Ventilation unit RT 700/1000S-EC-RS

Technicians Manual

INSTALLATION & ADJUSTMENT

OPERATION & CONTROL

Extract air filter, article No: Q4871
Supply air filter, article No: Q4872

CONTENTS

Ventilation unit RT 700/1000S-EC-RS

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.

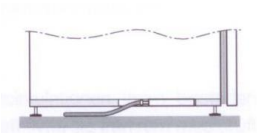
Keep an eye on children. An unassembled unit can easily tip over under abnormal loads.

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. 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.

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. ñDragavbrottò shall be used.

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, prefereably 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.

Open Fireplace

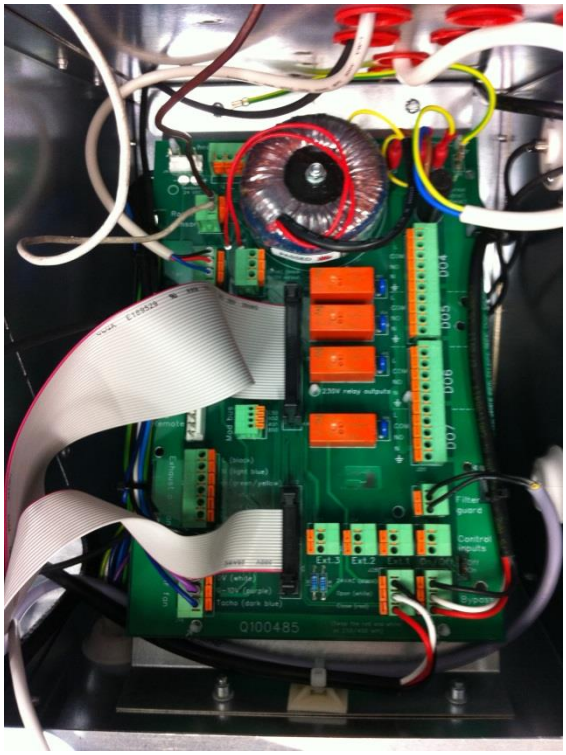
Most modern fireplaces and the like have a separate outdoor air connection which provides the combustion chamber with combustion air. If this is not available/possible, a separate outdoor air diffuser needs to be fitted. The stove consumes between 150-300 m3/h.
To make it easier to start the stove (ignition, the fireplace door is open), the Temovex unit can be equipped with the option "stove function".

Power connection

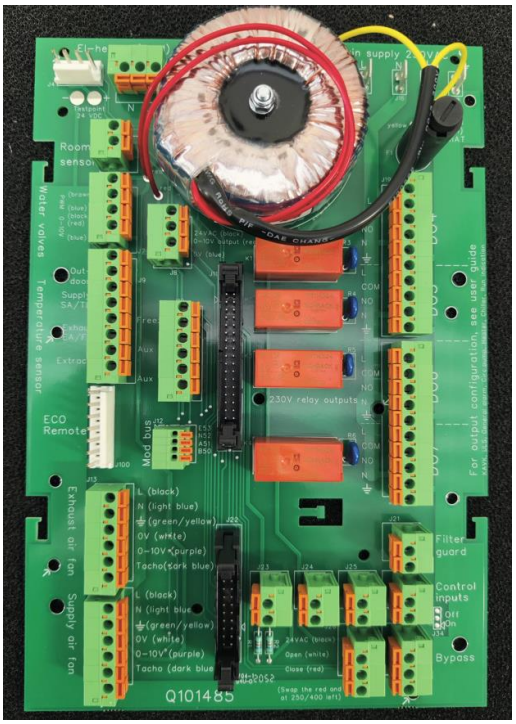
The AHU is provided with a grounded plug.
Connection at the top of the unit.

Access to connection terminals

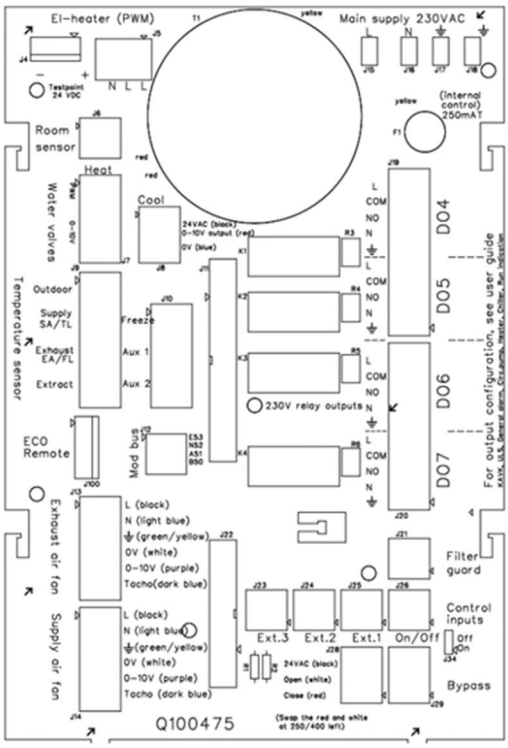
All connections are made on the circuit board located behind the control panel. Unscrew the cover on which the control panel is located to access the circuit board.
All connection terminals are numbered, and a description of resp. terminal is found on page 7.
In most cases, the electrical signal and cable color are also indicated on the circuit board.



Circuit board for connection of external functions.

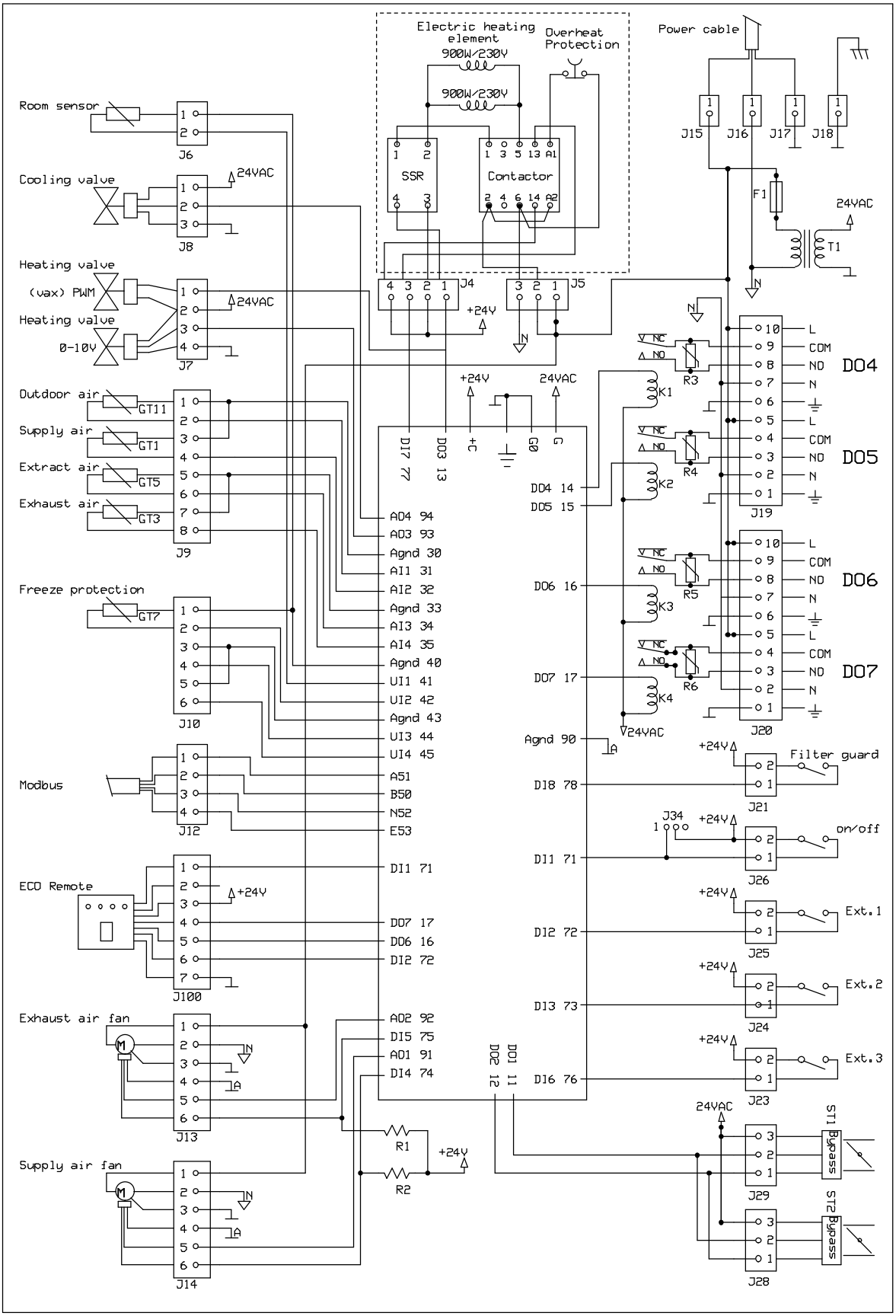


Circuit board



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

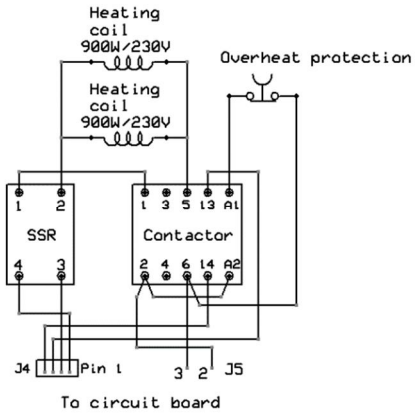
Chassis (Terminal J18)
Ground connection of chassis.

Electric heater, power supply (Terminal J5/2,3)
Pin 2 phase, pin 3 neutral (blue).

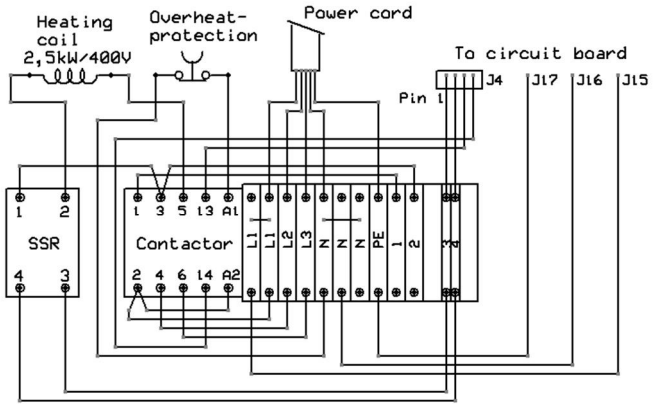
Electric heater, control signals (Terminal J4)

Connection electric heating

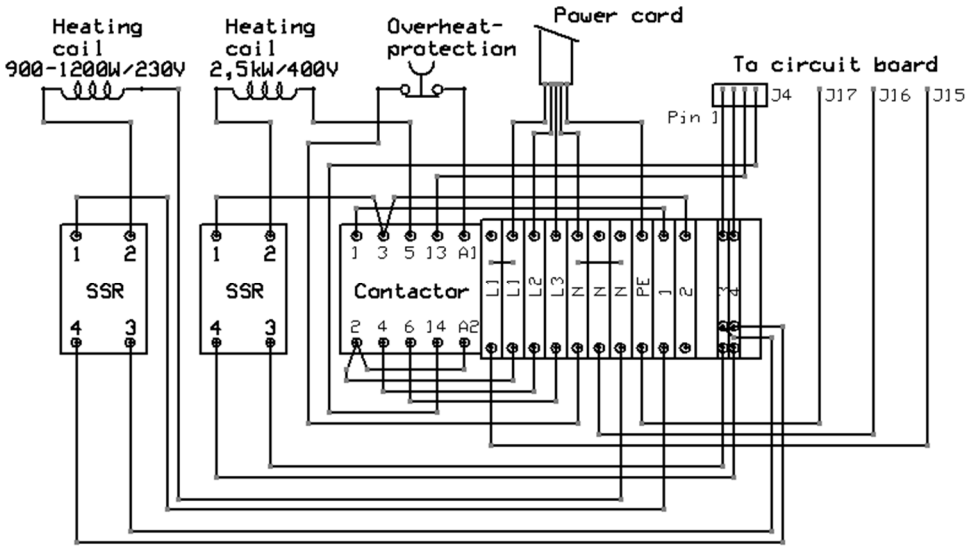
Circuit diagram supplement electric heating.



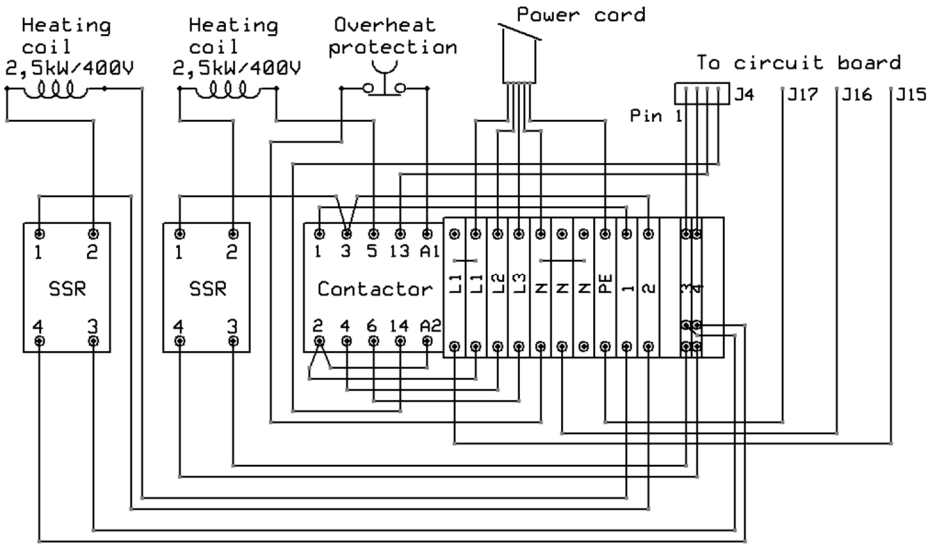
RT700 1-phase 900-1800W



RT700/1000 3-phase 2,5kW

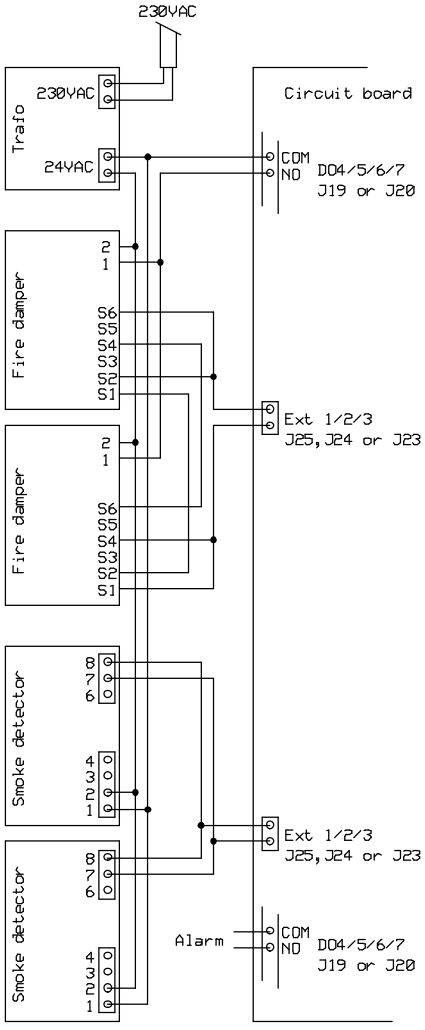


RT700/1000 3-phase 3,4 - 3,7kW

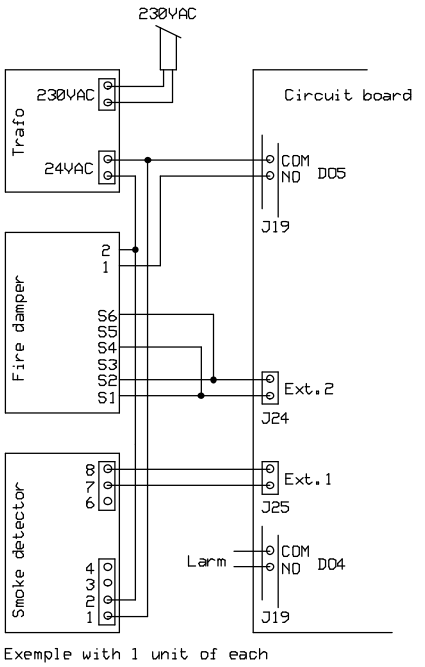


RT700/1000-unit 3-phase 5kW

Connection of fire damper and smoke detector



General connection with several units



Exemple with 1 unit of each

Power supply
The damper motor and the smoke detector are powered with 24VAC by an external transformer.

Damper motor
The damper motor is controlled via any of the relay outputs (DO4, 5, 6 or 7) on the circuit card. Which output you choose does not matter as long as the equivalent configuration of the control panel is made. See pages 40-41.
The damper motor has built-in limit switches and should be connected to any of the circuit card's digital inputs (Ext. 1, 2 or 3). See this page's diagram. Which output you choose does not matter as long as the equivalent configuration of the control panel is made. See pages 40-41.
The top diagram shows how more than one fire damper is connected. Maximum is 5 dampers.

Smoke detector
The smoke detector's output is connected to any of the circuit board's digital inputs (Ext. 1, 2 or 3). See this page's diagram. Which output you choose does not matter as long as the equivalent configuration of the control panel is made. See pages 40-41.
The top diagram shows how more than one smoke detector is connected. Maximum is 5 detectors.

Example
The bottom diagram shows the connection of one fire damper and one smoke detector.
In this example, we have chosen DO5 for the control of the fire dampler and external input 2 for the damper's limit switches.
External input 1 has been used for the smoke detector.
DO4 has been chosen for the alarm output.
How to configure, see pages 40-41.

Function

Fire alarm
If the smoke detector is activated by smoke or fire, there is a signal at the alarm output, at the same time as the fire dampers change position.

Fire damper
Fire dampers are normally configured to open in case of fire, but may be configured to close instead.

Exercising the fire damper
Exercise of the fire dampers can be configured. The interval between exercises is adjustable. To enable this function, the fire dampers are fitted with limit switches. When an exercise is carried out, the system checks that the dampers reach their limits and that the limit switches are working. If not, a signal at the alarm output is activated.

The controller may be configured to stop the fans in connection with the exercise.

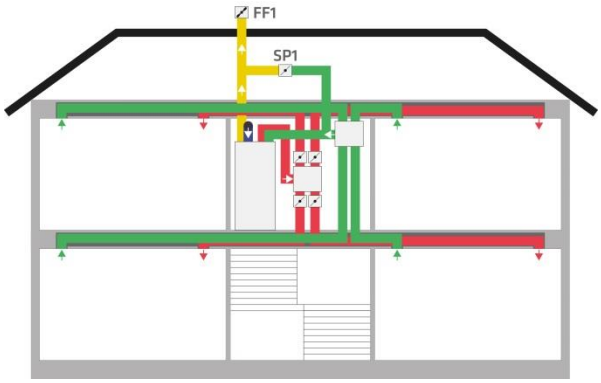
Connection of stairwell unit

What is meant by stairwell units?
REC's stairwell unit is an FTX unit located in the stairwell that serves up to 8 apartments. In multi-dwelling buildings (both new construction and ROT) with 2-4 floors, we can get FTX in a simple and cost-effective way without major intervention in the property. Examples of placement can be cleaning scrubber or storage (see type example below).

Example of standard installation:
The ventilation unit is a REC Temovex 700/1000S-EC-RS (counterflow exchanger) complete with control, constant supply air control and fire function. The unit has the optional EVBV (water reheater).
Outdoor air via grille in outer wall. The extract air normally passes through the unit / heat exchanger. The duct system from the apartments, both supply and extract air, is connected to the unit via collection ducts. When fire smoke is indicated in the extract air stems, a damper opens, and the air goes via a by-pass duct outside the unit. The fire gas fan on the roof, alternatively in the evacuation duct, evacuates fire smoke and prevents the spread between fire cells. On the supply air duct, backflow protection is installed to prevent fire gases from being pushed back into the apartments.
Read more about principal execution A and B below.

Principle implementation A

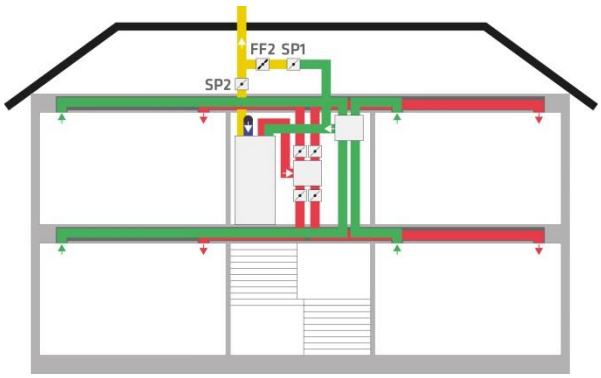
RT700/1000S-EC-RS-BFLF-BRAND
The unit's extract air fan has been removed and replaced by a fire gas fan (FF1) on the roof. When the fire indicator is triggered, the unit's fans stop, the bypass damper SP1 opens and the flue gas ceiling fan FF1 (300 ° C for 1 hour) forces out the smoke. Exercise of SP1 and control (0-10V) of the fire gas fan takes place from the unit.



Addition to version A - purchased separately.
ÅFire gas fan (ceiling)
0-10V controlled, 300 ° C for 1 hour. Ex. RDM from Gebhardt,
SEF from Exhausto or equivalent.
ÅBack flow protection
Ex. BASIC from Hagab, EKO-BSV from Ekovent or equivalent.
ÅBypass damper
24 V supplied 2-position with return.

Principle implementation B

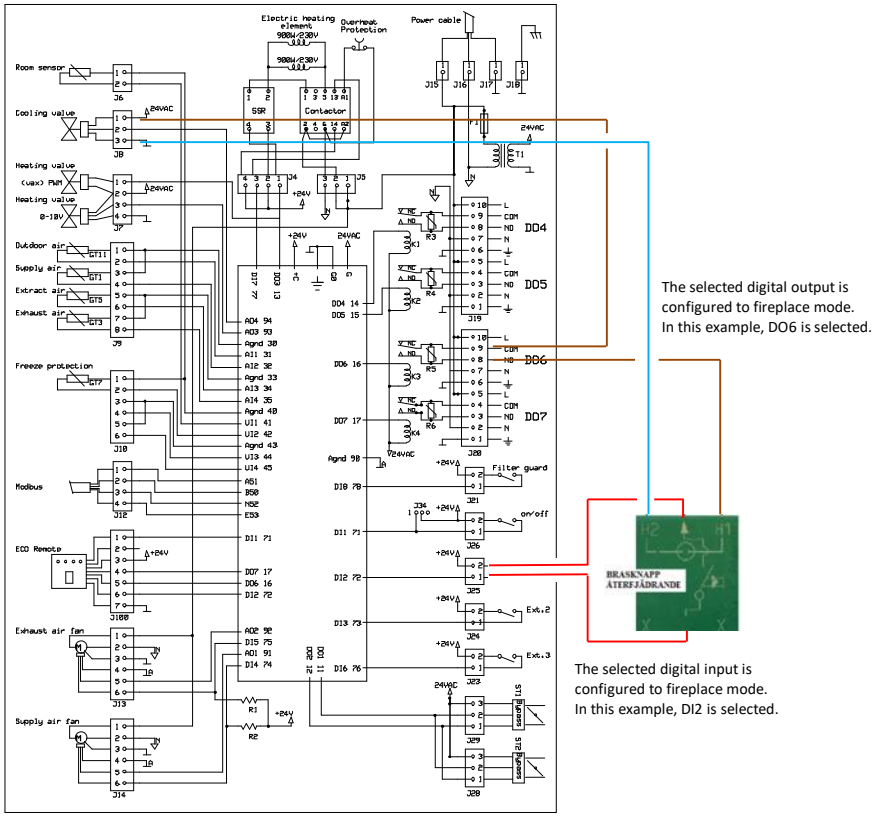
RT700/1000S-EC-RS-BRAND
During normal operation, the unit ventilates with built-in EC fans (supply and extract air). SP1 is normally closed and SP2 is normally open. When the fire indicator is triggered, the unit's fans stop. SP2 closes, SP1 opens and fire gas fan in duct FF2 (300 ° C for 1 hour) forces out the smoke. Exercise of SP1, SP2 and start signal of the fire gas fan takes place from the unit.



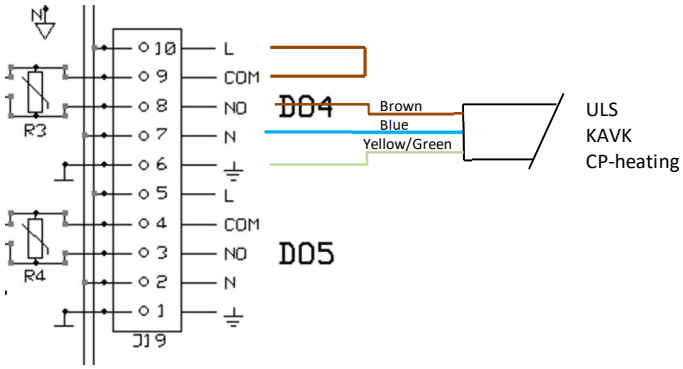
Addition to version B - purchased separately.
ÅAxial fan fire gas
300 ° C for 1 hour. Unit leaves start signal 24 V at fire. Ex. LCS from Gebhardt.
ÅBack flow protection
Ex. BASIC from Hagab, EKO-BSV from Ekovent or equivalent.
ÅBypass damper
24 V supplied 2-position with return.

Connection Options

Connection of Fireplace Button (24V)



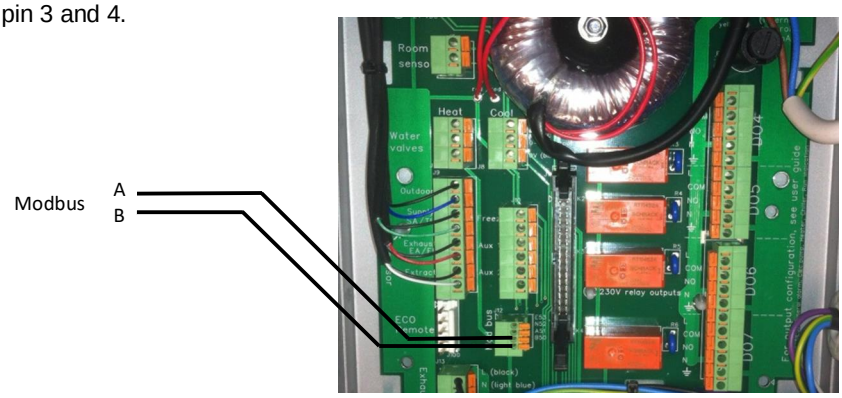
Connection of ULS, KAVK, CP-heating etc. (230V)



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.

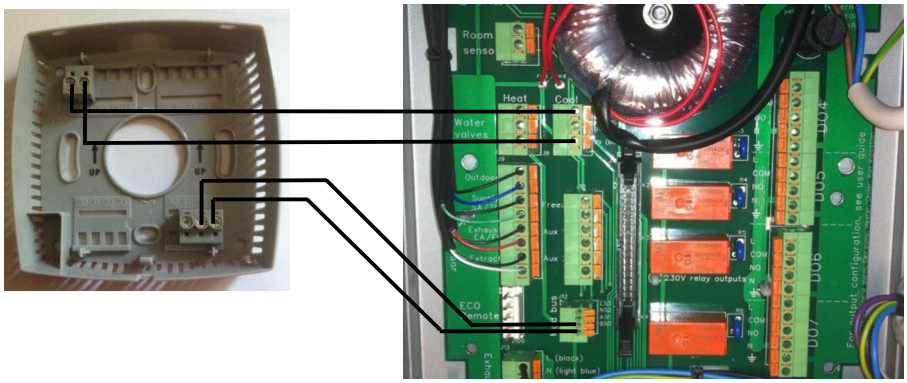


Connection Remote Panel ï With Display

You cannot have both Modbus and remote panel. To connect a remote panel with a display, Modbus communication must be deactivated. Contact REC.

Remote panel with display can be connected according to below.

Remote Panel	PCB
10	J8/1
11	J8/3
42	J12/3
43	J12/4

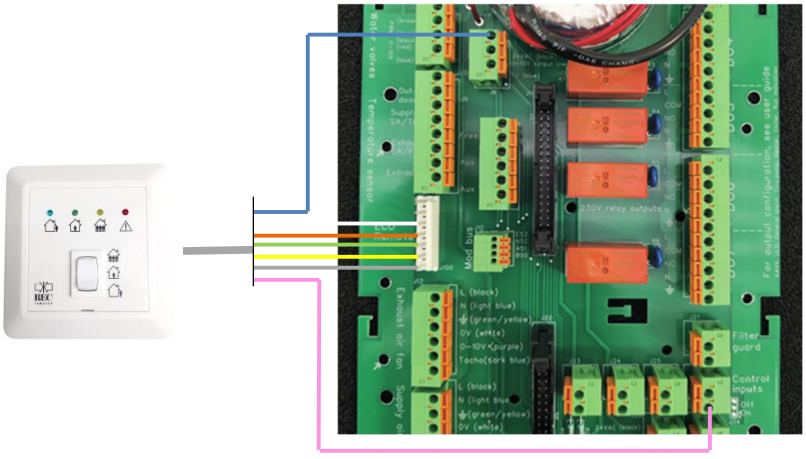


Connection Remote panel ï 3-position

Connect the socket to terminal 100 (ECO Remote).
Connect blue cable to terminal J8/1 (24VAC).
Connect pink cable to terminal J26/1.

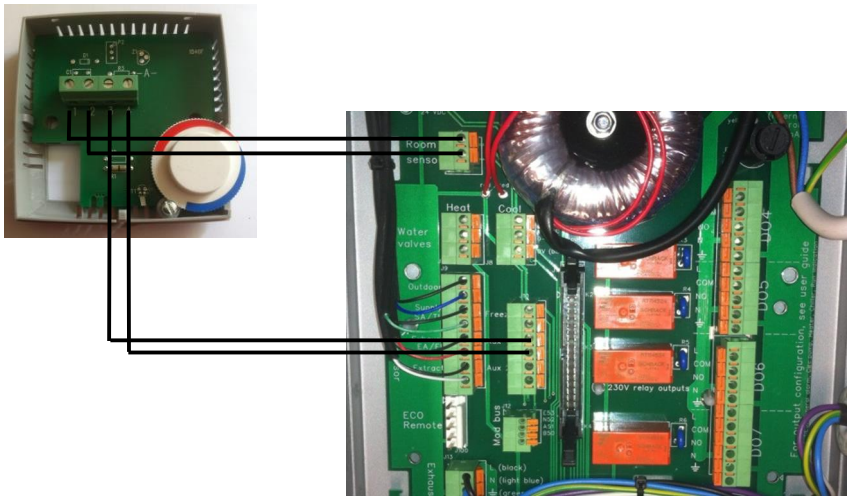
Please note! The configuration of inputs and outputs should be in this order for the display to work:

DO6 - Normal, DO7 - Alarm, DI1 - ECO, DI2 - Forc

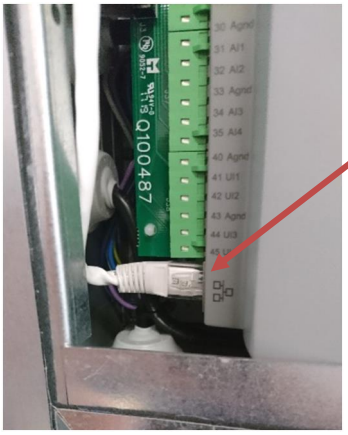


Connection Remote panel ï Easy (TG-R4)

Remote - panel	PCB
1	J6/1
2	J6/2
3	J10/3
4	J10/4



Connection Internet (Cloudigo)



Connect an internet cable to DUC as on picture.
Pull out the cable through a suitable lead-through on the top of the unit.

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 700/1000 (should not be selected)*

Parameter	Standard setting	Changed setting of this unit
2.1. Control function		
2.1.1. Control function	SA control	☐ODT comp. SA control, ☐Casc. room control, ☐Casc. EA control
2.1.1.1. When cascade control max/min SA setpoint		
Max	52,0 ęC	_____ ęC (0 - 150 ęC)
Min	12,0 ęC	_____ ęC (0 - 150 ęC)
2.1.2. Setpoint adjust.		
Min	-3,0 ęC	_____ ęC (-10,0 ï 0,0 ęC)
Max	3,0 ęC	_____ ęC (0,0 ï 10,0 ęC)
TG-R4	(Display of current setpoint)	
Ext. display	(Display of current setpoint)	
2.1.3. Room sensor *(displayed at Casc. room control and Remote panel)*	Only analog input	☐Only external display, ☐Mean value
2.2. Demand control *(only displayed with SA control)*		
2.2.1. Activate		
Temp.-control	No	☐Yes
2.2.1.1. Extract air temp. control		
Setpoint.	22,0 ęC	_____ ęC (0 - 50 ęC)
Control mode	Cool	☐Heat
2.2.1.1.1. PI-settings temperature		
P-band	33,0 ęC	_____ ęC
I-time	100,0 sec	_____ sec
CO2-control	No	☐Yes
2.2.1.2. CO2-control		
Setpoint	1000 ppm	_____ ppm (0 ï 2000 ppm)
2.2.1.2.1. PI-settings CO2		
P-band	100 ppm	_____ ppm
I-time	100,0 sec	_____ sec
Humidity-control	No	☐Yes
2.2.1.3. Humidity-control		
Setpoint	60 % RH	_____ % RH (0 ï 100 % RH)
2.2.1.3.1. PI-settings humidity		
P-band	33,0 % RH	_____ % RH
I-time	100,0 sec	_____ sec
2.3. Fan setup		
2.3.1. Fan control		
Fan control	Fixed Speed	☐Pressure, ☐Flow
2.3.2. Fan speeds		
2.3.2.1. Supply air fan		
Min	20 %	_____ %
Normal	50 %	_____ %
Boost	80 %	_____ %
Kitchen	80 %	_____ %
Stove	80 %	_____ %
Night cool	50 %	_____ %
Max	100 %	_____ %
Fire	0 %	_____ %
2.3.2.1.1. Delay SA fan		
Start	0 sec	_____ (0 ï 3600 sec)
Stop	60 sec	_____ (0 ï 3600 sec)
Ramp time	1.00 V/s	_____ V/s
2.3.2.2. Extract air fan		
Min	25 %	_____ %
Normal	55 %	_____ %
Boost	85 %	_____ %
Kitchen	20 %	_____ %
Stove	20 %	_____ %

Night cool	55 %	_____ %
Max	100 %	_____ %
Fire	100 %	_____ %
2.3.2.2.1. Delay EA fan		
Start	0 sec	_____ (0 ï 3600 sec)
Stop	0 sec	_____ (0 ï 3600 sec)
Ramp time	1.00 V/s	_____ V/s
2.4. Temperature control		
2.4.1. SA control		
P-band	33,0 ¢C	_____ ¢C
I-time	100,0 sec	_____ sec
2.4.2. Room control *(is displayed if Casc. room control is selected)*		
P-band	100,0 ¢C	_____ ¢C
I-time	300,0 sec	_____ sec
2.4.3. EA control *(is displayed if Casc. EA control is selected)*		
P-band	100,0 ¢C	_____ ¢C
I-time	300,0 sec	_____ sec
2.4.4. SA control Livingroom *(is displayed if Zone control is selected)*		
P-band	33,0 ¢C	_____ ¢C
I-time	100,0 sec	_____ sec
2.4.5. Room control Livingroom *(is displayed if Zone control is selected)*		
P-band	100,0 ¢C	_____ ¢C
I-time	300,0 sec	_____ sec
2.4.6. Preheat control *(is displayed if Pre Heater is selected)*		
P-band	33,0 ¢C	_____ ¢C
I-time	100,0 sec	_____ sec
2.5. PID output *(no settings)*		
2.5.1. PID output		
Heating	xxx %	
By-pass	xxx %	
Cooling	xxx %	
2.5.2. PID output preheater *(is displayed if preheater is selected)*		
Damper	xxx %	
Electric	xxx %	
2.5.3. PID output duct heater *(is displayed if zone control is selected)*		
Heating	xxx %	
Setpoint change	x,x ¢C	
2.6. ECO/ECO2 *(is displayed if ECO and/or ECO2 is selected under system settings)*		
2.6.1. Activate ECO2 cooling *(is displayed if ECO2 is selected under system settings)*	Yes	☐No
2.6.2. Temp. diff.		
Heat	1,0 ¢C	_____ ¢C (0 ï 10,0 ¢C)
Cool	2,0 ¢C	_____ ¢C (0 ï 10,0 ¢C)
Dead band	0,5 ¢C	_____ ¢C (0 ï 1,0 ¢C)
2.6.3. Temp diff for increase to boost		
Heat: TL>FL+	1,0 ¢C	_____ ¢C (0 ï 10,0 ¢C)
Cool: TL<FL-	1,0 ¢C	_____ ¢C (0 ï 10,0 ¢C)
2.6.4. Alarm delay		
Warning temperature deviation	300 sec	_____ sec
2.7. Heater		
2.7.1. Type of heater	Electric	☐Water (PWM), ☐No heater, ☐Water (0-10V)
2.7.1.1. *When selecting "Electric"*		
Period	60 sec	_____ sec (0 ï 600 sec)
2.7.1.2. *When selecting "Water (PWM)"*		
Frost protection Start temp.	13,0 ¢C	_____ ¢C (13 ï 50,0 ¢C)
Exercise valve	No	☐Yes
Day	Monday	_____ (Monday - Sunday)
Hour	0	_____ (0 - 23)
Valve runtime	180 sec	_____ sec
Period	10 sec	_____ sec (0 ï 600 sec)
Reg. area	67 - 87 %	_____ - _____ % (0 ï 100 %)
2.7.1.3. *When selecting "Water (0-10V)"*		
Frost protection	13,0 ¢C	_____ ¢C (13 ï 50,0 ¢C)

Start temp.		
Dead band valve	0,5 %	_____ % (0 ï 50,0 %)
Exercise valve	No	☐Yes
Day	Monday	_____ (Monday - Sunday)
Hour	0	_____ (0 - 23)
Valve runtime	180 sec	_____ sec
2.8. Defrost		
2.8.1. Exhaust temperature	0,0 ęC	☐_____ ęC (-30,0 ï 10,0 ęC)
Defrost time	5 min	☐_____ min
Delay	3 h	☐_____ h (0 - 24 h)
2.8.2. During stop defrost *(if electric reheater)*		
Bypass	0 %	☐_____ % (0 ï 100 %)
SAF	0 %	☐_____ % (0 ï 100 %)
Heat	0 %	☐_____ % (0 ï 100 %)
During stop defrost *(if water reheater)*		
Bypass	100 %	☐_____ % (0 ï 100 %)
SAF	0 %	☐_____ % (0 ï 100 %)
Heat	100 %	☐_____ % (0 ï 100 %)
2.9. Bypass		
2.9.1. Bypass damperös running time	45 s	_____ s (0 ï 300 s)
2.9.2. Bypass outdoor temp. limit for open		
Outdoor temp..	> 0,0 ęC	_____ ęC
Hysteresis	1,0 ęC	_____ ęC
2.9.3. Activate ramptime	Only defrosting	☐Not active, ☐Always active
Ramptime:	180 s	_____ s
2.10. Cold air recovery		
Recover cold air	Yes	☐No
Conditions to start recover		
Outdoor temp. >EA +	2,0 ęC	_____ ęC (0,0 ï 20,0 ęC)
2.11. Night cooling		
Activate night cooling	No 22:00 ï 06:00	☐Yes _____ - _____ (00:00 ï 24:00)
After time	4 hours	_____ h (0 ï 24 h)
Reset	No	☐Yes
2.11.1. Conditions night cooling		
Day OD	>22 ęC	_____ ęC (0 ï 30 ęC)
OD temp	10 ęC	_____ ęC (0 ï 30 ęC)
Room temp	>18 ęC	_____ ęC (10 ï 30 ęC)
2.12. Forced cooling		
Activate forced cooling on SA control	No 00:00 ï 24:00	☐Yes _____ - _____ (00:00 ï 24:00)
Setpoint Exhaust air	28,0 ęC	_____ ęC (10,0 ï 40,0 ęC)
Hysteresis	1,0 ęC	_____ ęC
2.13. Timer		
The timer controls	Min flow	☐ECO, ☐Boost, ☐Max, ☐AHU On/Off
2.14. KAVK/Condensation boiler *(is displayed if ðKAVKò is configured on any digital output)*		
Start temp	5,0 ęC	_____ ęC (0,0 ï 30,0 ęC)
Stop temp	10,0 ęC	_____ ęC (0,0 ï 30,0 ęC)
2.15. Fire function *(is displayed if ðFireò is activated under system settings)*		
Fire input	Normally open	☐Normally open
Exercise fire damper	No	☐Yes don´t stop AHU, ☐Yes stop AHU
Fire damper function	Not active	☐FDs normally closed, ☐FDs normally open
2.15.1. Exercise fire damper *(is displayed if ðExcercise fire damperò is configured to yes)*		
Run time	90 sec	☐_____ sec (0 - 600 sec)
Interval	1 days	☐_____ days (1 - 30 days)
Excercise time	0	☐_____ (0 - 23)
Fire indication	Normally open	☐Normally closed
Auto acknowledge delay	30 min	☐____1____ min (0 ï 30 min)
2.16. I/O configuration *(ATTENTION! if the function corresponding to the desired selection is not configured, the selection returns when you leave the menu)*		

2.16.1. Analog inputs			
	UI1	Not active	☐Room sensor, ☐Frost protection sensor, ☐TG-R4, ☐Duct heater sensor, ☐Option temp 1, ☐Option temp 2, ☐Option temp 3, ☐Option temp 4, ☐Temp after Exch, ☐SAF Pressure, ☐EAF Pressure, ☐Exch. Pressure, ☐CO2, ☐Humidity
	UI2	Not active	☐Room sensor, ☐Frost protection sensor, ☐TG-R4, ☐Duct heater sensor, ☐Option temp 1, ☐Option temp 2, ☐Option temp 3, ☐Option temp 4, ☐Temp after Exch, ☐SAF Pressure, ☐EAF Pressure, ☐Exch. Pressure, ☐CO2, ☐Humidity
	UI3	Not active	☐Room sensor, ☐Frost protection sensor, ☐TG-R4, ☐Duct heater sensor, ☐Option temp 1, ☐Option temp 2, ☐Option temp 3, ☐Option temp 4, ☐Temp after Exch, ☐SAF Pressure, ☐EAF Pressure, ☐Exch. Pressure, ☐CO2, ☐Humidity
	UI4	Not active	☐Room sensor, ☐Frost protection sensor, ☐TG-R4, ☐Duct heater sensor, ☐Option temp 1, ☐Option temp 2, ☐Option temp 3, ☐Option temp 4, ☐Temp after Exch, ☐SAF Pressure, ☐EAF Pressure, ☐Exch. Pressure, ☐CO2, ☐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
2.16.2. Digital inputs (*the function must be activated from the factory to be selected)			
	DI1	AHU On/Off	☐Not active, ☐Min flow, ☐Boost flow, ☐Max flow, ☐Kitchen mode*, ☐ECO*, ☐Stove mode*, ☐Fire input*, ☐Fire damper*, ☐Normal, ☐Filter guard fire, ☐Smoke detector error*, ☐T (connected to timer)
	DI2	Not active	☐Min flow, ☐Boost flow, ☐Max flow, ☐Kitchen mode*, ☐ECO*, ☐Stove mode*, ☐Fire input*, ☐Fire damper*, ☐AHU. On/Off, ☐Normal, ☐Filter guard fire, ☐Smoke detector error*, ☐T (connected to timer)
	DI3	Not active	☐Min flow, ☐Boost flow, ☐Max flow, ☐Kitchen mode*, ☐ECO*, ☐Stove mode*, ☐Fire input*, ☐Fire damper*, ☐AHU. On/Off, ☐Normal, ☐Filter guard fire, ☐Smoke detector error*, ☐T (connected to timer)
	DI6	Not active	☐Min flow, ☐Boost flow, ☐Max flow, ☐Kitchen mode*, ☐ECO*, ☐Stove mode*, ☐Fire input*, ☐Fire damper*, ☐AHU. On/Off, ☐Normal, ☐Filter guard fire, ☐Smoke detector error*, ☐T (connected to timer)
	DI7 *(is only displayed if a heat source other than electricity is selected)*	Not active	☐Min flow, ☐Boost flow, ☐Max flow, ☐Kitchen mode*, ☐ECO*, ☐Stove mode*, ☐Fire input*, ☐Fire damper*, ☐AHU. On/Off, ☐Normal, ☐Filter guard fire, ☐Smoke detector error*, ☐T (connected to timer)
	DI4	TF omr.	☐SA fan EC
	DI5	TF omr.	☐EA fan EC, ☐Not active
	Alarm delay SA	30 sec	_____ sec
	Alarm delay EA	30 sec	_____ sec
	2.16.2.1. Timer		
	Time	0 hour, ☒0 min	_____ h (0 ï 24 h), _____ min (0 ï 59 min)
	Edge	Hi	☐Low
	2.16.2.1.1. Stove timer (is displayed if "Stove mode" is configured on any digital output)		
	Ignite time	15 min	_____ min (0 ï 30 min)
	After time	12 hours	_____ h (0 ï 24 h)
2.16.3. Digital outputs (*the function must be activated from the factory to be selected)			
	DO3 *(only displayed if heater "water 0-10V" or "no heater" is selected)*	Not active	☐KAVK, ☐ULS, ☐Sum alarms, ☐CP heater, ☐CP chiller, ☐Normal flow, ☐Fire damper, ☐Stove,

			☑Section hatch, ☐Sum alarm A, ☐Sum alarm B, ☐Sum alarm C, ☑Smoke detector
		DO4	Not active	☐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
		DO5	Not active	☐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
		DO6	Not active	☐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
		2.16.3.1. Invert DO		
		DO3	No	☐Yes
		DO4	No	☐Yes
		DO5	No	☐Yes
		DO6	No	☐Yes
		DO7	No	☐Yes
	2.16.4. Analog outputs			
		AO3 Heating	0.0 V – 10.0 V	_____ V – _____ V
		AO4 Cooling	0.0 V – 10.0 V	_____ V – _____ V
2.17. 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, ☒8N1, ☐8E1
2.18. 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	_____
2.19. EXOline address				
	Address			
	PLA		254	_____
	ELA		30	_____
2.20. External display				
	Activate external display		No	☐Yes
	Port		2	_____
	2.20.1. Setpoint adjustment			
	Max		3,0 ęC	_____ ęC (0,0 ï 10,0 ęC)
	Min		-3,0 ęC	_____ ęC (-10,0 ï 0,0 ęC)
2.21. Setpoint adjustment TG-R4				
	Setpoint adjustment with TG-R4			
	Activate		No	☐Yes
2.22. Activate EA-fan				

	Activate EA-fan	Yes	☐No
2.23.	**Filter timer**		
	Activate Filter timer	Yes	☐No
	Number of days since start	*(Current value)*	_____
2.24.	**Cloudigo**		
	Activate Cloudigo	No	☐Yes
2.25.	**Save settings**		
	Save current settings	No	☐Yes
2.26.	**User menu**		
	Temperature	On	☐Off
	Mode	On	☐Off
	Timer	On	☐Off
	In/outputs	On	☐Off
	Hand/Auto	On	☐Off
	Alarm history	On	☐Off
	Load settings	On	☐Off
2.27.	**Zones**		
	Activate 2 Zones	No	☐Yes
	2.27.1. Configure external display		
	Configure Livingroom *(Connect **ONE** external display)*		
	Configure	No	☐Yes
	Configure Bedroom *(Connect **ONE** external display)*		
	Configure	No	☐Yes
2.28.	**Change Alarm Class**		
	Alarm		
	Sensor error OD temp	A	☐B, ☐C, ☐Inactive
	Sensor error SA temp	A	☐B, ☐C, ☐Inactive
	Sensor error EXT temp	A	☐B, ☐C, ☐Inactive
	Sensor error EA temp	A	☐B, ☐C, ☐Inactive
	Sensor error Room temp	A	☐B, ☐C, ☐Inactive
	Sensor error FRP temp	A	☐B, ☐C, ☐Inactive
	Freeze protection alarm	A	☐B, ☐C, ☐Inactive
	Supply fan failure	C	☐A, ☐B, ☐Inactive
	Extract fan failure	C	☐A, ☐B, ☐Inactive
	Preheat damper manual	C	☐A, ☐B, ☐Inactive
	Electric heater overheated	A	☐B, ☐C, ☐Inactive
	Filter guard DI8	A	☐B, ☐C, ☐Inactive
	Chiller manual	C	☐A, ☐B, ☐Inactive
	Heater manual	C	☐A, ☐B, ☐Inactive
	By-pass manual	C	☐A, ☐B, ☐Inactive
	ULS manual	C	☐A, ☐B, ☐Inactive
	KAVK manual	C	☐A, ☐B, ☐Inactive
	P1-heating manual	C	☐A, ☐B, ☐Inactive
	P1-cooling manual	C	☐A, ☐B, ☐Inactive
	SA fan manual	C	☐A, ☐B, ☐Inactive
	EA fan manual	C	☐A, ☐B, ☐Inactive
	SA controller manual	C	☐A, ☐B, ☐Inactive
	Internal battery failure	A	☐B, ☐C, ☐Inactive
	Filter alarm	Inactive	☐A, ☐B, ☐C
	Fire damper alarm	A	☐B, ☐C, ☐Inactive
	Fire alarm	A	☐B, ☐C, ☐Inactive
	Sensor error TG-R4	A	☐B, ☐C, ☐Inactive
	Warning low supply temp	C	☐A, ☐B, ☐Inactive
	Preheat electric manual	C	☐A, ☐B, ☐Inactive
	Supply air temp low	A	☐B, ☐C, ☐Inactive
	Duct heater manual	C	☐A, ☐B, ☐Inactive
	Sensor error duct heater	A	☐B, ☐C, ☐Inactive
	Sensor error temp. after exch.	A	☐B, ☐C, ☐Inactive

	Defrost failed A	A	☐B, ☐C, ☐Inactive
	Defrost failed B	B	☐A, ☐C, ☐Inactive
	Hatch manual	C	☐A, ☐B, ☐Inactive
	Autocalibration not finished	C	☐A, ☐B, ☐Inactive
	Fire indication	B	☐A, ☐C, ☐Inactive
	Smoke detector error	B	☐A, ☐C, ☐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 ï Easy (TG-R4). Hear you can set the setting range for the setpoint value adjustment. With the knob in center position (0 adjustment), the setpoint on the main display is the one that applies.
Current adjustment for TG-R4 can be seen in the display on line 3.
The current setpoint on the remote panel can be seen in line 4.

Remote panel - Easy

2.1.3. Room sensor

If there is more than one room sensor, where one is connected to the analog input (an ordinary simple standard sensor or e.g., remote panel - Simple (TG-R4)) and the other is a serial remote panel with built-in sensor connected to port 1 or 2, it is possible to choose from where the actual value should be taken. This menu is only displayed if room control is used.


Remote panel ï With display

2.2. Demand control

Demand control means that the fans regulate between normal flow and forced flow due to temperature, CO2 or humidity or a combination thereof. The extract air sensor is used as the temperature sensor. CO2 and humidity sensors are connected to an analog input 0-10V. If you choose a combination of sensors, it is the regulator that wants the highest fan speed that "wins".

2.2.1. Activate

Menu for activating the various demand control functions.

2.2.1.1. Temperature control

Menu for setting the temperature setpoint
If temperature control is selected, it is possible to choose if the demand control shall be connected to heating or cooling.
NOTE! Check that supply air and exhaust air setpoints do not contradict each other. Normally you choose a supply air setpoint that is a few degrees below what you want as room temperature. Demand setpoint should be the desired temperature in the room.

2.2.1.1.1. PI-settings temperature

Setting of control parameters.

2.2.1.2. CO2-control

Menu for setting the CO2 setpoint

2.2.1.2.1. PI-settings CO2

Setting of control parameters.

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 ï 32%	100 ï 0%	100%	0%
32 ï 64%	0%	100 ï 0%	0%
64 - 66%	0%	0%	0%
66 - 100%	0%	0%	0 - 100%

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.

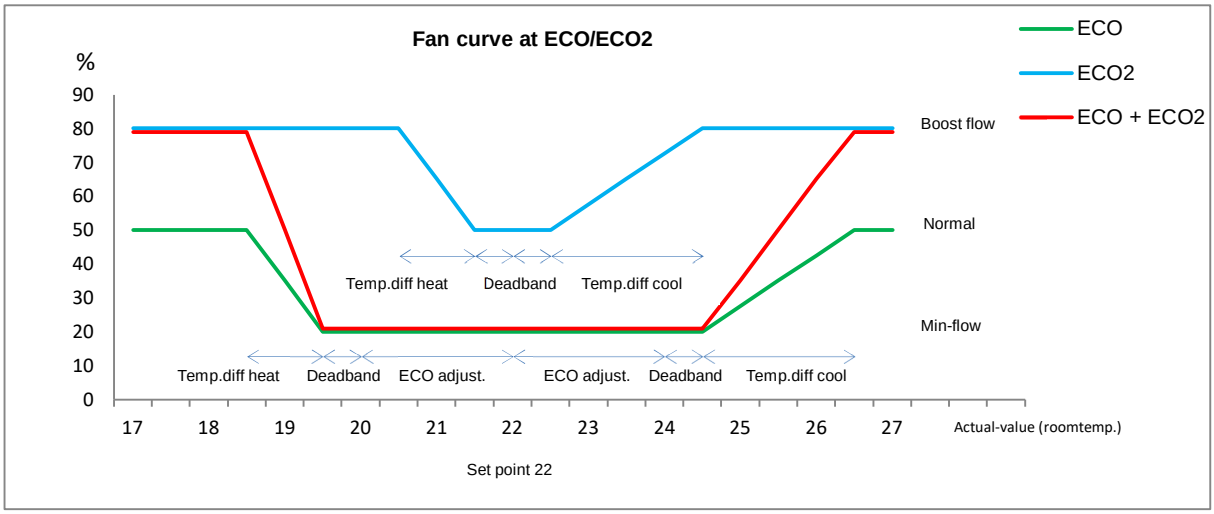
In the absence of heating media, the unit gives the alarm "Warning low supply air temp" when the fan speed has been at min-flow as standard for at least 5 min. The time can be set in this menu. The alarm is acknowledged and returns automatically as soon as the heat returns. No alarm is given in the absence 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: 2,0ºC
Dead band: 0,5ºC
Temp diff. heating: 1,0ºC
Temp diff. cooling: 2,0ºC
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 controllersô value and that of the freeze protection controller.

At set alarm temperature a freeze protection alarm is generated and both fans will be stopped, outdoor air damper (ULS) and bypass will close. The heat valve will still be open and the circulation pump for heat continues to run. The alarm can be acknowledged whatever freeze protection temperature, and the alarm output will then return. To get the AHU running again, the freeze protection temperature needs to be Óset alarm temp + 2,5 degrees.

Sensor error.
If there is a fault in the freeze protection sensor, this generates a freeze protection alarm and a sensor error alarm and 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 continue to run.

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% x 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 damperôs running time.

Here, the total run time is stated from open to closed or vice versa. The system can then easily set the desired degree of opening. The menu also shows the calculated current opening in percent.

2.9.2. Bypass limit for opening.

The default setting is that the bypass damper cannot open if minus degrees when it comes to the temperature control. If you want to change this, set at what outdoor temperature, bypass will be allowed to open if necessary. There is also an adjustable hysteresis, to prevent the bypass from open and close all times, if the temperature is around 0 degrees (default setting).

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.
ñDay ODòshows that the average value of the OD temperature between 9:00 ï 16:00 must be higher than set value. The value within parenthesis shows actual average value. The value resets at 9:00 h and a new value is calculated during the day.
Current OD temperature must be above a set value and below current room temperature (if EA control, the EA sensor). Room temperature must be above set value. Any set point adjustments will not affect this value.

Fan values for night cooling.
There are also special fan speeds connected to the night cooling. See chapter ñFan speedsò

Function.
If all conditions for night cooling are fulfilled the following will happen.

- Bypass is open max. Heat and cool is off.
- The fans change speed according to the settings for night cooling.
- Night cooling is displayed in the panel as long as it really is active (all conditions are fulfilled).
- If any of the conditions no longer are fulfilled, the extended running time will start and next the AHU will turn to normal mode.

2.12. Forced cooling

In supply air regulation, heating is normally handled by another system. The temperature of the supply air is regulated according to the supply setpoint, which is normally a few degrees below the set point for the primary heating system. When using forced cooling, a set value for this is set on the unit. The cooling value setpoint must be one or several degrees above the normal setpoint for the primary heating system.
If the temperature of the extract air rises above the forced cooling setpoint, the unit switches to extract air control and adjusts to the forced cooling setpoint, but only with the help of cooling (no heat is activated). If ECO2 cooling is activated it also forces to cool according to normal ECO2 routines.
There is an adjustable hysteresis and when the temperature eventually drops below the set point minus the hysteresis, the unit switches back to supply air control and adjusts to the supply air setpoint both by means of heat and bypass.

By activating the function, the cold is blocked during supply air regulation and thus only becomes active when the unit switches to extract air control. A time window can be specified if needed.

2.13. Timer

In this setup menu you configure what the timer should do.

Default is Min flow, which means the AHU will go to min flow during the periods set in the menu timer schedule. Normally used as an ñaway modeòif there are periods every week when nobody is at home.

The timer could for example instead be used to stop or boost the AHU according to a schedule.

2.14. KAVK (Condensation boiler)

If there is no floor drain available close to the AHU, a KAVK is a good solution. KAVK is an electric heater that starts when there is a risk of condensation. The water vaporizes and is ventilated out through the extract air duct.

The outdoor temperature when the KAVK shall start could be set in the menu, as well as the stop temperature. The start temperature should normally be lower that the stop temperature, which will make a so-called hysteresis between start and stop. If start and stop is the same, it could make the relay toggle all the time if the outdoor

temperature happens to be the set value. If stop temperature is set lower than start temperature, the start temp will have priority as both start and stop temp.

2.15. Brandfunktion

This function is used to adjust the fans in the event of a fire so that they evacuate fire gases and to adjust the fire damper to the appropriate positions.This menu is only displayed if Brand is activated at the factory.

Fire input

The fire input can be configured to normally open or closed.
This means that if you have configured normally open and get a closure (alarm), the unit is put in fire mode and the alarm output is activated.
You can choose if you want the fire dampers to be exercised (tested). If you want them to be exercised, you also have the choice of whether the unit should stop or not during the exercise.

Fire damper function

The fire damper function can be configured open, closed or not active.

2.15.1. Exercise fire damper

To ensure that the fire dampers really work in the event of a fire, the dampers can be exercised (tested) at regular intervals. The exercise interval is adjustable. To make this function possible, the fire dampers are equipped with limit switches. During fire damper exercise, it will be checked that the dampers reach their end positions and that the end position switches work. If not, an alarm is activated.
The running time for the dampers can be set. This is the maximum time that is allowed to take for the damper to go from one end position to the other.
The number of days between the exercises can also be set. In addition, what time of day the exercise should take place. If you set it to 0, the exercise takes place at midnight.

Fire indication

There is also a special function to possibly reduce the number of false alarms if you have problems with that.
The function sorts out alarms that are due to temporary smoke for some reason.
If it should be a real fire alarm, it is required that the smoke detector indicates smoke and that the extract air filter is clogged (by soot) to a certain limit (the pressure drop increased across the filter). This must then also take place within a certain adjustable time.

Example:
If you set the time to 15 minutes, the following applies:
When smoke is detected, a B-alarm (Fire indication) is activated, a timer starts, and the fans go to normal flow.
When the timer has expired (15min), the alarm is automatically acknowledged, and the smoke detector is reset by temporary interrupt the power to the detector.
If more smoke is detected when the timer is running (15min) nothing changes, (the smoke detector is already activated). The alarm is acknowledged when the timer has expired. The fans run in normal flow for another 15 minutes (same time as the first timer). All this time, in other words 30 minutes from the first smoke, the filter guard is monitored. If the filter becomes clogged within this time, the fire function is activated, fans and dampers go into fire mode.
If new smoke is detected after acknowledgment of the alarm (say after 16 minutes after the first smoke) the timer is restarted (the fans are then already running at normal flow).
To activate the function, configure one of the digital inputs to ñFilterg fireò(Filter Guard Fire).
Then "Fire indication" appears as a new window in the fire menu.
To be able to reset the smoke detector, this is connected to a digital output and which is configured as "Smoke det.".

2.16. I/O configuration

2.16.1. 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).

2.16.2. 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.

2.16.2.1. 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 ñTòwill light up at the row. To remove the ñTòuse up or down arrows. After acknowledging with OK the timer will be connected to that specific input. To move the timer to another row, it is necessary to first remove the T from the present row. If you try to configure the timer to a row and the timer already is connected to another row, the first T will light up when pushing the up or down arrow, but it disappears after you have passed through all rows.

Timer configuration
In addition to setting the timer time, you can specify whether it should start on a high or low signal and whether it is flank triggered.
When the input is triggered, the timer starts and the current function is active until the timer expires.
If you wish to reset the timer in advance, you do so by triggering the input once more.

2.16.2.1.1. Stove timer.

The Stove mode function must be enabled at the factory for Stove mode to work.
Stove mode means reduced exhaust air and increased supply air during the first time after ignition of the stove.
This also means that the cooling is blocked so you do not directly cool the comfortable stove heat.
Configure any of the inputs DI1, DI2, DI3 or DI6 to Stove mode. When Stove mode is selected, an arrow to the right is displayed. That means a new menu (Stove timer) is available to the right.

Configuring stove timer.
Two different times are set at the stove timer, the ignition time and the after time.
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.

2.16.3. 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.

2.16.3.1. 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.

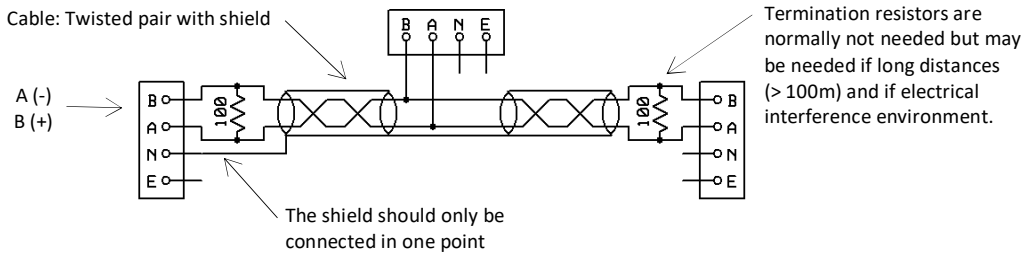
2.16.4. Analog outputs

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.

2.17. 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.

2.18. TCP/IP

Internet setting menu.

2.19. EXOline address

EXO line address setting menu.

2.20. 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.

2.20.1. Set point adjust.

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

2.21. Set point adjust. TG-R4

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

2.22. Activate EA-fan

Not relevant for Blue (should not be changed).

2.23. 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.

2.24. 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!

2.25. Save settings

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

2.26. 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 ñAuthorizationò Default is that all are visible.

2.27. 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.

2.27.1. 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 ñTemperatureò in the User Manual. There is one menu for bedroom settings and one for living room settings. Each zone also has its own ECO adjustment.

2.28. Change alarm class

In this menu you can change the alarm class for the different alarms.
The alarms are divided into three different classes A, B and C alarms. The cause for A-alarms must be fixed and then acknowledged before it disappears. B alarms have the same function as A alarms but are classified as slightly less important. C-alarms are internal alarms and automatically returns when the cause of the alarm disappears. C alarms are used e.g., to notify the user that the unit is in manual mode etc. In addition, inactive alarms may occur. E.g., as default, filter alarms are inactive. Instead, filter alarms are displayed in the display but still activate relay output if configured.
Inactivation means that the alarm is not visible, but the action is done automatically anyway, e.g., it would stop the unit etc.

Menu example when changing alarm class.

- Press OK in the first menu.
- Scroll with the up / down arrow to the alarm to be changed.
- Press OK when the current alarm is found.
- The current alarm class for the current alarm is now displayed.
- (NOTE: The current alarm class is only displayed when OK have been pressed).
- Press the right arrow and change to new alarm class.

Tip: If you change an alarm from A or B to C, the alarm will be automatically acknowledged when the cause has disappeared.

Notes:

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Medlem i Svensk Ventilation
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Rec Indovent reserves the right to alter specifications and design without prior notice.

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