Fan Coil Unit Controller

Fan Coil 49550

Application program:

description and examples

Woertz AG
Electrotechnical accessories, installation systems
Hofackerstrasse 47, P.O. Box 948, CH-4132 Muttenz 1
Phone ++41 61/ 466 33 33, Fax ++41 61/ 466 33 31
Internet: www.woertz.ch, Email: elektronik@woertz.ch

Version 05.2007

Fan Coil Unit Controller 49550 **Application program description**

Mai 2007

Use of the application program

Product family	Heating, cooling and air conditioning
Product type	Controller
Manufacturer	Woertz AG
Name	Fan Coil Unit Controller
Order No.	49550

I. Table of contents

II. Functional description

1. Brief description

The fan coil unit controller 49550 is used to control fan coil units (heating and cooling terminal units).
The mode of control is based on a time-discrete PI controller with setpoint/actual value comparison. The valves and the fan can be regulated directly by devices via the closed loop of this controller.

Both raise/lower valve drives and thermal valve drives can be connected to the device outputs. The power supply (24 V AC) of the drives is supplied directly by the device.
Three isolated contact outputs are provided on the device for the fan which has a maximum of three speeds.

The device also has inputs for the connection of a temperature sensor which records the actual temperature in the room and for the connection of a potentiometer which adjusts the setpoint temperature.

Two further binary inputs are provided for the window contact and the drip tray monitoring contact.

The contacts are debounced in the software, whereby the debounce time of the input for the drip tray monitoring contact can be set in a wide range.
All the devices or connections mentioned above are „local“.

The fan coil unit controller has a 230 V mains connection and can function fully independently with locally connected devices.

The EIB interface of the FCU controller enables communication with other EIB devices as well as data exchange with a building management system. In this case, sensors or actuators with EIB capability are able to exchange information with the device via EIB *objects*.

The application program enables the control of valves via ON/OFF commands or using positioning commands as percentage values. The correct parameter assignment is dependent on the valve type.

If the device is operated without a fan, the three isolated outputs for the fan can be parameterised as standard EIB binary outputs (3 channels).
The input objects 33, 34 and 35 are used to switch these outputs.
It is also possible to connect only a 1- or 2-speed fan and use the remaining outputs as EIB binary outputs.
The EIS types of the object are defined according to the EIB standard and enable the integration of the device into a visualisation program (building management system).
The base setpoint temperature (parameter) is stored in the non-volatile memory of the device.

To achieve a long service life for the device, a transfer rate for the activation of the heating or cooling mode of 10 times per day is assumed.

The activation status of the heating or cooling mode in so-called 2-pipe operation (i.e. only one valve for heating or cooling) is likewise stored in the non-volatile memory. This is normally only transferred twice a year.

2. Voltage failure

Mains failure 230V:
The valve outputs are de-energised and the relay contacts of the valve outputs are opened.
On voltage recovery, the sequence starts in accordance with the selected parameter settings.
If the installation is limited to local connecting devices, the device runs again normally on voltage recovery.

EIB bus voltage failure:
A bus voltage failure is only relevant if EIB devices are connected.
Direct monitoring of the bus voltage is not provided in the hardware of the device.

If the actual temperature is not refreshed for example, an error status can be generated and the device switches to absolute frost protection mode (see *Control value (heating) when actual temperature is absent or in event of frost alarm* under the parameter window *Temperature monitoring*).
On voltage recovery, the routine selected in the parameterisation is activated (see *Controller status at power on* in the parameter window *Setpoints 2*).
Care must also be taken when configuring the relevant EIB devices to guarantee the proper functionality on voltage recovery.

3. Local operation for testing purposes

The test sequence is carried out as soon as the device is connected to 230 V.

The EIB voltage is not necessary for these tests i.e. the test mode can also be implemented without the EIB connection.
A push button and an LED are attached to the front of the FCU controller.

After a push button action, various test sequences are recalled in a ring count system. Specific flashing sequences for the LED are used as a status display for the selected step in the test procedure.
Refer to the installation and operating instructions.

4. Commissioning functions

The device is supplied without any downloaded program. The functionality (independent function etc.) is guaranteed with local, default components as soon as the application program has been linked to the device (by means of ETS). Following configuration is supported:

Separate heating and cooling valve, fan with 3 speeds, temperature sensor (order no. 49570), active window contact (contact closed: window open), without drip tray monitoring.
After connecting the mains voltage, there is an interval of approx. 1-2 minutes before the controller is activated and the *locally connected actuators* can be triggered accordingly.

The *EIB system* is not taken into consideration as no external *EIB* devices (actuators or sensors) are activated or queried in the default parameter settings.
If the component set deviates from the default assignment, the device (without any components fitted) is connected to both the mains voltage and the *EIB* interface and the **pa-**

rameterised application program that has been configured using ETS should then be downloaded.

When assigning parameters to *EIB* components, the correct *EIS type correlation* must be observed.

The parameterisation of the physical address of the FCU controller is carried out using ETS in accordance with the *EIB* standard.

III. Communication objects and parameters

1. Communication objects

The following objects appeard in ETS depending on the selection in the parameter lists:

no.	Function	Object name	Type
0	Actual temperature	Input/output for actual temperature	2 Byte
1	Actual temperature	Actual temperature error signal	1 Bit
2	External temperature	External temperature	2 Byte
3	External temperature	External temperature error signal	1 Bit
4	Setpoint	Base setpoint temperature	2 Byte
5	Setpoint	Setpoint adjustment	2 Byte
6	Setpoint	Instantaneous setpoint	2 Byte
7	2-pipe operation	Activation of heating mode	1 Bit
8	2-pipe operation	Activation of cooling mode	1 Bit
9	Mode selection	ON command for comfort, comfort extension	1 Bit
10	Mode selection	ON command for standby mode	1 Bit
11	Mode selection	ON command for night setback	1 Bit
12	Mode selection	ON command for frost protection	1 Bit
13	Window contact	Input for window contact	1 Bit
14	Mode selection	Presence detector	1 Bit
15	Fan	Manual operation of fan	1 Byte
16	Fan	Toggling to automatic mode	1 Bit
17	Fan	Fan status (manual, automatic)	1 Bit
18	Fan	on / off	1 Bit
19	Fan	Speed 0-100%	1 Byte
21	Heating valve	Output for heating valve	1 Byte
22	Cooling valve	Output for cooling valve	1 Byte
23	Controller	Control value for PI controller	2 Byte
24	Dew point detector	Dew point signal	1 Bit
25	Temperature monitoring	Frost alarm error signal	1 Bit
26	Temperature monitoring	Temperature error signal (limit violation)	1 Bit
27	Drip tray overflow	Drip tray overflow signal	1 Bit
28	Error information	Group alarm signal	1 Bit
29	Error signal	Error information	1 Byte
30	Status	Status of fan coil controller	2 Byte
31	Status	Status of comfort mode	1 Bit
32	Input	Window Contact	1 Bit
33	Switch output	Switch output 1	1 Bit
34	Switch output	Switch output 2	1 Bit
35	Switch output	Switch output 3	1 Bit

Comments:

- All the objects made available in ETS are shown without group addresses in the diagram
- Specific objects can be hidden however depending on the concrete parameter assignments.

2. Description of the objects

Object	Function	Object name	Type	Flags
0	**Actual temperature**	Input/output for actual temperature	2 Byte	CRWTU
This object can be used as an input for a space temperature supplied by an EIB sensor. If however a local sensor is connected, the object is used as an output for the space temperature that has been measured by the sensor. The adjustable correction value is also taken into consideration. Cyclical sending can also be set in the parameters. Type: EIS 5001.				
1	**Actual temperature**	Actual temperature error signal	1 Bit	CRT
An error signal can be sent to the EIB with this object if the space temperature has not been refreshed within a set period. The output of the error signal can occur once or cyclically. Type: EIS 1.				
2	**External temperature**	**External temperature**	2 Byte	CWU
This object can be used as an input for an external temperature that is supplied by an EIB sensor. Type: EIS 5001.				
3	**External temperature**	External temperature error signal	1 Bit	CTR
An error signal can be sent to the EIB with this object if the external temperature has not been refreshed within a set period. The output of the error signal can occur once or cyclically. Type: EIS 1.				
4	**Setpoint**	Base setpoint temp.	2 Byte	CRWU
The base setpoint value can be modified via this input. It is stored in non-volatile memory. Type: EIS 5001.				
5	**Setpoint**	Setpoint adjustment	2 Byte	CRWU
When setpoint shift is selected via the EIB, the required shift can be carried out via this object. Type: EIS 5001.				
6	**Setpoint**	Instantaneous setpoint	2 Byte	CR
The setpoint that is currently used by the EIB (instantaneous setpoint) can be read out on request via this object. Type: EIS 5001.				
7	**2-pipe operation**	Activation of heating mode	1 Bit	CRWU
Input object for switching to heating mode in the case of a 2-pipe version with a common valve or selectable ON/OFF-Switching of heating-mode (4-pipe system). **1 common valve (heating or cooling)** has been selected under “General” during the parameterisation (for valve with EIB control). Stored in non-volatile memory. Type: EIS 1.				
8	**2-pipe operation**	Activation of cooling mode	1 Bit	CRWU
Input object for switching to cooling mode in the case of a 2-pipe version with a common valve or selectable ON/OFF-Switching of cooling-mode (4-pipe system). **1 common valve (heating or cooling)** has been selected under “General” during the parameterisation (for valve with EIB control). Stored in non-volatile memory. Type: EIS 1				
9	**Mode selection**	ON command for comfort, comfort extension	1 Bit	CWU
Input object for switching to comfort mode. If the operating mode has been switched to night setback from comfort mode, it is possible to retrieve comfort mode and prolongate it via this object. A further command during comfort mode resets the time period and thereby prolongates the comfort mode (retriggering). The prolongation can be parameterised. Type: EIS 1				

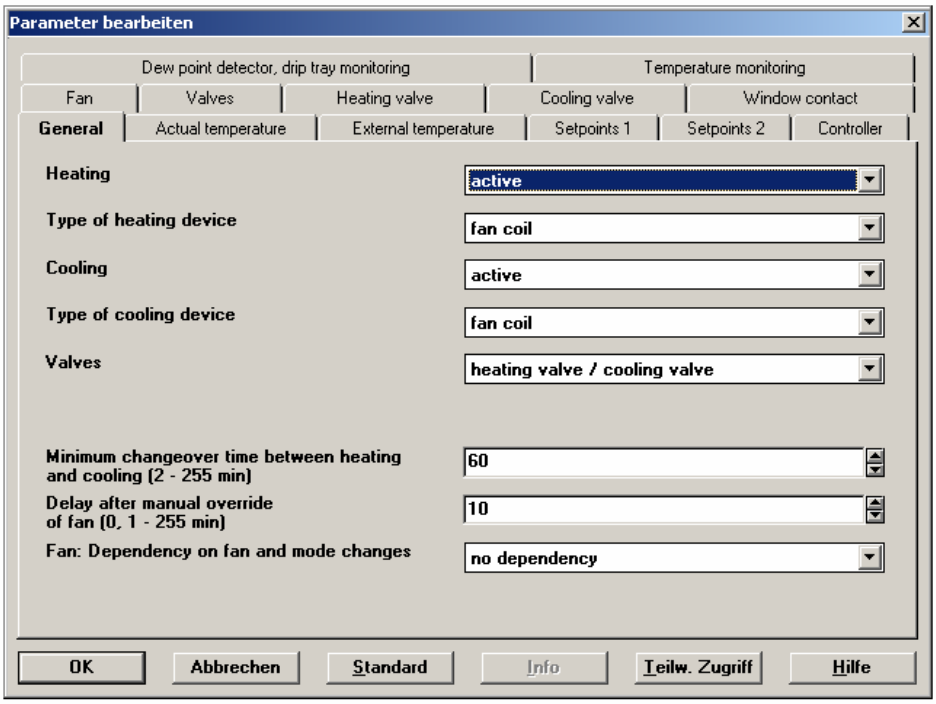
10	**Mode selection**	ON command for standby mode	1 Bit	CWU
Input object for switching to standby mode. Type: EIS 1.				
11	**Mode selection**	ON command for night setback	1 Bit	CWU
Input object for switching to night setback. Type: EIS 1.				
12	**Mode selection**	ON command for frost protection	1 Bit	CWU
Input object for switching to frost protection mode. Type: EIS 1				
13	**Window contact**	Input for window contact	1 Bit	CWU
Input object for evaluating the switching state of an EIB window contact. The controller is influenced accordingly. Type: EIS 1				
14	**Mode selection**	Presence detector	1 Bit	CWU
An ON or OFF command for “Presence” is received here. This command comes from an EIB control unit and signals that someone has entered the room. Type: EIS 1.				
15	**Fan**	Manual operation of fan	1 Byte	CWU
Input object for manual control of the fan. The fan can be set to a specified speed (manual operation) by an EIB control unit by preselecting a percentage value. Type: EIS 6				
16	**Fan**	Toggling to automatic mode	1 Bit	CWU
Input object for toggling the fan to automatic mode. The fan can be switched from manual to automatic mode by an EIB control unit. The fan speeds are automatically defined by the controller. Exception: In the operating mode of this object, it is not possible to go over to automatic mode with the command “switching to comfort mode in case of manual ventilation” (function is locked). Type: EIS 1.				
17	**Fan**	Fan status (manual, automatic)	1 Bit	CRT
This output object reflects the status of the fan, as to whether it is in manual or automatic mode. 0: Manual 1: Automatic Type: EIS 1.				
18	**Fan**	Speed 1	1 Bit /1 Byte	CT
Output object for EIB fan. If no fan is selected, this object is not visible in ETS. The type of the object is preset depending on the type of fan: -for fan types *EIB: on / off* and *EIB: 3 speeds* from the parameter list, the object type is EIS 1 and the fan speed is 1.				
19	**Fan**	Speed 2, status of fan	1 Bit	CT
Output object for fan speed, type of object EIS6; 33% speed 1active, 66% speed 2 active, 100% speed 3 active Output object for fan speed 2, only visible in ETS when the fan type *EIB: 3 speeds* is selected from the parameter list. Type: EIS 1. -for fan type *EIB: 0...100%*, the object type is EIS 6. The fan speeds are coded here as percentage values.				
20	**Fan**	Speed 3	1 Bit	CT
Output object for fan speed 3. Only visible in ETS when the fan type *EIB: 3 speeds* is selected from the parameter list. Type: EIS 1.				

21	**Heating valve**	Output for heating valve	1 Byte	CT
Output object for a heating valve that is controlled by the EIB. When a local valve is selected, this object is not visible in ETS. It is possible to send cyclically and in the event of changes. The object type is defined depending on the heating valve selected: Valve: *EIB valve, continuous*: object type EIS 6. Valve: *EIB valve, pulse width modulation*: object type EIS 1.				
22	**Cooling valve**	Output for cooling valve	1 Byte	CT
Output object for a cooling valve that is controlled by the EIB. When a local valve is selected, this object is not visible in ETS. It is possible to send cyclically and in the event of changes. The object type is defined depending on the cooling valve selected: Valve: *EIB valve, continuous*: object type EIS 6. Valve: *EIB valve, pulse width modulation*: object type EIS 1.				
23	**Controller**	Control value for PI controller	2 Byte	CWTU
Output object for the control value of the controller. Cyclical sending. The object only appears in ETS if ***on*** has been selected in the parameter *Controller: Sending of the control value.*				
24	**Dew point detector**	Dew point signal	1 Bit	CWU
This object can receive a dew point alarm from the EIB. Cooling mode is deactivated on receipt of this signal. As soon as the signal is no longer present, the controller restarts from zero once a set delay period has elapsed. Type: EIS 1.				
25	**Temperature monitoring**	Frost alarm error signal	1 Bit	CRT
Output object for the frost alarm. Can also send cyclically. Type: EIS 1.				
26	**Temperature monitoring**	Temperature error signal (limit violation)	1 Bit	CRT
An alarm is issued if the differential between the setpoint and actual values exceeds a specified value over a set period. This can happen for example if no hot water is available in heating mode. Can also send cyclically. Type: EIS 1.				
27	**Drip tray overflow**	Drip tray overflow signal	1 Bit	CRT
Output object for monitoring the drip tray level, signalled by a locally connected contact. Object only appears in ETS if a contact has been selected for drip tray monitoring in the parameter settings. Can be sent once or cyclically. Type: EIS 1. In case of parameterisation, “input normal” (inverted), the status of the connected contact will be transmitted (binary input)				
28	**Error information**	Group alarm signal	1 Bit	CRT
Output object for a group error signal. Type: EIS 1.				
29	**Error signal**	Error information	1 Byte	CR
Read object for visualisation or other central recording functions only. The error status of the device is stored in this object in individual bits: Bit 0 = 1: Space temperature error Bit 1 = 1: External temperature error Bit 2 = 1: Frost alarm Bit 3 = 1: Temperature monitoring Type: Non-EIB.				
30	**Status**	Status of fan coil unit controller	2 Byte	CR
Read object for reading out the device status for central recording functions. Bit 0 = 1: Heating active Bit 1 = 1: Cooling active Bit 2 = 1: Window open Bit 3 = 1: Cooling deactivated Type: Non-EIB.				

31	**Status**	Status of comfort mode	1 Bit	CRT
Output object for issuing the status of comfort. Type: EIS 1.				
32	**Input**	Window contact		
Output object for monitoring windows, notified by a locally connected contact. Object type EIS1 In case of parameterisation, “input normal” (inverted), the status of the connected contact will be transmitted (binary input).				
33	**Switch output**	Switch output 1	1 Bit	CWU
Input object for switch output (“Fan 1”). Objects 33, 34 and 35 are provided if fan outputs should be used as universal binary outputs for the EIB. If the device is operated without a fan, the three isolated fan outputs can be parameterised as standard EIB binary outputs (3 channels). It is also possible to connect a 1- or 2-speed fan and to use the remaining outputs as EIB binary outputs. Type: EIS 1				
34	**Switch output**	Switch output 2	1 Bit	CWU
Input object for switch output (“Fan 2”). Type: EIS 1				
35	**Switch output**	Switch output 3	1 Bit	CWU
Input object for switch output (“Fan 3”). Type: EIS 1				

3. Description of the parameters

3.1 General



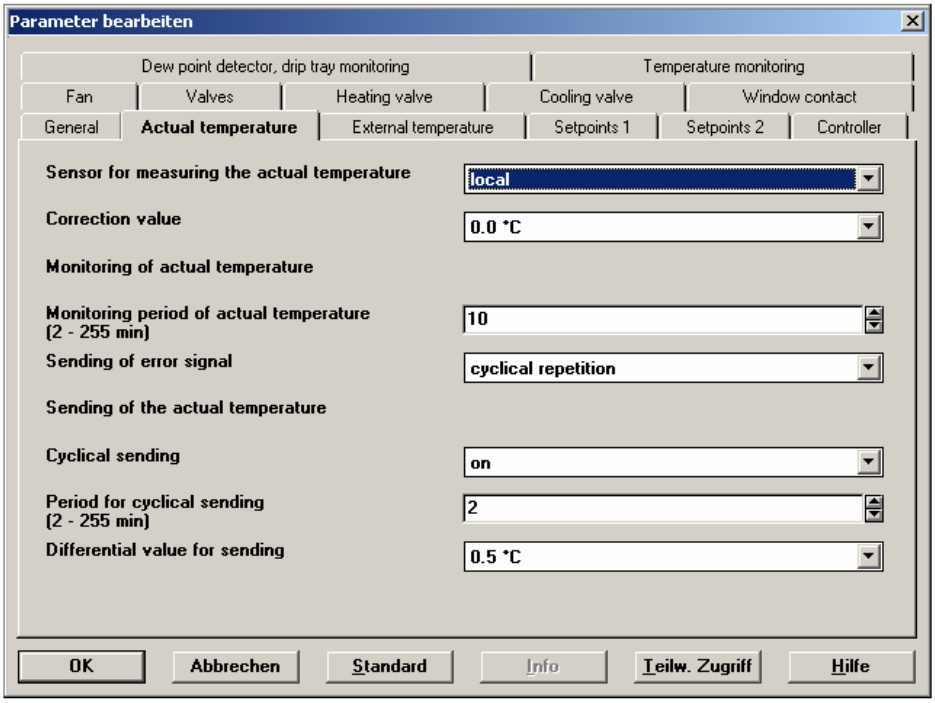
Note:
The settings in bold type correspond to the factory settings (default values)

Parameter	Settings
Heating	**Active** disabled
The heating function can be selected or disabled. If “disabled” is selected, some of the parameter windows outlined below are no longer displayed.	

Type of heating device	**Fan coil unit** Controller
Convector: The device only functions as a control unit for heaters without fans.	
Cooling	**Active** disabled
The cooling function can be selected or disabled. If “disabled” is selected, some of the parameter windows outlined below are no longer displayed.	

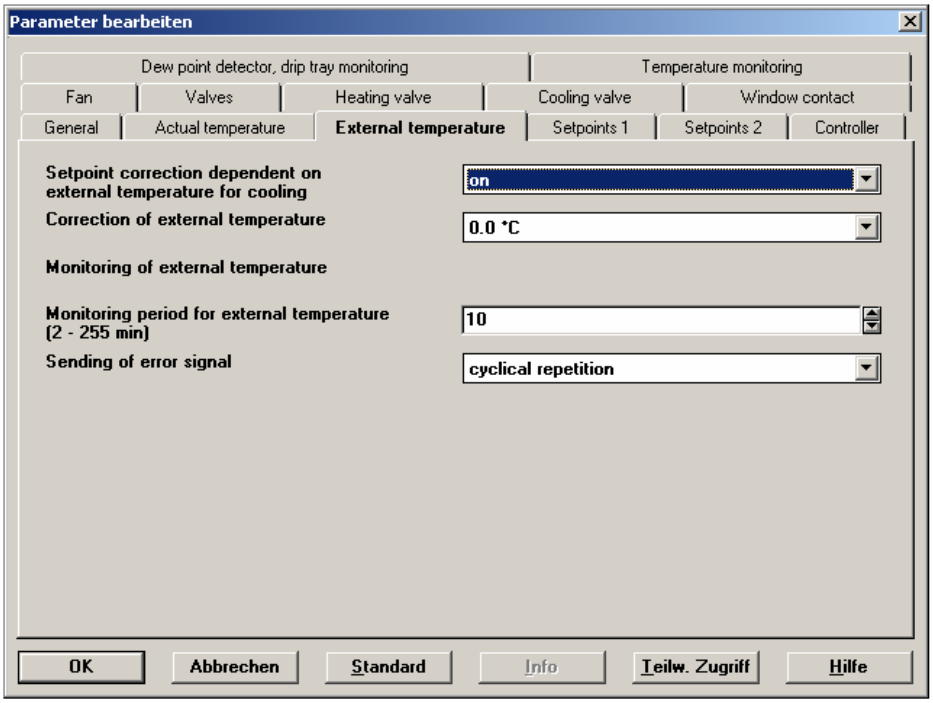
Type of cooling device	**Fan coil unit** Controller
Convector: The device only functions as a control unit for cooling units without fans.	
Valves	**Heating valve/cooling valve** 1 common valve (heating or cooling)
Heating valve / cooling valve: Installation type for 4-pipe version. *1 common valve (heating or cooling):* Installation type for 2-pipe version. Only one valve. Connected to the heating output. Object 7 for activation of the heating mode and object 8 for activation of the cooling mode.	
Minimum changeover time between heating and cooling	Setting range 2 to 255 minutes **60**
This parameter defines the pause in minutes between changing over from heating to cooling mode and vice versa.	
Delay after manual override of fan	Setting range 0 to 255 minutes **10**
If a fan speed has been selected with manual override, this setting retains the selected period in minutes. The fan controller then reverts to automatic mode. If „0“ is selected and with parameterisation „*Fan reverts to automatic mode in case of changeover”,* the fall-back on automatic mode is locked after manual override i.e. the fan remains permanently in the last chosen mode 1, 2, 3 or stop. (the automatic mode becomes active again when changing the operational mode).	
Fan, dependence on ventilator and change of operational mode	**No dependence** Fan reverts to automatic mode in case of transition Fall-back to comfort mode in case of manual ventilator
No dependence; ventilator in automatic mode, automatic fall-back (after pre-set period) on automatic mode in case of manual override. In case of parameterisation „*Fan reverts to automatic mode in case of changeover”,* the automatic mode becomes only active again after manual override when changing the operational mode (i.e. comfort → standby, standby → night setback etc.). *Fan reverts to comfort mode in case of manual ventilator;* direct changeover through object 15 manual ventilator (i.e. Value “0% = frost protection or controller OFF, value “>10%“ = comfort etc.)	

3.2 Actual temperature



Parameter	Settings
Sensor for measuring the actual temperature	**local** via EIB
This parameter gives the option of using a local sensor or an EIB sensor. The local sensor is connected via a 3-core cable to the device. Object 0 is the information input for EIB sensors.	
Correction value	Setting range -3℃ to +3℃ **0,0℃**
This parameter makes it possible to correct the incoming sensor value if required.	
Monitoring period of actual temperature	Setting range 2 to 255 minutes **10**
The software checks whether the sensor value has been refreshed at regular intervals within the set period.	
Sending of error signal	**Cyclical repetition** No repetition
If the space temperature value has not been refreshed, an error signal is sent on the EIB either once or at cyclical intervals, depending on the setting in this parameter. Object 1.	
Cyclical sending	**on** off
The space temperature can be sent cyclically on the EIB, object 0. Only applies to the local sensor. If the EIB sensor is selected, this parameter is not displayed.	
Period for cyclical sending	Setting range 2 to 255 minutes **2**
If the EIB sensor is selected, this parameter is not displayed.	
Differential value for sending	Setting range 0,1℃ to 1,0℃ **0,5**
The space temperature is also sent when there are changes in the value. If the EIB sensor is selected, this parameter is not displayed.	

3.3 External temperature

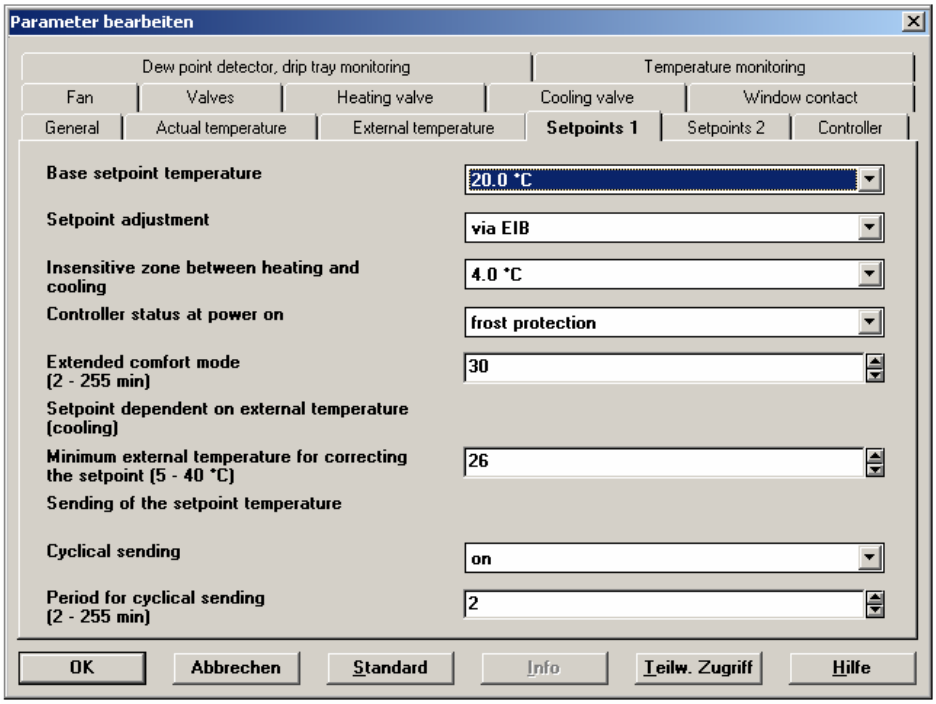


Parameters	Settings
Setpoint correction dependent on external temperature for cooling	**on** off
If “off” is selected, the setpoint value remains constant with the rise in the outside temperature. If “on” is selected, the setpoint value remains constant up to a certain outside temperature (horizontal line). If there is a further rise in the outside temperature, the setpoint increases in proportion and conforms on to a line with a defined gradient (see also the parameter list “Setpoints 1”). This window is not displayed if only heating mode has been activated. The outside temperature always comes from an EIB sensor, Object 2.	
Correction of external temperature	-3,0 to +3,0 **0,0**
Enables a correction of the outside temperature between –3℃ to +3℃.	
Monitoring period for external temperature	Setting range 2 to 255 minutes **10**
The software checks whether the outside temperature value has been refreshed at regular intervals within the set period.	
Sending of error signal	**Cyclical repetition** **No repetition**
If the external temperature value has not been refreshed, an error signal is sent on the EIB either once or at cyclical intervals, depending on the setting in this parameter. Object 3. In the event of an error, the calculation of the setpoint is carried out without dependence on the external temperature.	

3.4 Setpoints

The parameters of the setpoint are divided into 2 selection menus: Setpoints 1 and Setpoints 2.

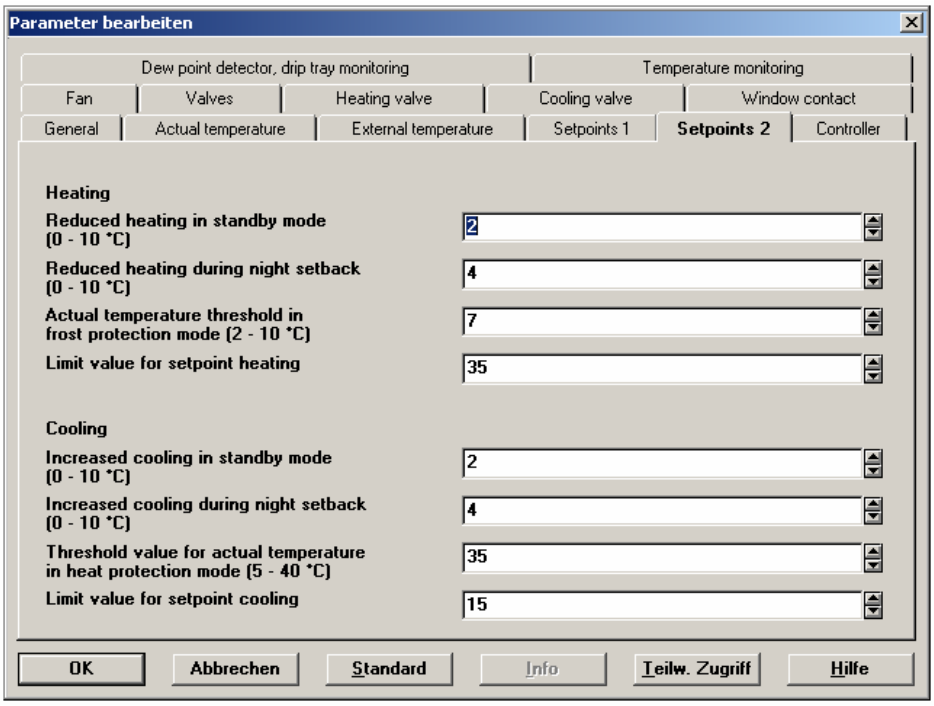
3.4.1 Setpoints 1



Parameters	**Settings**
Base setpoint temperature	Setting range 18℃ to 24℃ **20℃**
The required basic temperature of the control algorithm can thus be selected. This is stored in non-volatile memory. Can be modified via the EIB. Object 4.	
Setpoint shift	**via EIB** local
The setpoint shift can be carried out via the EIB or locally using a potentiometer that is connected to the device. Object 5 applies for EIB.	
Dead band between heating and cooling	Setting range 0,5℃ to 6,0℃ **4,0℃**
The adjustable dead band between the activation of heating or cooling modes enables an optimisation between comfort (accurate temperatures) and energy saving (less frequent switching of the units).	
Controller status at power on	**Frost protection** Standby mode Comfort mode Night setback
When the installation is switched on, the device is set to the required function. During operation, a selection can be made via the EIB. The ON commands are entered via the following objects: Frost protection: 12 Standby mode: 10 Comfort mode 9 (also used for comfort extension) Night setback: 11 Presence detector: 14 (receipt of the ON command for presence)	
Extended comfort mode	Setting range 2 to 255 minutes **30**
When switching from comfort mode to night setback, it is possible to retrieve and prolongate comfort mode via the EIB. The prolongation period can thus be parameterised. A further command during comfort mode resets the period and thereby prolongate comfort mode by the total amount (retriggering). Object 9.	

Minimum external temperature for correcting the setpoint	Setting range 5℃ to 40℃ **25**
In accordance with DIN 1946 part 2 (Jan. 94), the setpoint must increase in proportion with the outside temperature when the temperature value reaches a certain level. This value is specified here. The rate of rise is defined in the following way: an increase in the external temperature of 3℃ raise s the setpoint by 1℃.	
Cyclical sending of setpoint temperature	**on** off
The setpoint temperature can be sent cyclically on the EIB, Object 6.	
Period for cyclical sending	Setting range 2 to 255 minutes **2**

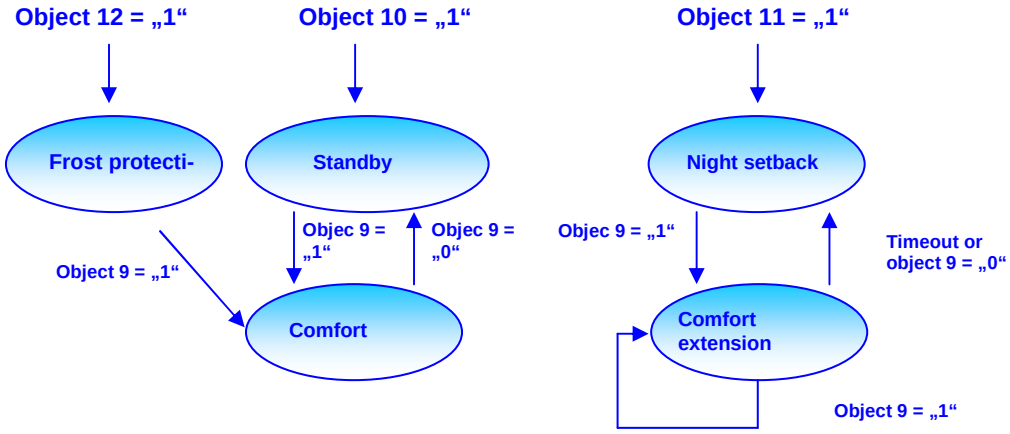
3.4.2 Setpoints 2



Parameters	**Settings**
Reduced heating in standby mode	Setting range 0℃ to 10℃ **2**
The setpoint temperature can be reduced by this value in standby mode.	
Reduced heating during night setback	Setting range 0℃ to 10℃ **4**
The setpoint temperature can be reduced by this value during night setback.	
Actual temperature threshold in frost protection mode	Setting range 2℃ to 10℃ **7**
This parameter defines the minimal space temperature which the heating must maintain in frost protection mode.	

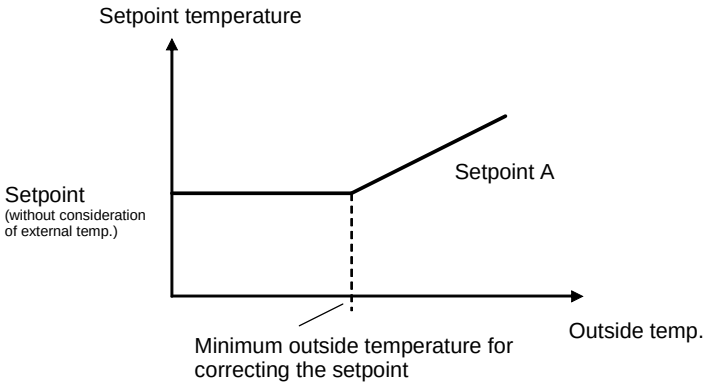
Limit value for setpoint heating	Setting range 5℃ to 60℃ **35**
This parameter specifies the absolute maximal setpoint temperature for heating.	
Increased cooling in standby mode	Setting range 0℃ to 10℃ **2**
The setpoint temperature can be increased by this value in standby mode.	
Increased cooling during night setback	Setting range 0℃ to 10℃ **4**
The setpoint temperature can be increased by this value during night setback.	
Threshold value for actual temperature in heat protection mode	Setting range 5℃ to 40℃ **35**
This parameter defines the threshold for overheating in a cooled room. This maximal temperature must be guaranteed by the cooling unit in heat protection mode.	
Limit value for setpoint cooling	Setting range 5℃ to 60℃ **15**
This parameter specifies the absolute minimal setpoint temperature for cooling.	

Diagram of the change in status on receipt of objects:



Calculation of the setpoints for the various operating modes
Comfort mode: - Heating: **Base setpoint temperature + Setpoint adjustment** - Cooling: **Base setpoint temperature + Setpoint adjustment + Dead band for cooling** + (if required) dependent on the external temperature *) Standby mode: - Heating: **Base setpoint temperature – Reduced heating in standby mode** - Cooling: **Base setpoint temperature + Increased cooling in standby mode** Night setback: - Heating: **Base setpoint temperature – Reduced heating during night setback** - Cooling: **Base setpoint temperature + Increased cooling during night setback** Frost protection: - Heating: **Threshold value for space temperature in frost protection mode** - Cooling: **Threshold value for space temperature in heat protection mode** Note: The terms in bold type are the parameters from the parameter lists “Setpoints 1” and “Setpoints 2”
The setpoint currently in use (i.e. instantaneous) is available in object 6 and can be read out via the EIB.

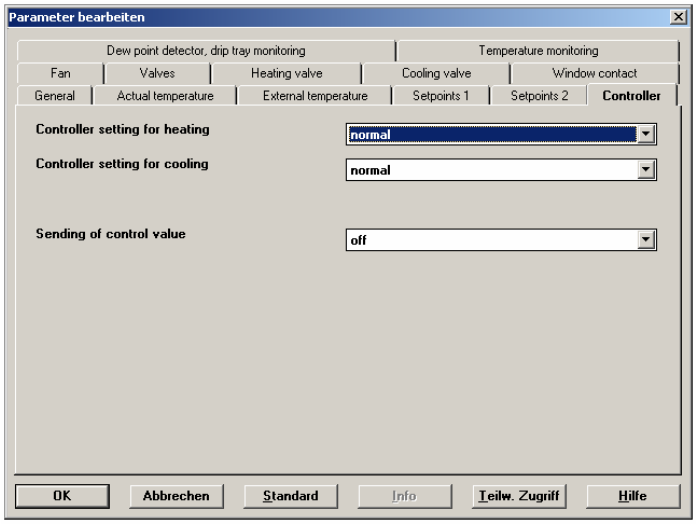
*) Setpoint for cooling is dependent on the external temperature
This dependency is only intended for cooling in comfort mode



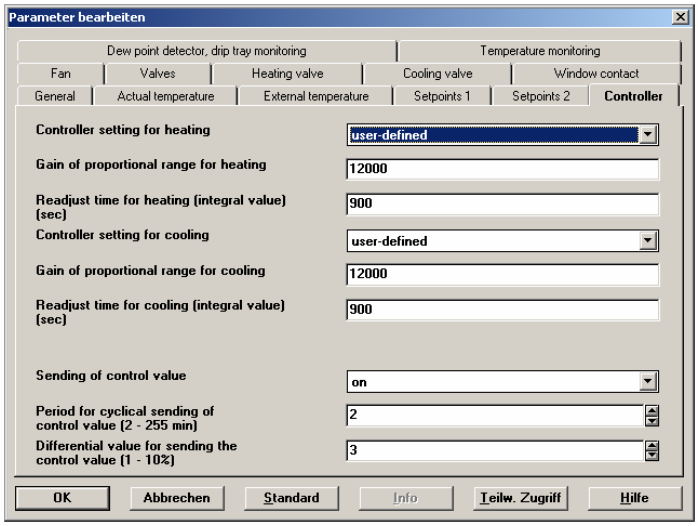
If the outside temperature is higher than the setting for **“Minimum external temperature for correcting the setpoint”** under “*Setpoints 1”*, the setpoint for cooling (Setpoint A) is calculated as follows:

$$\text{Setpoint A} = \text{Setpoint} + \frac{\text{(Outside temperature)} - \text{(Minimum outside temperature for correcting the setpoint)}}{3}$$

(whereby: Setpoint = **Base setpoint temperature + Sepoint adjustment + Dead band for cooling**, see above).



If one of the parameters is set to “user-defined”, “controller setting for heating” or “Controller setting for cooling”, further parameters become visible. Extensive knowledge of control technology in building automation is however necessary to carry out the correct settings.

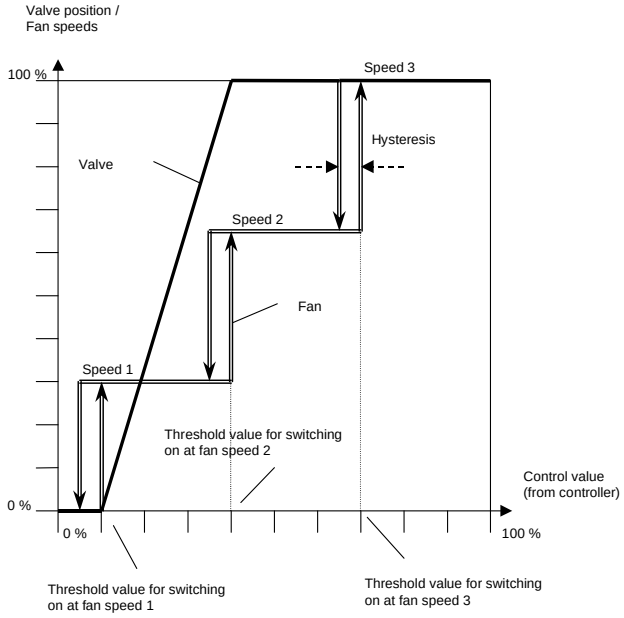


Parameters	**Settings**
Controller setting for heating	**normal** slow fast user defined
The controller type is PI with time-discrete operation. Various time factors can be selected for heating and cooling. The time factor for heating is set here.	
Controller setting for cooling	**normal** slow fast user defined
The time factor for cooling is set here.	
Sending of control value	**off** on
The value of the PI controller output can be sent via the EIB. This is important for an operator panel. Object 23.	
Period for cyclical sending of control value	Setting range 2 to 255 minutes **2**
Only shown if **on** is selected in the parameter *Sending of control value* and indicates the repetition interval for sending.	

Differential value for sending the control value	Setting range 1 to 10% **3**
Sent in addition if the change is higher than the set percentage value.	

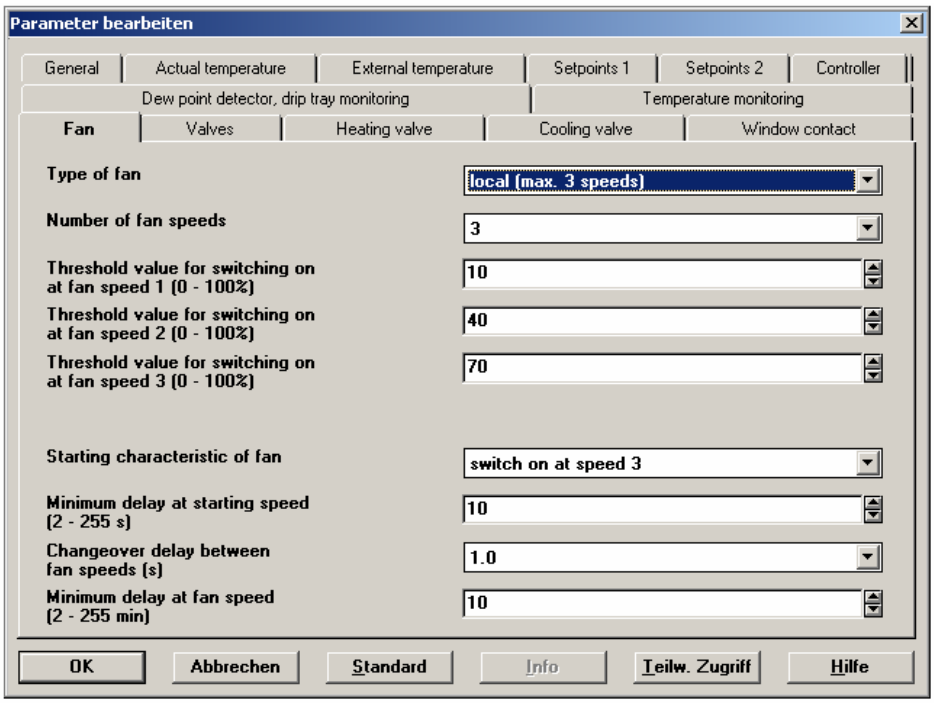
Influence of the control value on the fan and valves
The fan and the valves are influenced by the controller so that a dependency develops between the positions of the valves and the fan speeds. The following object influence the fan: Object 15 Manual operation of the fan Object 16 Toggling to automatic mode The following object reflects the status: Object 17 Output of the fan status i.e. manual or automatic

Diagram to illustrate the dependency between the control value, valve position and fan speed:



The valve opens on activation of fan speed 1 and opens up to a maximum of 100% at the end of speed 1.
The valve is always 100% open at fan speeds 2 and 3.
The diagram indicates the default threshold values of the control value for switching on at the 3 fan speeds (10%, 40%, 70%).

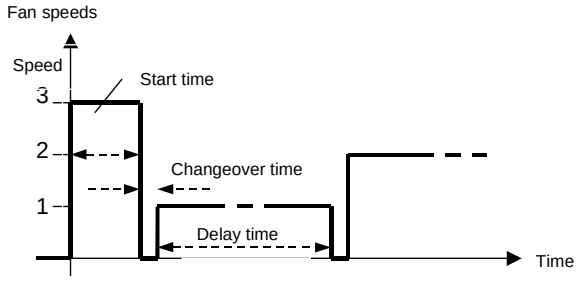
3.5 Fan type: local with max. 3 speeds



Parameters	**Settings**
Type of fan	**Local (max. 3 speeds)** No fan EIB: on / off EIB: 3 speeds EIB: 0....100%
Various types of fans can be selected here: local or EIB-controlled (1-speed, 2-speed or 3-speed). Some of the parameters are no longer displayed, depending on the type selected.	
Number of fan speeds	**3** 1 2
The maaximum number of fan speeds is 3.	
Threshold value for switching on of fan speed 1	Setting range 0 to 100% **10**
Threshold value refers to the control value of the controller which is assigned to fan speed 1 (i.e. 10% on the x-axis in the previous diagram showing dependency). With parameter “0”, the fan speed 1 keeps switched on if we fall below the *threshold value fan speed 2* even with control value (0%).	
Threshold value for switching on of fan speed 2	Setting range 0 to 100% **40**
Threshold value refers to the control value of the controller which is assigned to fan speed 2 (i.e. default of 40% on the x-axis in the previous diagram showing dependency). With parameter “0”, the fan speed 2 keeps switched on if we fall below the *threshold value fan speed 3* even with control value (0%).	
Threshold value for switching on of fan speed 2	Setting range 0 to 100% **70**
Threshold value refers to the control value of the controller which is assigned to fan speed 3 (i.e. default of 70% on the x-axis in the previous diagram showing dependency). With parameter “0”, the fan speed 3 keeps switched on continuously even with control value (0%).	
Starting characteristic of fan	**Switch on at speed 3** Switch on directly Switch on at speed 2
To ensure that the fan motor starts reliably, it is often advisable to switch the fan on first at a higher speed in order to achieve a higher torque for the start.	

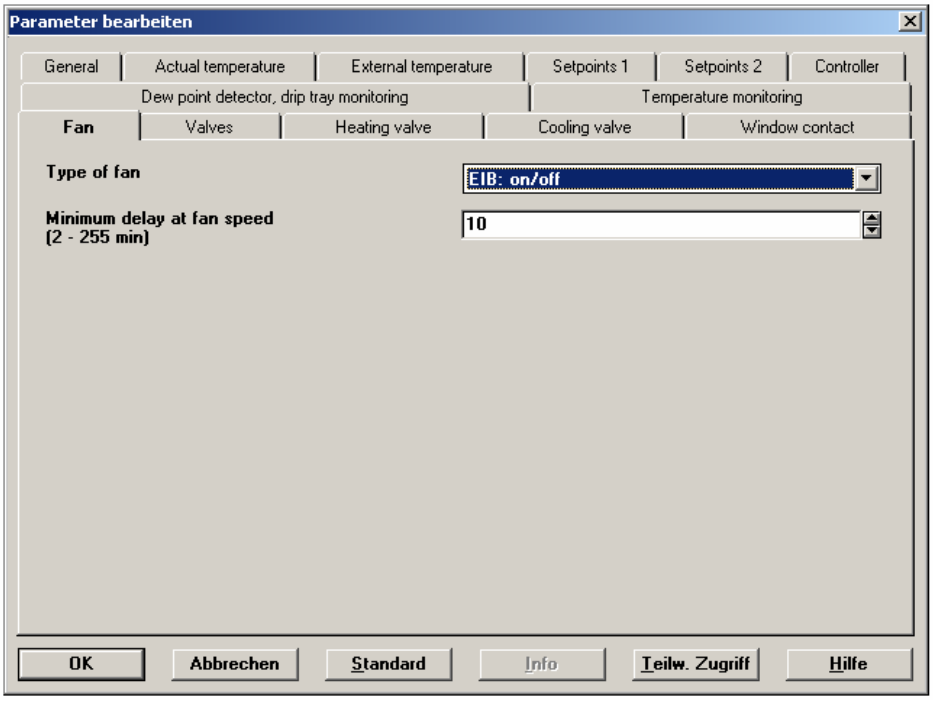
Minimum delay at starting speed	Setting range 2 to 255 seconds **10**
The starting time of the fan is entered here which can vary from fan to fan depending on the inertia of the rotating components.	
Changeover delay between fan speeds	Setting range 0,5 to 10,0 seconds **1,0**
The size of the fan can be adapted, depending on requirements.	
Minimum delay at fan speed	Setting range 2 to 255 minutes **10**
Used to prevent frequent toggling between fan speeds which can be detrimental to comfort levels.	

Starting characteristic of the fan
relates to start time, delay time and changeover delay between the fan speeds.



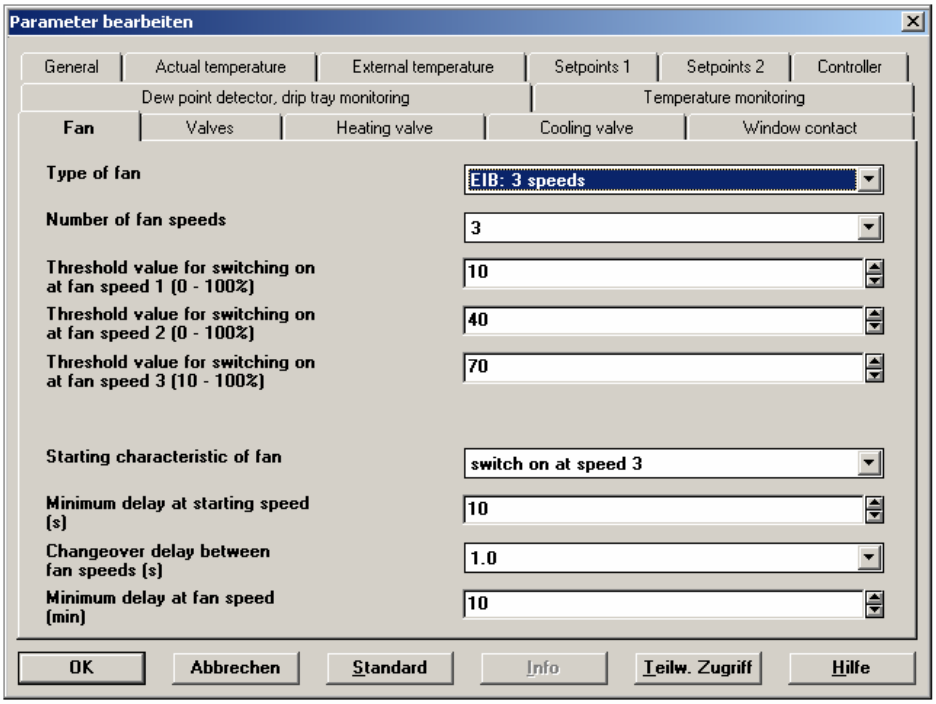
In this example, speed 3 was selected as the starting speed of the fan. The required speed is set following a start time and a changeover delay e.g. speed 1.
This ensures that the fan starts up with a high torque and is thus better able to withstand the increased initial friction in the bearings.

3.6 Fan type „EIB“ on/off only



Parameters	**Settings**
Type of fan	EIB on/off
The fan can be switched via an EIB binary output. Object 18	
Minimum delay at fan speed	Setting range 2 to 255 minutes **10**
Used to prevent frequent toggling between fan speeds which can be detrimental to comfort levels.	

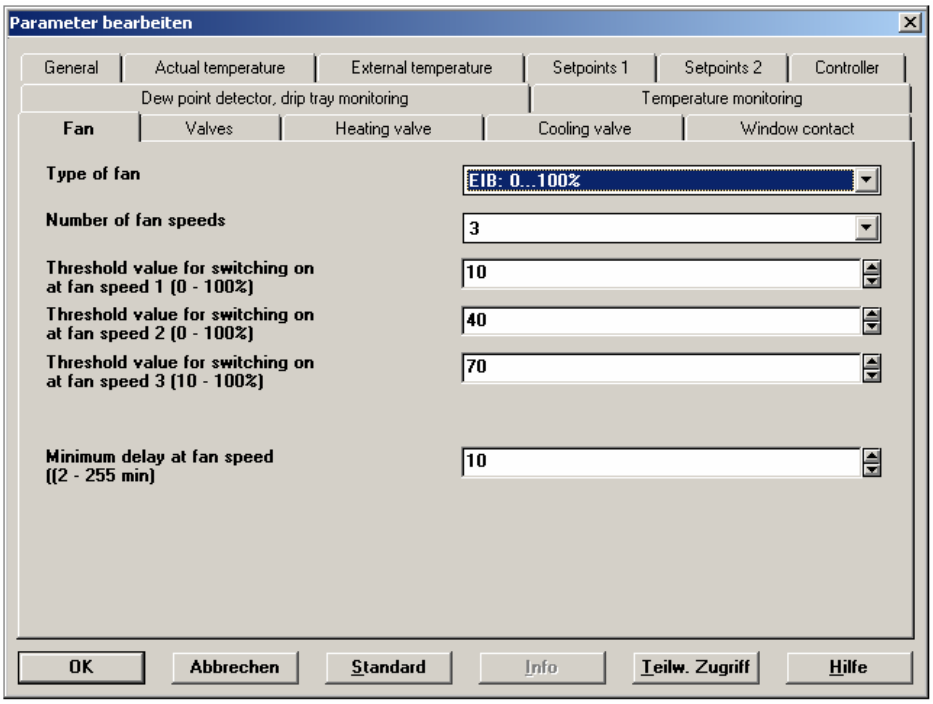
3.7 Fan type „EIB“ 3 speeds



Parameters	**Settings**
Type of fan	EIB 3 speeds
The fan can be switched via three EIB binary outputs (i.e. separate EIB devices).	
Number of fan speeds	**3** 1 2
The maximum number of fan speeds is 3. Fan speed 1: Object 18 Fan speed 2: Object 19 Fan speed 3: Object 20	
Threshold value for switching on at fan speed 1	Setting range 0 to 100% **10**
Threshold value refers to the control value of the controller which is assigned to fan speed 1 (i.e. 10% on the x-axis in the previous diagram showing dependency). With parameter “0”, the fan speed 1 keeps switched on if we fall below the *threshold value fan speed 2* even with control value (0%).	
Threshold value for switching on at fan speed 2	Setting range 0 to 100% **40**
Threshold value refers to the control value of the controller which is assigned to fan speed 2 (i.e. 40% on the x-axis in the previous diagram showing dependency). With parameter “0”, the fan speed 2 keeps switched on if we fall below the *threshold value fan speed 3* even with control value (0%).	
Threshold value for switching on at fan speed 3	Setting range 0 to 100% **70**
Threshold value refers to the control value of the controller which is assigned to fan speed 3 (i.e. 70% on the x-axis in the previous diagram showing dependency). With parameter “0”, the fan speed 3 keeps switched on continuously even with control value (0%).	
Starting characteristic of fan	**Switch on at speed 3** Switch on directly Switch on at speed 2
To ensure that the fan motor starts reliably, it is often advisable to switch the fan on first at a higher speed (higher torque).	

Minimum delay at starting speed	Setting range 2 to 255 seconds **10**
The starting time of the fan is entered here which can vary from fan to fan depending on the inertia of the rotating components.	
Changeover delay between fan speeds	Setting range 0,5 to 10,0 seconds **1,0**
The size of the fan can be adapted, depending on requirements.	
Minimum delay at fan speed	Setting range 2 to 255 minutes **10**
Used to prevent frequent toggling between fan speeds which can be detrimental to comfort levels.	

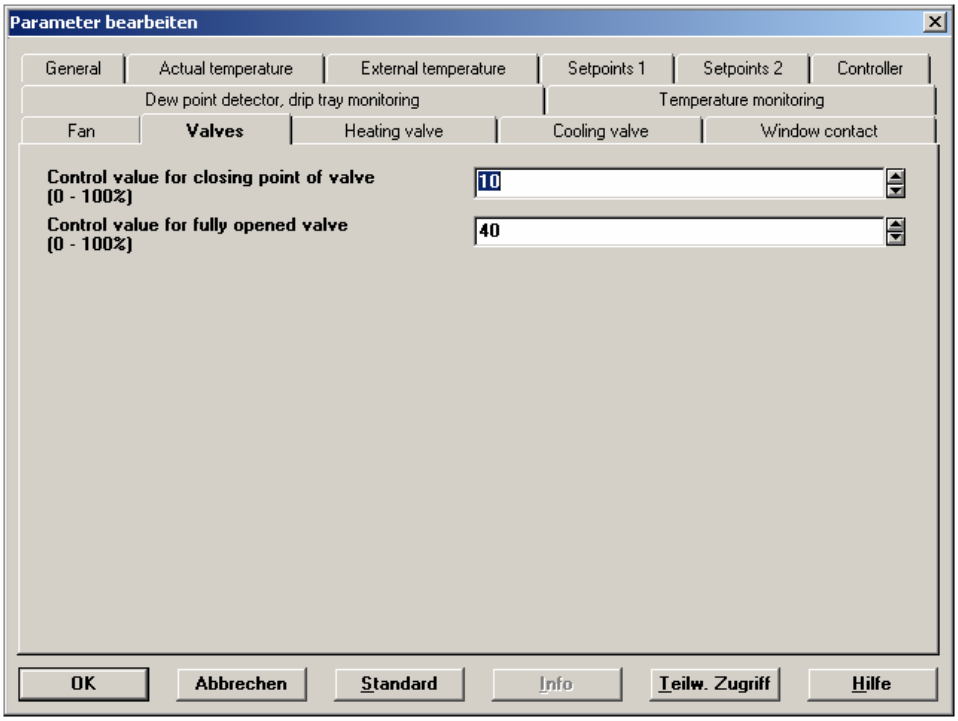
3.8 Fan type „EIB“ 0...100% (EIS6)



Parameters	**Settings**
Type of fan	EIB 0...100%
The fan is controlled with a % value, whereby a value is assigned to each speed. Object 18 (now as EIS 6).	
Number of fan speeds	**3** 1 2
The maximum number of fan speeds is 3.	
Threshold value for switching on at fan speed 1	Setting range 0 to 100% **10**
Threshold value refers to the control value of the controller which is assigned to fan speed 1 (i.e. 10% on the x-axis in the previous diagram showing dependency).	
Threshold value for switching on at fan speed 3	Setting range 0 to 100% **40**
Threshold value refers to the control value of the controller which is assigned to fan speed 2 (i.e. 40% on the x-axis in the previous diagram showing dependency).	

Threshold value for switching on at fan speed 2	Setting range 0 to 100% **70**
Threshold value refers to the control value of the controller which is assigned to fan speed 3 (i.e. 70% on the x-axis in the previous diagram showing dependency).	
Minimum delay at fan speed	Setting range 2 to 10 minutes **10**
Used to prevent frequent toggling between fan speeds which can be detrimental to comfort levels.	

3.9 Valves



Parameters	**Settings**
Control value for closing point of valve	Setting range 0 to 100% **10**
See below	
Control value for fully opened valve	Setting range 0 to 100% **40**
These two parameters represent the valve positioning range that is defined on the value axis of the control value i.e. at which control value the valve should open and at what value the valve is 100% open (see previous diagram of dependency: the two end points of the slanted line projected on the x axis. Values in %).	
Note: These default values are identical to the default values for the parameters *Threshold value for switching on at fan speed 1* and *…2* (see diagram of dependency). They can however be modified independently of these values.	

3.10 Valve types

An individual **valve adjustment** can be carried out for each valve type.
The properties of the specific parameters for valve adjustment are displayed in the following diagrams.

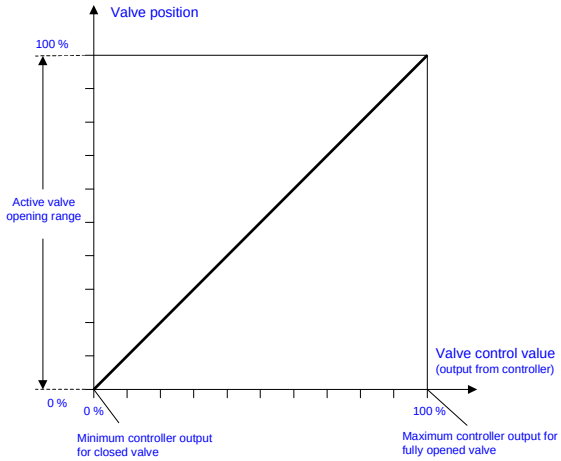
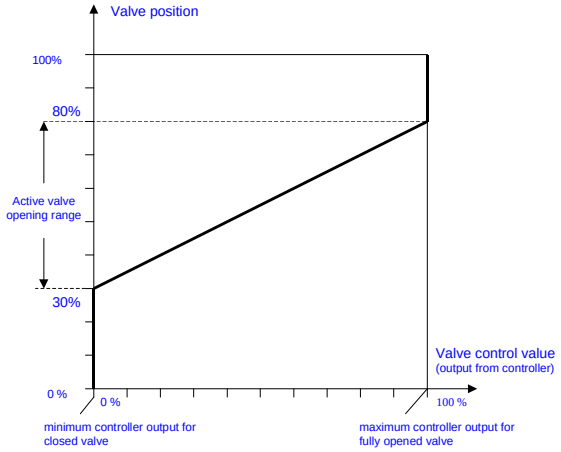
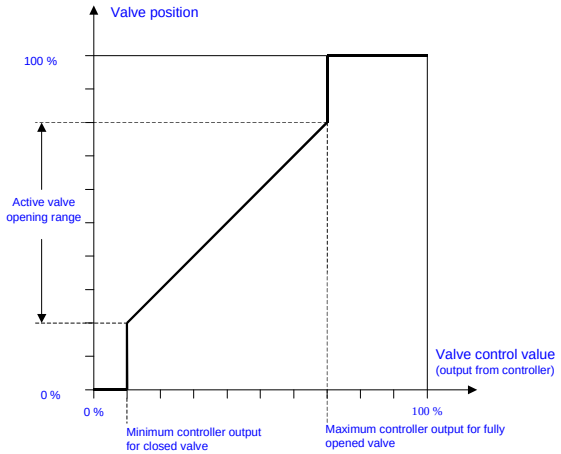


Diagram: no valve adjustment,
i.e. *Valve adjustment* is **off** in the parameter list (default):
In this case, the range of 0 to 100% for the valve control value that is derived from the controller corresponds exactly to the active valve opening range of 0 to 100%.

Examples of valve adjustment:



Example of a valve that is only opened at 30% but is already fully opened at 80%.
The control value of the valve covers the total range of the controller from 0 to 100%.

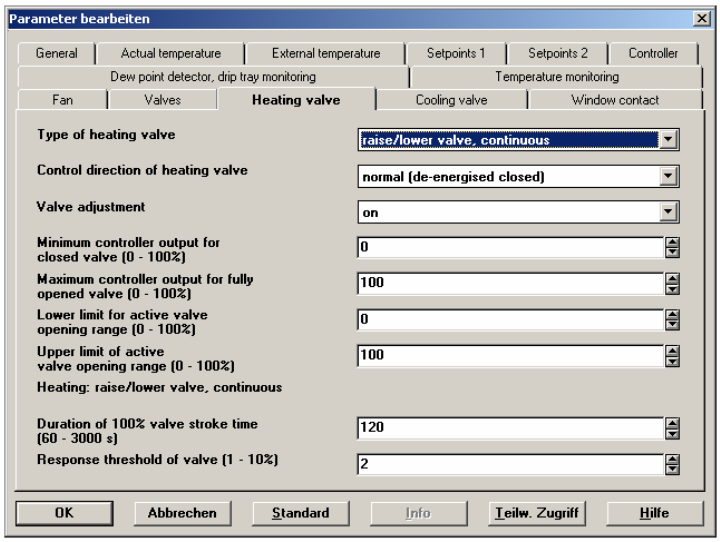


Example of a valve that is only opened at 20% but is already fully opened at 80%.
The value range of the valve control value is however reduced by 10% to 70%.

All the variations in the valve characteristics can be set for the individual valve types.

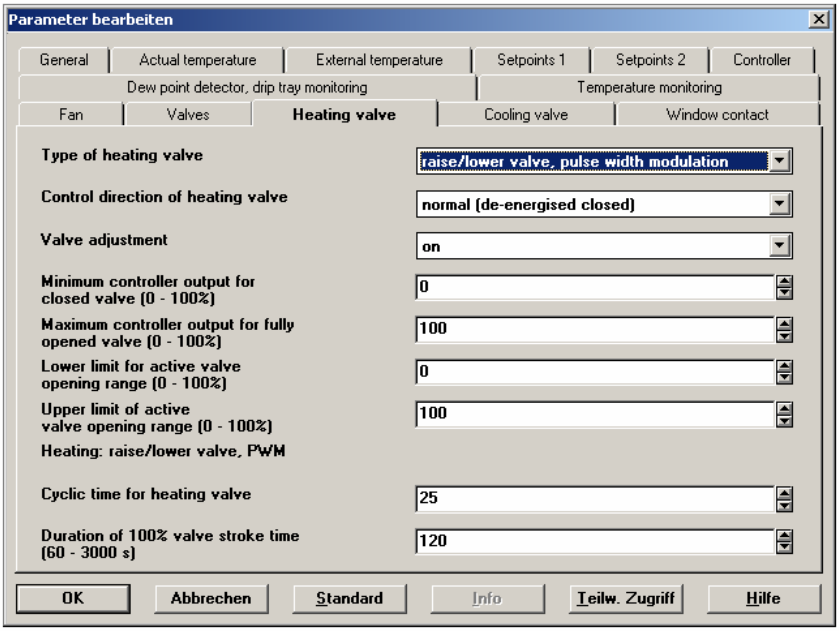
3.11 Heating valves

- **Valve type „local“ raise/lower valve, continuous**



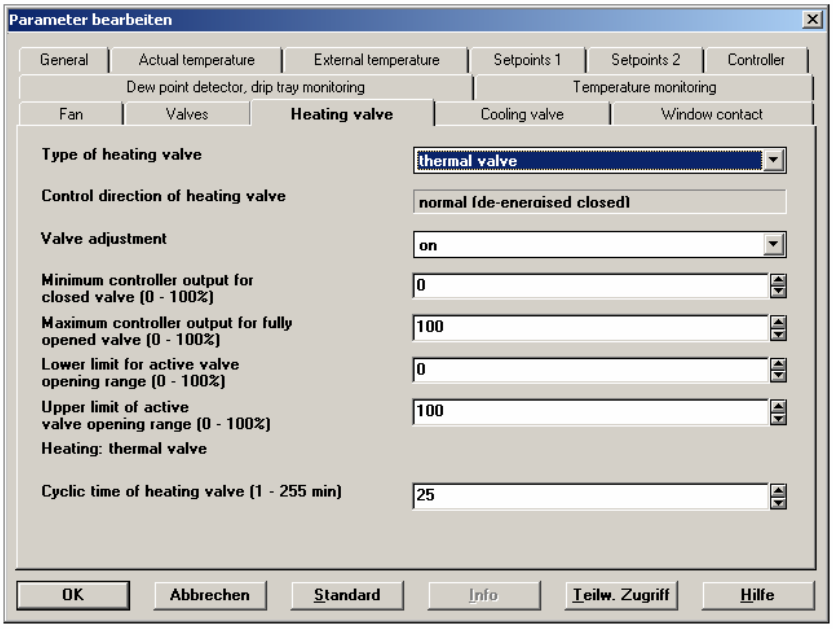
Parameters	**Settings**
Type of heating valve	**raise/lower valve, continuous** raise/lower valve, pulse width modulation thermal valve EIB valve, continuous EIB valve, pulse width modulation
The first three are local valve types while the last two are EIB-controlled valve types. The **raise/lower valve, continuous** has been selected in this case (default).	
Valve adjustment	**off** on
The valve adjustment sets the active valve opening range and the range for the control value of the controller. The valve adjustment can be switched on or off as required.	
Minimum controller output for closed valve	Setting range 0 to 100% **0**
Only displayed if the valve adjustment is “on”. Sets the lower limit for the valve control value that is derived from the controller.	
Maximum controller output for fully opened valve	Setting range 0 to 100% **100**
Only displayed if the valve adjustment is “on”. Sets the upper limit for the valve control value that is derived from the controller.	
Lower limit of active valve opening range	Setting range 0 to 100% **0**
Only displayed if the valve adjustment is “on”. It is possible to preset the lower limit value for the opening of the valve.	
Upper limit of active valve opening range	Setting range 0 to 100% **100**
Only displayed if the valve adjustment is “on”. It is possible to preset the upper limit value for the opening of the valve.	
Duration for 100% valve stroke time	Setting range 60 to 3000 seconds **120**
The individual period for a complete stroke of the valve type is defined here.	
Response threshold of valve	Setting range 1 to 10% **2**
The valve is only activated if the change is more than the set response threshold (in %). An increase in this value causes the number of continuous positioning movements to be reduced. This in turn extends the service life of the valve.	

- **Valve type „local“ raise/lower valve, pulse width modulation**



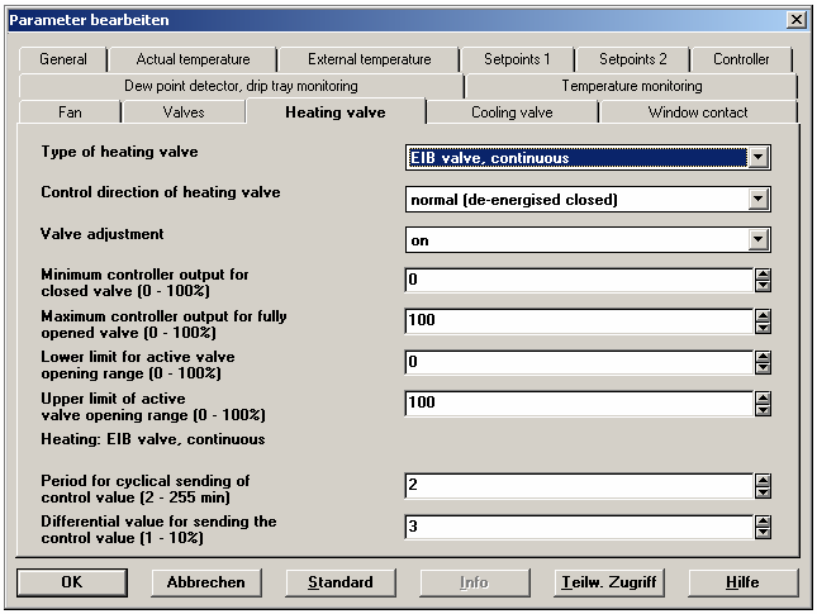
Parameters	**Settings**
Type of heating valve	**raise/lower valve, pulse width modulation**
(selected)	
Valve adjustment	**off** on
The valve adjustment sets the active valve opening range and the range for the control value of the controller. The valve adjustment can be switched on or off as required.	
Minimum controller output for closed valve	Setting range 0 to 100% **0**
Only displayed if the valve adjustment is “on”. Sets the lower limit for the valve control value that is derived from the controller.	
Maximum controller output for fully opened valve	Setting range 0 to 100% **100**
Only displayed if the valve adjustment is “on”. Sets the upper limit for the valve control value that is derived from the controller.	
Lower limit of active valve opening range	Setting range 0 to 100% **0**
Only displayed if the valve adjustment is “on”. It is possible to preset the lower limit value for the opening of the valve.	
Upper limit of active valve opening range	Setting range 0 to 100% **100**
Only displayed if the valve adjustment is “on”. It is possible to preset the upper limit value for the opening of the valve.	
Cyclic time of heating valve	Setting range 1 to 255 minutes **25**
The control value of the controller is sent to the valve as a coded mark-to-space ratio. This pulse length modulated signal is switched off when the valve is in the limit position. The cyclic time is the period for the signal.	
Duration of 100% valve stroke time	Setting range 60 to 3000 seconds **120**
The individual period for a complete stroke of the valve type is defined here.	

Valve type „local“, thermal valve, pulse length modulation:



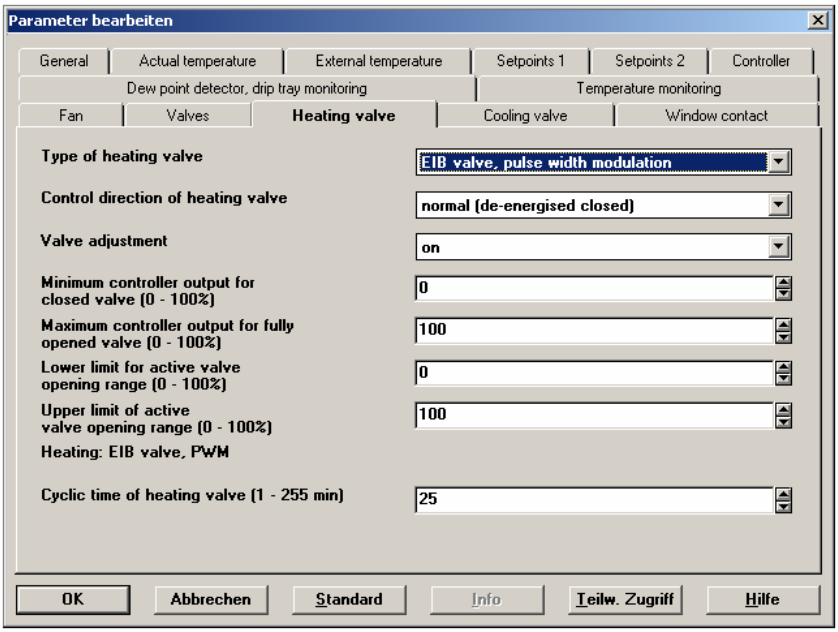
Parameters	**Settings**
Type of heating valve	**Thermal valve**
(selected)	
Valve adjustment	**off** on
The valve adjustment sets the active valve opening range and the range for the control value of the controller. The valve adjustment can be switched on or off as required.	
Minimum controller output for closed valve	Setting range 0 to 100% **0**
Only displayed if the valve adjustment is “on”. Sets the lower limit for the valve control value that is derived from the controller.	
Maximum controller output for fully opened valve	Setting range 0 to 100% **100**
Only displayed if the valve adjustment is “on”. Sets the upper limit for the valve control value that is derived from the controller.	
Lower limit of active valve opening range	Setting range 0 to 100% **0**
Only displayed if the valve adjustment is “on”. It is possible to preset the lower limit value for the opening of the valve.	
Upper limit of active valve opening range	Setting range 0 to 100% **100**
Only displayed if the valve adjustment is “on”. It is possible to preset the upper limit value for the opening of the valve.	
Only displayed if the valve adjustment is “on”. Defines the right end of the horizontal line in the range for the closed valve (this is indicated by the coordinates 100,100 in the diagram in accordance with the default value of 100%).	
Cyclic time of heating valve	Setting range 1 to 255 minutes **25**
The control value of the controller is sent to the valve as a coded mark-to-space ratio. This pulse length modulated signal is switched off when the valve is in the limit position. The cyclic time is the period for the signal. Caution: A reduction in the cyclic time causes the number of continuous movement cycles to be increased. This in turn shortens the service life of the valve.	

- **Valve type „EIB“, continuous:**



Parameters	**Settings**
Type of heating valve	**EIB-valve, continuous**
(selected)	
Control direction of heating valve	**normal (de-energised closed)** inverted (de-energised open)
Valve adjustment	**off** on
The valve adjustment sets the active valve opening range and the range for the control value of the controller. The valve adjustment can be switched on or off as required.	
Minimum controller output for closed valve	Setting range 0 to 100% **0**
Only displayed if the valve adjustment is “on”. Sets the lower limit for the valve control value that is derived from the controller.	
Maximum controller output for fully opened valve	Setting range 0 to 100% **100**
Only displayed if the valve adjustment is “on”. Sets the upper limit for the valve control value that is derived from the controller.	
Lower limit of active valve opening range	Setting range 0 to 100% **0**
Only displayed if the valve adjustment is “on”. It is possible to preset the lower limit value for the opening of the valve.	
Upper limit of active valve opening range	Setting range 0 to 100% **100**
Only displayed if the valve adjustment is “on”. It is possible to preset the upper limit value for the opening of the valve.	
Period for cyclical sending of control value	Setting range 2 to 255 minutes **2**
Sets how often the control value is sent on the EIB. Object 21.	
Differential value for sending the control value	Setting range 1 to 10% **3**
Sent in addition if the change is more than the set percentage value. Also object 21	

- **Valve type: EIB; pulse width modulation**



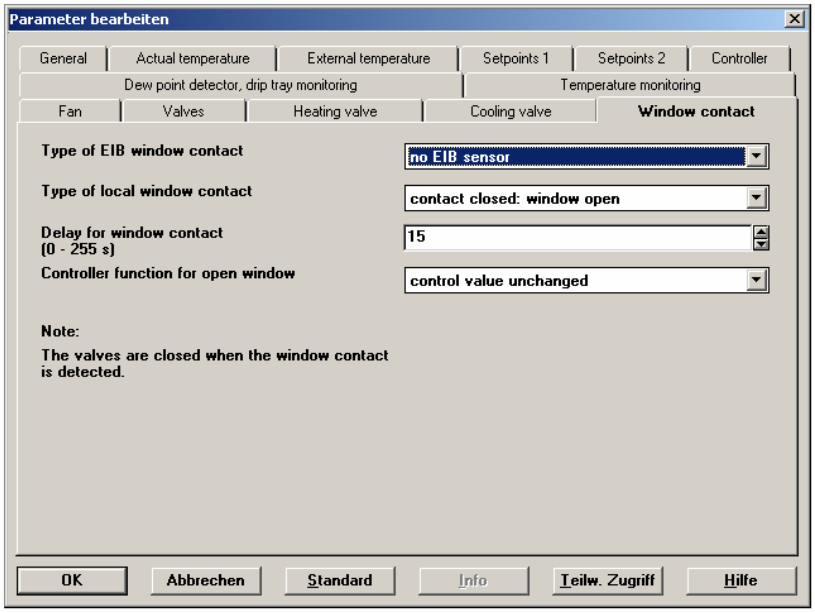
Parameters	**Settings**
Type of heating valve	**EIB-valve, pulse width modulation**
(selected)	
Valve adjustment	**off** on
The valve adjustment sets the active valve opening range and the range for the control value of the controller. The valve adjustment can be switched on or off as required.	
Minimum controller output for closed valve	Setting range 0 to 100% **0**
Only displayed if the valve adjustment is “on”. Sets the lower limit for the valve control value that is derived from the controller.	
Maximum controller output for fully opened valve	Setting range 0 to 100% **100**
Only displayed if the valve adjustment is “on”. Sets the upper limit for the valve control value that is derived from the controller.	
Lower limit of active valve opening range	Setting range 0 to 100% **0**
Only displayed if the valve adjustment is “on”. It is possible to preset the lower limit value for the opening of the valve.	
Upper limit of active valve opening range	Setting range 0 to 100% **100**
Only displayed if the valve adjustment is “on”. It is possible to preset the upper limit value for the opening of the valve.	
Cyclic time of heating valve	Setting range 1 to 255 minutes **25**
The control value of the controller is coded in a mark-to-space ratio. ON and OFF commands (EIS 1) are issued on the EIB which are evaluated by an EIB binary output, thereby controlling the valve. This pulse length modulated signal is switched off in the limit position of the valve. The cyclic time is the period for this signal. Object 21.	

3.12 Cooling valves

The parameters for cooling valves are identical to those for heating valves except that some of the default values are different:
Default values for *Cyclic time of cooling valve:*
Valve type: local, raise/lower valve, pulse length modulation: **15** minutes
Valve type: local, thermal valve, pulse length modulation: **10** minutes
Valve type: EIB valve, pulse length modulation: **10** minutes

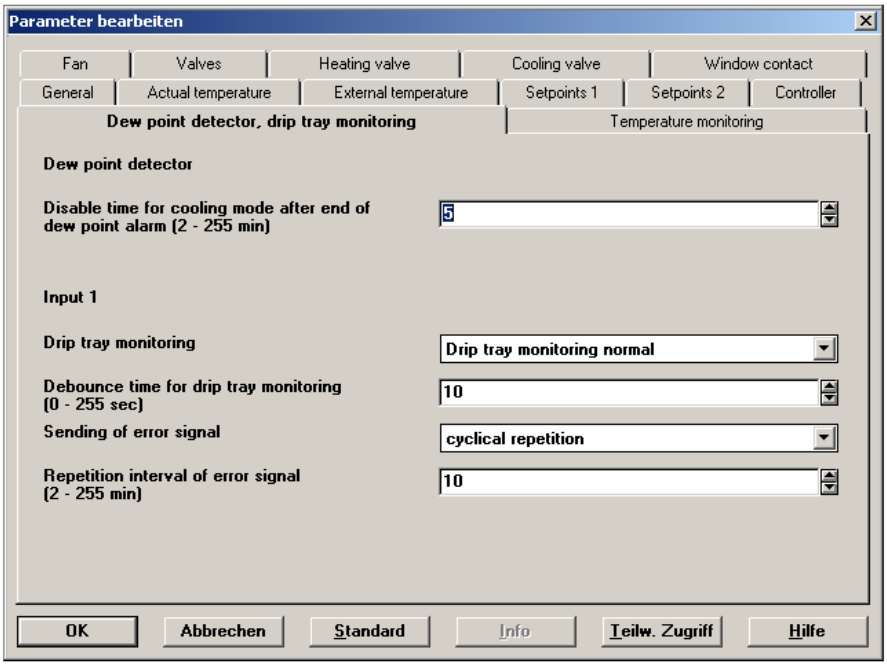
The output object for cooling valves is object **22**

3.13 Window contact



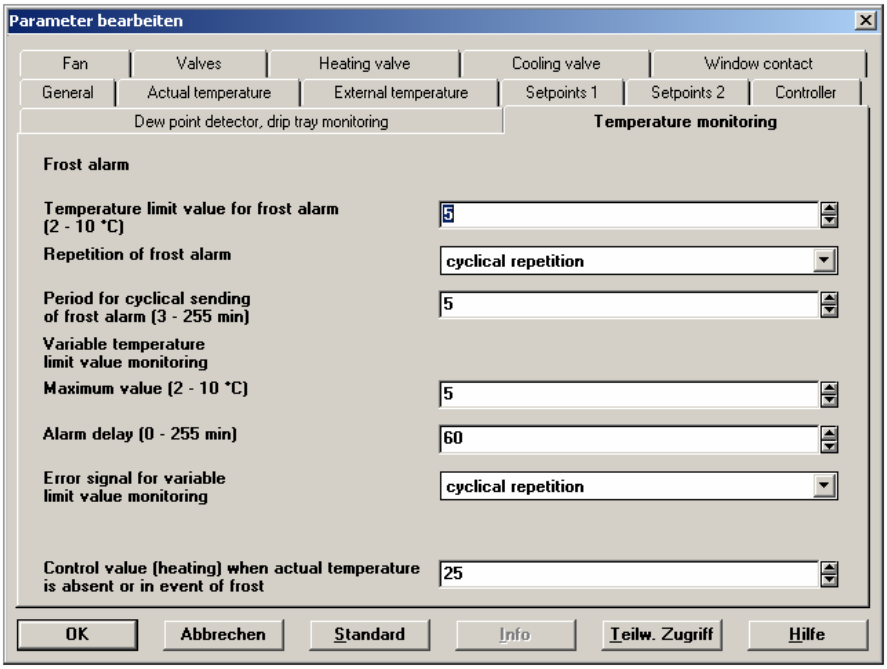
Parameters	Settings
Type of EIB window contact	**no EIB-sensor** normally open inverted (normally closed)
If an EIB sensor is selected, the contact type can be “normally open” or “normally closed”. Input for window contact: object 13.	
Type of local window contact	**contact closed: window open** contact open: window open no local sensor Input: normally open Input: inverted (normally closed)
Defines the type of the local window contact. Note: The software automatically carries out the debouncing of the contact. *Input normally open/inverted,* if no local window contact is used, this input may be used as a binary input (object 32).	
Delay for window contact	Setting range 0 to 255 seconds **15**
A brief opening of a window does not have any influence on the controller. Note: When a window has been opened, the valves are only closed once this period has elapsed.	
Controller function for open window	**Control value unchanged** normal (active) Control value = 0 (all off)
control value unchanged: The control value is fixed when a window is opened. The controller continues from this control output when the window is closed. *normal (active)* : The controller simply continues. *control value = 0 (all OFF)*: The control output is set to zero when a window is opened. When the window is closed, the controller regulates from zero upwards. Note: The frost alarm is always activated in the background.	

3.14 Dew point detector, drip tray monitoring



Parameters	**Settings**
Disable time for cooling mode after end of dew point alarm	Setting range 0 to 255 minutes **5**
The dew point alarm disables the cooling function for the selected period. The dew point alarm is issued via the EIB, object 24.	
Drip tray monitoring	**none** normally open inverted (normally closed) Input: normal Input: inverted
The drip tray monitoring function is reported by a local contact on the corresponding terminal of the device. The contact type can be “normally open” or “normally closed”. *Input normally open/inverted,* if no local contact for drip tray monitoring is used, this input may be used as a binary input (object 27).	
Debounce time for drip tray monitoring	Setting range 0 to 100 minutes **5**
Used for long-term debouncing. Since a floating contact is used in most cases, external vibrations in the drip tray can cause slow wave movements which lead to the constant opening and closing of the contact. It is possible to counteract this effect with a debounce time of an appropriate length.	
Sending of error signal	**Cyclical repetition** No repetition
The drip tray alarm can be issued once on the EIB or with repetitions in a set cycle. Object 27.	
Repetition interval of error signal	Setting range 2 to 100 minutes **10**
The repetition cycle of the error signal can be limited to a particular time period here.	

3.15 Temperature monitoring

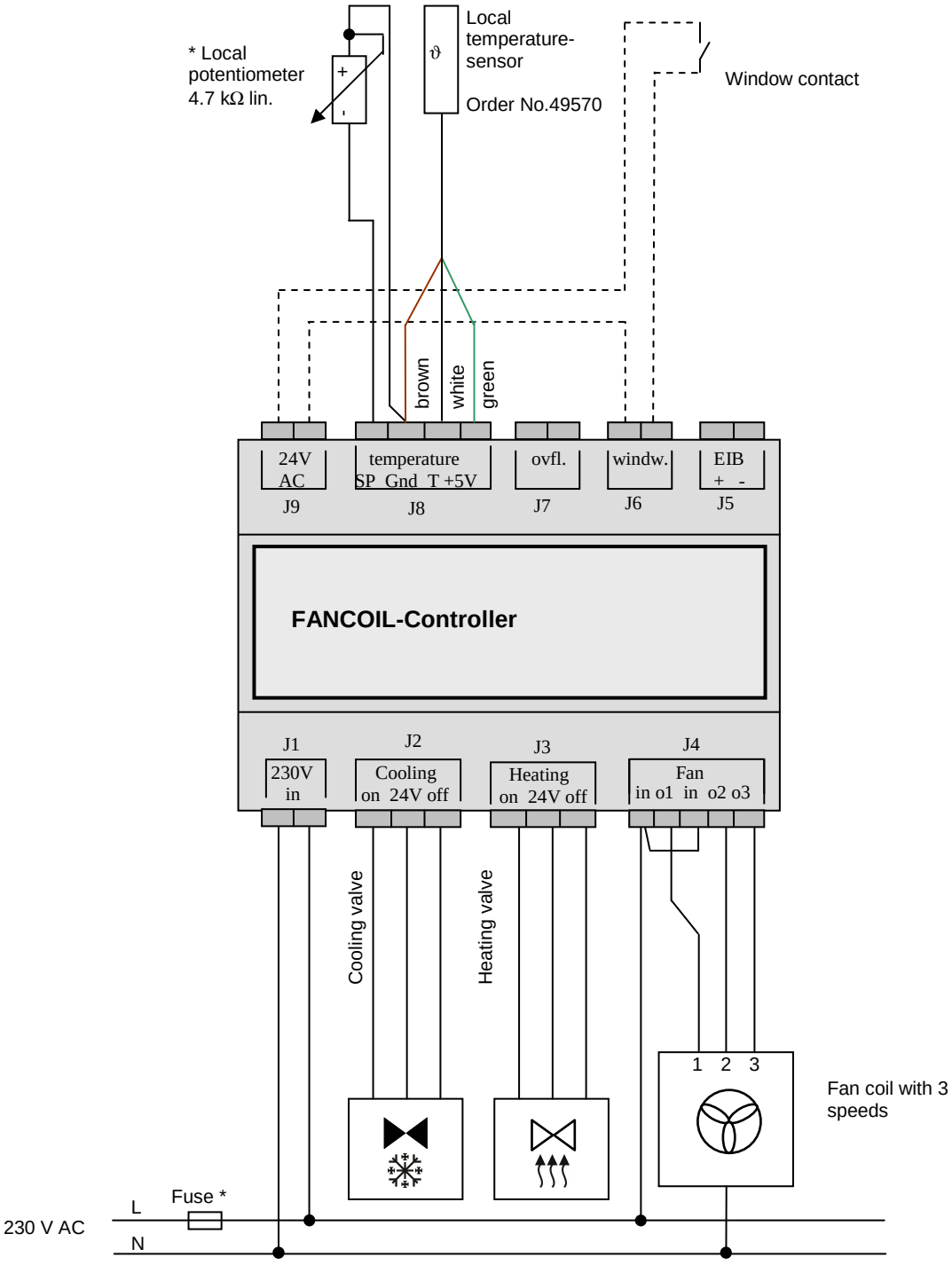


Parameters	**Settings**
Temperature limit value for frost allar	Setting range 2 to 10℃ **5**
This is the temperature which the frost protection mode uses to prevent damage caused by water freezing in the installation.	
Repetition of frost alarm	**Cyclical repetition**
If the value falls below the *Temperature limit value for frost alarm*, the frost alarm is sent on the EIB. Object 25.	
Period for cyclical sending of frost alarm	Setting range 2 to 255 minutes **5**
The repetition rate is set here.	
Maximum value	Setting range 2 to 10 ℃ **5**
Maximum value of the variable temperature limit monitoring. Indicates the maximum permitted deviation of the actual value from the setpoint.	
Alarm delay	Setting range 2 to 255 minutes **60**
The alarm triggered by a deviation in the maximum value is only issued after a delay and only if a corresponding approximation of the actual value to the setpoint has not been carried out within the set period i.e. undershoot of the *Maximum value* set above.	
Error signal for variable limit value monitoring	**Cyclical repetition** No repetition
Single or repeated cyclical output on the EIB via object 26.	
Control value (heating) when actual temperature is absent or in event of frost alarm	Setting range 0 to 100 % **25**
Global control: If the frost alarm is triggered or the actual temperature has not been refreshed for a long period, a specific control output for heating can be preselected which results in a specific valve position. This parameter ensures absolute frost protection.	

IV. Examples for application

1. Stand-alone application

(i.e. local, without EIB) with default values:



* Mains and device protection
Fuse max. 6 Amp. (see specification of the Fan Coil-Unit manufacturer)
*Local potentiometer optional for setpoint shift $^{+}/_{-}$ 3° C

Notes:
In case of the appropriate parameter settings for a stand-alone operation, the commissioning can be alone with the default values without ETS.
The following sensors, resp. actuators have to be connected to the device:

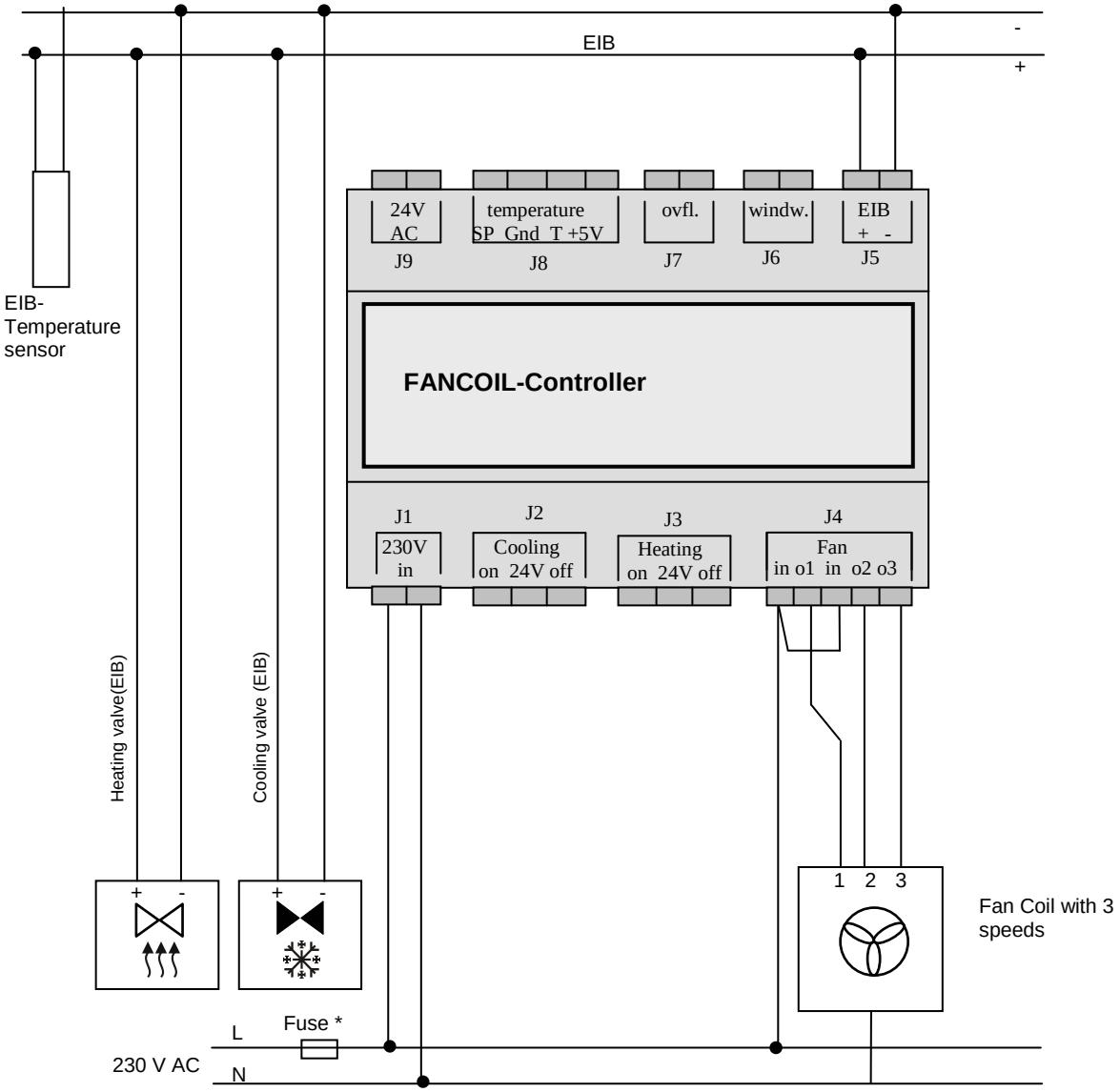
- local temperature sensor (3 leads), type: Woertz order No.49570
- separate valves for heating and cooling, type: raise/lower valves, continuous
- a fan coil with local fan with 3 speeds
- If need be, also a window contact, contact ON = open window

2. Application with EIB functions

In this example, the following EIB sensors are connected:

- Room temperature sensor
- Nighttime heating reduction switch
- Comfort switch
- Optional outside temperature sensor
- Optional window contact

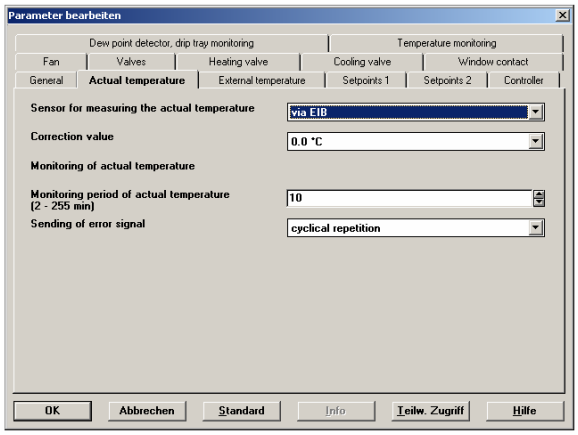
Separate valves with EIB interface are used for heating and cooling. (Type EIB valve, continues).
A fan with 3 speeds is connected to the corresponding outputs of the fan coil unit.



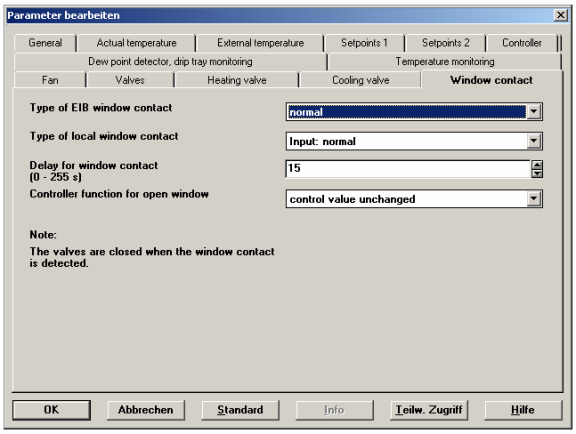
* Mains and device protection
Fuse max. 6 Amp. (see also specifications by fan coil unit manufacturer)

Parameter settings in the ETS

For receiving the actual temperature from EIB:



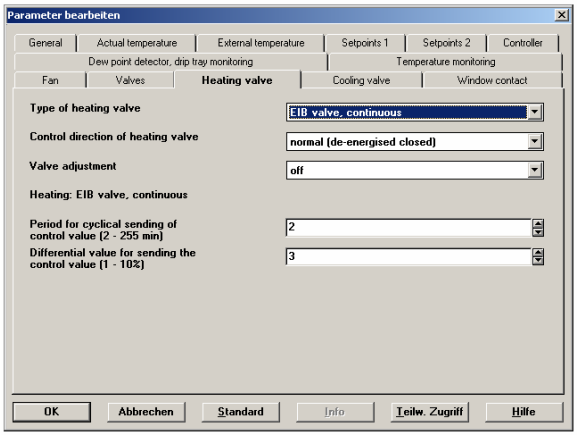
For receiving the state of a window contact (e.g. EIB binary input):



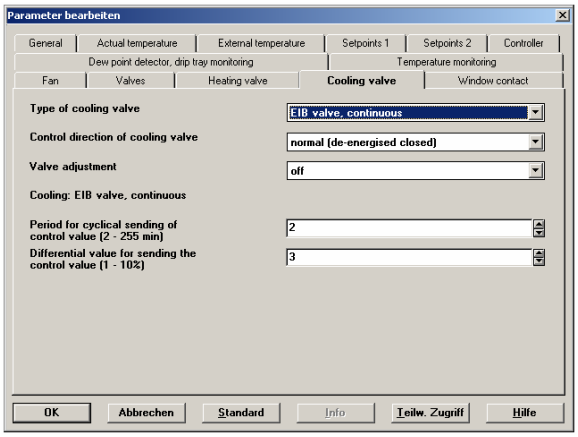
Receiving the outside temperature: this is basically expected only from the EIB, i.e. a local sensor input is not provided. Object 2 must be linked to a corresponding group address.

Night mode reduction switch and comfort mode switch: Objects 9 and/or 11 must be linked to the corresponding group addresses. The switching takes place as soon as EIB receives the appropriate group address and switching command have been received from the EIB.

Heating valve with EIB control:

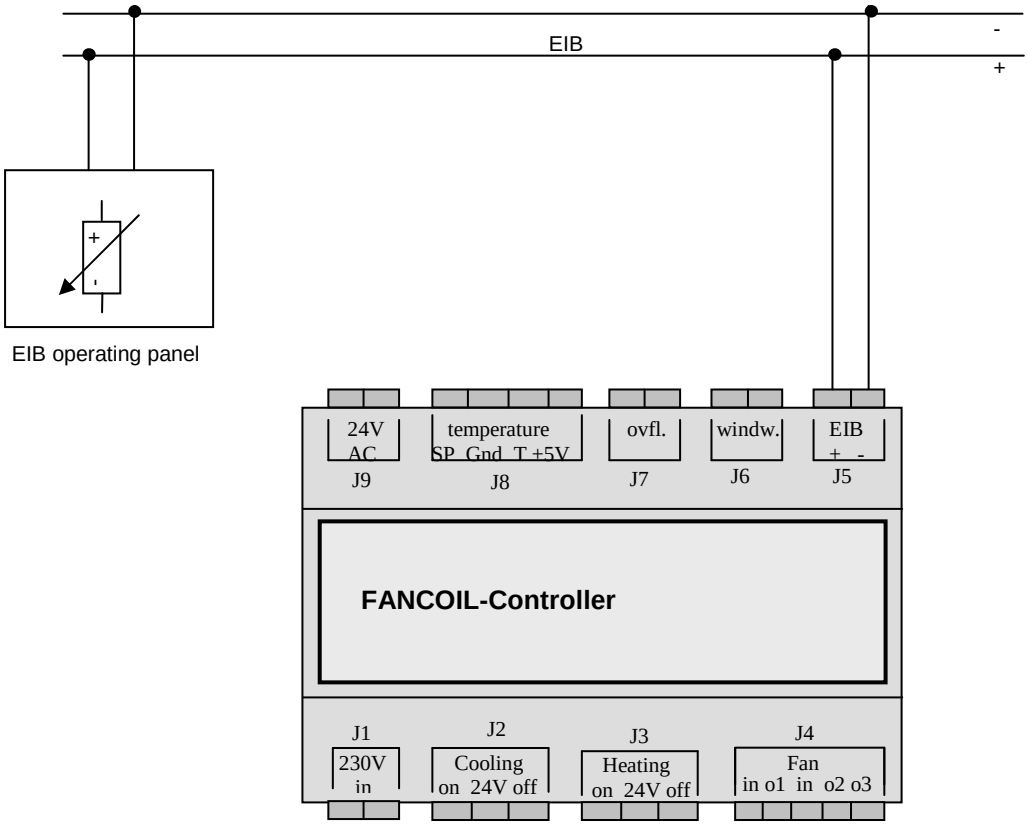


Cooling valve with EIB control:



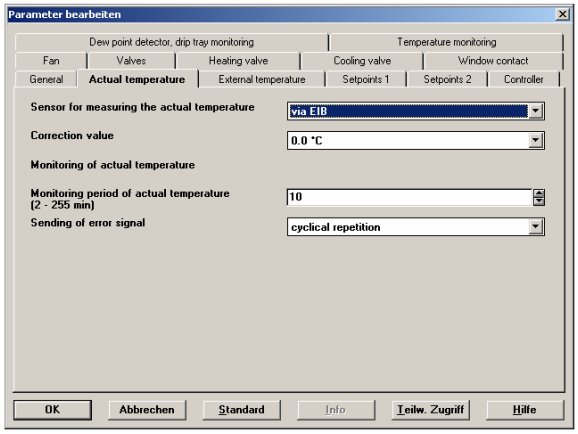
3. Application with an EIB operating panel

In this example, only the relevant function is shown.
The EIB operating panel includes a sensor for measuring the actual temperature, and the possibility of adjustment for displacement of the nominal value. Communication with the room temperature regulator 49550 takes place via EIB objects.

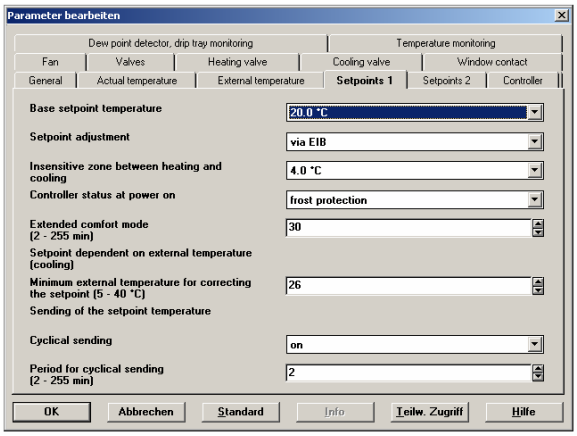


Parameter setting in the ETS

For receiving actual temperature from the EIB operating panel:

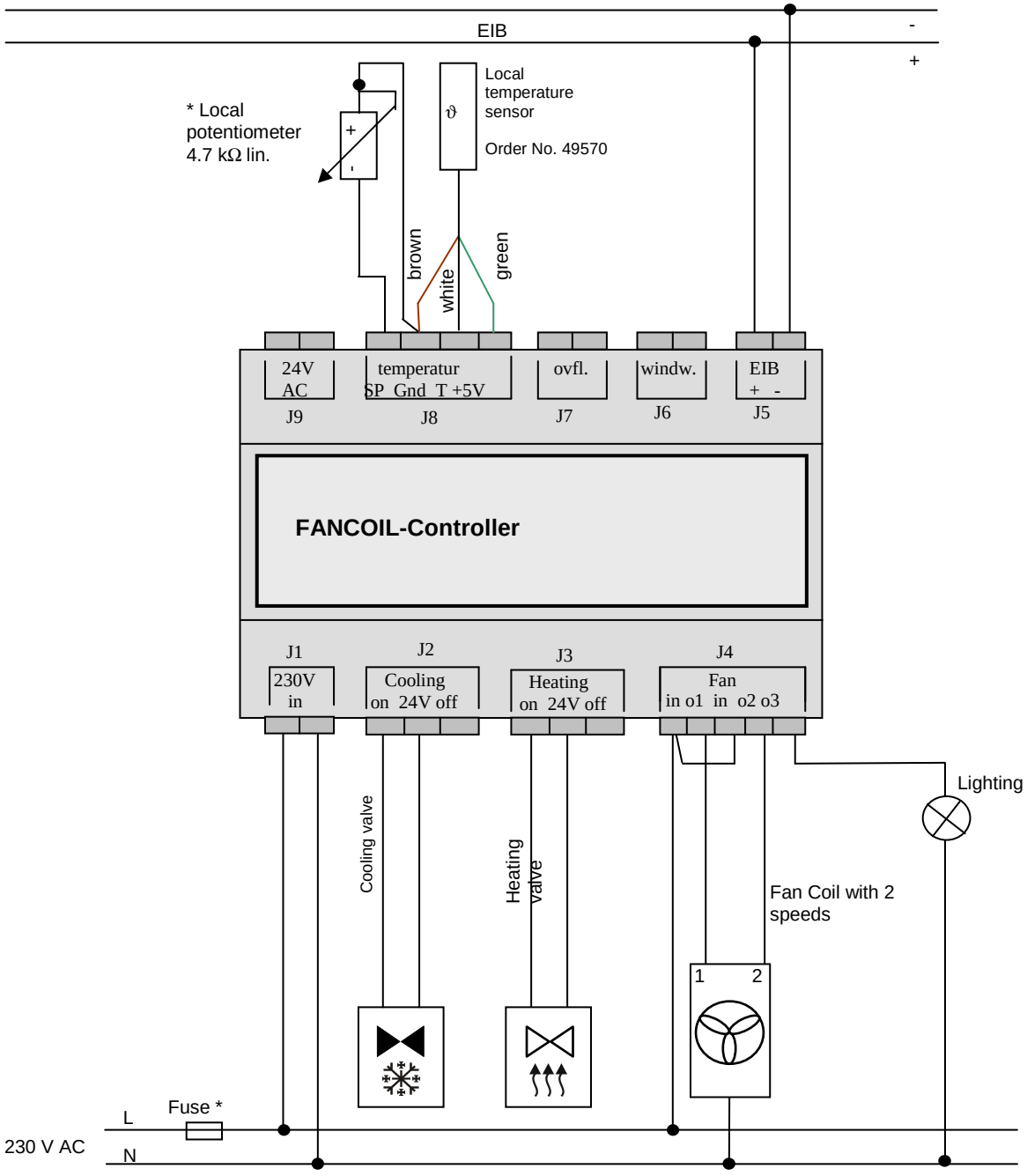


For receiving the setpoint value shift from the EIB operating panel:



4. Lighting control

- Local fan with 2 speeds
- Lighting control via the EIB
- Local potentiometer for setpoint value shift
- Thermal valves
- Local temperature sensor

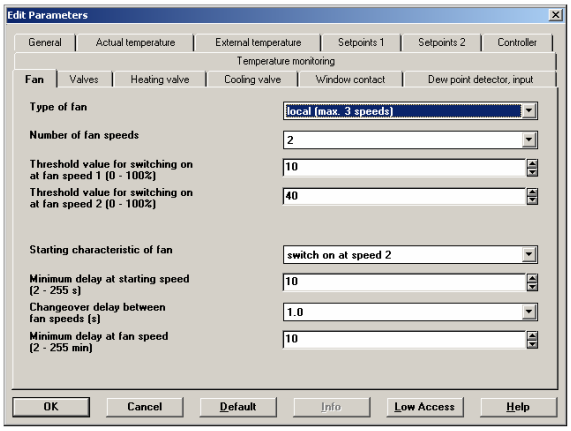


* Mains and device protection
Fuse max. 6 Amp. (see specifications of fan coil unit manufacturer)
* Local potentiometer optional for setpoint shift $^{+}/_{-}$ 3^{o} C

Note: Please observe the common terminal of the L-conductor for fan and lighting at the fan coil unit controller, No. 49550

Parameter settings in the ETS

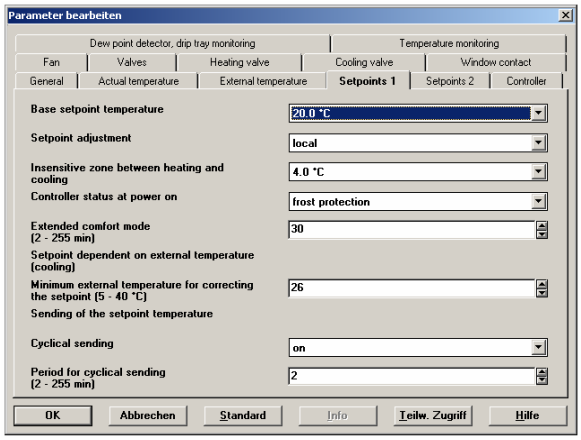
Fan with 2 speeds:



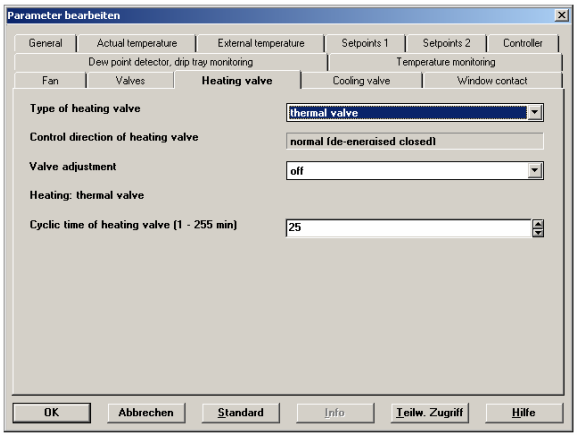
Choose “local” type of fan. Under “Starting characteristic”, however, “Switch on at speed 2” or “Switch directly on” should be selected.

Lighting:
To switch lighting on or off, object 20 (“Fan Speed 3”) must be assigned to the EIB group address which corresponds to the lighting control.

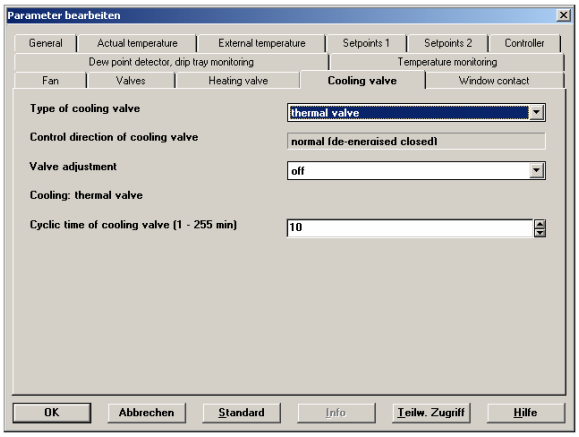
Local potentiometer for setpoint value shift:



Thermal heating valve:

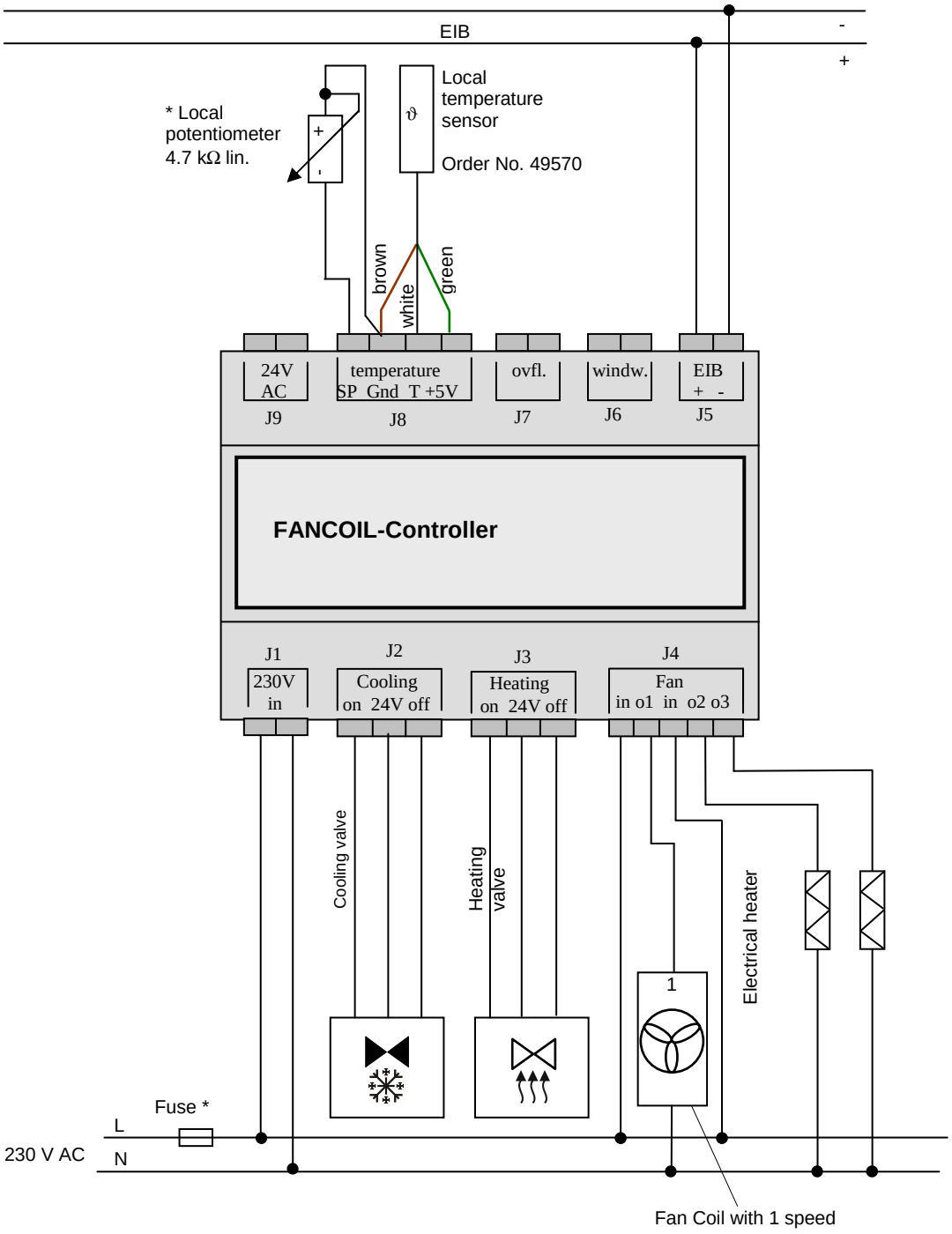


Thermal cooling valve:



5. Control of electrical heaters elements

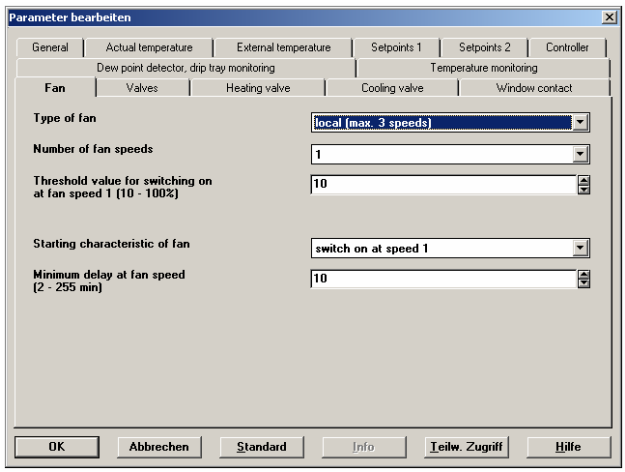
- Local fan with one speed
- Control of 2 electrical heaters via the EIB
- 3-point valves, continuous
- Local temperature sensor



* Mains and device protection
Fuse max. 6 Amp. (see specifications of fan coil unit manufacturer)
* Local potentiometer optional for setpoint shift $^{+}/_{-}$ 3^{o} C

Electrical heater:
Please observer the nominal current of 6 A for the fan outputs! If higher currents are needed, auxiliary relays must be connected to the fan outputs.

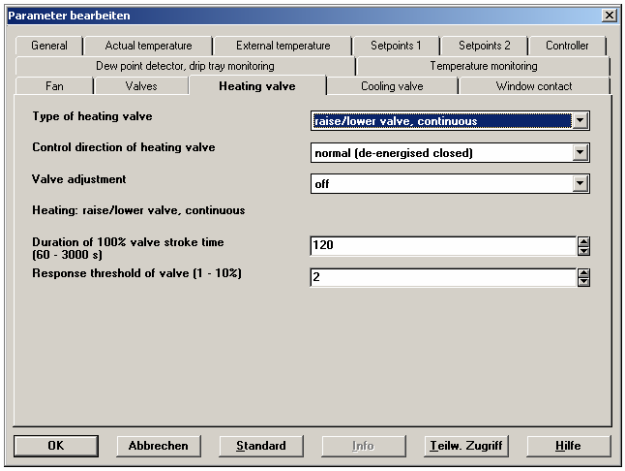
Parameter settings in the ETS



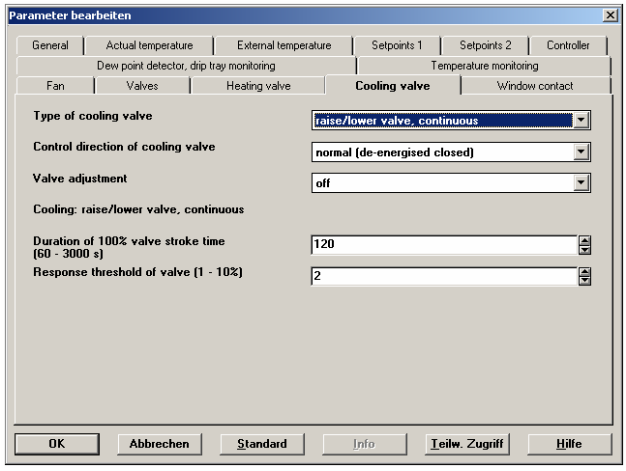
Choose “local” type of fan. Under “Starting characteristic”, however, “Switch on at speed 1” or “Switch directly on” should be selected.

Electrical heating elements:
For switching the electrical heating elements, objects 34 and 35 must be assigned to the appropriate EIB group addresses.

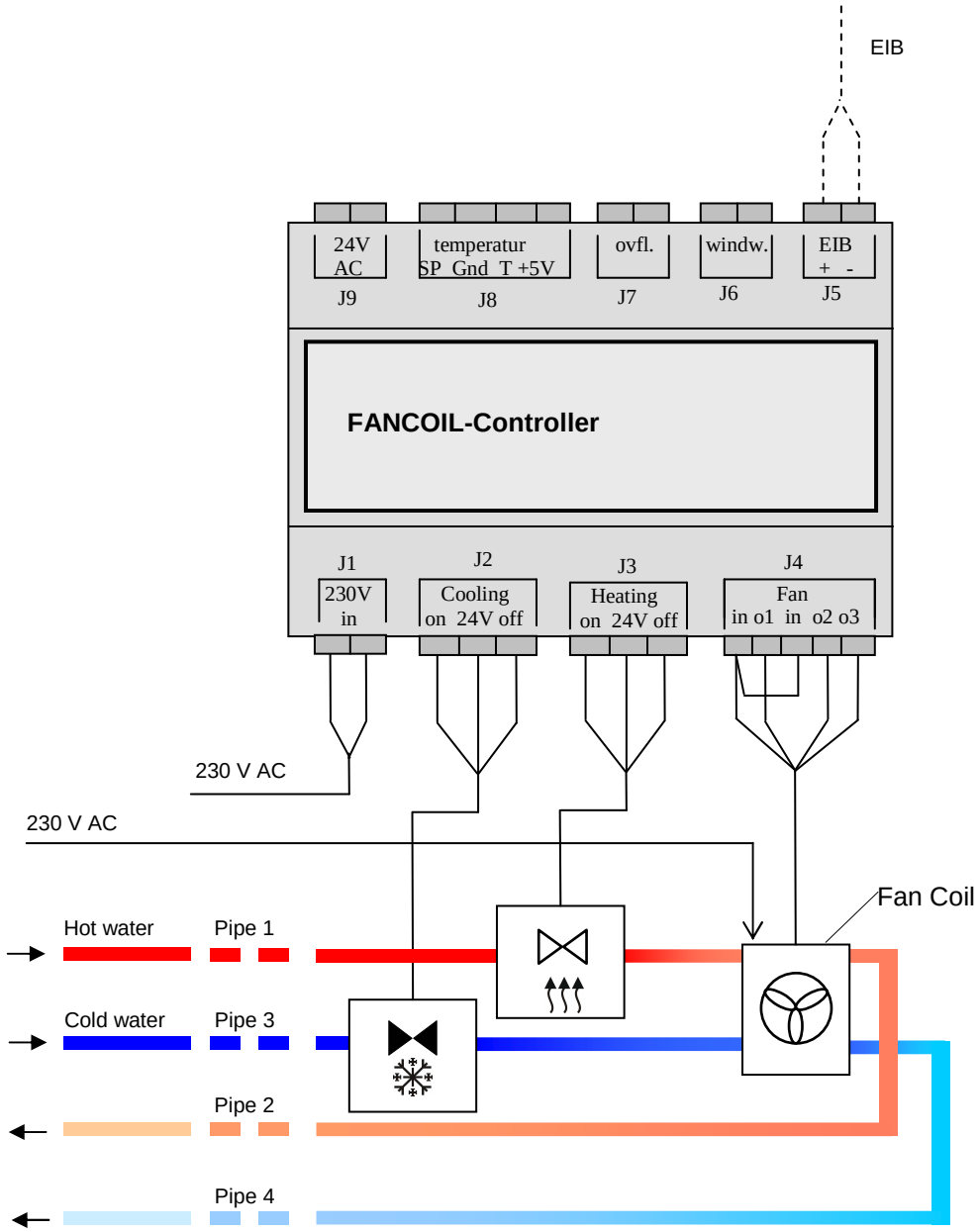
Raise/lower heating valve, continuous:



Raise/lower cooling valve, continuous:

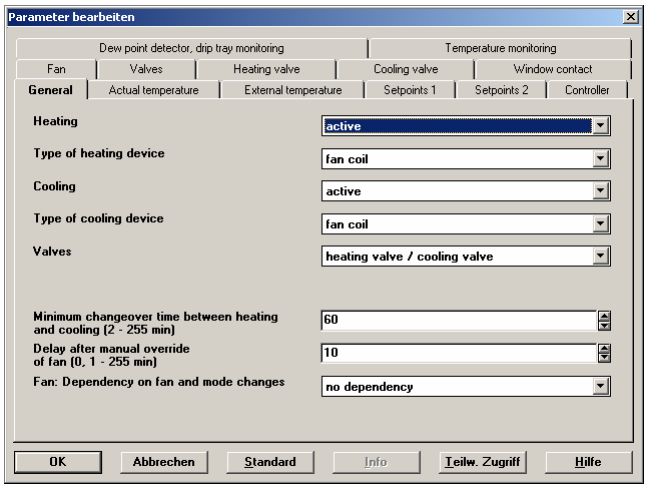


6. Installation as 4-pipe version

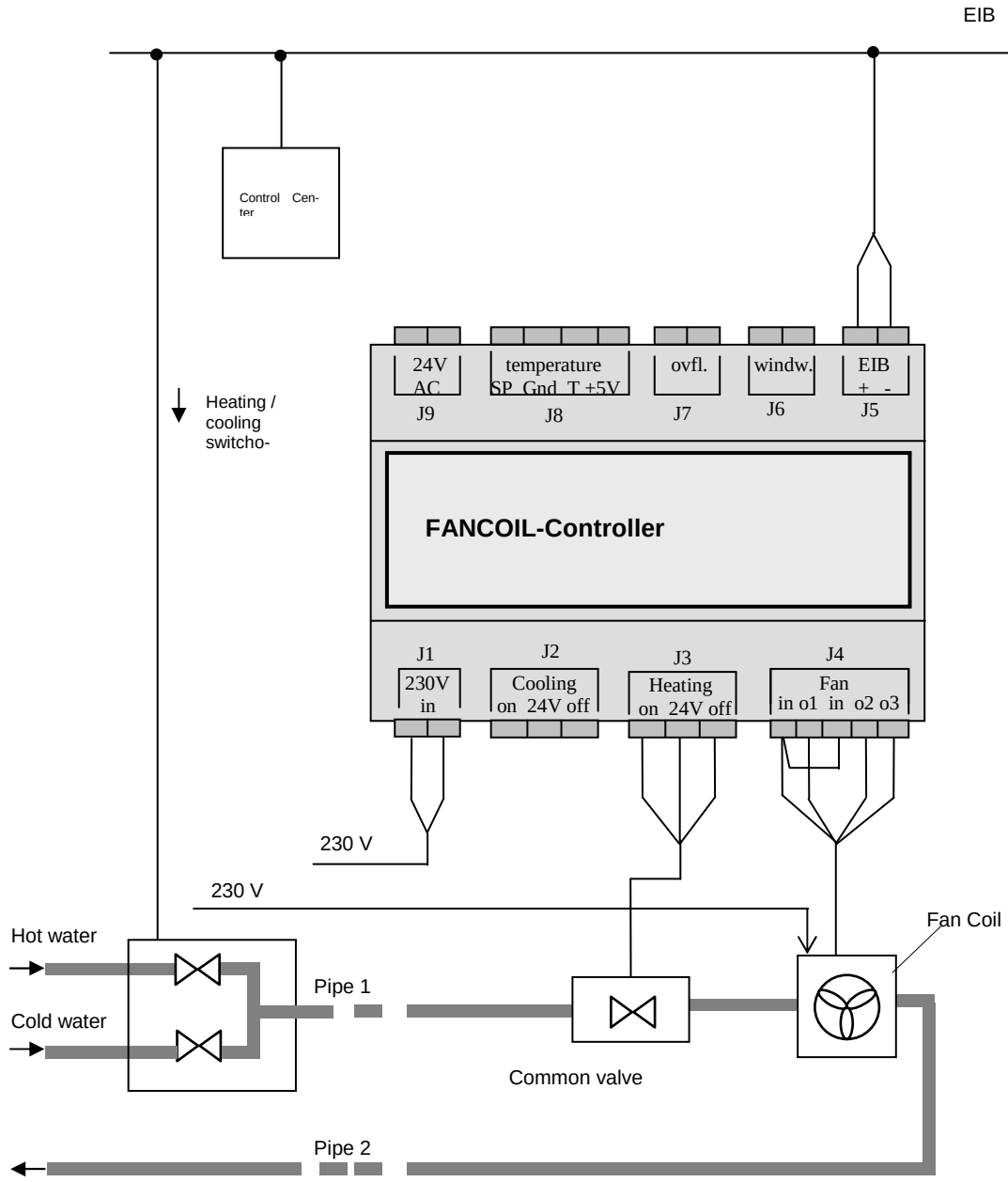


- Examples 1 to 5 using installation as 4-pipe version.

Parameter settings in the ETS



7. Installation as 2-pipe version



Hot water / cold water switching over is performed via a control center
The common valve is connected to the “heating valve” output

Parameter settings in the ETS