FLEXIT CS 50/CS 500

E **User Manual**
Automatic Control

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Contents

1   Overview

1.1   Brief Description

Controllers for standardised ventilation applications.
- Control, indication and monitoring functions
- Temperature, pressure and air flow rate sequences
- Sensor for winter and/or summer compensation
- Time channels (4 day programmes and 6 week programmes)

1.2   Functions

Control Functions

- Four types of control
    1. Constant supply air temperature
    2. Room/extract air control (not CS 50)
    3. Dif - temperature control (not CS 50)
    4. Supply air control compensated for outdoor air (not CS 50)
- Minimum and maximum limits for supply air temperature
- Night cooling function (not CS 50)
- Setpoint value changeover via an external signal (not CS 50)
- Anti-icing function for plate exchanger, thermoguard – patented solution
- Requirement-controlled ventilation (not CS 50)
- Frost protection function for the air or water side
- Electric heating battery or water battery
- Heat recovery with rotary wheel-type or plate exchanger
- Pressure or air flow rate control (not CS 50)
- Circulation pump maintenance operation
- Additional fan cooling
- Cooling (not CS 50)
- Operate the controller externally or via a pushbutton
- Common alarm with a contact output (priority A and B)

Monitoring Functions

- Control unit with 8-line display and 20 characters on each line
- Input for fire or smoke alarm (not CS 50)
- Frost alarm in water battery
- Electric battery, thermostat
- Fans, overload (not CS 50)
- Filter alarm
- Rotor alarm

1.3 Accessories for the CS 500

The list below contains examples of equipment that can be used with the CS 500.

CC 1050 Pressure Censor

Art. no. 09367
0-3000 Pa

SP 440 CO$_2$ Detector

Art. no. 09359

SP 430 Pressure Regulator

Art. no. 09357
For external
pressure adjustment

SP 445 Smoke Detector (duct mounted)

Art. no. 09362

SP 435 Movement Censor

Art. no. 09358
For 24V

SP 450 Movement Censor

Art. no. 09390
For 230V

1.4 Safety Comments

Use with Other Products

The CS 500 is designed exclusively for the control and monitoring of ventilation units. Only third-party products that Flexit has supplied with the CS 500 unit or that Flexit has recommended can be integrated in the system without restrictions. In relation to the overall configuration, the user must follow all safety instructions from the suppliers of such products.

It is possible to connect or integrate third-party products that have not been recommended by Flexit, but such products must meet the safety requirements and other technical requirements specified in the relevant product descriptions.

1.4.1 Requirements for Installation Engineers/System Operators

Preparatory work on and commissioning of the CS 500 unit must be performed by qualified personnel who have received training from Flexit.

The CS 500 must only be operated by people who have received adequate training from Flexit or Flexit's representatives and have acquired knowledge of possible risk areas.

1.5 Environmental Info: Protection/Disposal

Environmental Protection

The CS 500 controller has no negative impact on the environment.

Disposal

The symbol on the product shows that this product must not be treated as household waste. It must be taken to a reception station for recirculation of electric and electronic equipment.

By ensuring the correct disposal of the equipment, you will contribute to preventing the negative consequences for the environment and health that incorrect handling may entail. For further information on recirculation of this product, please contact your local authority, your refuse collection company or the company from which you purchased it.

2   Handling

2.1   Installation Procedure

2.1.1 Controller

The CS 500 controller is mounted on 5 distance sleeves. The terminals are divisible (can be removed from the printed circuit board) to allow the controller to be replaced easily. Remember to make the unit dead first.

STOP Electrical connections must be done in the following order:
Peripheral equipment first and then the mains voltage.

2.1.2 Fault Management

If a fault should occur, check the following first:
- The power supply is 230 V AC
- The peripheral units are correctly connected
- Fault diagnosis using the LEDs on the unit
- Fault diagnosis using the alarm menu in the handheld terminal.

If going through the above list does not help to locate and repair the fault, the controller must be replaced and the defective part returned (via your dealer) to the factory.

2.1.3 CI 500 (Operator Unit)

On the rear of the CI 500 is an opening that allows the operator unit to be hung on the wall.
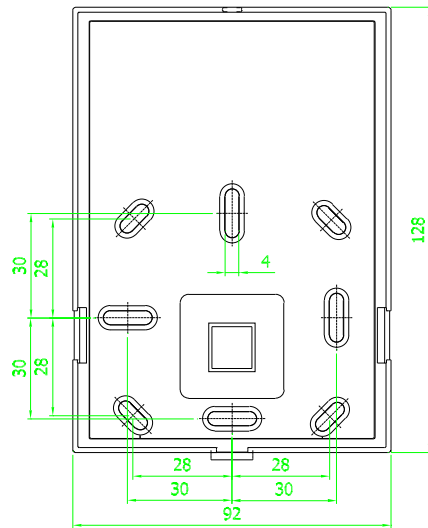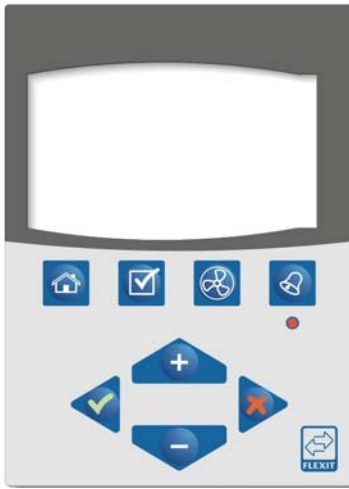
Installation drawing for panel holder.
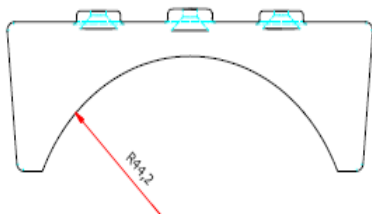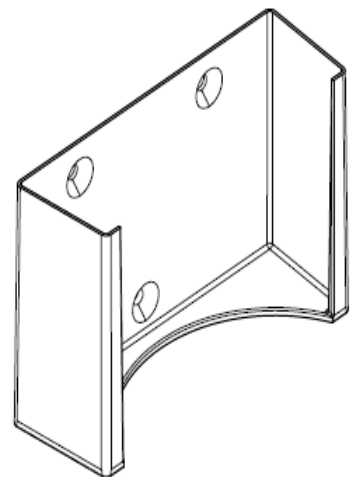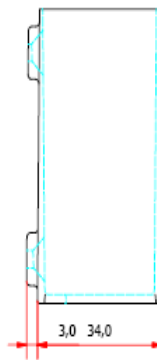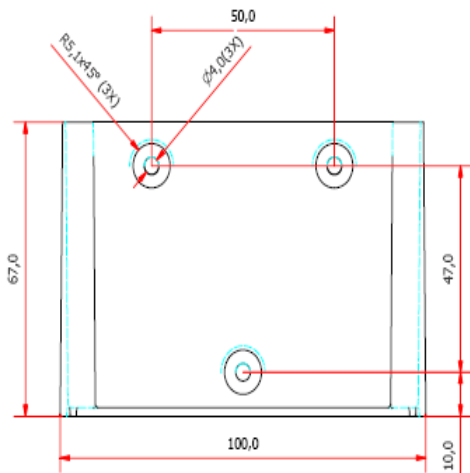
2.2 Connection Terminals

CS 500 IO	Function	IO Type	Connection CS 500	Connection Component
J1				
J1	PE	Digital	J1 (Pin 1)	
J1	Main supply	Digital (230 V)	J1 (Pin 2, 3)	
J1	Pump (water battery)/ heating stage 2 (electric battery)	Digital (230 V 11 A)	J1 (Pin 4, 5)	
J1	Not in use	Digital	J1 (Pin 6, 7)	
J1	Outdoor air damper (Pin 8 = L ON/OFF Pin 9 = L Pin 10 = N)	Digital (230 V 2 A)	J1 (Pin 8, 9, 10)	
J1	Operating voltage for supply air motor	Digital 85-230 V AC	J1 (Pin 11, 12)	
J1	Operating voltage for extract air motor	Digital 85-230 V AC	J1 (Pin 14-15)	
J2 (only transformator control)				
J2	L phase output	230 V AC 5 A	J2 (Pin 1)	
J2	N phase output	230 V AC 5 A	J2 (Pin 2)	
J2	Supply air fan speed 1. Relay output	230 V AC 5 A	J2 (Pin 3)	
J2	Supply air fan speed 2. Relay output	230 V AC 5 A	J2 (Pin 4)	
J2	Supply air fan speed 3. Relay output	230 V AC 5 A	J2 (Pin 5)	
J2	Extract air fan speed 1. Relay output	230 V AC 5 A	J2 (Pin 6)	
J2	Extract air fan speed 2. Relay output	230 V AC 5 A	J2 (Pin 7)	
J2	Extract air fan speed 3. Relay output	230 V AC 5 A	J2 (Pin 8)	
J3 (not CS 50)				
J3	Alarm output priority A	Digital	J3 (Pin 1, 4)	(not CS 50)
J3	Alarm output priority B	Digital	J3 (Pin 2, 4)	(not CS 50)
J3	Operation OK	Digital	J3 (Pin 3,4)	(not CS 50)
J3	Not in use		J3 (Pin 5)	
J3	DX cooling stage 1	Digital (230 V 1 A)	J3 (Pin 6, 8)	(not CS 50)
J3	DX cooling stage 2	Digital (230 V 1 A)	J3 (Pin 7, 8)	(not CS 50)
J4 (not CS 50)				
J4	External control speed 1	Digital	J4 (Pin 1, G0)	(not CS 50)
J4	External control speed 2	Digital	J4 (Pin 2, G0)	(not CS 50)
J4	Alarm, external fire/smoke	Digital	J4 (Pin 3, G0)	(not CS 50)
J4	Heating OFF/ON. External signal	Digital	J4 (Pin 4, G0)	(not CS 50)
J4	Temperature setting. External signal	Analogue (0 - 10 V)	J4 (Pin 5, 6)	(not CS 50)
J4	Supply air temperature reading	Analogue (0 - 10 V)	J4 (Pin 7, G0)	(not CS 50)
J4	Extract air temperature reading	Analogue (0 - 10 V)	J4 (Pin 8, G0)	(not CS 50)
J4	Outdoor air temperature reading	Analogue (0 - 10 V)	J4 (Pin 9, G0)	(not CS 50)
J4	Extract air/room temperature	NTC	J4 (Pin 10, 11)	(not CS 50)
J4	Outdoor air temperature	NTC	J4 (Pin 12, 13)	(not CS 50)
J4	External pressure sensor, supply air	Analogue (0 - 10 V)	J4 (Pin 14, G0)	(not CS 50)
J4	External pressure sensor, extract air	Analogue (0 - 10 V)	J4 (Pin 16, G0)	(not CS 50)
J5				
J5	Supply air temperature sensor	NTC	J5 (Pin 1, 2)	
J5	Frost/ice sensor, water battery	NTC	J5 (Pin 3, 4)	
J5	Thermostat manual reset, electric battery	Digital	J5 (Pin 5, 8)	
J5	12 V 30 mA supply	Analogue 12 V DC	J5 (Pin 6, 7)	
J5	Heating, full range water battery	Analogue (0 - 10 V)	J5 (Pin 9, 10)	
J5	Rotor or bypass motor	Analogue (0 - 10 V)	J5 (Pin 11, 12)	
J5	Rotor: rotor alarm	Digital	J5 (Pin 13, 14)	

CS 500 IO	Function	IO Type	Connection CS 500	Connection Component
J5	External start/stop	Digital	J5 (Pin 15, G0)	
J5	Forced operation. Speed 3	Digital	J5 (Pin 16, G0)	
J6				
J6	Supply air fan	Analogue (0 - 10 V)	J6 (Pin 1, 3)	
J6	Start/stop supply air fan	Digital	J6 (Pin 2, G0)	
J6	Alarm, supply air/extract air fan	Digital	J6 (Pin 4, 6)	
J6	12 V power supply	Analogue (12 V DC)	J6 (Pin 5)	
J6	Extract air fan	Analogue (0 - 10 V)	J6 (Pin 7, 9)	
J6	Start/stop extract air fan	Digital	J6 (Pin 8, G0)	
J6	Supply air pressure guard	Digital	J6 (Pin 10, G0)	(not CS 50)
J6	Extract air pressure guard	Digital	J6 (Pin 12, G0)	(not CS 50)
J6	Pulse with modulation (ON/OFF)	Analogue	J6 (Pin 13)	(not CS 50)
J6	Cooling	Analogue (0 - 10 V)	J6 (Pin 15, 16)	(not CS 50)

Microswitch	ON	OFF
1	Rotating exchanger	Cross heat exchanger
2	Unit fitted with a water battery	Unit fitted with an electric battery
3	The unit has an exchanger with a bypass	The unit has preheating (only if the unit has a plate exchanger)
4	Not in use	Not in use

3 Operation

3.1 CI 500 Operating Elements
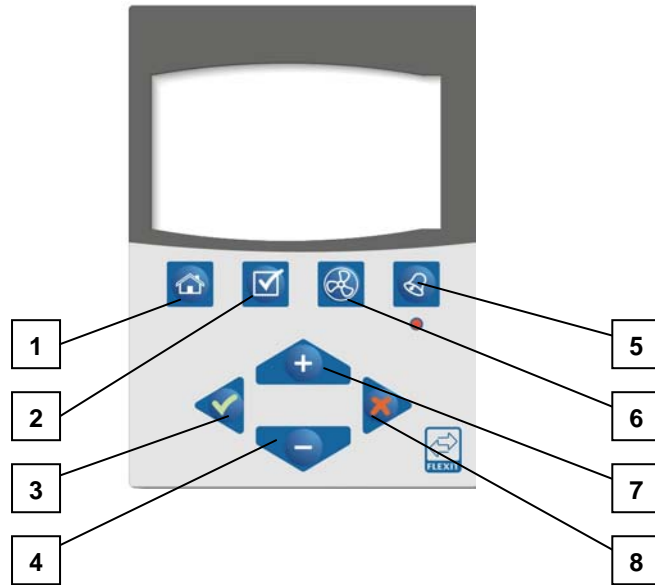
Legend

	Operating element	Function
①	Home key	Places the cursor on the home page again
②	Save key	Confirms a change to a value (setting)
③	Enter	Selects a menu/parameter/line
④	Down or decrease value	Moves the cursor and adjusts a value (-)
⑤	Alarm key with integrated LED	Display and confirmation of alarms
⑥	Forcing/Stop	Forced ventilation. Stops the unit if you hold the key in for 5 seconds
⑦	Up or increase value	Moves the cursor or adjusts a value (+)
⑧	Return key (ESC)	Places the cursor in the previous menu again

If there is no activity for 10 minutes, the light in the panel will go out.

3.2 General Information on Navigation

3.2.1 Levels

Data access is divided into three underlying levels:
- Operator level
- Service level
- Factory level

Operator level

The end user has access to the operator level:

On the operator level, the end user can read and change specific values without entering a password.

Service level

The service engineer has access to the service level:

The end user does not have access to the service level. This level is designed exclusively for the service engineer, who gains access by entering the correct password. When the password has been entered, the engineer gains access to the second highest level and can read and change all values that are accessible on the service level.

Factory level

The HVAC engineer has access to the factory level:

The end user and the service engineer do not have access to the factory level. This level is designed exclusively for the HVAC engineer, who gains access by entering the correct password. When the password has been entered, the engineer gains access to the highest level and can read and change all values.

In this documentation, the terms "end user parameters", "service engineer parameters" and "HVAC engineer parameters" refer to the settings defined via the parameter names (with the exception of the time channels). The basic settings (and the time channels) do not have these names.

3.2.2 Menus

You access the parameter names or setting lines via main menus (home page) and submenus.
The order in which the menus for the individual parameter names or setting lines are selected is also explained in the overview and description.

This appears as follows in the parameter overview:

Function		*Parameter name*		*Range*	*Unit*	*Default value*	*Read*	*Change*	*Section*
Fan control │ Speed setting │ Supply air │ Parameter name									
Setting the speed		*Speed 1*		0.0..100	%				

NB

Depending on the application, not all parameters are used. Therefore, they are not displayed on the handheld terminal either. The parameters listed and described in this documentation are always displayed in the same order. The menus are always displayed.

3.2.3 Password

The password function ensures that the data is protected.
Each password consists of 4 figures and is given within 3 levels.

Password levels

Info password (I)   for the information level (password not necessary!)
Service level (S)   for service engineers
Factory level password (F) for the HVAC engineer

.

The following numeric codes are used:

Password	Info password (I)	Service level (S)	Factory level code (F)
Level	0	1	2
Numeric code	0000	1000	xxxx

NB

The password levels are structured hierarchically. This means that if password 3 is entered, everything on password level 1 or 2 can be read or written as well.

3.2.4 Overview of the Menu Structure

Information	Temperature setting Supply air: Extract air: (not CS 50) Outdoor air: (not CS 50) Thermoguard: Return water: Cooling: : (not CS 50) Recovery system: Heating: Speed Timer: Temperature control type: (not CS 50) Fan control type: Supply air: Extract air:		
Configuration	**Language**	English Norwegian Swedish Danish Finnish German Dutch	
	Filter	Time counter activated Period of time	ON/OFF
		Reset time counter	YES/NO
		Supply air pressure guard	ON/OFF
		Extract air pressure guard	ON/OFF
	Fire/Smoke	Mode 1 Mode 2 Mode 3	
	Clock	Time Date	
	PIN codes	Service code	Set new service code	
	Timer	Daily timer 1	Active ON/OFF Time ON Speed Temperature Temperature ON/OFF Active YES/NO
		Daily timer 2	Active ON/OFF Time ON Speed Temperature

			Temperature ON/OFF
			Active YES/NO
		Daily timer 3	Active ON/OFF
			Time ON
			Speed
			Temperature
			Temperature ON/OFF
			Active YES/NO
		Daily timer 4	Active ON/OFF
			Time ON
			Speed
			Temperature
			Temperature ON/OFF
			Active YES/NO
		Weekly timer 1	Day ON
			Time ON
			Speed
			Temperature
			Temperature ON/OFF
			Time OFF
			Day OFF
			Active YES/NO
		Weekly timer 2	Day ON
			Time ON
			Speed
			Temperature
			Temperature ON/OFF
			Day OFF
			Time OFF
			Active YES/NO
		Weekly timer 3	Day ON
			Time ON
			Speed
			Temperature
			Temperature ON/OFF
			Day OFF
			Time OFF
			Active YES/NO
		Weekly timer 4	Day ON
			Time ON
			Speed
			Temperature
			Temperature ON/OFF
			Day OFF
			Time OFF
			Active YES/NO
		Weekly timer 5	Day ON
			Time ON
			Speed
			Temperature
			Temperature ON/OFF
			Day OFF

			Time OFF
			Active YES/NO
		Weekly timer 6	Day ON
			Time ON
			Speed
			Temperature
			Temperature ON/OFF
			Day OFF
			Time OFF
			Active YES/NO
	Setting	Save setting	YES/NO
		Reset	YES/NO
		Reset to factory setting	YES/NO
Temperature	Setting		
	Control	Extract air (not CS 50)	ON/OFF
			Min. supply air
			Max. extract air
		FanSlow	ON/OFF
		Comp (not CS 50)	ON/OFF
			Summer diff
			Stop summer
			Start summer
			Winter diff
			Stop winter
			Start winter
		Diff (not CS 50)	ON/OFF
			Temp. diff
			Min. supply air
			Max. supply air
		AutoExt/Sup (not CS 50)	ON/OFF
			Outdoor air temperature
			Deviation
		Step control (not CS 50)	ON/OFF
	External temp. control	ON/OFF	
	Cooling:	Min. outdoor air temp. Delay	
		Min. speed	
		Linear mode	ON/OFF
			Step 2
		Binary mode	ON/OFF
			Step 2
			Step 3
		Cooling recovery	ON/OFF
			Diff temp.
	Temperature sensor	Thermoguard	
		Supply air	ON/OFF
		Extract air (not CS 50)	ON/OFF
		Outdoor	

		Return water	ON/OFF
	Neutral zone	Cooling recovery system (not CS 50) Recovery system, heating	
Fan control	**Number of speeds**		
	Speed setting	Supply air	Speed 1 Speed 2 Speed 3
		Extract air	Speed 1 Speed 2 Speed 3
	Manual setting	Speed	
	Forced ventilation	Activated Default speed Default time	ON/OFF
	Control (not CS 50)	DCV supply air	ON/OFF Output min. value Output max. value Input ON level
		DCV extract air	ON/OFF Output min. value Output max. value Input ON level
		CPR supply air	ON/OFF Desired value Min. value Max. value
		CPR extract air	ON/OFF Desired value Min. value Max. value
		No. of fan sensors	2 1 – Supply air 1 – Extract air Differential
		Sensor, supply air	Type Min. level Max. level
		Sensor, extract air	Type Min. level Max. level
	Configuration	Motor protection Startup sequence	Delay Start delay 1 Start delay 2 Start delay 3 Start delay 4
		Stop sequence	Delay
	Alarms	Active alarms Alarm history Reset alarm	

Test	Information	System	Recovery system		
			Heating		
			Defrosting		
		Main board	Hardware rev.		
			Software rev.		
		Control panels	CS 500 panel 1:	Hardware rev. Software rev.	
			CS 500 panel 2:	Hardware rev. Software rev.	
			CS50 panel 1:	Hardware rev. Software rev.	
			CS50 panel 2:	Hardware rev. Software rev.	
			Inputs/outputs	Digital inputs 1	
		Factory			
			Control parameters	Fan parameters	
				Temp. parameters	
			FVP	Panel forced:	
				FVP speed:	
			Priorities	CO:	
				VVX:	
				EV2:	
				FV:	
				SUPPLY AIR FAN:	
				EXTRACT AIR FAN:	
			Reset alarm history	YES/NO	
		Time counter			
		Filter timer			
	Alarms	Active alarms			
		Alarm history			
		Reset alarm			
	Test	Fan speed			
		Heating	ON/OFF		
		Preheating	ON/OFF		
		Heat recovery system	ON/OFF		
		Cooling	ON/OFF		

		(not CS 50)		
		Alarm outputs (not CS 50)	ON/OFF	
		Factory test	ON/OFF	
		Sensors	Thermo-guard	
			Supply air	
			Extract air (not CS 50)	
			Outdoor air (not CS 50)	
			Return water	

3.2.5 Alarm List

Description
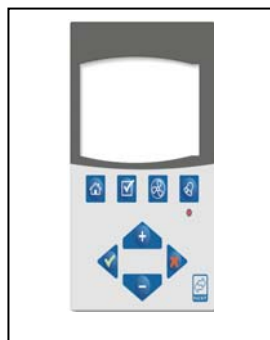
The alarm list provides an overview of active alarms (alarms that are still on). Up to 5 alarms can be displayed.
B alarms: Reset automatically (except where filter timers have been used (not a pressure guard). This must be reset manually).
A alarms: Must be reset manually (Test I Alarm I History I Reset Alarm).

Alarm point	Input	Alarm class	Description
A_Alarm	-		Joint alarm (class A alarm active)
B_Alarm	-		Joint alarm (class B alarm active)
Frost sensor out of range	Signal B6 <-45°C & >+50°C	A	Temperature sensor in the plate exchanger is out of its measuring range. Sensor fault or sensor not connected.
Supply air sensor out of range	Signal B1 <-45°C & >+50°C	A	Temperature is out of its measuring range. Sensor fault or sensor not connected.
Extract air sensor out of range	Signal B3 <-45°C & >+50°C	A	Temperature sensor in the plate exchanger is out of its measuring range. Sensor fault or sensor not connected.
Outdoor air sensor out of range	Signal B4 <-45°C & >+50°C	A	Temperature sensor in the plate exchanger is out of its measuring range. Sensor fault or sensor not connected.
Return water sensor out of range	Signal B5 <-45°C & >+80°C	A	Temperature sensor in the plate exchanger is out of its measuring range. Sensor fault or sensor not connected.
Frost sensor not connected	Signal TA active	?	Alarm unless the frost guard for the plate exchanger is connected (applies only to units with plate exchangers)
Thermostat active	Signal BT active	A	Overheating thermostat has been triggered on account of excessive temperature in electric battery
Fire/smoke sensor active (not CS 50)	Signal BR active	A(*B)	External signal from fire or smoke detector
Rotor alarm active	Signal RA active	B	Alarm from the rotor unit
Motor protection active (not CS 50)	Signal TP active	A	Alarm signal from motor protection. Joint alarm for the supply air and extract air fans
Frost alarm, water battery	Lowe return water temperature	A	Frost alarm from water battery on account of low temperature in the water battery
Filter alarm	Filter alarm	B	Filter replacement alarm (only in units without a pressure guard)
Supply air filter alarm (not CS 50)	Signal TFI	B	Supply air filter alarm
Extract air filter alarm (not CS 50)	Signal FFI	B	Extract air filter alarm

* Here you can choose whether the unit is to stop or continue.

3.2.6 Overview of End User Parameters

Function	Parameter name	Range	Unit	Default value	Read[1]	Change	Not CS 50
Information							
Supply air temperature	Supply air temperature	-50...150,0	°C				
Extract air temperature	Extract air temperature	-50...150,0	°C				X
Outdoor air temperature	Outdoor air temperature	-50...150,0	°C				X
Thermoguard	Thermoguard	-50...150,0	°C				
Return water	Return water	-50...150,0	°C				
Cooling	Cooling	0,0...100,0	%				X
Recovery system	Recovery system	0,0...100,0	%				X
Heating	Heating	0,0...100,0	%				
Speed	Speed	0, 1, 2 or 3					
Timer	Timer	OFF, Day 1-4/Week 1-4					
Desired temperature	Desired temperature	-50...150,0	°C				
Temperature control	Temperature control	Sup/Ext/DIF/Comp					X
Fan control	Fan control						
Supply air	Supply air	Speed 0..3/VAV, CPR					
Extract air	Extract air	Speed 0..3/VAV, CPR					
Configuration│Language│ Parameter name							
Language in handheld terminal (CI 500)	Language	English Norwegian Swedish Danish Finnish German Dutch		English			
Configuration│Filter│ Parameter name							
	Time counter activated	ON/OFF		OFF			
	Period of time	0…12	months	6			
	Reset time counter	YES/NO		NO			
	Supply air pressure guard	ON/OFF		ON			X
	Extract air pressure guard	ON/OFF		ON			X
Configuration│Fire/Smoke│ Parameter name							
Fire function	Mode 1 Mode 2 Mode 3			Mode 1			X
Configuration│Clock│ Parameter name							
Clock	Time	00:00...24:00					
Date	Date	dd.mm.yyyy					
Configuration│PIN code│ Parameter name							
	Service code	0 0 0 0 (0-9)					
Configuration│PIN code│ Service code							
	Set new service code	0 0 0 0 (0-9)					

Function	Parameter name	Range	Unit	Default value	Read[1]	Change	Not CS 50
Configuration⎮Timer⎮Daily timer 1⎮ Parameter name							
	Time ON	00:00/24:00		06:00			
	Speed	0,1,2,3		1			
	Temperature	10...40,0	°C	20			
	Temperature	ON/OFF		OFF			
	Active	YES/NO		YES			
Configuration⎮Timer⎮Daily timer 2⎮ Parameter name							
	Time ON	00:00/24:00		06:00			
	Speed	0,1,2,3		1			
	Temperature	10...40,0	°C	20			
	Temperature	ON/OFF		OFF			
	Active	YES/NO		NO			
Configuration⎮Timer⎮Daily timer 3⎮ Parameter name							
	Time ON	00:00/24:00		06:00			
	Speed	0,1,2,3		1			
	Temperature	10...40,0	°C	20			
	Temperature	ON/OFF		OFF			
	Active	YES/NO		NO			
Configuration⎮Timer⎮Daily timer 4⎮ Parameter name							
	Time ON	00:00/24:00		06:00			
	Speed	0,1,2,3		1			
	Temperature	10...40,0	°C	20			
	Temperature	ON/OFF		OFF			
	Active	YES/NO		NO			
Configuration⎮Timer⎮Weekly timer 1⎮ Parameter name							
	Day ON	Monday..Sunday		Saturday			
	Time ON	00:00/24:00		06:00			
	Speed	0,1,2,3		1			
	Temperature	10...40,0	°C	20			
	Temperature	ON/OFF		OFF			
	Time OFF	00:00/24:00		20:00			
	Day OFF	Monday..Sunday		Sunday			
	Day ON	Monday..Sunday		Saturday			
	Active	YES/NO		NO			
Configuration⎮Timer⎮Weekly timer 2⎮ Parameter name							
	Day ON	Monday..Sunday		Saturday			
	Time ON	00:00/24:00		06:00			
	Speed	0,1,2,3		1			
	Temperature	10...40,0	°C	20			
	Temperature	ON/OFF		OFF			
	Time OFF	00:00/24:00		20:00			
	Day OFF	Monday..Sunday		Sunday			
	Active	YES/NO		NO			

Configuration│Timer│Weekly timer 3│ Parameter name						
	Day ON	Monday..Sunday		Saturday		
	Time ON	00:00/24:00		06:00		
	Speed	0,1,2,3		1		
	Temperature	10...40,0	°C	20		
	Temperature	ON/OFF		OFF		
	Time OFF	00:00/24:00		20:00		
	Day OFF	Monday..Sunday		Sunday		
	Active	YES/NO		NO		
Configuration│Timer│Weekly timer 4│ Parameter name						
	Day ON	Monday..Sunday		Saturday		
	Time ON	00:00/24:00		06:00		
	Speed	0,1,2,3		1		
	Temperature	10...40,0	°C	20		
	Temperature	ON/OFF		OFF		
	Time OFF	00:00/24:00		20:00		
	Day OFF	Monday..Sunday		Sunday		
	Active	YES/NO		NO		
Configuration│Timer│Weekly timer 5│ Parameter name						
	Day ON	Monday..Sunday		Saturday		
	Time ON	00:00/24:00		06:00		
	Speed	0,1,2,3		1		
	Temperature	10...40,0	°C	20		
	Temperature	ON/OFF		OFF		
	Time OFF	00:00/24:00		20:00		
	Day OFF	Monday..Sunday		Sunday		
	Active	YES/NO		NO		
Configuration│Timer│Weekly timer 6│ Parameter name						
	Day ON	Monday..Sunday		Saturday		
	Time ON	00:00/24:00		06:00		
	Speed	0,1,2,3		1		
	Temperature	10...40,0	°C	20		
	Temperature	ON/OFF		OFF		
	Time OFF	00:00/24:00		20:00		
	Day OFF	Monday..Sunday		Sunday		
	Active	YES/NO		NO		
Configuration│Setting│ Parameter name						
	Save setting	YES/NO		NO		
	Reset setting	YES/NO		NO		
	Reset to factory setting	YES/NO		NO		
Temperature│Setting│ Parameter name						
	Setting	0...40,0	°C	20		
Temperature│Control│Extract air control│ Parameter name						
	Extract air	ON/OFF		OFF		X
	Min. supply air	5...25,0	°C	16		X
	Max. supply air	15...45,0	°C	35		X
Temperature│Control│Fan reduction│ Parameter name						
	FanSlow	ON/OFF		OFF		
Temperature│Control│Comp.│ Parameter name						

		Parameter name	Range	Unit	Default		
		Comp.	ON/OFF		OFF		X
		Summer diff	-10...10,0	°C	2		X
		Stop summer	10...40,0	°C	30		X
		Start summer	10...40,0	°C	25		X
		Winter diff	-10...10,0	°C	1		X
		Stop winter	-30...20,0	°C	-20		X
		Start winter	-30...20,0	°C	-30		X
Temperature │ Control │ DIF │ Parameter name							
		DIF	ON/OFF		OFF		X
		Temp. diff	-5...10,0	°C	2		X
		Min. supply air	5...25,0	°C	16		X
		Max. supply air	15...450,0	°C	35		X
Temperature │ Control │ AutoExt/Sup │ Parameter name							
		AutoExt/Sup	ON/OFF		OFF		X
		Outdoor air temperature	5...25,0	°C	15		X
		Deviation	1...3,0	°C	2		X
Temperature │ Control │ Night purging │ Parameter name							
		Night purging	ON/OFF		OFF		X
		Diff	1...20,0	°C	5		X
		Min. time	0…720	Min.	30		X
		Min. outdoor air temp.	5...30,0	°C	12		X
Temperature │ Control │ Step control							
		Step control	ON/OFF		OFF		X
Temperature │ External control │ Parameter name							
		External control	ON/OFF		OFF		X
Temperature │ Cooling │ Linear mode │ Parameter name							
		Linear mode	ON/OFF		OFF		X
		Stage 2	10-100	%	50		X
Temperature │ Cooling │ Binary mode │ Parameter name							
		Binary mode	ON/OFF		OFF		X
		Stage 2	10-70	%	40		X
		Stage 3	50-100	%	80		X
Temperature │ Cooling │ Cooling recovery │ Parameter name							
		Cooling recovery	ON/OFF		OFF		X
		Diff temp.	0...5	°C	1		X

Function		Parameter name	Range	Unit	Default value	Read[1]	Write[1]	Not CS 50
Temperature │ Temperature sensors │ Calibration │ Parameter name								
Calibration of temp. sensor for plate exchanger		Thermoguard	-5.0...5.0	°C	0,0			
		Supply air	-5.0...5.0	°C	0,0			
		Extract air	-5.0...5.0	°C	0,0			X
			ON/OFF		OFF			X
		Outdoor air	-5.0...5.0	°C	0,0			X
			ON/OFF		OFF			X
		Return water	-5.0...5.0	°C	0,0			
Temperature │ Neutral zone │ Parameter name								
		Cooling recovery system	-5.0...5.0	°C	0,0			X
		Recovery system, heating	-5.0...5.0	°C	0,0			
Fan control │ Speed setting │ Parameter name								
		Speed 1	0-100	%	35			
		Speed 2	0-100	%	50			
		Speed 3	0-100	%	100			
Fan control │ Manual setting │ Parameter name								
		Speed	0,1,2,3					
Fan control │ Forced ventilation │ Parameter name								
		Activate	OFF/ON		OFF			
		Default speed	0,1,2,3		2			
		Default time	0...360	m	30			
Fan control │ Control │ DCV supply air │ Parameter name								
		DCV supply air		OFF/ON	OFF			X
		Min. value		0...100 %	20			X
		Max. value		0...100 %	80			X
		On level		0... Pa	0			X
Fan control │ Control │ DCV extract air │ Parameter name								
		DCV extract air	OFF/ON		OFF			X
		Min. value						X
		Max. value						X
		On level	0...	Pa	0			X
Fan control │ Control │ CPR supply air │ Parameter name								
		CPR supply air	OFF/ON		OFF			X
		Desired value	0...	Pa	0			X
		Min. value	0...100	%	20			X
		Max. value	0...100	%	100			X
Fan control │ Control │ CPR extract air │ Parameter name								
		CPR extract air	OFF/ON		OFF			X
		Desired value	0...	Pa	0			X
		Min. value	0...100	%	20			X
		Max. value	0...100	%	100			X
Fan control │ Control │ No. of sensors │ Parameter name								

Function	Parameter name	Range	Unit	Default value	Read[l]	Write[l]	Not CS 50
	No. of sensors	2: 1 supply,1 extract		2			X
	Difference	0-200	%	100			X
Fan control│Control│Supply air sensor│ Parameter name							
	Type	Pa, ppm		Pa			X
	Min. level	0…9999		0			X
	Max. level	0…9999		300			X
Fan control│Control│Extract air sensor│ Parameter name							
	Type	Pa, ppm		Pa			X
	Min. level	0…9999		0			X
	Max. level	0…9999		300			X
Fan control│Configuration│Motor protection│ Parameter name							
	Motor protection	OFF/ON		OFF			X
	Time delay	0…180	S	30			X
Fan control│Configuration│Startup sequence│ Parameter name							
	Time delay 1	0…60	S	0			
	Time delay 2	0…60	S				
	Time delay 3	0…60	S				
	Time delay 4	0…60	S				
Fan control│Configuration│Shutdown sequence│ Parameter name							
	Time delay	0…300	S	180			
Test│Information│System│ Parameter name							
	Recovery system	Rotor/plate					
	Heating	Electric battery/ water battery					
	Defrosting	Preheating/by pass					
Test│Information│Main board│ Parameter name							
	Hardware rev.						
	Software rev.						
Test│Information│CS 500 panel 1│ Parameter name							
	Hardware rev.						
	Software						
Test│Information│CS 500 panel 2│ Parameter name							
	Hardware rev.						
	Software						
Test│Information│CS50 panel 1│ Parameter name							
	Hardware rev.						
	Software						
Test│Information│CS50 panel 1│ Parameter name							

Function		Parameter name	Range	Unit	Default value	Read[I]	Write[I]	Not CS 50
		Hardware rev.						
		Software						
		Software						
Test│Information│Factory│ Parameter name								
Test│Information│ Time counter								
		Time counter	0...	H	0			
Test│Alarm│ Parameter name								
		Active alarms						
		Alarm history						
		Reset alarm	ON/OFF		ON			
Test│Test│ Parameter name								
		Fan speed	Speed 0, 1, 2, 3					
		Heating	ON/OFF		OFF			
		Preheating	ON/OFF		OFF			
		Heat recovery system	ON/OFF		OFF			X
		Cooling	ON/OFF		OFF			
		Alarm output	ON/OFF		OFF			
		Factory test	ON/OFF		OFF			
Test│Test│Sensors│ Parameter name								
		Thermoguard		°C				
		Supply air		°C				
		Extract air		°C				X
		Outdoor air temp.		°C				X
		Return water		°C				

1   A password that permits a user to read the value and/or change it

<u>I</u>nfo password (I)   for the information level (password not necessary!)
<u>O</u>perator password (O)   for the operator level
<u>P</u>arameter password (P)   for the parameter level

Microswitch	ON	OFF
1	Rotating exchanger	Cross heat exchanger
2	Unit fitted with a water battery	Unit fitted with an electric battery
3	The unit has an exchanger with a bypass	The unit has preheating (only if the unit has a plate exchanger)
4	Not in use	Not in use

4 Description of the Functions

4.1 Menu Language Selection

Description

There are 6 different menu languages to choose from.

Setting

Configuration│**Language**│ English

Parameter name	Setting range	Unit	Default value
English	English, Norwegian, Swedish, Danish, Finnish, German, Dutch		English

4.2 Activation of Filter Replacement Time Counter

Description

By activating this function, you can get an alarm that indicates that a filter needs to be replaced after a specified period of time. This is used only if you do not have pressure guards in the unit.

Setting

Configuration│**Filter**│ Time counter activated

Parameter name	Setting range	Unit	Default value
Time counter activated	ON/OFF		OFF

4.3 Period of Time for Filter Replacement

Description

The set value will be the time between each filter alarm (B alarm). Does not apply if a pressure guard is fitted.

Setting

Configuration│**Filter**│ Period of time

Parameter name	Setting range	Unit	Default value
Period of time	0…12	Month	6

4.4 Resetting the Time Counter

Description

You have to reset the time after replacing a filter by using the clock for the filter alarm. Does not apply if a pressure guard is fitted.

Setting

Configuration│**Filter**│ Reset time counter

Parameter name	Setting range	Unit	Default value
Reset time counter	YES/NO		YES

4.5   Activation of Supply Air Pressure Guard

Description

The supply air pressure guard is used when the unit has a pressure guard fitted.

Setting

Configuration│**Filter**│ Supply air pressure guard (not CS 50)

Parameter name	Setting range	Unit	Default value
Supply air pressure guard	ON/OFF		ON

4.6   Activation of Extract Air Pressure Guard

Description

The extract air pressure guard is used when the unit has a pressure guard fitted.

Setting

Configuration│**Filter**│ Extract air pressure guard

Parameter name	Setting range	Unit	Default value
Extract air pressure guard	ON/OFF		ON

4.7   External Fire/Smoke Function, Mode 1

Description

When using an external fire/smoke signal, you can make the unit stop by selecting Mode 1.

Setting

Configuration│**Fire/Smoke**│ Mode 1 (not CS 50)

Parameter name	Setting range	Unit	Default value
Mode 1	ON/OFF		ON

4.8   External Fire/Smoke Function, Mode 2

Description

When using an external fire/smoke signal, you can make the unit go to speed 3 by selecting Mode 2.

Setting

Configuration│**Fire/smoke**│ Mode 2 (not CS 50)

Parameter name	Setting range	Unit	Default value
Mode 2	ON/OFF		OFF

4.9   External Fire/Smoke Function, Mode 3

Description

When using an external fire/smoke signal, you can make the supply air fan stop and the extract air fan go to speed 3 by selecting Mode 3.

Setting

Configuration│**Fire/smoke**│ Mode 3 (not CS 50)

Parameter name	Setting range	Unit	Default value
Mode 3	ON/OFF		OFF

4.10 Date/Time

Description

When the System Parameters menu is opened, the cursor flashes in the date field. You can enter the date (dd.mm.yyyy) and time (hh.mm.ss) on this setting line in accordance with predefined navigation criteria.

4.11 Change Service Code

Description

Here you can change the preset code.

Setting

Configuration│**PIN codes**│

Parameter name	Setting range	Unit	Default value
Service code	1000		

4.12 Daily Timer

Description

A Daily Timer is used to define when the unit is to **start, stop** or **change speed every day** and to lock the temperature set point value.
Under Timer, four independent changeover times can be entered. The times must be entered in chronological order.

Setting

Configuration│**Timer**│**Daily timer 1-4**│ Setting line

Description

Under Timer, four independent changeover times can be entered. The time, fan speeds and relevant set point value can be set.
The table below shows the operating functions that must be entered.

Settings

Configuration│**Timer**│**Period 1-4**│ Setting lines

Code input data

When you define a setting, you must be aware that a changeover time is activated. Weekly Timer in Active NO mode cannot be set in between two active timer settings. The time set for daily timer 1 must be earlier than daily timer 2, which again must be prior to daily timer 3 and so on. The settings for an active period are valid until the next setting becomes active the following day.

Active	OFF/ON		ON	
Timer – time ON (daily timer 1-4)	06.00		00.00-23.59	
Timer – speed (daily timer 1-4)*	1		0-3 *	
Timer – temperature (daily timer 1-4)**	20	°C	10-40 **	
Timer – temperature ON/OFF (daily timer 1-4)	OFF		ON/OFF	
Timer - active YES/NO				

Please note that you can set different setpoint values for the temperature in the different changeover periods. These will override the setpoint value under: Temperature I Setting. If you want to set the temperature manually the setting Temperature ON/OFF must be in the OFF-position.

* Under Menu I Speed adjustment I you can adjust the fans to the preferred air quantity.

(You can also select *Manual* here. Under Menu I Fans I Fan control I Manual, you can set the fan speeds. The unit will operate on this setting in the period in question.)

** You can also select *Manual* here.

You can do this under Menu I Temperature I Setting I and set the preferred temperature. The unit will operate on this setting in the period in question.

Example

The example below shows a standard operating situation in which the unit is on speed 2 and the set point values are locked to 20°C between 07:00 and 18:00 and speed 0 between 18:00 and 07:00 on every day of the week.

	Daily Timer 1	Daily Timer 2	Comments
Time on	07:00	18:00	Indicates when the time channel is to start to apply
Speed	2	0	Indicates the speed selected: 0, 1, 2 or 3
Temperature	20	20	Indicates the temperature set point value
Temperature	ON	ON	Indicates whether the temperature is to be controlled from the timer
Active	YES	YES	Indicates whether the time channel is active

4.13 Weekly Timer

Description

A Weekly Timer is used to override the times in the Daily Timer, for example stopping at weekends.

Under Weekly Timer, six independent changeover times can be entered. The time, fan speed and relevant set point value can be set.
NB. The Daily Timer must be correctly programmed before the Weekly Timer is programmed.

Setting

Configuration│Timer│Weekly Timer 1-6 I Setting line

Description

Under «Weekly Timer», six independent changeover times can be entered. The time, fan speed and relevant set point value can be set. These times override what is entered in the daily timer. The table below shows the operating functions that must be entered.

Settings

When you define a setting, you must ensure that a changeover time is activated.
Weekly Timer-settings with a higher period number preseds those with a lower number.

Timer – day ON (period 1-4)	Mon		Mon-Sun
Timer – time ON (period 1-4)	06.00		00.00-23.59
Timer – speed (period 1-4)	1		0-3 *
Timer – temperature (period 1-4)	20	°C	10-40 **
Timer – temperature ON/OFF (period 1-4)	OFF	°C	ON/OFF
Timer – time OFF (period 1-4)	20.00		00.00-23.59
Timer – day OFF (period 1-4)	Fri		Mon-Sun
Timer – active YES/NO			

Please note that you can set different setpoint values for the temperature in the different changeover periods. These will override the setpoint value under: Temperature I Setting I. If you want to set the temperature manually the setting Temperature ON/OFF must be in the OFF-position.

*   Under Menu I Speed adjustment I you can adjust the fans to the preferred air quantity.
(You can also select *Manual* here. Under Menu I Fans I Fan control I Manual, you can set the fan speeds. The unit will operate on this setting in the period in question.)

**   Please note that you can set different setpoint values for the temperature in the different changeover periods. These values will override the temperature setpoint value set under Menu I Temperature I Setting.

Example

The example below shows how the Weekly Timer is programmed to stop at weekends using the times set in the example under the Daily Timer. With these settings, the unit will operate from 07:00 to 18:00 on speed 2 and from 18:00 to 07:00 on speed 0, from Monday to Friday. The unit stops from Friday 18:00 to Monday 07:00.

Weekly Timer 1		
Day on	Saturday	Indicates the day on which the deviation from the Daily Timer is to start
Time on	06:00	Indicates the time at which the time channel is to start. Must be **before** the time in Daily Timer 1
Speed	0	Indicates the speed selected: 0, 1, 2 or 3
Temperature	20	Indicates the temperature setpoint value
Temperature	OFF	Indicates whether the temperature is to be controlled from the timer
Time OFF	19:00	Indicates the time at which the time channel is to stop. Must be **after** the time in Daily Timer 2
Day OFF	Sunday	Indicates the day on which the deviation from the Daily Timer is to stop
Active	YES	Indicates whether the time channel is active

4.14 Resetting to Factory Settings

Description

If you want to return to the factory settings, this can be done here.

Setting

Configuration | **Changes** | | Reset to factory setting

Parameter name	Setting range	Unit	Default value
Reset to factory setting	ON/OFF		OFF

4.15 Configuration of Temperature Control

Description

This is where you adapt the controller for different types of control. This is done by selecting the main sensors – room sensor, extract air sensor or supply air sensor. Selecting the room sensor or extract air sensor automatically leads to cascade control. Selecting the supply air sensor leads to constant supply air control.
Therefore, it is possible to select four different control functions.
The following temperature control options can be selected:

1. Constant supply air temperature
2. Room/extract air control (not CS 50)
3. Dif - temperature control (not CS 50)
4. Supply air control compensated for outdoor air

You cannot combine these two regulation functions. In order to be able to choose another regulation, you must turn off the active one. This does not apply for constant supply air regulation which is a standard.

4.15.1 Control Function 1, Constant Supply Air Temperature

Description

The supply air temperature is controlled using the following three functions:
* Heat recovery, Hrec
* Heating (electric or water battery)
* Cooling (not CS 50)

With constant supply air control, the desired temperature is maintained regardless of the outdoor sensor and extract air/room temperature.
You can select air flow rate reduction at low supply air temperature (if the heating battery does not produce enough heat, the fan speed will slowly be reduced).

Functional Description
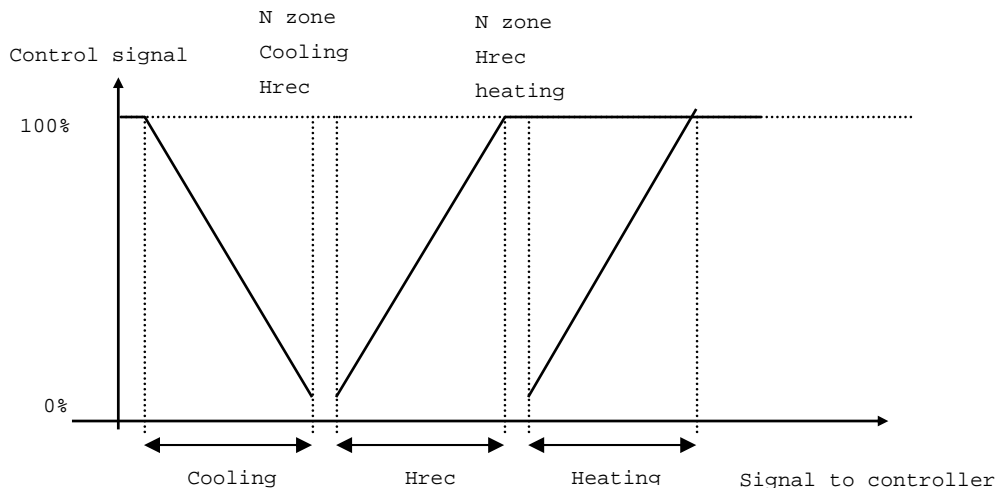
4.15.2 Control Function 2, Room or Extract Air Control (not CS 50)

Description

With room/extract air control, the incoming air temperature is controlled in accordance with the temperature measured in the room or in accordance with the extract air and the setpoint value for the room/extract air temperature. In order to obtain the best possible comfort, you can define the lowest/highest values for the incoming air temperature. If the temperature of the incoming air falls to the lowest setting, the automatic control functions attempt to control the supply air temperature in relation to this value.

Functional Description

4.15.3 Control Function 3, Diff (not CS 50)

Description

Using DIFF temperature control, you can define a temperature differential between the extract air and supply air temperatures and a minimum/maximum supply air temperature. The supply air temperature will follow the extract air/room temperature with a fixed temperature differential (temp. diff).

Functional Overview
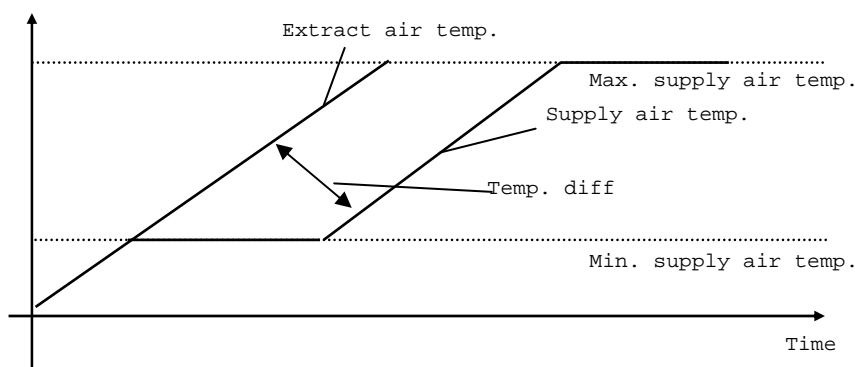
4.15.4 Control Function 4, Supply Air Control Compensated for Outdoor Air (not CS 50)

Description

In this case you can define a reference value for low and high outdoor air temperatures.

You can select air flow rate reduction at low supply air temperature (if the heating battery does not produce enough heat).
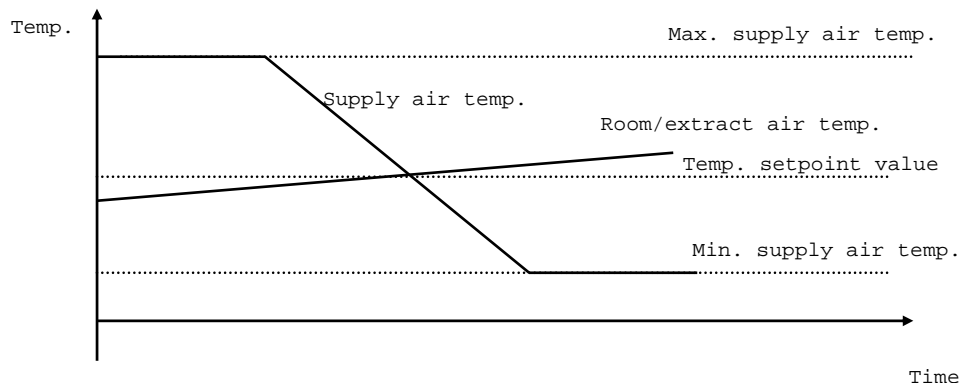
Functional Description
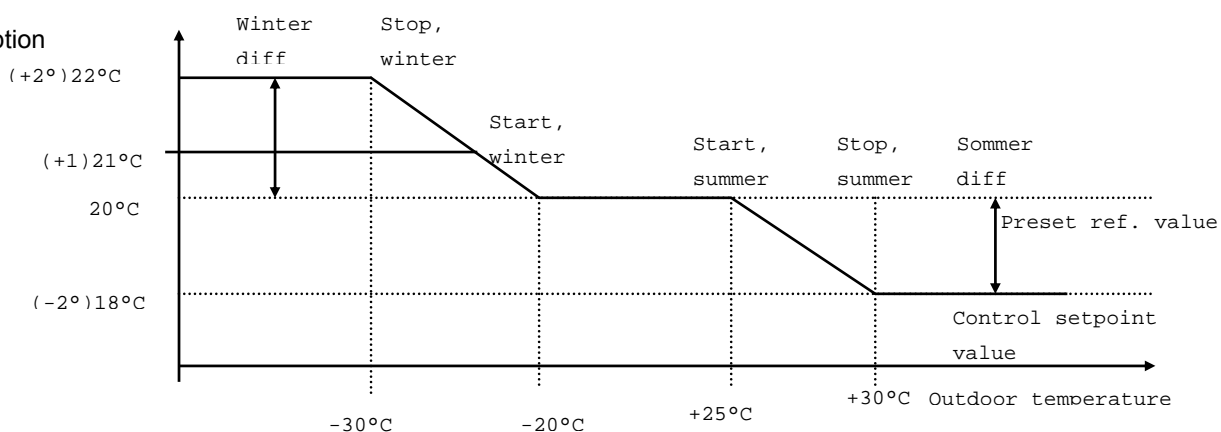
4.16 Control Type Selection

Description

Selection of the type of control function. The following temperature control options can be selected:

1. Constant supply air temperature
2. Room/extract air control (not CS 50)
3. DIF temperature control (not CS 50)
4. Supply air control compensated for outdoor air (not CS 50)

The unit will operate in supply air control mode unless one of the other functions is selected.

4.17 Temperature Setting, Main Sensor

Description

Here you set the temperature (setpoint value) that you want the unit to maintain (main sensor). If you want other values during the 24-hour period, these can be set under Timer.

Setting

Temperature │ Setting

Parameter name	*Setting range*	*Unit*	*Default value*
Setting	0...40,0	°C	20

4.18 Extract Air Control Selection (not CS 50)

Description

If you want to have extract air control, this is set here.

Setting

Temperature │ Control │ Extract air

Parameter name	*Setting range*	*Unit*	*Default value*
Extract air	ON/OFF		OFF

4.19 Min. Supply Air Temperature (not CS 50)

Description

With extract air control, the lowest temperature that you want to have in the supply air must be set.

Setting

Temperature | **Control** | Min. supply air

Parameter name	Setting range	Unit	Default value
Min. supply air	0...40,0	°C	16

4.20 Max. Supply Air Temperature (not CS 50)

Description

With extract air control, the highest temperature that you want to have in the supply air must be set.

Setting

Temperature | **Control** | Max. supply air

Parameter name	Setting range	Unit	Default value
Max. supply air	0...40,0	°C	35

4.21 Fan Reduction with Low Supply Air Temperature

Description

You can select air flow rate reduction at low supply air temperature (if the heating battery does not produce enough heat). Ventilation units with EC-fans have infinitely variable control and will gradually decrease in speed (and will stop at the set value for speed 1). Units with AC-fans (transformer control) will decrease to the next speed, for example from speed 2 to speed 1. At speed 1 no further reduction is available.

Settings

Temperature | **Control** | FanSlow

Parameter name	Setting range	Unit	Default value
FanSlow	ON/OFF		OFF

4.22 Outdoor Air Compensation (not CS 50)

Description

If you want to change the setpoint value for supply air according to the outdoor air temperature (compensation), set this function to ON.

Settings

Temperature | **Control** | **Comp.** | Comp.

Parameter name	Setting range	Unit	Default value
Comp.	ON/OFF		OFF

4.23 Compensate for High Summer Temperature
(not CS 50)

Description

This defines the desired temperature reduction in relation to the setpoint value temperature with a high outdoor air temperature.

Setting

Temperature | **Control** | **Comp.** | Summer diff

Parameter name	*Setting range*	*Unit*	*Default value*
Summer diff	-10…10,0	°C	-2.0

4.24 Stop Summer Compensation (not CS 50)

Description

This stops compensation for summer temperatures.

Setting

Temperature | **Control** | **Comp.** | Stop summer

Parameter name	*Setting range*	*Unit*	*Default value*
Stop summer	10...40,0	°C	30

4.25 Start Summer Compensation (not CS 50)

Description

This starts compensation for summer temperatures.

Setting

Temperature | **Control** | **Comp.** | Start summer

Parameter name	*Setting range*	*Unit*	*Default value*
Start summer	10...40,0	°C	25

4.26 Compensate for Low Outdoor Air Temperature
(not CS 50)

Description

This defines the desired temperature increase in relation to the setpoint value temperature with a low outdoor air temperature.

Setting

Temperature | **Control** | **Comp.** | Winter diff

Parameter name	*Setting range*	*Unit*	*Default value*
Winter diff	-10…10,0	°C	1,0

4.27 Stop Winter Compensation (not CS 50)

Description

This stops compensation for winter temperatures at this outdoor air temperature.

Setting	Temperature | Control | Comp. | Stop winter			

Parameter name	*Setting range*	*Unit*	*Default value*
Stop winter	-30,0...20,0	°C	-30

4.28 Start Winter Compensation (not CS 50)

Description

This starts compensation for winter temperatures.

Setting

Temperature | Control | Comp. | Start winter			

Parameter name	*Setting range*	*Unit*	*Default value*
Start winter	-30,0...20,0	°C	-20

4.29 DIF Control Selection (not CS 50)

Description

If you want DIF control, this is activated here.

Setting

Temperature | Control | Temp. diff			

Parameter name	*Setting range*	*Unit*	*Default value*
Temp. diff	ON/OFF		OFF

4.30 Desired Temperature Differential (not CS 50)

Description

The desired temperature differential between the supply air and the extract air is set here.

Setting

Temperature | Control | Temp. diff			

Parameter name	*Setting range*	*Unit*	*Default value*
Temp. diff	0...40,0	°C	2

4.31 Min. Supply Air Temperature (not CS 50)

Description

With DIF, the lowest temperature that you want to have in the supply air must be set.

Setting

Temperature | Control | Min. supply air			

Parameter name	*Setting range*	*Unit*	*Default value*
Min. supply air	0...40,0	°C	16

4.32 Max. Supply Air Temperature (not CS 50)

Description

With DIF, the highest temperature that you want to have in the supply air must be set.

Setting

Temperature | **Control** | Max. supply air

Parameter name	Setting range	Unit	Default value
Max. supply air	0...40,0	°C	35

4.33 Automatic Switching between Extract Air and Supply Air Control (not CS 50)

Description

If you decide to activate this function, the control switches automatically between extract air/room control and supply air control when the outdoor air temperature reaches a preset temperature, for example 15 °C. When the outdoor air temperature exceeds 15 °C, extract air/room control switches in. If it falls below (15 °C - $\triangle$T), supply air control starts. ($\triangle$T = 2 °C).
In order for this to work, either supply air or extract air/room control must be activated.

Settings

Temperature | **Control** | **AutoExt/Sup** | AutoExt/Sup

Parameter name	Setting range		Default value
AutoExt/Sup	ON/OFF		OFF

4.34 TempSwitchSup/Ext (not CS 50)

Description

Outdoor air temperature setting for automatic switching between extract air/room control and supply air control.

Settings

Temperature | **Control** | **AutoExt/Sup** | Outdoor air temperature

Parameter name	Setting range	Unit	Default value
Outdoor air temperature	5...25,0	°C	15

4.35 Delta Temp. for Resetting (not CS 50)

Description

Delta temperature setting for the function to be reset.
If the outdoor air temperature rises to 15 °C, the unit will switch to extract air control. In order for the unit to switch back to supply air control, the outdoor air temperature must fall to 13 °C or lower.

Settings

Temperature | **Control** | **AutoExt/Sup** | Deviation

Parameter name	Setting range	Unit	Default value
Deviation	1...3	°C	2

4.36 Step Control (not CS 50)

Description

Selection of the number of heating stages with an electric battery, 1 or 2.

1 stage: 1 group controlled by just pulse width modulation (ON/OFF).

2 stages: The electric battery is divided into two groups: 1-1.
                The first group is always controlled by pulse width modulation with signals of 0 or 10 V (ON/OFF) between the stages. The second group has binary OFF/ON control.

Temperature | **Control** | Step control

Settings

Parameter name	Setting range	Default value
Step control	ON/OFF	OFF

4.37 External Temperature Control (not CS 50)

Description

This function must be activated if you want to control the setpoint value of the temperature from an external 0-10 V signal (10 kOhm).

Temperature | **External control** | External temp. control

Settings

Parameter name	Setting range	Default value
External temp. control	ON/OFF	OFF

4.38 Cooling (not CS 50)

Description

Select from 3 different controls:

        0-10 V operation (ice water)

        DX cooling battery, binary (cooling battery divided into two different groups)

        DX cooling battery, linear (cooling battery divided into two identical groups)

0-10 V operation (ice water)

Controlled from a 0-10 V signal with 10 V as the maximum cooling requirement.

DX cooling battery, binary (cooling battery divided into two different groups)

The cooling battery is divided into two groups: 1-2. The intention is to supply a cooling machine that covers 1/3 of the desired cooling effect and a cooling machine that covers 2/3 of the desired cooling effect.

The machines are controlled by both the outdoor air temperature and the extract air/room temperature.

Example:

- DX-1 starts when the outdoor air temperature is over the *Min. outdoor air temperature* and the extract air is over the setpoint value (desired extract air temperature + neutral zone)
- DX-2 starts and DX-1 stops when the cooling output reaches 40 % (controllable – Stage 2)
- DX-1 starts again (DX-1 and DX-2 operate) when the cooling output reaches 70 % (controllable – Stage 3)

At the same time, it is necessary to have a time function in connection with these outputs – they must be OFF for at least 3 minutes before being switched on (this value can be adjusted – *Delayed activation)*.

DX cooling battery, linear (cooling battery divided into two identical groups)
The cooling battery is divided into two groups: 1-2. The intention is to supply a cooling machine that has two equally large effects.
The machines are controlled by both the outdoor air temperature and the extract air/room temperature.
Example:
- DX-1 starts when the outdoor air temperature is over the *Min. outdoor air temperature* and the extract air is over the setpoint value (desired extract air temperature + neutral zone)
- DX-2 starts and DX-1 remains on when the cooling output reaches 50 % (controllable – Stage 2)

At the same time, it is necessary to have a time function in connection with these outputs – they must be OFF for at least 3 minutes before being switched on (this value can be adjusted – *Delayed activation)*.

Common to the DX cooling batteries:

The following criteria must be met for cooling to work:
- Temperature above the preset value (N zone) between heating and cooling
- For DX machines, at least 3 minutes must pass between each start
- The air flow rate must be over the lowest setting (DX start)
- Output for heat recovery (HR) is 0 % (0 V)

With extract air control, you can set the lowest temperature for the supply air to avoid cold draughts. You are recommended to set this value low to avoid the cooling battery being switched on/off too frequently (increases the operating time of the cooling battery).

4.39 Outdoor Air Temperature for Start of Cooling (not CS 50)

Description

The outdoor air temperature that allows cooling on DX stage 1 or 0-10 V control (ice water) to start.

Settings

Temperature│Cooling│Min. outdoor air temp.

Parameter name	Setting range	Unit	Default value
Min. outdoor air temp.	0,0...35	°C	18

4.40 Time between Each Start (not CS 50)

Description

For DX machines, 3 minutes should pass between each start. This delay time can be changed here.

Settings

Temperature│Cooling│Delay

Parameter name	Setting range	Unit	Default value
Delay	0...300	s	180

4.41 Minimum Speed for Cooling (not CS 50)

Description

If the fans fall below this value (Min. speed), cooling will not be possible. This is to prevent the DX machines from freezing up. With transformer control of the fans, cooling will not be possible in speed 1.

Settings

Temperature	**Cooling**	Min. speed		
Parameter name	*Setting range*	*Unit*	*Default value*
Min. speed	0...100	%	45

4.42 Selection of Linear Control for DX Machine (not CS 50)

Description

You can select 3 different controls:
1) 0-10 V operation (ice water)
2) DX cooling battery, binary (cooling battery divided into two different groups)
3) DX cooling battery, linear (cooling battery divided into two identical groups)
If you want to have the linear setup, set this function to ON.

Temperature	**Cooling**	**Linear mode**	Linear mode

Settings

Parameter name	*Setting range*	*Default value*
Linear mode	ON/OFF	ON

4.43 DX Stage 2 (not CS 50)

DX-1 starts when the outdoor air temperature is over the *Min. outdoor air temperature* and the extract air is over the setpoint value (desired extract air temperature + neutral zone).
DX-2 starts and DX-1 remains on when the cooling output reaches 50 % (controllable – Stage 2).

Settings

Temperature	**Cooling**	**Linear mode**	Stage 2	
Parameter name	*Setting range*	*Unit*	*Default value*
Stage 2	0...100	%	50

4.44 Selection of Binary Control for DX Machine (not CS 50)

Description

You can select 3 different controls:
1) 0-10 V operation (ice water)
2) DX cooling battery, binary (cooling battery divided into two different groups)
3) DX cooling battery, linear (cooling battery divided into two identical groups)
If you want to have the binary setup, set this function to ON.

Temperature	**Cooling**	**Binary mode**	Binary mode

Settings

Parameter name	*Setting range*	*Default value*
Binary mode	ON/OFF	OFF

4.45 DX Stage 2 (not CS 50)

DX-1 starts when the outdoor air temperature is over the *Min. outdoor air temperature* and the extract air is over the setpoint value (desired extract air temperature + neutral zone).
DX-2 starts and DX-1 stops when the cooling output reaches 40 % (controllable – Stage 2).

Settings

Temperature⎮Cooling⎮Binary⎮Stage 2

Parameter name	Setting range	Unit	Default value
Stage 2	0...100	%	40

4.46 DX Stage 3 ((not CS 50)

DX-1 starts when the outdoor air temperature is over the *Min. outdoor air temperature* and the extract air is over the setpoint value (desired extract air temperature + neutral zone).
DX-2 starts and DX-1 stops when the cooling output reaches 40 % (controllable – Stage 2).
DX-1 starts again (DX-1 and DX-2 operate) when the cooling output reaches 70 % (controllable – Stage 3).

Settings

Temperature⎮Cooling⎮Binary⎮Stage 3

Parameter name	Setting range	Unit	Default value
Stage 3	0...100	%	70

4.47 Activation of Cooling Recovery System (not CS 50)

Description

Here you can activate cooling recovery (using the rotor).

Settings

Temperature⎮Cooling⎮Cooling recovery⎮OFF/ON

Parameter name	Setting range	Default value
Cooling recovery	OFF/ON	OFF

4.48 Start Temp. Differential for Cooling Recovery (not CS 50)

If the cooling recovery function is selected and the outdoor air temperature is 1 $^{\circ}$C warmer than the extract air (the value can be adjusted), the rotor is set to 100 % if cooling is required. Cooling recovery stops when cooling is no longer required or when the outdoor air temperature is the same as the temperature of the extract air.

Settings

Temperature⎮Cooling⎮Cooling recovery⎮Diff temp.

Parameter name	Setting range	Unit	Default value
Diff temp.	0...5	°C	1

4.49 Calibration with Measured Values + Activation of Sensors

Description

A number of disturbance factors can impair the display of measured values. If the temperature displayed is not the same as the temperature measured with the sensor, the display can be corrected.

Effects

- Parallel movement of the sensor's properties with the corrected value
- The respective actual value parameters show the corrected temperature

Settings

Temperature│Temperature sensors│Calibration
```
                              │ Frost relay
                              │ Supply air
                              │ Extract air
                              │ ON/OFF
                              │ Outdoor air
                              │ ON/OFF
                              │ Return water
```

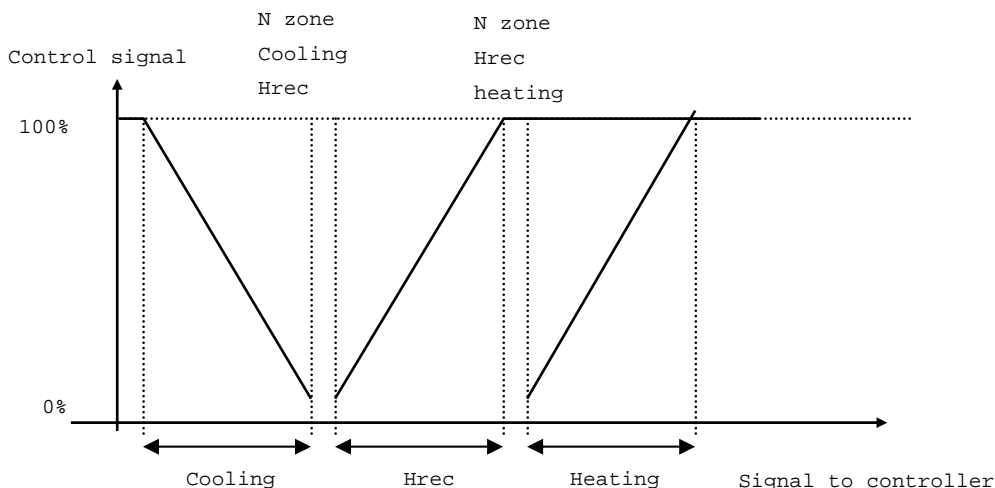| *Parameter name*	*Setting range*	*Unit*
Thermoguard	-5,0...5,0	°C
Supply air	-5,0...5,0	°C
Extract air	-5,0...5,0	°C
	ON/OFF	
Outdoor air temp.	-5,0...5,0	°C
	ON/OFF	
Return water	-5,0...5,0	°C

4.50 Neutral Zones

Description

The supply air temperature is controlled using the following three functions:

- Heat recovery, Hrec
- Heating (electric or water battery)
- Cooling (not CS 50)

Between the functions, it is necessary to have a neutral zone to avoid oscillation between the functions. Avoid going below 2 °C.

Functional Description

Setting	Temperature｜Neutral zone｜		
	Parameter name	*Setting range*	*Unit*
	Cooling – heat exchanger(Hrec) (not CS 50)	-5,0...5,0	°C
	(Hrec)Heat exchanger - Heating	-5,0...5,0	°C

4.51 Speed Stage 1, Supply Air

Description	Sets the desired speed for stage 1. This applies only to units that have infinitely variable fan control.

Setting	Fan control I Speed setting I Supply air I Speed 1			
	Parameter name	*Setting range*	*Unit*	*Default value*
	Speed 1	0…100%	%	35

4.52 Speed Stage 2, Supply Air

Description	Sets the desired speed for stage 2. This applies only to units that have infinitely variable fan control.

Setting	Fan control I Speed setting I Supply air I Speed 2			
	Parameter name	*Setting range*	*Unit*	*Default value*
	Speed 2	0…100%	%	50

4.53 Speed Stage 3, Supply Air

Description	Sets the desired speed for stage 3. This applies only to units that have infinitely variable fan control.

Setting	Fan control I Speed setting I Supply air I Speed 3			
	Parameter name	*Setting range*	*Unit*	*Default value*
	Speed 3	0…100%	%	100

4.54 Speed Stage 1, Extract Air

Description	Sets the desired speed for stage 1. This applies only to units that have infinitely variable fan control.

Setting	Fan control I Speed setting I Extract air I Speed 1			
	Parameter name	*Setting range*	*Unit*	*Default value*
	Speed 1	0…100%	%	35

4.55 Speed Stage 2, Extract Air

Description

Sets the desired speed for stage 2.
This applies only to units that have infinitely variable fan control.

Setting

Fan control I Speed setting I Extract air I Speed 2

Parameter name	Setting range	Unit	Default value
Speed 2	0…100%	%	50

4.56 Speed Stage 3, Extract Air

Description

Sets the desired speed for stage 3.
This applies only to units that have infinitely variable fan control.

Setting

Fan control I Speed setting I Extract air I Speed 3

Parameter name	Setting range	Unit	Default value
Speed 3	0…100%	%	100

4.57 Manual Control of Fan Speed

Description

Sets the desired speed. Stage 0, 1, 2 or 3. The timer must be OFF.

Setting

Fan control │ Manual setting │ Select speed

Parameter name	Setting range	Unit	Default value
Select speed	0,1,2,3		2

4.58 Forced Ventilation

Description

Indicates wether the unit is in forced ventilation mode or not. If you want forced ventilation, this is initiated from the panel. When the signal for forced ventilation is high, all settings for fan control are ignored and the fans are set to constant air flow rate with the setpoint value for forced constant air flow rate.

Settings

Fan control │ Forced ventilation │ Activate

Parameter name	Setting range	Unit	Default value
Activate	ON/OFF		OFF

4.59 Speed for Forcing

Description

Fan speed setting that is desired for forced ventilation.

Settings

Fan control │ Forced ventilation │ Default speed

Parameter name	Setting range	Unit	Default value
Default speed	0,1,2,3		3

4.60 Time for Forcing

Description

Setting for the time you want to have forced ventilation.

Settings

Fan control│Forced ventilation│Default time

Parameter name	Setting range	Unit	Default value
Default time	0…360		30

4.61 DCV Control (not CS 50/transformer control)

Description

NB! The timer must be on speed 1.
With requirement-controlled ventilation, the fans can be controlled by the air quality, which is measured with a CO_2 sensor.
The fans will normally operate at min. fan speed (adjustable). If the CO_2 sensor registers a higher value than desired, the fans will gradually increase RPM.
Immediately the desired level has been reached (or the value has fallen below it), the fans will gradually reduce RPM to min. fan speed. If the desired CO_2 level is not reached, the fans go right up to max. fan speed and remain at that speed until the CO_2 level has fallen below the desired level.

4.62 Supply Air DCV Control (not CS 50/transformer control)

Description

NB! The timer must be on speed 1.
Remember to select the sensor type. This is done under: Fan control I Control I Supply air sensor.
You can activate the variable air flow rate (VAV) function for the supply air fan here. This works on all timer settings apart from OFF.

Settings

Fan control│Control│DCV supply air│DCV supply air

Parameter name	Setting range	Unit	Default value
DCV supply air	OFF/ON		OFF

4.63 Min. Extract Air (not CS 50/transformer control)

Description

Here you can set the lowest air flow rate you want to have in the supply air. This is set as a % of the working range of the fan.

Settings

Fan control│Control│DCV supply air│Min. value

Parameter name	Setting range	Unit	Default value
Min. value	0…100	%	20

4.64 Max. Extract Air (not CS 50/transformer control)

Description

Here you can set the highest air flow rate you want to have in the supply air. This is set as a % of the working range of the fan.

Settings

Fan control│Control│DCV supply air│`Max. value`

Parameter name	Setting range	Unit	Default value
Max. value	0…100	%	80

4.65 Desired Supply Air Working Point
(not CS 50/transformer control)

Description

Here you set the desired working point for the sensor (setpoint value) for supply air if the sensor does not have a controller. If the sensor has a controller, this value must be set equal to the minimum value of the controller.

Settings

Fan control│Control│DCV supply air│`ON level`

Parameter name	Setting range	Unit	Default value
ON level	0…100	Pa/CO_2	0

4.66 Extract Air DCV Control (not CS 50/transformer control)

Description

Remember to select the sensor type. This is done under: Fan control I Control I Extract air sensor.
You can activate the variable air flow rate (VAV) function for the supply air fan here. This works on all timer settings apart from OFF.

Settings

Fan control│Control│DCV extract air│`DCV extract air`

Parameter name	Setting range	Unit	Default value
DCV extract air	ON/OFF		OFF

4.67 Min. Supply Air (not CS 50/transformer control)

Description

Here you can set the lowest air flow rate you want to have in the extract air. This is set as a % of the working range of the fan.

Settings

Fan control│Control│DCV extract air│`Min. value`

Parameter name	Setting range	Unit	Default value
Min. value	0…100	%	20

4.68 Max. Supply Air (not CS 50/transformer control)

Description

Here you can set the highest air flow rate you want to have in the extract air. This is set as a % of the working range of the fan.

Settings

Fan control│Control│DCV extract air I `Max. value`

Parameter name	*Setting range*	*Unit*	*Default value*
Max. value	0…100	%	80

4.69 Desired Working Point (not CS 50/transformer control)

Description

Here you set the desired working point for the sensor (setpoint value) for extract air if the sensor does not have a controller. If the sensor has a controller, this value must be set equal to the minimum value of the controller.

Settings

Fan control│Control│DCV extract air│ `ON level`

Parameter name	*Setting range*	*Unit*	*Default value*
ON level	0…100	Pa/CO_2	0

4.70 Supply Air Constant Pressure Control
(not CS 50/transformer control)

Description

NB! The timer must be on speed 1.
Remember to select the sensor type. This is done under: Fan control I Control I Supply air sensor.
You can activate the constant pressure control (CPR) function for the supply air fan here. **Only applies for fans with stepless regulation**.
This works on all timer settings apart from OFF.

Settings

Fan control│Control│CPR supply air│ `CPR supply air`

Parameter name	*Setting range*	*Unit*	*Default value*
CPR supply air	ON/OFF		OFF

4.71 Desired Working Point (not CS 50/transformer control)

Description

Here you set the desired working point for the sensor (setpoint value) for supply air.

Settings

Fan control│Control│CPR supply air│ `Desired value`

Parameter name	*Setting range*	*Unit*	*Default value*
Desired value	0…1000	Pa	0

4.72 Min. Supply Air (not CS 50/transformer control)

Description

Here you can set the lowest air flow rate you want to have in the supply air. This is set as a % of the working range of the fan.

Settings

Fan control│Control│CPR supply air│Min. value

Parameter name	*Setting range*	*Unit*	*Default value*
Min. value	0…100	%	20

4.73 Max. Supply Air (not CS 50/transformer control)

Description

Here you set the highest air flow rate you want to have in the supply air. This is set as a % of the working range of the fan.

Settings

Fan control│Control│CPR supply air│Max. value

Parameter name	*Setting range*	*Unit*	*Default value*
Max. value	0…100	%	80

4.74 Extract Air Constant Pressure Control
(not CS 50/transformer control)

Description

NB! The timer must be on speed 1.

Remember to select the sensor type. This is done under: Fan control I Control I Extract air sensor.
You activate the constant pressure control (CPR) function for the extract air fan here. **Only applies for fans with stepless regulation.** You set the desired min. and max. values and the value you want to control by.
This works on all timer settings apart from OFF.

Settings

Fan control│Control│CPR extract air│CPR extract air

Parameter name	*Setting range*	*Unit*	*Default value*
CPR extract air	OFF/ON		OFF

4.75 Desired Working Point (not CS 50/transformer control)

Description

Here you set the desired working point for the sensor (setpoint value) for extract air.

Settings

Fan control│Control│CPR extract air│Desired value

Parameter name	*Setting range*	*Unit*	*Default value*
Desired value	0…1000	Pa	0

4.76 Min. Extract Air (not CS 50/transformer control)

Description

Setting for the lowest air flow rate you want to have in the extract air. This is set as a % of the working range of the fan.

Settings

Fan control │ Control │ CPR extract air │ Min. value

Parameter name	Setting range	Unit	Default value
Min. value	0…100	%	20

4.77 Max. Extract Air (not CS 50/transformer control)

Description

Setting for the highest air flow rate you want to have in the extract air. This is set as a % of the working range of the sensor.

Settings

Fan control │ Control │ CPR extract air │ Max. value

Parameter name	Setting range	Unit	Default value
Max. value	0…100	%	80

4.78 No. of External Fan Sensors (not CS 50/transformer control)

Description

Selection of the number of fan sensors (pressure or CO_2). The alternatives are 2, 1-supply air, 1-extract air. It is possible here to select the number of sensors to be used in the unit, usually used for external sensors. **Only applies for fans with stepless regulation.**

- 2 = Both sensors fitted and each fan follows its own sensor.
- 1-supply air = Only a supply air sensor is fitted and the extract air fan follows the supply air fan signal +/- xx %.
- 1-extract air = Only an extract air sensor is fitted and the supply air fan follows the extract air fan signal +/- xx %.

Setting

Fan control │ Control │ No. of fan sensors │ No. of fan sensors

Parameter name	Setting range	Default value
No. of fan sensors	2: 1-supply air/1-extract air	2

4.79 With One Sensor – Second Fan % Differential
(not CS 50/transformer control)

Description

With just one external fan sensor (pressure or CO_2), the % differential works as follows: 100 % means the second fan operates at the same speed as the main fan, 50 % means the second fan operates at half speed and 200 % means the second fan operates at double speed. The default value is 100 % (same speed).

Setting

Fan control │ Control │ Sensor diff │ Sensor diff

Parameter name	Setting range	Default value
Sensor diff	0,0…200	100

4.80 Selection of Sensor Type for Supply Air
(not CS 50/transformer control)

Description

Here you set the type of sensor to be used. You can use a pressure sensor (Pa) or air quality meter (ppm).

Setting

Fan control│**Configuration**│**Supply air sensor**│Type

Parameter name	*Setting range*	*Unit*	*Default value*
Type	Pa/ppm		Pa

4.81 Min. Working Range for Supply Air Sensor
(not CS 50/transformer control)

Description

The minimum working range desired. The sensor will not fall below this value.

Setting

Fan control│**Configuration**│**Supply air sensor**│Min. level

Parameter name	*Setting range*	*Unit*	*Default value*
Min. level	0…9999		0

4.82 Max. Working Range for Supply Air Sensor
(not CS 50/transformer control)

Description

The maximum working range desired. The sensor will not exceed this value.

Setting

Fan control│**Configuration**│**Supply air sensor**│Max. level

Parameter name	*Setting range*	*Unit*	*Default value*
Max. level	0…9999		300

4.83 Selection of Sensor for Extract Air
(not CS 50/transformer control)

Description

Here you set the type of sensor to be used. You can use a pressure sensor (Pa) or air quality meter (ppm).

Setting

Fan control│**Configuration**│**Extract air sensor**│Type

Parameter name	*Setting range*	*Unit*	*Default value*
Type	Pa/ppm		Pa

4.84 Min. Working Range for Extract Air Sensor
(not CS 50/transformer control)

Description

The minimum working range desired. The sensor will not fall below this value.

Setting

Fan control│**Configuration**│**Extract air sensor**│Min. level

Parameter name	*Setting range*	*Unit*	*Default value*
Min. level	0…9999		0

4.85 Max. Working Range for Extract Air Sensor
(not CS 50/transformer control)

Description

The maximum working range desired. The sensor will not exceed this value.

Setting

Fan control | **Configuration** | **Extract air sensor** | Max. level

Parameter name	Setting range	Unit	Default value
Max. level	0…9999		300

4.86 Motor Protection Delay

Description

Here you set the delay for the alarm signal. Some fans have an integrated automatic reset if the cause of the fault disappears within 5-15 seconds.

Setting

Fan control | **Configuration** | **Motor protection** | Delay

Parameter name	Setting range	Unit	Default value
Delay	0…180	Sec.	30

4.87 Startup

Description

The following parameter setting lines contain the settings that are most important when a system is to be started up.
- Preheating time
- Start delay, extract air and supply air fans

Preheating time:

Water batteries (water) are sensitive to frost. If the ventilation system is switched off at night and the outdoor air temperature falls below freezing point in the morning, the sudden intake of cold outdoor air when the system starts up may lead to the water in the coils freezing for a short time. This problem is particularly relevant for systems that use ON/OFF air dampers. To avoid this, the heating circuit is flushed with hot water before the outdoor air and extract air dampers are opened. The risk of freezing is thus eliminated and the system is switched on and operated at the correct level.

Effects

- The heating circuit pump is activated
- The valve is opened
- The air dampers are opened

4.88 Start Delay for Extract Air Fan, Speed 1

Description

Setting the start delay for the extract air fan – speed 1.

Settings

Fan control | **Configuration** | **Startup sequence** | Start delay 1

Parameter name	Setting range	Unit	Default value
Start delay 1	0...60,0	Sec.	30

4.89 Start Delay for Extract Air Fan, Normal Operation

Description

Setting the delay for the extract air fan between speed 1 and normal operation.

Settings

Fan control │ Configuration │ Startup sequence │ `Start delay 2`

Parameter name	*Setting range*	*Unit*	*Default value*
Start delay 2	0...60,0	Sec.	30

4.90 Start Delay for Supply Air Fan, Speed 1

Description

Setting the start delay for the supply air fan – speed 1.

Settings

Fan control │ Configuration │ Startup sequence │ `Start delay 3`

Parameter name	*Setting range*	*Unit*	*Default value*
Start delay 3	0...60,0	Sec.	30

4.91 Start Delay Supply Air Fan, Normal Operation

Description

Setting the delay for the supply air fan between speed 1 and normal operation.

Settings

Fan control │ Configuration │ Startup sequence │ `Start delay 4`

Parameter name	*Setting range*	*Unit*	*Default value*
Start delay 4	0...60,0	Sec.	30

4.92 Overtravel

Description

In connection with the electric air heater, the fans have a certain overtravel (time setting) when the unit stops normally. In the event of a fire alarm for a changeover to an emergency stop, there is no overtravel. Units with water batteries must not have any overtravel time, set this time to 0.

Settings

Fan control │ Configuration │ Stop sequence │ `Delay`

Parameter name	*Setting range*	*Unit*	*Default value*
Delay	0…300	Sec.	180

4.93 Components

Description

This shows which main components the unit contains.

Settings

Test │ Information │ System │

Parameter name	*Setting range*
Recovery system	Rotor/plate
Heating	Electric battery/water battery
Defrosting	Preheating/none

4.94 Printed Circuit Board Version

Description   This shows the hardware and software on the board.

Settings   <code>Test│Information│Main board│ │</code>

Parameter name	*Version*
Hardware rev.	
Software	

4.95 Printed Circuit Board Version

Description   This shows the hardware and software on the board.

Settings   <code>Test│Information│CSxx│ │</code>

Parameter name	*Version*
Hardware rev.	
Software	

4.96 Factory Settings

Description   These are basic settings that must not be changed.

<code>Test│Information│Factory │</code>

4.97 Operating Hours Counter

Description   The <code>Time counter</code> parameter shows the total number of operating hours for the fan after the controller was put into operation.

Setting   <code>Test│Information│Time counter</code>

Parameter name	*Display range*	*Unit*
Time counter	0,0... entire upper display range	t

4.98 Active Alarms

Description   This displays active alarms and alarms. The time at which the alarm was registered is also displayed.

Setting   <code>Test│Alarms│ Active alarms</code>

Parameter name	*Display range*	*Unit*
Active alarms	0,0... entire upper display range	

4.99 Alarm History

Description

This displays the last 5 alarms. The time the alarm was registered is displayed.

Setting

Parameter name	Display range	Unit
Alarm history	0,0... entire upper display range	

4.100 Resetting Alarms

Description

This deletes active alarms.

Setting

Parameter name	Display range	Unit
Reset	NO/YES	NO

4.101 Manual Override

Description

Here you can manually force the functions (this overrides all other settings).

Setting

Parameter name	Display range	Unit
Fan speed	Speed 0, 1, 2, 3	
Heating	ON/OFF	OFF
Preheating	ON/OFF	OFF
Heat recovery system	ON/OFF	OFF
Cooling (not CS 50)	ON/OFF	OFF
Alarm output	ON/OFF	OFF
Factory test	ON/OFF	OFF

4.102 Sensor Temperature Display

Description

The current temperature on the sensors is displayed here. Those that are not connected will display 55 °C.

Setting

Parameter name	Display range	Unit
Thermoguard	-50...150,0	°C
Supply air	-50...150,0	°C
Extract air (not CS 50)	-50...150,0	°C
Outdoor air (not CS 50)	-50...150,0	°C
Return water	-50...150,0	°C

5 Description of I/O

5.1 J1 (Pin 1) PE

Description Earthing of the printed circuit board.

5.2 J1 (Pin 2, 3) Power Supply to the Board

Description Power supply to the board, 230 V 50 Hz.

5.3 J1 (Pin 4, 5) Pump, Water Battery, or Stage 2, Electric Battery

Description Relay output 230 V 11 A.
With a water battery: used to start/stop the water pump. Closes when heating is required.
With an electric battery: Used to control element group 2 (stage 2).
(Stage 2 comes on at 5 V)

5.4 J1 (Pin 6, 7) Not in Use

Description Vacant function.

5.5 J1 (Pin 8, 9, 10) Outdoor Air Damper

Description Relay output 230 V 2 A.
Pin 8 = L (230 V) OFF/ON
Pin 10 = N (230 V)

Pin 8 is powered when the unit starts up.

5.6 J1 (Pin 11, 12) Supply Air Fan Operating Voltage

Description Output for the supply air fan operating voltage with transformer control.

5.7 J1 (Pin 14, 15) Extract Air Fan Operating Voltage

Description Output for the extract air fan operating voltage with transformer control.

5.8 J1 (Pin 13 - 16)

Description Vacant function.

5.9 J2 (Pin 1, 2) 230 V Supply

Description   230 V AC supply.

5.10 J2 (Pin 3) Input from Transformer Speed 1, Supply Air

Description   Input from transformer for speed 1, supply air. This voltage can be changed by changing the voltage on the transformer.

5.11 J2 (Pin 4) Input from Transformer Speed 2, Supply Air

Description   Input from transformer for speed 2, supply air. This voltage can be changed by changing the voltage on the transformer.

5.12 J2 (Pin 5) Input from Transformer Speed 3, Supply Air

Description   Input from transformer for speed 3, supply air. This voltage can be changed by changing the voltage on the transformer.

5.13 J2 (Pin 6) Input from Transformer Speed 1, Extract Air

Description   Input from transformer for speed 1, extract air. This voltage can be changed by changing the voltage on the transformer.

5.14 J2 (Pin 7) Input from Transformer Speed 2, Extract Air

Description   Input from transformer for speed 2, extract air. This voltage can be changed by changing the voltage on the transformer.

5.15 J2 (Pin 8) Input from Transformer Speed 3, Extract Air

Description   Input from transformer for speed 3, extract air. This voltage can be changed by changing the voltage on the transformer.

Common description of speed control with transformer control
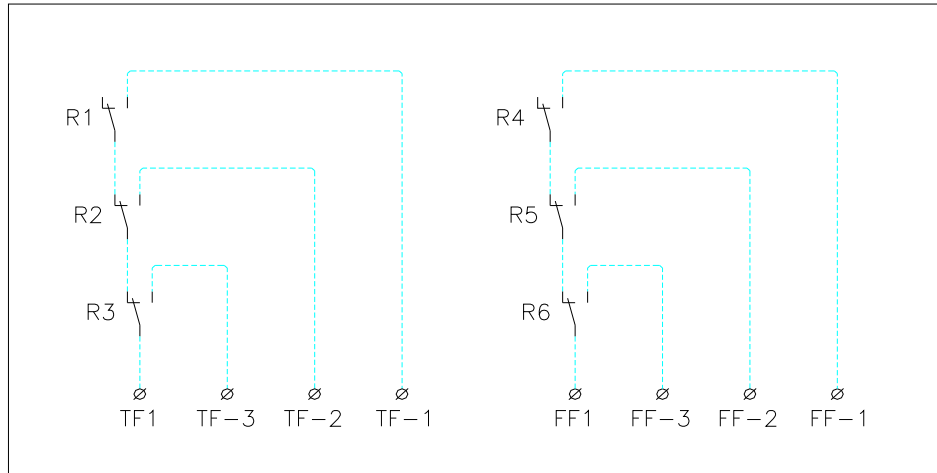
TF1 = voltage out to the supply air motor, speed 1, 2 or 3 (J1 Pin 11)
TF-1 = Supply air speed 1 from transformer (J2 Pin 3)
TF-2 = Supply air speed 2 from transformer (J2 Pin 4)
TF-3 = Supply air speed 3 from transformer (J2 Pin 5)
R1 = Relay for supply air speed 1
R2 = Relay for supply air speed 2
R3 = Relay for supply air speed 3

FF1 = voltage out to the extract air motor, speed 1, 2 or 3 (J1 Pin 14)
TF-1 = Extract air speed 1 from transformer (J2 Pin 6)
TF-2 = Extract air speed 2 from transformer (J2 Pin 7)
TF-3 = Extract air speed 3 from transformer (J2 Pin 8)
R1 = Relay for extract air speed 1
R2 = Relay for extract air speed 2
R3 = Relay for extract air speed 3

This is the L phase (applies to both supply air and extract air). The fans' N phase comes from the printed circuit board.
N phase, supply air, J1 Pin 12.
N phase, extract air, J1 Pin 15.

The supply air fan can be set to 4 different speeds:
Speed 0   R1 – OFF : R2 – OFF : R3 – OFF
Speed 1   R1 – ON : R2 – OFF : R3 – OFF
Speed   R1 – OFF : R2 – ON : R3 – OFF
Speed   R1 – OFF : R2 – OFF : R3 – ON

The extract air fan can be set to 4 different speeds:
Speed 0   R4 – OFF : R5 – OFF : R6 – OFF
Speed 1   R4 – ON : R5 – OFF : R6 – OFF
Speed 2   R4 – OFF : R5 – ON : R6 – OFF
Speed 3   R4 – OFF : R5 – OFF : R6 – ON

5.16 J3 (Pin 1, 4) Alarm Output Priority A
(not CS 50)

Description

Output for common fault alarm A. The output is activated if there is still an A alarm that has not been processed (230 V 1 A).

5.17 J3 (Pin 2, 4) Alarm Output Priority B
(not CS 50)

Description

Output for common fault alarm B. The output is activated if there is still a B alarm that has not been processed (230 V 1 A).

General description of the alarm function

The alarm outputs for the two parameters `A_Alarm` and `B_Alarm` are used to monitor the entire system. Isolated system faults are collected in the common fault and displayed as one alarm with priority A or B. The common fault message indicates that there is a fault in the system but does not say what the fault is. If an alarm is triggered, the LED flashes beside the alarm key on the control panel.

* Fire/smoke alarm priority depends on the choice of action in connection with fire. If there is no action, the priority = B. In the event of stop or full extract air, the priority = A.

Difference

The differences between the two alarm types are as follows:

Priority A	Priority B
• The system stops • Must be confirmed manually before the system is switched on again	• As soon as the fault has been remedied, the deactivated system element begins operation again. The fault is no longer indicated under the alarm menu even if the LCD continues to flash. The alarm must now be confirmed manually.
• Displayed under `A_Alarm`	• Displayed under `B_Alarm`
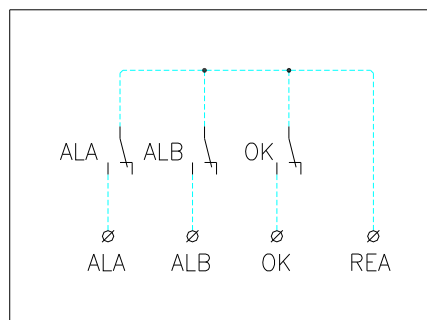
ALA = Alarm A, Pin 1 Pot. fri relè 1A . 230V (stengt = alarm)
ALB = Alarm B, Pin 2 Pot. fri relè 1A . 230V (stengt = alarm)
OK = OK, Pin 3 Pot. fri relè 1A 230V . (open = alarm)
REA = Felles, Pin 4

5.18 J3 (Pin 5) Not in Use (not CS 50)

Description

Vacant function.

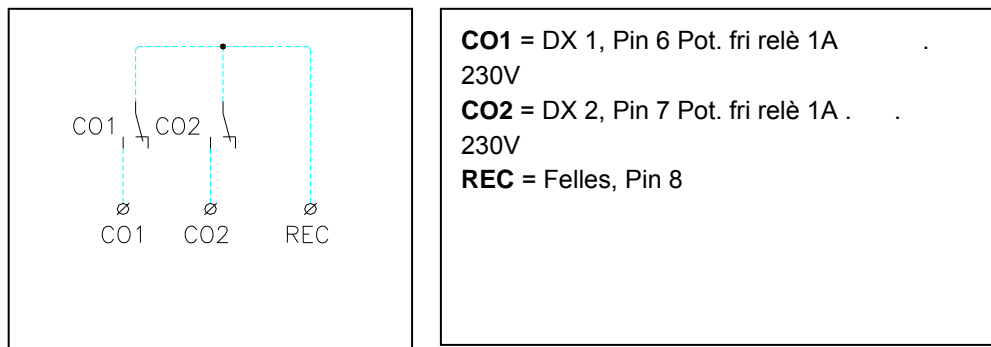## 5.19 J3 (Pin 6, 8) DX Stage 1 (not CS 50)

Description

Relay output 230 V 1 A.
Control of cooling machine stage 1.

5.20 J3 (Pin 7, 8) DX Stage 2 (not CS 50)

Description

Relay output 230 V 1 A.
Control of cooling machine stage 2.

CO1 = DX 1, Pin 6 Pot. fri relè 1A .
230V
CO2 = DX 2, Pin 7 Pot. fri relè 1A . .
230V
REC = Felles, Pin 8

5.21 J4 (Pin 1, G0) External Control, Speed 1 (not CS 50)

Description

Connection of an external switch for speed 1 (potential-free contact).

5.22 J4 (Pin 2, G0) External Control, Speed 2 (not CS 50)

Description

Connection of an external switch for speed 2 (potential-free contact).

5.23 J4 (Pin 3, G0) External Fire/Smoke Alarm (not CS 50)

Description

Connection of an external fire or smoke guard.
Using the handheld terminal, you can select from the following functions:
>   Mode 1: The unit stops
>   Mode 2: The unit switches to speed 3
>   Mode 3: The supply air fan stops and the extract air fan will operate at speed 3

5.24 J4 (Pin 4, G0) Heating OFF/ON with an External Signal (not CS 50)

Description

Input for switching off heating (potential-free contact). If the contact is closed, the heating battery will not be able to operate (risk of frost in the water battery will override this function).

5.25 J4 (Pin 5, 6) Temperature Setting (not CS 50)

Description

Input for adjusting the temperature setpoint value (0-10 V requirement for resistance of 10 kOhm). Can adjust the temperature between 10 and 30 °C.

5.26 J4 (Pin 7, G0) Temperature Readout, Supply Air (not CS 50)

Description

Output for reading the supply air temperature, 0-10 V. The temperature range is - 50 °C to + 50 °C.

5.27 J4 (Pin 8, G0) Temperature Readout, Extract Air (not CS 50)

Description

Output for reading the extract air temperature, 0-10 V. The temperature range is - 50 °C to + 50 °C.

5.28 J4 (Pin 9, G0) Temperature Readout, Outdoor Air (not CS 50)

Description

Output for reading the outdoor air temperature, 0-10 V. The temperature range is - 50 °C to + 50 °C.

5.29 J4 (Pin 10, 11) Extract Air Temperature Sensor (not CS 50)

Description

Connection of the extract air temperature sensor. This must be of type NTC (Philips 23226406.103).

5.30 J4 (Pin 12, 13) Outdoor Air Temperature Sensor (not CS 50)

Description

Connection of the outdoor air temperature sensor. This must be of type NTC (Philips 23226406.103).

5.31 J4 (Pin 14, G0) External Pressure Sensor, Supply Air (not CS 50)

Description

Connection of an external pressure sensor (0-10 V) to control the supply air fan.

5.32 J4 (Pin 16, G0) External Pressure Sensor, Extract Air (not CS 50)

Description

Connection of an external pressure sensor (0-10 V) to control the extract air fan.

5.33 J5 (Pin 1, 2) Supply Air Temperature Sensor

Description

Connection of the supply air temperature sensor. This must be of type NTC (Philips 23226406.103).

5.34 J5 (Pin 3, 4) Temperature Sensor, Water Battery

Description

Connection of the temperature sensor. This must be of type NTC (Philips 23226406.103). It is connected to the water battery to monitor the temperature in the battery.

General description of the function

- If there is a risk of frost in the water battery, sensors in the return water ensure that the valve is opened. This function is activated when the temperature in the water battery falls below 10 °C. This value is activated when the unit is in operation.
- If the temperature falls below the frost alarm value of 5 °C, an A alarm is activated and the unit stops.
- When the unit is not in operation, the temperature in the water battery is kept at 25 °C (standby operation). Heat preservation function.
- The relay that controls the water pump will be activated for at least 30 seconds every day for cleaning. Starts at 24.00.

5.35 J5 (Pin 5, 8) Electric Battery Thermostat

Description

Connection of a thermostat to measure the temperature in the electric battery. It is triggered if the temperature reaches 80 °C. This must be manually reset using the pushbutton on the electric battery (RESET).

5.36 J5 (Pin 6, 7) Not in Use

Description

Vacant function.

5.37 J5 (Pin 9, 10) Control Signal for Heating 0-10 V

Description

0-10 V output. 10 V for maximum heating requirement. Used to control the valve motor in connection with the water battery.

5.38 J5 (Pin 11, 12) Control Signal to Recovery System

Description

0-10 V output. 10 V for maximum heating requirement.
Units that have a rotor: used to control the speed of the rotor. The heat required is controlled by a 0-10 V signal that controls the speed of the rotor. A rotation relay indicates whether rotation is in progress. In the event of a stoppage, it also triggers an alarm. In addition, there is an integrated operating test. This starts once a day and runs for 1 minute in connection with each start.
Units that have a plate exchanger: used to control the bypass exchanger air damper.

5.39 J5 (Pin 13, 14) Rotor Alarm

Description

Connection of the rotor alarm (potential-free contact). Produces a B alarm.

5.40 J5 (Pin 15, G0) External Start/Stop

Description   Used to start/stop the unit from an external switch (potential-free contact).

5.41 J5 (Pin 16, G0) Forced Ventilation

Description   Connection of an external switch for forced ventilation (potential-free contact).
The unit will operate at speed 3.

5.42 J6 (Pin 1, 3) Supply Air Fan Control Signal (0-10 V)

Description   Connection of a 0-10 V signal to control the speed of the supply air fan.

5.43 J6 (Pin 2, G0) Start/Stop Supply Air Fan (0-10 V)

Description   Connection of a start/stop signal for the supply air fan (potential-free contact). This is just for internal control.

5.44 J6 (Pin 4, 5) Supply Air Fan and Extract Air Fan Motor Protection

Description   Connection of motor protection for the supply air fan and extract air fan (potential-free contact).

5.45 J6 (Pin 7, 9) Extract Air Fan Control Signal (0-10 V)

Description   Connection of a 0-10 V signal to control the speed of the extract air fan.

5.46 J6 (Pin 8, G0) Start/Stop Extract Air Fan (0-10 V)

Description   Connection of a start/stop signal for the extract air fan (potential-free contact). This is just for internal control.

5.47 J6 (Pin 10, G0) Supply Air Pressure Guard
(not CS 50)

Description   Connection of the supply air pressure guard (potential-free contact).

5.48 J6 (Pin 12, G0) Extract Air Pressure Guard
(not CS 50)

Description   Connection of the extract air pressure guard (potential-free contact).

5.49 J6 (Pin 13, 14) PWM Heating Control OFF/ON
(not CS 50)

Description

Connection of a control signal for the heating battery OFF/ON signal (0/24 V DC). PWM (Pulse With Modulation). This is used to control SSR with an electric heating battery.

5.50 J6 (Pin 15, 16) Cooling 0-10 V (not CS 50)

Connection of a control signal for the cooling battery (0-10 V).

5.51 ISDN Contact for Plate Exchanger

Description

Heat Recovery System – Plate Exchanger
The heat required is controlled by a 0-10 V signal that controls the bypass air damper in modulating fashion.
The bypass air damper is closed at 10 V and ensures full recovery.
De-icing the heat exchanger cassette:
This is done using the patented *Thermoguard* system.
Description of the Thermoguard system:
The Thermoguard consists of two components, a temperature sensor and a humidity sensor.
The temperature sensor T consists of a passive Ni1000 element and thus produces different resistance values at different temperatures.
The humidity sensor H also produces different resistance values at different humidity levels.
Frost is avoided using the following combinations:
- Temperature, T, < +1 °C and humidity, H, (< 800 kΩ)
- Temperature, T, < -3 °C and dry, H, (< 1200 kΩ)

De-icing stops when the temperature in the cassette increases by +2 (adjustable) $^{\circ}$C from the frost position (+5 or -3).
Cables: 4 (2 from the Ni1000 and 2 from the humidity sensor).
The Thermoguard sensor is located in the cold corner of the heat exchanger cassette.
During de-icing, the control signal to the heat recovery unit will be on 0 V (full bypass).
The fan speed must be the same throughout the de-icing period unless you have selected fan reduction at too low supply air temperature.