

# Installation instruction

**CTS 602** by Nilan

**Comfort 1200**

**Comfort 5000**

Version: 10.00, 13-04-2015  
Software-version: 2.30



## Table of contents

Table of contents .....	2
Introduction.....	3
Power supply.....	4
Assembly of Comfort .....	5
Condensation drain / water seal .....	6
Heating surface, water.....	7
Heating surface, electrical (retrofitting) .....	9
Activating the service menu .....	10
Heating surface.....	11
Air quality .....	12
Air exchange.....	13
Defrost .....	14
Temp. control.....	15
Inlet control .....	16
Room control .....	17
Re-start.....	18
Preset .....	19
Manual.....	20
Modbus .....	21
Datalog .....	22
System dimensions .....	23
Accessories/spare parts .....	25

## Introduction



Please control that the following documents have been delivered together with the unit:

- Directions for assembly & use (this document)
- CTS 600 directions
- Electrical chart

Comfort is designed for heat recovery with air volumes up to 1200m<sup>3</sup> / h. The energy from the exhaust is recovered to the inlet via the counter flow heat exchanger, where the two air streams pass each other without coming into direct contact.

The system is prepared for retrofitting of a post-heating element (electricity or water) for supply heating of the inlet air. The post-heating element is controlled via CTS 602.

The system comes standard with filter class F5 on the extract air and F7 on the supply air.

Operating the unit is done with the CTS 602 control. The control has many functions such as menu based attendance, week programme, time controlled filter guard and adjustment of the velocity of the ventilator. (Directions for the CTS 602 control is described in another document delivered with the unit.)

Comfort is delivered tested and ready for use. Installation and start-up must be carried out by an authorized electrician.

## Power supply



Power supply including safety switch must be installed by an authorized electrician. The Comfort-unit must be connected according to the attached electrical chart.

The unit is delivered with 1m test cable for the CTS 602 panel. The panel should be connected to the CTS 602 control in the unit with cable type 2x2x0.25mm<sup>2</sup> twisted in pairs. (Maximum length 50m).

The CTS 602 panel must be placed dry and frost-proof. The panels' integrated feeler prevents further cooling of the building if the primary heat-supply stops by stopping the ventilation if the panel feeler gets below a specific value. (Factory setting is 10°C; the value can be set from 1-20°C.)



**CTS 602 control**

If a water heating element is installed in the system, the regulation vent must be connected electrically as described in the enclosed wiring diagrams.

## Assembly of Comfort



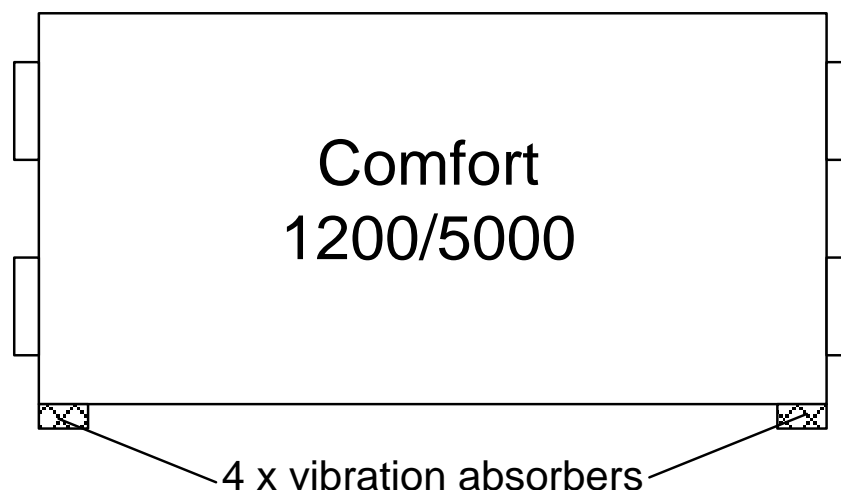
When mounting the Comfort-unit future service and maintenance should be considered. There is required a minimum of open space in front and behind of the unit of 60cm.

In order to ease the mounting each of the connection pieces is labeled. Please notice the labels. The connection between the unit and the ducting should be a flexible transition.

The system must be level because of the condense outlet. The condense outlet requires a minimum clearance height of 125mm beneath the outlet connection.

The exchanger is low-noise and low-vibration. However, potential vibrations spreading from the system to the individual building parts must be taken into account. To detach the system from the floor, we recommend that the system is placed on vibration absorbers. The vibration absorbers must be placed diagonally on each corner to ensure that the system does not “fall down” from them. If a water heating element is installed in Comfort 300/450/600, a clearance distance of 60cm is required behind the system.

It is not necessary to re-insulate the system as it is delivered with a 20mm standard insulation.



**Mounting the Comfort unit**

## Condensation drain / water seal

The Comfort unit is delivered with a 20mm condensation drain. (PVC, GF-fittings). The drain is placed under the discharge.



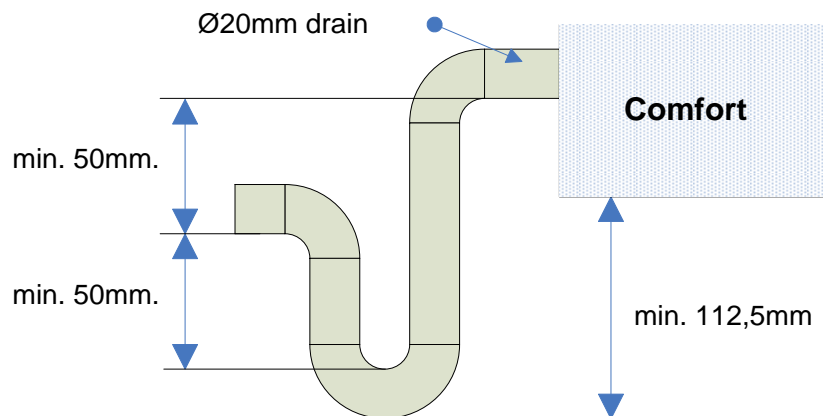
The condensation drain should be carried with an even inclination of at least 1cm per metre, frost-proof to the nearest outlet. The overflow from the safety valve should also be carried to the nearest outlet.



To avoid frost problems it can be necessary to supply the condensation drain with a heating cable. It is the plumbers' responsibility to secure the drain. (See Accessories)

When the system is running, there can be a vacuum of up to 500Pa (corresponding to 50mm water column) in the outlet. For this reason, the difference in height in the water seal must be minimum 50mm.

The water seal can dry out and avoid the water from running out of the unit. Therefore the water seal should be tested regularly and refilled with water if necessary. An elevated height of the water seal will reduce the need for refilling with water.



**Condensation drain / water seal**



The water seal should be tested as described below. (the unit must be connected to the ducting and the front door should be closed):

## Heating surface, water



Connecting the heating surface must be done by an authorized plumber.



If the unit is placed outside or in a cold location the installation must frost secured.

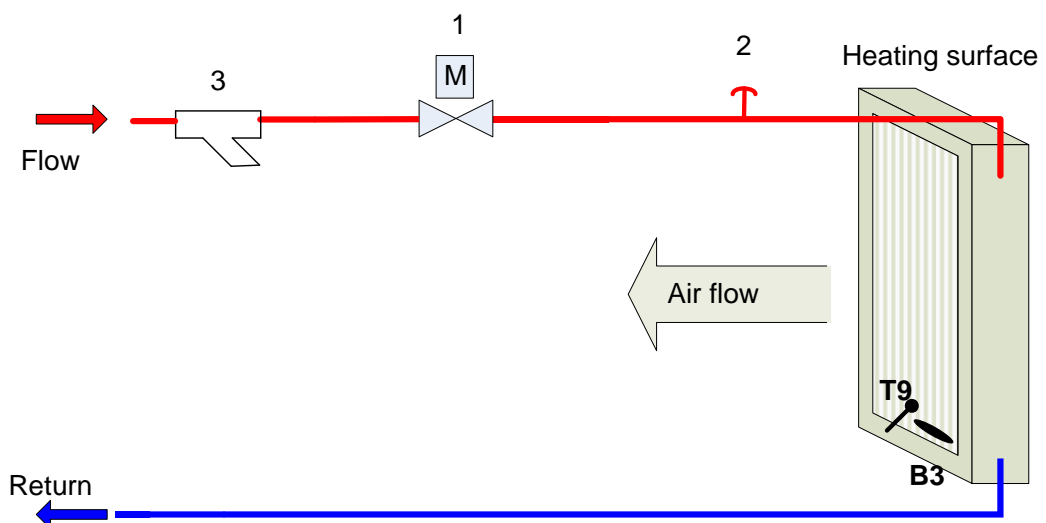
The heating surface should be connected, scavenged and checked for any leakages before starting the unit.

The dirt-catcher should be checked and cleaned after a thoroughly flushing of the system.



*To obtain a stable control of the heating surface, the distance between the mixing loop and heating coil must not exceed 2 meters.*

*Avoid routing pipes in the system in such a way that the fan cannot be removed.*



Note that the temperature sensor T9 and frost-protection B3 is placed at the heated side of the heating surface close to the return connection. See electrical chart.

- 1: Actuator and regulating valve:  
Danfoss AME 140/24V, - 3-vejsventil VZ3 DN15 Kv0,63, (Nilan delivery)
- 2: Circulation pump, eg. Grundfos UPS 25-40 or equivalent (not Nilan supply)
- 3: Dirt-catcher (not Nilan delivery)
- 4: Shutoff valve (not Nilan delivery)
- 5: Exhaust (not Nilan delivery)

### Connecting the heating surface, suggestion

### IMPORTANT regarding Danfoss Actuator type AME 140:

Re-installing the actuator must be done as described below:

1. Disconnect the power supply and remove the cover of the actuator.
2. Liberate the gear by pressing down the button as the spindle is turned up (counter clockwise)
3. Re-install the actuator and turn on power.
4. DIP-switch nr. 1 should be moved to ON and then to OFF.
5. The actuator is automatically calibrating for up to 6 minutes.  
(The LED is flashing when calibrating and is lit constantly when finished).
6. Re-install the cover of the actuator.

The actuator should be placed in an environment of 0°C to 55°C.

Indicative performance data for the Comfort 1200 water heating element							
Pipe connection: Ø15 (by factory-mounted water heating element)							
Flow/return temperature	Airflow	Performance	Air supply temperature (at temperature of 5 °C immediately prior to the heating element)	Pressure drop on water side	Pressure drop on air side	Water Quantity	Recommended Kv value for valve
[°C]	[m <sup>3</sup> /h]	[kW]	[°C]	[kPa]	[Pa]	[l/h]	
40/30	400	3	26,1	5	4,3	259	0,63
	600	4	23,7	8,4	8,4	344	
	800	4,8	22	11,8	13,5	416	
	1.000	5,6	20,7	15,3	19,5	480	
	1.200	6,2	19,6	18,7	26	537	
60/40	400	4,5	36,8	2,9	4,3	196	
	600	6	33,1	4,8	8,4	260	
	800	7,2	30,5	6,7	13,5	314	
	1.000	8,3	28,4	8,6	19,5	361	
	1.200	9,3	26,8	10,5	26	403	
70/40	400	5	39,9	1,6	4,3	144	
	600	6,5	35,6	2,7	8,4	189	
	800	7,9	32,7	3,7	13,5	228	
	1.000	9	30,4	4,7	19,5	261	
	1.200	10	28,6	5,8	26	291	



## Heating surface, electrical (retrofitting)

Electrical heating surface should be installed in the ducting Ø315mm, 400V, 3~.



Power supply must be installed by an authorized electrician.

Electric heating surface mounted in supply air duct for Comfort 1200.

There must be a safety distance of minimum 150 mm from the electrical heating element to flammable material. The heating element must be insulated with a fire-resistant insulating material, however the connection box must not be insulated. (Important: The instructions from the manufacturer of the heating element **MUST** be followed).

- Electrical assembly must be performed by a qualified electrician.
- Power supply is installed with the ventilation system.
- T7, air supply sensors, installed in supply air duct approx. 1 meter after the electrical heating element.
- 0-10V signal is connected to electrical heating element.
- Signal to overheating from the electrical heating element is connected to the CTS 602 print in the ventilation system.

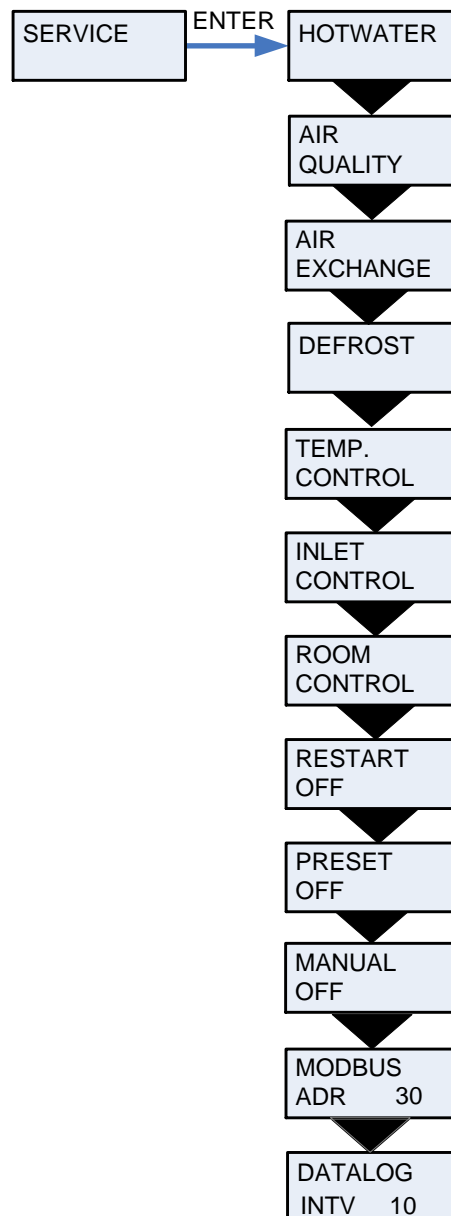
The Nilan supplied heating element is installed in accordance with the enclosed chart

The heating element is now an option in the software via the control panel. See the instructions on the following pages.

See electrical chart for the ventilation unit.

## Activating the service menu

Press ▼ and **ENTER** at the same time for 10 seconds. The service menu is now available. Press ▼ multiple times until the panel shows **SERVICE**. Press **ENTER** to enter the service menu. It is now possible to move around in the menu by using ▲▼. The headlines of the service menu are shown below:



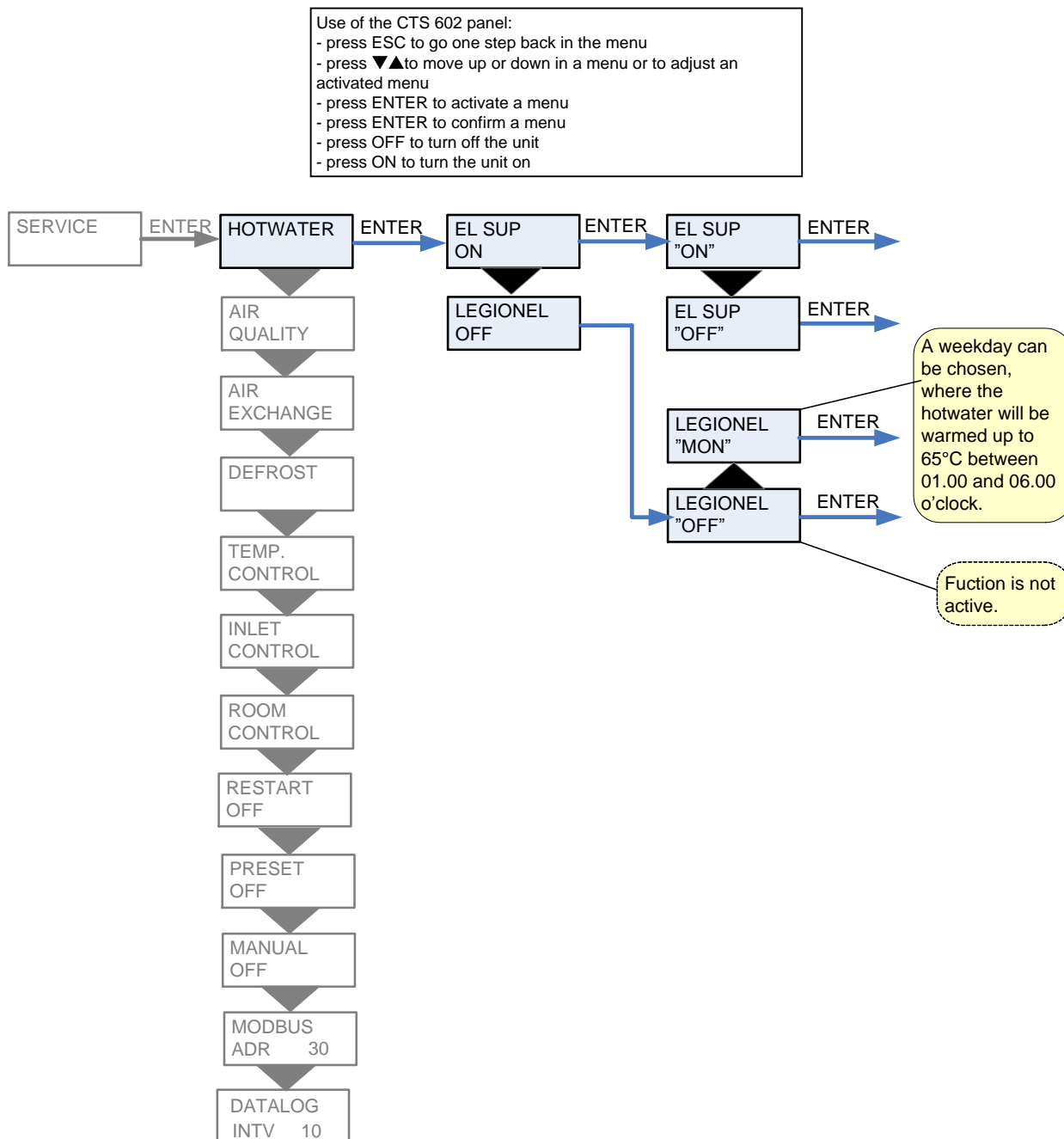
### Headlines in the service menu

## Heating surface

The unit can be equipped with a heating surface.

It is possible to retrofit a heating surface. The surface must be activated in the CTS 602 control in order to function together with the unit and for the frost-protection to be active.

When installing a heating surface T7 is the temperature sensor in the inlet.



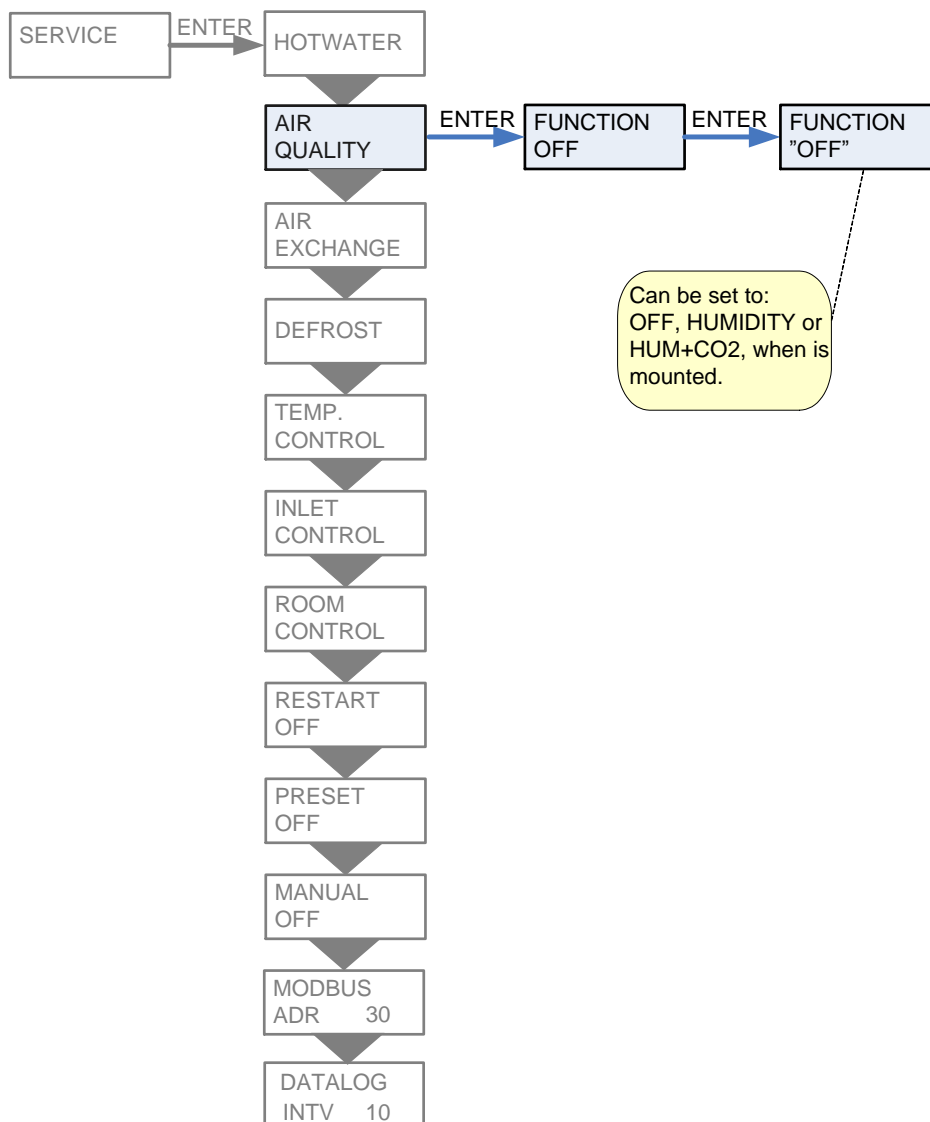
The "Central heating" menu

## Air quality

In the "Air quality" menu it is possible to choose between 3 types of regulation: Humidity, Humidity + CO<sub>2</sub> or OFF.

Use of the CTS600 panel:

- press ESC to go one step back in the menu
- press ▼▲to move up or down in a menu or to adjust an activated menu
- press ENTER to activate a menu
- press ENTER to confirm a menu
- press OFF to turn off the unit
- press ON to turn the unit on



### The "Air quality" menu

## Air exchange

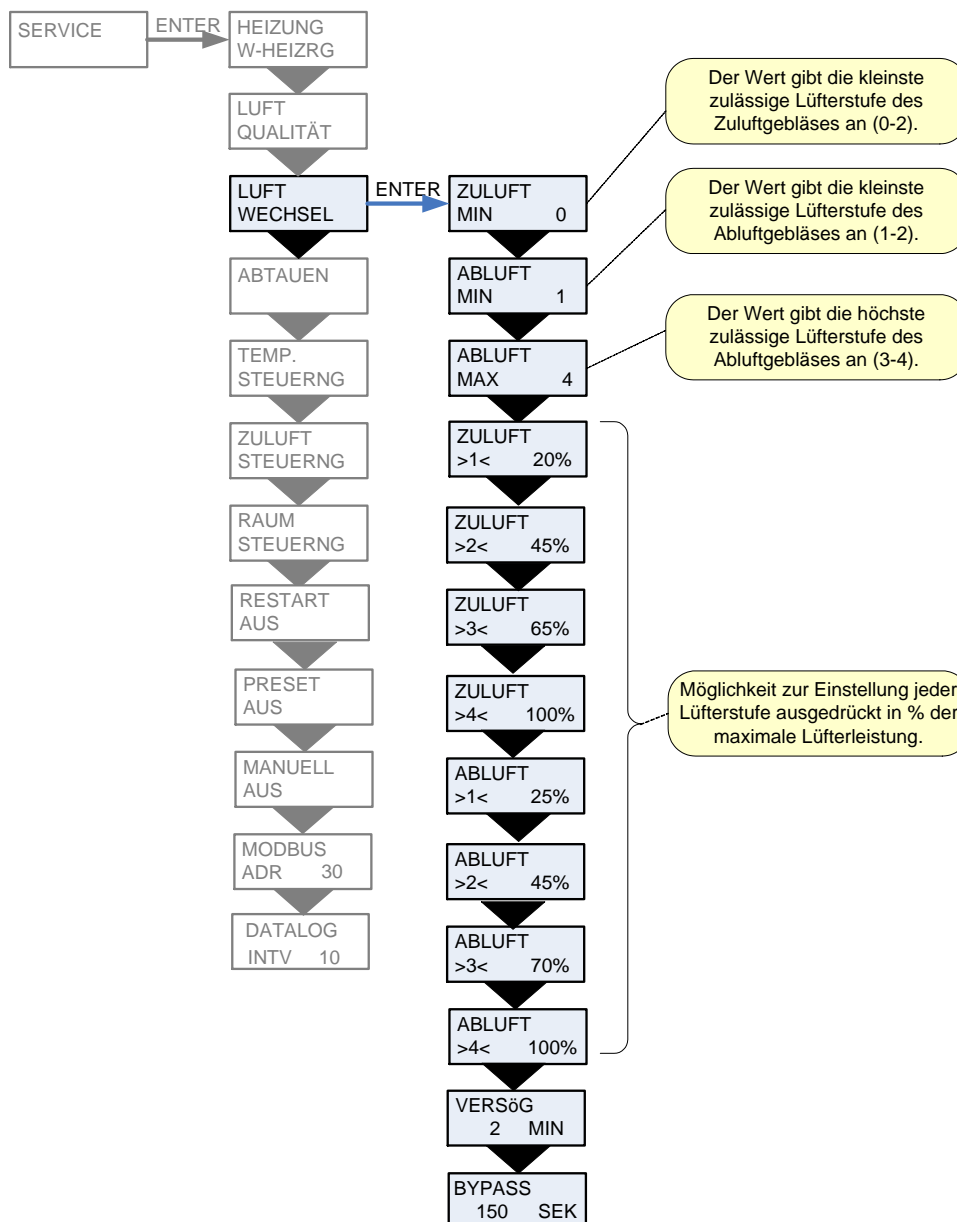
In the "Air exchange" menu it is possible to adjust 4 steps of ventilation speed (air volume). Inlet and exhaust is to be adjusted individually at each level.

The inlet speed can be adjusted to a minimum and the exhaust can be adjusted to both a maximum and a minimum.

It is possible to delay the starting of the fan in order to give time to the register to open.

Use of the CTS600 panel:

- press ESC to go one step back in the menu
- press ▼▲ to move up or down in a menu or to adjust an activated menu
- press ENTER to activate a menu
- press ENTER to confirm a menu
- press OFF to turn off the unit
- press ON to turn the unit on

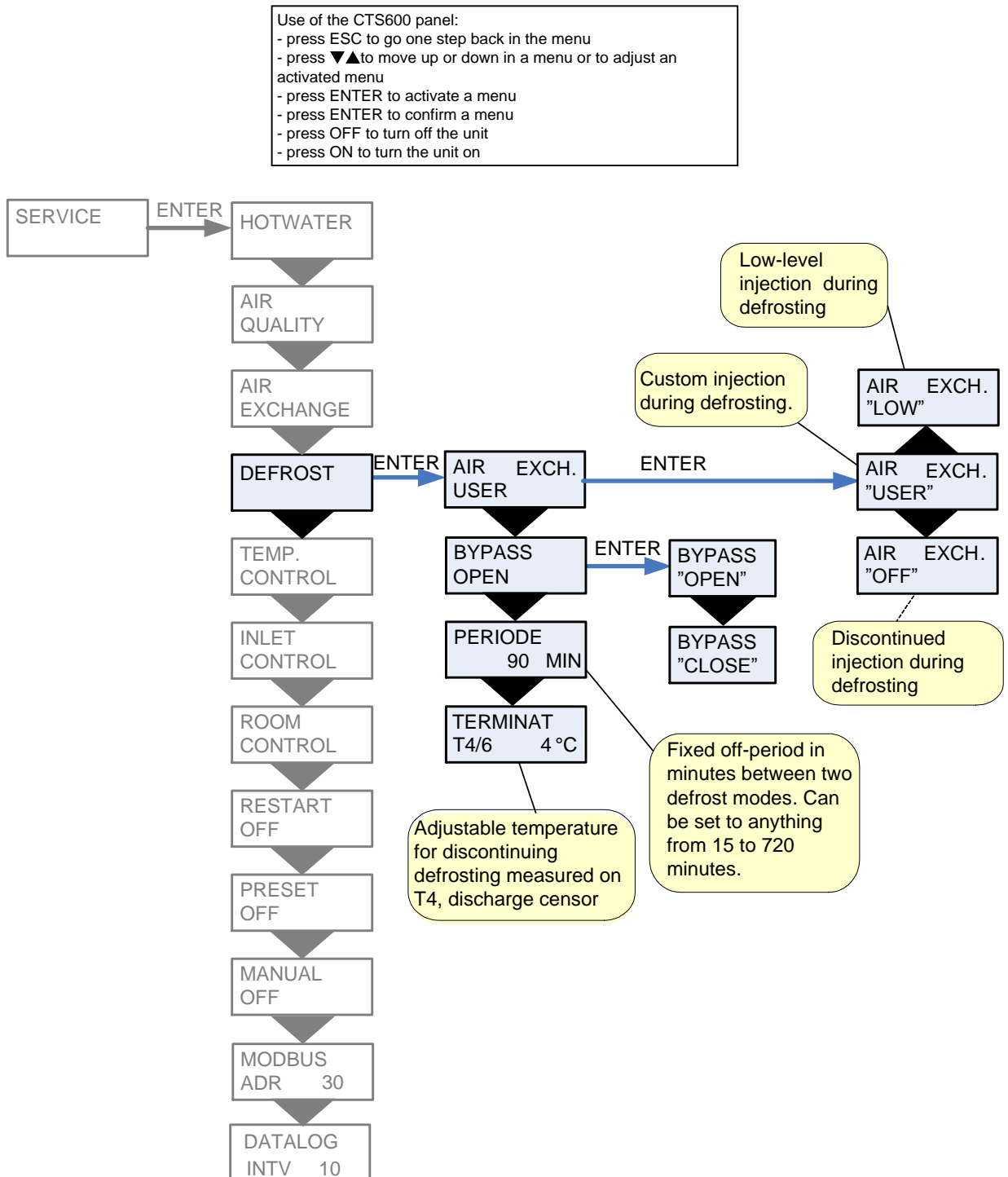


The "Air exchange" menu

## Defrost

In the "Defrost" menu it is possible to choose how the unit should perform during defrosting of the evaporator in the exhaust.

" " indicates that the menu point flashes and can be set to another value



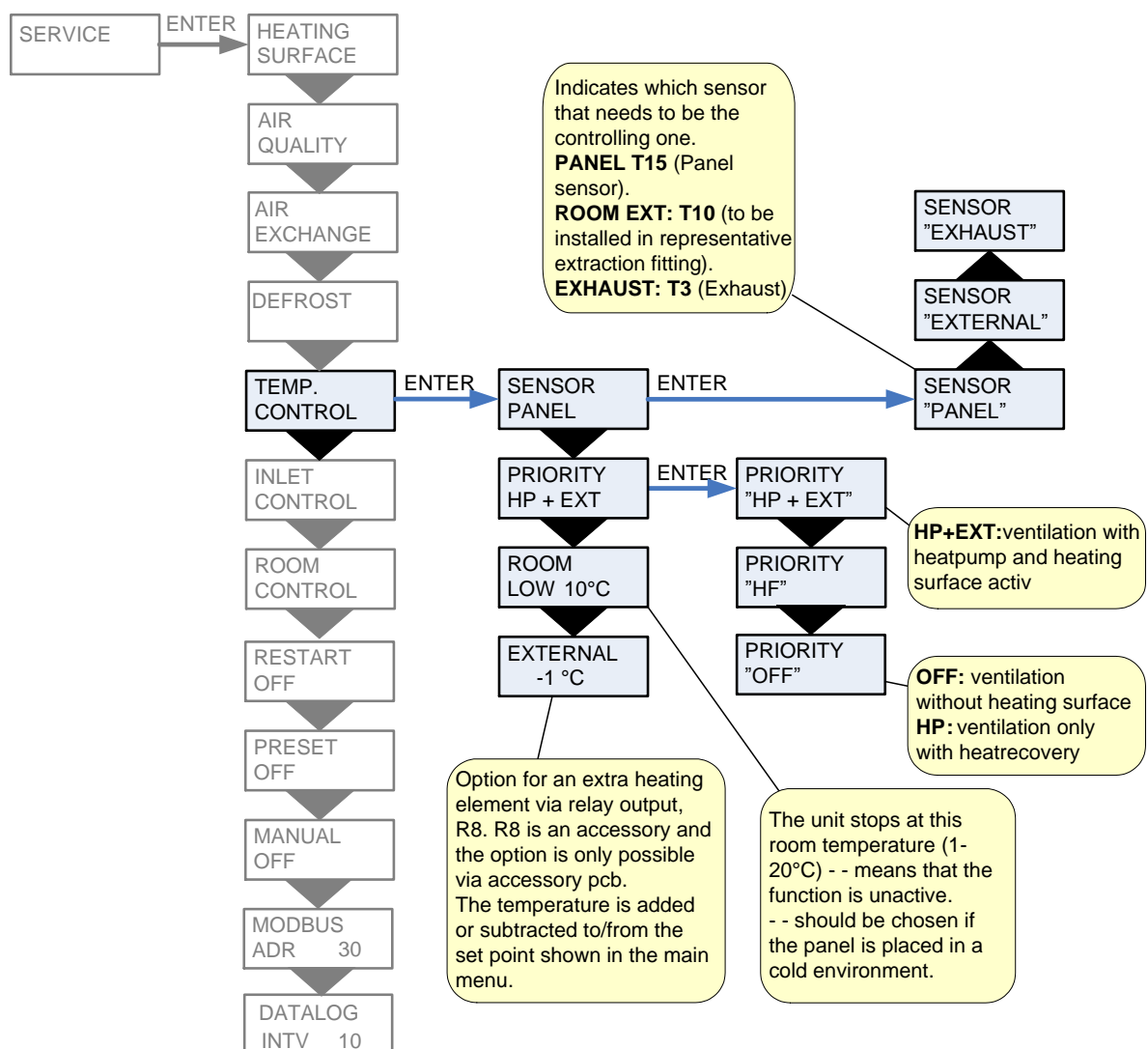
The "Defrost" menu

## Temp. control

In the "Temp. control" menu it is possible to chose a room temperature where the unit stops in order to avoid further cooling of the building if the primary heating shuts down.

Use of the CTS600 panel:

- press ESC to go one step back in the menu
- press ▼▲ to move up or down in a menu or to adjust an activated menu
- press ENTER to activate a menu
- press ENTER to confirm a menu
- press OFF to turn off the unit
- press ON to turn the unit on



The "Temp. control" menu

## Inlet control

In the "Inlet control" menu it is possible to adjust the regulation of the inlet. The menu is only accessible when the unit has a heating surface installed.

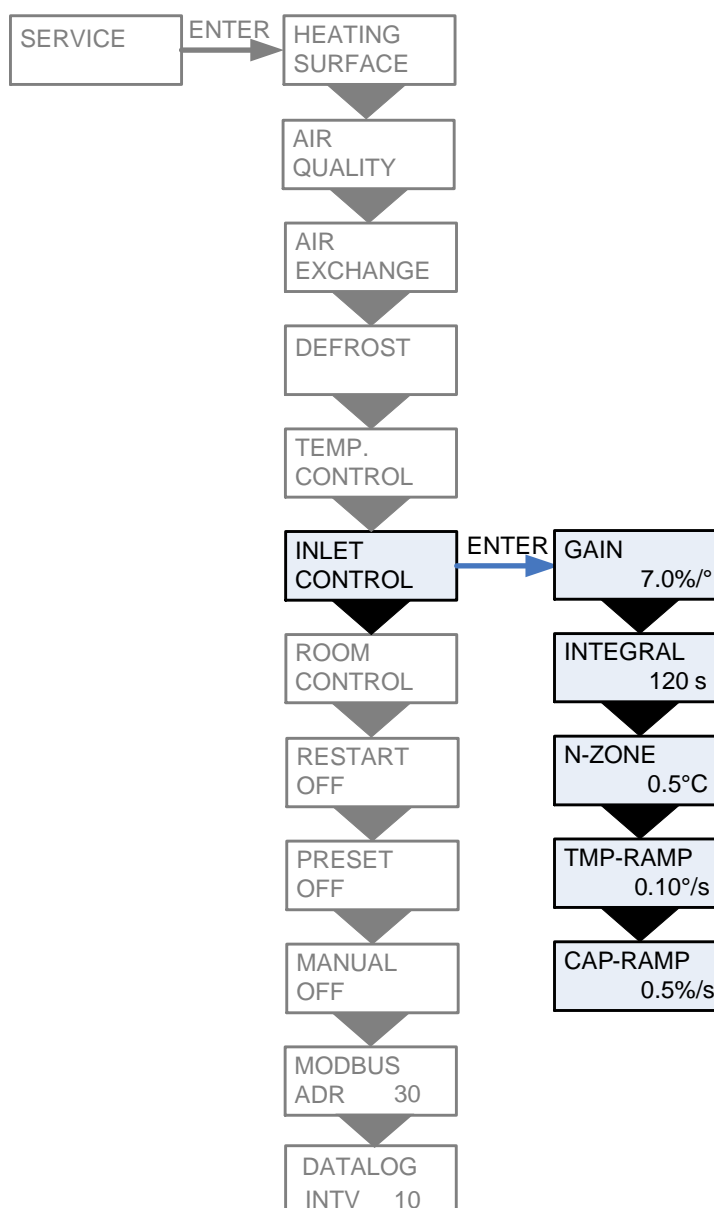


The "Inlet control" menu should only be adjusted by persons with knowledge of control engineering.

" " indicates that the menu point flashes and can be set to another value.

Use of the CTS600 panel:

- press ESC to go one step back in the menu
- press ▼▲ to move up or down in a menu or to adjust an activated menu
- press ENTER to activate a menu
- press ENTER to confirm a menu
- press OFF to turn off the unit
- press ON to turn the unit on



The "Inlet control" menu



## Room control

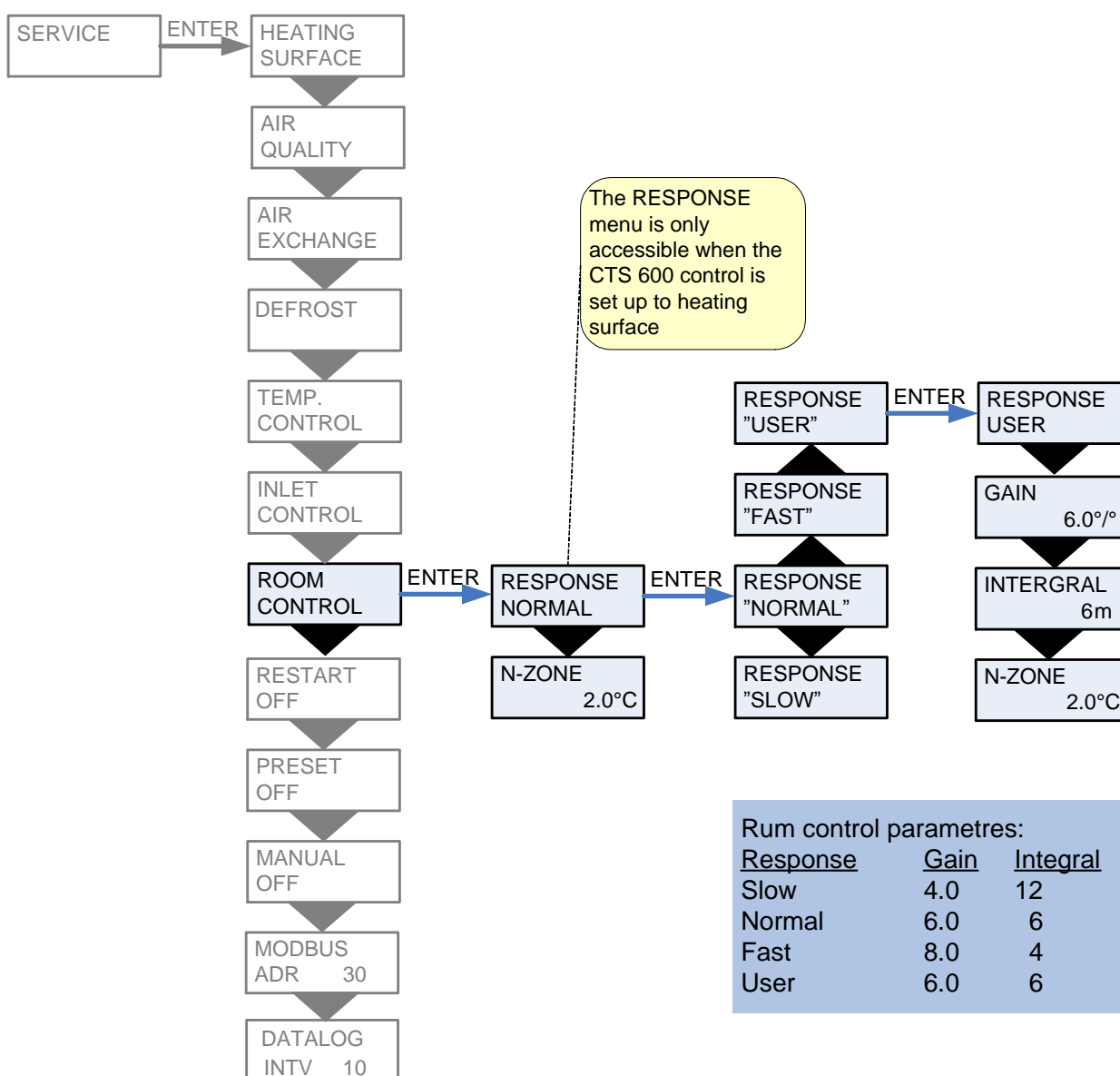
In the "Room control" menu it is possible to adjust the regulator for controlling the room temperature.



The "Room control" menu should only be adjusted by persons with knowledge of control engineering.

" " indicates that the menu point flashes and can be set to another value.

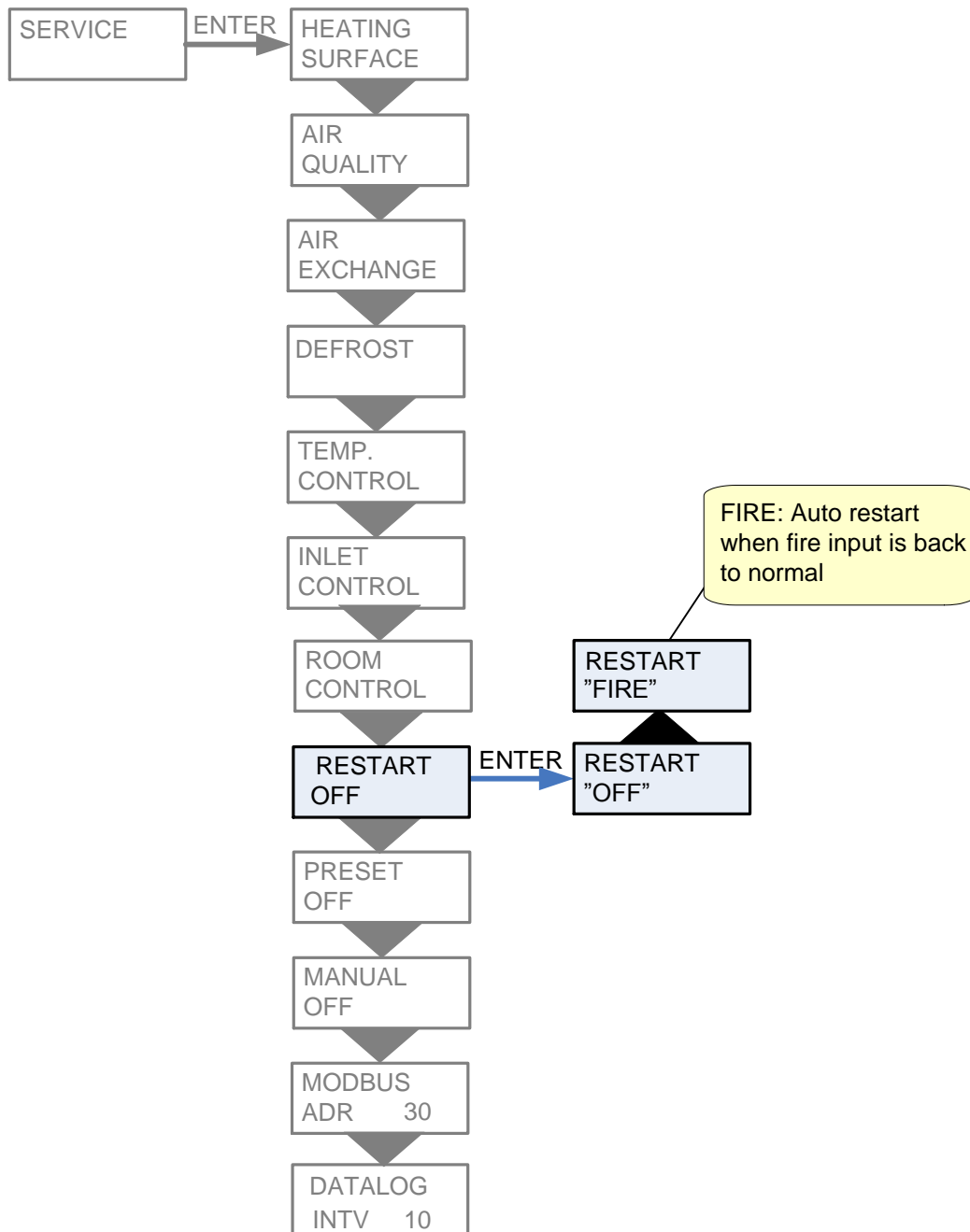
Use of the CTS600 panel:  
 - press ESC to go one step back in the menu  
 - press ▼▲to move up or down in a menu or to adjust an activated menu  
 - press ENTER to activate a menu  
 - press ENTER to confirm a menu  
 - press OFF to turn off the unit  
 - press ON to turn the unit on



The "Room control" menu

## Re-start

Fire alarms can be acknowledged automatically in connection with fire drills/testing. A condition for acknowledgement is that the fire thermostat input has returned to normal state.



### The "Restart"

## Preset

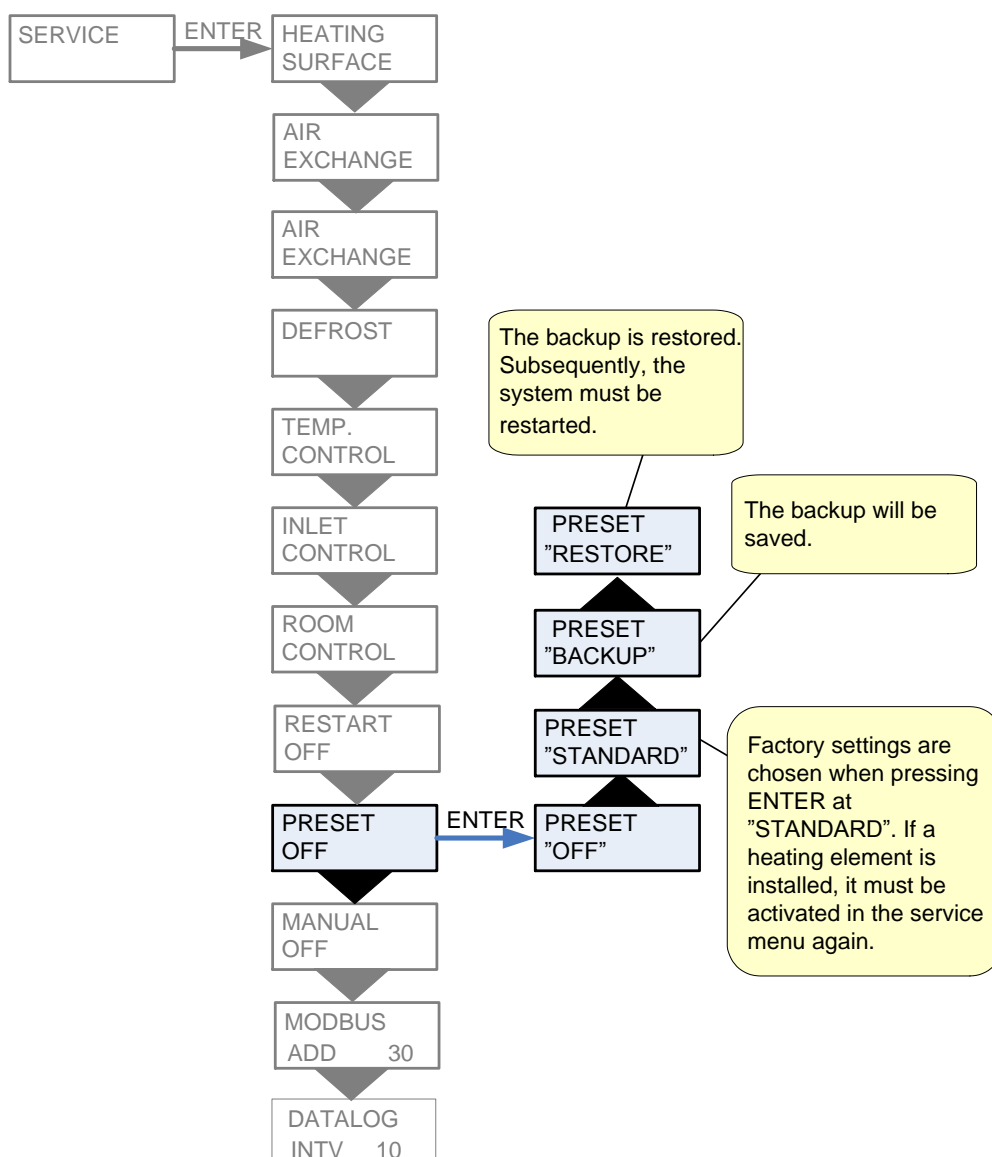
” ” indicates that the menu point flashes and can be set to another value.

RESTORE menu allows you to reload a copy of the installation setup.

By keeping the ESC + ▲ key pressed for 5 seconds a new menu item RESTORE appear, this is then acceptable / activated by pressing the ENTER

Use of the CTS600 panel:

- press ESC to go one step back in the menu
- press ▼▲to move up or down in a menu or to adjust an activated menu
- press ENTER to activate a menu
- press ENTER to confirm a menu
- press OFF to turn off the unit
- press ON to turn the unit on



### The "Preset" menu

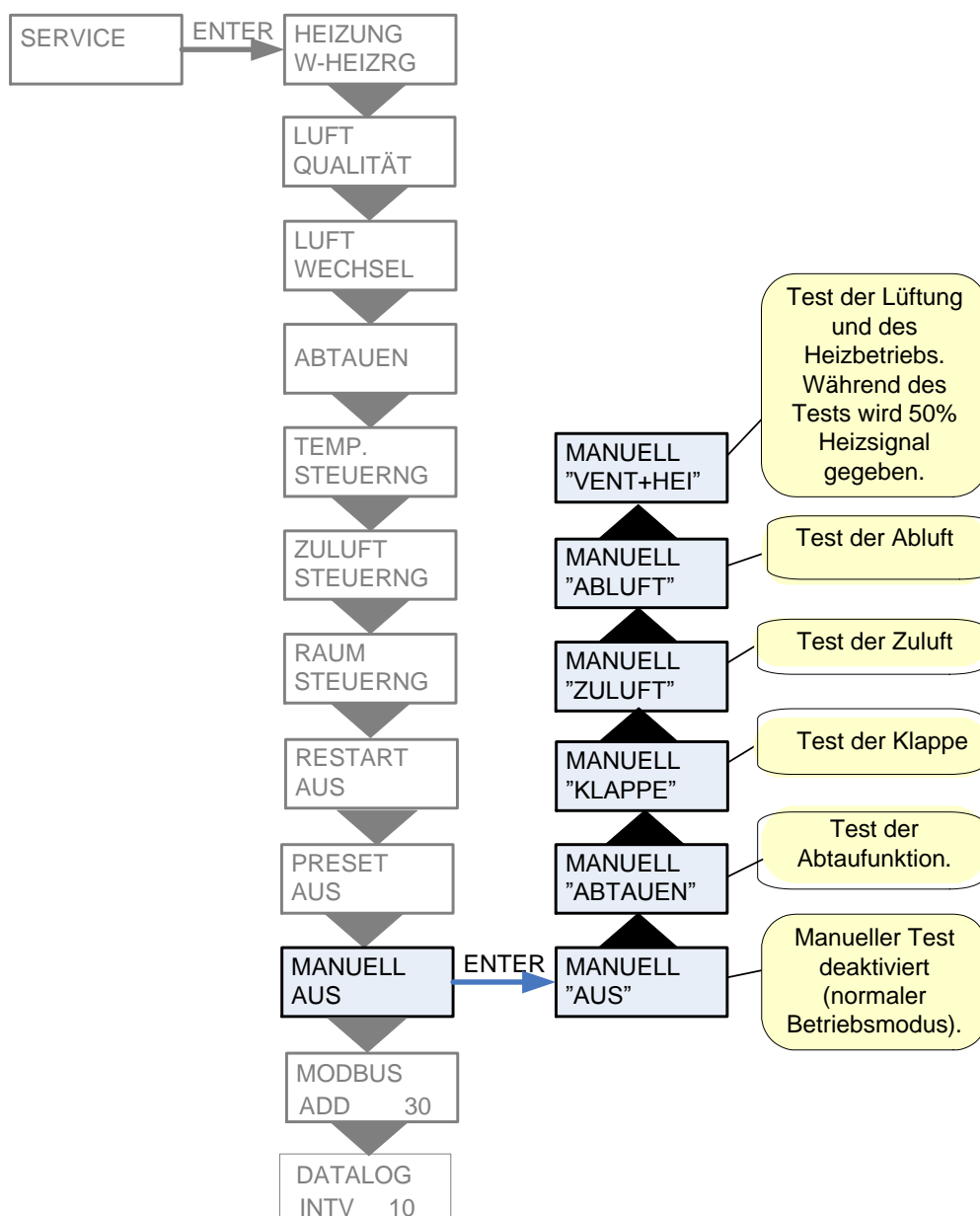
## Manual

In the "Manual" menu it is possible to test the functions of the unit manually.

" " indicates that the menu point flashes and can be set to another value.

Use of the CTS600 panel:

- press ESC to go one step back in the menu
- press ▼▲ to move up or down in a menu or to adjust an activated menu
- press ENTER to activate a menu
- press ENTER to confirm a menu
- press OFF to turn off the unit
- press ON to turn the unit on



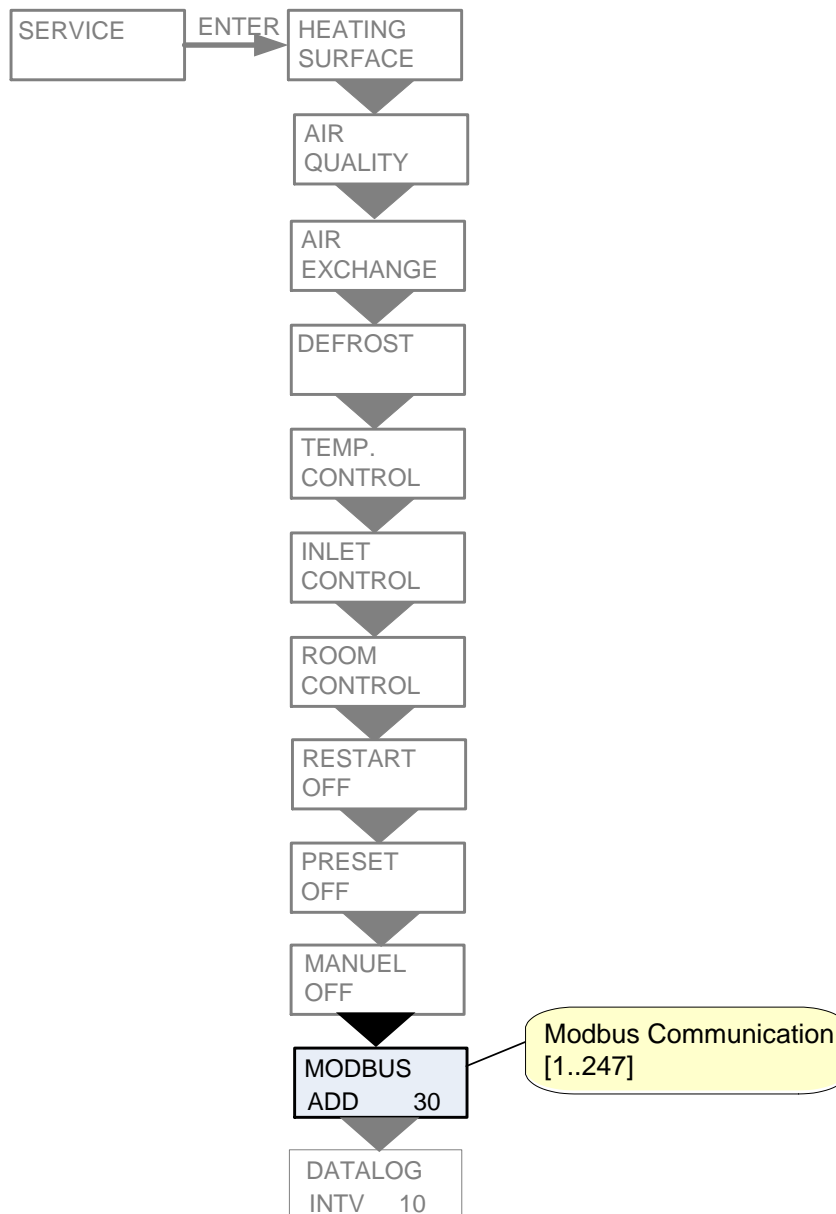
The "Manual" menu

## Modbus

” ” indicates that the menu point flashes and can be set to another value.

Use of the CTS600 panel:

- press ESC to go one step back in the menu
- press ▼▲to move up or down in a menu or to adjust an activated menu
- press ENTER to activate a menu
- press ENTER to confirm a menu
- press OFF to turn off the unit
- press ON to turn the unit on



The "Modbus" menu

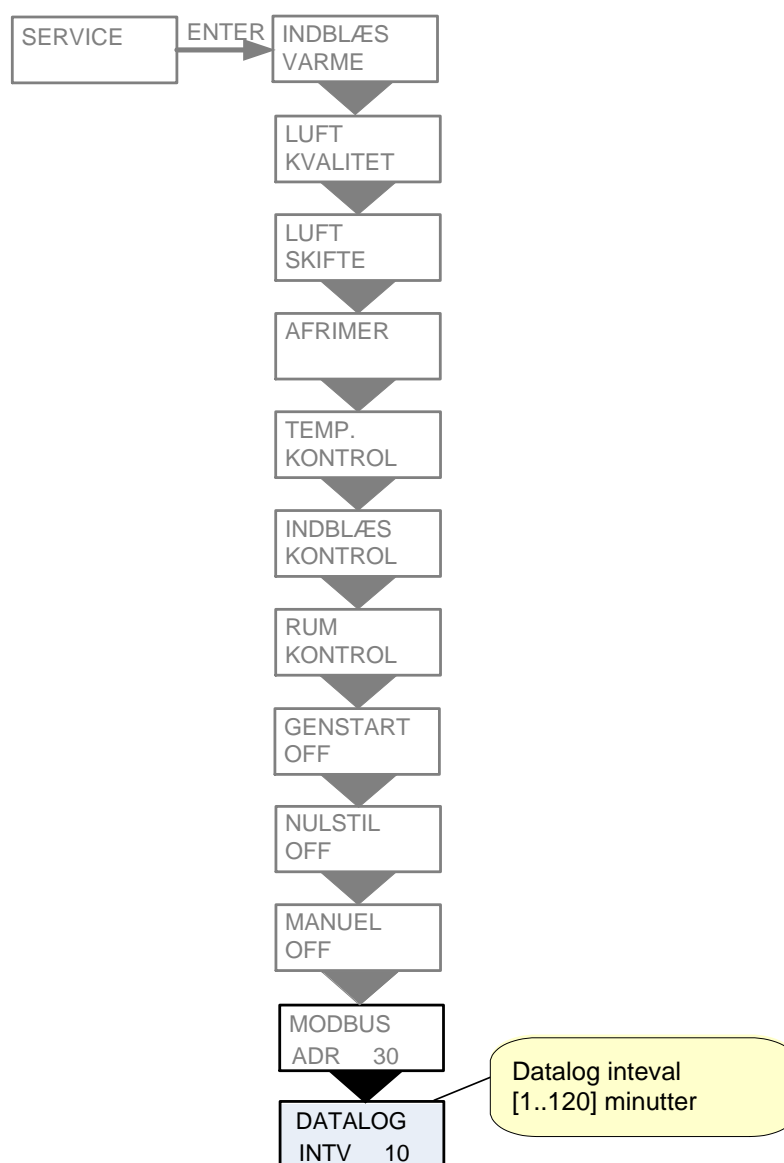
## Datalog

Data log intervallet indstilles via menuen SERVICE - DATALOG INTV mellem 1 og 120 minutter. Hvis der vælges 0 / OFF, logges der ikke periodisk, men kun ved events og alarmer.

- Det er valgt at logge temperaturer i hele grader celsius, for at minimere log fil størrelsen.
- Status for digitale ind- og udgange er slået sammen i to fælles log variable, "Din" og "Dout".

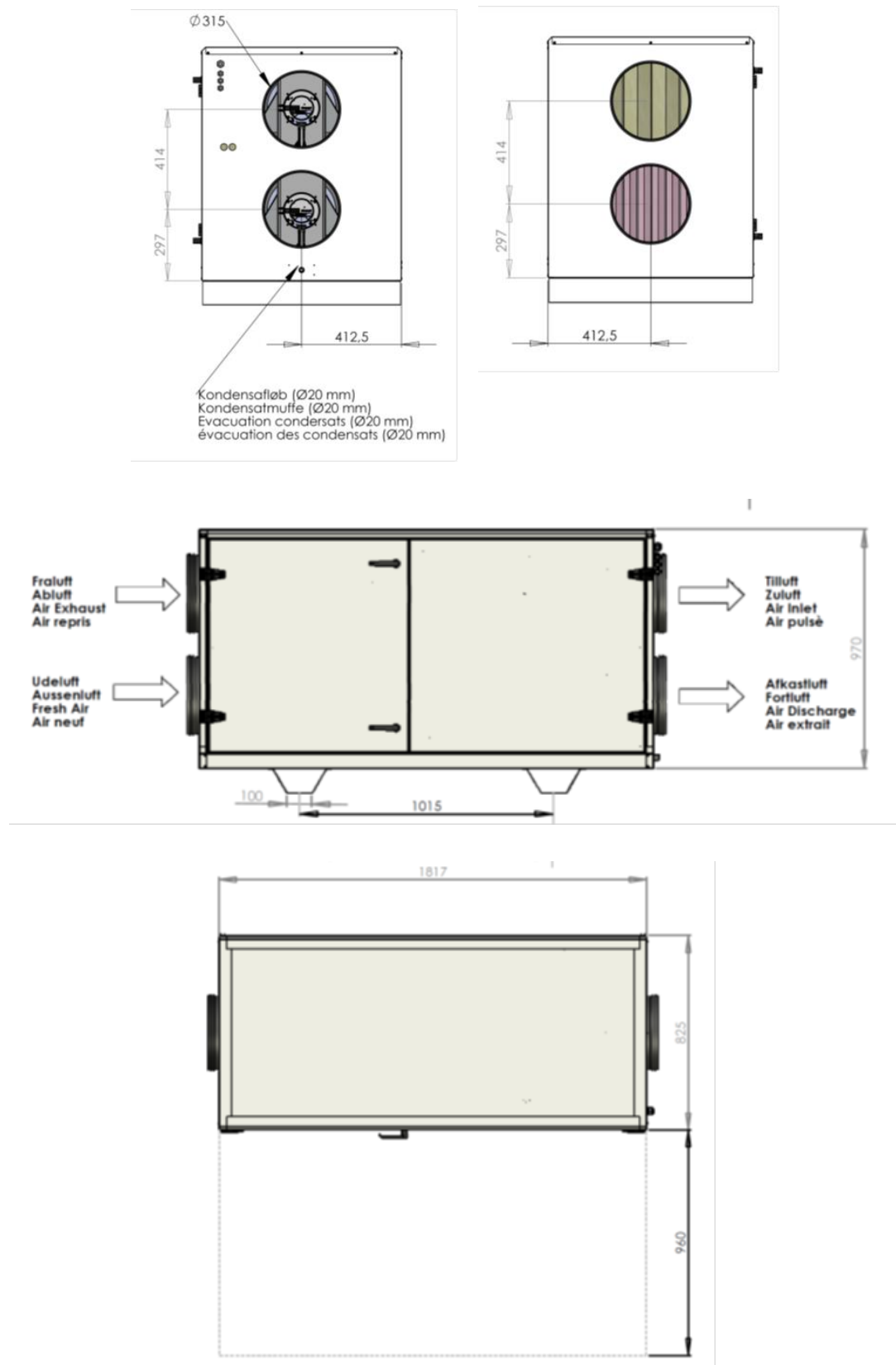
Menuen "Manuel" giver mulighed for en manuel test af anlæggets funktioner.

På CTS602 Panelet tryk:	
- ESC	for at gå et trin tilbage i menuen
- ▼▲	for at gå hhv. ned og op i menuen eller for at justere et aktiveret menupunkt
- ENTER	for at aktivere et menupunkt
- ENTER	for at bekræfte et menupunkt
- OFF	for at slukke anlægget
- ON	for at tænde anlægget

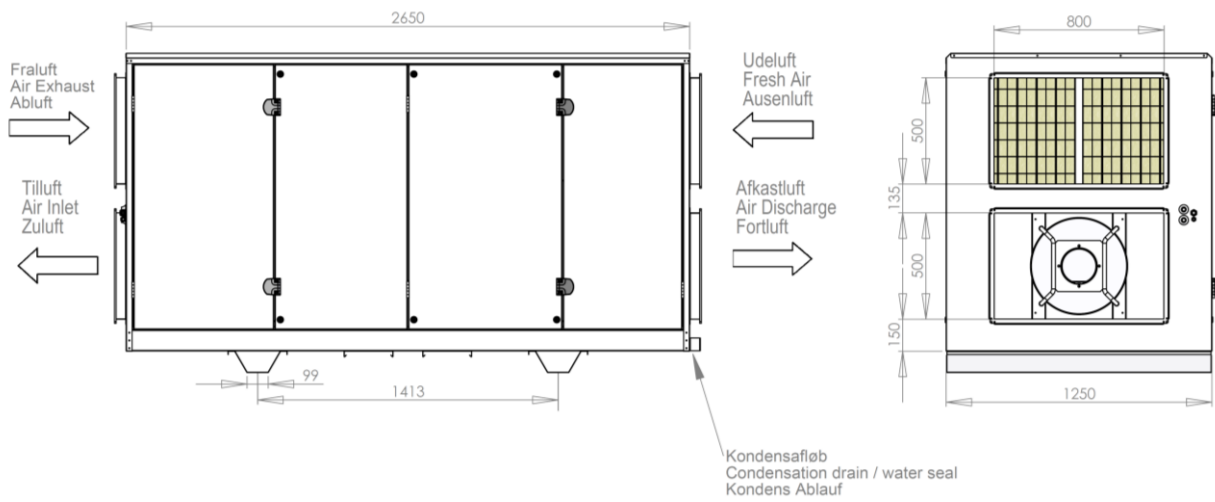


### The "Datalog"

## System dimensions



**System dimensions for Comfort 1200**



**System dimensions for Comfort 5000**



## Accessories/spare parts

<b>Filters</b>			
Type	System type	Qty	Nilan item no.
F7	Comfort 1200	1	3949
F5	Comfort 1200	1	3948

<b>Heating surface for water incl. regulation</b>		
System	Qty	Nilan item no.
Comfort 1200 (right)	1	76792
Comfort 1200 (left)	1	76793

<b>Electrical heating surface (for fitting in inlet duct)</b>			
System	Output	Qty	Nilan item no.
Comfort 1200	6kW, 400V, 3~	1	7644

<b>Spare parts/accessories</b>		
Type	Qty	Nilan item no.
Hygrostat	1	3637
CTS 602, control PCB	1	239932
CTS 602, control panel, complete	1	2398
CTS 602, white control panel enclosure	1	2398HX
Filterguard excl. hose (3m item nr. 3049)	1	3635
Vibration absorber	1	7722401
Humidity sensor	1	23997
CO <sub>2</sub> -Sensor	1	7134B13

<b>Heating cable for condensation outlet (frost protection)</b>		
System	Type	Nilan item no.
Comfort	Heating cable	2172