

Technicians Manual

INSTALLATION & ADJUSTMENT

OPERATION & CONTROL

Exhaust air filter, article No: Q120101
Supply air filter, article No: Q120100



	Page		
Installation & Adjustment			
Safety and Security	3		
Receipt of Delivery	3		
Installation	3		
Mounting	3		
Installation of Water-Resistant Substrate	3		
Anti-tip Protection	3		
Condensate Drain	3		
The Duct System	3		
Silencing	4		
Placing of Temperature Sensors	4		
Insulation	4		
Duct cover for AHU top	4		
Open Fireplace	4		
Power connection	4		
Access to connection terminals	5		
Circuit Diagram	6		
Terminal Description	7		
Connection Options	8		
Fireplace Button			
ULS, KAVK, CP Heat Etc.			
Modbus			
Remote Panel – With Display			
Remote Panel – 3-Position			
Remote Panel – Easy (TG-R4)			
Internet			
Operation & Control			
2. Menu table configuration	11		
2.1. Control function	17		
Control Functions			
Cascade Control			
Setpoint Adjustment			
Room Sensors			
2.2. Demand Control	17		
Activate			
Temperature control			
CO2 control			
Moisture control			
2.3. Fan Setup	18		
Fan control			
Setting fan speeds			
Fan delay			
2.4. Temperature control	18		
Setting the controllers			
What are P and I			
Supply air controller			
Room controller			
Exhaust air controller			
Zone control			
Pre-heat controller			
2.5. PID output	19		
Heating, Bypass, Cooling			
Pre-heater			
Duct heater			
2.6. ECO/ECO2	19		
ECO-mode			
ECO2-mode			
ECO adjustment			
Fault safe mode			
		Activate ECO2 cooling	
		Temp diff.	
		Temperature conditions for forcing	
		Screen view at boosting and ECO	
		Fan curve at ECO/ECO2	
		2.7. Heater	21
		Type of heater	
		Electric heater	
		Water heater	
		Anti-freeze function	
		Exercise of valve	
		2.8. Defrosting	22
		Stop defrost	
		During stop defrost	
		2.9. Bypass	22
		Bypass dumper's running time	
		Outdoor temp. limit of open	
		Activate ramptime	
		2.10. Cooling recovery	23
		2.11. Night cooling	23
		Extended running time.	
		Boost cooling	
		Conditions night cooling	
		2.12. Forced cooling	24
		2.13. Timer	24
		2.14. KAVK (Condensation boiler)	24
		2.15. I/O configuration	25
		Analog inputs	
		Digital inputs	
		Priority order	
		Timer	
		Stove mode	
		Digital outputs	
		Inverting digital outputs	
		Analog outputs	
		2.16. Modbus	26
		2.17. TCP/IP	27
		2.18. EXOline address	27
		2.19. Remote Panel	27
		2.20. Setpoint Adjustment TG-R4	27
		2.21. Activate Exhaust fan	27
		2.22. Filter Timer	27
		2.23. Cloudigo	27
		2.24. Save Settings	27
		2.25. User Menu	27
		2.26. Zones	28
		Enable Zones	
		Remote Panel Configuration	
		Temperature Menus	
		2.27. Change Alarm Class	28

Safety and Security

Please read this manual carefully. Pay special attention to the safety text marked with the exclamation mark above.

Receipt of Delivery

Check that the number of packages matches the consignment note and that there is no transport damage. The ventilation unit must be stored indoors.

If possible, the unit should be kept lying down to minimize the risk of personal injury in case of overturning. Pay special attention to this if children are nearby.

Installation

Work performed by the layman can impair the performance of the ventilation unit and result in injury to person or property. Incorrectly adjusted units will not achieve the desired benefits such as adequate air quality and maximized energy savings.

The unit is heavy. Edges and corners that you do not usually come in contact with can be sharp. Use gloves when moving the unit.

Keep an eye on children. An unassembled unit can easily tip over under abnormal loads.

Mounting

The ventilation unit is mounted upright in the utility room, laundry room or the like. The unit is designed to stand in frost-free space, which is extra important when using condensate drains.

Ensure that there is a stable and level surface on the installation site. If the unit is placed on wooden floors or other moisture-sensitive materials, the unit must be placed on a water-resistant substrate (type Temovex Art. No. Q100490) to prevent marks and moisture damage if possible. leakage or condensation. (See next paragraph for assembly.) It is an advantage if the unit can be placed at least 10 mm away from the wall. This is to minimize the risk of muffler noise. We recommend that the walls of surrounding rooms also be soundproofed. These precautions should be maintained despite the fact that Temovex units are generally very quiet. The unit is equipped with adjustable rubber feet and well balanced fans, to avoid vibration.

The unit should be installed in such a way that it is easy to access for maintenance and inspection. Make sure the door at the front can be fully opened. The unit must be placed so that it cannot be flushed with water during operation. As an option, the unit can be provided with protection that allows the installation to withstand IP class X5.

Installation of Water-Resistant Substrate Q100490

The ventilation unit is often installed in a corner or next to another cabinet. In this case, there are two sides to support the Water-Resistant Substrate. The third side is created with suitable wooden strip which is attached to the floor with eg double-sided adhesive tape, glue, screw etc. Cut lower the base to a width of 500mm (440mm + 30mm fold in each side). Cut equally on each side. Otherwise, follow the instructions that come with the underlay.

Anti-tip Protection Q100428

If it is judged that there is a risk that the unit may tip forward, there is a tip guard (art. no. Q100428) as an option. This is then fixed to the back of the unit and screwed during installation in the wall behind the unit.

Condensate Drain

The unit is equipped with a condensation drain at the bottom of the unit. This should be connected to a drain or routed to a floor well. Make sure that the condensation line is placed far enough down in the floor well, otherwise it can draw cold air from it. The condensation line does not need to be fitted with a water trap. The condensate drain has to be connected when the unit is installed. If the unit is equipped with condensation boiler (KAVK) no external connection is needed.

The Duct System

Ducts and duct details should be made of an age-resistant material that is also easy to clean inside. For shorter adaptations between, for example a roof hood and the duct system, a flexible duct called "Drasuten" can advantageously be used. Tumble dryers and drying cabinets must not be connected directly to the duct system.

Silencing

Silencers dimensioned for the installation should be fitted both for the supply air and exhaust air, either directly onto the Temovex unit, or to the duct system as close to the unit as possible. Under certain conditions, silencers on the outdoor air duct as well as extract air duct may be necessary.

Placing of Temperature Sensor

The four duct sensors are color-marked at both ends as follow:

Outdoor air = blue

Supply = red

Extract = green

Exhaust = yellow

At delivery, all temperature sensors are electrically connected to the control system. The extract and exhaust air sensors are also pre-mounted in the AHU's respective air ducts.

The outdoor air and supply air sensors must be mounted during installation in respective duct. The supply air sensor should be placed in the supply air duct, at least 0,6 m from the heater to avoid direct heat radiation, and after the first bend if possible, where the temperature is more homogeneous.

The outdoor air sensor should be placed as far from the unit as possible (as far as the cable allow).

Remember to seal the holes carefully.

If the unit is equipped with a water battery, the anti-freeze sensor is also pre-mounted and connected. If a room sensor is used, it should be placed approx. 1,8 m above the floor in the living room, preferably on an interior wall.

Insulation

Outdoor air and extract air ducts in heated spaces must be insulated against condensation along their entire length, using an insulation sleeve minimum PE30. The diffusion barriers are sealed with ventilation tape.

Supply and exhaust air ducts in warm rooms do not need to be insulated against condensation, however, heat insulation may be appropriate. Decided on a case by case basis.

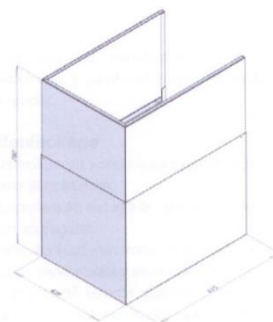
If the supply and exhaust air ducts are placed in cold or unheated spaces, they shall be heat insulated. If insulation mat is used, a total thickness of at least 120 mm should be achieved. The insulation should be shared in two layers with overlapping joints.

If placement in loose wool, the cover layer over the ducts should be at least 150 mm.

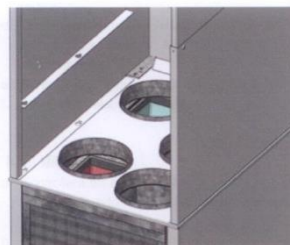
Duct cover for AHU top

The lacquered, 2-piece cover hides the ducts at the top of the Temovex unit. The cover is telescopic and will fit ceiling heights between 2,30 - 2,70 m. We recommend a gap of 5 mm between ceiling and duct cover to avoid any transfer of vibrations.

1. Measure the distance from the top of the unit (without duct cover) to the ceiling. Assemble the two pieces on a flat surface/floor, and ensure that the height will allow a gap of approx. 5 mm to the ceiling. Use the enclosed 4 self-tapping screws to make the holes in the upper (smaller) cover plate. Use the 4 white screws to join the two cover plates.



2. Put the duct cover on top of the unit, placing the screw-heads in the "key" holes. Fix the cover onto the unit by sliding it backwards some 5 mm (see picture). If the duct cover is mounted onto an existing unit, the pop rivets at the unit top have to be replaced by screws.



some 5 mm (see picture). If the duct cover is mounted onto an existing unit, the pop rivets at the unit top have to be replaced by screws.

3. Whenever you need access to the upper part of the Temovex unit, the duct cover is lifted off in one piece (point 2 above, but reverse order)



Open Fireplace

Most modern fireplaces and the like have a separate outdoor air connection which provides the combustion chamber with combustion air. If this is not available/possible, a separate outdoor air diffuser needs to be fitted. The stove consumes between 150-300 m³/h.

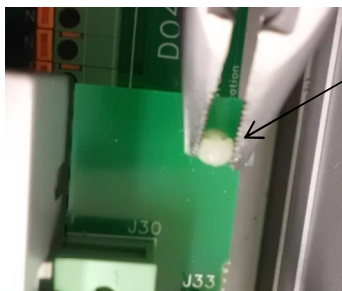
To make it easier to start the stove (ignition, the fireplace door is open), the Temovex unit can be equipped with the option "stove function".

Power connection

The AHU is provided with a grounded plug. Connect the plug to an earthed 1-phase socket (230 VAC / 10 A).

Connection at the top of the unit.

Access to connection terminals



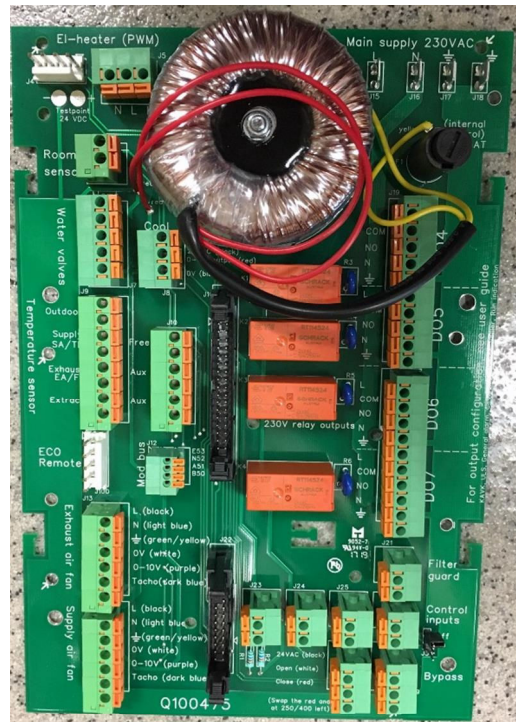
DUC

Remove the DUC from the PCB by squeezing each top of the four spacers with a pair of pliers. Squeeze one at a time and ease the DUC out at the same time.

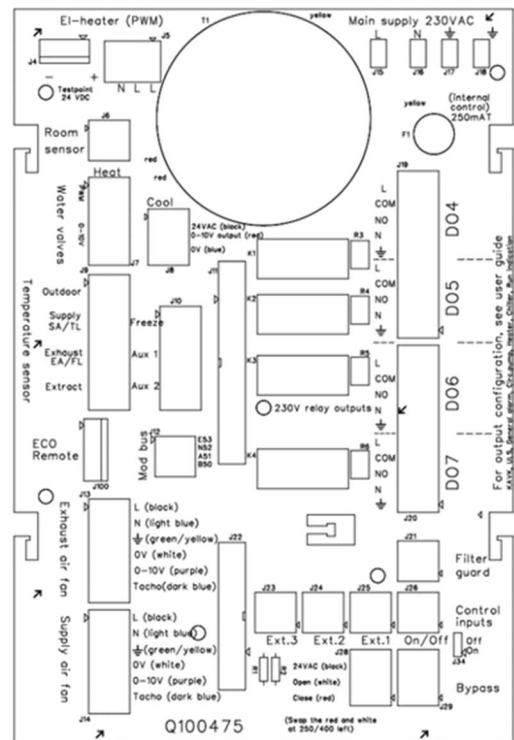
The DUC is now attached to the board by 2 ribbon cables only.

The spring locks on the plugs of the DUC's ribbon cables make it easy to loosen them from the circuit board.

The bottom card can now be reached and set up with required functions.

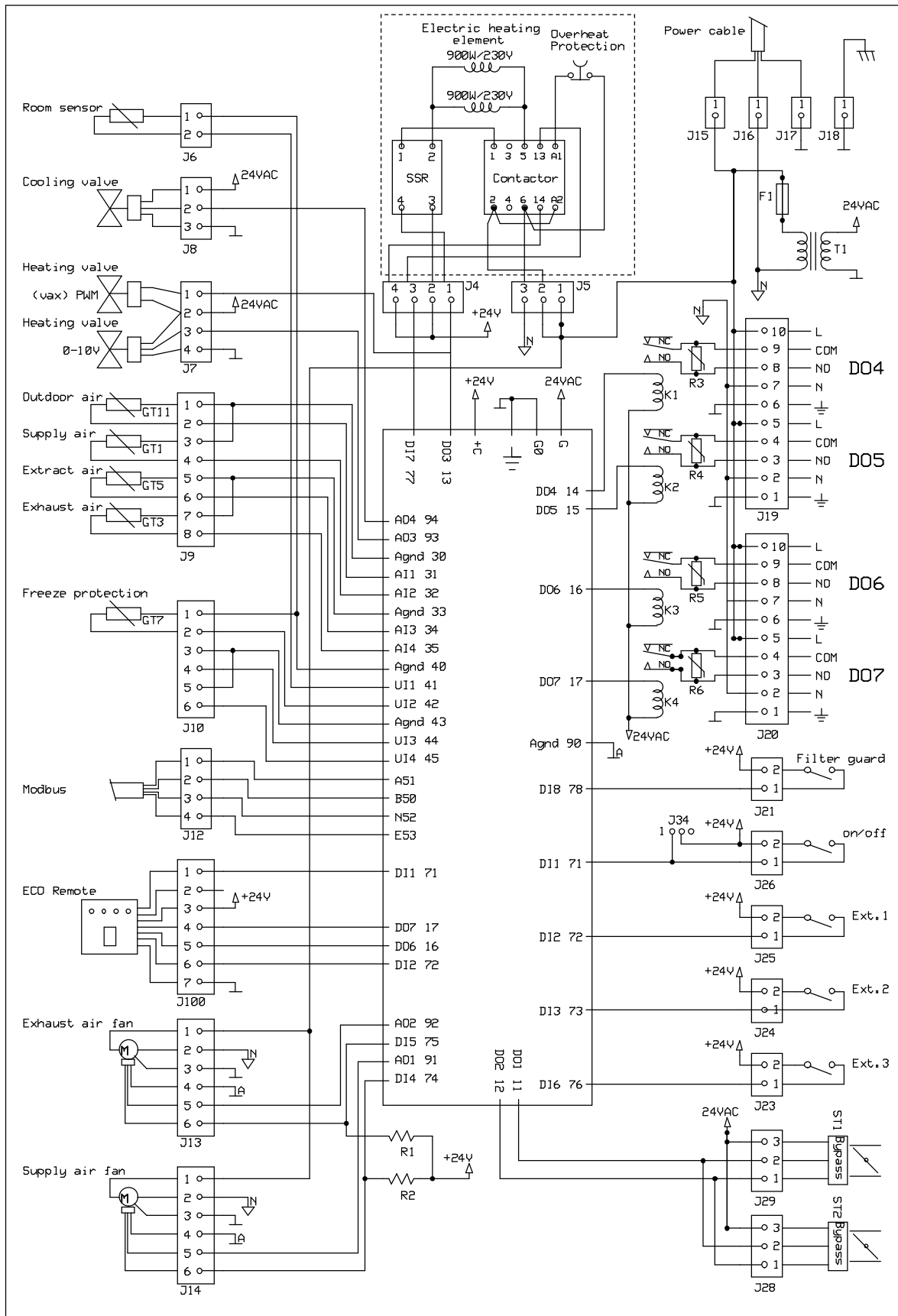


After the installation of functions is done, re-fit the DUC in reverse order.



The printed circuit board screen print.

Circuit Diagram



Description of terminal blocks

General

Joining of circuits is made on the bottom circuit board. To access the circuit board, remove the DUC (see previous page).

Texts on the circuit board show where to connect what. All terminals have a Jxx No. and a small triangle on pin 1.

When in the following text for example J26/1,2 is stated, it means that the function should be connected to terminal J26, pin 1 and 2.

Where appropriate, the signal is marked on the board.

Room sensor (Terminal J6/1,2)

If room sensor is to be used, keep in mind that room control must be selected in the configuration of the system.

External cooling (Terminal J8/1,2,3)

The system also has ability to handle an external water-cooling battery, e.g. natural cooling from boreholes.

The cooling battery is controlled via an external valve (0 - 10 V).

Reheater water (Terminal J7)

Two alternative is possible, so called wax-actuator (controlled by PWM-signal) or motor-actuator (0-10V signal).

(The cable may already be connected upon delivery)

Temperature sensors (Terminal J9)

Temperature sensors (PT1000) for **outdoor air**, **supply air**, **extract air** and **exhaust air** are already connected at delivery.

Freeze protection (Terminal J10/1,2)

In order to prevent freezing of the water battery in the case of water heating, a freeze protection sensor (temperature sensor) is placed on the return line from the water battery.

Modbus (Terminal J12)

Terminal for possible modbus communication.

ECO Remote (Terminal J100)

Terminal for connecting a remote control (optional) with among other things alarm indication and a switch for ECO mode.

NOTE! When using ECO Remote, DO6 must be configured for Normal flow, DO7 for Sum alarms and DI2 to ECO.

Fans (Terminal J13 and J14)

Connection terminals for the fans. These are already connected at delivery.

By-pass (Terminal J28)

Connection terminal for the by-pass damper. The cable is already connected at delivery.

Optional terminal for by-pass (Terminal J29)

Extra connection terminal for by-pass damper (some AHU models).

Ext.1, Ext.2 and Ext.3 (Terminals J23 to J25/1,2)

There is, as an option, the possibility to connect three external switches which at closing change the fan speeds according to the choices made during configuration. Appropriate flows are preset but can be changed by a qualified installer via the control panel.

For available choices see section "Operation & Control".

Start/stop (Terminal J26/1,2)

An external switch for "Start/stop" can be connected. The switch does not make the unit powerless. It just makes the AHU stop running. If this function is used, the jumper J34 should be moved to mode OFF.

Optional terminal for filter guard (Terminal J21)

For some of the larger AHU models only.

Relay outputs (Terminals J19, J20)

The system has 4 identical relay outputs which can be configured to various functions. The configuration in the circuit diagram above is just one example, others is possible. To see which options are available, please turn to chapter "Operation & control".

A condensation boiler (KAVK), if any, is already connected at delivery.

Mains voltage (Terminals J15, J16, J17)

230VAC, 50Hz

Chassis (Terminal J18)

Ground connection of chassis.

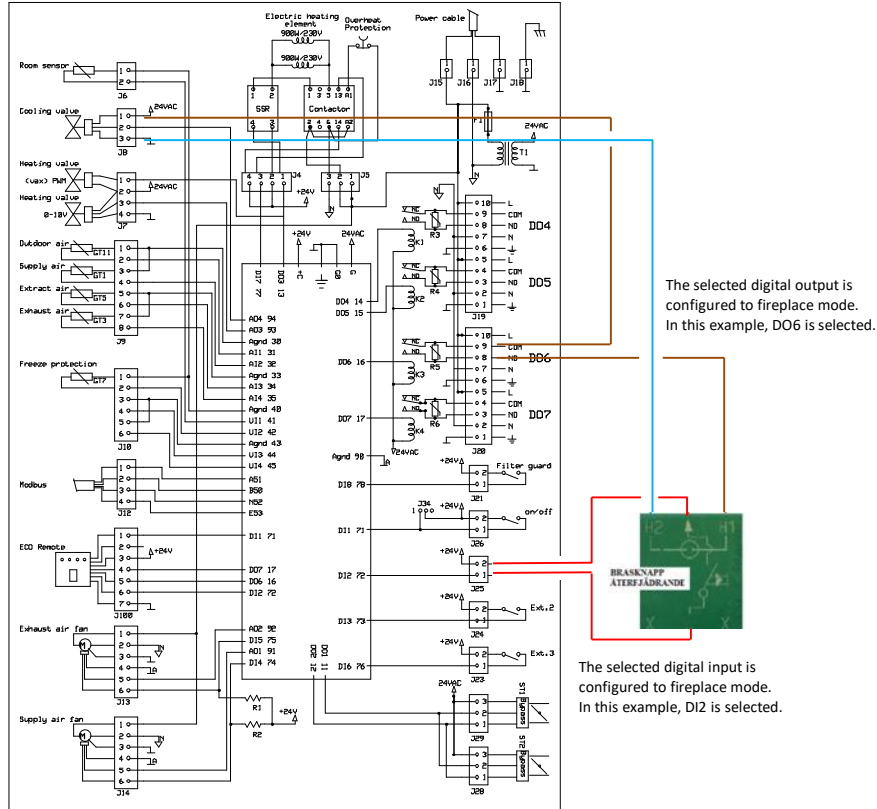
Electric heater, power supply (Terminal J5/2,3)

Pin 2 phase, pin 3 neutral (blue).

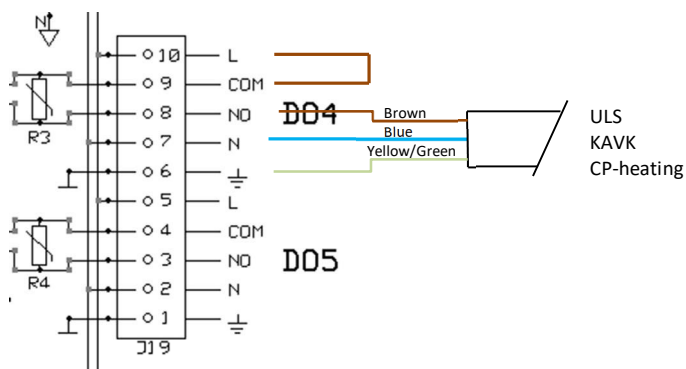
Electric heater, control signals (Terminal J4)

Connection Options

Connection of Fireplace Button (24V)



Connection of ULS, KAVK, CP-heating etc. (230V)



Connection according to above, on any output DO4-DO7 and selected output configure to selected function.

Connection Modbus

Connect Modbus on Terminal J12 pin 3 and 4.

Connection Remote Panel

Connection Remote panel

For initial information see the User Manual!
 Start at Authorization and log in as Technician with code 2222.

2. Menu table configuration

Not relevant for RT 250/400 (should not be selected)

Parameter	Standard setting	Changed setting of this unit
2.1. Control function		
2.1.1. Control function	SA control	<input type="checkbox"/> ODT comp. SA control, <input type="checkbox"/> Casc. room control, <input type="checkbox"/> Casc. EA control
2.1.1.1. When cascade control max/min SA setpoint		
Max	52,0	

	Night cool	55 %	_____ %
	Max	100 %	_____ %
	Fire	100 %	_____ %
2.3.2.2.1. Delay EA fan			
	Start	0 sec	_____ (0

		Start temp.		
		Dead band valve	0,5 %	_____ % (0

UI3	Not active	<input type="checkbox"/> Room sensor, <input type="checkbox"/> Frost protection sensor, <input type="checkbox"/> TG-R4, <input type="checkbox"/> Duct heater sensor, <input type="checkbox"/> Option temp 1, <input type="checkbox"/> Option temp 2, <input type="checkbox"/> Option temp 3, <input type="checkbox"/> Option temp 4, <input type="checkbox"/> Temp after Exch., <input type="checkbox"/> SAF Pressure, <input type="checkbox"/> EAF Pressure, <input type="checkbox"/> Exch. Pressure, <input type="checkbox"/> CO2, <input type="checkbox"/> Humidity
UI4	Not active	<input type="checkbox"/> Room sensor, <input type="checkbox"/> Frost protection sensor, <input type="checkbox"/> TG-R4, <input type="checkbox"/> Duct heater sensor, <input type="checkbox"/> Option temp 1, <input type="checkbox"/> Option temp 2, <input type="checkbox"/> Option temp 3, <input type="checkbox"/> Option temp 4, <input type="checkbox"/> Temp after Exch., <input type="checkbox"/> SAF Pressure, <input type="checkbox"/> EAF Pressure, <input type="checkbox"/> Exch. Pressure, <input type="checkbox"/> CO2, <input type="checkbox"/> Humidity
2.16.1.4. CO2 (is displayed if CO2 is selected on any analog input)		
	0.0 V -> 0 ppm	_____ V -> _____ ppm
	10.0 V -> 1200 ppm	_____ V -> _____ ppm
2.16.1.5. Humidity (is displayed if Humidity is selected on any analog input)		
	0.0 V -> 0.0 %RH	_____ V -> _____ %RH
	10.0 V -> 100.0 %RH	_____ V -> _____ %RH
2.15.2. Digital inputs (*the function must be activated from the factory to be selected)		
DI1	AHU On/Off	<input type="checkbox"/> Not active, <input type="checkbox"/> Min flow, <input type="checkbox"/> Boost flow, <input type="checkbox"/> Max flow, <input type="checkbox"/> Kitchen mode*, <input type="checkbox"/> ECO*, <input type="checkbox"/> Stove mode*, <input type="checkbox"/> Fire input*, <input type="checkbox"/> Fire damper*, <input type="checkbox"/> Normal, <input type="checkbox"/> Filter guard fire, <input type="checkbox"/> Smoke detector error*, <input type="checkbox"/> T (connected to timer)
DI2	Not active	<input type="checkbox"/> Min flow, <input type="checkbox"/> Boost flow, <input type="checkbox"/> Max flow, <input type="checkbox"/> Kitchen mode*, <input type="checkbox"/> ECO*, <input type="checkbox"/> Stove mode*, <input type="checkbox"/> Fire input*, <input type="checkbox"/> Fire damper*, <input type="checkbox"/> AHU. On/Off, <input type="checkbox"/> Normal, <input type="checkbox"/> Filter guard fire, <input type="checkbox"/> Smoke detector error*, <input type="checkbox"/> T (connected to timer)
DI3	Not active	<input type="checkbox"/> Min flow, <input type="checkbox"/> Boost flow, <input type="checkbox"/> Max flow, <input type="checkbox"/> Kitchen mode*, <input type="checkbox"/> ECO*, <input type="checkbox"/> Stove mode*, <input type="checkbox"/> Fire input*, <input type="checkbox"/> Fire damper*, <input type="checkbox"/> AHU. On/Off, <input type="checkbox"/> Normal, <input type="checkbox"/> Filter guard fire, <input type="checkbox"/> Smoke detector error*, <input type="checkbox"/> T (connected to timer)
DI6	Not active	<input type="checkbox"/> Min flow, <input type="checkbox"/> Boost flow, <input type="checkbox"/> Max flow, <input type="checkbox"/> Kitchen mode*, <input type="checkbox"/> ECO*, <input type="checkbox"/> Stove mode*, <input type="checkbox"/> Fire input*, <input type="checkbox"/> Fire damper*, <input type="checkbox"/> AHU. On/Off, <input type="checkbox"/> Normal, <input type="checkbox"/> Filter guard fire, <input type="checkbox"/> Smoke detector error*, <input type="checkbox"/> T (connected to timer)
DI7 (is only displayed if a heat source other than electricity is selected)	Not active	<input type="checkbox"/> Min flow, <input type="checkbox"/> Boost flow, <input type="checkbox"/> Max flow, <input type="checkbox"/> Kitchen mode*, <input type="checkbox"/> ECO*, <input type="checkbox"/> Stove mode*, <input type="checkbox"/> Fire input*, <input type="checkbox"/> Fire damper*, <input type="checkbox"/> AHU. On/Off, <input type="checkbox"/> Normal, <input type="checkbox"/> Filter guard fire, <input type="checkbox"/> Smoke detector error*, <input type="checkbox"/> T (connected to timer)
DI4	TF omr.	<input type="checkbox"/> SA fan EC
DI5	TF omr.	<input type="checkbox"/> EA fan EC, <input type="checkbox"/> Not active
Alarm delay SA	30 sec	_____ sec
Alarm delay EA	30 sec	_____ sec
2.15.2.1. Timer		
Time	0 hour, <input checked="" type="checkbox"/> 0 min	_____ h (0

	DO6	Not active	☐ Smoke detector ☐KAVK, ☐ULS, ☐Sum alarms, ☐CP heater, ☐CP chiller, ☐Normal flow, ☐ Fire damper , ☐PWM preheat, ☐Stove, ☐ Section hatch , ☐Sum alarm A, ☐Sum alarm B, ☐Sum alarm C, ☐ Smoke detector
	DO7	Sum alarm	☐Not active ☐KAVK, ☐ULS, ☐CP heater, ☐CP chiller, ☐Normal flow, ☐ Fire damper , ☐PWM preheat, ☐Stove, ☐ Section hatch , ☐Sum alarm A, ☐Sum alarm B, ☐Sum alarm C, ☐ Smoke detector
2.15.3.1. Invert DO			
	DO3	No	☐Yes
	DO4	No	☐Yes
	DO5	No	☐Yes
	DO6	No	☐Yes
	DO7	No	☐Yes
2.15.4. Analog outputs			
	AO3 Heating	0.0 V - 10.0 V	_____ V - _____ V
	AO4 Cooling	0.0 V - 10.0 V	_____ V - _____ V
2.16. Modbus			
	Modbus communication	Active	☐Not active
	Modbus TCP	On	☐Off
	Modbus Address	1	_____
	Baud rate	9600 bps	☐4800 bps, ☐14k4 bps, ☐19k2 bps, ☐28k8 bps, ☐38k4 bps, ☐57k6 bps, ☐76k8 bps, ☐115k2 bps
	Format	801	☐8N2, ☐8E2, ☐802, <input checked="" type="checkbox"/> 8N1, ☐8E1
2.17. TCP/IP			
	DHCP	Yes	☐No
Current IP ->			
	IP	192.168.001.234	_____
	Current subnet mask	255.255.255.000	_____
	Current gateway	192.168.001.001	_____
	Current DNS	192.168.001.001	_____
2.18. EXOline address			
Address			
	PLA	254	_____
	ELA	30	_____
2.19. External display			
	Activate external display	No	☐Yes
	Port	2	_____
2.19.1. Setpoint adjustment			
	Max	3,0	_____

Mode	On	<input type="checkbox"/> Off
Timer	On	<input type="checkbox"/> Off
In/outputs	On	<input type="checkbox"/> Off
Hand/Auto	On	<input type="checkbox"/> Off
Alarm history	On	<input type="checkbox"/> Off
Load settings	On	<input type="checkbox"/> Off
2.26. Zones		
Activate 2 Zones	No	<input type="checkbox"/> Yes
2.26.1. Configure external display		
Configure Livingroom (Connect ONE external display)		
Configure	No	<input type="checkbox"/> Yes
Configure Bedroom (Connect ONE external display)		
Configure	No	<input type="checkbox"/> Yes
2.27. Change Alarm Class		
Alarm		
Sensor error OD temp	A	<input type="checkbox"/> B, <input type="checkbox"/> C, <input type="checkbox"/> Inactive
Sensor error SA temp	A	<input type="checkbox"/> B, <input type="checkbox"/> C, <input type="checkbox"/> Inactive
Sensor error EXT temp	A	<input type="checkbox"/> B, <input type="checkbox"/> C, <input type="checkbox"/> Inactive
Sensor error EA temp	A	<input type="checkbox"/> B, <input type="checkbox"/> C, <input type="checkbox"/> Inactive
Sensor error Room temp	A	<input type="checkbox"/> B, <input type="checkbox"/> C, <input type="checkbox"/> Inactive
Sensor error FRP temp	A	<input type="checkbox"/> B, <input type="checkbox"/> C, <input type="checkbox"/> Inactive
Freeze protection alarm	A	<input type="checkbox"/> B, <input type="checkbox"/> C, <input type="checkbox"/> Inactive
Supply fan failure	C	<input type="checkbox"/> A, <input type="checkbox"/> B, <input type="checkbox"/> Inactive
Extract fan failure	C	<input type="checkbox"/> A, <input type="checkbox"/> B, <input type="checkbox"/> Inactive
Preheat damper manual	C	<input type="checkbox"/> A, <input type="checkbox"/> B, <input type="checkbox"/> Inactive
Electric heater overheated	A	<input type="checkbox"/> B, <input type="checkbox"/> C, <input type="checkbox"/> Inactive
Filter guard DI8	A	<input type="checkbox"/> B, <input type="checkbox"/> C, <input type="checkbox"/> Inactive
Chiller manual	C	<input type="checkbox"/> A, <input type="checkbox"/> B, <input type="checkbox"/> Inactive
Heater manual	C	<input type="checkbox"/> A, <input type="checkbox"/> B, <input type="checkbox"/> Inactive
By-pass manual	C	<input type="checkbox"/> A, <input type="checkbox"/> B, <input type="checkbox"/> Inactive
ULS manual	C	<input type="checkbox"/> A, <input type="checkbox"/> B, <input type="checkbox"/> Inactive
KAVK manual	C	<input type="checkbox"/> A, <input type="checkbox"/> B, <input type="checkbox"/> Inactive
P1-heating manual	C	<input type="checkbox"/> A, <input type="checkbox"/> B, <input type="checkbox"/> Inactive
P1-cooling manual	C	<input type="checkbox"/> A, <input type="checkbox"/> B, <input type="checkbox"/> Inactive
SA fan manual	C	<input type="checkbox"/> A, <input type="checkbox"/> B, <input type="checkbox"/> Inactive
EA fan manual	C	<input type="checkbox"/> A, <input type="checkbox"/> B, <input type="checkbox"/> Inactive
SA controller manual	C	<input type="checkbox"/> A, <input type="checkbox"/> B, <input type="checkbox"/> Inactive
Internal battery failure	A	<input type="checkbox"/> B, <input type="checkbox"/> C, <input type="checkbox"/> Inactive
Filter alarm	Inactive	<input type="checkbox"/> A, <input type="checkbox"/> B, <input type="checkbox"/> C
Fire damper alarm	A	<input type="checkbox"/> B, <input type="checkbox"/> C, <input type="checkbox"/> Inactive
Fire alarm	A	<input type="checkbox"/> B, <input type="checkbox"/> C, <input type="checkbox"/> Inactive
Sensor error TG-R4	A	<input type="checkbox"/> B, <input type="checkbox"/> C, <input type="checkbox"/> Inactive
Warning low supply temp	C	<input type="checkbox"/> A, <input type="checkbox"/> B, <input type="checkbox"/> Inactive
Preheat electric manual	C	<input type="checkbox"/> A, <input type="checkbox"/> B, <input type="checkbox"/> Inactive
Supply air temp low	A	<input type="checkbox"/> B, <input type="checkbox"/> C, <input type="checkbox"/> Inactive
Duct heater manual	C	<input type="checkbox"/> A, <input type="checkbox"/> B, <input type="checkbox"/> Inactive
Sensor error duct heater	A	<input type="checkbox"/> B, <input type="checkbox"/> C, <input type="checkbox"/> Inactive
Sensor error temp. after exch.	A	<input type="checkbox"/> B, <input type="checkbox"/> C, <input type="checkbox"/> Inactive
Defrost failed A	A	<input type="checkbox"/> B, <input type="checkbox"/> C, <input type="checkbox"/> Inactive
Defrost failed B	B	<input type="checkbox"/> A, <input type="checkbox"/> C, <input type="checkbox"/> Inactive
Hatch manual	C	<input type="checkbox"/> A, <input type="checkbox"/> B, <input type="checkbox"/> Inactive
Autocalibration not finished	C	<input type="checkbox"/> A, <input type="checkbox"/> B, <input type="checkbox"/> Inactive
Fire indication	B	<input type="checkbox"/> A, <input type="checkbox"/> C, <input type="checkbox"/> Inactive
Smoke detector error	B	<input type="checkbox"/> A, <input type="checkbox"/> C, <input type="checkbox"/> Inactive

2.1. Control function

2.1.1. Control functions

Selectable features:

- SA control: The temperature is regulated by the SA sensor only.
- ODT comp. SA control: The temperature is regulated as a function of the SA sensor and OD sensor.
- Casc. Room control: The temperature is regulated as a function of the room sensor and SA sensor.
- Casc. EA control: The temperature is regulated as a function of the EA sensor and SA sensor.

2.1.1.1. When cascade control max/min SA setpoint

This function is only active when cascade room control and cascade exhaust air control is used. The rooms desired set point is set on the room sensor if room control and on the EA sensor if EA control. The system calculates a new supply air (SA) set point based on the control error. In the extreme case (if large control error) this could be very high (or low), which could generate too cold or hot supply air, which could feel uncomfortable. It is possible to limit the SA set point both up and down.

2.1.2. Set point adjust

The menu "Set point adjust" is used together with room sensor with set point adjust included, like Remote panel

2.2.1.3. Humidity-control

Menu for setting the humidity setpoint

2.2.1.3.1. PI-settings RH

Setting of control parameters.

2.3. Fan setup

2.3.1. Fan control

Selectable features:

- Fixed Speed: The fan is running with a fixed %-value of the maximum speed.

2.3.2. Fan speeds

Menu group for fan speeds. When adjusting, you can balance the correct flows by changing the setting for resp. fan.

2.3.2.1. Supply air fan

In this menu, you set the setpoints for the speeds of the supply air fan, corresponding to the various operating modes.

Fan speed night cooling

The value for night cooling is, on delivery, the same as normal mode. If the value for normal mode is changed, the value for night cooling will be changed too, unless the value for night cooling is actively set to something else. To get them synchronized again, set the night cooling value at the same value as normal mode.

2.3.2.1.1. Delay SA fan

Menu for setting the supply air fan start and stop delay.

2.3.2.2. Extract air fan

Menu like 2.3.2.1. but for the exhaust fan.

2.3.2.2.1. Delay EA fan

Menu like 2.3.2.1.1. but for the exhaust fan.

2.4. Temperature control

In this menu group, you can adjust the control parameters for the different temperature controllers. All controllers are of the PI type with adjustable P-band and I-time.

Setting the controllers

In most cases, it works with the default setting, but if you see a need for it, you can adjust it.

Warning! At the same time, an incorrect setting can cause the system to function very badly.

It is the same supply air regulator in all three cases above. A change follows if you change the control function.

What is P and I?

P-band is the temperature change needed to move the actuator from closed to fully open. A small P-band (= large gain) causes an unstable system. A small temperature change on the sensor generates maximum heat and provides large overshoots. A large P-band (low gain) on the other hand provides smaller overshoots but will take longer before the correct value is reached.

Including an integrator (I-value) in the control loop will provide smaller overshoots. The gain decreases the closer the set point comes.

2.4.1. SA control

The supply air regulator is indirect acting, i.e., the output signal increases with decreasing temperature. With the correct P and I parameter, the temperature at the supply air sensor will be kept constant at the set setpoint.

2.4.2. Room control

The room regulator works together with the supply air regulator in so-called cascade regulation. A deviation in room temperature compared to the set point generates a shift of the operating point of the supply air regulator so that the deviation is eliminated.

2.4.3. EA control

The exhaust air regulator works together with the supply air regulator in so-called cascade regulation. A deviation in exhaust air temperature compared to the set point generates a shift of the operating point of the supply air controller so that the deviation is eliminated.

2.4.4. SA Control Livingroom

See section 2.4.1.

2.4.5. Room control Livingroom

See section 2.4.2.

2.4.6. Preheat control

Preheater control parameters.

2.5. PID output

2.5.1. PID output (Heating, Bypass, Cooling)

Here the output from the SA controller is displayed, divided between the three outputs cooling, bypass and heating. The output from the SA controller 0-100% is divided between the outputs as follow.

Controller output (PID-output)	Cooling	By-pass	Heating
0			

2.5.2. PID output preheat

Menu showing pre-heat output.

2.5.3. PID output duct heater

The line "Heating" shows the equipment of the duct heater. When this has reached 100% and the living room still has not reached its setpoint, the bedroom's setpoint is shifted (increased) little by little, causing the unit's built-in heater to increase so that the living room's setpoint is reached. How many degrees the displacement is now can be seen on the last line.

2.6. ECO/ECO2

ECO-mode

- ECO can be used together with all control functions.
- ECO saves energy when nobody is at home. The fans go down to minimum flow.
- ECO means that the fans, when they go on min. flow, increase speed up to normal flow, to carry more heat or cool if min. flow cannot hold the set point.
- ECO-boosting together with cooling works even without cooler. The AHU takes cold air through the bypass only and will cool as far as possible.
- ECO-mode can be activated in different ways, either by a manual switch connected to a digital input or automatically according to a time schedule. ECO can also be activated manually in the mode menu.

ECO2-mode

- ECO2 is used only together with EA and room -control.
- ECO2 means that the fans increase the speed more than with ECO alone. They increase all the way to boost-flow, to carry more heat or cool if actual flow cannot hold the set point.
- ECO2-boosting together with cooling, works even without cooler. The AHU takes cold air through the bypass only and will cool the room as far as possible.
- ECO2 works just as well in ECO mode (when nobody home), as it does when you are at home and the unit is running at normal flow.
- ECO2-boosting together with cooling can be turned off, if you want boosting together with heating only.

ECO-adjusting

- ECO-adjusting is only active with EA- and room-control.
- ECO-adjusting needs ECO to be activated.
- ECO-adjusting indicates a temperature range where heat and cool is inactive. E.g., with ECO-adjust 2 °C and a set temp of 20 °C, the heat and cool will be inactive between 18 °C and 22 °C.

Safe mode

- To make it possible to heat/cool with air, it is necessary that enough heat/cool is available through the heater/cooler.
- Safe mode is an extra protection function that blocks the boosting, in the event of lack of heating / cooling media. The aim is to bring as little unwanted cooling / heating to the apartment as possible during a possible unit failure, but still have some ventilation. The fans regulate down towards minimum flow, pending the return of heating / cooling media. It is a continuous regulation, which means that if there is not enough heat/cool, the fans speed up only as much as the heat/cool allows to give a positive heat/cool supplement.
- In the absence of heating media, the unit gives the alarm "Warning low supply air temp". See further at the point alarm delay below.
- Safe mode is only active in exhaust and room control and if ECO and / or ECO2 are installed at the factory. The setting menus for this are displayed only if ECO and / or ECO2 are installed.

2.6.1. Activate ECO2 cooling.

If you wish to use ECO2 cooling, change No to Yes.

2.6.2. Temp. diff.

In this menu, you set how fast the fans shall increase to boost flow. There is a dead band, before the fans start to increase at all. I.e., this is how much the actual temperature may differ from the set point before the fans start to increase the flow. The same dead band applies to both heat and cold.

The value for heat and resp. cooling means how many degrees further, in addition to the deadband, which the actual value is allowed to deviate before the fans must have reached forced flow. The fans advance proportionally to the temperature deviation within the range specified.

2.6.3. Temp. diff for increase to boost.

Here you specify how much warmer (or colder) the supply air must be to allow boosting. Example: with a setting for heat 1 degree, the fans will start to regulate towards minimum flow when the supply air temperature is one degree above the exhaust air, and then reach min flow when supply air and exhaust air temperature are equal.

The table below specifies how the fans regulate in different conditions.

ECO Factory setting	ECO2 Factory setting	ECO- mode	Heating requirement	Cooling requirement
-	-	-	Normal	Normal
Yes	-	-	Normal	Normal
Yes	-	Yes	Min → Normal	Min → Normal
-	Yes	-	Normal → Boost	Normal → Boost if ECO2 cooling is activated
Yes	Yes	-	Normal → Boost	Normal → Boost if ECO2 cooling is activated
Yes	Yes	Yes	Min → Boost	Min → Normal and → Boost if ECO2 cooling is activated

2.6.4. Alarm delay.

In the absence of heating media, the unit gives the alarm "Warning low supply air temp" when the fan speed has been at min-flow as standard for at least 5 min. The time can be set in this menu. The alarm is acknowledged and returns automatically as soon as the heat returns. No alarm is given in the absence of cooling.

Screen view at boosting and ECO.

At fan speed between min and normal: ECO.

At fan speed normal: Normal.

At fan speed between normal and boost: ECO2.

Example of fan curve at ECO, ECO2 and ECO+ECO2 (The value below is used in the example).

NOTE! ECO is only permitted when nobody is at home.

With no ECO-functions activated the fans work at normal flow all the time.

The following values have been used in the example below.

ECO adjust: 2,0°C

Dead band: 0,5°C

Temp diff. heating: 1,0°C

Temp diff. cooling: 2,0°C

ECO2 cooling activated

2.7. Heater

2.7.1. Type of heater.

In this menu, you select the type of reheater that is installed in the unit.

2.7.1.1. Electric.

The only setting for electric heating is the period time.

Example: With a heat distribution of 50% and a period time of 60s, this means that the heat is switched on for 30 s and then switched off for 30 s, etc.

Electric heating controls both digital output DO3 (PWM) and analog output AO3 (0-10V).

2.7.1.2. Water (PWM)

Water (PWM) is intended for so-called wax actuators of the ON/OFF type which are controlled proportionally with a PWM signal.

Freeze protection control.

Water heating entails a risk that the water may freeze if the hot water supply fails. Therefore, the AHU is equipped with a freeze protection sensor and a freeze protection controller.

The water temperature is measured close to the water heater with a freeze protection sensor (PT1000) clamped on the return pipe and then isolated.

There is a freeze protection control 0-100% according to a linear scale, between start value and alarm temperature plus 1 degree. The heat level will be whichever is the higher of the normal temperature controllers

Special case.

If the AHU is in manual heating, no freeze protection control will be made of the heating. Instead, the manual value will be valid all the way down to the set alarm temperature. When reaching alarm temperature both fans stop, outdoor air damper and bypass will close, the heat valve will open to its maximum and the circulation pump for heat will start. This will happen even if some of these are set in manual mode. Stop delay for the fans is ignored if the stop is due to freeze protection alarm and/or freeze protection sensor alarm.

Setting freeze protection control.

The start temperature (the temperature of the freeze protection sensor when the control starts) is set in the setup menu.

The alarm temperature (the temperature when the alarm activates) will automatically be changed to 6 °C lower than start temp.

Dead band valve means that the step response from the controller must be over a set %-value of max. control voltage to give a change of the signal to the valve. Example: at dead band 0,5% the step response must be $5\% \times 10V = 0,5V$.

Exercise of valve.

It is possible to exercise the valve so that it does not get stuck if it is in the same place for a long time.

This happens once a week at the set time. The valve opens fully for set time and then closes for an equally long time, then returns to current control value.

Period time and regulation range. (Only available for water PWM).

Period time and regulation range are set on delivery to fit the wax valves we deliver with the units and should not be changed.

2.7.1.3. Water (0-10V)

Water (0-10V) is meant for motor actuators that are controlled with 0-10V. Freeze protection function etc. is the same as for water (PWM) see above.

2.8. Defrosting

2.8.1. Stop defrost.

Stop-defrost starts when the exhaust air has been below a certain temperature for a long time. The defrosting takes a few minutes.

If the exhaust air temperature, due to the stop-defrost, has not risen above the limit value, the alarm "Defrosting fails" is activated. This is to alert the user that a defrost sequence has not been sufficient to defrost the exchanger. The defrosting time should perhaps be slightly extended.

Even if the alarm is not acknowledged, the unit returns to normal mode at the same time as a new defrost sequence starts. To reset the alarm, it must be acknowledged.

2.8.2. During stop defrost.

The standard setting for what happens during defrosting is that the supply air fan stops and the exhaust air fan goes to normal flow. In addition, with electric heating, the heat is switched off and the bypass closes, but with water heating, the heat is switched on fully and the bypass opens.

This menu shows what happens during defrosting with the current heating battery selection. If a different setting than the default is desired, it can be changed here.

2.9. Bypass

2.9.1. Bypass damper

However, there are circumstances that do not take this limit into account, for example:

- Bypass opens by the function "hand/auto".
- Freeze protection is active.
- Stop defrosting in progress.

2.9.3. Activate ramptime.

During defrosting, the bypass opens so that the cold outside air passes the exchanger for a while so that the warm exhaust air can defrost the exchanger. At the same time, the heating battery increases to compensate. Bypass normally opens faster than the heat has time to increase. Therefore, there is an adjustable ramp time for the bypass, so it opens a little slower when defrosting. The function can also be deactivated or always active.

2.10. Cooling recovery

If cooling is required, the heat exchanger can use the cool air that is already in the house to cool warm incoming air. If cooling recovery is activated and extract air temperature is a set number of degrees lower than the outdoor temperature, cool indoor air will be recovered.

How it works

The bypass is affected by the relationship between outdoor air and extract air. See how the bypass damper is regulating in the table below.

Requirement	Cool	Cool	Heat	Heat
OD air	>EA+2	<EA+2	>EA+2	<EA+2
Bypass	Regulates towards closed to cold exchange the cooler inside air.	Regulates towards open to cool with the colder outside air.	Regulates towards open to heat with the warmer outside air.	Regulates towards closed to heat exchange the warmer inside air.

2.11. Night cooling

Night cooling means that at night during the warmer season, cold outdoor air is taken directly into the house to cool down the house and buffer for the warm day ahead.

Night cooling is recommended if warming with air, like EA or room control. But it is also possible to use together with supply air control, as the AHU switches to EA control when night cooling (including after time) is active. This works on conditions that the normal heating equipment has been turned off.

Activating night cooling.

For night cooling to work, it must be activated.

Extended running time.

The heat is off during the part of the extended running time that is within the night cooling activating time. The remaining time the heat is controlled with the room temperature set in the menu "conditions night cooling" as set point. (This to save the newly acquired cool air). If the extended running time would encroach on next day's activating time, night cooling will have priority. If the conditions for night cooling no longer are fulfilled within the activating time, the extended running time will start at this point. If the conditions should be fulfilled again before the activating time ends, night cooling will start again, and the extended running time resets itself.

The last row in the menu shows if the activating time is active or not. It is also possible to reset an ongoing extended running time. (If the extended running time is set to 0 hour the time will be 1 min, which makes it easy to test the functions).

Boost cooling.

During the time night cooling is active, boost cooling is disabled. (See chapter ECO including safe mode). Default 22:00 to 06:00. Even if night cooling has ended because the conditions no longer are fulfilled, boost cooling is disabled during the time stated.

In the standard case the fans will run at the same speed (normal speed) all night long (22:00-06:00). In the morning boosting is allowed but still with a low set point (18 degrees) until the extended running time (4 h) has ended, which will be at 10:00h.

2.11.1. Conditions night cooling.

In this setup menu you configure the temperature conditions for night cooling to be active.

2.15. I/O configuration

2.15.1. Analog inputs

Possibility to select function for respective. input UI1, UI2, UI3 and UI4.

ATTENTION!

Room sensor (automatically selected on UI1 during room control).

Freeze protection sensor (automatically selected on UI2 for water heating).

TG-R4 (automatically selected on UI3 at remote panel TG-R4).

Duct heating sensor (automatically selected on UI4 in case of zone heating).

2.15.2. Digital inputs

Possibility to select function for respective input DI1, DI2, DI3, DI6 and DI7.

Priority order for functions and inputs.

No.1 has the highest priority.

1. Aggr. on/off regardless of whether it is configured to any input or to the time channel.
2. Fire alarm and Fire damper regardless of which inputs they are configured.
1. Any of other functions connected to DI6
2. Any of other functions connected to DI3
3. Any of other functions connected to DI2
4. Any of other functions connected to DI1
7. Timer (all functions except Aggr. On/off. See prio 1).

Configuring fan type

On DI4 and 5 it is possible to select different types of feedback signal from the fan. These are normally configured from the factory and should not be changed.

It is also possible to disconnect the feedback signal from the exhaust fan to avoid alarms if an external exhaust fan is used without a feedback signal.

There is an adjustable alarm delay for the fan alarms.

2.15.2.1. Timer

A timer could be connected to any of the inputs if a T is activated at any of the rows. There is only one timer. All functions except Not active, Fire damper, Fire alarm and Stove mode can have timer connected.

Connection of timer to desired function

When you have gone through the rows and selected functions for the inputs, the cursor will make one more loop and there is a possibility is to put a T against any of the rows. Use arrow up and down to connect the timer to a specific row. A

During the ignition time the fans will run at the speed set for stove (see section fan speeds).
When the after time starts, the fans return to their previous setting.
During both the startup time and the cooldown time, bypass does not open, and cooling is blocked.

Start of stove timer.

A momentary switch (which is included when ordering the stove function) is connected to the selected input according to above. When you press the switch, the stove function starts, and the timer starts to count down. To cancel the function, push the switch again. Both startup time and cooldown time resets then.

Visual indication.

On the switch that comes with the function, there is also an indicator lamp that is connected to any digital output. The relay toggles during the startup time 5s on and 5s off. During the cooldown period the relay is constant on. The display shows "Stove mode" during the startup time and during the cooldown period it toggles between "Normal" and "Stove cooldown".

Using stove together with EA-control or room control.

To reduce the risk of blowing cold air from the ventilation system in connection with the stove heating, the system ensures that during both the startup time and the cooldown time, the supply air temperature is at least equal to the set point.

2.15.3. Digital outputs

If needed, select function for output DO3, DO4, DO5, DO6 and DO7.

ATTENTION!

PWM preheater is automatically selected on DO4 in case of electric preheater.

PWM duct heater automatically selected on DO5 in case of zoned heating.

2.15.3.1. Invert DO

In some cases, it may be preferred that the alarm relay turns on immediately when the unit gets power, and instead switch off if there is an alarm.

This will generate an alarm if there is an interruption in the power supply.

In this menu one or more outputs can be inverted.

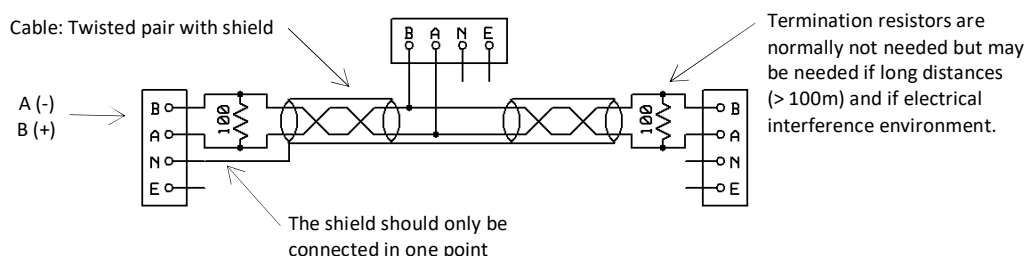
2.15.4. Analog outputs

If the valves do not have a 0-10V input (default), then there are free choices 0.0-10.0V or vice versa 10.0-0.0 in steps of 0.1V.

2.16. Modbus

Connection

Modbus via RS485.



As an alternative, Modbus is also available via the TCP / IP port!

Parameter settings

Modbus is activated by default on port 1, but if a remote panel is to be used, modbus must be deactivated. Modbus via TCP is normally on but should be deactivated if you use a "public network" in cases where you connect the controller to the internet. This is to prevent outsiders from being able to read from the controller.

Complete Modbus list can be obtained from REC on request.

2.17. TCP/IP

Internet setting menu.

2.18. EXOline address

EXO line address setting menu.

2.19. Remote panel

There is only 1 port, and it is configured to Modbus by default. Thus, you cannot have both Modbus and a remote panel.

If a remote panel is ordered at the same time as the AHU, the configuration is done for remote panel at the factory. When ordering a remote panel as supplement later, the Modbus must be deactivated. Contact REC for help with this.

2.19.1. Set point adjust.

Here you can set the limits for how much setpoint adjust. you want to allow via the remote panel.

2.20. Set point adjust. TG-R4

TG-R4 activation menu.

When the TG-R4 is activated, the current setting is displayed on the bottom line.

2.21. Activate EA-fan

Not relevant for Blue (should not be changed).

2.22. Filter timer

The filter timer should not be deactivated!

If you would like to change the time to next filter change, is it possible to adjust the number of days since the timer started.

2.23. Cloudigo

Cloudigo is a system that allows to view and change parameters via the Internet. The system requires a subscription. Contact your supplier for more information!

2.24. Save settings

Here you save all current settings. Earlier saved settings will be lost. All settings are saved except date and time.

2.25. User menu

Use this menu to select which items that should be visible for the user. All items that are visible as default are selectable, except

2.26. Zones

The unit's standard heater heats the bedrooms, as well as pre-heats the living room. The temperature in the living room is raised slightly more than the bedroom temperature via a duct heater, which is also controlled by the AHU. The temperature in the living room is controlled via a remote panel with display. The temperature in the bedrooms can be controlled either via remote panel with display or via room sensor with setpoint adjustment (TG-R4). The set value in the living room is the highest priority. The temperature in the bedroom can be set to the same value as the living room or lower. If room sensors with setpoint adjustment (TG-R4) are used and the adjustment wheel is set in center position, the temperature in the bedroom will be equal with the setpoint for the bedroom. From there, the temperature can be raised or lowered as required within the set adjustment limits. The setpoint setting for the bedrooms that are higher than for the living room are ignored in the program and the value of the living room also applies to the bedrooms.

The AHU's normal supply air regulator will control the temperature in the bedrooms according to their setpoint, using the built-in heater and the by-pass damper. Another regulator, by means of an external duct heater, regulates the living room temperature against its setpoint. If the setpoint in the living room cannot be reached even though the duct heater is at 100%, then the temperature in the bedroom is adjusted so that the set point in the living room is reached (with the duct heater still at 100%).

If the living room setpoint cannot be maintained despite full heat on both the built-in heater and the duct heater, will ECO2 (if activated) boost the fans as usual.

Activate 2 zones.

For zone control to work, it must be activated.

2.26.1. Configure external display.

Since two remote panels will be connected on the same port, these must be configured as bedroom display and living room display. Plug in one remote panel at a time to configure. When the configuration is complete, "Idle" changes to "Config ok".

When both are configured, you connect both in parallel to the port.

Temperature menus.

When zones are activated, other temperature menus are displayed, see section

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Rec Indovent reserves the right to alter specifications and design without prior notice.



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