lead exhaust gases into the rooms.

» Install and operate the Combi Unit Genius only together with an **air-ventilated fireplace** according to DIN 18897-1:2005!

» If a wood-burning stove is used which is independent of the room air, and pressure monitoring is installed, the function ***Additional Frost Protection*** must be set to ***Off***.

10.8.1.2 Hot Water

Hot Water	
Start charge pump if HW temp. < S...	1 °C
Stop charge pump if HW temp. > S...	2 °C
Extended running pump	150 s
Default value time program	Automatic

Start/Stop charge pump	Start/Stop charge pump describes the hot water generation hysteresis. Default setting: 3 °C; i.e. with a default setting of the hot water temperature with 45 °C, the heat pump and the storage charge pump start at a temperature of 44 °C and end the generation at 47 °C.
Extended running pump	The pump continues running for 150 seconds so that the heat pump can release all the heat.

Hot Water		
Default value time program	Automatic	▼
	Automatic	
	Individual	

Default value time program (see 10.7.2 Time Program)

PTC activation

PTC	
PTC function	Off
PTC start delay	45 min
PTC defrost power HP	20 %
Switch-off point	-20 °C
Setpoint preheater	-10 °C
P-Gain preheater	2

NOTE

The PTC function is deactivated in the factory.

During cooling circuit defrost, the elements will also be activated when switched off.

PTC

Adjustment range: *0 - 60 minutes*
Default setting: *45 minutes*

Electric heating elements (PTC elements "positive temperature coefficient") fulfil three functions:

- Individual room temperature control,
- Emergency operation,
- peak load covering.

A heat pump priority circuit ensures an optimized normal operation of the PTCs.

Start delay

The adjustable start delay prevents early switching on of the heating elements and opens a time window for the heat pump to provide the requested heat amount alone. The correct setting of the start delay ensures an optimized energy efficiency.

Defrosting HP

Factory settings 20 %

Defrosting of the heat pump is done by a reverse cycle, i.e. during this time cold supply air is blown in for a short time. The PTCs will be controlled to counteract.

Switch-off point

Factory settings -20°C

If the external temperature reaches the set value, the heat pump switches off and emergency operation will be activated.

Setpoint preheater

Factory settings -10°C

If a preheater is installed (Accessories), here, set the temperature at which the heater starts.

P-Gain preheater

Default setting: 2

The preheater can be steplessly adjusted from 0 ... 100%.

Using this value, it is possible to set the speed at which the power increases.

NOTE

A preheater is recommended for cold regions. This ensures operational safety for the air heat pump at extremely cold external temperatures.

10.8.1.3 Night cooling

Night cooling

Settings: *No / Yes*
Default setting: *No*

With the setting ***Night cooling*** (***free cooling***), the combi unit ***Genius*** passively cools (under certain conditions) the house/apartment during the night in summer.

Night cooling	
Activation night cooling	No
Activated at outdoor temperature	22 °C
Max. outdoor temp. night	18 °C
Min. outdoor temp. night	5 °C
min. room temperature	20 °C

NOTE

Both night cooling settings (enabled / disabled) stop the rotation heat exchanger when the following conditions occur simultaneously:

- The outdoor temperature is lower than the extract air temperature.

AND

- The actual room temperature is above the setpoint temperature (see Rotor Settings).

The heat recovery and outdoor air heating will be disabled. Colder outdoor air enters the building. This is done during day and at night without night cooling function in each set ventilation level.

Activated night cooling

Night cooling activated

Setting:
no settings required

Default setting: 85 %, speed level for supply and extract air fan

When night cooling is enabled, the speeds will automatically be increased during a fixed period of time (see Service, Settings). Thus, the air flow and the cooling capacity increases.

The following factors are preset for the ***Activated night cooling***:

- The function is active when the average outdoor temperature was higher than 22 °C from 12:00 to 17:00.
- The function is active from 24:00 to 6:00.
- The function remains active at night with outdoor temperatures between 5 °C and 18 °C. Below or above it is interrupted.
- The function is terminated when the average room temperature in the house falls below 20 °C.

These factory settings can be adjusted on demand, the fan request below the ***Speed***.

NOTE

A passive cooling by the rotary heat exchanger can only provide a relatively low temperature reduction. It can not replace active heat pump cooling.

10.8.1.4 Filter alarm

Filter alarm	
Reset filter life	No
Number of months for filter change	12
Number of months since last filter change	1

At the end of the set months for filter change, an alarm message appears (see ***Alarm status***). Once the filter has been changed, the function must be reset. The alarm remains visible even when it has been confirmed.

Reset filter alarm

The alarm remains active until the filter life is reset. No confirm response.

- ☞ Change the filter (see Filter Change).
- ☞ Set ***Reset filter life*** to Yes.
- ☞ Acknowledge filter alarm at ***Alarm status***.
- » The filter alarm is now reset. Number of months since last filter change is set to zero.

Filter alarm		
Reset filter life	Yes	▼
Number of months for filter change	No	
Number of months since last filter change	Yes	

NOTE

Shows the number of months for filter changes:

a) down, if the filter is heavily contaminated.

b) up, if the filter still has a very good quality, max. 12 months.

10.8.1.5 E-mail

e-mail	
Alarms via e-mail	No
e-mail address	

Sender name	Systemair
Re:	Alarm Genius

When this function is activated, an e-mail will be sent in the event of an alarm.

NOTE

To use this function, it may be necessary to make settings in the router.

10.8.1.6 Activate Supply Air Rooms/Room Controller

Heat pump	
ModBus address	1
Activate supply air rooms	
Number of rooms	6
Room 1	
Modbus room address (ELA)	197
Room 2	
Modbus room address (ELA)	39
Room 3	
Modbus room address (ELA)	147
Room 4	
Modbus room address (ELA)	82
Room 5	
Modbus room address (ELA)	237
Room 6	
Modbus room address (ELA)	200

Activate supply air rooms / room controller

Number of rooms

The control of the building service centre Genius is designed for a maximum of 10 rooms. Since heating/cooling takes place in the supply air rooms, in general, controllers are only installed in these rooms. Exception: if extract air rooms are heated, e.g. via electrical underfloor heating, these can also be regulated by the room controller. These are installed in the appropriate rooms (see page 67 "Individual room temperature control").

ModBus address HP

The ModBus address of the heat pump is fixed with 1 and is not adjustable.

Room controller

Each room controller of the type RC-CDO has its own address combination. It must be entered in order to ensure communication with each other. The addresses are located on the back of each controller (see „7 Commissioning“ page 25).

Define number of rooms

Number of rooms	6
Room 1	
ELA room address	
Room 2	
ELA room address	
Room 3	
ELA room address	

1
2
3
4
5
6

Basic settings rooms

Default settings rooms	
Room 1	
Room sensor	internal
Window contact	No
NO/NC	NO
Setpoint room sensor	20.0 °C
Temperature rise +	3 °C
Temperature setback -	3 °C
P-band	3 °C
I-time	20 s
Room designation	Living room
Room 2	
Room sensor	internal
Window contact	No
NO/NC	NO
Setpoint room sensor	20.0 °C
Temperature rise +	3 °C
Temperature setback -	3 °C
P-band	3 °C
I-time	20 s
Room designation	Bedroom

Room sensor

Room 1	
Room sensor	internal
Setpoint room temperature	
Temperature rise +	

internal
external

NOTE

Always set this parameter to ***internally***!

Exception: Due to e.g. an unfavourable arrangement in the room, an external sensor is needed.

Setpoint room temperature

Setpoint room temperature	20.0 °C
Temperature rise +	3 °C
Temperature setback -	3 °C

Use this setting to specify the minimum and maximum setpoints of each room.

Factory settings: 20 °C / ±3 °C each.

This means that the room temperature setpoint can be set below the ***Actual value/Setpoint*** and as well as at the ***room controller*** between 17 °C and 23 °C. If other values are desired for individual rooms, the first room definition needs to be changed.

- Proportional band (P-Band), Integral time (I-Time)

P-band	3 °C
I-time	20 s

These parameters define the action of the PTC elements of the individual room.

The PID controllers are preset and need normally no adjustment. If changes must be made, this must be carried out only by qualified personnel.

Room designation

Room designation	Living room

Any room / zone can be specified. These designations are transferred to the other tab pages.

Window contact

NO/NC

Via a window contact, each room controller is able to activate a motorised shut-off valve (Accessories), for example, in the bedroom. If the window is opened, the valve closes and interrupts the air supply to this room; and with it the heating function.

Via the Option NO/NC, this logic can be reversed if necessary, depending on the design of the contact or the valve.

If the window contact function is activated, the status display will be shown under ***Actual Value/Setpoint***.

10.9 Manual/Auto

Heat pump	
Status	Auto
Control output	0 %
Supply air fan	
Status	Auto
Control output	0.0 V
Extract air fan	
Status	Auto
Control output	0.0 V
Secondary air fan	
Status	Auto
Control output	0.0 V
Room 1	Living room
Status	Auto
PTC output	0 %
Room 2	Bedroom
Status	Auto
PTC output	0 %
Bypass cooling	
Status	Auto
Bypass	Off
Rotor (DO4)	
Status	Auto
Stat	On
Storage charge pump (DO6)	
Status	Auto
Pump	Off
Heating rod HW (DO7)	
Status	Auto
Heating rod HW	Off
Preheater (AO4)	
Status	Auto
Control output	0.0 V

This page is exclusively available in the service level. It is used for manual operation. This is useful, e.g. during the control of the residential ventilation, but also for a temporary operation.

There are three possible ways of doing this: Off, Manual, Auto. The controller or PTC demand is only relevant for the selection Manually.

Heat pump	
Status	Auto
Control output	Off
Supply air fan	Manual
Status	Auto

10.10 Chart Function

☞ Click on the ***chart*** link. This can be opened from all pages.
» The ***Chart*** page opens.

The ***Chart*** function shows all status, temperatures etc. and saves them. Almost all temperatures, status, demands etc. can be recorded. Each recording is limited to 8 values per recording (time window).

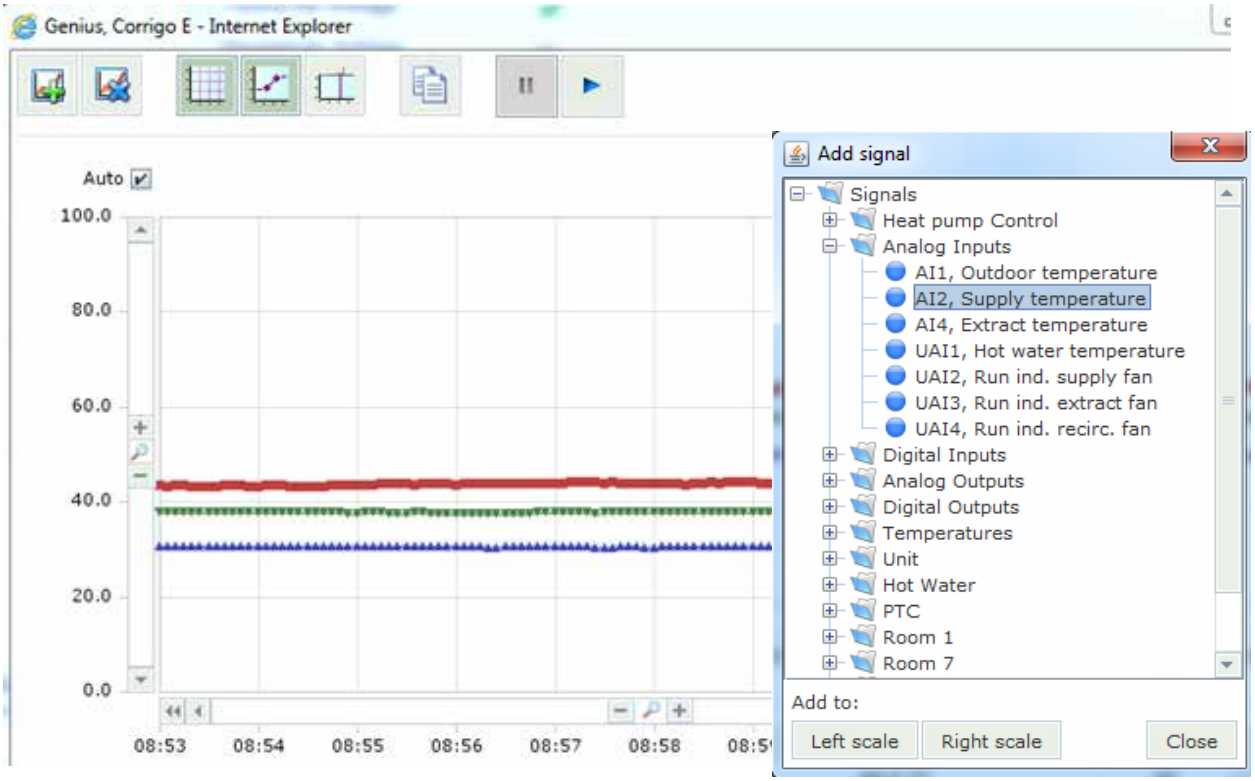


*Figure 27: see **Chart***

Signal	Scale	Last value	Display
Actual temperature	left	25.0 °C	✔ …
Actual temperature	left	24.1 °C	✔ …
Actual temperature	left	24.7 °C	✔ …
Actual temperature	left	45.5 °C	✔ …

Der ***Status*** is defined by the following digit sequence:

0	Off	1	Rotor operation
2	Heating	3	Cooling
4	Night cooling	5	Rotor defrosting
6	Hot water generation	7	Emergency operation
8	Setback operation	9	Holiday operation
10	Legionella mode	11	Defrost heat pump
12	Rotor alarm	13	Heat pump alarm
14	Switch-off point		

10.10.1 Command *Add signal*

Add signal

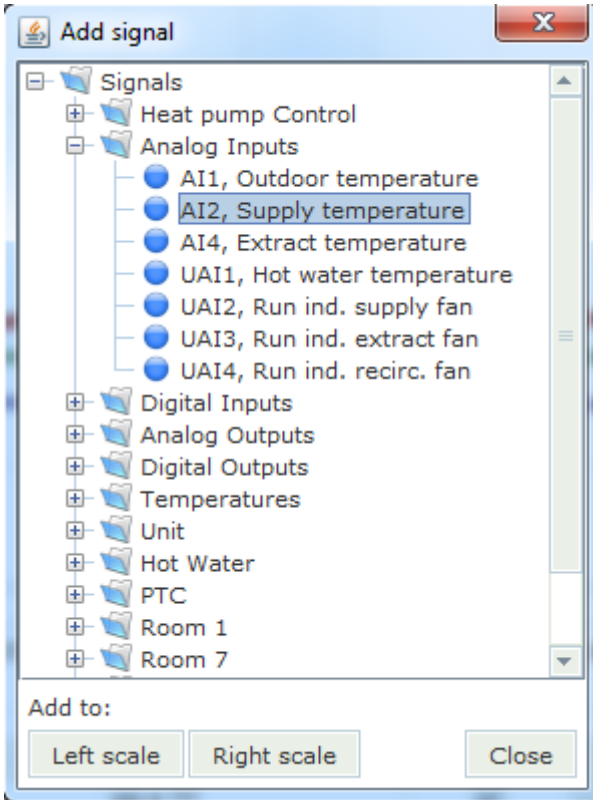


Figure 28: ***Add signal***

Add signal:

1. Select a value in the ***Add signal*** window.
2. Decide whether the value should appear on the left or right scale.
3. Repeat 1 and 2 for all the values that you want to record.

The recording starts.

Adjust the vertical scale values: *+ / - and up / down buttons*

- Reduce the highlighted scale by the + button.
- Increase the highlighted scale by the - button.
- Move the highlighted scale up with the up button.
- Move the highlighted scale down with the down button.

TIP

It may be useful to record the status of the unit (rotor operation, defrost, etc., illustrated with figures, see above) on a scale of 0 to 10. Display a second scale in parallel with values from 0 to 100 to capacity demand, supply air temperature etc.

Change the horizontal time scale: *+ / - and left / right button*

- Reduce the scale with the + button.
- Increase the scale with the - button.
- Move the scale to the left with the left button.
- Move the scale to the right with the right button.

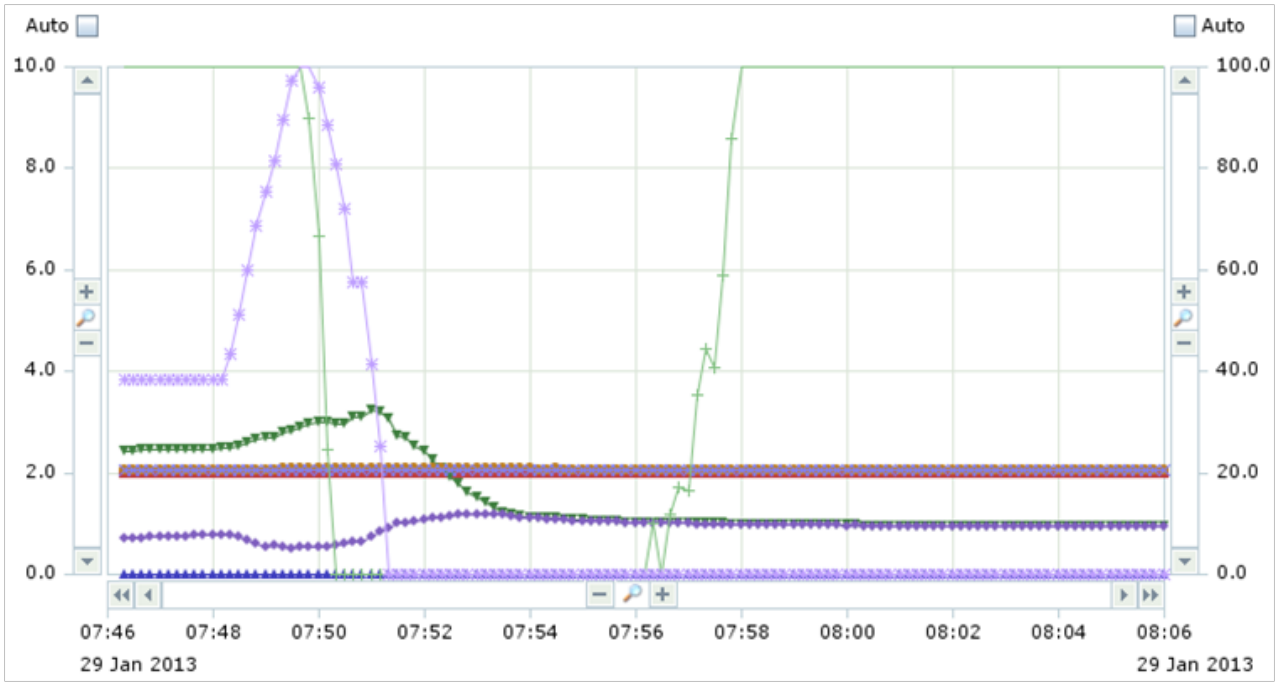


Figure 29: Display example

Signal	Scale	Last value	Display	
Status	left	2	✔	...
4-way valve	left	0	✔	...
Evaporator pressure	left	9.7 bar	✔	...
Cond. pressure	left	9.8 bar	✔	...
Actual Room Temperature	Right	20.9 °C	✔	...
Deired Room Temperature	Right	21.0 °C	✔	...
Output power	Right	100 %	✔	...
Compressor Actual Capacity	Right	0 %	✔	...

1 2 3 4 5 6

Figure 30: Values to the display example

1		Display of the graphs and values
2	Signal	Name of the signal
3	Scale	The graph will be displayed on the left or right scale
4	Last value	Last displayed value
5	Display	Show/hide graph
6	...	Show properties

Change *properties*

- Change the colour of the graph (***Colour***).
- Change the side of the display of the scale (***left scale*** or ***right scale***).
- Remove the signal with ***Remove***.
- Confirm with ***OK***.
- Close the window ***Properties*** with ***Cancel***.

You will see the change immediately in the ***chart*** being displayed.

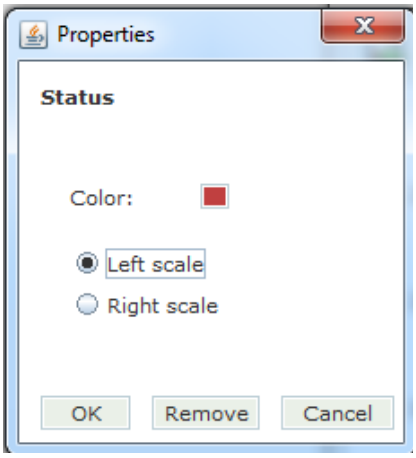


Figure 31: Properties

10.10.2 Command *Remove all signals*

Remove all signals

Remove all signals

- Click the symbol.
- Confirm the security query with ***Yes***.

The signals in the chart are deleted.

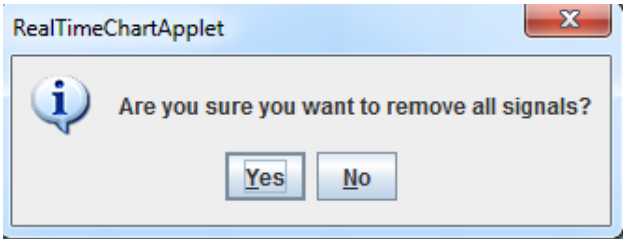
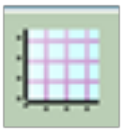


Figure 32: Properties / Security query

10.10.3 Command *Show grid*

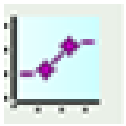


Show grid

Show grid

- Click the symbol..

10.10.4 Command *Show sample marks*



Show sample marks

Show sample marks

☞ Click the symbol.

Hide sample marks

☞ Click the symbol.

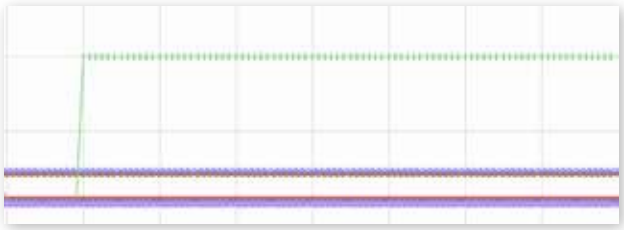
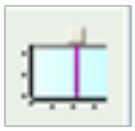


Figure 33: Sample marks shown

Figure 34: Sample marks hidden

10.10.5 Command *Hide/show ruler*



Show ruler

Hide/show ruler

☞ Click the symbol.

The ruler and the corresponding values will be displayed.

Value at ruler (07:48:44)
2
0
26,5 bar
6,5 bar
21,0 °C
21,0 °C
100 %
67 %

Figure 35: Values shown at the ruler

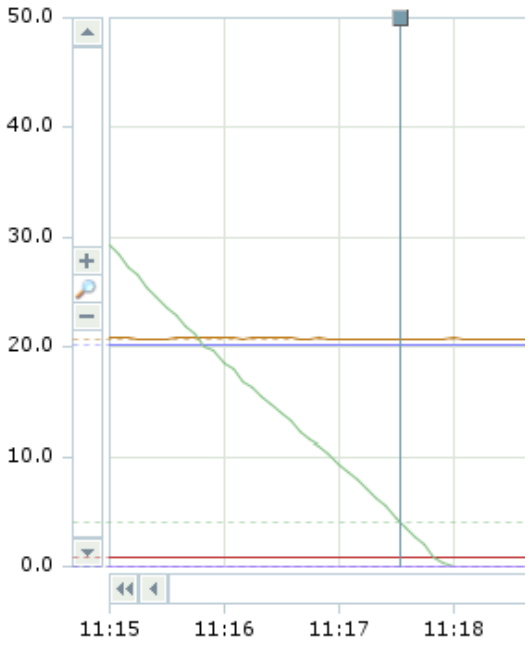


Figure 36: Rulers shown

10.10.6 Command *Copy values to clipboard*

This feature allows exporting all recorded values to the clipboard. These can then be pasted to a table, for example in Word or Excel.

Copy values to clipboard

Define Time window (interval)

- Define the time window with the ***+/-*** and ***</>*** buttons.
- Click the symbol.

The window ***Copy*** opens.

Define resolution

- Select the desired resolution in the ***Copy*** window in the ***Pull-down menu***.

Cancel

- Click ***Cancel*** to cancel the action.

Copy values to clipboard

- Click ***OK*** to add the settings.
- Click ***OK*** in the ***Confirmation window***.

The values have been copied to the clipboard.

Copy clipboard to file

- Open Word or Excel..
- Click ***Edit***/***Paste***.

The data have been imported to the file and can be saved.

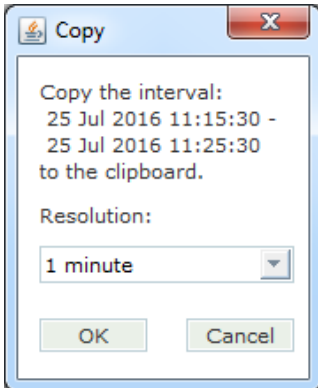


Figure 37: Window copy

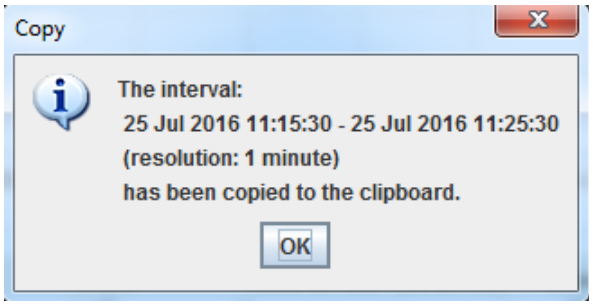
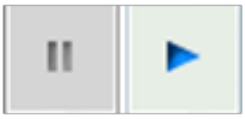


Figure 38: Confirmation window

Example data

29. Jan 13	Status	4-Wege-Ventil	rdampf. Druck (b	rfl. Druck (bælle Raumtemperatu	emperaturngsanforderu	Leistung Komp. (%)	
07:46:00							
07:47:00	2	0	24,5	7,6	20,9	21	100	39
07:48:00	2	0	24,7	7,8	20,9	21	100	39
07:49:00	2	0	26,8	5,5	21	21	100	75
07:50:00	2	0	29,9	5,7	21,1	21	67	96
07:51:00	2	0	32,4	7,6	21,2	21	0	42
07:52:00	2	0	24,2	11	21,2	21	0	0

10.10.7 Command *Start/Stop Recording*



Stop recording

- Click the symbol II.

Start recording

- Click the arrow symbol.

11 Control via Display

Control the unit via the website, as this is the comfortable way. You can also set all parameters via the display. The tree logic or hierarchy can be found in „11.5 Display Tree Logic“ page 89.

11.1 Display

The display of the combi unit ***Genius*** provides 4x20 characters. It is background illuminated. The illumination is normally off. It is activated as soon as a button is pressed. The illumination will be turned off again after a period of inactivity.

NOTE

Values and status are displayed by colours:

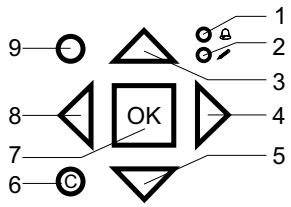
Blue font: The values can be adjusted in the user level.

Red font: Adjustable in the service level after entering the password.

The password to access the service level is: 1111

11.2 Access

LEDs and Buttons



1	Alarm LED (red)
2	Input/Enable LED (yellow)
3	UP button
4	RIGHT button
5	DOWN button
6	C button (clear)
7	OK button (confirm)
8	LEFT button
9	ALARM button

LEDs

Alarm LED (red)	The alarm LED is illuminated when the combi unit has triggered an alarm.
Input/Enable LED (yellow)	In some menus there are parameters that can be set. This is indicated by the flashing yellow LED. Fast flashing (2x/sec.): The parameter can be changed. Slower flashing (1x/sec.): This parameter can be changed in the service level.

Buttons

UP/DOWN button	The UP/DOWN buttons have two functions: • Move between the menus of the actual menu levels. • Increase/decrease parameters.
RIGHT/LEFT button	The UP/DOWN buttons have two functions: • Move between the menu levels • Move between the parameter decimal digits
OK button	Confirm the entered parameters with OK.
C button	The C button cancels a parameter change and resets to the stored value.
ALARM button	The ALARM button switches to the alarm list.

Software Corrigo E

The software menus of the combi unit ***Genius*** are arranged in a horizontal tree logic.

Menus

The menus are used to adjust the parameters by the user or service technician.

Parameters

Change parameters in the service level:

- ☞ Move with the RIGHT, LEFT, UP and DOWN buttons to scroll through the menus until you reach the parameter you want to change.
- ☞ Push OK button.
- » The cursor is positioned at the adjustable parameter.
- ☞ Increase or decrease the values with the up or down buttons.
- ☞ Push OK button.
- » The new value is now confirmed.

Change parameters in the service level:

- ☞ Move with the RIGHT, LEFT, UP and DOWN buttons to scroll through the menus until you reach the parameter you want to change.
- ☞ Push OK button.
- » The display shows the Log on menu:
- ☞ Enter the service password.
- ☞ Push OK button.
- » The cursor is positioned at the adjustable parameter.
- ☞ Increase or decrease the values with the up or down buttons.
- ☞ Push OK button.
- » The new value is now confirmed.

11.3 Alarm Log

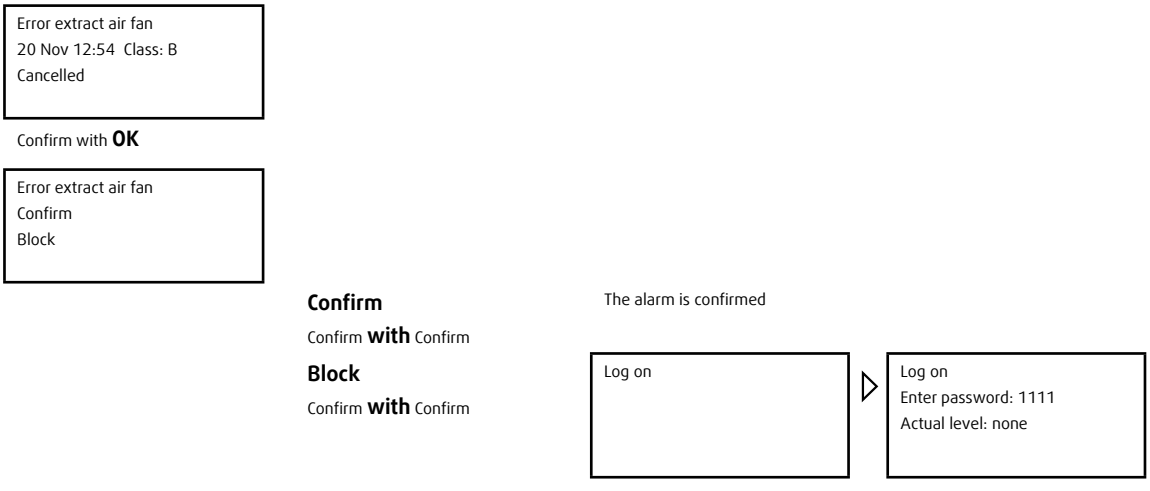
NOTE

The alarm log of the unit can only be read by the display. Therefore, it is especially important in case of service to have access to it. Access to the alarm log is described on „Alarm event" page 91."

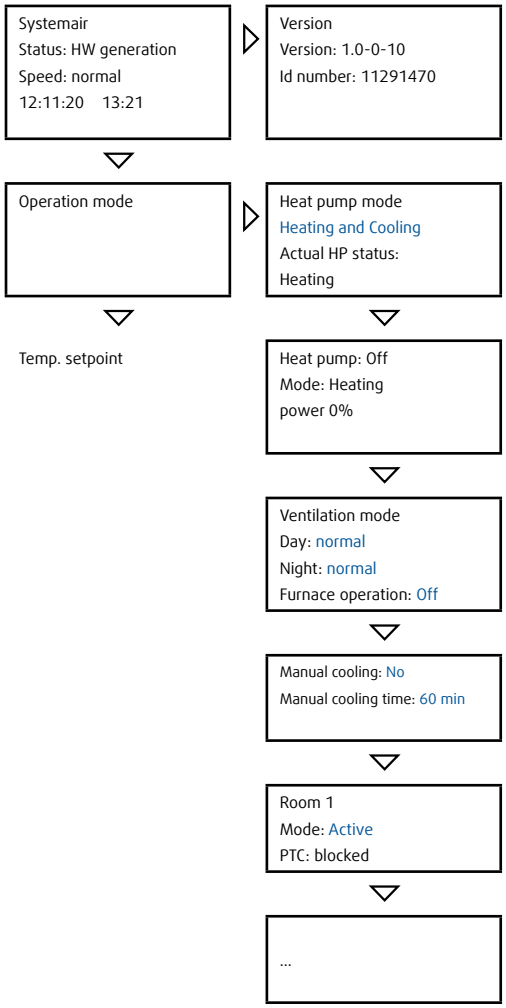
11.4 Read Alarm

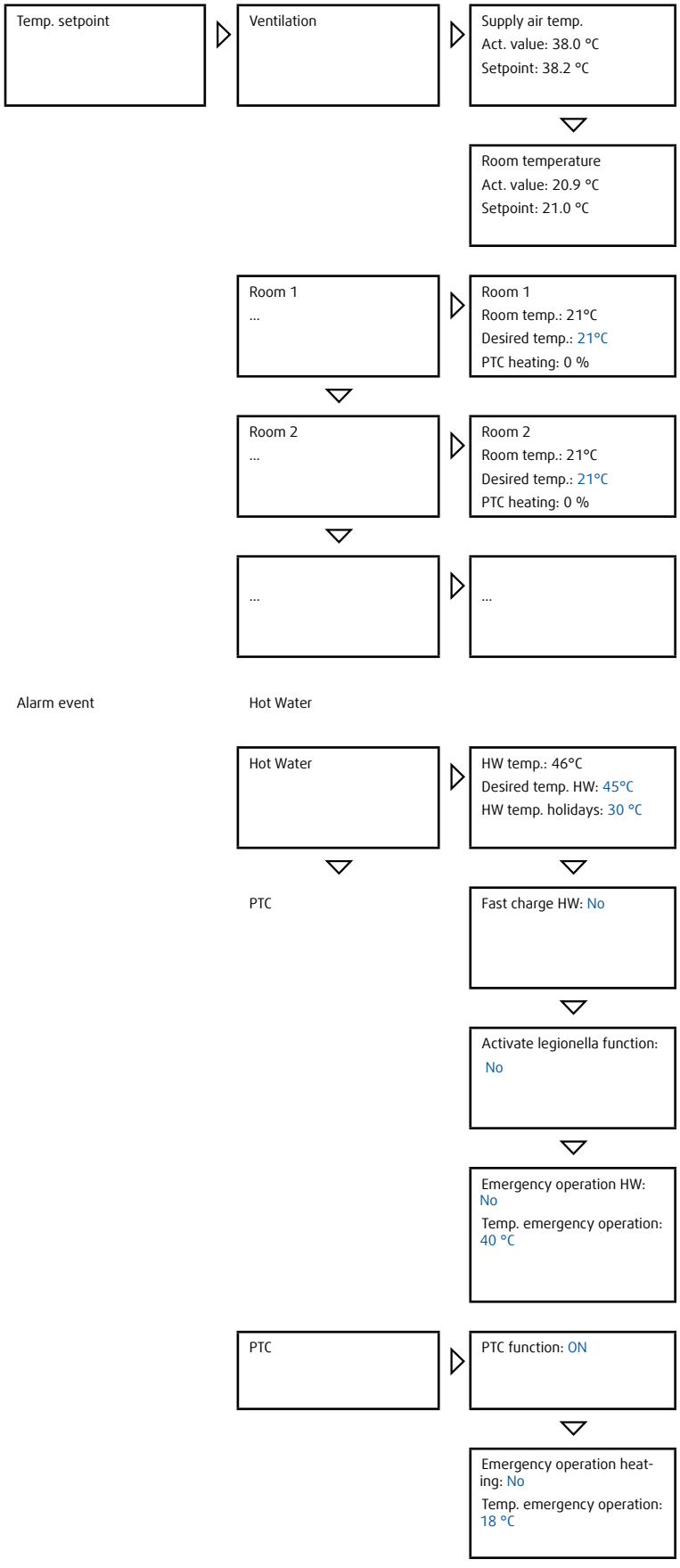
If the Alarm LED is flashing, one or more active alarms can be read by pressing the red alarm button.
Alarms can be directly confirmed, blocked or released.
Block and release is only available after entering the service password "1111". The log on window appears automatically, if necessary.

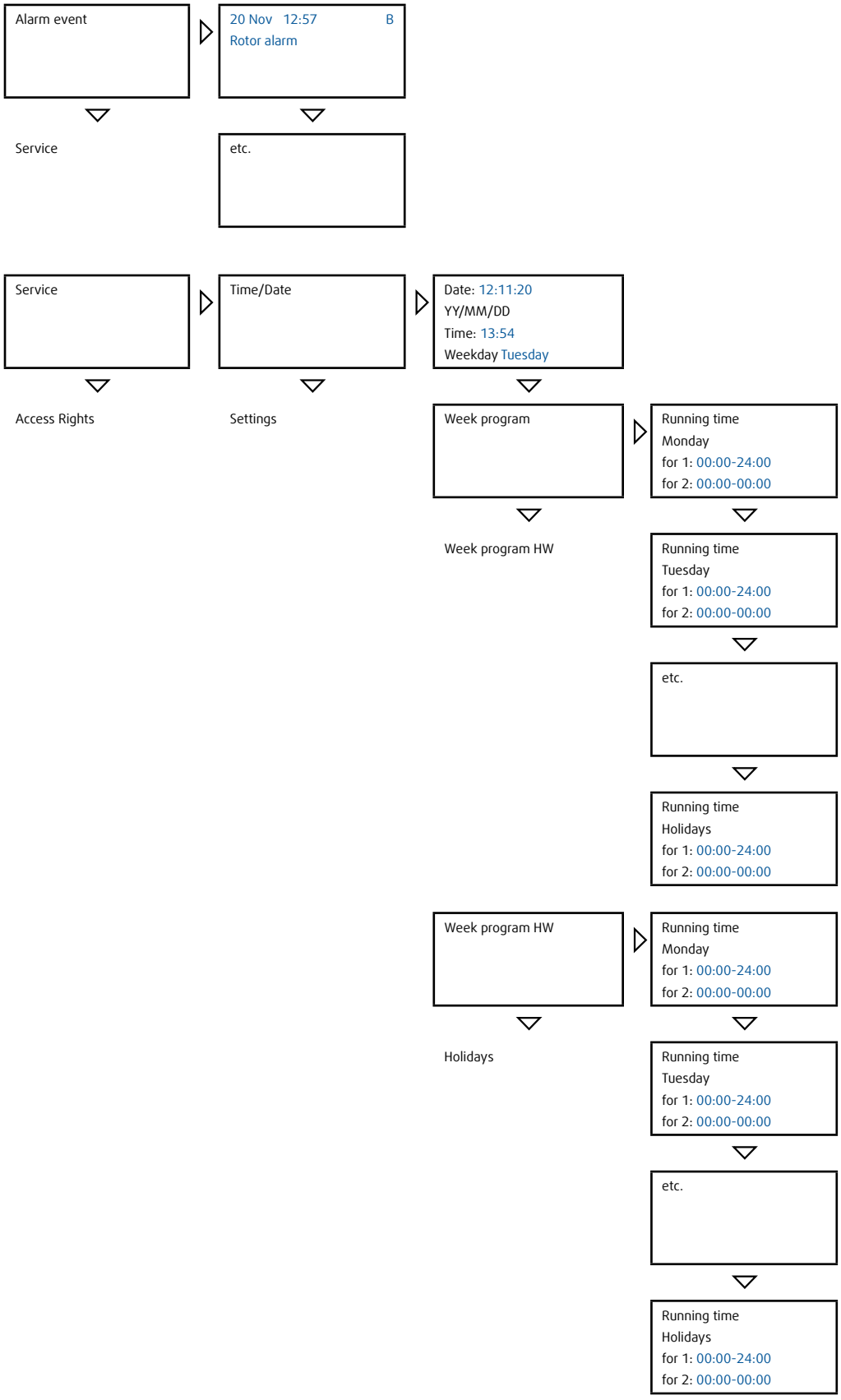
Example

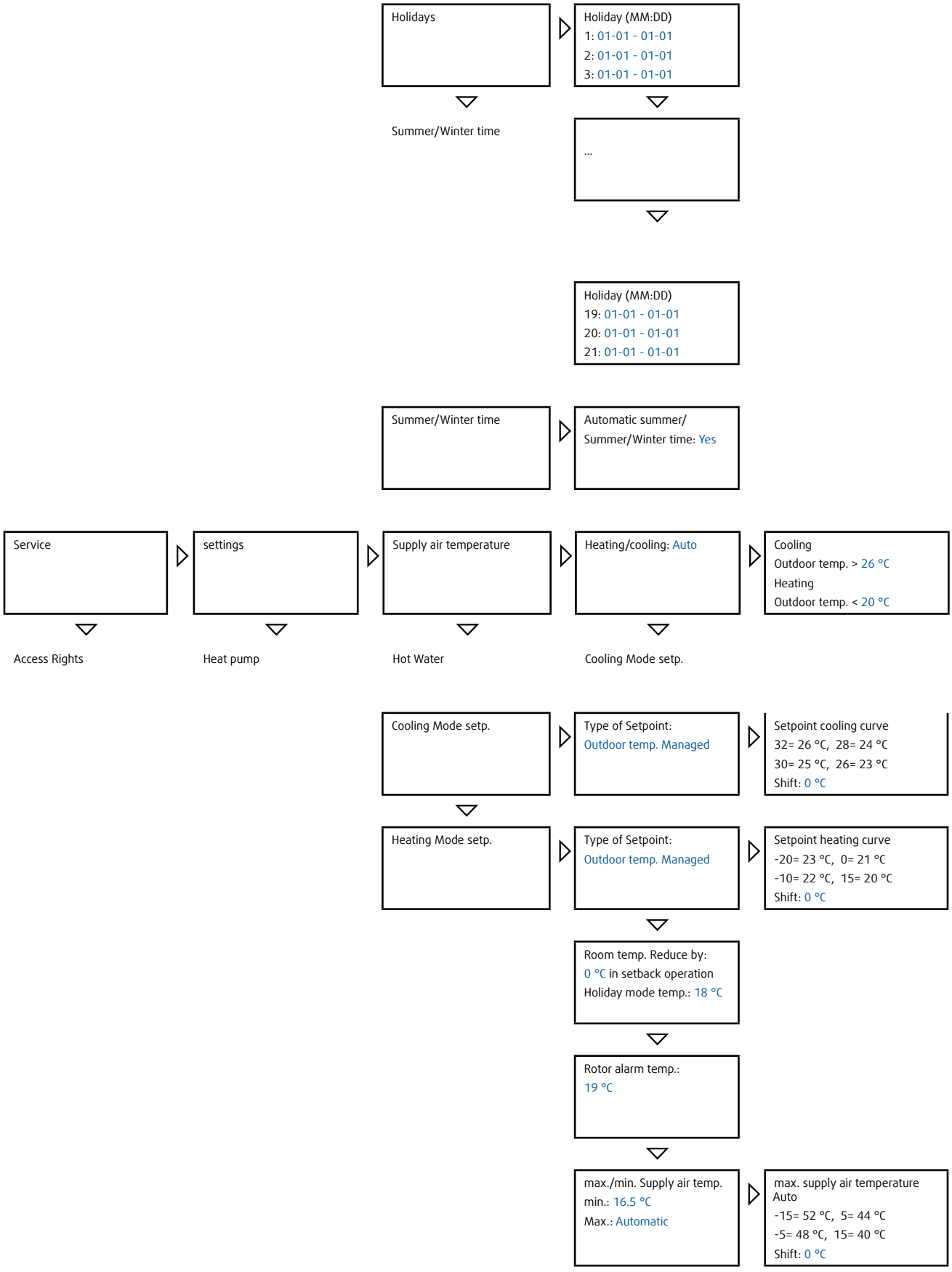


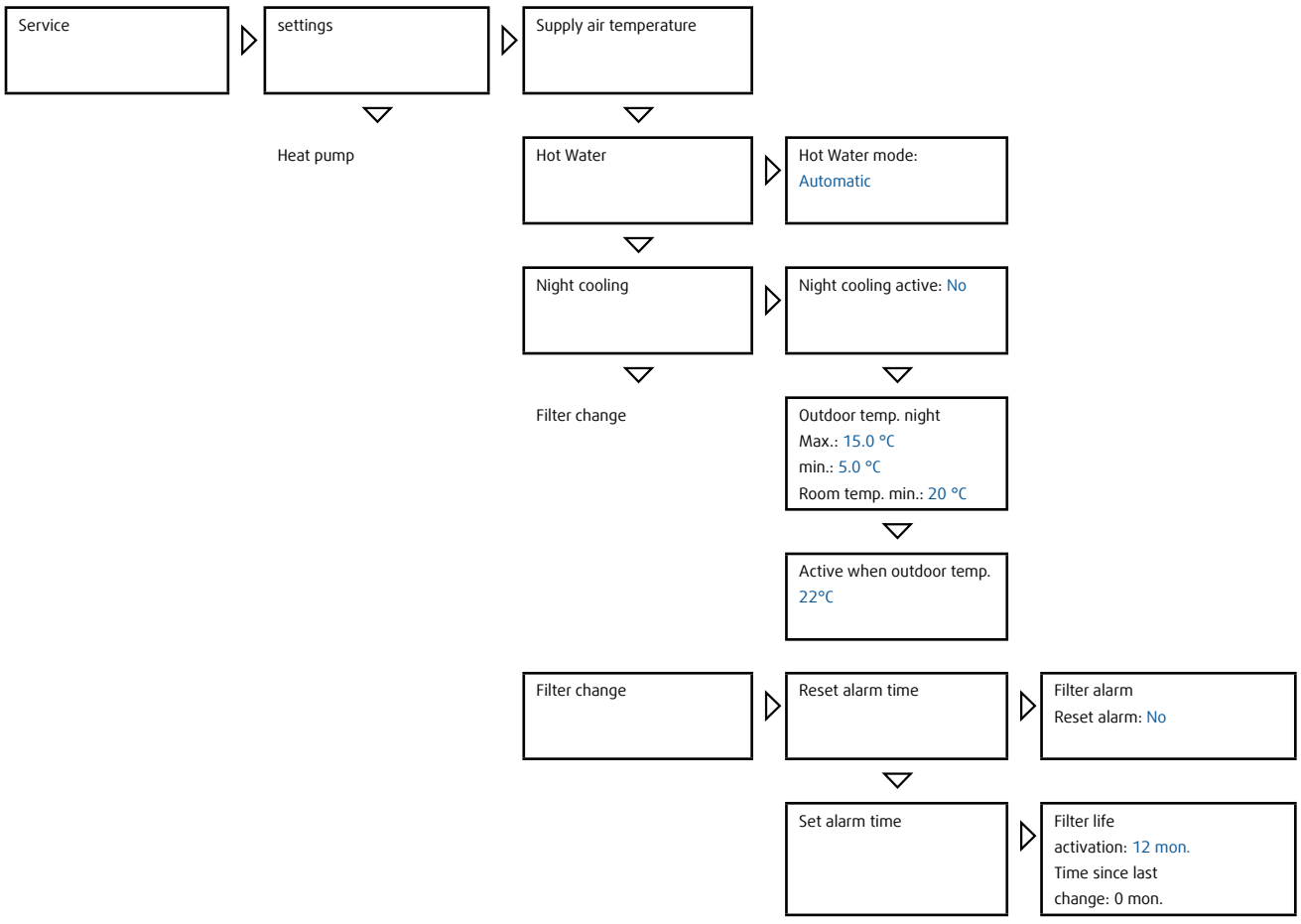
11.5 Display Tree Logic

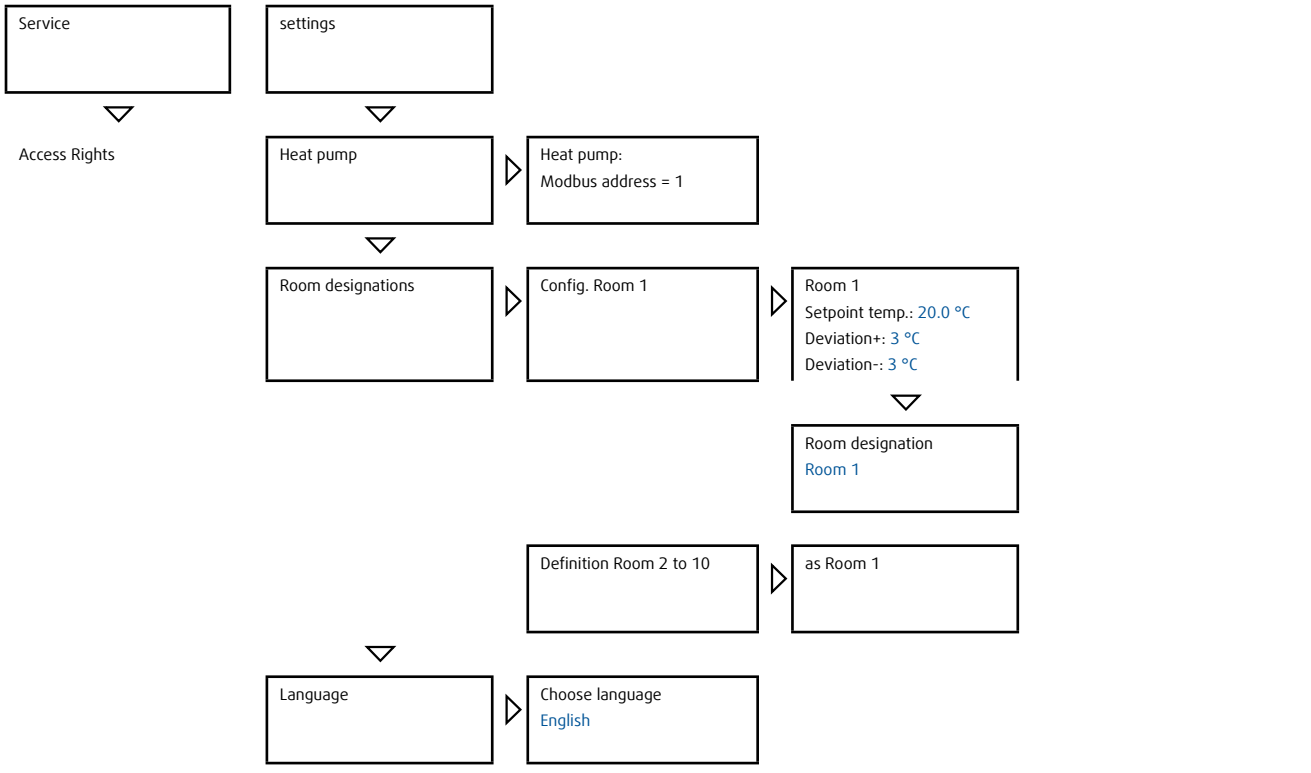


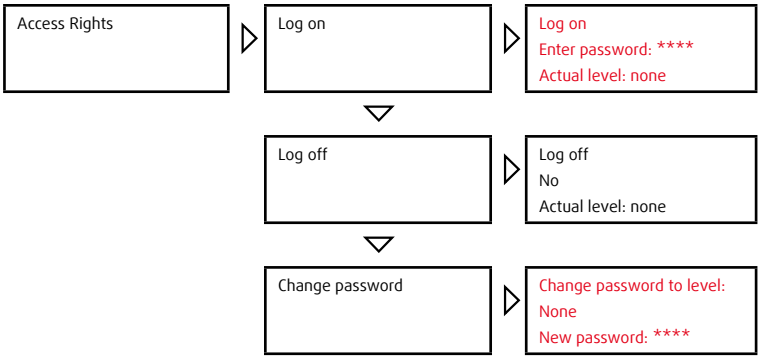

Temp. setpoint
Ventilation
Supply air temp.
Act. value: 38.0 °C
Setpoint: 38.2 °C
Room temperature
Act. value: 20.9 °C
Setpoint: 21.0 °C
Room 1
...
Room 1
Room temp.: 21°C
Desired temp.: 21°C
PTC heating: 0 %
Room 2
...
Room 2
Room temp.: 21°C
Desired temp.: 21°C
PTC heating: 0 %
...
...
Alarm event
Hot Water
Hot Water
HW temp.: 46°C
Desired temp. HW: 45°C
HW temp. holidays: 30 °C
PTC
Fast charge HW: No
Activate legionella function:
No
Emergency operation HW:
No
Temp. emergency operation:
40 °C
PTC
PTC function: ON
Emergency operation heat-
ing: No
Temp. emergency operation:
18 °C


Alarm event
20 Nov 12:57 B
Rotor alarm
Service
etc.
Service
Time/Date
Date: 12:11:20
YY/MM/DD
Time: 13:54
Weekday Tuesday
Access Rights
Settings
Week program
Running time
Monday
for 1: 00:00-24:00
for 2: 00:00-00:00
Week program HW
Running time
Tuesday
for 1: 00:00-24:00
for 2: 00:00-00:00
etc.
Running time
Holidays
for 1: 00:00-24:00
for 2: 00:00-00:00
Week program HW
Running time
Monday
for 1: 00:00-24:00
for 2: 00:00-00:00
Holidays
Running time
Tuesday
for 1: 00:00-24:00
for 2: 00:00-00:00
etc.
Running time
Holidays
for 1: 00:00-24:00
for 2: 00:00-00:00

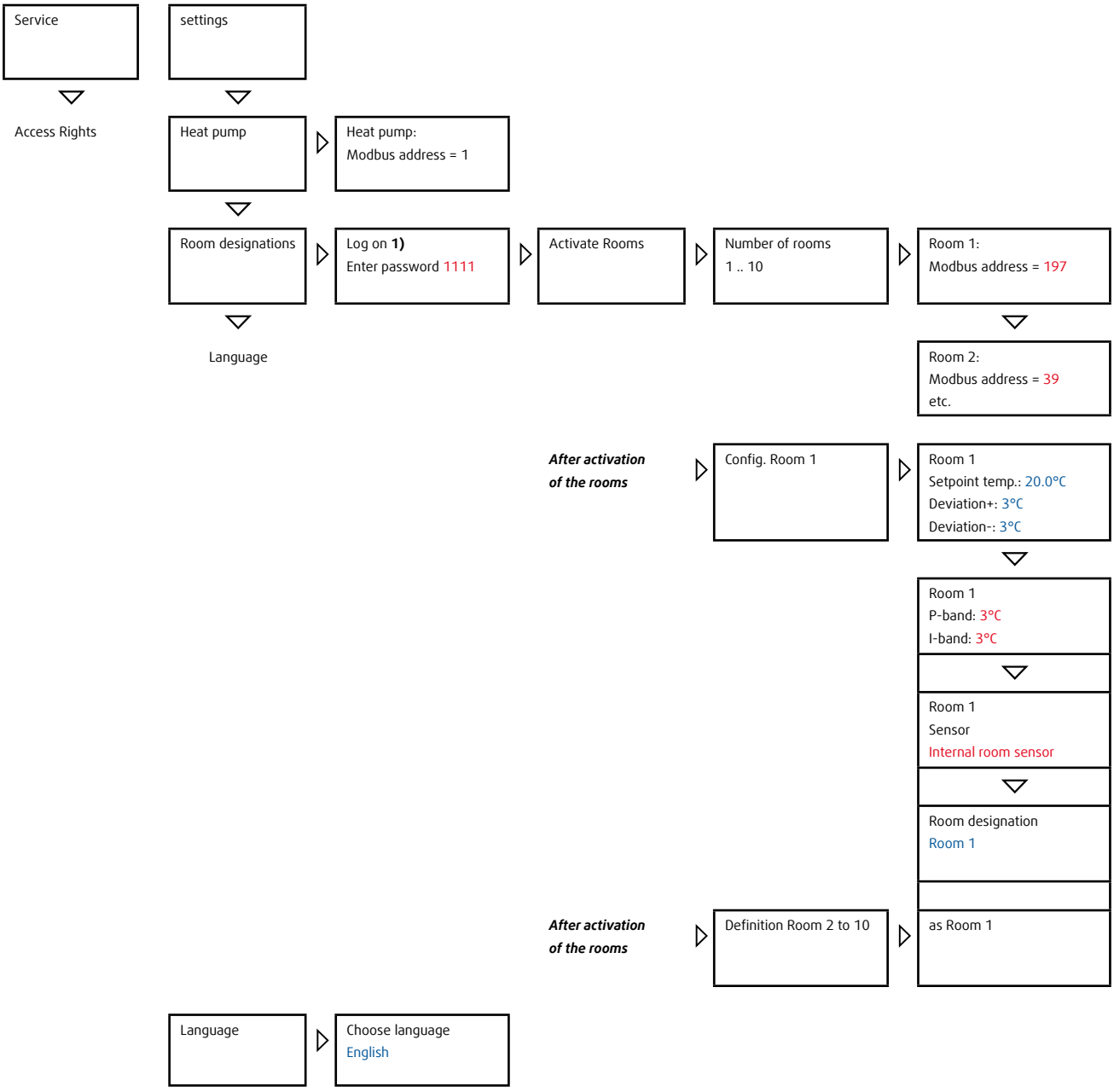

Holidays
Holiday (MM:DD)
1: 01-01 - 01-01
2: 01-01 - 01-01
3: 01-01 - 01-01
Summer/Winter time
...
Holiday (MM:DD)
19: 01-01 - 01-01
20: 01-01 - 01-01
21: 01-01 - 01-01
Summer/Winter time
Automatic summer/
Summer/Winter time: Yes
Service
settings
Supply air temperature
Heating/cooling: Auto
Cooling
Outdoor temp. > 26 °C
Heating
Outdoor temp. < 20 °C
Access Rights
Heat pump
Hot Water
Cooling Mode setp.
Cooling Mode setp.
Type of Setpoint:
Outdoor temp. Managed
Setpoint cooling curve
32= 26 °C, 28= 24 °C
30= 25 °C, 26= 23 °C
Shift: 0 °C
Heating Mode setp.
Type of Setpoint:
Outdoor temp. Managed
Setpoint heating curve
-20= 23 °C, 0= 21 °C
-10= 22 °C, 15= 20 °C
Shift: 0 °C
Room temp. Reduce by:
0 °C in setback operation
Holiday mode temp.: 18 °C
Rotor alarm temp.:
19 °C
max./min. Supply air temp.
min.: 16.5 °C
Max.: Automatic
max. supply air temperature
Auto
-15= 52 °C, 5= 44 °C
-5= 48 °C, 15= 40 °C
Shift: 0 °C


Service
settings
Supply air temperature
Heat pump
Hot Water
Hot Water mode:
Automatic
Night cooling
Night cooling active: No
Filter change
Outdoor temp. night
Max.: 15.0 °C
min.: 5.0 °C
Room temp. min.: 20 °C
Active when outdoor temp.
22°C
Filter change
Reset alarm time
Filter alarm
Reset alarm: No
Set alarm time
Filter life
activation: 12 mon.
Time since last
change: 0 mon.

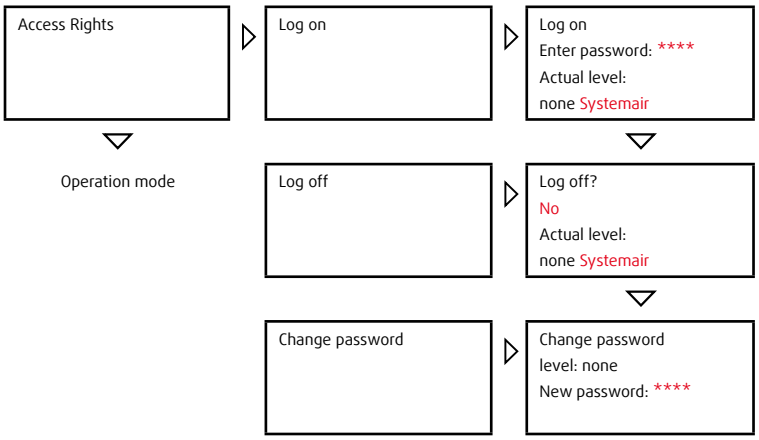

Service
settings
Access Rights
Heat pump
Heat pump:
Modbus address = 1
Room designations
Config. Room 1
Room 1
Setpoint temp.: 20.0 °C
Deviation+: 3 °C
Deviation-: 3 °C
Room designation
Room 1
Definition Room 2 to 10
as Room 1
Language
Choose language
English



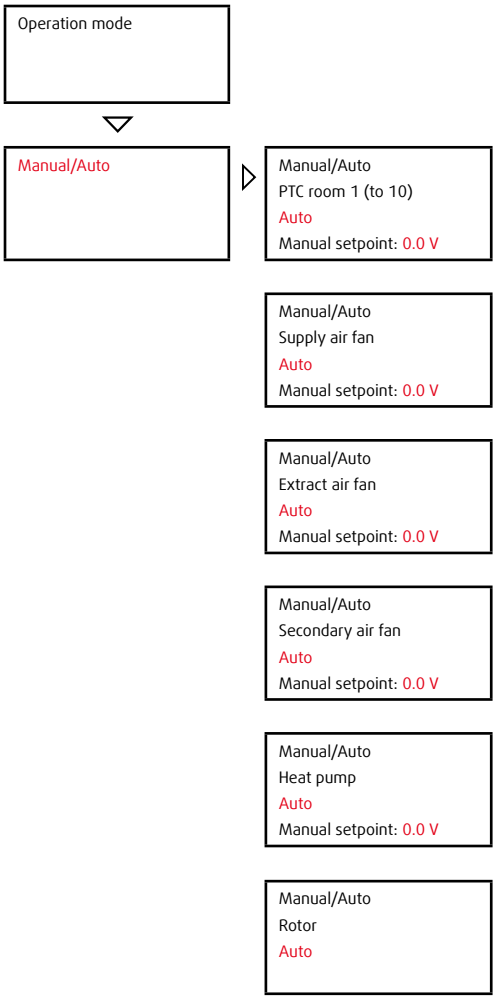
Activate rooms:

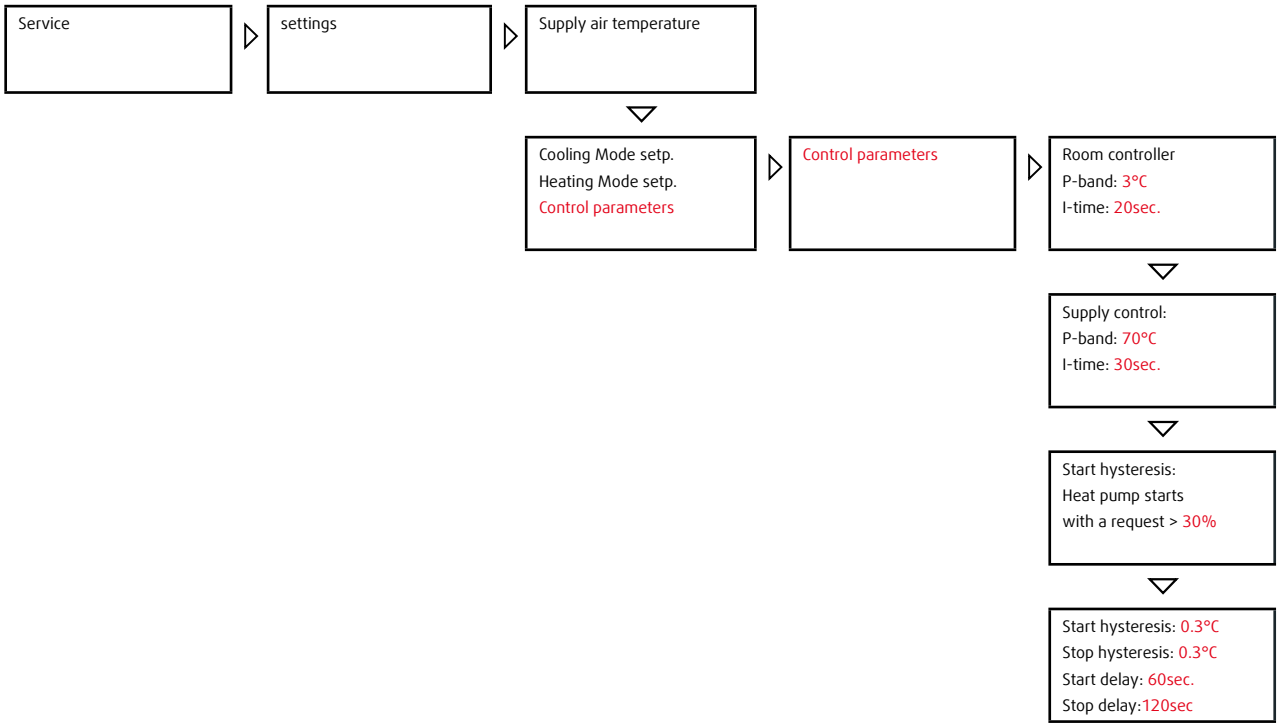


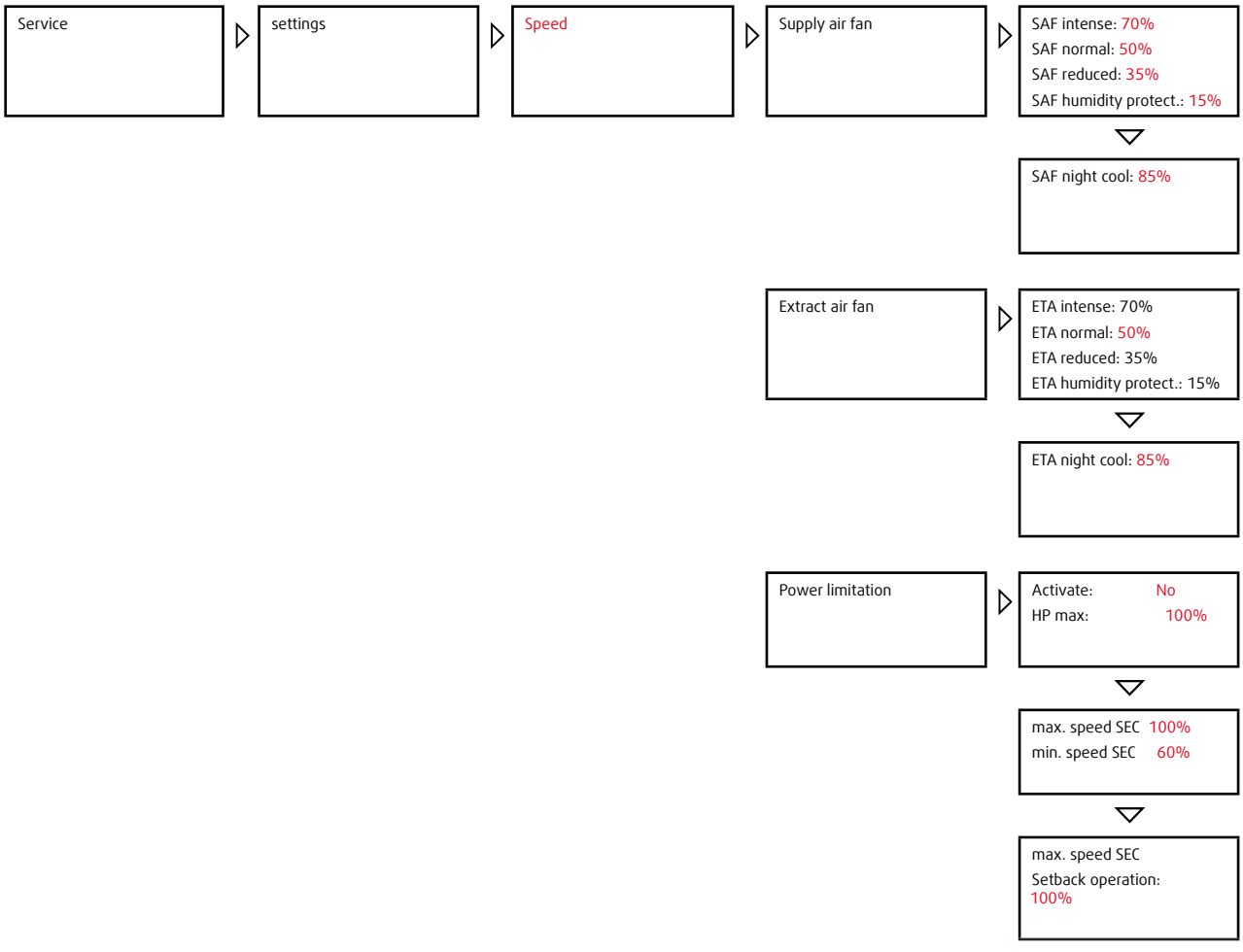
1) This window will not be shown when rooms are already activated. To activate further rooms, use the log on via access rights and select room definitions.

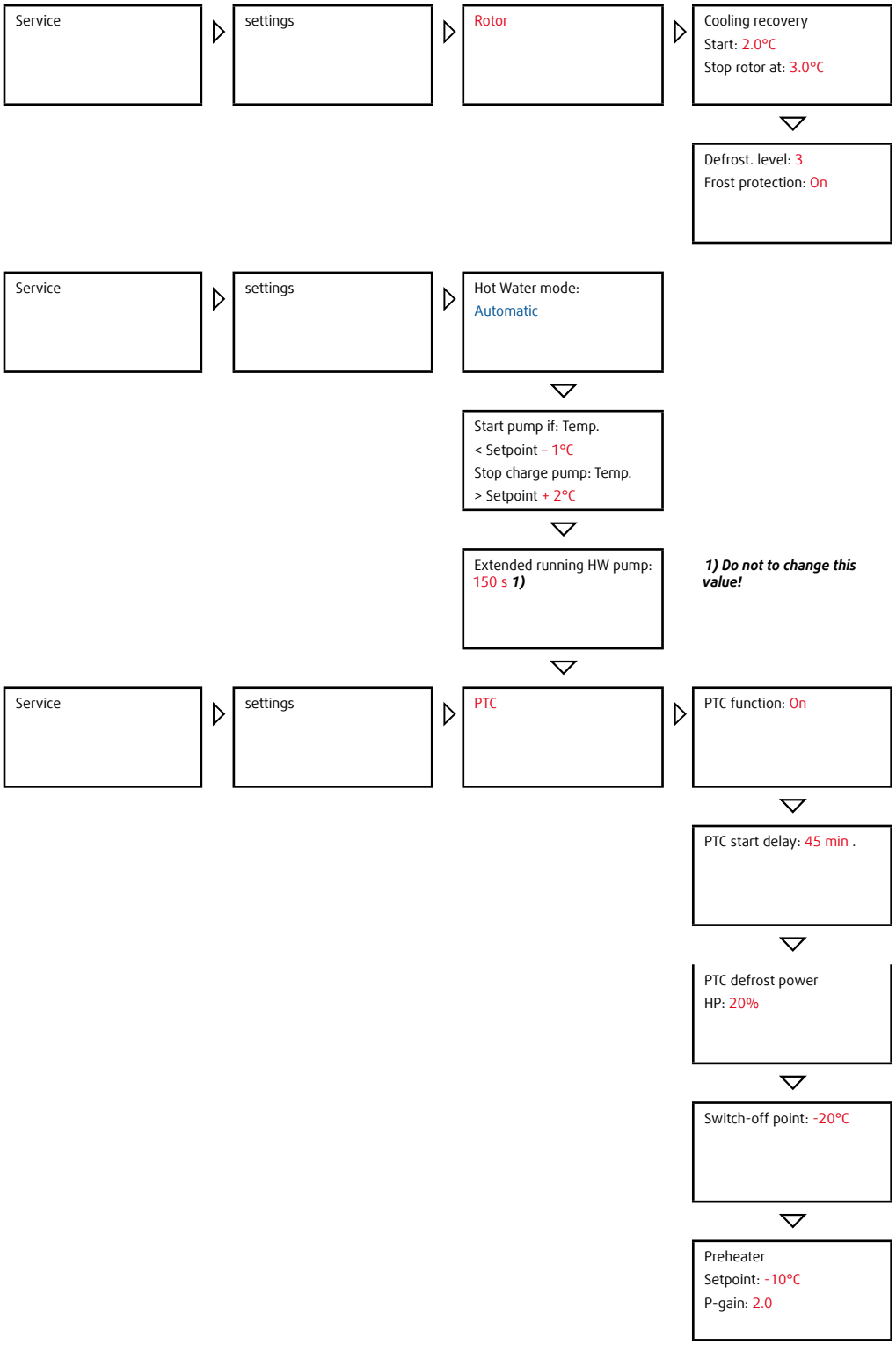


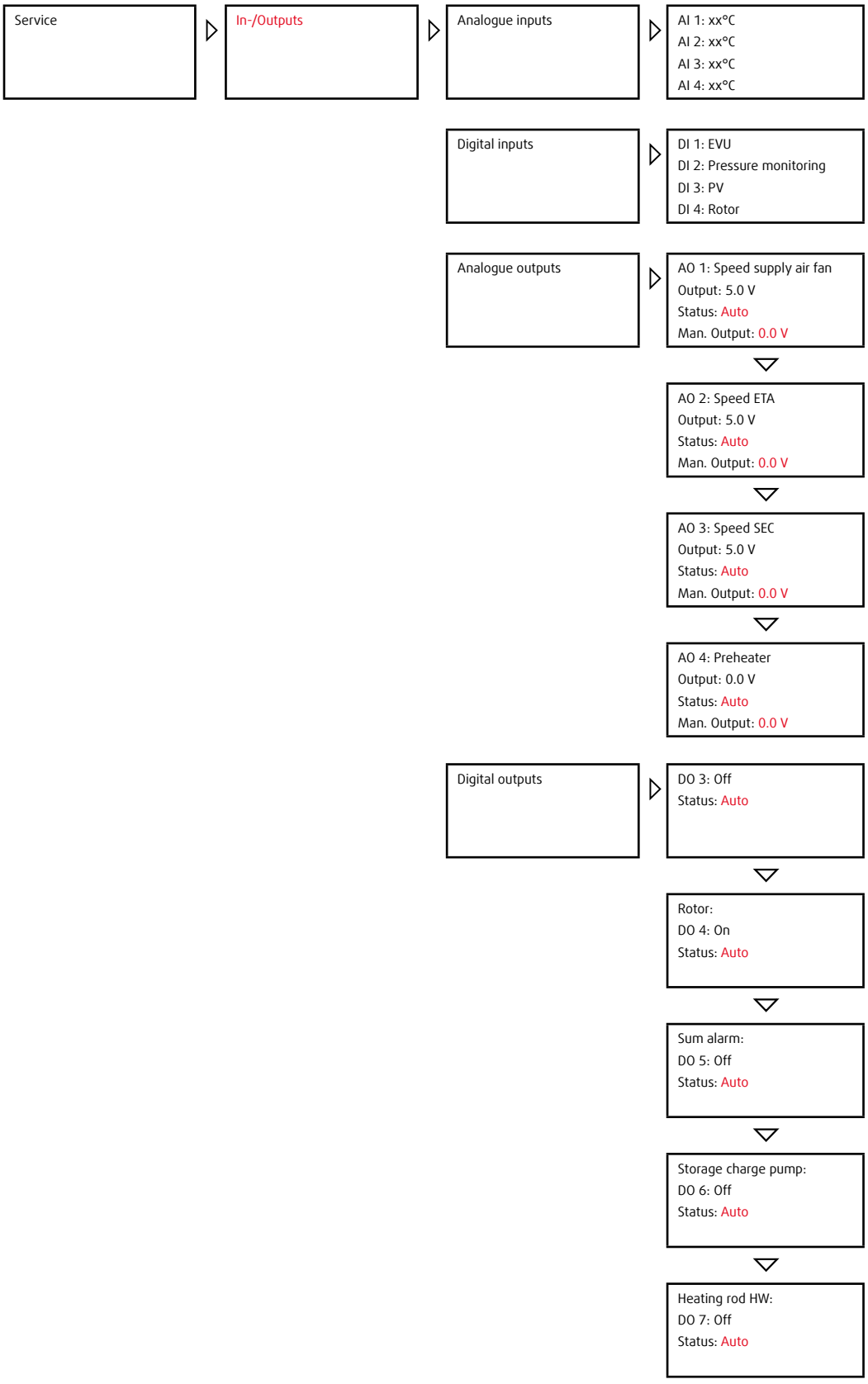
The following display settings/lines will be shown only after log on:




Service
settings
Supply air temperature
Cooling Mode setp.
Heating Mode setp.
Control parameters
Control parameters
Room controller
P-band: 3°C
I-time: 20sec.
Supply control:
P-band: 70°C
I-time: 30sec.
Start hysteresis:
Heat pump starts
with a request > 30%
Start hysteresis: 0.3°C
Stop hysteresis: 0.3°C
Start delay: 60sec.
Stop delay:120sec


Service
settings
Speed
Supply air fan
SAF intense: 70%
SAF normal: 50%
SAF reduced: 35%
SAF humidity protect.: 15%
SAF night cool: 85%
Extract air fan
ETA intense: 70%
ETA normal: 50%
ETA reduced: 35%
ETA humidity protect.: 15%
ETA night cool: 85%
Power limitation
Activate: No
HP max: 100%
max. speed SEC 100%
min. speed SEC 60%
max. speed SEC
Setback operation:
100%


Service
settings
Rotor
Cooling recovery
Start: 2.0°C
Stop rotor at: 3.0°C
Defrost. level: 3
Frost protection: On
Service
settings
Hot Water mode:
Automatic
Start pump if: Temp.
< Setpoint – 1°C
Stop charge pump: Temp.
> Setpoint + 2°C
Extended running HW pump:
150 s 1)
1) Do not to change this value!
Service
settings
PTC
PTC function: On
PTC start delay: 45 min .
PTC defrost power
HP: 20%
Switch-off point: -20°C
Preheater
Setpoint: -10°C
P-gain: 2.0


Service
In-/Outputs
Analogue inputs
AI 1: xx°C
AI 2: xx°C
AI 3: xx°C
AI 4: xx°C
Digital inputs
DI 1: EVU
DI 2: Pressure monitoring
DI 3: PV
DI 4: Rotor
Analogue outputs
AO 1: Speed supply air fan
Output: 5.0 V
Status: Auto
Man. Output: 0.0 V
AO 2: Speed ETA
Output: 5.0 V
Status: Auto
Man. Output: 0.0 V
AO 3: Speed SEC
Output: 5.0 V
Status: Auto
Man. Output: 0.0 V
AO 4: Preheater
Output: 0.0 V
Status: Auto
Man. Output: 0.0 V
Digital outputs
DO 3: Off
Status: Auto
Rotor:
DO 4: On
Status: Auto
Sum alarm:
DO 5: Off
Status: Auto
Storage charge pump:
DO 6: Off
Status: Auto
Heating rod HW:
DO 7: Off
Status: Auto

12 Room Controller

12.1 Description/Operation

Detecting the room temperature and routing a request are the prior functions of room controllers.

Figure 39: Room controller

1 On/Off button

2 UP button

3 DOWN button

On/Off button

☞ The ON/OFF button deactivates the specific room.

» Consequence: The setpoint temperatures will change. The room will no longer be controlled individually. Depending on the settings, the temperature follows a different set value.

On/Off button

☞ The UP/DOWN button changes the room setpoint temperatures.

NOTE: These changes can be done via internet/App and are described there.

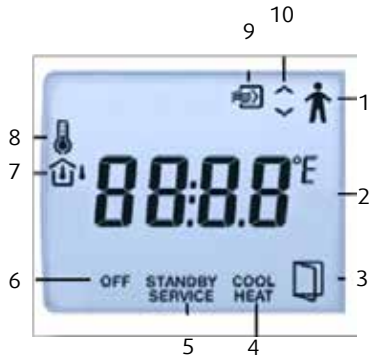


Figure 40: Room controller display

1 Occupation: Room active

2 Actual room temperature [°C]

3 Service relevant; deactivated for the indicated configuration

4 Actual unit condition:
- Heating: Off (no display);
- Cooling: not displayed,
- Ventilation: active
- Electric reheater: active (heat)
- Window contact: active (cool)

5 Relevant for service

6 Off: Room deactivated

7 Deactivated for the indicated configuration

8 Setpoint: Room temperature changeable

9 Service relevant; deactivated for the indicated configuration

10 Temperature changeable

13 Comfort and Energy Efficiency

13.1 Utility Company Rates

RECOMMENDATION

Before unit installation, consult the utility company and the electrical installation company for your suitable rate.

13.1.1 Heat Pump Special Rate with Forced Interruption

Most energy supply companies (utilities) offer special rates for heat pumps. These tariffs are linked to the right for the energy supply companies to separate the heat pump daily up to three times for one or two hours from the power network. The energy supply companies usually lay down mandatory interruption times. A sufficient hot water buffer is recommended to ensure constant comfort.

The combi unit ***Genius*** can not be operated with a buffer based on the pure air heating principle. However, a house with low energy or passive house standard acts as a buffer. An appropriate insulation of the house saves enough energy to bridge interruption times.

13.1.2 Heat Pump Special Rate without Forced Interruption

The power input of the combi unit ***Genius*** is lower than 3 kW. Many energy supply companies offer a heat pump special rate without forced interruption for this performance class.

13.1.3 Heating current/Night current

To avoid interruption times, the so called heat current or night current an is an alternative. The tariff is often split in high tariff periods (HT) and low-tariff period (LT).

☞ Select this tariff if the unit approaches the operating limits in the low energy rate and no heat pump tariff is available without forced interruption.

13.2 Setpoint Temperatures/Settings

13.2.1 Winter Operation

If the operating limits and the requirements meet planning and installation, the system will ensure the comfort even at low outdoor temperatures without additional heating. To optimize the efficiency of the system, a very low supply air temperature is necessary. However, it must be sufficiently high that it can cover the heat demand.

Changing the max. supply air temperature

NOTE

The default settings ensure usually a comfortable operation with high energy efficiency. The temperature can be adjusted individually.

A curve is stored and described on the ***Settings*** page which changes the maximum supply air temperature depending on the outdoor temperature. It can be shifted parallel for fine adjustment. The temperature can also be set manually. Due to the modulating operation of the combi unit, the supply air temperature decreases when approaching the room temperature setpoint. In addition, the heat pump decreases its performance automatically after reaching the max. supply air temperature.

RECOMMENDATION

Modifying the curve or the use of manual settings requires a corresponding user behaviour. It should only be performed by technically skilled persons.

At lower insulation standard, large living area or longer cold periods, it may be necessary to shift the curve upwards. The default curve of the maximum supply air temperature is a good method to control the temperature of the heat generator only as high as necessary. Due to different conditions, a readjustment can be necessary.

Changing the heating curve

NOTE

The default settings ensure usually a comfortable operation with high energy efficiency. The temperature can be adjusted individually.

Any reduction of the setpoint room temperatures by 1 °C leads to an energy saving of about 6%. However, you should never give up comfort. Therefore, a heating curve was stored as a default setting in ***Settings***. This curve provides a gradual increase of the setpoint temperature with decreasing outdoor temperature (see ***Settings***).

This compensates the influence of the lower surface temperatures of room walls and windows to comfort. A parallel offset and other setpoint settings enable the user an individual adjustment.

Individual room temperature control

A special control is the individual room temperature control. This is the most energy consuming but also the most convenient control method, as the PTC elements are constantly activated. Different temperature control of bedrooms and living rooms provide a comfortable profit especially in very cold winter periods. These periods and therefore also the energy consumption is limited.

The combination of outdoor temperature compensated and individual room temperature control ensures highest comfort, but is also energy intensive. Different user behaviour and demands can be taken into regard by different control options.

Residential ventilation

A manual window ventilation is not required due to the system integrated controlled residential ventilation. This is especially important in winter and as a basic requirement for proper heating.

Window shading

The windows should not be shaded to ensure a solar input and thus to reduce the heating demand.

Night setback

A night setback is integrated in the control. In a building with very good thermal insulation, the effect of the night setback has a negligible importance. A night setback can be recommended for the outdoor compensated room setpoint offset (factory setting), because an automatic setpoint increase can be avoided or compensated.

13.2.2 Summer Operation

Active cooling

Due to modern building standards, active cooling has become considerably more important. It is very difficult to nearly impossible to carry away the generated heat of unintended solar entry or increased internal loads in summer.

The combi unit ***Genius*** realizes the cooling function by a reverse cycle. However, this feature is not comparable to an air conditioning system, since the maximum input power and thus the possible cooling performance of the heat pump is limited due to the design according to the heating load. In addition, negative side effects of an air conditioning system can be avoided, such as high power consumption or unpleasant low air temperatures.

RECOMMENDATION

Ensure in summer that the solar entry will be largely minimized as well as to minimize and control internal loads. This is a fundamental condition for energy efficiency houses ensure a comfortable living standard in general as well as for a proper cooling function of the unit.

However, activate the cooling function when needed in time. Otherwise, the cooling load can be reduced only inadequate.

By the cooling curve stored in the control (see ***Settings***), the temperature setpoint is gradually increased in order to avoid large temperature differences between indoor and outdoor temperature. In addition, the cooling energy consumption is reduced. A useful side effect of active cooling is an associated dehumidification. It improves the comfort especially on hot, humid days.

Basically, it is in the users discretion whether, and if so, how he uses the cooling function. The increased power consumption must be considered even during the summer months when intensively used.

The starting point for the active cooling is freely selectable (see ***Settings***, default settings 26 °C). The minimum supply air temperature for cooling mode is activated by default to 16.5 °C for comfort reasons.

An increase or decrease of the minimum value is only useful in exceptional cases. It may be necessary e.g. according to an unintended high solar entry, to reduce the supply air temperature over a certain time period to discharge the cooling load.

Cooling recovery by the rotating heat exchanger

The cooling recovery by the rotary heat exchanger can not to be compared to active cooling. The warm outdoor air is only pre-heated by the cooler extract air. The cooling capacity is low. However, when the night cooling is activated (see ***Settings***), this power is increased. The setting ***Night cooling*** is particularly suitable for a considerably cooling-down of the outside temperature in the night.

13.2.3 Hot Water Generation

Energy-efficient hot water comfort is a challenge, especially for heat pumps. An intelligent control as well as a corresponding user behaviour is important for this.

Setpoint temperature change

The setpoint temperature is preset at 45 °C, i.e. the hot water generation starts at a value of 44 °C and ends at 47 °C. This so-called hysteresis is adjustable in the service level. It should remain unchanged in order to ensure an adequate working zone. In contrast, the setpoint can be gradually reduced to optimize this setting so that the comfort for the entire house is secured as well as high working coefficient is reached. A constant water exchange must be ensured, which is usually given in a single-family area. In case of longer absence, the setpoint temperature must be raised or the legionella function must be activated.

Electric heating rod

The combi unit ***Genius*** includes an electric heating rod of 3 kW. It ensures hot water comfort even during a failure of the heat pump (emergency operation), with a short-term high demand (quick charge, parallel operation with the heat pump) and during long periods of cold weather.

The bivalence point represents the performance limit of the heat pump depending on the outside temperature. If the bivalence point is undergone, the electric heating rod is switched on for hot water generation and to ensure the required heat demand. The default setting is -7 °C and should normally be maintained. If a decreasing DHW comfort occurs, this value must be corrected upwards. As days with average temperatures below -5 °C are very rare, the heating rod is hardly used.

In addition, the heating rod is activated in parallel with the heat pump from the actual temperature of 53 °C at setpoint temperatures of 52 °C.

Electric heating rod for legionella mode

The water is heated to a temperature of 60 °C with an activated legionella function. This happens once a week, on the night of Sunday to Monday.

Circulation system

A hot water circulation is not recommended for energetic reasons. If a hot water circulation is necessary due to unfavourable ducting, it must be carried out according to the standards. When using a circulation pump, a timer must be integrated, because an additional time program in the control is omitted intentionally. Alternatively, the use of a so-called self-learning pump is recommended.

NOTE

One- and two-family houses are excluded from the applicable requirements to the construction and operation of drinking water installations. Relevant regulations according to the state of the art which describe effective prevention of legionella growth in drinking water installations, have only an advisory purpose for small systems. They are not made mandatory. Therefore, it is in the users discretion whether and how he uses them.

⚠ WARNING

Scalding hazard

The water is heated to a temperature of 60 °C with an activated legionella function.

› In order to avoid injuries hands must be kept away from the water tank!

Hot water emergency operation

In the case of water heating in emergency mode (failure of the heat pump), the setting range is limited to 30 °C to 50 °C with a default setting of 40 °C. In this case, the drinking water is only electrically heated. This setpoint temperature should be increased only when needed. The function hot water emergency operation can only be activated manually and during heat pump alarm to avoid operating errors.

13.3 Fan Stages

The ventilation system as well as the setting of the nominal flow rate is adjusted by the specialist company during commissioning.

Ventilation system settings

- **Ventilation for humidity protection**
  Use this function only in case of longer absence.
  NOTE: Larger humidity loads despite absence should not be present, e.g. a large number of plants.
- **Reduced ventilation stage**
  Use this function in case of longer absence, optionally in the night.
  This function can be temporarily applied, if the air humidity is below the comfort limit during longer periods of cold weather.
  NOTE: Avoid dry air in winter by plants, laundry dryer in the house or other measures.
- **Nominal ventilation**
- **Intense ventilation**
  Select the "party mode" in order to remove short-term peak loads. This function is reset automatically after one hour.
- **Off**
  Switching off the unit must be ensured for safety reasons. Turn the ventilation unit to ***Off*** when you ventilate manually.

RECOMMENDATION

Turn the ventilation unit only to ***Off*** in exceptional circumstances, e.g. when you ventilate manually.

Remember, however, that the solar entry on hot days can increase in a way that the cooling load can not be discharged without active cooling.

The energy savings by heat or cooling recovery, heat loss prevention in winter as well as heat entry in summer compensates the energy consumption of the fans.

14 Declaration of Conformity

The manufacturer:	**Systemair GmbH** **Seehöfer Straße 45** **D-97944 Windischbuch**	
herewith declares that the following product:	Description of the Products: Indication: Year of manufacture:	**Combi unit** **Genius** **2016**

all relevant regulations of the machinery directive 2006/42/EG
Electromagnetic Compatibility Directive (EMV) (2014/30/EG).

The following harmonised standards were used:

DIN EN ISO 12100:2013	Safety of machinery Principles for design - risk assessment and risk reduction
DIN N 60204-1:2010	Safety of machinery - Electrical equipment of machines Part 1: General requirements
DIN EN 60335-1:2014	Safety of household and similar electrical appliances Part 1: General requirements
DIN EN 13141-10:2008	Ventilation for buildings Performance testing of components / products for residential ventilation Part 8: Performance testing of unducted mechanical supply and exhaust ventilation units (including heat recovery) for mechanical ventilation systems intended for a single room
DIN EN 61000-6-1:2007	Electromagnetic Compatibility Directive: Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
DIN EN 61000-6-3:2012	Electromagnetic Compatibility Directive: Part 6-3: Generic standards - Immunity for residential, commercial and light-industrial environments

This declaration is issued under the responsibility of the manufacturer:

Boxberg, 28/02/2016	i. A. Kurt Maurer Director

15 Glossary

Setback operation	Heat the rooms in setback operation during periods of absence or sleep. The periods can be defined by using the time program for room heating. The rooms will be heated with reduced room temperature during these periods.
Alarm	An alarm informs that the system has reported an error to the controller.
Outdoor temperature compensated operation	In the outdoor air compensated mode the setpoint room temperature is controlled depending on the outdoor temperature. On the one hand heat is not more generated as needed and on the other hand a high comfort can be ensured.
User level for the operator	The user level includes all the features that can be changed by the operator.
Bivalence point	The bivalence point (dimensioning point) is the performance limit of the heat pump depending on the outdoor temperature. If the bivalence point is undergone, the electric heating rod is switched on for hot water generation and to meet the required heat demand.
Legionella	Legionella are aquatic bacteria that spread rapidly and can cause serious illness. Legionella occur where heated water offers optimal conditions for propagation. Short-term water heating above 60 °C will kill Legionella. The continuous exchange of water, as provided by the combi unit, prevents legionella growth.
Air filter	A component which extracts particulate material from the air. The supply air filter is a F7 pollen, secondary air and exhaust air filter of the class G4.
Reduced room temperature	Set the reduced room temperature (setback) for periods of your absence or sleep.
Rotating heat exchanger	Due to the rotation of the heat exchanger, supply and extract air flow through in one revolution alternately by the cells. Thus transfers the heat regenerative cycle the heat of extract air by rotation to the supply air. In summer, the principle works in reverse by the cooler extract air precools the warmer supply air. Thus, energy is recovered for air conditioning. And in addition, humidity recovery is taking place. When no power transmission is required, the rotor stops.
Protection class	The protection class indicates the suitability of electrical equipment for various environmental conditions and in addition to protecting people against potential dangers in their use.
Service level for the expert technician	The service level contains additional functions for the expert technician that may not be changed without expert knowledge. This service level is reserved for the expert technician and therefore protected by a password.
Safety valve	A safety device which must be installed in the water pipe by your certified heating company. The safety valve opens automatically so that the pressure in the hot water storage tank will not increase too high.
Setpoint temperature	Predetermined temperature to be achieved, e.g. room temperature setpoint.
Summer operation	Operating program for ***Cooling and hot water*** for the warmer seasons, i.e. if the rooms do not have to be heated.
Storage charge pump	Circulation pump for heating of drinking water in the hot water storage tank.
Winter operation	Operating program for ***Cooling and hot water*** for the cold season.
Time slot	A time slot is a preset time period in which heating, cooling or hot water generation are switched on.

SHEET	TITLE
1	INDEX
2	LAYOUT
3	AUXILIARY CIRCUIT
4	AUXILIARY CIRCUIT
5	AUXILIARY CIRCUIT
6	AUXILIARY CIRCUIT
7	AUXILIARY CIRCUIT
8	AUXILIARY CIRCUIT
9	AUXILIARY CIRCUIT
10	AUXILIARY CIRCUIT
11	AUXILIARY CIRCUIT
12	CIRCUITO AUSILARIO
13	TERMINAL BLOCK
14	PART LIST

CAREL

DESIGN	VOLTAGE EXERCISE 230V/400V	STANDARD	PROTECTION
SERIES	VOLTAGE CONTROLS 24V		
JOB	VOLTAGE SIGNALS		
CLIENT			

CM00009756R2

	DATE	NAME
DRAFT	31/08/2016	M.B.
VIEW		
APPR.		

EP SYSTEMAIR GENIUS MODEL

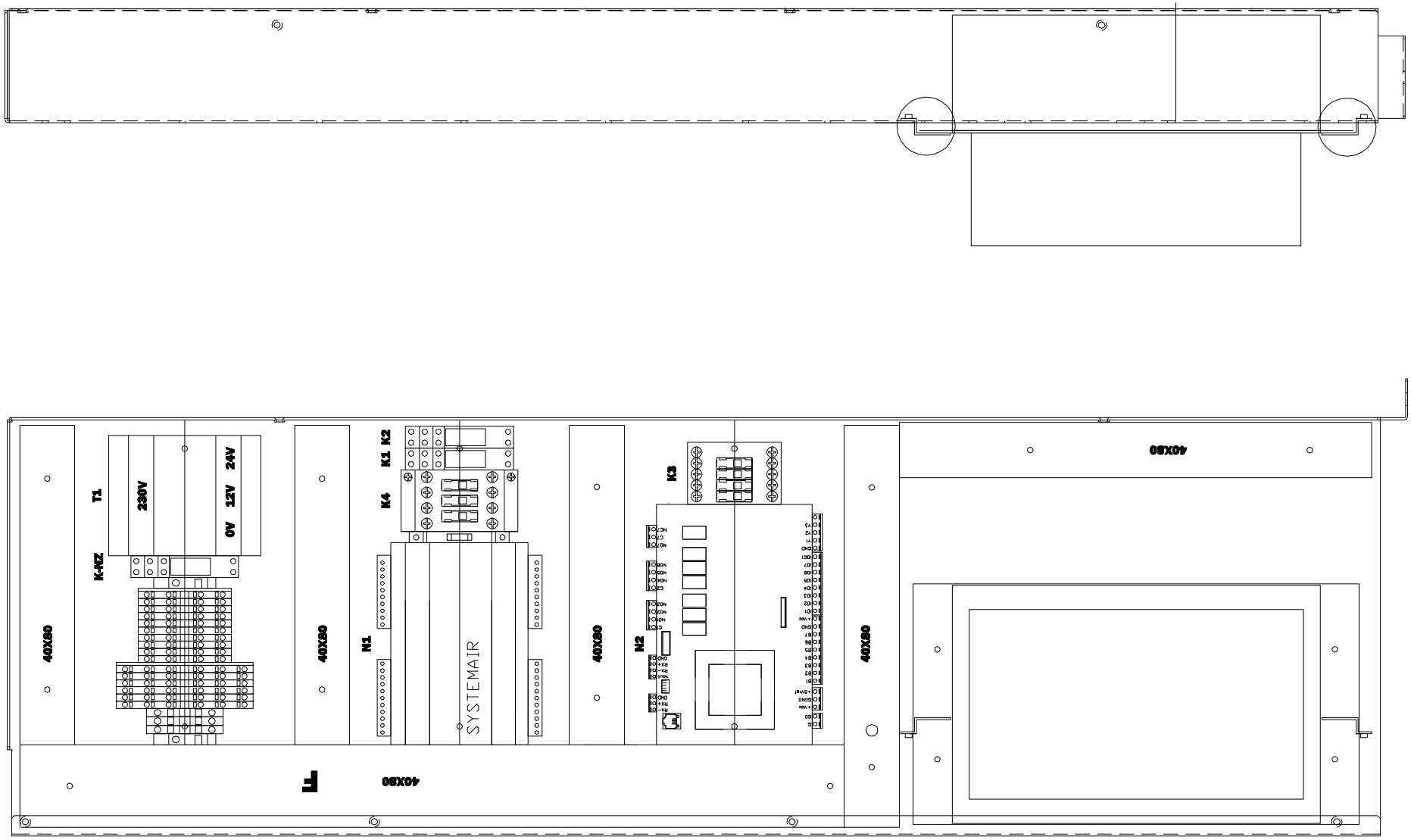
CM00009756R2.DWG

SHEET 1
T.F. 14

REV.	REVISION	DATE	NAME

Rev. 0 31/08/2016 M.B.

SHEET	OBJECT	DATE	Responsible	REVISION



unit of measure: mm

REV.	MODIFY	DATE	NAME

CAREL

LAYOUT

PROJECT CM00009756R2.DWG

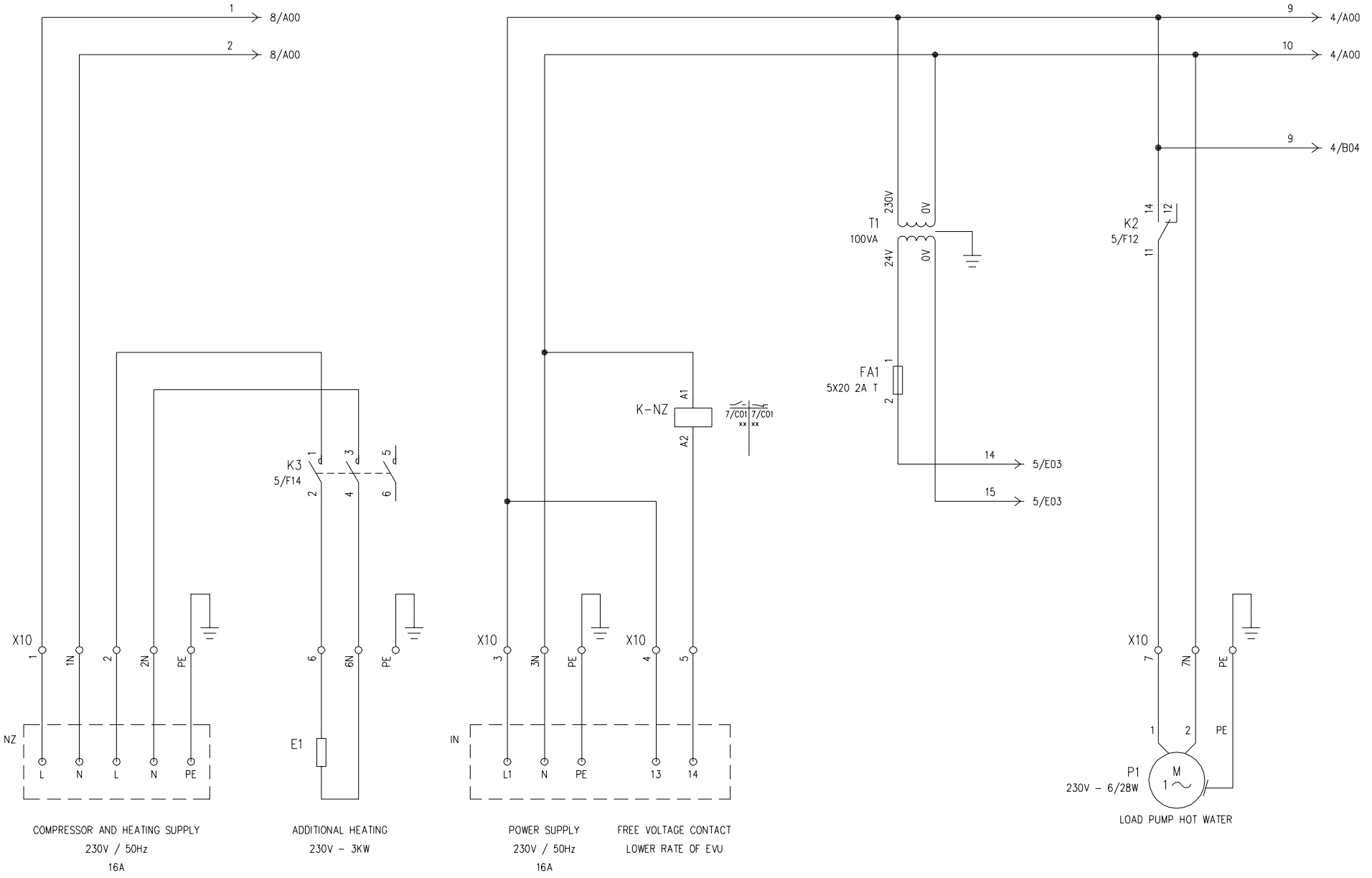
CLIENT

DRAFT M.B.

DATE 31/08/2016

SHEET 2 OF 14

FOLLOWS 3

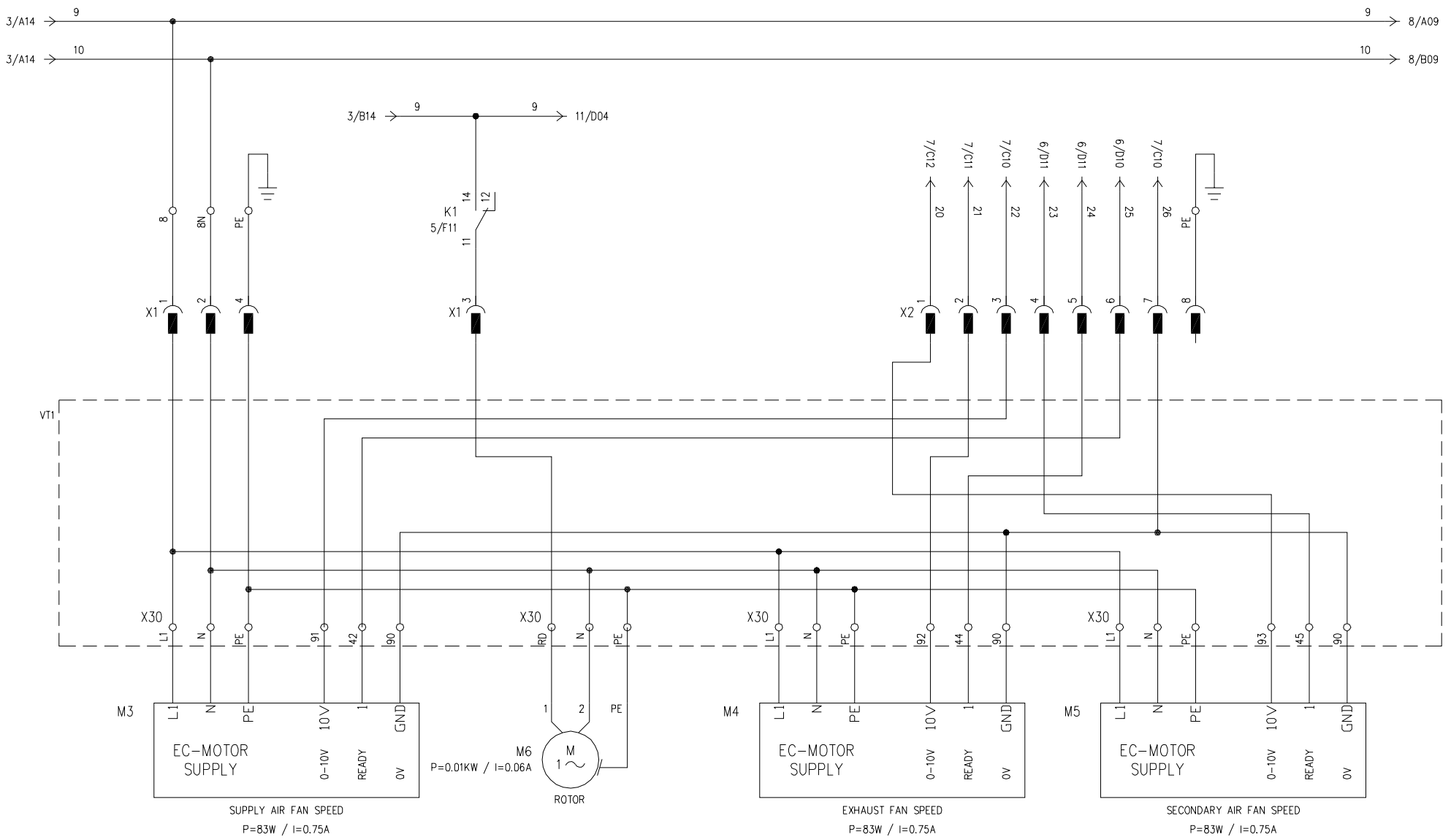


REV.	MODIFY	DATE	NAME

CAREL

AUXILIARY CIRCUIT

PROJECT	CM00009756R2.DWG
CLIENT	
DRAFT M.B.	DATE 31/08/2016
SHEET	3 OF 14
FOLLOWS	4



REV.	MODIFY	DATE	NAME

CAREL

AUXILIARY CIRCUIT

PROJECT CM00009756R2.DWG

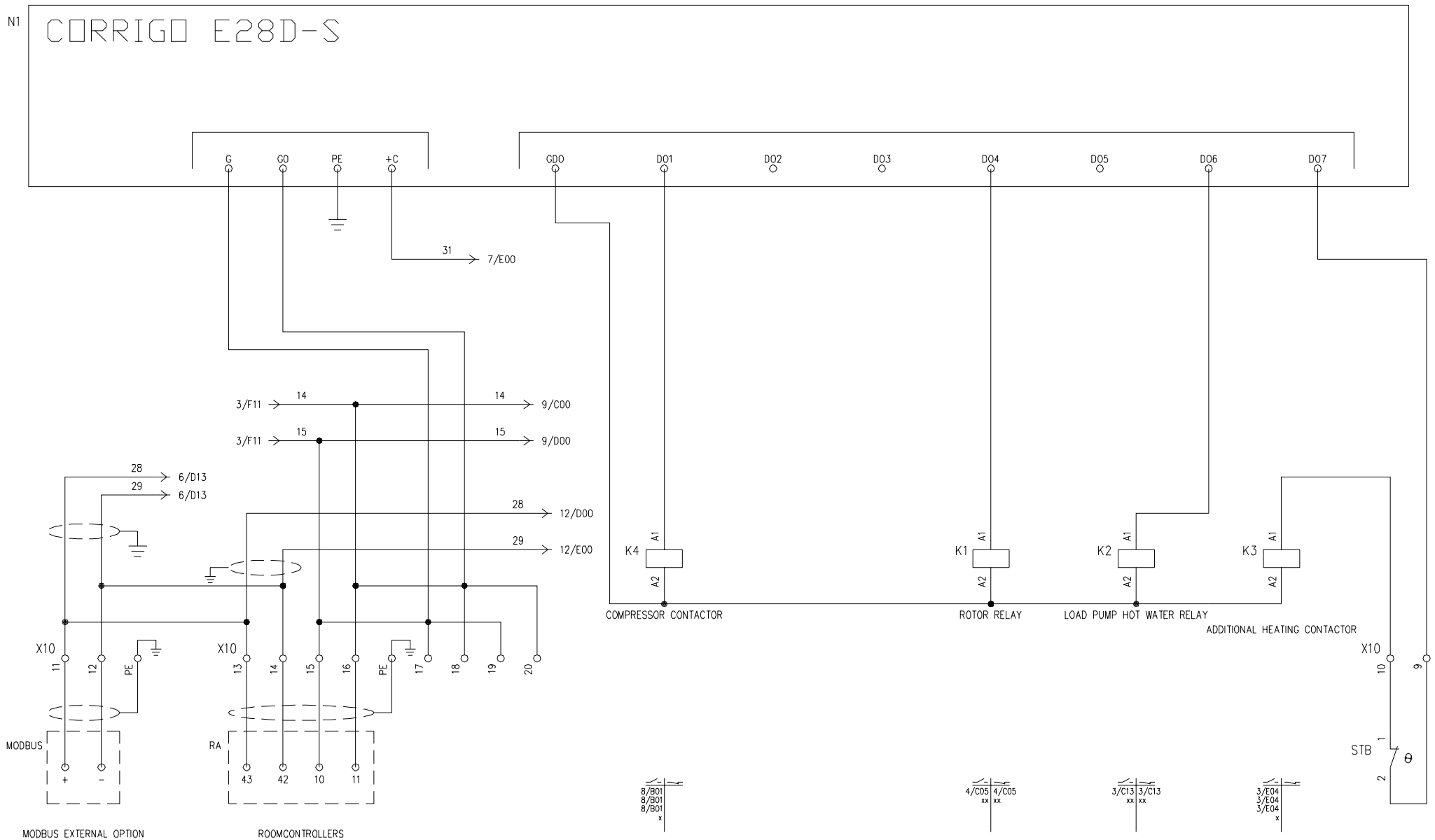
CLIENT

DRAFT M.B.

DATE 31/08/2016

SHEET 4 OF 14

FOLLOWS 5



REV.	MODIFY	DATE	NAME

CAREL

AUXILIARY CIRCUIT

PROJECT CM00009756R2.DWG

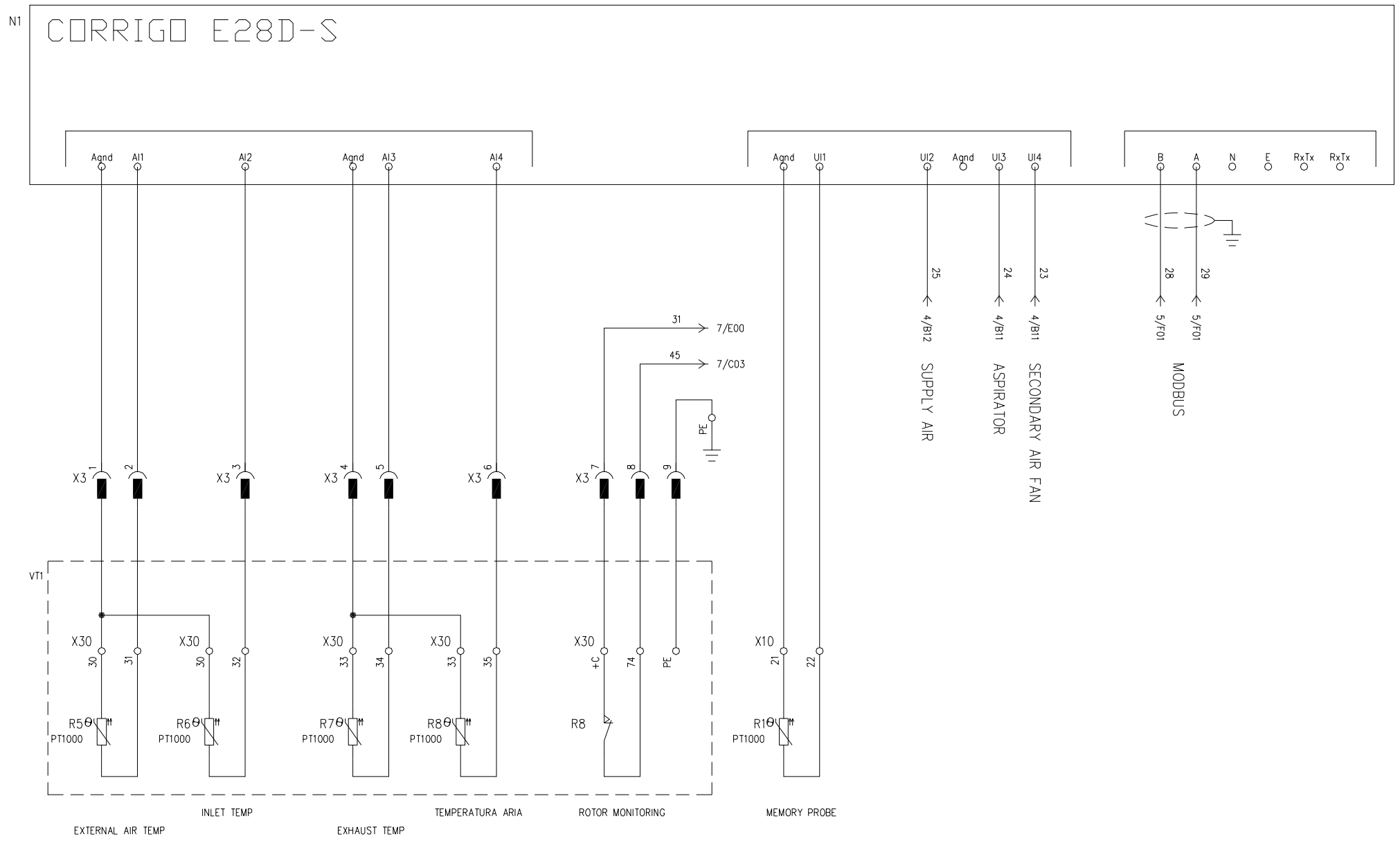
CLIENT

DRAFT M.B.

DATE 31/08/2016

SHEET 5 OF 14

FOLLOWS 6

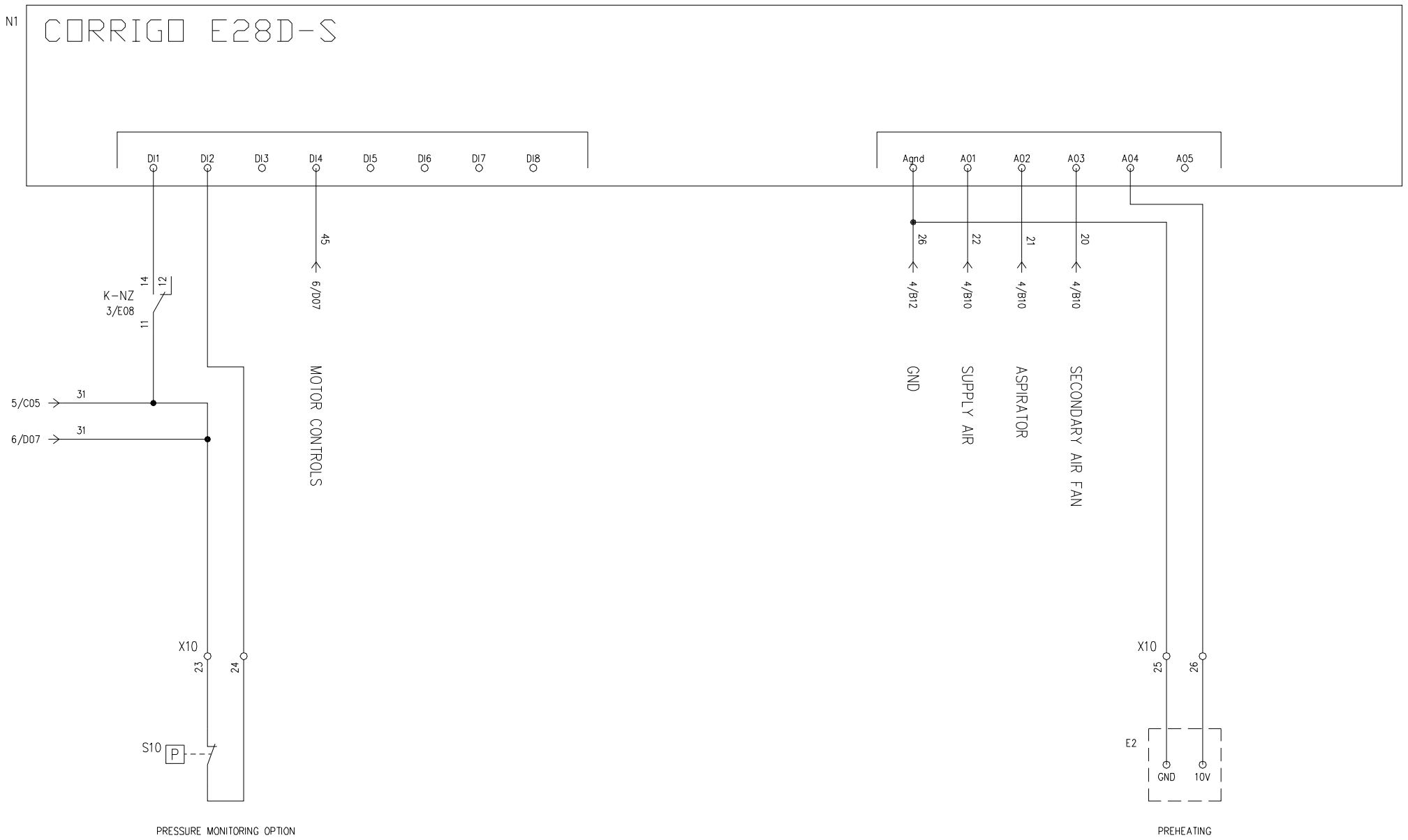


REV.	MODIFY	DATE	NAME

CAREL

AUXILIARY CIRCUIT

PROJECT CM00009756R2.DWG		
CLIENT		
DRAFT M.B.	DATE 31/08/2016	SHEET 6 OF 14
		FOLLOWS 7



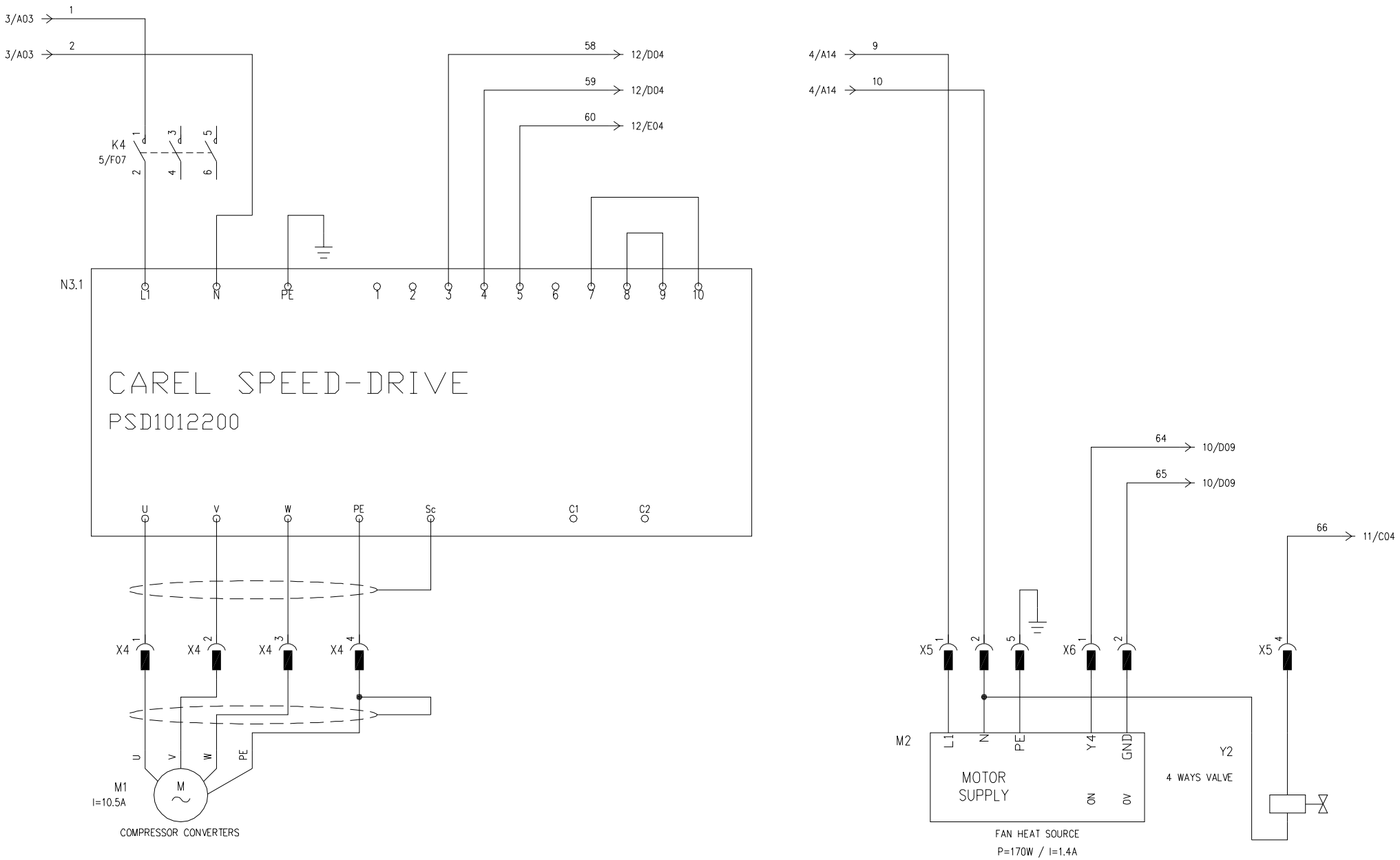
REV.	MODIFY	DATE	NAME

CAREL

AUXILIARY CIRCUIT

PROJECT	CM00009756R2.DWG
CLIENT	
DRAFT M.B.	DATE 31/08/2016

SHEET 7 OF 14
FOLLOWS 8

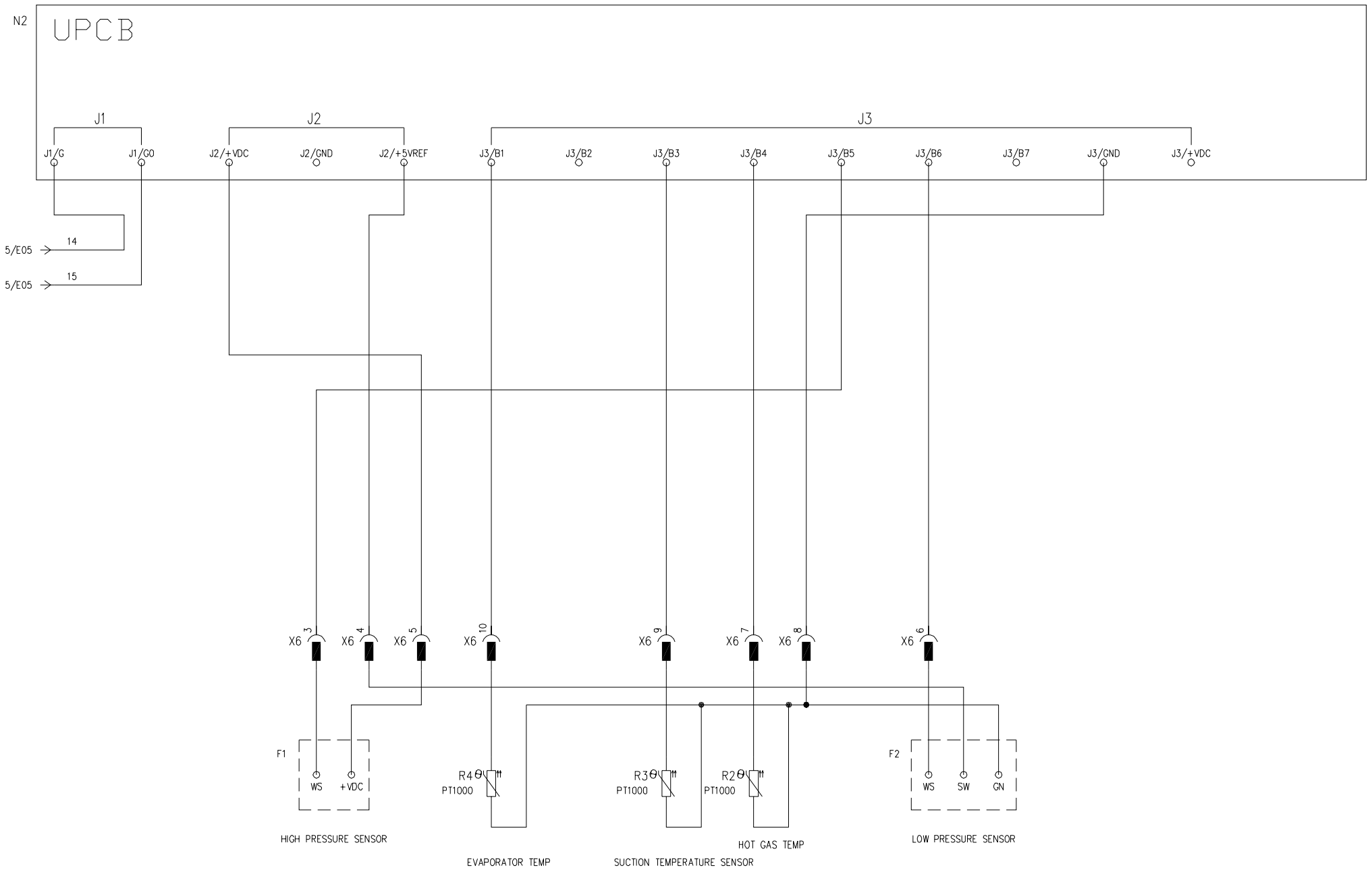


REV.	MODIFY	DATE	NAME

CAREL

AUXILIARY CIRCUIT

PROJECT	CM00009756R2.DWG
CLIENT	
DRAFT M.B.	DATE 31/08/2016
SHEET	8 OF 14
FOLLOWS	9

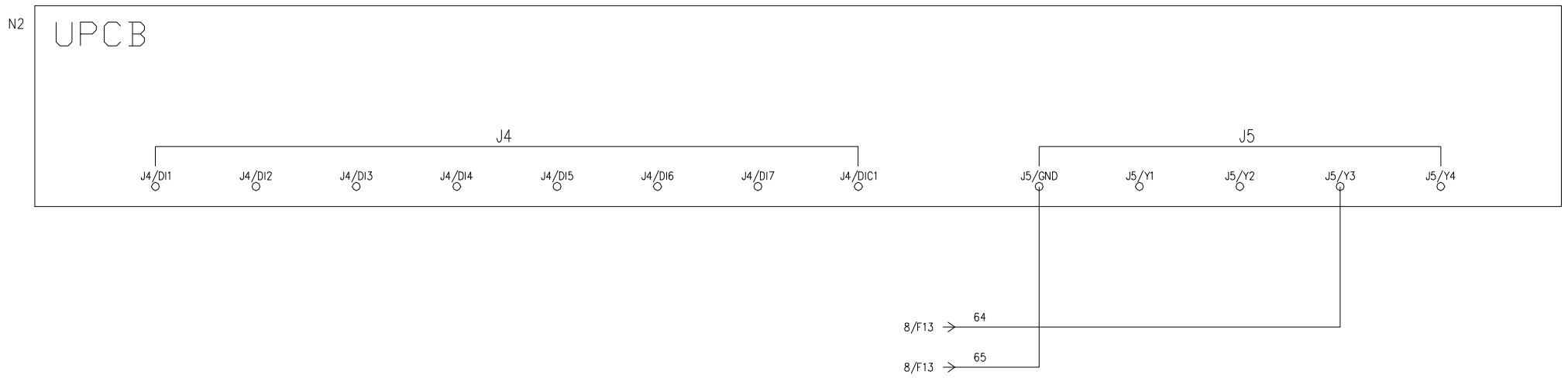


REV.	MODIFY	DATE	NAME

CAREL

AUXILIARY CIRCUIT

PROJECT CM00009756R2.DWG		
CLIENT		
DRAFT M.B.	DATE 31/08/2016	SHEET 9 OF 14
		FOLLOWS 10

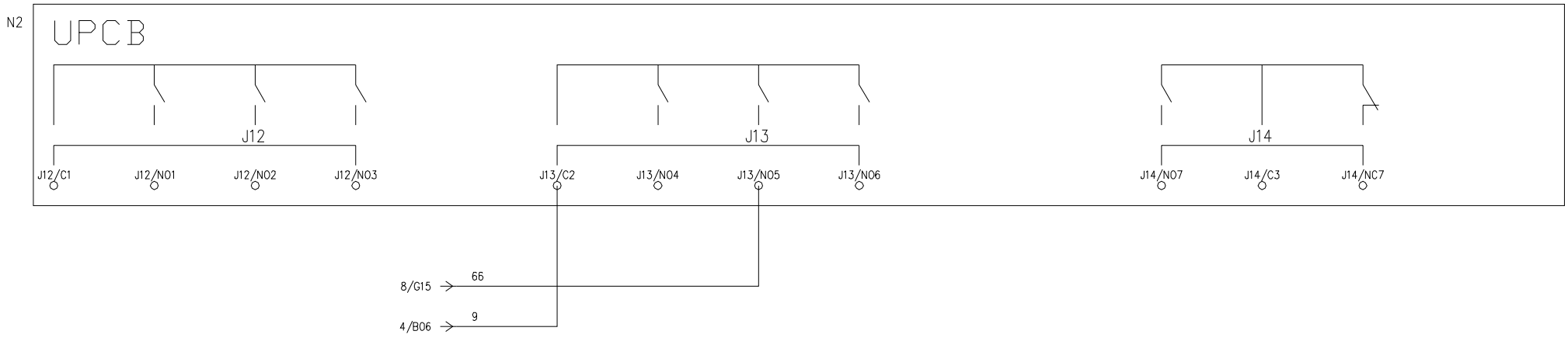


REV.	MODIFY	DATE	NAME

CAREL

AUXILIARY CIRCUIT

PROJECT CM00009756R2.DWG		
CLIENT		
DRAFT M.B.	DATE 31/08/2016	SHEET 10 OF 14
		FOLLOWS 11

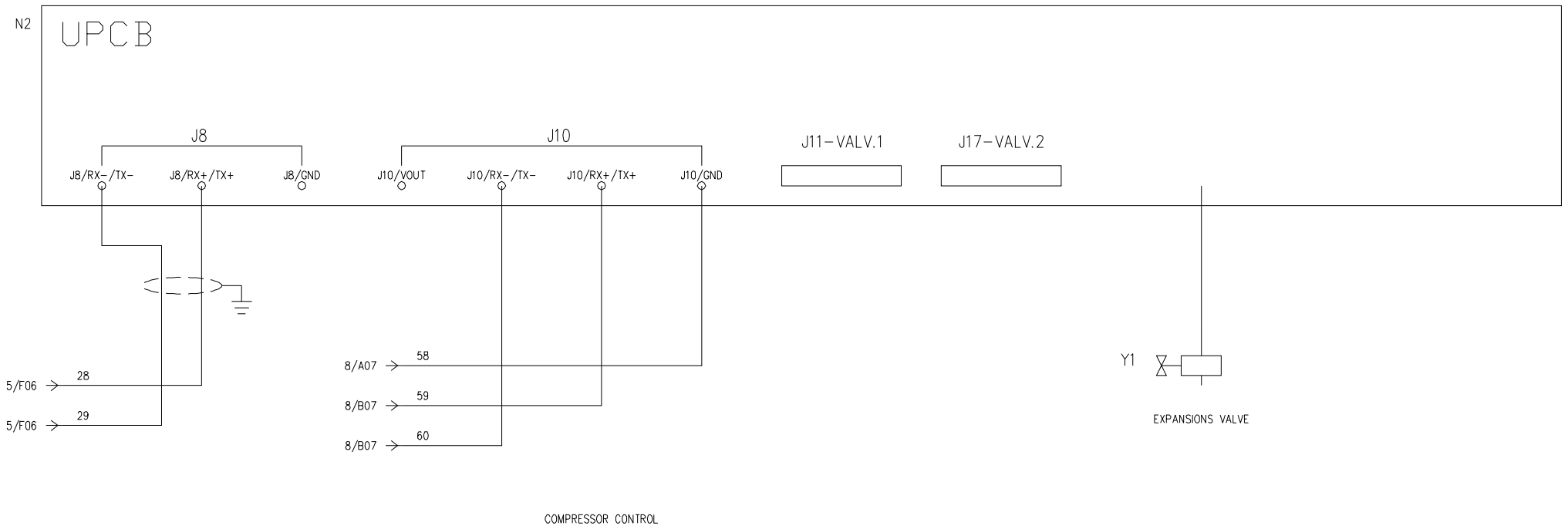


REV.	MODIFY	DATE	NAME

CAREL

AUXILIARY CIRCUIT

PROJECT	CM00009756R2.DWG
CLIENT	
DRAFT M.B.	DATE 31/08/2016
SHEET	11 OF 14
FOLLOWS	12

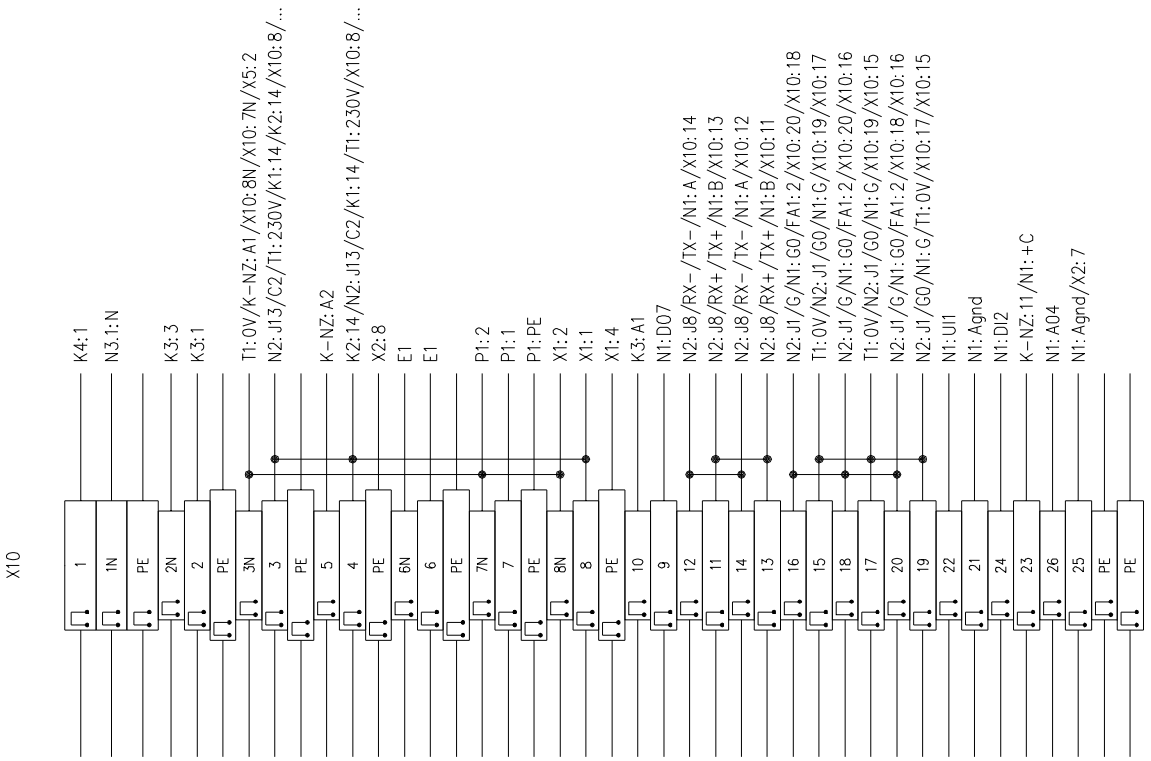


REV.	MODIFY	DATE	NAME

CAREL

CIRCUITO AUSILARIO

PROJECT	CM00009756R2.DWG
CLIENT	
DRAFT M.B.	DATE 31/08/2016
SHEET	12 OF 14
FOLLOWS	13



REV.	MODIFY	DATE	NAME

CAREL

TERMINAL BLOCK

PROJECT CM00009756R2.DWG		
CLIENT		
DRAFT M.B.	DATE 31/08/2016	SHEET 13 OF 14
		FOLLOWS 14

Sign	Description	Position	Description	Notes
E1	ADDITIONAL HEATING	3/H04		230V – 3KW
FA1	PROTECTION FUSE SECONDARY TRANSFORMER	3/D10	OMEGA	5X20 2A T
K1	ROTOR RELAY	5/F11	FINDER	40.61 24V
K2	LOAD PUMP HOT WATER RELAY	5/F12	FINDER	40.61 24V
K3	ADDITIONAL HEATING CONTACTOR	5/F14	MOELLER	DILM9–10 24V
K4	COMPRESSOR CONTACTOR	5/F07	MOELLER	DILM15–10 24V
K–NZ	RELAY	3/E08	FINDER	40.52 230V
M1	COMPRESSOR CONVERTERS	8/I01		I=10.5A
M2	FAN HEAT SOURCE	8/I10		P=170W / I=1.4A
M3	SUPPLY AIR FAN SPEED	4/H02		P=83W / I=0.75A
M4	EXHAUST FAN SPEED	4/H08		P=83W / I=0.75A
M5	SECONDARY AIR FAN SPEED	4/H12		P=83W / I=0.75A
M6	ROTOR	4/H06		P=0.01KW / I=0.06A
N1	CONTROLLER 1	5/B02	SYSTEMAIR	CORRIGO 28
N2	CONTROLLER 2	9/B00	CAREL	UPCB001DS0
N3.1	SPEED–DRIVE	8/D01	CAREL	PSD1012200
P1	LOAD PUMP HOT WATER	3/H13		230V – 6/28W
T1	TRANSFORMER	3/C10	MARINI	100VA
X1	CONNECTOR	4/D02	PHOENIX	SP 2,5/ 4
X2	CONNECTOR	4/D10	PHOENIX	SP 2,5/ 8
X3	CONNECTOR	6/F01	PHOENIX	SP 2,5/10
X4	CONNECTOR	8/H01	PHOENIX	SP 2,5/ 4
X5	CONNECTOR	8/H10	PHOENIX	SP 2,5/ 5
X6	CONNECTOR	8/H12	PHOENIX	SP 2,5/10
X10	TERMINAL BLOCK	3/H01	PHOENIX	ST4 (1–1N–PE) ST2.5 3L(2N/8N) STTB2.5 (9/26)
Y2	4 WAYS VALVE	8/I14		

REV.	MODIFY	DATE	NAME

CAREL

PART LIST

PROJECT CM00009756R2.DWG

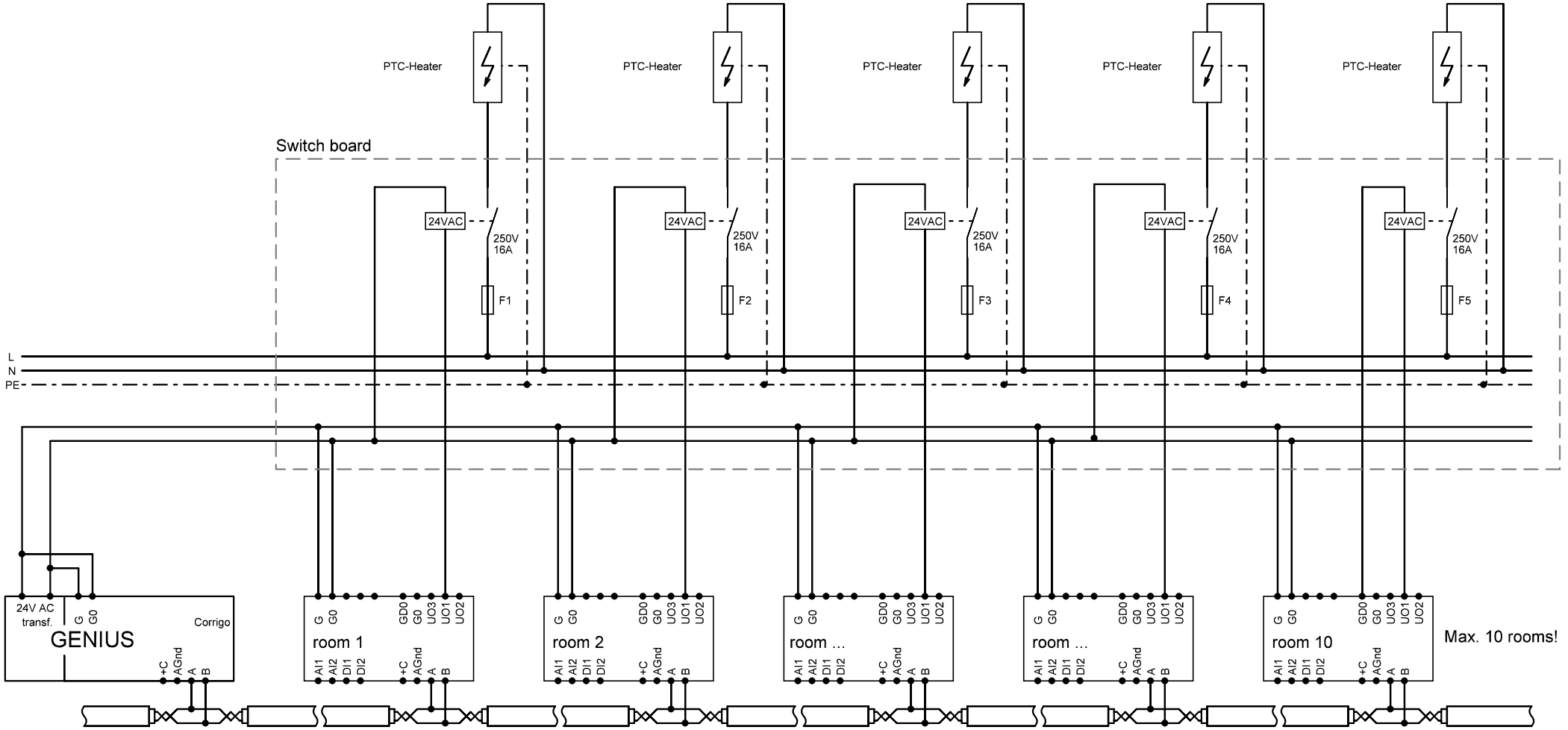
CLIENT

DRAFT M.B.

DATE 31/08/2016

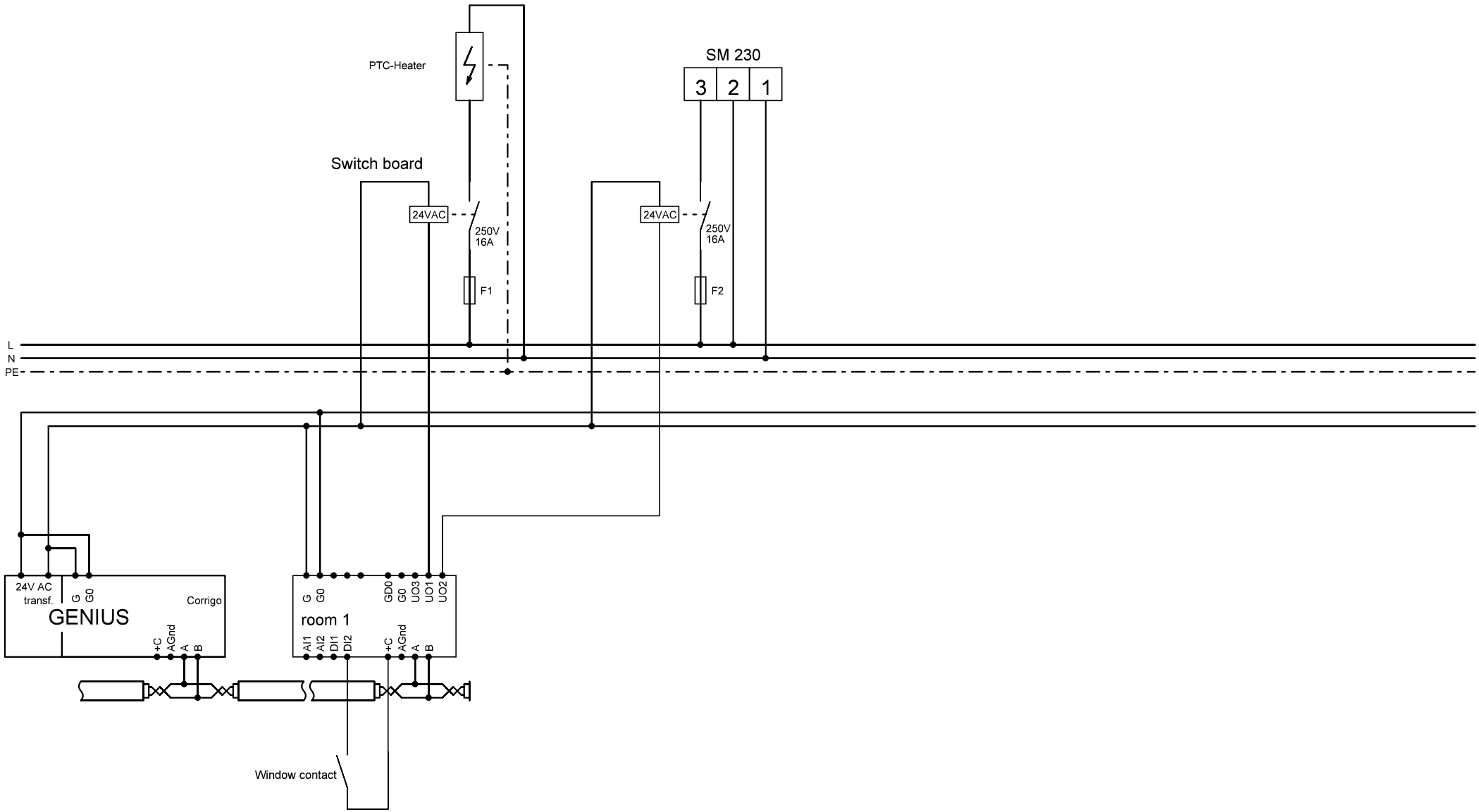
SHEET 14 OF 14

FOLLOWS



Installation and connection must be carried out by qualified personnel complying with valid electrical safety regulations (e.g. EN 60204)

Changes			Date	Name	Bezeichnung:	Pages:
Date	Name	gez.:	07.02.13	PEES	Genuis Roomunits	
01.12.15	PEES	gepr.:				Page-No.:
25.07.16	PEES	systemair			Zeichnungs-Nr.: Raumfühler_Index 2_en.spl7	



Installation and connection must be carried out by qualified personnel complying with valid electrical safety regulations (e.g. EN 60204)

Changes			Date	Name
Date	Name	gez.:	04.04.16	PEES
25.07.16	PEES	gepr.:		

systemair

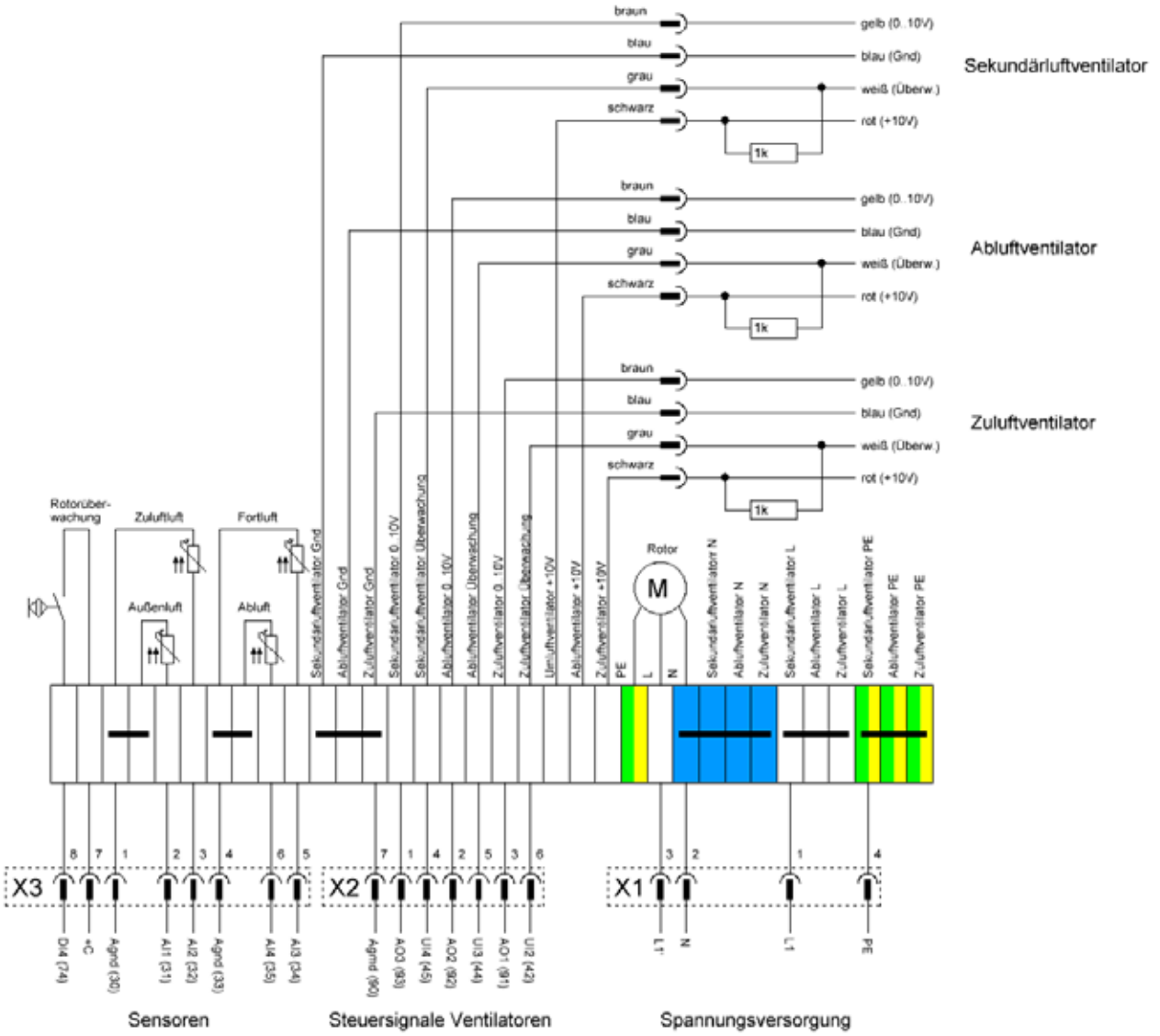
Bezeichnung:
Genuis
window contact

Zeichnungs-Nr.:
Klappe_Fensterkontakt_en.spl7

pages:

page-no.:

Terminal block ventilation module



Systemair GmbH • Seehöfer Str. 45 • D-97944 Windischbuch
Tel.: +49 (0)7930/9272-0 • Fax: +49 (0)7930/9273-92
info@systemair.de • www.systemair.de

systemair

Article no. / date