

USER MANUAL

ROOM CONTROLLER EVOLUTION *SERIES FH-xxSH1*



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FH room controller

1. Technical data

Power supply:	110...230 Vca ±10%, 50/60 Hz
Power consumption:	max 1.3 W
Operating temperature:	0...50°C
Display:	Backlit LCD display
Inputs:	2 potential-free contacts 2 or 3 NTC 10k sensors
Outputs:	USB for parameter configuration and software updates 1 analogue output 0...10 V ($R_L > 10K$) depending on the model 5 SPST 250 VAC, 3A relays (AC1) depending on the model N.B: the total current output obtained adding each current output must be lower than 7A (AC1).
Communication:	Master or slave RTU modbus
Temperature reading range:	-15...90°C
Humidity reading range:	10...90% r.h., non-condensing
Dimensions:	128 x 80 x 55.5 mm
Installation:	3 module flush-mounted box
Protection class:	IP30, class 2
EU compliance standard:	EN 60730-1, EN 61000-6-3, EN 61000-6-1

2. Code selection

Room controller: FH	-	x	M	x	S	H	1
Model: 3 digital outputs + 1 analogue output + 3 analogue inputs		2					
5 digital outputs + 0 analogue outputs + 3 analogue inputs		4					
Communication: Modbus			M				
Clock: Without clock				S			
With clock				C			
Internal sensor: Temperature + humidity						H	

3. Display, keypad and icons

	Display A
	Display B
	On/Off
	Timer extension on
	Clock setting
ECO	Economy function on
	General alarm
	Communications alarm
	Parameters menu
HEAT COOL	Operating season
	Dirty filter alarm
	Floor temperature too high while cooling
	Cooling on
	Condensation alarm
	Dehumidification on
	Floor temperature too high while heating
	Heating on
	Holiday function
	Fan speed
OFF ON	Display C Time zone number with status
Keypad	
	On/Off, navigation and confirm keys
	Change setpoint, navigation and modify value keys
	Speed type and ESC function in navigation keys
	Manual season or occupation change key or operating mode (see <i>"MODE button function"</i> page 22)

4. General description

The controller is used to manage a radiant panel heating or cooling system.

It may be configured to be used as MASTER or SLAVE controller.

The MASTER controller receives the information from the SLAVE controllers. The communication between the MASTER controller and the SLAVE controllers may be performed in 2 ways: contact communication, communication through Modbus RTU protocol.

- **Contact communication:**

the MASTER controller receives on its digital inputs the information from the digital contacts. The information is: regulation request and condensation alarm. The first information will activate the parts used for the generation of the delivery fluid at the requested temperature. The second information will interrupt the flow delivery as long as there is an abnormal condition.

This information may reach the MASTER controller from the SLAVE controllers or from the contact of the electrothermal thermal actuators of the plant..

- **Modbus communication:**

The FH controller may be equipped with a RS485 based communication system with Modbus RTU protocol. This feature allows the transmission of digital data between the two types of functions. The MASTER controller will cyclicly query all SLAVE controllers connected to it through the bus, to check if there is any current temperature request; in this case, other information such as alarms, dehumidification request, etc. may also travel on the Modbus line. We call this type of connection horizontal type Modbus, since it is likely that this type of application follows an equipment layout on the same level of the building.

For example: One (primary) level controller and “n” area controllers (SLAVE_X).

The Modbus communication also offers the possibility to use the controllers with a system that we call vertical, also in relation to the building view. In this case, the interconnected controllers are various level controllers suitable for producing the water for the radiant panels (SLAVE_Y). The advantage of connecting various level appliances through Modbus allows all controllers, from different levels, to know the value of a single external sensor. In the same way, the various level controllers send to the central controller (in this primary case) a request to start the system, avoiding in this way the connection of more electrical connections between the level and thermal generating unit.

The MASTER controller can manage up to 31 SLAVE controllers. The network must be composed of controllers with progressive addresses, starting from 1. In the event of a communication problem between the master and a slave node, the master indicates on the page of the alarms the first node with which communication is not successful (e.g. if the master is not properly communicating with the slave controller with address 5, the master indicates the message “*CE05*” in the alarm page)

The functions of the FH controller are divided into 2 categories:
fluid control and area control.

The fluid control controller may control:

- the column pump
- an area circulator
- a control valve
- a dehumidifier

The area control controller manages various areas (up to 4) and can control:

- 1 to 4 ON/OFF thermal actuators
- one ON/OFF 3-speed or EC fan, depending on the equipment model
- a dehumidifier
- one ON/OFF valve

Broadcast writing from MASTER to SLAVE

Registers:	Description:
MASTER_WR_ON_OFF	the MASTER controller ON/OFF sent depending on the I90 parameter (see paragraph "Switch off command from the MASTER controller to the SLAVE controllers:" page 20)
MASTER_WR_EXT_TEMP	Value of the external temperature sensor connected to the MASTER controller
MASTER_WR_SEASON	Operational season set on the MASTER controller
MASTER_WR_SUPPLY_T	Value of the delivery temperature on the MASTER controller
MASTER_WR_ALARM_DEWPOINT	Alarm for temperature control lower than dew temperature + I45 on the MASTER controller (see paragraph "20. Dew point function in cooling mode" page 59)
MASTER_WR_ALARM_CONDENS	Indication of condensation alarm from external contact (M04=4 or M05=4) connected to the MASTER controller
MASTER_WR_ALARM_GEN	Indication of general alarm from external contact (M04=6 or M05=6) connected to the MASTER controller
MASTER_WR_ALARM_LIM	Indication of limit alarm on the MASTER controller, if the limit function is enabled (see paragraph "17. Supply limits function" page 56)
MASTER_WR_ALARM_TEMP_CT	Indication of high temperature from external contact (M04=7 or M05=7) connected to the MASTER controller
MASTER_WR_AUTHORIZATION	Validity key of the broadcast data. Register value = 32478 if the sent data is valid Register value ≠ 32478 if the sent data is not valid

Data sent by the MASTER controller prevail over the local settings performed on the SLAVE controllers.

SLAVE FROM MASTER register reading

Registers:	Description:
MASTER_RD_REG_ACTIVATION	Fluid control request (request for column pump, circulator activation and valve control)
MASTER_RD_DEHUM_REQUEST	Dehumidification activation request
MASTER_RD_DEWPOINT_SLAVE	Dew temperature value + I45 of the slave controller
MASTER_RD_ALARM_DEWPOINT	Alarm for temperature lower than dew temperature + I45 on the SLAVE controller
MASTER_RD_ALARM_CONDENS	Indication of condensation alarm from external contact (M04=4 or M05=4) connected to the SLAVE controller


Sequence of messages sent or received by the MASTER controller:

Time (seconds)	Messages on the Modbus network
0	MASTER reading of the SLAVE 1 controller registries
↓	
1	MASTER reading of the SLAVE 2 controller registries
↓	
2	MASTER reading of the SLAVE 3 controller registries
↓	
⋮	⋮
↓	
n (*)	MASTER reading of the SLAVE n (I85) controller registries
↓	
n + 1	Broadcast writing from the MASTER controller to all SLAVE controllers

(*) Number n depends on the number of available slaves. To optimize the Modbus communication, set the parameter I85=n. If at least one SLAVE controller requires fluid control, the MASTER controller activates the column pump, the circulator and controls the valve.

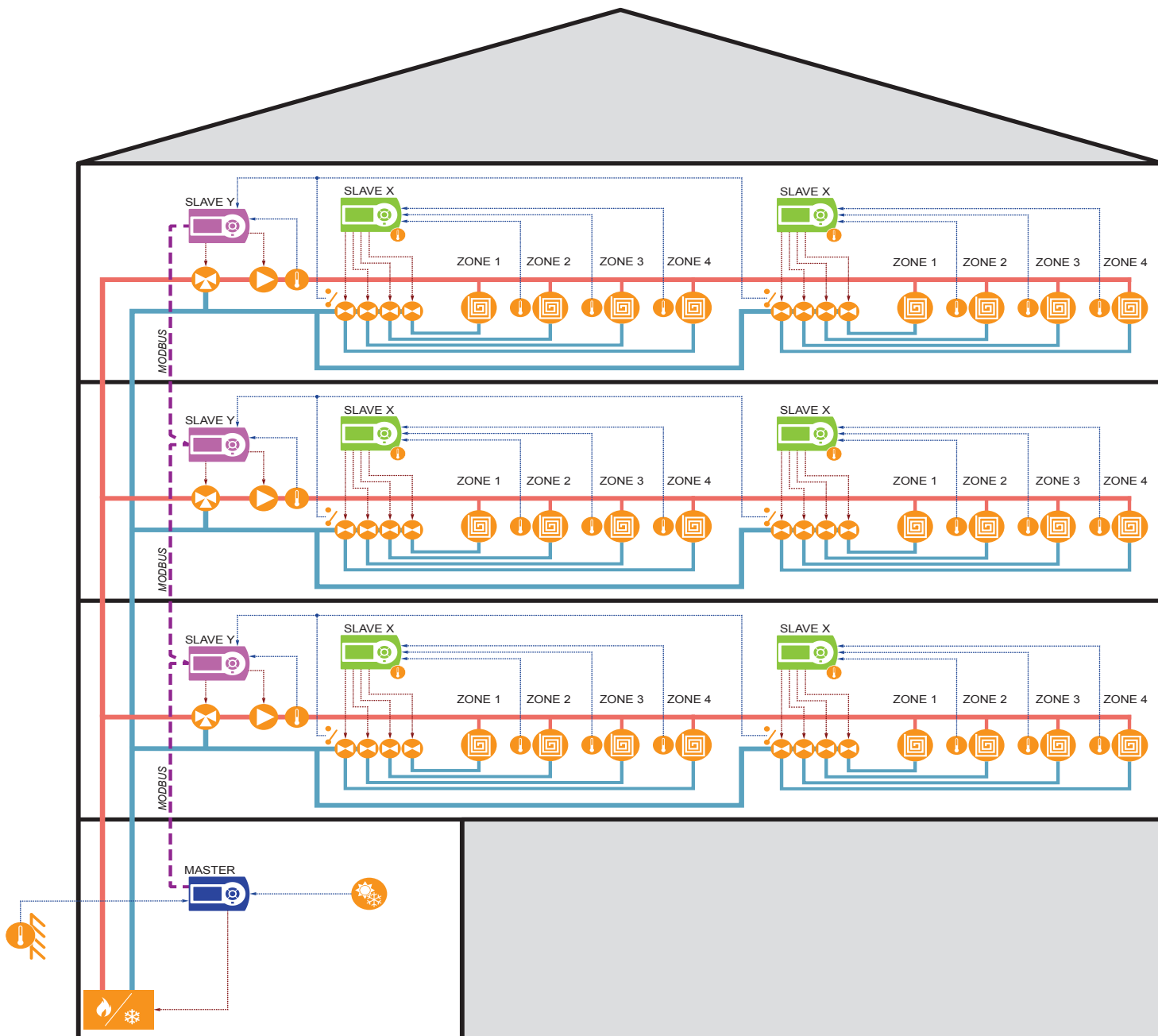
If at least one SLAVE controller sends the dehumidification activation request, the MASTER controller activates the dehumidifier if this is available in the configuration of the MASTER controller.

If at least one SLAVE_X controller indicates the dew or condense point, the fluid control is no longer performed on the MASTER controller (column pump, circulator and valve are disabled, the dehumidifier, if any, is enabled). See paragraph "26. Alarms" page 63.

If the communication between the MASTER controller and the SLAVE controller is interrupted, after 120 seconds, the SLAVE controller displays the flashing icon  and continues controlling based on its local settings.











Note: The MASTER controller is also able to manage a system without a slave controller composed of a pump, control valve, thermal actuator and any dehumidifier to control a single area.

The next pages contain system examples.

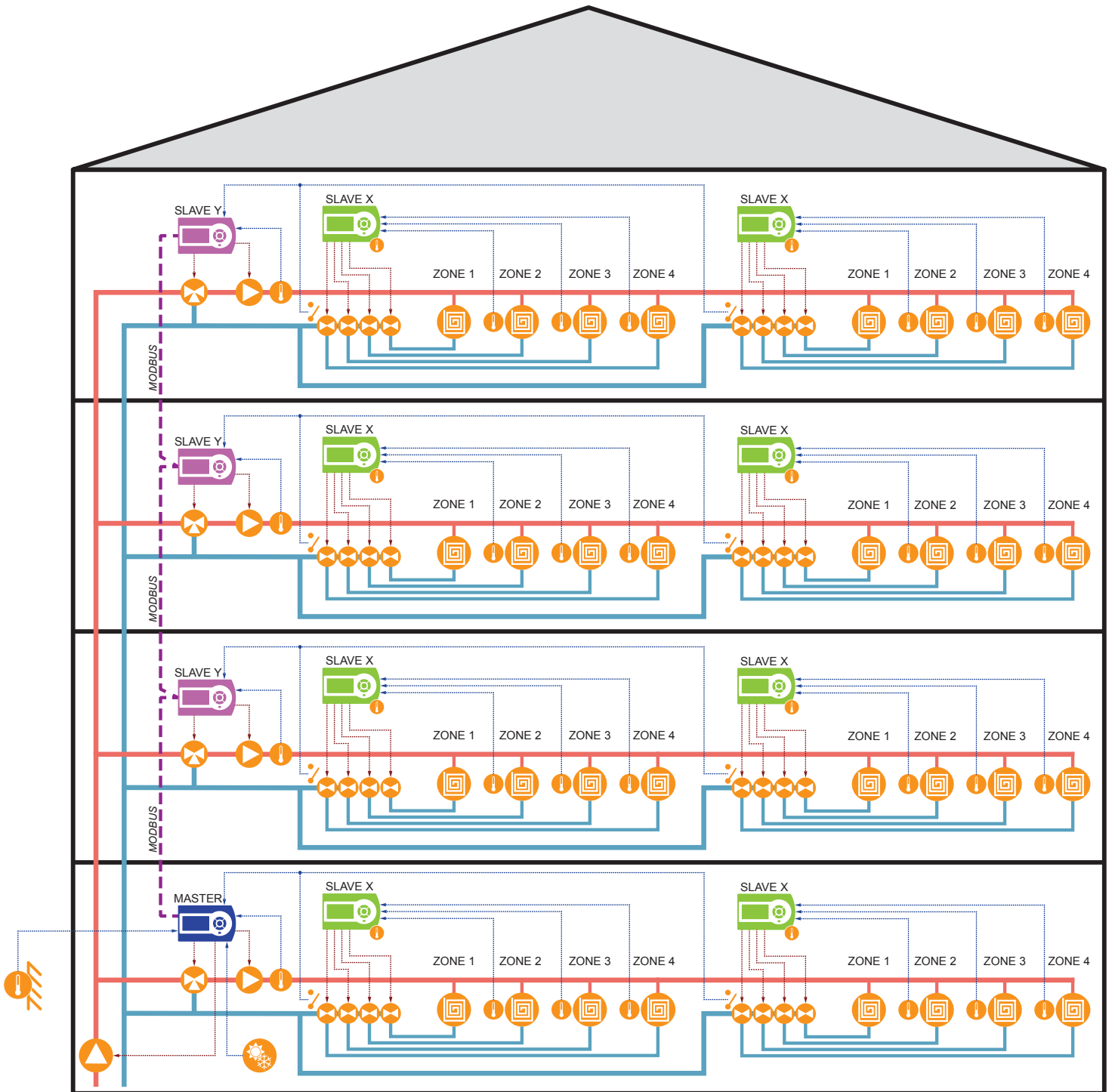


The SLAVE_X controllers send the regulation request to the SLAVE_Y controller, through contact. The activation contact may be the one from the electrothermal actuator or the one from the SLAVE_X controller (only for certain configurations).

Key:











-  remote season change,
-  external temperature sensor,  temperature sensor,
-  hot/cold water generator,  column pump,
-  valve,  circulator,  floor hydraulic circuit,
-  thermal actuator,  thermal actuator with limit switch contact.

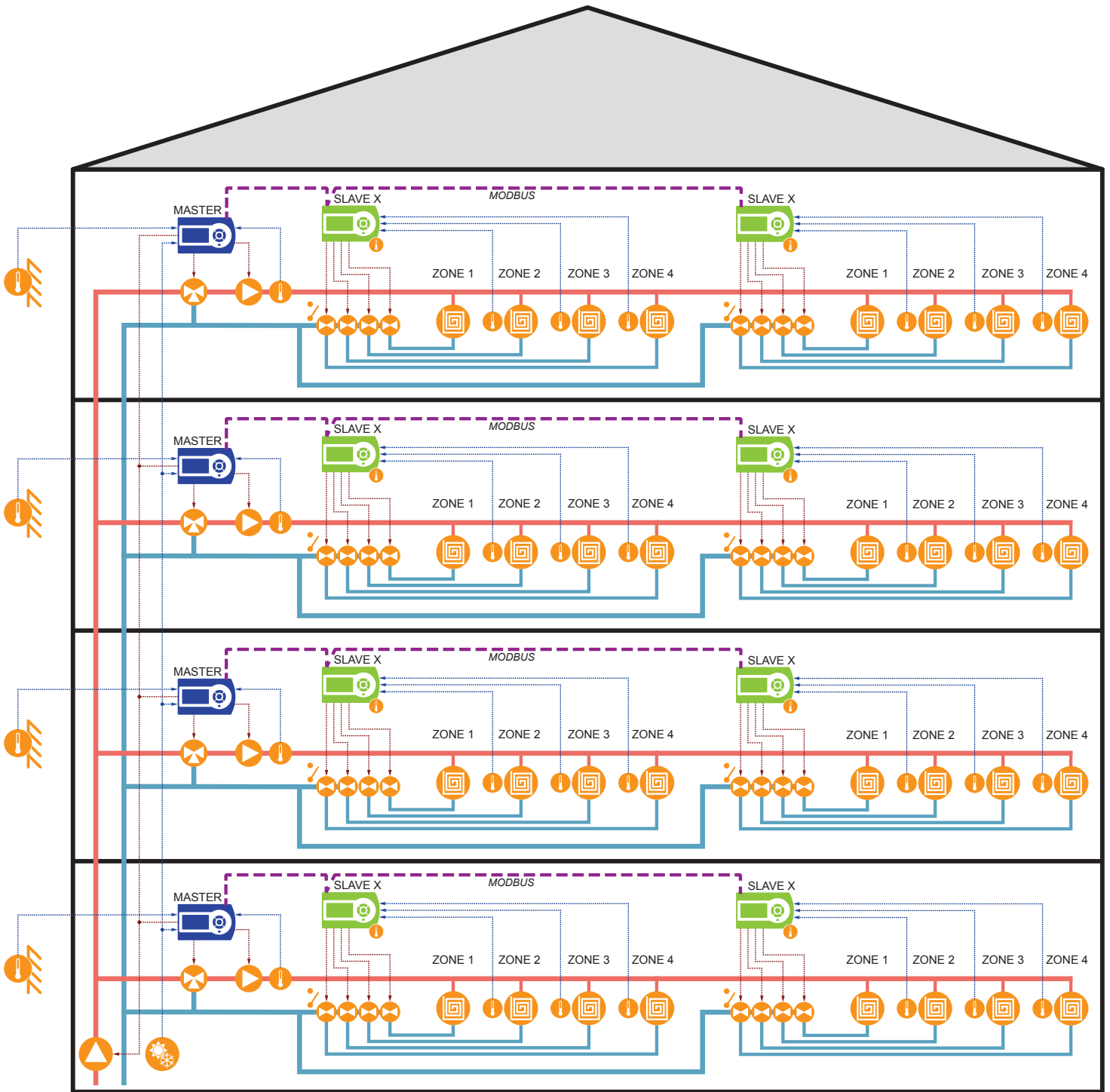
Vertical Modbus network between the MASTER controller and the SLAVE_Y controllers



Certain SLAVE_X controllers send the regulation request to the SLAVE_Y through the contact, others to the MASTER controller. The activation contact may be the one from the electrothermal actuator or the one from the SLAVE_X controller (only for certain configurations).

Key:

-  remote season change,
-  external temperature sensor,  temperature sensor,
-  hot/cold water generator,  column pump,
-  valve,  circulator,  floor hydraulic circuit,
-  thermal actuator,  thermal actuator with limit switch contact.













Each MASTER controller is independent from other MASTER controllers and is connected through Modbus to SLAVE_X controllers.

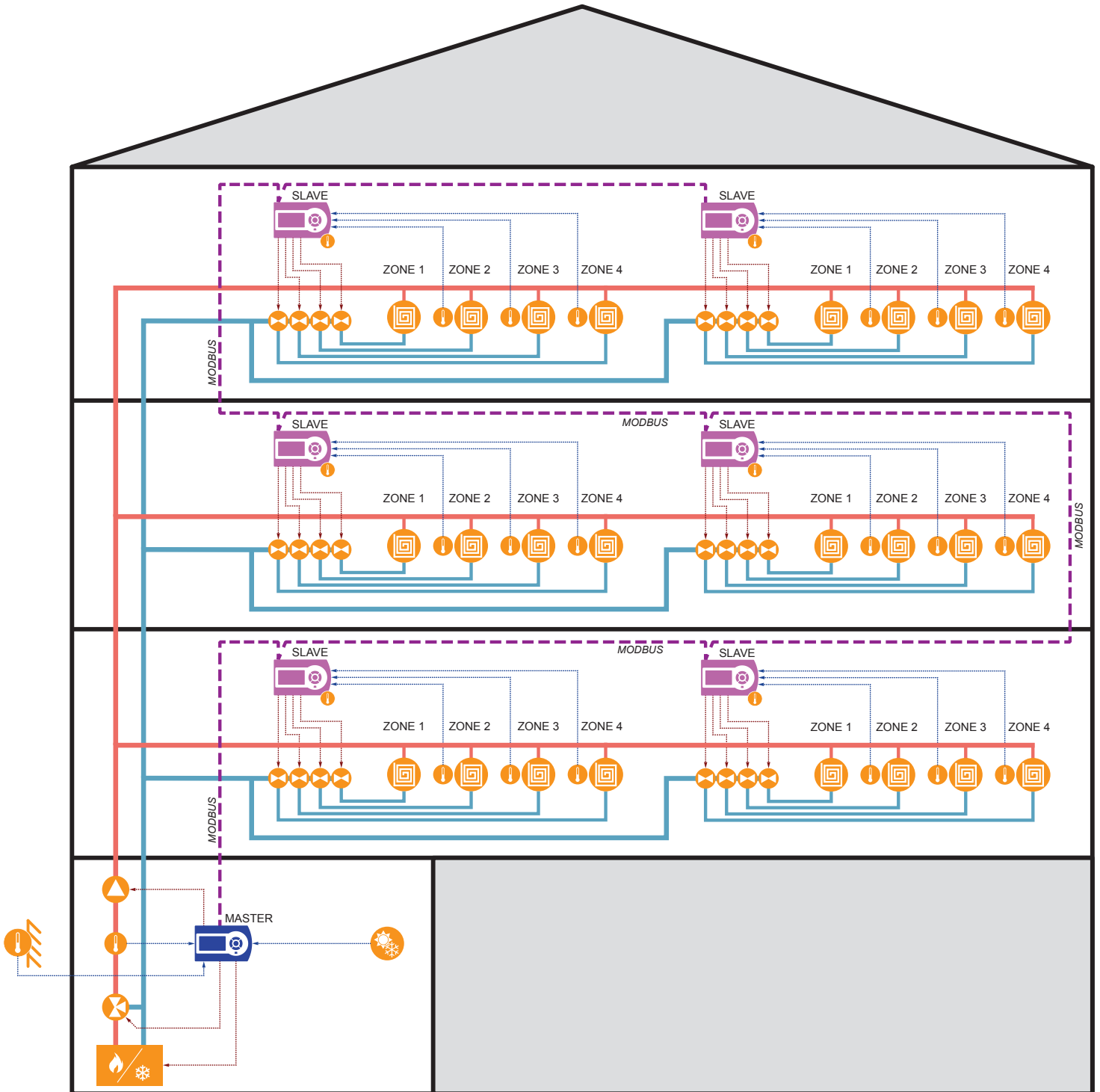
The column pump is controlled by all MASTER controllers.

Each MASTER controller will have an external sensor, if necessary.

Key:











-  remote season change,
-  external temperature sensor,  temperature sensor,
-  hot/cold water generator,  column pump,
-  valve,  circulator,  floor hydraulic circuit,
-  thermal actuator,  thermal actuator with limit switch contact.

Single Modbus network between the MASTER controller and the SLAVE_X controllers

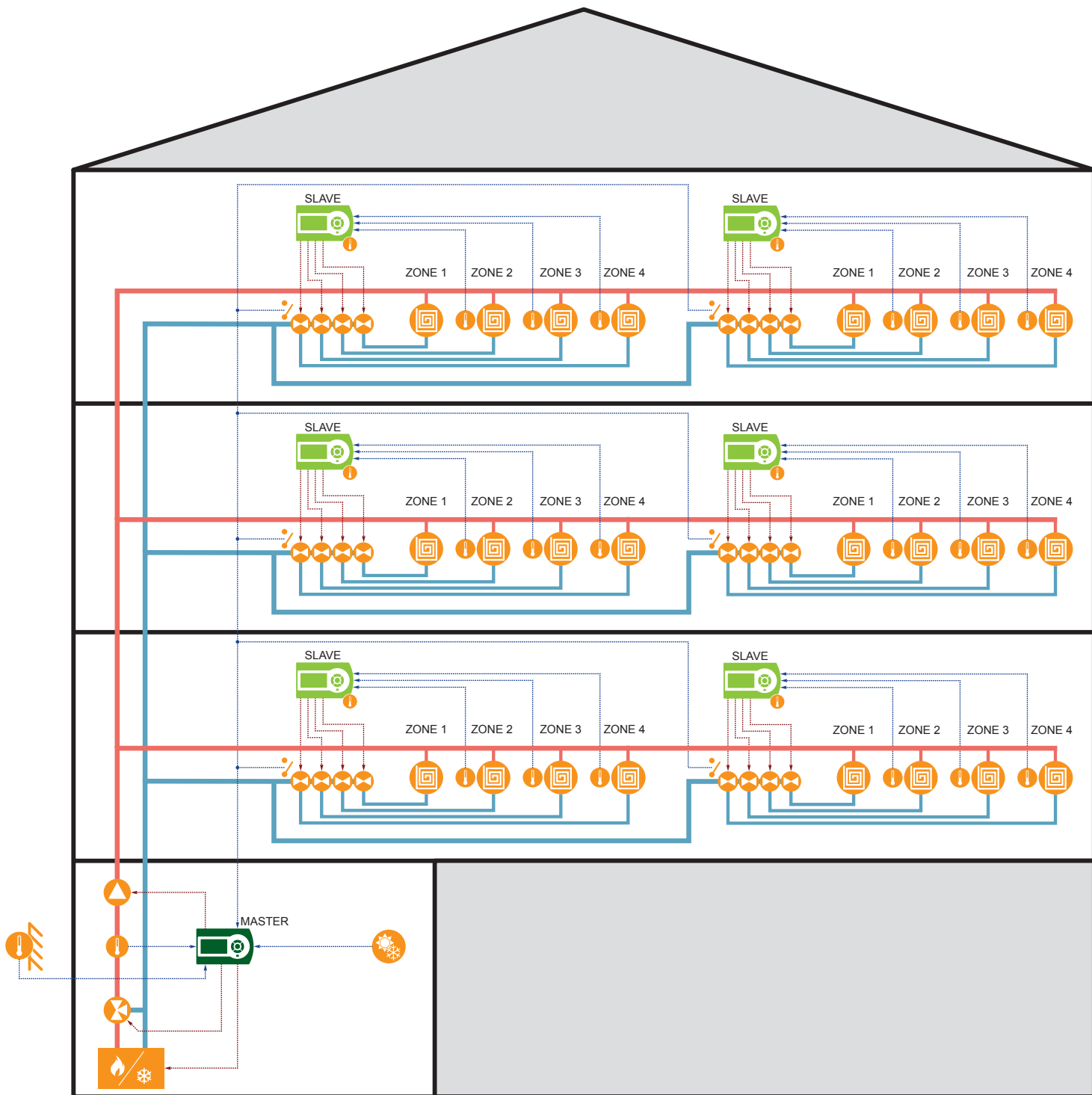


The MASTER controller is connected through Modbus to the SLAVE_X controllers.
The column pump is controlled by the MASTER controller.

Key:











-  remote season change,
-  external temperature sensor,  temperature sensor,
-  hot/cold water generator,  column pump,
-  valve,  circulator,  floor hydraulic circuit,
-  thermal actuator,  thermal actuator with limit switch contact.

Network without Modbus

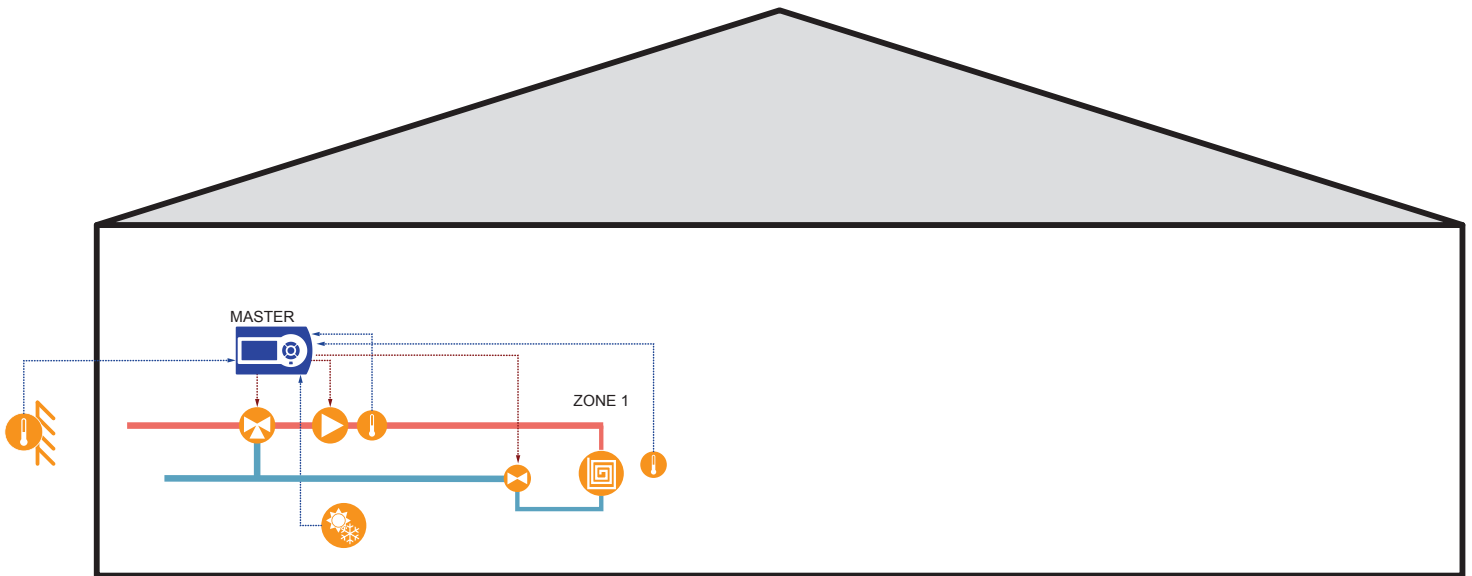


The MASTER controller receives certain information only through the digital inputs

Key:








-  remote season change,
-  external temperature sensor,  temperature sensor,
-  hot/cold water generator,  column pump,
-  valve,  circulator,  floor hydraulic circuit,
-  thermal actuator,  thermal actuator with limit switch contact.

MASTER controller without slave for single area control

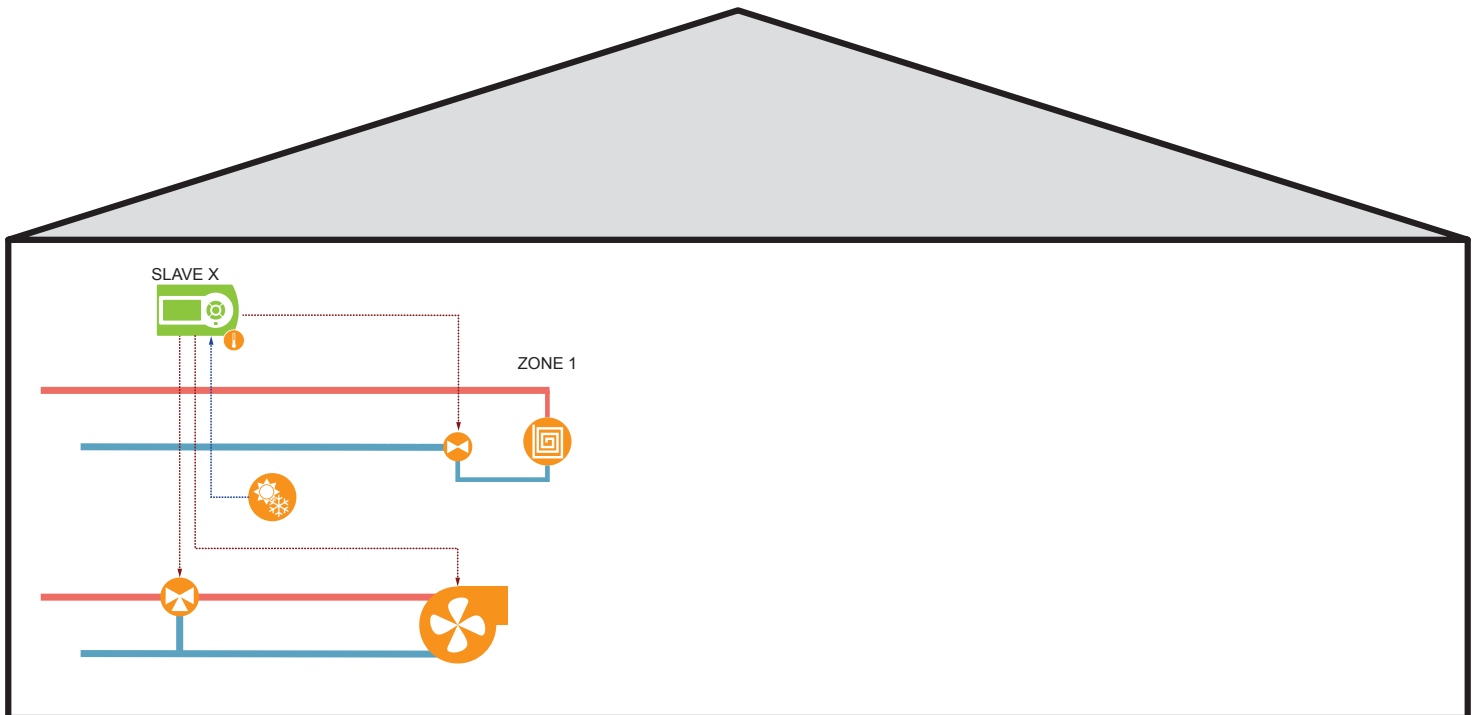


The MASTER controller controls a single area (vds [“5. Configurations table” page 16](#))

Key:

-  external temperature sensor,  temperature sensor,
-  valve,  pump,  floor hydraulic circuit,
-  remote season change,  thermal actuator.

SLAVE controller without master for single area control, fan-coil + valve



5. Configurations table

• MASTER controller or SLAVE Y controller:

Configuration	Controller type	Column pump	Thermal actuator zone 2	Dehumidifier ON/OFF	Valve 0..10 V zone1	Valve ON/OFF	Output configurable
- 4	FH-2 or FH-4	DO1 (M 15 = 12)	DO2 (M 16 = 7)	-	-	DO3 (M 17 = 10)	DO5 (Note 2)
- 3	FH-2	DO1 (M 15 = 12)	DO2 (M 16 = 7)	-	AO1 (M 20 = 1)	-	DO3 (Note 2)
- 2	FH-4	DO1 (M 15 = 12)	DO2 (M 16 = 7)	DO3 (M 17 = 5)	-	DO4 (M 18 = 10)	DO5 (Note 2)
- 1	FH-2	DO1 (M 15 = 12)	DO2 (M 16 = 7)	DO3 (M 17 = 5)	AO1 (M 20 = 1)	-	-
Configuration	Controller type	Column pump	Circulator	Dehumidifier ON/OFF	Valve 0..10 V	Valve ON/OFF	Output configurable
0 (Note 1)	FH-2 or FH-4	-	-	-	-	-	-
1	FH-2	DO1 (M 15 = 12)	DO2 (M 16 = 11)	DO3 (M 17 = 5)	AO1 (M 20 = 1)	-	-
2	FH-4	DO1 (M 15 = 12)	DO2 (M 16 = 11)	DO3 (M 17 = 5)	-	DO4 (M 18 = 10)	DO5 (Note 2)
3	FH-2	DO1 (M 15 = 12)	DO2 (M 16 = 11)	-	AO1 (M 20 = 1)	-	DO3 (Note 2)
4	FH-2 or FH-4	DO1 (M 15 = 12)	DO2 (M 16 = 11)	-	-	DO3 (M 17 = 10)	DO5 (Note 2)

Note 1: for the 0 configuration, all outputs are disabled and the digital and analogue inputs are set to default values.

• SLAVE X controller

Control with one sensor/zone:

Configuration	Type controller	Thermal actuator zone 1	Thermal actuator zone 2	Thermal actuator zone 3	Thermal actuator zone 4	Fan zone 1	Fan zone 2	Dehumidifier ON/OFF	Output configurable
5	FH-2 or FH-4	DO1 (M 15 = 6)	-	-	-	-	-	DO2 (M 16 = 5)	DO5 (Note 2)
6	FH-2 or FH-4	DO1 (M 15 = 6)	DO2 (M 16 = 7)	-	-	-	-	DO3 (M 17 = 5)	DO5 (Note 2)
7	FH-4	DO1 (M 15 = 6)	DO2 (M 16 = 7)	DO3 (M 17 = 8)	-	-	-	DO4 (M 18 = 5)	DO5 (Note 2)
8	FH-4	DO1 (M 15 = 6)	DO2 (M 16 = 7)	DO3 (M 17 = 8)	DO4 (M 18 = 9)	-	-	DO5 (M 19 = 5)	-
9	FH-2 or FH-4	DO1 (M 15 = 6)	-	-	-	ON/OFF DO2 (M 16 = 3)	-	DO3 (M 17 = 5)	DO5 (Note 2)
10	FH-4	DO1 (M 15 = 6)	DO2 (M 16 = 7)	-	-	ON/OFF DO3 (M 17 = 3)	ON/OFF DO4 (M 18 = 4)	DO5 (M 19 = 5)	-
11	FH-4	DO1 (M 15 = 6)	DO2 (M 16 = 7)	DO3 (M 17 = 8)	-	ON/OFF DO4 (M 18 = 3)	-	DO5 (M 19 = 5)	-
12	FH-4	DO1 (M 15 = 6)	-	-	-	3 speeds DO2, DO3, DO4 (M 16 = 0, M 17 = 1, M 18 = 2)	-	DO5 (M 19 = 5)	-
13	FH-2	DO1 (M 15 = 6)	-	-	-	0..10 V AO1 (M 20 = 0)	-	DO5 (M 19 = 5 / 10)	DO3 (Note 2)
14	FH-2	DO1 (M 15 = 6)	DO2 (M 16 = 7)	-	-	0..10 V AO1 (M 20 = 0)	-	DO2 (M 16 = 5 / 10)	-
15	FH-2	DO1 (M 15 = 6)	DO2 (M 16 = 7)	DO3 (M 17 = 8)	-	0..10 V AO1 (M 20 = 0)	-	-	-

• SLAVE X controller

Control with one sensor/zone, zone 1 has several thermal actuators that are controlled in order:

Configuration	Controller type	Thermal actuator 1 zone 1	Thermal actuator 2 zone 1	Thermal actuator 3 zone 1	Thermal actuator 4 zone 1	Fan 1 zone 1	Fan 2 zone 1	Dehumidifier ON/OFF	Configurable output
16	FH-2 or FH-4	DO1 (M15 = 6)	DO2 (M15 = 7)	-	-	-	-	DO3 (M17 = 5)	DO5 (Note 2)
17	FH-4	DO1 (M15 = 6)	DO2 (M15 = 7)	DO3 (M17 = 8)	-	-	-	DO4 (M18 = 5)	DO5 (Note 2)
18	FH-4	DO1 (M15 = 6)	DO2 (M15 = 7)	DO3 (M17 = 8)	DO4 (M18 = 9)	-	-	DO5 (M19 = 5)	-
19	FH-4	DO1 (M15 = 6)	DO2 (M16 = 7)	-	-	ON/OFF DO3 (M17 = 3)	ON/OFF DO4 (M18 = 4)	DO5 (M19 = 5)	-
20	FH-4	DO1 (M15 = 6)	DO2 (M16 = 7)	DO3 (M17 = 8)	-	ON/OFF DO4 (M18 = 3)	-	DO5 (M19 = 5)	-
21	FH-2	DO1 (M15 = 6)	DO2 (M16 = 7)	-	-	0..10 V AO1 (M20 = 0)	-	DO3 (M17 = 5)	-
22	FH-2	DO1 (M15 = 6)	DO2 (M16 = 7)	DO3 (M17 = 8)	-	0..10 V AO1 (M20 = 0)	-	-	-

• SLAVE X controller

Control with one sensor/zone, zones 1 and 2 have 2 thermal actuators that are controlled in order:

Configuration	Controller type	Thermal actuator 1 zone 1	Thermal actuator 2 zone 1	Thermal actuator 3 zone 2	Thermal actuator 4 zone 2	Fan zone 1	Fan zone 2	Dehumidifier ON/OFF	Configurable output
23	FH-4	DO1 (M15 = 6)	DO2 (M16 = 7)	DO3 (M17 = 8)	DO4 (M18 = 9)	-	-	DO5 (M19 = 5)	-

Key:

- = not selected

DO1 = Digital output 1

DO2 = Digital output 2

DO3 = Digital output 3

DO4 = Digital output 4

DO5 = Digital output 5

AO1 = Analogue output 1

Note 2: see the explanations in paragraph “configurable digital output set up” below.

Configurable digital output set up

Configurations -2, -4, 2 and 4 related to the FH-4 controllers have the DO5 output configurable such as the indication for exceeded condensation or dew point (M19=13), control request (M19=14), season change (M19=15) or no function (M19=16).

Configurations 5, 6, 7, 9, 16, 17 related to the FH-4 controllers have the DO5 output configurable such as the indication for exceeded condensation or dew point (M19=13), control request (M19=14) or no function (M19=16).

Configurations -3 and 3 related to the FH-2 controllers have the DO3 output configurable such as the indication for exceeded condensation or dew point (M17=13), control request (M17=14), season change (M17=15) or no function (M17=16).

Configuration 12 related to the FH-4 controllers have the DO5 output configurable such as dehumidifier (M19=5 and M23=0) or on/off valve (M19=10 and M23=1).

Configurations 13 related to the FH-2 controllers have the DO2 output configurable such as dehumidifier (M16=5 and M23=0) or on/off valve (M16=10 and M23=1) and DO3 output configurable such as the indication for exceeded condensation or dew point (M17=13), control request (M17=14) or no function (M17=16).

The dehumidifier does not belong to any zone.

6. Configuration of quick access parameters

The controller provides the following functions with a simple press of a button:

- Switch on and off
- Configuration of the setpoint or setpoint offset
- Fan operating mode
- **MODE** button functionality

The **MODE** button can be assigned one quick access function and other normal access functions, depending on parameter $I74$ (see “[MODE button function](#)” page 22)

$I74=0$: season change (if it is local, for 2-pipe systems)

$I74=1$: zone 1 timer extension


$I74=2$: zone 2 timer extension

$I74=3$: zone 3 timer extension

$I74=4$: zone 4 timer extension

$I74=5$: operating mode (without clock, using time slots, holiday)

• Keypad lock

To lock the keypad, press buttons  at the same time; the display shows *LK* for one second. When any button is pressed, it is no longer possible to access the parameters and the display shows *LK*.


To unlock the keypad, press the buttons  again; the display shows *NLK* for one second.

• Switch on and off

Distinction can be made between two types of switch on/off commands:

- global command
- local command for one zone

The global command switches off all equipment and may be performed in 3 ways:

- manually using the  button,
- from an external contact,
- from the Modbus (solely for the SLAVE controller with Modbus)

The local command switches off only one zone and may be performed in two ways:

- manually by accessing parameters $OC1$ for zone 1, $OC2$ for zone 2, $OC3$ for zone 3, $OC4$ for zone 4
- automatically from the clock, programming the time slots of the 4 zones (if $I78=1$)


Global commands:

Switching on/off from an external contact has maximum priority. If the external contact is in OFF position, the equipment cannot be manually restarted or by Modbus or by time slots.

To use the external contact as a way of switching on or off the appliance, configure a digital input as “Remote On/Off” ($M04=1$ or $M05=1$).

Example for digital input 1 ($M04=1$):

Unit ON=		($M05=0$)
Unit OFF=		($M05=0$)
Unit ON=		($M05=1$)
Unit OFF=		($M05=1$)

If the external contact is on ON position or it is not configured with “Remote On/Off” functionality, appliance can be switched on or off by pressing button  (until *ON* or *OFF* is displayed) or through Modbus (through the **ON_OFF_VIA_MODBUS** register (see “[40. Modbus \(for FH-xMxSH1 models\)](#)” page 103).

The manual global switch on/off has the same priority as the one through Modbus. This means that if the appliance is globally off in manual mode, it can be restarted through Modbus or viceversa.

Local commands:

To use the switching on/off by time slots, configure parameter $I7B=1$ and set the switch on time slots (see "8. TIMER SLOTS operation and configuration (Model FH-xxCSH1)" page 31).

To manually switch off zone 1, set parameter $OC1$ to $OFF1$.

To manually switch off zone 2, set parameter $OC2$ to $OFF2$.

To manually switch off zone 3, set parameter $OC3$ to $OFF3$.

To manually switch off zone 4, set parameter $OC4$ to $OFF4$.

To switch off a zone via Modbus, write in the relevant register (see "40. Modbus (for FH-xMxSH1 models)" page 103).


To switch off area 1, write value 2 in the register **MANUAL_OCCUPANCY_ZONE_1**.

To switch off area 2, write value 2 in the register **MANUAL_OCCUPANCY_ZONE_2**.

To switch off area 3, write value 2 in the register **MANUAL_OCCUPANCY_ZONE_3**.

To switch off area 4, write value 2 in the register **MANUAL_OCCUPANCY_ZONE_4**.

Switch off command from the MASTER controller to the SLAVE controllers:

The MASTER controller may be switched off through external contact if one of the digital inputs is configured as "Remote On/Off" ($MO4=1$ or $MO5=1$), manually (by pressing button  or setting parameter $OC1$ to $OFF1$) or using time slots. Depending on the values of parameter $I9B$, switching off the MASTER controller may cause the horizontal controllers to switch off.

$I9B$	ON/OFF sent by the MASTER controller
0	ON/OFF not sent
1	ON/OFF from an external contact
2	Manual ON/OFF
3	Manual ON/OFF or from an external contact
4	ON/OFF from the time slots
5	ON/OFF from an external contact and from the time slots
6	Manual ON/OFF and from the time slots
7	Manual ON/OFF, from an external contact and from the time slots

Note: SLAVE_Y controllers are never switched off by the MASTER controller.

If the appliance is switched off, the display shows the mode in which it was switched off.



MR = global manual switch off using button .




rEM = switched off using remote contact.



MOd = switched off by Modbus.



L, Mb = switched off using time slots (if $I7B=1$). This mask is shown only on the MASTER controller.



If one zone is switched off, icon  will be lit on display for the displayed switched off zone.

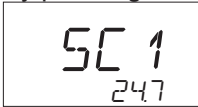
If the appliance is switched off globally, all outputs are disabled.



If one zone is switched off, only the outputs related to that area are disabled.

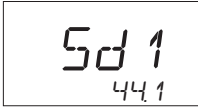
• Setpoint and setpoint offset configuration

Depending on the control method chosen, the room setpoint is set manually or calculated automatically.

- For balanced setpoint controls based on the external temperature, the operating setpoint is automatically calculated based on parameters $I47$ to $I54$ and the external temperature (see “18. Control with compensated setpoint” page 57). By pressing the  or  button, the user can only view the calculated balanced setpoint:








- For dew point + offset $I45$ controls during the summer season (see “19. Dew setpoint control during the summer season” page 58), the operating setpoint is automatically calculated based on the temperature and humidity sensors used for the calculation. By pressing the  or  button, the user can only view the dew setpoint:





- For the fixed point controls, it is possible to modify the setpoint of various zones $SE1$ (for the valve or thermal actuator 1), $SE2$ (for thermal actuator 2), $SE3$ (for thermal actuator 3), $SE4$ (for thermal actuator 4) corresponding to parameters $I06$, $I08$, $I10$, $I12$ (for the 2-pipe operation in heating mode) and $I07$, $I09$, $I11$, $I13$, (for the 2-pipe operation in cooling mode) if $I83=0$, or a setpoint variation of $\pm x^{\circ}\text{C}$ (controllable with parameter $I84$) if $I83=1$. Based on the selected configuration, a specific number of zones can be controlled. The setpoints related to those zones can be accessed.

If $I83=0$, press the button  or  to access the setpoints menu.





Press the  or  button to select the setpoint to be modified and the button  to enter edit mode; display B flashes with the current value of the parameter.


Then press the  or  button to change the value.

To exit the menu, press button  or  two times or wait for 5 seconds.

If $I83=1$ (COMFORT function activated), a change of $\pm x^{\circ}\text{C}$ to apply to the setpoint is defined by parameter $I84$.

This function is used when the application needs to set a setpoint which is not accessible to the user.

By pressing the  or  button, the value of the setpoint offset to be applied to the operating setpoints is displayed. The icon “°C” or “°F” flashes, based on the current operating unit. The value can be changed using the  or  button; every change is automatically saved.

To exit the setpoint configuration menu, wait 4 seconds or press the  button.



• Fan operating mode


Depending on the value of the selected configuration (parameter $M14$), the controller is able to control 1-speed or 3-speed ON/OFF fans, modulating 0..10 V fans or no fan.





To select operating with 1-speed fan, configure parameter $M14$ to 9, 10, 11, 19 or 20.

To select operating with 3-speed fan, configure parameter $M14$ to 12.

To select operating with modulating fans, configure parameter $M14$ to 13, 14, 15, 21, 22.



Press the button  and the icon  flashes together with the indication of the fan operating mode on display B.

Press the button  one or more times to select the speed for fans with multiple ON/OFF speeds or modulating fans ($M14 = 12, 13, 14, 15, 21, 22$).



 A	$RUL0$ =Automatic control,
 M	$SPE1$ =Control with speed 1,
 M	$SPE2$ =Control with speed 2,
 M	$SPE3$ =Control with speed 3.

The value is automatically saved.

To exit the menu, wait 4 seconds until display B stops flashing.


Note: Pressing the  button has no effect and Icon  is permanently disabled when no fan is controlled ($M14 = -4$ to 8, 16, 17, 18, 23).



MODE button function

The quick access function assigned to the MODE button is defined with parameter $I74$. The other functions can also be accessed by pressing the   buttons.

Quick access function using the MODE button:

- If $I74=0$ (quick access to the local season change configuration if no contact is configured as remote season change and for the SLAVE_X controllers no season definition command has been received via Modbus)


Press the  button, the “HEAT” (for heating) or “COOL” (for cooling) icon flashes depending on the current configuration and the same flashing text appears on display B.



Press the  button to change the setting. The value is automatically saved. To exit the menu, wait for 4 seconds or press the  button.

- If $I74=1$ (quick access to the zone 1 timer extension configuration or to zone 1 switch off)

The extended timer function extends operation with the base setpoint by excluding the economy function and the “non-occupied holiday” function for a time corresponding to parameter $I77$ if the time slots function parameter $I78=0$ (time slots for normal/economy function).

With $I78=1$ (switch on/off using time slots) the timer extension function extends ON mode by excluding the timer slots for a period of time corresponding to parameter $I77$.

Press button  one or more times to select the operating mode for zone 1:

- zone 1 without timer extension, the icon $NOC1$ flashes on display B
- zone 1 with timer extension, icons $OC1$ and  flash on display B.
- zone 1 off, text $OFF1$ flashes on display B and icon  turns on after the flashing text ceases for that zone.


The value is automatically saved.



To exit the menu, wait for 4 seconds or press the  button.

- If $I74=2$ (quick access to the zone 2 timer extension configuration or zone 2 switch off)


The extended timer function extends operation with the base setpoint by excluding the economy function and the “non-occupied holiday” function for a time corresponding to parameter $I77$ if the time slots function parameter $I78=0$ (timer for normal/economy function).

With $I78=1$ (switch on/off using time slots) the timer extension function extends ON mode by excluding the timer slots for a period of time corresponding to parameter $I77$.

Press button  one or more times to select the operating mode for zone 2:

- zone 2 without timer extension, the icon $NOC2$ flashes on display B
- zone 2 with timer extension, icons $OC2$ and  flash on display B.
- zone 2 off, text $OFF2$ flashes on display B and icon  turns on after the flashing text ceases for that zone.


The value is automatically saved.



To exit the menu, wait for 4 seconds or press the  button.

- If $I74=3$ (quick access to the zone 3 timer extension configuration or to zone 3 switch off)

The extended timer function extends operation with the base setpoint by excluding the economy function and the “non-occupied holiday” function for a time corresponding to parameter $I77$ if the time slots function parameter $I78=0$ (time slots for normal/economy function).

With $I78=1$ (switch on/off using time slots) the timer extension function extends ON mode by excluding the timer slots for a period of time corresponding to parameter $I77$.

Press button  one or more times to select the operating mode for zone 3:

- zone 3 without timer extension, the icon $NOC3$ flashes on display B
- zone 3 with timer extension, icons $OC3$ and  flash on display B.
- zone 3 off, text $OFF3$ flashes on display B and icon  turns on after the flashing text ceases for that zone.

The value is automatically saved.



To exit the menu, wait for 4 seconds or press the  button.

- If $I74=4$ (quick access to the zone 4 timer extension configuration or to zone 4 switch off)

The extended timer function extends operation with the base setpoint by excluding the economy function and the “non-occupied holiday” function for a time corresponding to parameter $I77$ if the time slots function parameter $I78=0$ (time slots for normal/economy function).

With $I78=1$ (switch on/off using time slots) the timer extension function extends ON mode by excluding the timer slots for a period of time corresponding to parameter $I77$.

Press button  one or more times to select the operating mode for zone 4:

- zone 4 without timer extension, the icon $NOC4$ flashes on display B.
- zone 4 with timer extension, icons $OC4$ and  flash on display B.
- zone 4 off, text $OFF4$ flashes on display B and icon  turns on after the flashing text ceases for that zone.

The value is automatically saved.


To exit the menu, wait for 4 seconds or press the  button.

- If $I74=5$ (quick access to the operating mode configuration)


The operating mode function is used to select whether to control with or without the time slots (if the parameter $I78=0$ control is done using the time slots see [“8. TIMER SLOTS operation and configuration \(Model FH-xxCSH1\)” page 31](#)) or with “non-occupied holiday” mode (see [“15. Season, operating setpoint, economy, holiday mode” page 53](#)).

Pressing button  will cause the following message to flash (with time slots function $I78=0$)


$NO-TM$ on display B (to control without the timer slots) or


$LT-Mb$ on display B and the icon  (to control using the time slots) or


$HOLY$ on display B and the  icon (to control in “non-occupied holiday” mode).

Pressing button  will cause the following message to flash (with time slots function $I78=1$)



$NO-TM$ on display B (for control with base setpoints) or

$HOLY$ on display B and the  icon (to control in “non-occupied holiday” mode).

Press the  button one or more times to select the control mode. The value is automatically saved.

To exit the menu, wait for 4 seconds or press the  button.

Non-quick access to the functions using the keypad



- If the MODE button quick access function is set to local season change ($I74=0$), to access the other functions press the  and  buttons at the same time to enter the menu for changing the extended running and operating mode functions:


Parameter	Description	Default	Min	Max.
$OC1$	Zone 1 timer extension off / with timer extension / off $nOC1$ = zone 1 timer extension off $OC1$ = zone 1 with timer extension (with the period of time corresponding to the parameter $I77$ this excludes the economy/boost and non-occupied holiday modes if $I78=0$ or the appliance remains switched on if $I78=1$) $OFF1$ = zone 1 off	$nOC1$	$OC1$	$OFF1$
$OC2$ (*)	Zone 2 timer extension off / with timer extension / off $nOC2$ = zone 2 without timer extension $OC2$ = zone 2 with timer extension (with the period of time corresponding to the parameter $I77$ this excludes the economy/boost and non-occupied holiday modes if $I78=0$ or the appliance remains switched on if $I78=1$) $OFF2$ = zone 2 off	$nOC2$	$OC2$	$OFF2$
$OC3$ (*)	Zone 3 timer extension off / with timer extension / off $nOC3$ = zone 3 without timer extension $OC3$ = zone 3 with timer extension (with the period of time corresponding to the parameter $I77$ this excludes the economy/boost and non-occupied holiday modes if $I78=0$ or the appliance remains switched on if $I78=1$) $OFF3$ = zone 3 off	$nOC3$	$OC3$	$OFF3$
$OC4$ (*)	Zone 4 timer extension off / with timer extension / off $nOC4$ = zone 4 timer extension off $OC4$ = zone 4 with timer extension (with the period of time corresponding to the parameter $I77$ this excludes the economy/boost and non-occupied holiday modes if $I78=0$ or the appliance remains switched on if $I78=1$) $OFF4$ = zone 4 off	$nOC4$	$OC4$	$OFF4$
MOd	Operating mode with $I78=0$: $nOrM$ = Operation without time slots EMb = Operation using the time slots $HOLY$ = Non-occupied holiday mode	$nOrM$	$nOrM$ EMb $HOLY$	
	Operating mode with $I78=1$: $nOrM$ = Normal operation with base setpoints $HOLY$ = Non-occupied holiday mode	$nOrM$	$nOrM$ $HOLY$	

(*) visible if the zone is available


Press the  or  button to select a parameter and the  button to enter change mode, display B flashes with the current parameter value.



Then press the  or  button to change the value.

Press the  button to save the configuration, or the  button to quit without saving the changes.

To exit the menu press the  button again or wait for about 10 seconds.


If timer extension is activated, the icon  flashes for the time set in parameter $I77$.

If the timer extension function is not active, the  icon is off.



- If the **MODE** button quick access function is set to timer extension / zone 1 off ($I74=1$), to access other functions press the  and  buttons together to enter the menu for setting the operating mode and season change functions.


Parameter	Description	Default	Min	Max.
<i>SEA</i>	Local season change (local season change configuration for 2-pipe systems): <i>HEAT</i> =Heating mode <i>COOL</i> =Cooling mode	<i>HEAT</i>	<i>HEAT</i>	<i>COOL</i>
<i>OC2</i> (*)	Zone 2 timer extension off / with timer extension / off <i>nOC2</i> = zone 2 without timer extension <i>OC2</i> = zone 2 with timer extension (with the period of time corresponding to the parameter <i>I77</i> this excludes the economy/boost and non-occupied holiday modes if $I78=0$ or the appliance remains switched on if $I78=1$) <i>OFF2</i> = zone 2 off	<i>nOC2</i>	<i>OC2</i>	<i>OFF2</i>
<i>OC3</i> (*)	Zone 3 timer extension off / with timer extension / off <i>nOC3</i> = zone 3 without timer extension <i>OC3</i> = zone 3 with timer extension (with the period of time corresponding to the parameter <i>I77</i> this excludes the economy/boost and non-occupied holiday modes if $I78=0$ or the appliance remains switched on if $I78=1$) <i>OFF3</i> = zone 3 off	<i>nOC3</i>	<i>OC3</i>	<i>OFF3</i>
<i>OC4</i> (*)	Zone 4 timer extension off / with timer extension / off <i>nOC4</i> = zone 4 timer extension off <i>OC4</i> = zone 4 with timer extension (with the period of time corresponding to the parameter <i>I77</i> this excludes the economy/boost and non-occupied holiday modes if $I78=0$ or the appliance remains switched on if $I78=1$) <i>OFF4</i> = zone 4 off	<i>nOC4</i>	<i>OC4</i>	<i>OFF4</i>
<i>MOd</i>	Operating mode with $I78=0$: <i>nOrM</i> =Operation without time slots <i>EMb</i> =Operation using the time slots <i>HOLY</i> =Non-occupied holiday mode	<i>nOrM</i>	<i>nOrM</i> , <i>EMb</i> , <i>HOLY</i>	
	Operating mode with $I78=1$: <i>nOrM</i> =Normal operation with base setpoints <i>HOLY</i> =Non-occupied holiday mode	<i>nOrM</i>	<i>nOrM</i> , <i>HOLY</i>	



(*) visible if the zone is available

Press the  or  button to select a parameter and the  button to enter change mode, display B flashes with the current parameter value.

Then press the  or  button to change the value.

Press the  button to save the configuration, or the  button to quit without saving the changes.

To exit the menu press the  button again or wait for about 10 seconds.



- If the **MODE** button quick access function is set to timer extension / zone 2 off ($I74=2$), to access other functions press the  and  buttons together to enter the menu for setting the operating mode and season change functions.


Parameter	Description	Default	Min	Max.
<i>SEA</i>	Local season change (local season change configuration for 2-pipe systems): <i>HEAT</i> =Heating mode <i>COOL</i> =Cooling mode	<i>HEAT</i>	<i>HEAT</i>	<i>COOL</i>
<i>OC 1</i>	Zone 1 timer extension off / with timer extension / off <i>nOC 1</i> = zone 1 timer extension off <i>OC 1</i> = zone 1 with timer extension (with the period of time corresponding to the parameter <i>I77</i> this excludes the economy/boost and non-occupied holiday modes if $I78=0$ or the appliance remains switched on if $I78=1$) <i>OFF 1</i> = zone 1 off	<i>nOC 1</i>	<i>OC 1</i>	<i>OFF 1</i>
<i>OC 3 (*)</i>	Zone 3 timer extension off / with timer extension / off <i>nOC 3</i> = zone 3 without timer extension <i>OC 3</i> = zone 3 with timer extension (with the period of time corresponding to the parameter <i>I77</i> this excludes the economy/boost and non-occupied holiday modes if $I78=0$ or the appliance remains switched on if $I78=1$) <i>OFF 3</i> = zone 3 off	<i>nOC 3</i>	<i>OC 3</i>	<i>OFF 3</i>
<i>OC 4 (*)</i>	Zone 4 timer extension off / with timer extension / off <i>nOC 4</i> = zone 4 timer extension off <i>OC 4</i> = zone 4 with timer extension (with the period of time corresponding to the parameter <i>I77</i> this excludes the economy/boost and non-occupied holiday modes if $I78=0$ or the appliance remains switched on if $I78=1$) <i>OFF 4</i> = zone 4 off	<i>nOC 4</i>	<i>OC 4</i>	<i>OFF 4</i>
<i>MOd</i>	Operating mode with $I78=0$: <i>nOrM</i> =Operation without time slots <i>L.Mb</i> =Operation using the time slots <i>HOLY</i> =Non-occupied holiday mode	<i>nOrM</i>	<i>nOrM</i> , <i>L.Mb</i> , <i>HOLY</i>	
	Operating mode with $I78=1$: <i>nOrM</i> =Normal operation with base setpoints <i>HOLY</i> =Non-occupied holiday mode	<i>nOrM</i>	<i>nOrM</i> , <i>HOLY</i>	



(*) visible if the zone is available

Press the  or  button to select a parameter and the  button to enter change mode, display B flashes with the current parameter value.

Then press the  or  button to change the value.

Press the  button to save the configuration, or the  button to quit without saving the changes.

To exit the menu press the  button again or wait for about 10 seconds.



- If the **MODE** button quick access function is set to timer extension / zone 3 off ($I74=3$), to access other functions press the  and  buttons together to enter the menu for setting the operating mode and season change functions.


Parameter	Description	Default	Min	Max.
<i>SEA</i>	Local season change (local season change configuration for 2-pipe systems): <i>HEAT</i> =Heating mode <i>COOL</i> =Cooling mode	<i>HEAT</i>	<i>HEAT</i>	<i>COOL</i>
<i>OC 1</i>	Zone 1 timer extension off / with timer extension / off <i>nOC 1</i> = zone 1 timer extension off <i>OC 1</i> = zone 1 with timer extension (with the period of time corresponding to the parameter <i>I77</i> this excludes the economy/boost and non-occupied holiday modes if $I78=0$ or the appliance remains switched on if $I78=1$) <i>OFF 1</i> = zone 1 off	<i>nOC 1</i>	<i>OC 1</i>	<i>OFF 1</i>
<i>OC 2</i> (*)	Zone 2 timer extension off / with timer extension / off <i>nOC 2</i> = zone 2 without timer extension <i>OC 2</i> = zone 2 with timer extension (with the period of time corresponding to the parameter <i>I77</i> this excludes the economy/boost and non-occupied holiday modes if $I78=0$ or the appliance remains switched on if $I78=1$) <i>OFF 2</i> = zone 2 off	<i>nOC 2</i>	<i>OC 2</i>	<i>OFF 2</i>
<i>OC 4</i> (*)	Zone 4 timer extension off / with timer extension / off <i>nOC 4</i> = zone 4 timer extension off <i>OC 4</i> = zone 4 with timer extension (with the period of time corresponding to the parameter <i>I77</i> this excludes the economy/boost and non-occupied holiday modes if $I78=0$ or the appliance remains switched on if $I78=1$) <i>OFF 4</i> = zone 4 off	<i>nOC 4</i>	<i>OC 4</i>	<i>OFF 4</i>
<i>MOd</i>	Operating mode with $I78=0$: <i>nOrM</i> =Operation without time slots <i>t.Mb</i> =Operation using the time slots <i>HOLY</i> =Non-occupied holiday mode	<i>nOrM</i>	<i>nOrM. t.Mb. HOLY</i>	
	Operating mode with $I78=1$: <i>nOrM</i> =Normal operation with base setpoints <i>HOLY</i> =Non-occupied holiday mode	<i>nOrM</i>	<i>nOrM. HOLY</i>	



(*) visible if the zone is available

Press the  or  button to select a parameter and the  button to enter change mode, display B flashes with the current parameter value.

Then press the  or  button to change the value.

Press the  button to save the configuration, or the  button to quit without saving the changes.

To exit the menu press the  button again or wait for about 10 seconds.



- If the **MODE** button quick access function is set to timer extension / zone 4 off ($I74=4$), to access other functions press the  and  buttons together to enter the menu for setting the operating mode and season change functions.


Parameter	Description	Default	Min	Max.
<i>SEA</i>	Local season change (local season change configuration for 2-pipe systems): <i>HEAT</i> =Heating mode <i>COOL</i> =Cooling mode	<i>HEAT</i>	<i>HEAT</i>	<i>COOL</i>
<i>OC 1</i>	Zone 1 timer extension off / with timer extension / off <i>nOC 1</i> = zone 1 timer extension off <i>OC 1</i> = zone 1 with timer extension (with the period of time corresponding to the parameter <i>I77</i> this excludes the economy/boost and non-occupied holiday modes if $I78=0$ or the appliance remains switched on if $I78=1$) <i>OFF 1</i> = zone 1 off	<i>nOC 1</i>	<i>OC 1</i>	<i>OFF 1</i>
<i>OC 2 (*)</i>	Zone 2 timer extension off / with timer extension / off <i>nOC 2</i> = zone 2 without timer extension <i>OC 2</i> = zone 2 with timer extension (with the period of time corresponding to the parameter <i>I77</i> this excludes the economy/boost and non-occupied holiday modes if $I78=0$ or the appliance remains switched on if $I78=1$) <i>OFF 2</i> = zone 2 off	<i>nOC 2</i>	<i>OC 2</i>	<i>OFF 2</i>
<i>OC 3 (*)</i>	Zone 3 timer extension off / with timer extension / off <i>nOC 3</i> = zone 3 without timer extension <i>OC 3</i> = zone 3 with timer extension (with the period of time corresponding to the parameter <i>I77</i> this excludes the economy/boost and non-occupied holiday modes if $I78=0$ or the appliance remains switched on if $I78=1$) <i>OFF 3</i> = zone 3 off	<i>nOC 3</i>	<i>OC 3</i>	<i>OFF 3</i>
<i>MOd</i>	Operating mode with $I78=0$: <i>nOrM</i> =Operation without time slots <i>L, Mb</i> =Operation using the time slots <i>HOLY</i> =Non-occupied holiday mode	<i>nOrM</i>	<i>nOrM, L, Mb, HOLY</i>	
	Operating mode with $I78=1$: <i>nOrM</i> =Normal operation with base setpoints <i>HOLY</i> =Non-occupied holiday mode	<i>nOrM</i>	<i>nOrM, HOLY</i>	



(*) visible if the zone is available

Press the  or  button to select a parameter and the  button to enter change mode, display B flashes with the current parameter value.

Then press the  or  button to change the value.

Press the  button to save the configuration, or the  button to quit without saving the changes.

To exit the menu press the  button again or wait for about 10 seconds.



- If the **MODE** button quick access function is set to operating mode ($I74=5$), to access the other functions press the  and  buttons together to enter the menu for setting the timer extension and season change functions.


Parameter	Description	Default	Min	Max.
<i>SEB</i>	Local season change (local season change configuration for 2-pipe systems): <i>HEAT</i> =Heating mode <i>COOL</i> =Cooling mode	<i>HEAT</i>	<i>HEAT</i>	<i>COOL</i>
<i>OC 1</i>	Zone 1 timer extension off / with timer extension / off <i>nOC 1</i> = zone 1 timer extension off <i>OC 1</i> = zone 1 with timer extension (with the period of time corresponding to the parameter <i>I77</i> this excludes the economy/boost and non-occupied holiday modes if <i>I78</i> =0 or the appliance remains switched on if <i>I78</i> =1) <i>OFF 1</i> = zone 1 off	<i>nOC 1</i>	<i>OC 1</i>	<i>OFF 1</i>
<i>OC 2</i> (*)	Zone 2 timer extension off / with timer extension / off <i>nOC 2</i> = zone 2 without timer extension <i>OC 2</i> = zone 2 with timer extension (with the period of time corresponding to the parameter <i>I77</i> this excludes the economy/boost and non-occupied holiday modes if <i>I78</i> =0 or the appliance remains switched on if <i>I78</i> =1) <i>OFF 2</i> = zone 2 off	<i>nOC 2</i>	<i>OC 2</i>	<i>OFF 2</i>
<i>OC 3</i> (*)	Zone 3 timer extension off / with timer extension / off <i>nOC 3</i> = zone 3 without timer extension <i>OC 3</i> = zone 3 with timer extension (with the period of time corresponding to the parameter <i>I77</i> this excludes the economy/boost and non-occupied holiday modes if <i>I78</i> =0 or the appliance remains switched on if <i>I78</i> =1) <i>OFF 3</i> = zone 3 off	<i>nOC 3</i>	<i>OC 3</i>	<i>OFF 3</i>
<i>OC 4</i> (*)	Zone 4 timer extension off / with timer extension / off <i>nOC 4</i> = zone 4 timer extension off <i>OC 4</i> = zone 4 with timer extension (with the period of time corresponding to the parameter <i>I77</i> this excludes the economy/boost and non-occupied holiday modes if <i>I78</i> =0 or the appliance remains switched on if <i>I78</i> =1) <i>OFF 4</i> = zone 4 off	<i>nOC 4</i>	<i>OC 4</i>	<i>OFF 4</i>

(*) visible if the zone is available

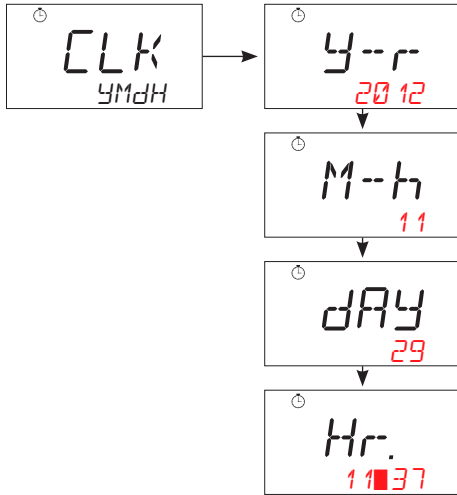
Press the  or  button to select a parameter and the  button to enter change mode, display B flashes with the current parameter value.

Then press the  or  button to change the value.

Press the  button to save the configuration, or the  button to quit without saving the changes.

To exit the menu press the  button again or wait for about 10 seconds.

7. DATE and TIME setting (Model FH-xxCSH1)



Press the and buttons together.
CLK appears on display A and *YMDH* on display B.
 Press the button to enter the date and time setting menu.

Parameter	Description	Min	Max.
<i>CLK</i>	Date and time setting menu		
<i>Y-r</i>	Year	2012	2100
<i>M-h</i>	Month	1	12
<i>dAY</i>	Day	1	31
<i>Hr.</i>	Time (hour)	0	23
	Time (minutes)	0	59

Press the or button to select a parameter to be modified and the button to enter edit mode; display B flashes with the current value of the parameter.

Then press the or button to change the value.

Press the button to save the configuration, or the button to quit without saving the changes.

To exit the menu press the button again or wait for about 120 seconds.

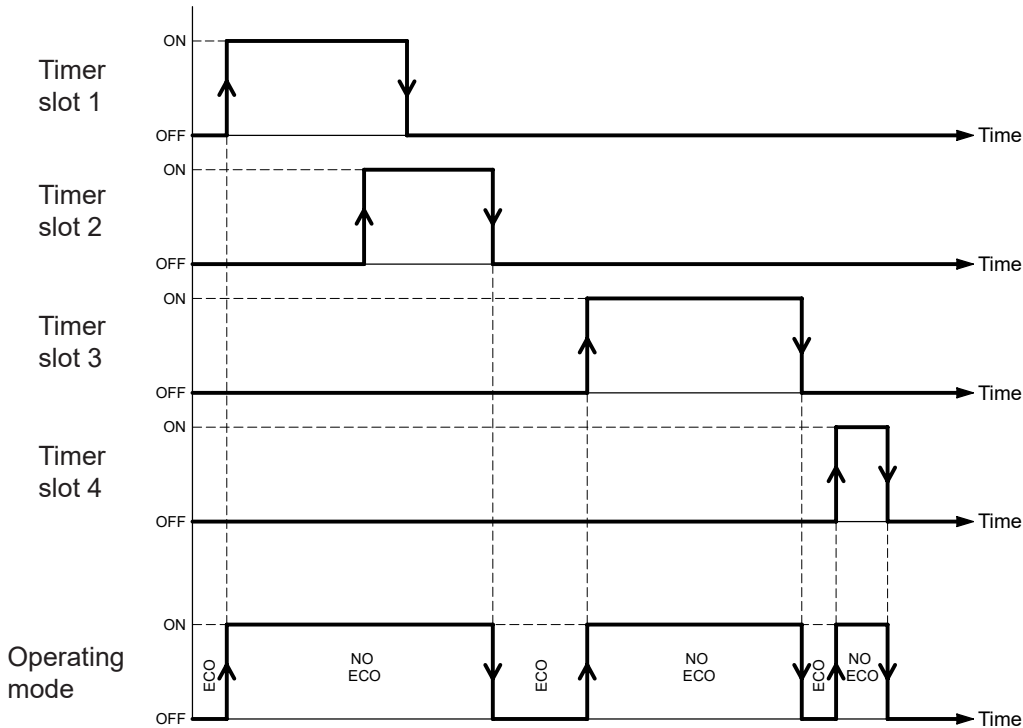
Note: setting parameter *I 76*=1 for European zone or *I 76*=2 for USA zone, the device is able to automatically update summertime. If parameter *I 76*=0 (other region), the automatic update to summertime is disabled.

8. TIMER SLOTS operation and configuration (Model FH-xxCSH1)

Depending on parameter $I7B$, the time slots can be assigned to normal/economy control ($I7B=0$) or to switch on/off the appliance ($I7B=1$).

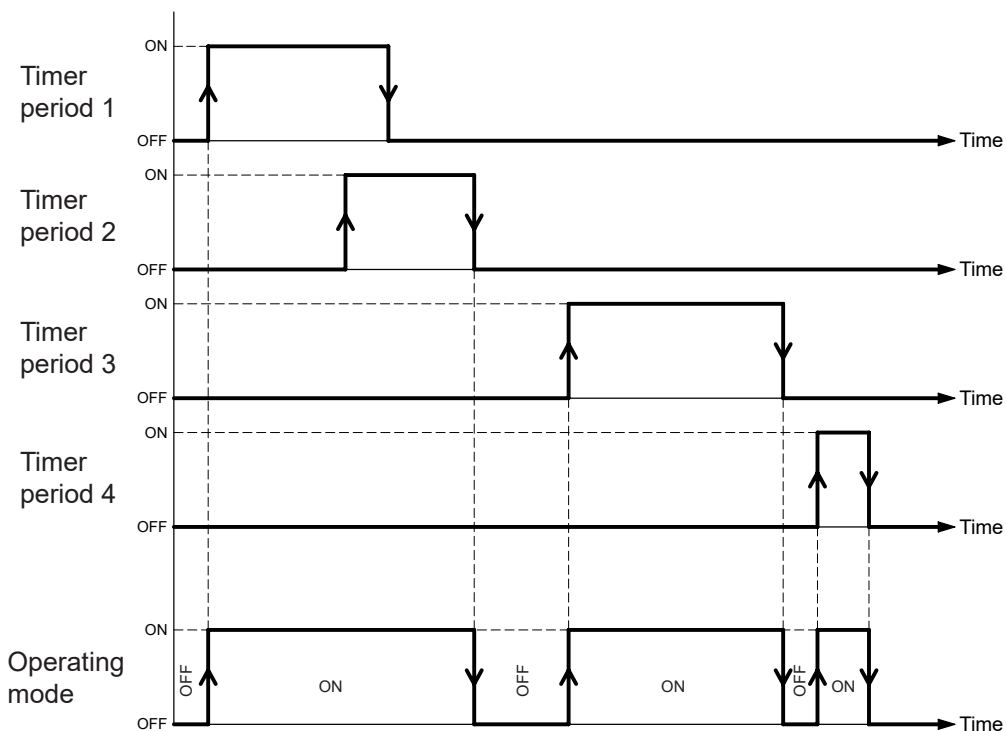
A maximum of 4 time slots can be used for each zone per day.

- With $I7B=0$ control is normal within an ON period (control with base setpoints). Outside ON period, the controller works in economy mode (see [“15. Season, operating setpoint, economy, holiday mode” page 53](#)).



ECO = economy mode, NO ECO = normal mode (control with base setpoint).

- With $I7B=1$ the appliance is switched on within an ON period. Outside ON period, the controller is switched off.





OFF = appliance switched off, ON = appliance switched on.

To operate using the time slots, set the start time (ON) and the end time (OFF).


If the start time (ON) is equal or subsequent to the end time (OFF), the corresponding timer slot is ignored.

If one timer slot is included on another timer slot, the first start time and the last end time will be used by the system.

To modify a timer slot of a certain zone, use the following procedure.

Press the  and  buttons together, the main menu is displayed:



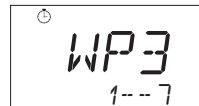
Press button  one or more times to select the time slots of the zone to be modified. The screen is displayed:



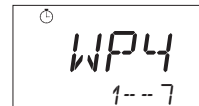
for zone 1,




for zone 2,



for zone 3,




for zone 4.

Press the  button, the screen appears with the number 1 flashing corresponding to period 1:




Press the  or  button to select the timer slot to be modified.



Press the  button, the screen is displayed showing the day of the flashing timer slot:






Press the  or  button to select the required day.


Press the  button, the screen displays the day, timer slot number and the starting time (ON) of the flashing period:



Press the  or  button to select the desired hour.

Press the  button, the timer slot starting time stops flashing and is saved to the memory. The minutes field of the start of the selected timer slot starts flashing.


Press the  or  button to select the desired minutes.



Press the  button, the minutes of the starting time of the timer slot stop flashing and are saved to the memory.


The screen for setting the end time of the timer slot in question is displayed:




Press the  or  button to select the desired hour.

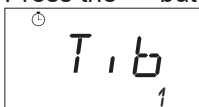
Press the  button, the timer slot end time stops flashing and is saved to the memory. The minutes field of the end of the selected timer slot starts flashing.


Press the  or  button to select the desired minutes.

Press the  button, the minutes of the end time of the timer slot stop flashing and are saved to the memory.

The screen for selecting the timer slot day is displayed (flashing).

Press the  button to return to the timer slot selection menu:



Press the  button to return to the main menu or repeat the procedure to set another timer slot.

Parameter	Description	Min	Max.
<i>WP1</i>	Zone 1 timer slot configuration menu		
<i>WP2</i>	Zone 2 timer slot configuration menu		
<i>WP3</i>	Zone 3 timer slot configuration menu		
<i>WP4</i>	Zone 4 timer slot configuration menu		
<i>T, b</i>	Timer slot selection	1	4
<i>X</i>	Day of the week <i>Mon</i> = Monday; <i>TUE</i> = Tuesday; <i>WEd</i> = Wednesday; <i>Thu</i> = Thursday; <i>Fri</i> = Friday; <i>SAT</i> = Saturday; <i>Sun</i> = Sunday	<i>Mon</i>	<i>Sun</i>
ON	Start of timer slot (hours)	0	23
	Start of timer slot (minutes)	0	59
OFF	End of timer slot (hours)	0	23
	End of timer slot (minutes)	0	59


Note: depending on the selected configuration, the timer slots of zones that are not controlled cannot be accessed.
Example: if configuration 6 ($M^{14}=6$) is selected, two zones, 1 and 2, can be controlled. The timer slots of zones 3 and 4 cannot be accessed (*WP3* and *WP4* displays are not visible).

9. TIMER SLOTS duplication (Model FH-xxCSH1)

It is possible to copy the configuration of the timer slots from one day to another, or to 5 days from Monday to Friday, or to 2 days from Saturday to Sunday for a certain zone, or it is possible to copy all time slots from one zone to another.

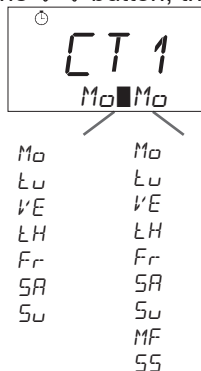
• Timer slots duplication from one day to another of a zone:

To copy the timer slots from one day to another, follow the procedure described below.

Press the  and  buttons together, the main menu is displayed:





Press the  button, the following screen of the considered zone is displayed: For example, for zone 1:



Day to be copied: destination day



Press the  button, the day to be copied flashes.

Select the day to copy with the  and  buttons.

Press the  button, the day to which the time slots will be copied starts to flash.

Select the target day with the  and  buttons.

If you set "MF" as the target value, the timer slots of the selected day will be copied to the days from Monday to Friday.
If you set as target the value "SS", the timer slots of the selected day will be copied to Saturday and Sunday.

Press the  button to make the duplication or press the  button to cancel.


Parameter	Description	Min	Max.
CTx	Copy time slots (Mo, Lu, UE, LH, Fr, SA, Su)	Mo	SS
Mo	Monday		
Lu	Tuesday		
VE	Wednesday		
LH	Thursday		
Fr	Friday		
SA	Saturday		
Su	Sunday		
MF	copy to Monday, Tuesday, Wednesday, Thursday and Friday		
SS	copy to Saturday and Sunday		

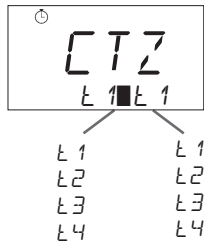
• Timer slots duplication of a zone:

To copy all timer slots from one zone to another, follow the procedure below:


Press the  and  buttons together, the main menu is displayed:





Press the  button until the following screen is displayed:



Timer slots of zone to be copied: target zone

Press the  button, the zone to be copied flashes.

Select the zone to be copied using the  and  buttons.

Press the  button, the target zone to which the copy will be performed starts to flash.



Press the  button to make the duplication or press the  button to cancel.

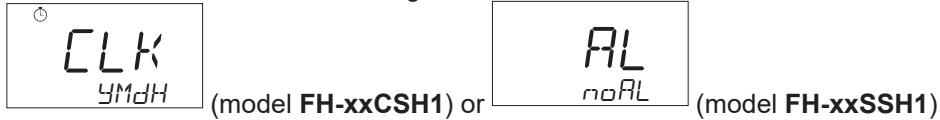
Parameter	Description	Min	Max.
CTZ	Timer slots duplication of a zone:	L 1	L 4
L 1	Zone 1 timer slots		
L 2	Zone 2 timer slots		
L 3	Zone 3 timer slots		
L 4	Zone 4 timer slots		



Note: if the selected configuration has only one zone, parameter CTZ is not displayed.

10. Parameter factory settings (level 1 password)

The parameter factory settings are password protected.

Press the  and  buttons together to access the main menu. The following screen is displayed:





Press the  or  button to display the following screen:








Press the  button and then the  button until the value **22** is displayed.


Press the  button to access level 1. The screen corresponding to the first level 1 parameter is displayed:



Use the  or  button to scroll through the parameters.

To modify a parameter press the  button and then the  or  buttons to select its value.

Press the  button to save the value or the  button to exit the parameter editing mode without saving.

To exit the menu, press the  button one or more times or wait for about 120 seconds.

Parameter	Description	Default	Min	Max.
M01	Controller type 0=Secondary SLAVE controller 1=MASTER controller	0	0	1
M02	Appliance control type: 0=Fixed point control for 2-pipe operation 1=Control with external temperature compensation for 2-pipe operation 2=Control with fixed point in heating mode, with external temperature compensation in cooling mode 3=Fixed point control in heating mode, on the dew point in cooling mode 4=Control with external temperature compensation in heating mode, with fixed point in cooling mode 5=Control with external temperature compensation in heating mode, on the dew point in cooling mode	0	0	5
M03	Modbus activation for SLAVE controller 0=Without Modbus 1=With Modbus	1	0	1
M04	Digital input 1 function: 0=Remote season change (INPUT ON=Winter, INPUT OFF=Summer) 1=Remote On/Off (INPUT ON=OFF, INPUT OFF=ON) 2=Economy (INPUT ON=Economy on) 3=Non-occupied holiday (INPUT ON=Occupied) 4=Condensation contact (INPUT ON=Condensation present) 5=Control request (INPUT ON=Control requested) 6=General alarm (INPUT ON=Active alarm) 7=High temperature alarm (INPUT ON=High temperature) (shown only for MASTER controller) 8=Not used	8	0	8
M05	Digital input 1 contact logic: 0=Normally open (open=INPUT OFF, closed=INPUT ON) 1=Normally closed (closed=INPUT OFF, open=INPUT ON)	0	0	1
M06	Digital input 2 function: 0=Remote season change (INPUT ON=Winter, INPUT OFF=Summer) 1=Remote On/Off (INPUT ON=OFF, INPUT OFF=ON) 2=Economy (INPUT ON=Economy on) 3=Non-occupied holiday (INPUT ON=Occupied) 4=Condensation contact (INPUT ON=Condensation present) 5=Control request (INPUT ON=Control requested) 6=General alarm (INPUT ON=Active alarm) 7=High temperature alarm (INPUT ON=High temperature) (shown only for MASTER controller) 8=Not used	8	0	8
M07	Digital input 2 contact logic: 0=Normally open (open=INPUT OFF, closed=INPUT ON) 1=Normally closed (closed=INPUT OFF, open=INPUT ON)	0	0	1

Parameter	Description	Default	Min	Max.
M08	Analogue input 1 function: 0=Remote control sensor for zone 1 1=Remote control sensor for zone 2 2=Remote control sensor for zone 3 3=Remote control sensor for zone 4 4=External sensor 5=Floor sensor for zone 1 6=Floor sensor for zone 2 7=Floor sensor for zone 3 8=Floor sensor for zone 4 9=Season change remote contact (INPUT ON=Winter, INPUT OFF=Summer) 10=Remote On/Off remote contact (INPUT ON=OFF, INPUT OFF=ON) 11=Non-occupied holiday remote contact (INPUT ON=Occupied) 12=Economy remote contact (INPUT ON=Economy on) 13=Sensor for dew point calculation (only for MASTER or SLAVE_Y controller) 14=Limit sensor (used by the MASTER or SLAVE_Y controller) 15=Not used	15	0	15
M09	Analogue input 1 logic (only with M08>=9 and M08<=12): 0=Normally open (open=INPUT OFF, closed=INPUT ON) 1-Normally closed (closed=INPUT OFF, open=INPUT ON)	0	0	1
M10	Analogue input 2 function: 0=Remote control sensor for zone 1 1=Remote control sensor for zone 2 2=Remote control sensor for zone 3 3=Remote control sensor for zone 4 4=External sensor 5=Floor sensor for zone 1 6=Floor sensor for zone 2 7=Floor sensor for zone 3 8=Floor sensor for zone 4 9=Season change remote contact (INPUT ON=Winter, INPUT OFF=Summer) 10=Remote On/Off remote contact (INPUT ON=OFF, INPUT OFF=ON) 11=Non-occupied holiday remote contact (INPUT ON=Occupied) 12=Economy remote contact (INPUT ON=Economy on) 13=Sensor for dew point calculation (only for MASTER or SLAVE_Y controller) 14=Limit sensor (used by the MASTER or SLAVE_Y controller) 15=Not used	15	0	15
M11	Analogue input 2 logic (only with M10>=9 and M10<=12): 0=Normally open (open=INPUT OFF, closed=INPUT ON) 1-Normally closed (closed=INPUT OFF, open=INPUT ON)	0	0	1
M12	Analogue input 3 function: 0=Remote control sensor for zone 1 1=Remote control sensor for zone 2 2=Remote control sensor for zone 3 3=Remote control sensor for zone 4 4=External sensor 5=Floor sensor for zone 1 6=Floor sensor for zone 2 7=Floor sensor for zone 3 8=Floor sensor for zone 4 9=Season change remote contact (INPUT ON=Winter, INPUT OFF=Summer) 10=Remote On/Off remote contact (INPUT ON=OFF, INPUT OFF=ON) 11=Non-occupied holiday remote contact (INPUT ON=Occupied) 12=Economy remote contact (INPUT ON=Economy on) 13=Sensor for dew point calculation (used only by the MASTER or SLAVE_Y controller) 14=Limit sensor (used by the MASTER or SLAVE_Y controller) 15=Not used 16=0...10 V input for humidity sensor	15	0	16
M13	Analogue input 3 logic (only with M12>=9 and M12<=12): 0=Normally open (open=INPUT OFF, closed=INPUT ON) 1-Normally closed (closed=INPUT OFF, open=INPUT ON)	0	0	1
M14	Type of configuration selected: 0=No configuration -4 to 4=Configuration for MASTER controller or SLAVE_Y controller 5 to 23=Configuration for SLAVE_X controller	0	0	23

Parameter	Description	Default	Min	Max.
M 15	Digital output 1 function (reading only, cannot be modified) 0=Speed 1 of the 3 speed ON/OFF fan 1=Speed 2 of the 3 speed ON/OFF fan 2=Speed 3 of the 3 speed ON/OFF fan 3=ON/OFF fan 1 4=ON/OFF fan 2 5=Dehumidifier 6=ON/OFF thermal actuator output for zone 1 7=ON/OFF thermal actuator output for zone 2 8=ON/OFF thermal actuator output for zone 3 9=ON/OFF thermal actuator output for zone 4 10=ON/OFF valve 11=Local pump 12=Column pump 13=Dew point or condensation alarm (relay enabled=alarm) ^(Note1) 14=Control request (relay enabled=control request) ^(Note1) 15=Season change (relay enabled=heating, relay disabled=cooling) ^(Note1) 16=Not used	16	0	16
M 16	Digital output 2 function (reading only, cannot be modified) 0=Speed 1 of the 3 speed ON/OFF fan 1=Speed 2 of the 3 speed ON/OFF fan 2=Speed 3 of the 3 speed ON/OFF fan 3=ON/OFF fan 1 4=ON/OFF fan 2 5=Dehumidifier 6=ON/OFF thermal actuator output 1 7=ON/OFF thermal actuator output 2 8=ON/OFF thermal actuator output 3 9=ON/OFF thermal actuator output 4 10=ON/OFF valve 11=Local pump 12=Column pump 13=Dew point or condensation alarm (relay enabled=alarm) ^(Note1) 14=Control request (relay enabled=control request) ^(Note1) 15=Season change (relay enabled=heating, relay disabled=cooling) ^(Note1) 16=Not used	16	0	16
M 17	Digital output 3 function (reading only, cannot be modified) 0=Speed 1 of the 3 speed ON/OFF fan 1=Speed 2 of the 3 speed ON/OFF fan 2=Speed 3 of the 3 speed ON/OFF fan 3=ON/OFF fan 1 4=ON/OFF fan 2 5=Dehumidifier 6=ON/OFF thermal actuator output 1 7=ON/OFF thermal actuator output 2 8=ON/OFF thermal actuator output 3 9=ON/OFF thermal actuator output 4 10=ON/OFF valve 11=Local pump 12=Column pump 13=Dew point or condensation alarm (relay enabled=alarm) ^(Note1) 14=Control request (relay enabled=control request) ^(Note1) 15=Season change (relay enabled=heating, relay disabled=cooling) ^(Note1) 16=Not used	16	0	16
M 18	Digital output 4 function (only for FH-4xxSH1) (reading only, cannot be modified) 0=Speed 1 of the 3 speed ON/OFF fan 1=Speed 2 of the 3 speed ON/OFF fan 2=Speed 3 of the 3 speed ON/OFF fan 3=ON/OFF fan 1 4=ON/OFF fan 2 5=Dehumidifier 6=ON/OFF thermal actuator output 1 7=ON/OFF thermal actuator output 2 8=ON/OFF thermal actuator output 3 9=ON/OFF thermal actuator output 4 10=ON/OFF valve 11=Local pump 12=Column pump 13=Dew point or condensation alarm (relay enabled=alarm) ^(Note1) 14=Control request (relay enabled=control request) ^(Note1) 15=Season change (relay enabled=heating, relay disabled=cooling) ^(Note1) 16=Not used	16	0	16

Parameter	Description	Default	Min	Max.
M19	Digital output 5 function (only for FH-4xxSH1) (reading only, cannot be modified) ^(Note1) 0=Speed 1 of the 3 speed ON/OFF fan 1=Speed 2 of the 3 speed ON/OFF fan 2=Speed 3 of the 3 speed ON/OFF fan 3=ON/OFF fan 1 4=ON/OFF fan 2 5=Dehumidifier 6=ON/OFF thermal actuator output 1 7=ON/OFF thermal actuator output 2 8=ON/OFF thermal actuator output 3 9=ON/OFF thermal actuator output 4 10=ON/OFF valve 11=Local pump 12=Column pump 13=Dew point or condensation alarm (relay enabled=alarm) ^(Note1) 14=Control request (relay enabled=control request) ^(Note1) 15=Season change (relay enabled=heating, relay disabled=cooling) ^(Note1) 16=Not used	16	0	16
M20	Analogue output 1 function (only for FH-2xxSH1) 0=Fan output 1=Valve output 0..10 V 2=Not used	2	0	2
M23	Dehumidifier/valve on/off selection (only for configurations 12 and 13) It allows to choose if a dehumidifier or an on/off valve, mounted on the fancoil, is used (hydraulic line of the fan separate from hydraulic line of thermal actuator) 0=Dehumidifier used 1=ON/OFF valve used to supply the fan	0	0	1



Note 1:
Parameters M15 to M19 are automatically saved, based on the selected configuration and cannot be modified except for the ones indicated in paragraph “Configurable digital output set up” page 17.

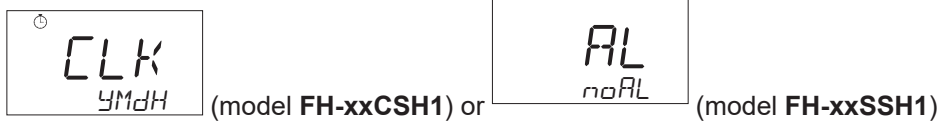
The dehumidifier does not belong to any zone.



Note: Depending on the model of the appliance used, certain parameters are not displayed.
Example: for the FH-2xxSH1 model, parameters M18 and M19 are not shown.

11. Configuration of installer parameters (level 2 password)

Installer parameters are password protected.

Press the  and  buttons together to access the main menu. The following screen is displayed:




Press the  or  button to display the following screen:







Press the  button and then the  button until the value **11** is displayed.


Press the  button to access level 2. The screen corresponding to the first level 2 parameter is displayed:



Use the  or  button to scroll through the parameters.

To modify a parameter press the  button and then the  or  buttons to select its value.

Press the  button to save the value or the  button to exit the parameter editing mode without saving.


To exit the menu, press the  button one or more times or wait for about 120 seconds.

Parameter	Description	Default	Min	Max.
I01	Internal temperature correction (K) (°C [°F]) The internal correction parameter is added to the temperature read by the sensor I01	0	-5.0 [-9.0]	5.0 [9.0]
I02	Correction of internal humidity reading (% R.H.) The correction parameter I02 is added to the detected humidity (only for FH-xxxSH1 models)	0	-10.0	10.0
I03	Temperature sensor correction AI1 (K) (°C [°F]) The correction parameter I03 is added to the temperature read by the external sensor AI1	0	-5.0 [-9.0]	5.0 [9.0]
I04	Temperature sensor correction AI2 (K) (°C [°F]) The correction parameter I04 is added to the temperature read by the external sensor AI2	0	-5.0 [-9.0]	5.0 [9.0]
I05	Temperature sensor correction AI3 (K) (°C [°F]) The correction parameter I05 is added to the temperature read by the external sensor AI3	0	-5.0 [-9.0]	5.0 [9.0]
I06	Thermal actuator 1 heating setpoint for fixed point controls (°C [°F])	20.0 [68]	I 15	I 14
I07	Thermal actuator 1 cooling setpoint for fixed point controls (°C [°F])	25.0 [77]	I 17	I 16
I08	Thermal actuator 2 heating setpoint for fixed point controls (°C [°F])	20.0 [68]	I 15	I 14
I09	Thermal actuator 2 cooling setpoint for fixed point controls (°C [°F])	25.0 [77]	I 17	I 16
I 10	Thermal actuator 3 heating setpoint for fixed point controls (°C [°F])	20.0 [68]	I 15	I 14
I 11	Thermal actuator 3 cooling setpoint for fixed point controls (°C [°F])	25.0 [77]	I 17	I 16
I 12	Thermal actuator 4 heating setpoint for fixed point controls (°C [°F])	20.0 [68]	I 15	I 14
I 13	Thermal actuator 4 cooling setpoint for fixed point controls (°C [°F])	25.0 [77]	I 17	I 16
I 14	Maximum heating control setpoint value (°C [°F]) Sets a maximum limit for setpoints I06, I08, I 10, I 12	40.0 [104]	I 15	50.0 [122]
I 15	Minimum heating control setpoint value (°C [°F]) Sets a minimum limit for setpoints I06, I08, I 10, I 12	6.0 [43]	6.0 [43]	I 14
I 16	Maximum cooling control setpoint value (°C [°F]) Sets a maximum limit for setpoints I07, I09, I 11, I 13	40.0 [104]	I 17	50.0 [122]
I 17	Minimum cooling control setpoint value (°C [°F]) Sets a minimum limit for setpoints I07, I09, I 11, I 13	6.0 [43]	6.0 [43]	I 16
I 18	Heating control proportional band (K) (°C [°F])	2.0 [3.6]	1.0 [1.8]	20.0 [36.0]
I 19	Integral control time in heating mode(s). Parameter which can be used for the control of 0..10 V modulating valves (I 14=-3, -1, 1, 3) If I 19=0, the integral action is excluded.	0	0	999

Parameter	Description	Default	Min	Max.
I20	Derivative control time in heating mode(s). Parameter which can be used for the control of 0..10 V modulating valves (M14=-3, -1, 1, 3) If I20=0, the derivative action is excluded.	0	0	999
I21	Cooling control proportional band (K) (°C [°F])	2.0 [3.6]	1.0 [1.8]	20.0 [36.0]
I22	Integral control time in cooling mode(s). Parameter which can be used for the control of 0..10 V modulating valves (M14=-3, -1, 1, 3) If I22=0, the integral action is excluded.	0	0	999
I23	Derivative control time in cooling mode(s). Parameter which can be used for the control of 0..10 V modulating valves (M14=-3, -1, 1, 3) If I23=0, the derivative action is excluded.	0	0	999
I24	Hysteresis for zone 1 thermal actuator control (K) (°C [°F])	1.0 [1.8]	0.2 [0.4]	2.0 [3.6]
I25	Hysteresis for zone 2 thermal actuator control (K) (°C [°F])	1.0 [1.8]	0.2 [0.4]	2.0 [3.6]
I26	Hysteresis for zone 3 thermal actuator control (K) (°C [°F])	1.0 [1.8]	0.2 [0.4]	2.0 [3.6]
I27	Hysteresis for zone 4 thermal actuator control (K) (°C [°F])	1.0 [1.8]	0.2 [0.4]	2.0 [3.6]
I28	Differential between thermal actuator 1 and fan coil 1 (K) (°C [°F])	1.0 [1.8]	0 [0]	3.0 [5.4]
I29	Differential between thermal actuator 2 and fan coil 2 (K) (°C [°F])	1.0 [1.8]	0 [0]	3.0 [5.4]
I30	Economy offset (K) (°C [°F]) In economy mode, the cooling setpoint is increased by I30, The heating setpoint is decreased by I30	3.0 [5]	1.0 [2]	6.0 [11]
I31	“Non-occupied holiday” operating mode offset (K) (°C [°F]) In “non-occupied holiday” mode, the cooling setpoint is increased by I31, the heating setpoint is decreased by I31.	5.0 [9]	1.0 [2]	10.0 [18]
I32	Minimum supply limit activation for fixed point controls 0=Not enabled 1=Enabled	0	0	1
I33	Low supply limit setpoint (°C [°F])	10.0 [50]	6.0 [43]	I35
I34	Maximum supply limit activation for fixed point controls 0=Not enabled 1=Enabled	0	0	1
I35	High supply limit setpoint (°C [°F])	30.0 [86]	I33	50.0 [122]
I36	Limit proportional band (K) (°C [°F])	2.0 [3.6]	1.0 [1.8]	20.0 [36.0]
I37	Zone 1 floor sensor function 0=Floor temperature not controlled 1=Limit control with room sensor control 2=Limit control, room sensor control excluded	0	0	2
I38	Zone 2 floor sensor function 0=Floor temperature not controlled 1=Limit control with room sensor control 2=Limit control, room sensor control excluded	0	0	2
I39	Zone 3 floor sensor function 0=Floor temperature not controlled 1=Limit control with room sensor control 2=Limit control, room sensor control excluded	0	0	2
I40	Zone 4 floor sensor function 0=Floor temperature not controlled 1=Limit control with room sensor control 2=Limit control, room sensor control excluded	0	0	2
I41	Floor minimum temperature (°C [°F])	15.0 [59]	15 [59]	35 [95]
I42	Floor maximum temperature (°C [°F])	32.0 [90]	15 [59]	35 [95]
I43	Floor hysteresis	0.5 [0.9]	0.2 [0.4]	2.0 [3.6]

Parameter	Description	Default	Min	Max.
I44	Dew point control activation. Avoids condensation during regulation. 0=Not enabled 1=Dew point controller activation with humidity sensor in the appliance for zone 1 2=Dew point controller activation with humidity sensor in the appliance for zone 2 3=Dew point controller activation with humidity sensor in the appliance for zone 3 4=Dew point controller activation with humidity sensor in the appliance for zone 4 5=Dew point controller activation with humidity sensor in the appliance for the MASTER or SLAVE_Y controller 6=Dew point controller activation with remote humidity sensor for zone 1 7=Dew point controller activation with remote humidity sensor for zone 2 8=Dew point controller activation with remote humidity sensor for zone 3 9=Dew point controller activation with remote humidity sensor for zone 4 10=Dew point controller activation with remote humidity sensor for the MASTER or SLAVE_Y controller	0	0	10
I45	Dew point offset to add to the dew point to obtain a safety temperature under which the regulation is stopped to avoid condensation.	2.0 [3.6]	-10.0 [-18.0]	10.0 [18.0]
I46	Circulator and valve switch on/off in case of condensation or dew point alarm 0=Circulator and valve switched off in case of condensation or dew point alarm 1=Circulator and valve switched on in case of condensation or dew point alarm	1	0	1
I47	Minimum external temperature for heating compensation (°C [°F])	-10.0 [14.0]	-10.0 [14.0]	I48
I48	Maximum external temperature for heating compensation (°C [°F])	20.0 [68]	I47	50.0 [122]
I49	Compensated setpoint corresponding to the minimum external temperature for heating compensation I47 (°C [°F])	35.0 [95]	5.0 [41]	80.0 [176]
I50	Compensated setpoint corresponding to the maximum external temperature for heating compensation I48 (°C [°F])	28.0 [82]	5.0 [41]	80.0 [176]
I51	Minimum external temperature for cooling compensation (°C [°F])	24.0 [75]	-10.0 [14.0]	I52
I52	Maximum external temperature for cooling compensation (°C [°F])	35.0 [95]	I51	50.0 [122]
I53	Compensated setpoint corresponding to the minimum external temperature for cooling compensation I51 (°C [°F])	20.0 [68]	5.0 [41]	80.0 [176]
I54	Compensated setpoint corresponding to the maximum external temperature for cooling compensation I52 (°C [°F])	16.0 [61]	5.0 [41]	80.0 [176]
I55	Dehumidification activation (see “30. Dehumidifier” page 73) 0=Not enabled 1=Enabled with humidity sensor inside the appliance 2=Enabled with remote humidity sensor 3=Enabled with humidity sensor inside the appliance only in summer mode 4=Enabled with remote humidity sensor only in summer mode	0	0	4
I56	Dehumidification setpoint (% r.h.)	50.0	0	100
I57	Dehumidification proportional band (%r.h.)	5.0	1.0	100
I58	Fan coil 1 hysteresis (K) (°C [°F])	1.0 [1.8]	0.2 [0.4]	5.0 [9.0]
I59	Fan coil 2 hysteresis (K) (°C [°F])	1.0 [1.8]	0.2 [0.4]	5.0 [9.0]
I60	Differential between speeds 1 and 2 (3-speed fan, see “35. Fan Coil” page 87)	0.2 [0.4]	0.2 [0.4]	5.0 [9.0]
I61	Differential between speeds 2 and 3 (3-speed fan, see “35. Fan Coil” page 87)	0.2 [0.4]	0.2 [0.4]	5.0 [9.0]
I62	Minimum EC fan start-up voltage (see “35. Fan Coil” page 87)	1.0	0	I63
I63	Maximum voltage applicable to the EC fan (see “35. Fan Coil” page 87)	8.0	I62	10.0
I64	Speed 1 of the EC fan (% of range I63 - I62) 0% corresponds to I62 100% corresponds to I63 (see “35. Fan Coil” page 87)	10	0	I65
I65	Speed 2 of the EC fan (% of range I63 - I62) 0% corresponds to I62 100% corresponds to I63 (see “35. Fan Coil” page 87)	65	I64	I66
I66	Speed 3 of the EC fan (% of range I63 - I62) 0% corresponds to I62 100% corresponds to I63 (see “35. Fan Coil” page 87)	100	I65	100
I67	Fan boost Defines the fan start during control 0=Fan starts at required speed 1=Fan starts at maximum speed for 1 s and then goes to the required speed	1	0	1

Parameter	Description	Default	Min	Max.
I 68	Air destratification function Determines whether to start the fan at minimum speed if control is not active to prevent the air to stratify when the control sensor is mounted on the fan coil return. 0=OFF 1=ON in heating and cooling 2=ON in heating only 3=ON in cooling only	1	0	3
I 69	Fan start time during destratification cycle (minutes)	1	1	5
I 70	Fan stop time if control is not active before starting a new destratification cycle (minutes)	10	1	60
I 71	Maximum operating time of the fan before considering the filter to be dirty (hours) 0=Function not used X=Maximum number of fan operating hours before a warning appears on the display.	2000	0	9990
I 72	Value displayed on display A 0=Internal temperature sensor 1=Remote temperature sensor AI1 2=Remote temperature sensor AI2 3=Remote temperature sensor AI3 4=Zone 1 control temperature (see page 51) 5=Actuator 2 zone control temperature (see page 51) 6=Actuator 3 zone control temperature (see page 51) 7=Actuator 4 zone control temperature (see page 51) 8=Control temperature for all zones, alternately 9 =Internal humidity reading (for FH-xxxSH1 models only) 10=Thermal actuator 1 operating setpoint (see page 53) 11=Thermal actuator 2 operating setpoint (see page 53) 12=Thermal actuator 3 operating setpoint(see page 53) 13=Thermal actuator 4 operating setpoint (see page 53) 14=Operating setpoint for all zones, alternately 15=Dew point 16=MASTER controller flow temperature 17=Output value 0..10 V AO1 (V) 18=Output value 0..10 V AO2 (V) 19=Output value 0..10 V AO3 (V)	0	0	19
I 73	Value displayed on display B 0=Internal temperature sensor 1=Remote temperature sensor AI1 2=Remote temperature sensor AI2 3=Remote temperature sensor AI3 4=Zone 1 control temperature (see page 51) 5=Actuator 2 zone control temperature (see page 51) 6=Actuator 3 zone control temperature (see page 51) 7=Actuator 4 zone control temperature (see page 51) 8=Control temperature for all zones, alternately 9 =Internal humidity reading (for FH-xxxSH1 models only) 10=Thermal actuator 1 operating setpoint (see page 53) 11=Thermal actuator 2 operating setpoint (see page 53) 12=Thermal actuator 3 operating setpoint(see page 53) 13=Thermal actuator 4 operating setpoint (see page 53) 14=Operating setpoint for all zones, alternately 15=Dew point 16=MASTER controller flow temperature 17=Output value 0..10 V AO1 (V) 18=Output value 0..10 V AO2 (V) 19=Output value 0..10 V AO3 (V) 20=Current hours:minutes 21=Total hours of fan 1 operation 22=Total hours of fan 2 operation 23=Value of input AI3 configured as 0...10 V input 24= <u>Display B</u> off	19	0	24
I 74	MODE button function 0=Local change of season if a season change contact is not used 1=Timer extension zone 1 2=Timer extension zone 2 3=Timer extension zone 3 4=Timer extension zone 4 5=Operating mode (normal, using the time slots or “non-occupied holiday”)	1	0	5
I 75	Unit of measurement (0 = °C, 1 = °F)	0	0	1

Parameter	Description	Default	Min	Max.
I 76	Summertime change Determines whether summertime is used automatically 0=No automatic update of summertime change 1=Automatic summertime change in Europe 2=Automatic summertime change in the USA	1	0	2
I 77	Duration of extension timer (minutes). With timer extension function activated <ul style="list-style-type: none"> If I 78=0, the operating setpoint is the base setpoint, economy and holiday modes are excluded for the duration defined by parameter I 77 If I 78=1, the appliance remains switched on for duration defined by parameter I 77 regardless of the timer slot. 	60	1	480
I 78	Timer slots function 0=Timer slots for normal/economy operation 1=Timer slots to switch on/off the appliance	0	0	1
I 79	Modbus baud rate (1=2400, 2=4800, 3=9600, 4=19200, 5=38400 bit/s) (for FH-xMxSH1 models only)	4	1	5
I 80	Modbus parity (0=none, 1=odd, 2=even) (for FH-xMxSH1 models only)	2	0	2
I 81	Appliance address in Modbus (1...247) (for FH-xMxSH1 models only)	1	1	247
I 82	Reset fan coil 1 and/or 2 working hours counter ^(Note1) The operating hours of the fans are stored. When they exceed I 71, the icon  is displayed. To erase the fan 1 counter, put I 82=1. The parameter I 82 automatically returns to 0 after reset. To erase the fan 2 counter, put I 82=2. The parameter I 82 automatically returns to 0 after reset. To erase the fan 1 and 2 counters, put I 82=3. The parameter I 82 automatically returns to 0 after reset.	0	0	3
I 83	COMFORT function 0=Current setpoint, modifiable via quick access 1=Setpoint offset, modifiable via quick access See paragraph <i>“Setpoint and setpoint offset configuration” page 21</i> for further information	0	0	1
I 84	Setpoint offset range applied in the comfort function (K) (°C [°F]). Defines how much the setpoint can be varied in the comfort function	3.0[5]	0[0]	10[18]
I 85	Maximum number of SLAVE controllers with Modbus (parameter considered only by the MASTER controller)	31	1	31
I 86	Scale lower end for 0...10 V input	0	-50	I 87
I 87	Scale upper end for 0...10 V input	100	I 86	9999
I 88	Unit of measurement on <u>display B</u> for 0...10 V input 0=ppm 1=% R.H. 2=No unit	1	0	2
I 89	A13 0...10 V input correction	0	-98.0	98.0
I 90	ON/OFF source sent by the MASTER controller (parameter considered only by the MASTER controller). Allows the MASTER controller to send the on/off source to be considered to the SLAVE_X controllers. 0=No on/off sent 1=On/off from contact sent 2=Manual on/off sent 3=Manual on/off and from contact sent 4=On/off from timer slot sent 5=On/off from timer slot and on/off from contact sent 6=Manual on/off and from timer slot sent 7=Manual on/off, from timer slot and from contact sent	7	0	7
I 91	Activation of the thermal actuator 1 operation 0=Actuator disabled 1=Actuator enabled only during summer season 2=Actuator enabled only during winter season 3=Actuator enabled in all seasons	3	0	3
I 92	Activation of the thermal actuator 2 operation 0=Actuator disabled 1=Actuator enabled only during the summer season 2=Actuator enabled only during winter season 3=Actuator enabled in all seasons	3	0	3

Parameter	Description	Default	Min	Max.
<i>I93</i>	Activation of the thermal actuator 3 operation 0=Actuator disabled 1=Actuator enabled only during the summer season 2=Actuator enabled only during winter season 3=Actuator enabled in all seasons	3	0	3
<i>I94</i>	Activation of the thermal actuator 4 operation 0=Actuator disabled 1=Actuator enabled only during the summer season 2=Actuator enabled only during winter season 3=Actuator enabled in all seasons	3	0	3
<i>I95</i>	Limit alarm activation delay if the limit setpoint (minutes) is exceeded	5	0	60
<i>I96</i>	Delay before activating condensation risk alarm when the temperature of water decreases below the dew point calculated in the SLAVE controller (minutes)	30	0	240
<i>I97</i>	Activation of the fancoil 0=Fan disabled 1=Fan enabled only during the summer season 2=Fan enabled only during winter season 3=Fan enabled in all seasons	3	0	3

Note 1: Resetting can be performed only if fan 1 or 2 is available on the selected configuration, otherwise variable *I82* does not return to 0.

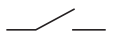

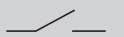





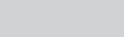
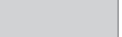
12. Digital and analogue inputs logic

• Digital inputs DI1 and DI2

Parameter	Logic		
$M04=0$ (Input DI1) or $M05=0$ (Input DI2) Remote season changeover contact	Logic DI1 $M05 =$ Logic DI2 $M07 =$	0	1
	Summer		
	Winter		
$M04=1$ (Input DI1) or $M05=1$ (Input DI2) Remote on/off	Logic DI1 $M05 =$ Logic DI2 $M07 =$	0	1
	On		
	Off		
$M04=2$ (Input DI1) or $M05=2$ (Input DI2) Economy mode	Logic DI1 $M05 =$ Logic DI2 $M07 =$	0	1
	No economy mode		
	Economy mode		
$M04=3$ (Input DI1) or $M05=3$ (Input DI2) Non-occupied	Logic DI1 $M05 =$ Logic DI2 $M07 =$	0	1
	"Non-occupied holiday" mode		
	Occupied mode		
$M04=4$ (Input DI1) or $M05=4$ (Input DI2) Condensation alarm	Logic DI1 $M05 =$ Logic DI2 $M07 =$	0	1
	No condensation		
	Condensation alarm		
$M04=5$ (Input DI1) or $M05=5$ (Input DI2) Control request	Logic DI1 $M05 =$ Logic DI2 $M07 =$	0	1
	No control request		
	Control request		
$M04=6$ (Input DI1) or $M05=6$ (Input DI2) Alarm	Logic DI1 $M05 =$ Logic DI2 $M07 =$	0	1
	No alarm		
	Alarm active		
$M04=7$ (Input DI1) or $M05=7$ (Input DI2) High temperature alarm	Logic DI1 $M05 =$ Logic DI2 $M07 =$	0	1
	No temp. alarm		
	Temp. alarm active		
$M04=8$ (Input DI1) or $M05=8$ (Input DI2) Not used			

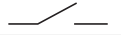

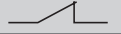
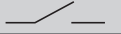
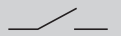
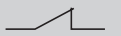

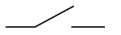



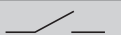




- **Analogue inputs**

1. Analogue input 1 (**AI1**):

Parameter			
<i>M00</i> =0 Remote control sensor for zone 1	Sensor AI1 is used as a control sensor for zone 1.		
<i>M00</i> =1 Remote control sensor for zone 2	Sensor AI1 is used as a control sensor for zone 2.		
<i>M00</i> =2 Remote control sensor for zone 3	Sensor AI1 is used as a control sensor for zone 3.		
<i>M00</i> =3 Remote control sensor for zone 4	Sensor AI1 is used as a control sensor for zone 4.		
<i>M00</i> =4 External sensor	Sensor AI1 is used as an external sensor for control with compensation		
<i>M00</i> =5 Floor sensor for zone 1	The AI1 sensor is used as floor temperature measurement sensor for zone 1		
<i>M00</i> =6 Floor sensor for zone 2	The AI1 sensor is used as floor temperature measurement sensor for zone 2		
<i>M00</i> =7 Floor sensor for zone 3	The AI1 sensor is used as floor temperature measurement sensor for zone 3		
<i>M00</i> =8 Floor sensor for zone 4	The AI1 sensor is used as floor temperature measurement sensor for zone 4		
<i>M00</i> =9 Remote season changeover contact	<i>M09</i> =	0	1
	Summer		
<i>M00</i> =10 Remote on/off	<i>M09</i> =	0	1
	On		
<i>M00</i> =11 Non-occupied holiday	<i>M09</i> =	0	1
	"Non-occupied holiday" mode		
<i>M00</i> =12 Economy mode	<i>M09</i> =	0	1
	No economy mode		
<i>M00</i> =13	<i>M09</i> =	0	1
	Economy mode		
<i>M00</i> =14	The AI1 sensor is used for the dew point calculation (only for the MASTER or SLAVE_Y controller)		
<i>M00</i> =15	The AI1 sensor is used as limit sensor for the MASTER or SLAVE:Y controller		
<i>M00</i> =15	Sensor not used		

For configurations *M00*=9, 10, 11, 12, the analogue input 1 is used as a digital input. The contact is considered closed if there is a short-circuit on the analogue input. The contact is considered open if there is no connection.

2. Analogue input 2 (AI2):

Parameter			
$M 10=0$ Remote control sensor for zone 1	Sensor AI2 is used as a control sensor for zone 1.		
$M 10=1$ Remote control sensor for zone 2	Sensor AI2 is used as a control sensor for zone 2.		
$M 10=2$ Remote control sensor for zone 3	Sensor AI2 is used as a control sensor for zone 3.		
$M 10=3$ Remote control sensor for zone 4	Sensor AI2 is used as a control sensor for zone 4.		
$M 10=4$ External sensor	Sensor AI2 is used as an external sensor for control with compensation		
$M 10=5$ Floor sensor for zone 1	The AI2 sensor is used as floor temperature measurement sensor for zone 1		
$M 10=6$ Floor sensor for zone 2	The AI2 sensor is used as floor temperature measurement sensor for zone 2		
$M 10=7$ Floor sensor for zone 3	The AI2 sensor is used as floor temperature measurement sensor for zone 3		
$M 10=8$ Floor sensor for zone 4	The AI2 sensor is used as floor temperature measurement sensor for zone 4		
$M 10=9$ Remote season changeover contact	$M 11=$	0	1
	Summer		
	Winter		
$M 10=10$ Remote on/off	$M 11=$	0	1
	On		
	Off		
$M 10=11$ Non-occupied holiday	$M 11=$	0	1
	"Non-occupied holiday" mode		
	Occupied mode		
$M 10=12$ Economy mode	$M 11=$	0	1
	No economy mode		
	Economy mode		
$M 10=13$	The AI2 sensor is used for the dew point calculation (only for the MASTER or SLAVE_Y controller)		
$M 10=14$	The AI2 sensor is used as limit sensor for the MASTER or SLAVE:Y controller		
$M 10=15$	Sensor not used		

For configurations $M 10=9, 10, 11, 12$, the analogue input 2 is used as a digital input. The contact is considered closed if there is a short-circuit on the analogue input. The contact is considered open if there is no connection.

3. Analogue input 3 (AI3):

Parameter			
$M_{12}=0$ Remote control sensor for zone 1	Sensor AI3 is used as a control sensor for zone 1.		
$M_{12}=1$ Remote control sensor for zone 2	Sensor AI3 is used as a control sensor for zone 2.		
$M_{12}=2$ Remote control sensor for zone 3	Sensor AI3 is used as a control sensor for zone 3.		
$M_{12}=3$ Remote control sensor for zone 4	Sensor AI3 is used as a control sensor for zone 4.		
$M_{12}=4$ External sensor	Sensor AI3 is used as an external sensor for control with compensation		
$M_{12}=5$ Floor sensor for zone 1	The AI3 sensor is used as floor temperature measurement sensor for zone 1		
$M_{12}=6$ Floor sensor for zone 2	The AI3 sensor is used as floor temperature measurement sensor for zone 2		
$M_{12}=7$ Floor sensor for zone 3	The AI3 sensor is used as floor temperature measurement sensor for zone 3		
$M_{12}=8$ Floor sensor for zone 4	The AI3 sensor is used as floor temperature measurement sensor for zone 4		
$M_{12}=9$ Remote season changeover contact	$M_{13}=\text{Summer}$	0	1
	$M_{13}=\text{Winter}$		
$M_{12}=10$ Remote on/off	$M_{13}=\text{On}$	0	1
	$M_{13}=\text{Off}$		
$M_{12}=11$ Non-occupied holiday	$M_{13}=\text{"Non-occupied holiday" mode}$	0	1
	$M_{13}=\text{Occupied mode}$		
$M_{12}=12$ Economy mode	$M_{13}=\text{No economy mode}$	0	1
	$M_{13}=\text{Economy mode}$		
$M_{12}=13$	The AI3 sensor is used for the dew point calculation (only for the MASTER or SLAVE_Y controller)		
$M_{12}=14$	The AI3 sensor is used as limit sensor for the MASTER or SLAVE:Y controller		
$M_{12}=15$	Sensor not used		
$M_{12}=16$	0..10 V input		

For configurations $M_{12}=9, 10, 11, 12$, the analogue input 3 is used as a digital input. The contact is considered closed if there is a short-circuit on the analogue input. The contact is considered open if there is no connection.

Note: Using the keyboard it is not possible to assign the same functionality to two digital or analogue inputs. The configuration via modbus does not include any assignation control and observes the following priority in case of identical assignation:

Input priority:

Digital input 1 (**DI1**) - Highest priority

Digital input 2 (**DI2**)

Analogue input 1 (**AI1**)

Analogue input 2 (**AI2**)

Analogue input 3 (**AI3**) - Lowest priority



The remote contact configuration for season changeover, ON/OFF, non-occupied, energy saving can be selected for a digital input or an analogue input, but not for both.

13. Control sensor(s)

The MASTER or SLAVE_Y controller uses a remote sensor for valve control. Configure one of the analogue inputs as control sensor for zone 1 ($M08=0$ or $M10=0$ or $M12=0$) to be able to use the control. If no analogue input is used as control sensor for zone 1, the valve remains off.

The SLAVE_X controller can control from 1 to 4 zones, based on the selected configuration.

For the configuration with 4 zones (configuration 8), one of the zones is controlled by the internal sensor, while the other zones are controlled by the remote sensors. For configurations with less than 4 zones, one zone can be controlled with the internal sensor and the other two with remote sensors or all zones can be controlled with remote sensors.

Set parameters $M08$, $M10$ and $M12$ to 0, 1, 2 or 3 to use a remote sensor as control sensor for a specific zone. The first zone with the highest priority, to which a remote sensor is not assigned, uses the internal sensor for control purposes.

The priority for the assignment of the internal sensor as control sensor for the zones without assigned remote control sensor is as follows:

Zone 1	-	Highest priority
Zone 2		↓
Zone 3		
Zone 4	-	Lowest priority

This means that if several zones are not assigned a remote control sensor, the internal sensor will be assigned only to the zone with the lowest number. The other zone will not perform any control.

Example 1 (configuration 8): zone 1 controls with the AI1 remote sensor ($M08=0$), zone 2 controls with the AI2 remote sensor ($M10=1$), zone 4 controls with the AI3 remote sensor ($M12=3$) and zone 3 controls thus with the internal sensor, since no remote sensor is configured as remote control sensor for zone 3.

Example 2 (configuration 7): zone 1 is not assigned any remote control sensor ($M08\neq0$, $M10\neq0$, $M12\neq0$ and $M08\neq5$), zone 2 is not assigned any remote control sensor ($M08\neq1$, $M10\neq1$, $M12\neq1$), zone 3 controls with the AI2 remote sensor ($M10=2$). Zone 1 will operate with the internal sensor, while zone 2 will not operate due to no control sensor assignment.

For configurations from -4 to -1, from 5 to 15, each zone is controlled by a thermal actuator.

For configurations from 16 to 22, 2 to 4 thermal actuators are used to control a single zone.

For configuration 23, 2 thermal actuators are used to control each zone.

Note: If the floor sensor is used, the control sensor may be excluded from control (see the next paragraph).

Depending on the settings on [display A](#) (I72) and [display B](#) (I73) and on the selected configuration, the information related to each operating zone or thermal actuator may be viewed.

Examples:

If the selected configuration is configuration 10, there are 2 zones. By setting parameters $I72=8$ and $I73=14$, the temperature and setpoint of zone 1 and temperature and setpoint of zone 2 will be displayed alternately.

If the selected configuration is configuration 17, there is only one zone. By setting parameters $I72=8$ and $I73=14$, the temperature of zone 1 and the setpoint of actuator 1, the temperature of zone 1 and the setpoint of actuator 2, the temperature of zone 1 and the setpoint of actuator 3 will be displayed alternately. For further information, see ["16. Zone display or alternate zones on the display:" page 55](#).

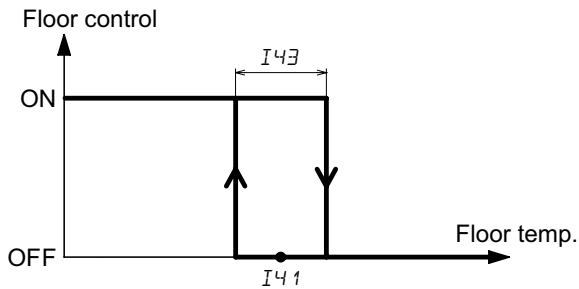
14. Control with floor temperature control

In heating mode, any zone can also operate considering the floor sensor, if the floor temperature control is enabled ($I37=1$ for zone 1, $I38=1$ for zone 2, $I39=1$ for zone 3, $I40=1$ for zone 4) and one of the remote sensors is configured as floor sensor ($M08=5$ or $M10=5$ or $M12=5$ for zone 1, $M08=6$ or $M10=6$ or $M12=6$ for zone 2, $M08=7$ or $M10=7$ or $M12=7$ for zone 3, $M08=8$ or $M10=8$ or $M12=8$ for zone 4).

In this case, control is possible based on the normal control sensor and it can be guaranteed that the floor temperature does not fall under a certain lever (parameter $I41$) or does not rise over a limit (parameter $I42$).

This type of control is recommended in spaces with large windows exposed to sunlight which can guarantee room heating without control intervention. This situation may allow the floor to cool down. In case of sunset, a considerable period of time may be necessary before the floor is heated again. In this case, the room may cool down excessively at the beginning of the evening. This situation can be avoided, by setting a minimum floor temperature.

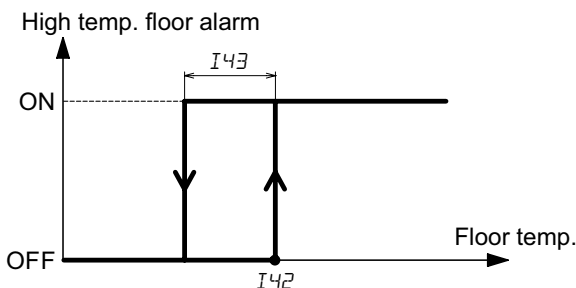
• Minimum floor temperature control:







Be careful not to set the minimum floor temperature at a temperature that is too high, otherwise the room may become overheated.

• Maximum floor temperature control:

In case of wooden floors, the maximum floor temperature (parameter $I42$) is used to avoid damage to the floor itself, locking the thermal actuator control if the maximum admissible temperature is exceeded. If there is a fan, it will be controlled as usual.



If the maximum floor temperature is exceeded ($I42$) for the considered zone, the message "FL-H" is displayed on the alarm page and icons  and  for cooling mode or icons  and  for heating mode will flash.

If the zone control sensor is excluded ($I37=2$ for zone 1, $I38=2$ for zone 2, $I39=2$ for zone 3, $I40=2$ for zone 4) and one of the remote sensors is configured as floor sensor ($M08=5$ or $M10=5$ or $M12=5$ for zone 1, $M08=6$ or $M10=6$ or $M12=6$ for zone 2, $M08=7$ or $M10=7$ or $M12=7$ for zone 3, $M08=8$ or $M10=8$ or $M12=8$ for zone 4) the control takes place to maintain the minimum floor temperature ($I41$) in heating mode. There is no control in the cooling mode.

If there is a fan, it will not be controlled and will remain off.

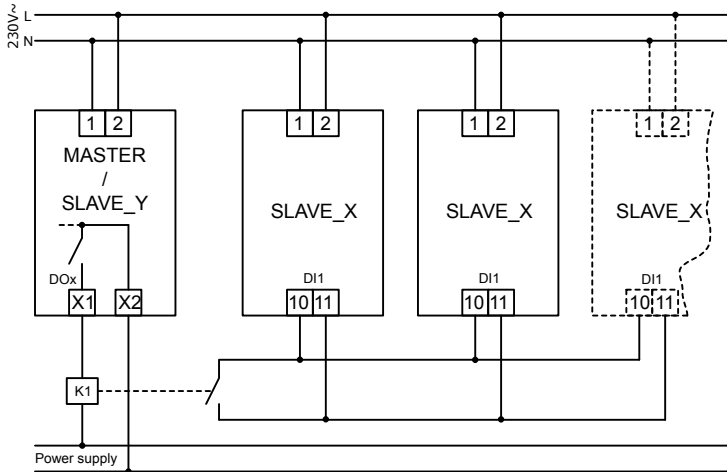
15. Season, operating setpoint, ECONOMY, HOLIDAY mode

For the MASTER controller, the operating season may be defined from digital contact if $M04=0$ or $M05=0$, from analogue input configured as season changeover contact if $M08=9$ or $M10=9$ or $M12=9$ or from parameter if no digital contact and analogue input is configured as season changeover contact ($M04\neq 0$ and $M05\neq 0$ and $M08\neq 9$ and $M10\neq 9$ and $M12\neq 9$).

The MASTER controller informs all available controllers on the Modbus networks regarding the operating season.

The operating season of the SLAVE controllers with Modbus is defined by the information supplied by the MASTER controller, regardless of the digital or analogue inputs settings.

If there is no Modbus network on the SLAVE_X controllers, the information related to the season changeover may be taken from the MASTER or SLAVE_Y controller of the same level. This controller provides the season information by an output (see paragraph [“Configurable digital output set up” page 17](#)). To use this output, the connection of a support relay is needed.



X1: digital output for control request (terminal 32 for FH-2 model, terminal 34 for FH-4 model)

X2: common digital outputs (terminal 33 for FH-2 model, terminal 35 for FH-4 model)

DOx: for model FH-2xxSH1 = digital output DO3 ($M17 = 15$)

for model FH-4xxSH1 = digital output DO5 ($M19 = 15$)

(in heating mode, the output is enabled, in cooling mode, it is disabled)

DI1: digital input 1 ($M04 = 5$)

K1: support relay

Note: the K1 relay coil voltage must correspond to the voltage of other digital outputs of the controller.

If a digital contact is configured as remote contact “non-occupied holiday” $M04=3$ or $M05=3$ or a remote sensor is configured as remote contact “non-occupied holiday” $M08=11$ or $M10=11$ or $M12=11$, “non-occupied holiday” function can be activated if the corresponding contact is in the appropriate position (see digital paragraph [“12. Digital and analogue inputs logic” page 46](#)).

In “non-occupied holiday” mode, the heating setpoints of the various zones are decreased by $I31$ (see the diagram containing the heating analogue output or the heating digital output on the next page): WHS), the cooling setpoints of the various zones are increased by $I31$ (see the cooling analogue output or the cooling digital output diagram on the next page: WCS).

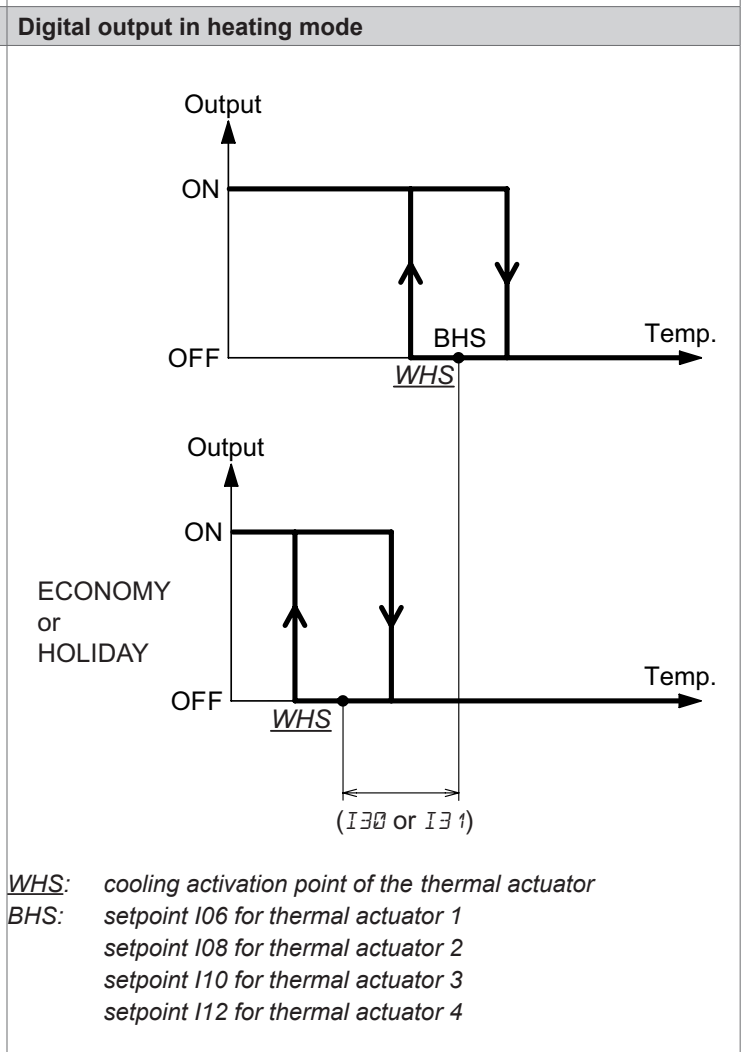
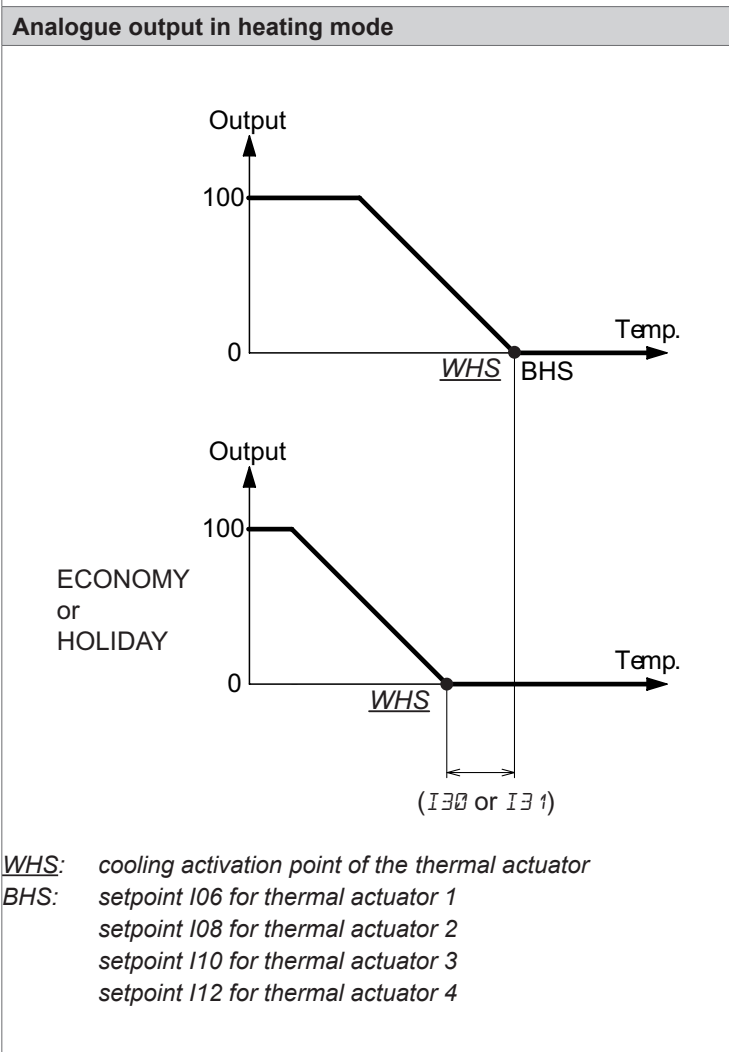
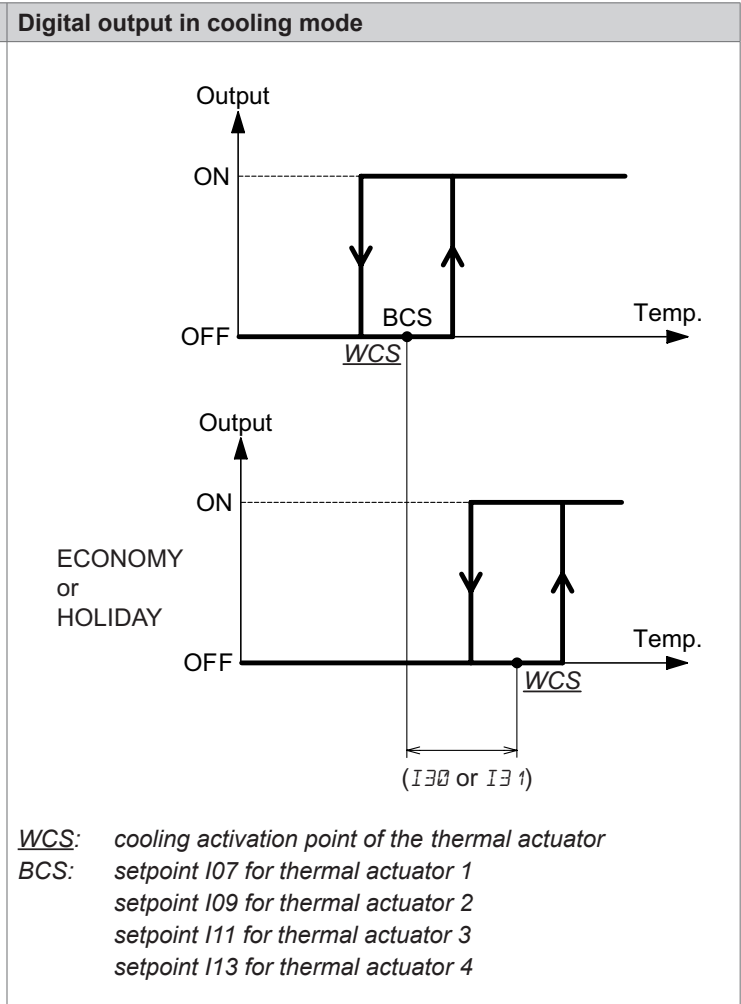
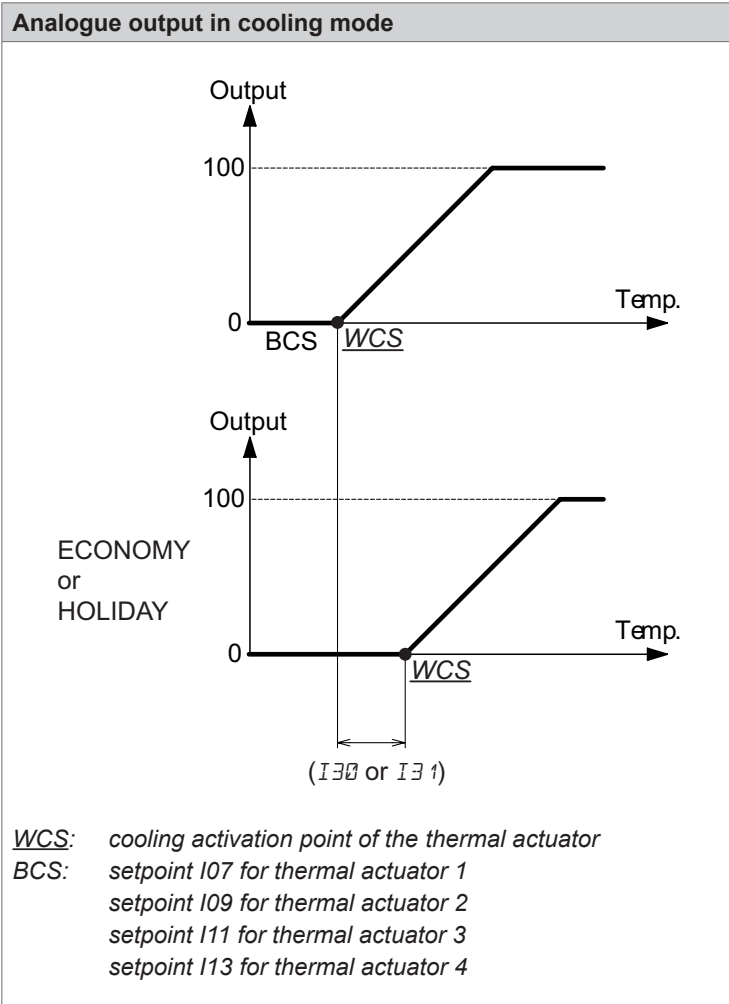
Icon is activated to signal the “non-occupied holiday” mode.

If one of the digital contacts is configured as remote contact “energy saving” $M04=2$ or $M05=2$ or a sensor is configured as remote contact “energy saving” $M08=12$ or $M10=12$ or $M12=12$, the energy saving mode can be activated if the corresponding contact is in the appropriate position (see paragraph [“12. Digital and analogue inputs logic” page 46](#)).

In “energy saving” mode, the heating setpoints of the various zones are decreased by $I30$ (see the heating analogue output or heating digital output diagram on the next page: WHS), the cooling setpoints of the various zones are increased by $I30$ (see the cooling analogue output or the cooling digital output diagram on the next page: WCS).

The “**ECO**” icon is activated to indicate the “energy saving” mode.

The “non-occupied holiday” mode has priority over economy mode when both modes are activated.



16. Zone display or alternate zones on the display:

The operating setpoint may be displayed for a specific zone, setting the parameter $I72$ (display A) or $I73$ (display B) to 10 (zone 1) or 11 (zone 2) or 12 (zone 3) or 13 (zone 4). In this case, in heating mode, the value corresponding to WHS is displayed, in cooling mode the value corresponding to WCS is displayed.

To view the operating temperature for a specific zone on display A, set parameter $I72$ to 4 (zone 1) or 5 (zone 2) or 6 (zone 3) or 7 (zone 4). The number of the corresponding zone and the icons related to the operation of that zone are displayed on display C.

By setting $I72$, related to display A, to 8 (or 14), all operating temperatures (or operating setpoints) of the zones will be alternately displayed. The zone corresponding to the operating temperature (or operating setpoint) is indicated on display C and changes every 10 seconds. The indicated icons are related to the operation corresponding to the zone indicated by display C. If $I72$ is set to a value different than 4, 5, 6, 7, 8, 10, 11, 12, 13, 14 the icons regarding the operation of the various areas will be disabled. If there are more thermal actuators per zone, the alternate display will refer to the thermal actuators, not to the zones. In this case, display C shows the number corresponding to the thermal actuator.

Note: For the SLAVE_X controller, if $I72=8$ and $I73=14$, if the floor temperature control function with control sensor exclusion is enabled (see "[14. Control with floor temperature control](#)" page 52), the display shows:

	Display_A	Display_B
Heating	floor temperature sensor	$I41$ (minimum floor temperature)
Cooling	floor temperature sensor	98.0°C (209.0°F) *

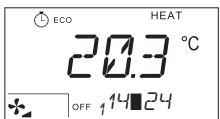
* the setpoint is forced at a high value to avoid any start-up of the thermal actuator.

Note: Setting parameter $I72$ (related to display A) at a value different than 4, 5, 6, 7, 8, 10, 11, 12, 13, 14 will not allow the display of the icons regarding the operation of the corresponding zone. By setting parameter $I73$ to 8 or 14, the operating temperatures or the operating setpoints will not be displayed alternately, unless on display A the alternate display of operating zones ($I72=8$ or $I72=14$) is enabled

If no contacts are configured in "non-occupied holiday" or "energy saving" mode, and if the operating mode has been set manually with time slots (through quick access parameters → see "[MODE button function](#)" page 22) and the time slots function $I78=0$, then within the time slot it is controlled with the base setpoint. In this case, next to "display C" (see "[3. Display, keypad and icons](#)" page 7), the text ON is displayed and icon ☀ will be enabled.



Outside the time slots, the economy mode is controlled and next to "display C" (see "[3. Display, keypad and icons](#)" page 7) the OFF text will be displayed and icons ☀ and **ECO** will be enabled.



Otherwise, the contact configured in "non-occupied holiday" or "energy saving" mode has priority over timer slots which are not considered (**FH-xxCSH1** models).

If one of the contacts is configured in "non-occupied holiday" or "energy saving" mode and if the operating mode is in holiday mode (manually selected through quick access parameters → see "[MODE button function](#)" page 22), control is done based on contact setting. The contact configured in the "non-occupied holiday" or "energy saving" mode has priority over the manual configuration. If the function "non-occupied holiday" is active, icon ☀ is enabled.

When timer extension mode is activated manually, it takes priority over energy saving, holiday (see "[Timer extension or forced presence modes](#)" page 60) and timer slots modes (models **FH-xxCSH1**). During the timer extension period, the icon ☀ flashes.

17. Supply limits function

For the MASTER or SLAVE_Y controller, it is possible to take the water supply limits into account to prevent the supply of too hot or too cold water into the pipes.

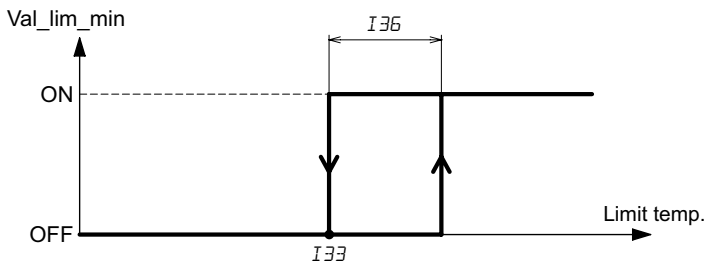
The minimum and maximum limits may be enabled separately, based on the value of parameters $I32$ and $I34$ respectively. The limit sensor must be defined and may be only a remote sensor ($M10B=14$ or $M10=14$ or $M12=14$). If there is no such limit sensor, the limit function cannot be used.

Lower limit:


To enable the lower limit, set $I32=1$.


To disable this function, set $I32=0$.

• Lower limit in cooling mode:



Val_lim_min: theoretical value of the lower limit output

During control, if the supply temperature drops below the minimum supply setpoint $I33$, the pre-alarm state is activated, the valve is closed and icon  flashes. On the alarms page, the following message is displayed $PL-L$.

If the pre-alarm state persists for more time than the alarm time $I95$, the low cooling alarm status is enabled. On the main display and on the alarms page, the $LI-L$ message is displayed. Icon  keeps flashing. All outputs are disabled.

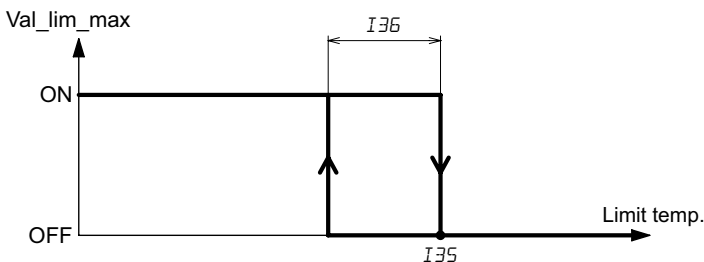
The alarm state is disabled when the limit temperature returns above the supply minimum setpoint $I33 +$ the limit proportional band $I36$.

Upper limit:


To enable the higher limit, set $I34=1$.


To disable this function, $I34=0$.

• Upper heating limit



Val_lim_min: theoretical value of the higher limit output

During control, if the supply temperature exceeds the maximum supply setpoint $I35$, the pre-alarm state is activated, the valve is closed and icon  flashes. On the alarms page, the following message is displayed $PL-H$.

If the pre-alarm state persists for more time than the alarm time $I95$, the high heating alarm status is enabled. On the main display and on the alarms page, the $LI-H$ message is displayed. Icon  keeps flashing. All outputs are disabled.

The alarm state is disabled when the limit temperature drops below the supply maximum setpoint $I35 -$ the limit proportional band $I36$.

18. Control with compensated setpoint

The compensated setpoint applies to the MASTER or SLAVE_Y controller for the valve control. The function allows an operating setpoint to be dynamically calculated according to the external temperature. In winter, it is normally used to raise the supply setpoint, when the external temperature falls. In summer, it can calculate a supply setpoint, based on the external temperature to avoid having a large temperature difference between the cooled internal environment and the external one.

To use the compensated setpoint, select an operating mode with compensation: $M02=1, 2$ (control with compensation in cooling mode) or $M02=1, 4, 5$ (control with compensation in heating mode).

For the MASTER controller, set a configured analogue input to read an external sensor. Set $M08=4$ to use input AI1 or $M10=4$ to use input AI2 or $M12=4$ to use input AI3.

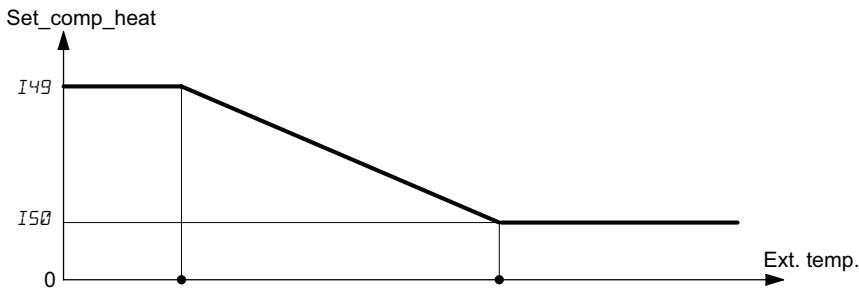
For SLAVE_Y controller with Modbus, the external sensor temperature information is received by the MASTER controller via Modbus.

For SLAVE_Y controllers without Modbus, if operation with compensated setpoint is chosen, an external sensor must be connected to each SLAVE_Y controller.

- To enable the compensation in cooling mode, set parameter $M02=1$ or 2 ,
- To enable the compensation in heating mode, set parameter $M02=1$ or 4 or 5 ,
- To enable the compensation in cooling and heating mode, set parameter $M02=2$,
- To disable this function, set parameter $M02=0$ or 3 .

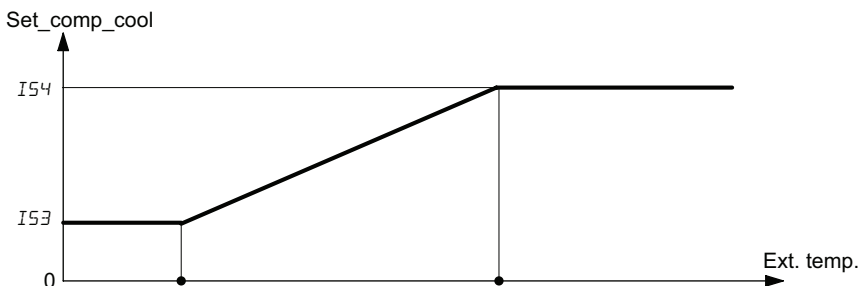
The winter and summer compensation curves are defined by 2 independent points for each of them:

• Winter compensation curve:



Note: If the external sensor breaks, the winter compensated setpoint is still calculated.
If the external sensor is open, the compensated setpoint corresponds to I49.
If the external sensor is short-circuited, the compensated setpoint corresponds to I50.

• Summer compensation curve:



Note: If the external sensor breaks, the summer compensated setpoint is still calculated.
If the external sensor is open, the compensated setpoint corresponds to I53.
If the external sensor is short-circuited, the compensated setpoint corresponds to I54.

19. Dew setpoint control during the summer season

The dew point control applies to the MASTER or SLAVE_Y controller for the valve control. The function allows an operating setpoint to be dynamically calculated according to the temperature and humidity selected for this calculation. During winter, this control is not used.

To use the dew point control, select the $M02=3$ or 5 operating mode.

Select the temperature sensor to calculate the dew point ($M08=13$ or $M10=13$ or $M12=13$). If no remote sensor is selected, the internal sensor is automatically taken into account for the calculation.

Select the humidity sensor to be considered:

- $I44=5$ to use the internal humidity sensor

- $I44=10$ to use the remote humidity sensor. In this case, a 0..10 V humidity transmitter will be connected to the AI3 input. The AI3 input must be configured to 16 ($M12=16$) and the JP1 jumper set in position "3-2" (see paragraph "[39. Jumper configuration](#)" page 102).

To obtain the dew setpoint, the $I45$ offset is then added to the calculated dew point.

To perform the control, the MASTER controller takes into account the highest dew setpoint among the dew setpoints sent by the slave controller and its own dew setpoint (if calculated).

The SLAVE_Y controller operates with its calculated dew setpoint.

20. Dew point function in cooling mode

During the summer season the dew point function is used to avoid the control with a temperature that may be too close or lower than the calculated dew temperature, avoiding thus the formation of condensation in the floor.

The dew point function may be applied for a single area that can be selected for SLAVE_X controller or for the MASTER or SLAVE_Y controller.

• SLAVE_X controller

To calculate the dew temperature, the value of the room temperature and humidity of the considered zone must be known.

The temperature sensor corresponds to the control temperature used for the considered zone.

The humidity sensor may be the one inside the appliance (only for the FH-xxxSH1 appliances), or a humidity transmitter with 0..10 V output, connected to the AI3 input set as 0..10 V input for humidity ($M12=16$). In this latter case, fit the humidity sensor in the desired zone.

To use the dew point function with the internal humidity sensor for zone 1, set parameter $I44$ to 1.

To use the dew point function with a humidity transmitter for zone 1, set parameter $I44$ to 6.

To use the dew point function with the internal humidity sensor for zone 2, set parameter $I44$ to 2.

To use the dew point function with a humidity transmitter for zone 2, set parameter $I44$ to 7.

To use the dew point function with the internal humidity sensor for zone 3, set parameter $I44$ to 3.

To use the dew point function with a humidity transmitter for zone 3, set parameter $I44$ to 8.

To use the dew point function with the internal humidity sensor for zone 4, set parameter $I44$ to 4.

To use the dew point function with a humidity transmitter for zone 4, set parameter $I44$ to 9.

• MASTER or SLAVE_Y controller

To calculate the dew temperature, select a remote temperature sensor or the internal sensor.

To select a remote temperature sensor, set $M08=13$ for the AI1 remote sensor, or $M10=13$ for the AI2 remote sensor, or $M12=13$ for the AI3 remote sensor. To use the internal temperature sensor, check that parameters $M08$, $M10$, $M12$ are all set at a different value than 13.



To use the dew point function with the internal humidity sensor, set parameter $I44$ to 5.

To use the dew point function with a humidity transmitter, set parameter $I44$ to 10.



The minimum control setpoint is the sum of the calculated dew temperature and the dew point offset (parameter $I45$). This last parameter allows operation with a certain safety margin in relation to the dew temperature.

The selected zone is controlled by taking the maximum value between the previously calculated minimum control setpoint (dew temperature + $I45$) and the cooling control setpoint set by the user for that zone.

If, during operation, the control temperature of the zone drops below the minimum control setpoint, the dew point alarm is triggered and the DO5 relay configured as condensation or dew point alarm ($M19=13$) is enabled (available only for SLAVE_X controllers for the following configurations: 5, 6, 7, 9, 16, 17, SLAVE_Y or MASTER for the following configurations -4, -2, 2, 4) or relay DO3 configured as condensation or dew point alarm ($M17=13$) is enabled (only available for SLAVE_X controllers

for configurations 13, SLAVE_Y or MASTER for configurations -3, 3). The icons  and  flash. The dew point alarm state goes off if the control temperature returns above the minimum control setpoint + 2°C.

21. Anti-condensation function

If one of the digital inputs is configured as condensation alarm contact ($M04=4$ or $M05=4$), in case of alarm activation, the cooling valve is closed while the other functions remain active. Icons  and  flash.

MASTER controller or SLAVE_Y controller:

If there is a dehumidifier (configurations -2, -1, 1, 2), it will be enabled in case of condensation alarm. A condensation alarm at the MASTER will be sent to all SLAVE_X controllers.

SLAVE_X controller:

In case of condensation alarm, the thermal actuator is closed and the fan stops. If there is a dehumidifier (configurations 5 to 14, 16 to 21, 23), it will be enabled.

If the DO5 relay output has the condensation or dew point alarm function ($M19=13$) or if DO3 has the condensation or dew point alarm function, ($M17=13$) is enabled in case of condensation alarm.

The alarm is sent to the MASTER controller which stops the circulator, the valve if $I46=0$ and enables the dehumidifier (if any).

If there is any Modbus communication during operation, the MASTER controller sends the supply temperature value to all SLAVE controllers. During the summer season if one SLAVE controller calculates a dew point (dew temperature + $I45$), it will also control that the supply temperature is not below or equal to the dew point. If the supply temperature reaches or drops below this point for a period of time longer than $I95$ minutes, a potential condensation risk on the SLAVE may occur. The

SLAVE stops all controlled thermal actuators, icons  and  flash until the temperature exceeds or is equal to the dew point + 0.2°C (0.4°F).

Timer extension or forced presence modes

If timer slots are used for the “energy saving” function ($I78=0$), in the event that the “energy saving” or “non-occupied holiday” functions are used, the operating setpoints are calculated taking into account parameters $I30$ (offset economy) and $I31$ (“non-occupied holiday” operating mode offset).


It is possible to bypass these functions for a specified time (parameter $I77$) and then to go on controlling using the base setpoints.

If timer slots are used to switch on/off the appliance $I78=1$, if the timer extension function is activated for a specific zone, the zone does not take into account the timer slots and stays active for the time corresponding to parameter $I77$.

To manually enable the timer extension function for a specific zone, set parameter $0C1$ (for zone 1) to $0C1$ or $0C2$ (for zone 2) to $0C2$ or $0C3$ (for zone 3) to $0C3$ or $0C4$ (for zone 4) to $0C4$ (see “[MODE button function](#)” page 22). Once activated, a delay equal to $I77$ must elapse before normal operation resumes.

If the timer extension function is activated by the external contact, the bypass of the functions continues until the contact is in the active position.

22. Dirty filter

The dirty filter function counts the fan’s hours of operation and displays a warning message with the  icon when it exceeds the maximum number of hours defined by parameter $I71$.


In this case, the fan filter is considered to be dirty and must be changed.

To activate the dirty filter function, set the maximum number of hours with parameter $I71$ to a value different than 0.

To deactivate this function, set the maximum number of hours with $I71$ to 0.

The controller can control from up to 2 fans, based on the selected configuration. Two different counters count the operating hours of each fan.

With the function activated, the fan operating hours counter is saved to the memory every 2 hours.

To reset the counter of fan 1 set parameter $I82$ to 1. Set parameter $I82$ to 2 to reset the counter of fan 2. Set parameter $I82$ to 3 to reset the counters for fans 1 and 2. The counter is reset and parameter $I82$ changes to 0 automatically and the  icon stops flashing, until the counter again exceeds the value $I71$.

Note: With the function deactivated the fan’s operating hours are not counted.

23. Summertime change

The appliance is pre-configured to be able to make the summertime change automatically for certain regions.

To be able to use this function, set parameter $I75$ to 1 if the controller is used in Europe.

Set parameter $I75$ to 2 if the controller is used in the USA. In the latter case, also set the unit of measurement to °F by setting $I75$ to 1. All parameters referring to temperature are expressed in °F and the controller operates using °F automatically.

For all regions other than Europe and the USA, set parameter $I75$ to 0. In this case, the summertime change cannot be updated automatically. Update the time appropriately for the country.

24. AI3 sensor used as 0...10 V input

If input **AI3** is used with the 0...10 V input, position jumper JP1 in position "2-3" (see "[39. Jumper configuration](#)" page 102) and set parameter *M12* to 16.

The appliance is configured to read the humidity transmitter with the 0...10 V output. The scale is automatically set as *I86* = 0 and *I87* = 100, the unit of measurement *I88* is 1 (% R.H.).

To display the corresponding value on display B, set parameter *I73* to 23.

It is possible to correct the displayed value using parameter *I89*.

25. Forced outputs via Modbus

It is possible to force any output via Modbus independently of the appliance's control. To force the output, write the forced key to the FORCED_OUTPUTS_KEY (8095) register and then write the appropriate value on the register corresponding to the output to be forced.

Definition of the forced key

The forced key is a 16-bit variable comprising 2 parts: the upper weighting has a fixed value (01100110) and the lower weighting is a variable, depending on the forcing requests.

Upper weighting	Lower weighting							
from 15 to 8 bits	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
01100110 fixed value	x	x	x	x	x	x	x	x
	AO3	AO2	AO1	DO5	DO4	DO3	DO2	DO1

x=0 refers to an output which is not able to be forced (the output takes the value given by the controller);

x=1 refers to an output which can be forced. The output is disconnected from the controller and takes the value written to the relevant register via Modbus.

Output enabled in forced mode	Modbus write register and register number	
AO3	OUT_C	8015
AO2	OUT_B	8014
AO1	OUT_A	8013
DO5	STATE_REL5	8012
DO4	STATE_REL4	8011
DO3	STATE_REL3	8010
DO2	STATE_REL2	8009
DO1	STATE_REL1	8008

Example:

Enabling of relay 1 in forced mode:

Forced key = 01100110 00000001 in binary, 26113 in decimal.

Write variable FORCED_OUTPUTS_KEY to 26113.

Activation of the relay: write variable STATE_REL1 to 1.

Deactivation of the relay: write variable STATE_REL1 to 0.

Enabling of analogue output **AO2**:

Forced key = 01100110 01000000 in binary, 26176 in decimal.

Write variable FORCED_OUTPUTS_KEY to 26176.

Configuration of output to 3.4 V: write variable OUT_B to 34.

It is possible to enable forced mode for one or more outputs.

Example:

Enabling of relays 2 and 3 and analogue output **AO1** in forced mode:

Forced key = 01100110 00100110 in binary, 26150 in decimal.


Write variable FORCED_OUTPUTS_KEY to 26150.

Activation of relay 2: write variable STATE_REL2 to 1.

Activation of relay 3: write variable STATE_REL3 to 1.

Configuration of output to 4.2 V: write the variable OUT_A to 42.



In forced mode, the  icon is continuously displayed below the setpoint modification menu.

To exit forced outputs mode, write variable FORCED_OUTPUTS_KEY to 0.

Note:

If the controller is connected to a Master control system and the forced outputs option is selected, AB Industrietechnik does not take responsibility for any damage caused by the incorrect command of these outputs.

26. Alarms



There are two types of alarms:

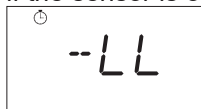
alarms which do not affect the controller (only error messages are displayed);

alarms which do affect the controller (error messages are displayed and certain outputs are disabled);

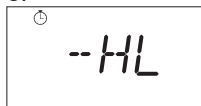
In case of alarm, the general alarm icon flashes .

Digital contacts configured as alarms do not affect the controller.

When an alarm occurs, it is displayed on display A during control. To return to the normal regulation display, press button . If an alarm corresponds to a faulty sensor displayed on the display, after pressing the  button, the following screen is shown if the sensor is open:



or



if the sensor is in short circuit.

The status of the alarms can be displayed on the dedicated page (see paragraph "[27. Alarms page](#)" page 67).


• Alarms table

Alarm type	Message on display A
Dew point alarm	<i>RLd</i>
Condensation alarm	<i>RLC</i>
Condensation risk on slave alarm	<i>RLc</i>
General alarm	<i>RL -</i>
Exceeded low temperature limit pre-alarm	<i>PL -L</i>
Exceeded high temperature limit pre-alarm	<i>PL -H</i>
Exceeded low temperature limit alarm	<i>L i L</i>
Exceeded high temperature limit alarm	<i>L i H</i>
High temperature from digital contact alarm	<i>L i H</i>
High floor temperature alarm	<i>FLH</i>
Control sensor alarm	<i>"Table of alarms (faulty temperature sensors)" page 64</i>
Internal humidity sensor alarm (model FH-xxxSH1)	<i>EHU</i>
Faulty clock alarm (model FH-xxCSH1)	<i>ECL</i>
Alarm for MASTER controller off while the SLAVE controllers are on	<i>MOFF</i> (indication only on the SLAVE_Y controllers alarms screen)
Communication problem between Master and slave number x (x=01 or ... 31)	<i>CEX</i>

• Table of alarms (faulty temperature sensors)

	AI3	AI2	AI1	Internal sensor
E01	No alarm	No alarm	No alarm	Alarm
E02	No alarm	No alarm	Alarm	No alarm
E03	No alarm	No alarm	Alarm	Alarm
E04	No alarm	Alarm	No alarm	No alarm
E05	No alarm	Alarm	No alarm	Alarm
E06	No alarm	Alarm	Alarm	No alarm
E07	No alarm	Alarm	Alarm	Alarm
E08	Alarm	No alarm	No alarm	No alarm
E09	Alarm	No alarm	No alarm	Alarm
E10	Alarm	No alarm	Alarm	No alarm
E11	Alarm	No alarm	Alarm	Alarm
E12	Alarm	Alarm	No alarm	No alarm
E13	Alarm	Alarm	No alarm	Alarm
E14	Alarm	Alarm	Alarm	No alarm
E15	Alarm	Alarm	Alarm	Alarm


• Dew point alarm:

In cooling mode, if the dew point control function is active (see paragraph “20. Dew point function in cooling mode” page 59) and the control is not performed on the dew point + offset I_{45} ($M02\neq 3$ and $M02\neq 5$) if the control temperature drops below the threshold [dew point + offset I_{45}] the dew point alarm is triggered. Icon  flashes as long as the alarm condition persists.

Alarm type	MASTER controller action	Secondary controller action	
		SLAVE_Y	SLAVE_X
MASTER controller alarm	Column pump ON Circulator (*) Valve (*) Dehumidifier ON	Alarm ignored	Thermal actuator OFF Fan coil OFF Dehumidifier ON
SLAVE_Y controller alarm	Alarm ignored	Column pump ON Circulator (*) Valve (*) Dehumidifier ON	=
SLAVE_X controller alarm	Column pump ON Circulator (*) Valve (*) Dehumidifier ON	-	Thermal actuator OFF Fan coil OFF Dehumidifier ON

(*) Circulator and valve = ON if $I_{46} = 1$
Circulator and valve = OFF if $I_{46} = 0$

• Condensation alarm:


In case of condensation alarm, the general alarm icon flashes, along with the icon  (see “21. Anti-condensation function” page 59).

Alarm type	MASTER controller action	Secondary controller action	
		SLAVE_Y	SLAVE_X
MASTER controller alarm	Column pump ON Circulator (*) Valve (*) Dehumidifier ON	Alarm ignored	Thermal actuator OFF Fan coil OFF Dehumidifier ON

SLAVE_Y controller alarm	Alarm ignored	Column pump ON Circulator (*) Valve (*) Dehumidifier ON	=
SLAVE_X controller alarm	Column pump ON Circulator (*) Valve (*) Dehumidifier ON	-	Thermal actuator OFF Fan coil OFF Dehumidifier ON

(*) Circulator and valve = ON if $I45 = 1$
Circulator and valve = OFF if $I45 = 0$

• Condensation risk on slave alarm:

In case of condensation alarm, the general alarm icon flashes, along with the icon  (see "[21. Anti-condensation function](#)" page 59).

Alarm type	MASTER controller action	Secondary controller action	
		SLAVE_Y	SLAVE_X
SLAVE_Y controller alarm	Alarm ignored	Thermal actuator OFF	=
SLAVE_X controller alarm	Alarm ignored	-	Thermal actuators OFF

• General alarm:

The digital contacts configured as general alarms do not affect the controller. Only an alarm message is displayed ("AL-").



For the position of the contact corresponding to the alarm position, refer to "[12. Digital and analogue inputs logic](#)" page 46.

• Limits exceeded alarms:

The limits exceeded function is activated on the MASTER controller if the lower limit $I32 \neq 0$ and/or the upper limit $I34 \neq 0$ function is enabled.

Alarm type	MASTER controller action	Secondary controller action	
		SLAVE_Y	SLAVE_X
Low cooling limit alarm on the MASTER controller	Column pump OFF Circulator OFF Valve OFF Dehumidifier OFF	Circulator OFF Valve OFF	Thermal actuator OFF Fan coil OFF Dehumidifier OFF
High heating limit alarm on the MASTER controller	Column pump OFF Circulator OFF Valve OFF Dehumidifier OFF	Circulator OFF Valve OFF	Thermal actuator OFF Fan coil OFF Dehumidifier OFF
Low cooling limit alarm on the SLAVE_Y controller	Ignored	Column pump OFF Circulator OFF Valve OFF Dehumidifier OFF	Ignored
High heating limit alarm on the SLAVE_Y controller	Ignored	Column pump OFF Circulator OFF Valve OFF Dehumidifier OFF	Ignored

• High floor temperature alarm:

If $I37 \neq 0$ for area 1 or $I38 \neq 0$ for area 2 or $I39 \neq 0$ for area 3 or $I40 \neq 0$ for area 4 (see "[14. Control with floor temperature control](#)" page 52), if the maximum floor temperature is exceeded ($I42$), the message "FLH" is indicated on display A and "FL-H" is displayed on the alarms page, icons  and  flash for the heating. The thermal actuator of the zone with alarm is disabled.

• Faulty control sensor alarm:

If the sensors used to control are faulty (open or in short circuit), the outputs are disabled,


If parameter *I72* or *I73* is set to show on the display the operating setpoint of a specific zone, when the operating temperature cannot be calculated (open or short circuited sensor), the display shows “----” instead of the setpoint.


For sensors used as external sensors in the event of a sensor failure, if the compensated setpoint function is enabled, the function is not blocked:

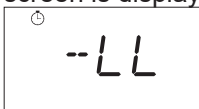
- In the event of a short circuit of the sensor, the sensor temperature is considered to be high and setpoint *I50* (for winter compensation) or *I54* (for summer compensation) is used as the compensation setpoint.
- In the event of an open sensor, the sensor temperature is considered to be low and setpoint *I49* (for winter compensation) or *I53* (for summer compensation) is used (see paragraph “18. Control with compensated setpoint” page 57).

If a remote sensor is used as valve control sensor for the MASTER or SLAVE_Y controller and the limit function was enabled, in case of limit sensor or remote sensor malfunction, the column pump, the control valve and the circulator are stopped.

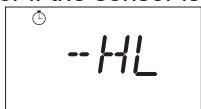
For the **AI3** sensor input used as 0...10 V input (*M12=16* and JP1 jumper located on 0..10 V -> position “3-2”, see paragraph “39. Jumper configuration” page 102) in the event of a sensor alarm, display A shows the message “L-HI” (> 10 V) or “EHI” if the internal humidity sensor is faulty and internal humidity sensor is used).

For sensor alarms, it is possible to return to the normal controller display by pressing the key , until the display A view changes.

If the temperature sensor displayed on display A is in alarm, if the sensor is open, after pressing key , the following screen is displayed;





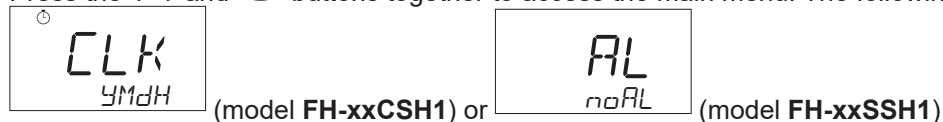
or if the sensor is in short circuit:



27. Alarms page

The status of the alarms can be displayed on the dedicated page. To access the alarms page, carry out the following procedure:

Press the  and  buttons together to access the main menu. The following screen is displayed:



For models with a clock, press the  or  button until the following screen is displayed:



On display A, the alarms screen is displayed and on display B, an alarm message is shown

Alarm type	Message on display A
Dew point alarm	ALd
Condensation alarm	ALC
Condensation risk on slave alarm	ALc
General alarm	AL-
Exceeded low temperature limit pre-alarm	PL-L
Exceeded high temperature limit pre-alarm	PL-H
Exceeded low temperature limit alarm	L,L
Exceeded high temperature limit alarm	L,H
High temperature from digital contact alarm	L,H
High floor temperature alarm	FLH
Control sensor alarm	<u>"Table of alarms (faulty temperature sensors)" page 64</u>
Internal humidity sensor alarm (model FH-xxxSH1)	EHU
Faulty clock alarm (model FH-xxCSH1)	ECL
Alarm for MASTER controller off while the SLAVE controllers are on	MOFF (indication only on the SLAVE_Y controllers alarms page)
Communication problem between Master and slave number x (x=01 or ... 31)	CEx
No alarm	NOAL

On the alarms page, the alarm with the highest priority is displayed in the event that there is more than one alarm condition.

Alarm priorities:

- Dew point alarm
- Condensation alarm
- Condensation risk alarm
- General alarm
- Low temp. limit pre-alarm
- Low temp. limit alarm
- high temp. limit pre-alarm
- High temp. limit alarm or from temp. limit or from contact
- High floor temperature alarm
- Internal sensor alarm
- Control sensors alarm
- Internal humidity sensor (if any) alarm
- Clock fault (if any)
- MASTER controller OFF indication ^(Note 1)

Highest priority





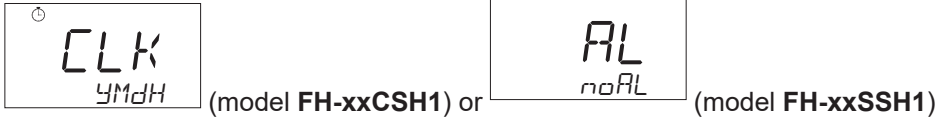
Lowest priority


Note 1: only for SLAVE_Y controller.

28. Restoring default parameters

It is possible to reload the initial configuration of the default parameters by carrying out the following procedure:

Press the  and  buttons together to access the main menu. The following screen is displayed:




Press button  or  until the following screen is displayed:






Press the  button and then the  button until the value **33** is displayed.

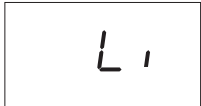
Press the  button to access the default parameters reset level.



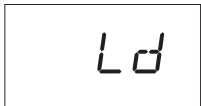
To cancel and return to the controller, press the  button.

To activate the procedure, press the  button, the value 0 starts to flash. Press the  button to change the value to 1 and press the  button again.


The default parameter loading procedure begins. The display shows the following messages:



at the beginning of default parameters loading



at the end of default parameters loading

When the following screen appears again, it is possible to exit the menu by pressing the  button once, or by waiting for around 120 seconds.

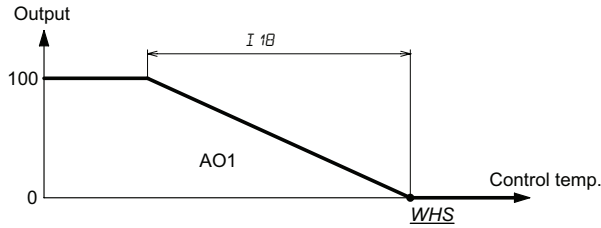


29. Valve output

• Fixed point 2-pipe HEATING control ($M02=0$)


The "HEAT" icon is displayed to indicate that the heating mode is active.

- The PID type controller operates in the following way for modulating control:




WHS: control setpoint for zone "15. Season, operating setpoint, economy, holiday mode" page 53

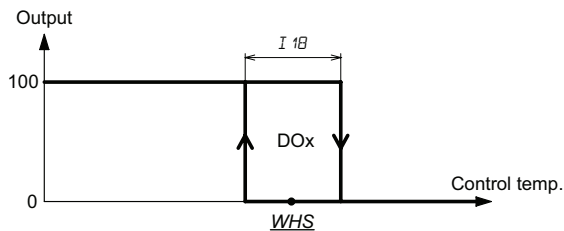
AO1: control valve

If the operating temperature falls below WHS, the valve starts to open. The  icon is displayed. The valve may be controlled with

- P action (if the integral heating time $I19=0$ and the derivative heating time $I20=0$),
- PI action (if the integral heating time $I19\neq0$ and the derivative heating time $I20=0$)
- PID action (if the integral heating time $I19\neq0$ and the derivative heating time $I20\neq0$).


The  icon switches off if the **AO1** valve closes.


- The ON/OFF type controller operates in the following way:



WHS: control setpoint for zone "15. Season, operating setpoint, economy, holiday mode" page 53

DOx: control valve

If the operating temperature drops below $\underline{WHS} - (I1B : 2)$ the valve is enabled. The  icon is displayed.

If the temperature rises above $\underline{WHS} + (I1B : 2)$ the valve is disabled and the  icon turns off.

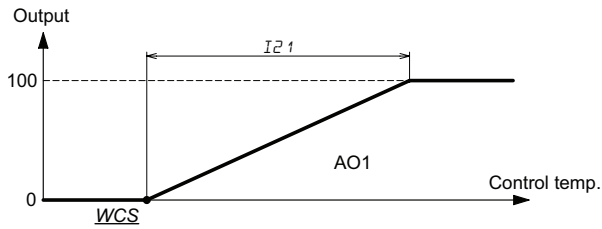
Note: one of the following conditions closes the valve:

- Regulator OFF
- Control sensor open or in short circuit or not defined ($M08=15$ and $M10=15$ and $M12=15$)
- Limit sensor open or in short circuit or not defined ($M08=15$ and $M10=15$ and $M12=15$) of the limit function is enabled ($I32\neq0$ and/or $I34\neq0$)
- High temperature alarm from contact (if a digital input was configured as high temperature contact $M04=7$ or $M05=7$)
- High temperature limit alarm (if the high supply limit function is enabled $I34\neq0$).
- No control requested from all SLAVE_X controllers.

• **Fixed point 2-pipe COOLING control ($M01=0$)**

The “COOL” icon is displayed to indicate that cooling mode is active.

- The PID type controller operates in the following way for modulating control:



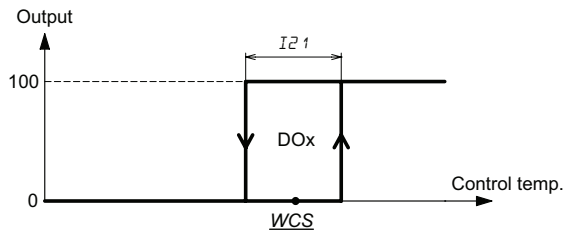
WCS: control setpoint for zone “15. Season, operating setpoint, economy, holiday mode” page 53
AO1: control valve

If the operating temperature rises above WCS, the **AO1** valve starts to open. The ❄️ icon is displayed. The valve may be controlled with

- P action (if the integral cooling time $I22=0$ and the derivative cooling time $I23=0$),
- PI action (if the integral cooling time $I22\neq0$ and the derivative cooling time $I23=0$)
- PID action (if the integral cooling time $I22\neq0$ and the derivative cooling time $I23\neq0$).

The ❄️ icon switches off if the **AO1** valve closes again.

- The ON/OFF type controller operates in the following way:



WCS: control setpoint for zone “15. Season, operating setpoint, economy, holiday mode” page 53
DOx: control valve

If the operating temperature rises above WCS + ($I21 : 2$) the valve is enabled. The ❄️ icon is displayed. If the temperature drops below WCS - ($I21 : 2$) the valve is disabled and the ❄️ icon turns off.

Note: one of the following conditions closes the valve:

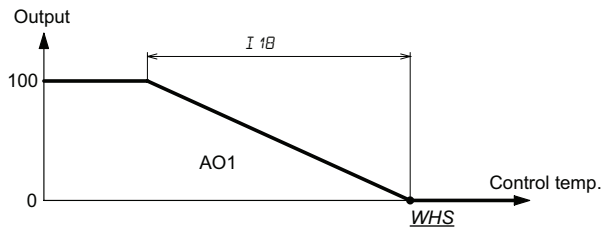
- Regulator OFF
- Condensation alarm
- Dew point alarm (if the dew point control function was enabled)
- Control sensor open or in short circuit or not defined ($M08=15$ and $M10=15$ and $M12=15$)
- Limit sensor open or in short circuit or not defined ($M08=15$ and $M10=15$ and $M12=15$) of the limit function is enabled ($I32\neq0$ and/or $I34\neq0$)
- Low temperature limit alarm (if the low supply limit function is enabled $I32\neq0$).
- High temperature alarm from contact (if a digital input was configured as high temperature contact $M04=7$ or $M05=7$)
- No control requested from all SLAVE_X controllers.

• 2-pipe compensated setpoint control (M02=1)

Winter compensation


The “HEAT” icon is displayed to indicate that the heating mode is active.

- The PID type controller operates in the following way for modulating control:



WHS compensation setpoint, calculated on the basis of the winter compensation curve see paragraph “18. Control with compensated setpoint” page 57

AO1: control valve

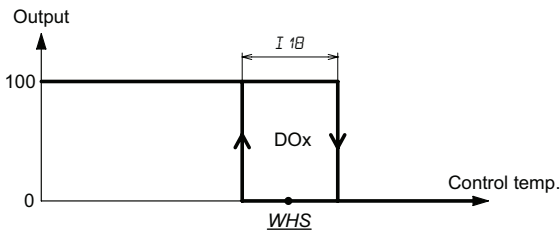
If the operating temperature falls below WHS, the valve starts to open. The  icon is displayed.

The valve may be controlled with

- P action (if the integral heating time $I 19=0$ and the derivative heating time $I 20=0$),
- PI action (if the integral heating time $I 19\neq 0$ and the derivative heating time $I 20=0$)
- PID action (if the integral heating time $I 19\neq 0$ and the derivative heating time $I 20\neq 0$).


The  icon switches off if the **AO1** valve closes.


- The ON/OFF type controller operates in the following way:



WHS compensation setpoint, calculated on the basis of the compensation curve see paragraph “18. Control with compensated setpoint” page 57.

DOx: control valve

If the operating temperature drops below WHS - ($I 1B : 2$) the valve is enabled. The  icon is displayed.

If the temperature rises above WHS + ($I 1B : 2$) the valve is disabled and the  icon turns off.

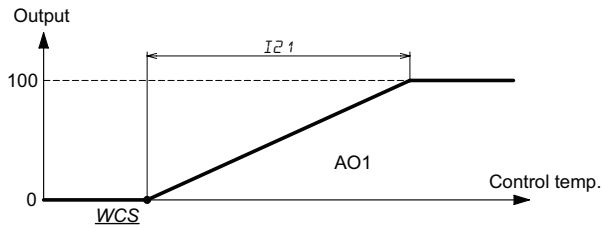
Note: one of the following conditions closes the valve:

- Regulator OFF
- Control sensor open or in short circuit or not defined ($M 08=15$ and $M 10=15$ and $M 12=15$)
- Limit sensor open or in short circuit or not defined ($M 08=15$ and $M 10=15$ and $M 12=15$) of the limit function is enabled ($I 32\neq 0$ and/or $I 34\neq 0$)
- High temperature alarm from contact (if a digital input was configured as high temperature contact $M 04=7$ or $M 04=7$)
- High temperature limit alarm (if the high supply limit function is enabled $I 34\neq 0$).
- No control requested from all SLAVE_X controllers.

Summer compensation

The “COOL” icon is displayed to indicate that cooling mode is active.

- The PID type controller operates in the following way for modulating control:



WCS compensation setpoint, calculated on the basis of the compensation curve see paragraph “18. Control with compensated setpoint” page 57.

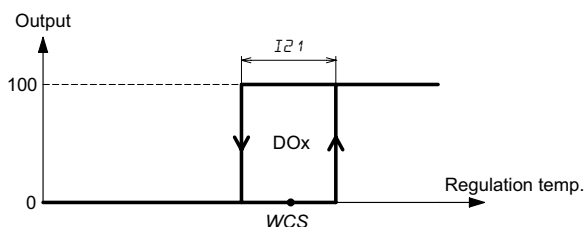
AO1: control valve

If the operating temperature rises above WCS, the **AO1** valve starts to open. The ❄️ icon is displayed. The valve may be controlled with

- P action (if the integral cooling time $I22=0$ and the derivative cooling time $I23=0$),
- PI action (if the integral cooling time $I22\neq 0$ and the derivative cooling time $I23=0$)
- PID action (if the integral cooling time $I22\neq 0$ and the derivative cooling time $I23\neq 0$).

The ❄️ icon switches off if the **AO1** valve closes again.

- The ON/OFF type controller operates in the following way:



WCS compensation setpoint, calculated on the basis of the compensation curve see paragraph “18. Control with compensated setpoint” page 57.

DOx: control valve

If the operating temperature rises above $WCS + (I21 : 2)$ the valve is enabled. The ❄️ icon is displayed. If the temperature drops below $WCS - (I21 : 2)$ the valve is disabled and the ❄️ icon turns off.

Note: one of the following conditions closes the valve:

- Regulator OFF
- Condensation alarm
- Dew point alarm (if the dew point control function is enabled)
- Control sensor open or in short circuit or not defined ($M08=15$ and $M10=15$ and $M12=15$)
- Limit sensor open or in short circuit or not defined ($M08=15$ and $M10=15$ and $M12=15$) if the limit function is enabled ($I32\neq 0$ and/or $I34\neq 0$)
- Low temperature limit alarm (if the low supply limit function is enabled $I32\neq 0$).
- High temperature alarm from contact (if a digital input was configured as high temperature contact $M04=7$ or $M05=7$)
- No control requested from all SLAVE_X controllers.

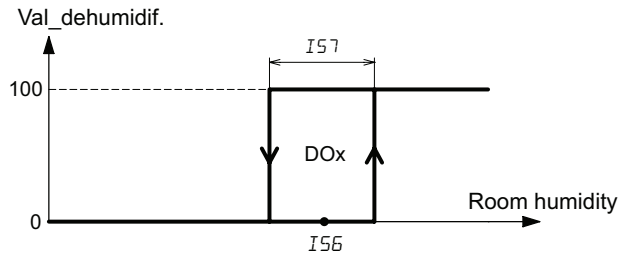
30. Dehumidifier

To use the ON/OFF dehumidifier function, select a configuration that uses this element ($M14 \neq -3, -4, 0, 3, 4, 15, 22$ see "5. Configurations table" page 16). Then select with which humidity sensor to perform the dehumidification:



- if $I55=1$ the internal humidity sensor for models FH-xxxxH1 is used. The dehumidification may be performed in all seasons
- if $I55=2$ a remote humidity transmitter is used; in this case, the analogue input AI3 must be set to 0..10 V ($M12=16$). The dehumidification may be performed in all seasons.
- if $I55=3$ the internal humidity sensor for models FH-xxxxH1 is used. The dehumidification is disabled in heating mode.
- if $I55=4$ a remote humidity transmitter is used; in this case, the analogue input AI3 must be set to 0..10 V ($M12=16$). The dehumidification is disabled in heating mode.

Then define the P dehumidification control parameters ($I56$: dehumidification set, $I57$: proportional dehumidification band)

Theoretical dehumidification:



$Val_dehumidif.$: theoretical dehumidification value

If the humidity rises above $I56 + (I57 : 2)$ the dehumidifier is enabled, the  icon turns on.
If the humidity drops below $I56 - (I57 : 2)$ the  icon turns off.

One of the following conditions activates the dehumidifier, regardless of the control:

- Condensation alarm
- Dew point alarm (if the dew point control function is enabled $I44 \neq 0$)
- For the MASTER controller only -> if there is a dehumidification request from a SLAVE_X controller.

One of the following conditions deactivates the dehumidifier, regardless of the control:

- Controller OFF. The dehumidifier does not belong to any zone. Therefore, only the switch off commands that put all the appliance in OFF can switch off the dehumidifier (global manual shut down, from remote contact or Modbus). A local shut down command of one zone, manual or from time slots (if $I78=1$) will not switch off the dehumidifier
- if the dehumidification with remote humidity transmitter is enabled ($I55=2$ or 4):
 - the AI3 sensor input was not configured as 0..10 V input for the remote humidity transmitter ($M12 \neq 16$)
 - the AI3 sensor input was configured as 0..10 V input for the remote humidity sensor ($M12=16$) but the signal 0..10 V is higher than 11 V
- if the dehumidification with internal humidity sensor is enabled ($I55=1$ or 3) and the appliance is not equipped with internal humidity sensor
- High temperature alarm from contact (if a digital input is configured as high temperature contact $M04=7$ or $M05=7$)
- High temperature alarm in heating mode (if the limit function is enabled $I34 \neq 0$)
- Low temperature alarm in cooling mode (if the limit function is enabled $I32 \neq 0$)
- for the MASTER controller, only -> if there is no dehumidification request from a SLAVE_X controller and if the MASTER controller does not need to enable the dehumidifier.

The conditions that force the disabling of the dehumidifier have priority over the conditions that force the activation of the dehumidifier, regardless of the control.

31. Circulator

The circulator is connected to the MASTER or SLAVE_Y controller. It distributes the control circuit water to all horizontal controllers of the same level.

It is enabled during control if one of the SLAVE_X controllers needs to control and activates a thermal actuator.

One of the following conditions deactivates the circulator, regardless of the control requests from the horizontal controllers:

- Regulator OFF
- Control sensor open or in short circuit or not defined ($M08=15$ and $M10=15$ and $M12=15$)
- Limit sensor open or in short circuit or not defined ($M08=15$ and $M10=15$ and $M12=15$) if the limit function is enabled ($I32\neq 0$ and/or $I33\neq 0$)
- Condensation alarm if $I46=0$
- Dew point alarm (if the dew point control function was enabled $I44=5$ or 10) and $I46=0$
- Low temperature alarm in cooling mode (if the limit function is enabled $I32\neq 0$).
- High temperature alarm from contact (if a digital input was configured as high temperature contact $M04=7$ or $M06=7$)
- High temperature alarm in heating mode (if the limit function is enabled $I34\neq 0$).

If there is no control request (from the thermal actuator or dehumidifier), the circulator is disabled.

32. Column pump

The column pump is connected to the MASTER and/or SLAVE_Y controller. It distributes the control circuit water to all horizontal controllers of the system.

It is enabled during control if one of the SLAVE_X or vertical controllers needs to control and activates a thermal actuator.

One of the following conditions deactivates the column pump, regardless of the control requests from the controllers:

- Regulator OFF
- no control request from the various SLAVE controllers
- for the SLAVE_Y controller:
 - control sensor open or in short circuit or not defined ($M08=15$ and $M10=15$ and $M12=15$),
 - limit sensor open or in short circuit or not defined ($M08=14$ and $M10=14$ and $M12=14$) if the limit function is enabled ($I32\neq 0$ and/or $I34\neq 0$),
 - Condensation alarm if $I46=0$
 - Dew point alarm (if the dew point control function was enabled $I44=5$ or 10) and $I46=0$
 - Low temperature alarm in cooling mode (if the limit function is enabled $I32\neq 0$).
 - High temperature alarm from contact (if a digital input is configured as high temperature contact $M04=7$ or $M06=7$)
 - High temperature alarm in heating mode (if the limit function is enabled $I34\neq 0$).

33. Thermal actuator

The thermal actuator supplies with water the floor circuit during control. It is always connected to a SLAVE_X controller, except for configurations from -4 to -1, in which a thermal controller may be connected to a MASTER or SLAVE_Y controller. For its operation, a control sensor must be coupled to the control element. It can be the internal sensor, if no remote control sensor has been assigned to the zone in which the thermal actuator is mounted or a remote sensor assigned to the zone in which the thermal actuator is mounted.

Note: for one x zone and no remote sensor has been assigned, the control is performed taking into account the internal sensor if this is not already in use for another zone.

If for a zone, the “limit control with room sensor control” is active (for example for zone 1 if $I37=1$), the control in heating mode is performed taking into account the control setpoint and the temperature of the room sensor. If, during control, the floor temperature falls below $I41 - (I43 / 2)$, the thermal actuator is enabled, even if the room temperature does not require so.

If for a zone, the floor temperature control with control sensor exclusion function is active (for example for zone 1 if $I37=2$), the control in heating mode is performed to maintain the minimum floor temperature $I41$.

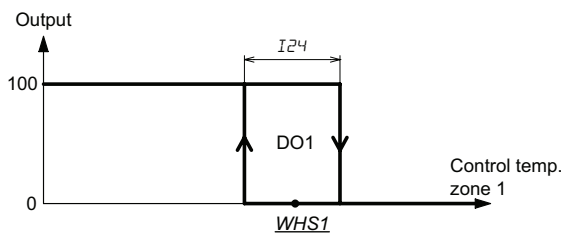
One of the following conditions deactivates the thermal actuator of the zone, regardless of the control:

- Controller OFF or zone OFF
- Control sensor open or in short circuit or not defined
- for the desired zone, if the floor temperature control function is enabled ($I37 \neq 0$ for zone 1, $I38 \neq 0$ for zone 2, $I39 \neq 0$ for zone 3, $I40 \neq 0$ for zone 4) and the floor sensor is not defined ($M08 \neq 5$ and $M10 \neq 5$ and $M12 \neq 5$ for zone 1, $M08 \neq 6$ and $M10 \neq 6$ and $M12 \neq 6$ for zone 2, $M08 \neq 7$ and $M10 \neq 7$ and $M12 \neq 7$ for zone 3, $M08 \neq 8$ and $M10 \neq 8$ and $M12 \neq 8$ for zone 4) or the floor sensor is open or in short circuit.
- Condensation alarm
- Dew point alarm (if the dew point control function is enabled $I44 \neq 0$)
- Low temperature alarm in cooling mode detected at the MASTER controller.
- High temperature alarm in heating mode detected at the MASTER controller.
- High temperature alarm from contact (if a digital input is configured as high temperature contact $M04=7$ or $M06=7$)

A SLAVE_X controller can manage up to 4 zones. In each zone, a thermal actuator is mounted. The thermal actuator is controlled in heating and cooling mode based on the control sensor of the considered zone, the operating setpoint of the zone (calculated as indicated in paragraph [“15. Season, operating setpoint, economy, holiday mode” page 53](#)) and the corresponding hysteresis:

• Controls with one sensor per zone:


Configurations from 5 to 15, thermal actuator 1 in heating mode:




$WHS1$: setpoint of the zone 1 calculated according to paragraph [“15. Season, operating setpoint, economy, holiday mode” page 53](#)

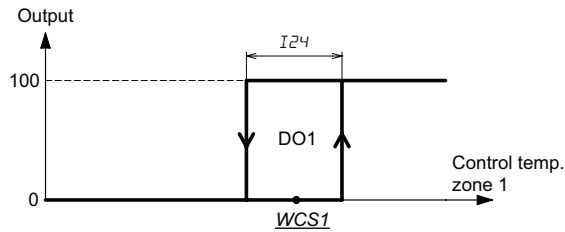
$DO1$: thermal actuator 1 output.

$I24$: thermal actuator 1 hysteresis

If the operating temperature drops below $WHS1 - (I24 : 2)$ the thermal actuator is enabled. The  icon turns on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature rises above $WHS1 + (I24 : 2)$ the thermal actuator is deactivated and the  icon turns off if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

Configurations from 5 to 15, thermal actuator 1 in cooling mode:



WCS1: setpoint of the zone 1 calculated according to paragraph “15. Season, operating setpoint, economy, holiday mode” page 53

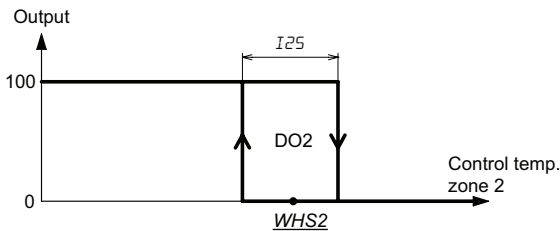
DO1: thermal actuator 1 output.

I24: thermal actuator 1 hysteresis

If the operating temperature rises above WCS1 + (I24 : 2) the thermal actuator is enabled. The ❄️ icon turns on if zone 1 is displayed (I72=4 or [8 alternately with other zones]).

If the temperature drops below WCS1 - (I24 : 2) the thermal actuator is deactivated and the ❄️ icon turns off if zone 1 is displayed (I72=4 or [8 alternately with other zones]).

Configurations -4, -3, -2, -1, 6, 7, 8, 10, 11, 14, 15, thermal actuator 2 in heating mode:



WHS2: setpoint of the zone 2 calculated according to paragraph “15. Season, operating setpoint, economy, holiday mode” page 53

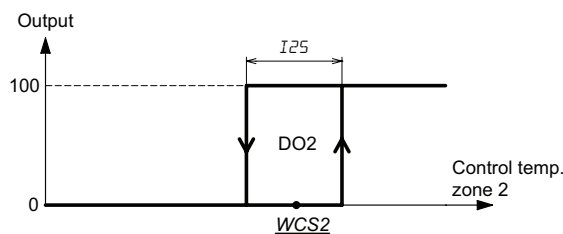
DO2: thermal actuator 2 output.

I25: thermal actuator 2 hysteresis

If the operating temperature drops below WHS2 - (I25 : 2) the thermal actuator is enabled. The 🔥 icon turns on if zone 2 is displayed (I72=5 or [8 alternately with other zones]).

If the temperature rises above WHS2 + (I25 : 2) the thermal actuator is deactivated and the 🔥 icon turns off if zone 2 is displayed (I72=5 or [8 alternately with other zones]).

Configurations -4, -3, -2, -1, 6, 7, 8, 10, 11, 14, 15, thermal actuator 2 in cooling mode:



WCS2: setpoint of the zone 2 calculated according to paragraph “15. Season, operating setpoint, economy, holiday mode” page 53

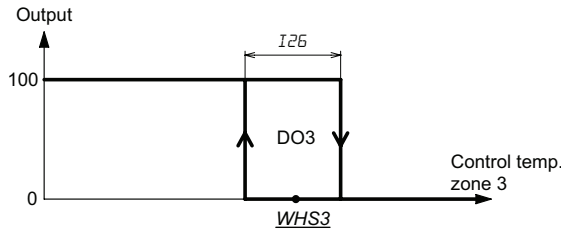
DO2: thermal actuator 2 output.

I25: thermal actuator 2 hysteresis

If the operating temperature rises above WCS2 + (I25 : 2) the thermal actuator is enabled. The ❄️ icon turns on if zone 2 is displayed (I72=5 or [8 alternately with other zones]).

If the temperature drops below WCS2 - (I25 : 2) the thermal actuator is deactivated and the ❄️ icon turns off if zone 2 is displayed (I72=5 or [8 alternately with other zones]).

Configurations 7, 8, 11, 15, thermal actuator 3 in heating mode:



WHS3: setpoint of the zone 3 calculated according to paragraph “15. Season, operating setpoint, economy, holiday mode” page 53

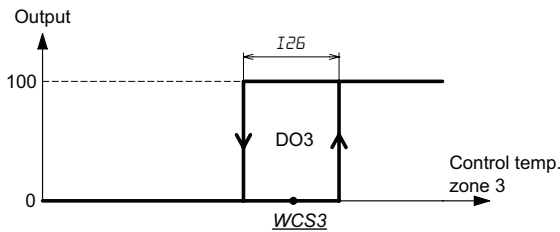
DO3: thermal actuator 3 output

I25: thermal actuator 3 hysteresis

If the operating temperature drops below $WHS3 - (I25 : 2)$ the thermal actuator is enabled. The \lll icon turns on if zone 3 is displayed ($I72=6$ or [8 alternately with other zones]).

If the temperature rises above $WHS3 + (I25 : 2)$ the thermal actuator is deactivated and the \lll icon turns off if zone 3 is displayed ($I72$ or [8 alternately with other zones]).

Configurations 7, 8, 11, 15, thermal actuator 3 in cooling mode:



WCS3: setpoint of the zone 3 calculated according to paragraph “15. Season, operating setpoint, economy, holiday mode” page 53

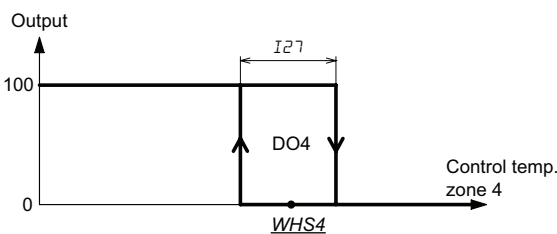
DO3: thermal actuator 3 output.

I25: thermal actuator 3 hysteresis

If the operating temperature rises above $WCS3 + (I25 : 2)$ the thermal actuator is enabled. The \ast icon turns on if zone 3 is displayed ($I72=6$ or [8 alternately with other zones]).

If the temperature drops below $WCS3 - (I25 : 2)$ the thermal actuator is deactivated and the \ast icon turns off if zone 3 is displayed ($I72=6$ or [8 alternately with other zones]).

Configuration 8, thermal actuator 4 in heating mode:



WHS4: setpoint of the zone 4 calculated according to paragraph “15. Season, operating setpoint, economy, holiday mode” page 53

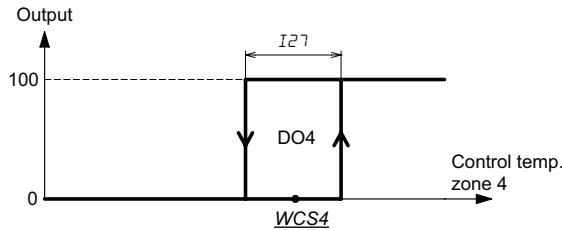
DO4: thermal actuator 4 output

I27: thermal actuator 4 hysteresis

If the operating temperature drops below $WHS4 - (I27 : 2)$ the thermal actuator is enabled. The icon \lll turns on if zone 4 is displayed ($I72=7$ or [8 alternately with other zones]).

If the temperature rises above $WHS4 + (I27 : 2)$ the thermal actuator is deactivated and the \lll icon turns off if zone 4 is displayed ($I72=7$ or [8 alternately with other zones]).

Configurations from 8, thermal actuator 4 in cooling mode:



WCS4: setpoint of the zone 4 calculated according to paragraph “15. Season, operating setpoint, economy, holiday mode” page 53

DO4: thermal actuator 4 output

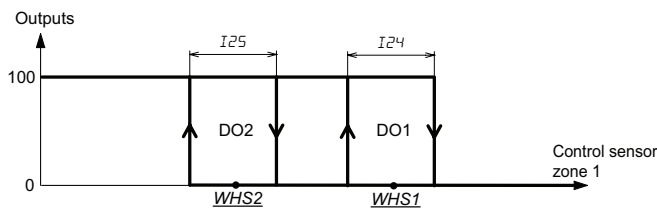
I27: thermal actuator 4 hysteresis

If the operating temperature rises above $WCS4 + (I27 : 2)$ the thermal actuator is enabled. The icon ❄️ turns on if zone 4 is displayed ($I17=7$ or [8 alternately with other zones]).

If the temperature drops below $WCS4 - (I27 : 2)$ the thermal actuator is deactivated and the ❄️ icon turns off if zone 4 is displayed ($I17=7$ or [8 alternately with other zones]).

Controls with a single sensor with several thermal actuators for a single zone:

Configurations 16, 19, 21 thermal actuators 1, 2 in heating mode:



WHS1: setpoint thermal actuator 1,

WHS2: setpoint thermal actuator 2, calculated according to paragraph “15. Season, operating setpoint, economy, holiday mode” page 53

DO1: thermal actuator 1 output

DO2: thermal actuator 2 output

I24: thermal actuator 1 hysteresis

I25: thermal actuator 2 hysteresis

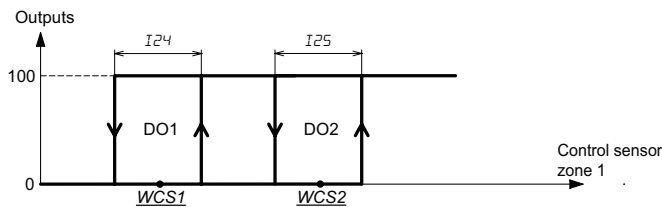
If the operating temperature drops below $WHS1 - (I24 : 2)$ the thermal actuator 1 is enabled. The ❄️ icon turns on if zone 1 is displayed ($I17=4$ or [8 alternately with other zones]).

If the temperature rises above $WHS1 + (I24 : 2)$ the thermal actuator 1 is deactivated and the ❄️ icon turns off if zone 1 is displayed ($I17=4$ or [8 alternately with other zones]).

If the operating temperature drops below $WHS2 - (I25 : 2)$ the thermal actuator 2 is enabled. The ❄️ icon turns on if zone of the thermal actuator 2 is displayed ($I17=5$ or [8 alternately with other zones]).

If the temperature rises above $WHS2 + (I25 : 2)$ the thermal actuator 2 is deactivated and the ❄️ icon turns off if the zone of thermal actuator 3 is displayed ($I17=5$ or [8 alternately with other zones]).

Configurations 16, 19, 21 thermal actuators 1, 2 in cooling mode:



WHS1: setpoint thermal actuator 1,

WCS2: setpoint thermal actuator 2, calculated according to paragraph "15. Season, operating setpoint, economy, holiday mode" page 53

DO1: thermal actuator 1 output

DO2: thermal actuator 2 output

I24: thermal actuator 1 hysteresis

I25: thermal actuator 2 hysteresis

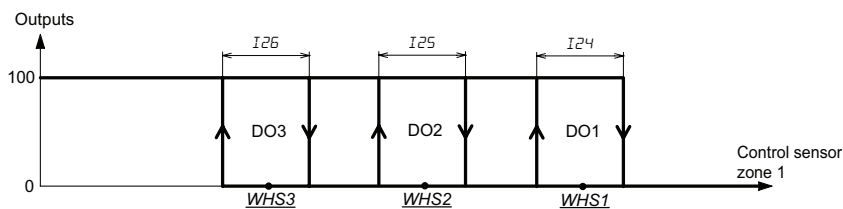
If the operating temperature rises above $\underline{WCS1} + (I24 : 2)$ the thermal actuator 1 is enabled. The ❄️ icon turns on if zone 1 is displayed (I72=4 or [8 alternately with other zones]).

If the temperature drops below $\underline{WCS1} - (I24 : 2)$ the thermal actuator 1 is deactivated and the ❄️ icon turns off if zone 1 is displayed (I72=4 or [8 alternately with other zones]).

If the operating temperature rises above $\underline{WCS2} + (I25 : 2)$ the thermal actuator 2 is enabled. The ❄️ icon turns on if zone of the thermal actuator 2 is displayed (I72=5 or [8 alternately with other zones]).

If the temperature drops below $\underline{WCS2} - (I25 : 2)$ the thermal actuator 2 is deactivated and the ❄️ icon turns off if the zone of thermal actuator 2 is displayed (I72=5 or [8 alternately with other zones]).

Configurations 17, 20, 22 thermal actuators 1, 2, 3 in heating mode:



WHS1: setpoint thermal actuator 1,

WHS2: setpoint thermal actuator 2,

WHS3: setpoint thermal actuator 3, calculated according to paragraph "15. Season, operating setpoint, economy, holiday mode" page 53

DO1: thermal actuator 1 output

DO2: thermal actuator 2 output

DO3: thermal actuator 3 output

I24: thermal actuator 1 hysteresis

I25: thermal actuator 2 hysteresis

I26: thermal actuator 3 hysteresis

If the operating temperature drops below $\underline{WHS1} - (I24 : 2)$ the thermal actuator 1 is enabled. The 🔥 icon turns on if zone 1 is displayed (I72=4 or [8 alternately with other zones]).

If the temperature rises above $\underline{WHS1} + (I24 : 2)$ the thermal actuator 1 is deactivated and the 🔥 icon turns off if zone 1 is displayed (I72=4 or [8 alternately with other zones]).

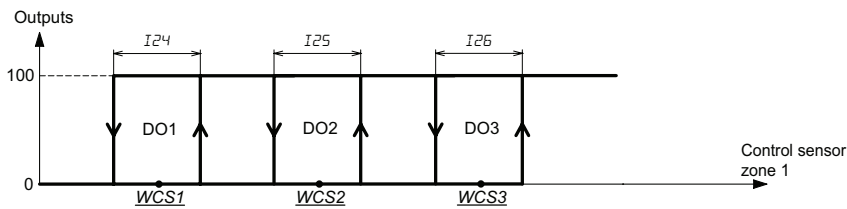
If the operating temperature drops below $\underline{WHS2} - (I25 : 2)$ the thermal actuator 2 is enabled. The 🔥 icon turns on if zone of the thermal actuator 2 is displayed (I72=5 or [8 alternately with other zones]).

If the temperature rises above $\underline{WHS2} + (I25 : 2)$ the thermal actuator 2 is deactivated and the 🔥 icon turns off if the zone of thermal actuator 2 is displayed (I72=5 or [8 alternately with other zones]).

If the operating temperature drops below $\underline{WHS3} - (I26 : 2)$ the thermal actuator 3 is enabled. The 🔥 icon turns on if zone of the thermal actuator 3 is displayed (I72=6 or [8 alternately with other zones]).

If the temperature rises above $\underline{WHS3} + (I26 : 2)$ the thermal actuator 3 is deactivated and the 🔥 icon turns off if the zone of thermal actuator 3 is displayed (I72=6 or [8 alternately with other zones]).

Configurations 17, 20, 22 thermal actuators 1, 2, 3 in cooling mode:



WCS1: setpoint thermal actuator 1,"

WCS2: setpoint thermal actuator 2,

WCS3: setpoint thermal actuator 3, calculated according to paragraph "15. Season, operating setpoint, economy, holiday mode" page 53

DO1: thermal actuator 1 output

DO2: thermal actuator 2 output

DO3: thermal actuator 3 output

I24: thermal actuator 1 hysteresis

I25: thermal actuator 2 hysteresis

I26: thermal actuator 3 hysteresis

If the operating temperature rises above WCS1 + (I24 : 2) the thermal actuator 1 is enabled. The ❄️ icon turns on if zone 1 is displayed (I12=4 or [8 alternately with other zones]).

If the temperature drops below WCS1 - (I24 : 2) the thermal actuator 1 is deactivated and the ❄️ icon turns off if zone 1 is displayed (I12=4 or [8 alternately with other zones]).

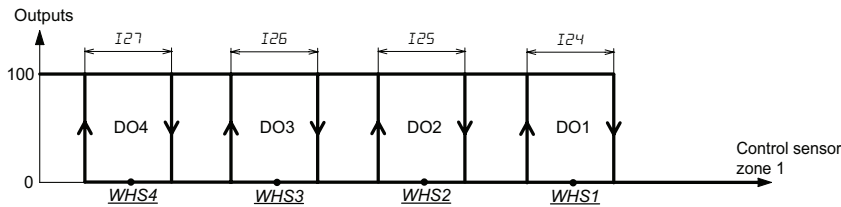
If the operating temperature rises above WCS2 + (I25 : 2) the thermal actuator 2 is enabled. The ❄️ icon turns on if zone of the thermal actuator 2 is displayed (I12=5 or [8 alternately with other zones]).

If the temperature drops below WCS2 - (I25 : 2) the thermal actuator 2 is deactivated and the ❄️ icon turns off if the zone of thermal actuator 2 is displayed (I12=5 or [8 alternately with other zones]).

If the operating temperature rises above WCS3 + (I26 : 2) the thermal actuator 3 is enabled. The ❄️ icon turns on if zone of the thermal actuator 3 is displayed (I12=6 or [8 alternately with other zones]).

If the temperature drops below WCS3 - (I26 : 2) the thermal actuator 3 is deactivated and the ❄️ icon turns off if the zone of thermal actuator 3 is displayed (I12=6 or [8 alternately with other zones]).

Configuration 18, thermal actuators 1, 2, 3, 4 in heating mode:



WHS1: setpoint thermal actuator 1,

WHS2: setpoint thermal actuator 2,

WHS3: setpoint thermal actuator 3,

WHS4: setpoint thermal actuator 4, calculated according to paragraph "15. Season, operating setpoint, economy, holiday mode" page 53

DO1: thermal actuator 1 output

DO2: thermal actuator 2 output

DO3: thermal actuator 3 output


DO4: thermal actuator 4 output


I24: thermal actuator 1 hysteresis


I25: thermal actuator 2 hysteresis


I26: thermal actuator 3 hysteresis


I27: thermal actuator 4 hysteresis


If the operating temperature drops below WHS1 - (I24 : 2) the thermal actuator 1 is enabled. The  icon turns on if zone 1 is displayed (I72=4 or [8 alternately with other zones]).


If the temperature rises above WHS1 + (I24 : 2) the thermal actuator 1 is deactivated and the  icon turns off if zone 1 is displayed (I72=4 or [8 alternately with other zones]).


If the operating temperature drops below WHS2 - (I25 : 2) the thermal actuator 2 is enabled. The  icon turns on if zone of the thermal actuator 2 is displayed (I72=5 or [8 alternately with other zones]).

If the temperature rises above WHS2 + (I25 : 2) the thermal actuator 2 is deactivated and the  icon turns off if the zone of thermal actuator 2 is displayed (I72=5 or [8 alternately with other zones]).

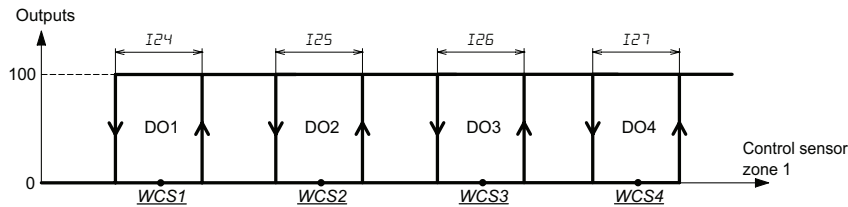
If the operating temperature drops below WHS3 - (I26 : 2) the thermal actuator 3 is enabled. The  icon turns on if zone of the thermal actuator 3 is displayed (I72=6 or [8 alternately with other zones]).

If the temperature rises above WHS3 + (I26 : 2) the thermal actuator 3 is deactivated and the  icon turns off if the zone of thermal actuator 3 is displayed (I72=6 or [8 alternately with other zones]).

If the operating temperature drops below WHS4 - (I27 : 2) the thermal actuator 4 is enabled. The  icon turns on if zone of the thermal actuator 4 is displayed (I72=7 or [8 alternately with other zones]).

If the temperature rises above WHS4 + (I27 : 2) the thermal actuator 4 is deactivated and the  icon turns off if the zone of thermal actuator 4 is displayed (I72=7 or [8 alternately with other zones]).

Configuration 18, thermal actuators 1, 2, 3, 4 in cooling mode:



WCS1: setpoint thermal actuator 1,

WCS2: setpoint thermal actuator 2,

WCS3: setpoint thermal actuator 3,

WCS4: setpoint thermal actuator 4, calculated according to paragraph "15. Season, operating setpoint, economy, holiday mode" page 53

DO1: thermal actuator 1 output

DO2: thermal actuator 2 output

DO3: thermal actuator 3 output

DO4: thermal actuator 4 output

I24: thermal actuator 1 hysteresis

I25: thermal actuator 2 hysteresis

I26: thermal actuator 3 hysteresis

I27: thermal actuator 4 hysteresis

If the operating temperature rises above $\underline{WCS1} + (I24 : 2)$ the thermal actuator 1 is enabled. The ❄️ icon turns on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature drops below $\underline{WCS1} - (I24 : 2)$ the thermal actuator 1 is deactivated and the ❄️ icon turns off if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the operating temperature rises above $\underline{WCS2} + (I25 : 2)$ the thermal actuator 2 is enabled. The ❄️ icon turns on if zone of the thermal actuator 2 is displayed ($I72=5$ or [8 alternately with other zones]).

If the temperature drops below $\underline{WCS2} - (I25 : 2)$ the thermal actuator 2 is deactivated and the ❄️ icon turns off if the zone of thermal actuator 2 is displayed ($I72=5$ or [8 alternately with other zones]).

If the operating temperature rises above $\underline{WCS3} + (I26 : 2)$ the thermal actuator 3 is enabled. The ❄️ icon turns on if zone of the thermal actuator 3 is displayed ($I72=6$ or [8 alternately with other zones]).

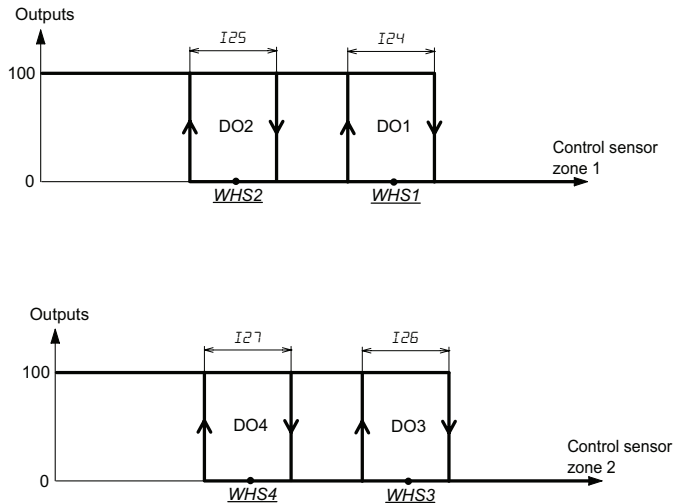
If the temperature drops below $\underline{WCS3} - (I26 : 2)$ the thermal actuator 3 is deactivated and the ❄️ icon turns off if the zone of thermal actuator 3 is displayed ($I72=6$ or [8 alternately with other zones]).

If the operating temperature rises above $\underline{WCS4} + (I27 : 2)$ the thermal actuator 4 is enabled. The ❄️ icon turns on if zone of the thermal actuator 4 is displayed ($I72=7$ or [8 alternately with other zones]).

If the temperature drops below $\underline{WCS4} - (I27 : 2)$ the thermal actuator 4 is deactivated and the ❄️ icon turns off if the zone of thermal actuator 4 is displayed ($I72=7$ or [8 alternately with other zones]).

• **Controls with 2 thermal actuators per zone: (two control sensors are required)**

Configuration 24, thermal actuators 1, 2, 3, 4 in heating mode:



WHS1: setpoint thermal actuator 1,

WHS2: setpoint thermal actuator 2,

WHS3: setpoint thermal actuator 3,

WHS4: setpoint thermal actuator 4, calculated according to paragraph “15. Season, operating setpoint, economy, holiday mode” page 53

DO1: thermal actuator 1 output

DO2: thermal actuator 2 output

DO3: thermal actuator 3 output

DO4: thermal actuator 4 output

I24: thermal actuator 1 hysteresis

I25: thermal actuator 2 hysteresis

I26: thermal actuator 3 hysteresis

I27: thermal actuator 4 hysteresis

If the operating temperature of zone 1 drops below WHS1 - (I24 : 2) the thermal actuator 1 is enabled. The ❄ icon turns on if zone 1 is displayed (I72=4 or [8 alternately with other zones]).

If the operating temperature of zone 1 rises above WHS1 + (I24 : 2) the thermal actuator 1 is deactivated and the ❄ icon turns off if zone 1 is displayed (I72=4 or [8 alternately with other zones]).

If the operating temperature of zone 1 drops below WHS2 - (I25 : 2) the thermal actuator 2 is enabled. The ❄ icon turns on if zone of the thermal actuator 2 is displayed (I72=5 or [8 alternately with other zones]).

If the operating temperature of zone 1 rises above WHS2 + (I25 : 2) the thermal actuator 2 is deactivated and the ❄ icon turns off if the zone of thermal actuator 2 is displayed (I72=5 or [8 alternately with other zones]).

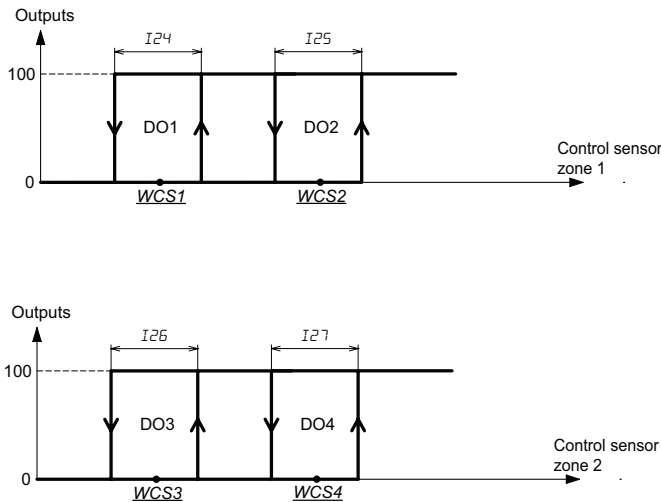
If the operating temperature of zone 2 drops below WHS3 - (I26 : 2) the thermal actuator 3 is enabled. The ❄ icon turns on if zone of the thermal actuator 3 is displayed (I72=6 or [8 alternately with other zones]).

If the operating temperature of zone 2 rises above WHS3 + (I26 : 2) the thermal actuator 3 is deactivated and the ❄ icon turns off if the zone of thermal actuator 3 is displayed (I72=6 or [8 alternately with other zones]).

If the operating temperature of zone 2 drops below WHS4 - (I27 : 2) the thermal actuator 4 is enabled. The ❄ icon turns on if zone of the thermal actuator 4 is displayed (I72=7 or [8 alternately with other zones]).

If the operating temperature of zone 2 rises above WHS4 + (I27 : 2) the thermal actuator 4 is deactivated and the ❄ icon turns off if the zone of thermal actuator 4 is displayed (I72=7 or [8 alternately with other zones]).

Configuration 24, thermal actuators 1, 2, 3, 4 in cooling mode:



WCS1: setpoint thermal actuator 1,

WCS2: setpoint thermal actuator 2,

WCS3: setpoint thermal actuator 3,

WCS4: setpoint thermal actuator 4, calculated according to paragraph "15. Season, operating setpoint, economy, holiday mode" page 53

DO1: thermal actuator 1 output

DO2: thermal actuator 2 output

DO3: thermal actuator 3 output

DO4: thermal actuator 4 output

I24: thermal actuator 1 hysteresis

I25: thermal actuator 2 hysteresis

I26: thermal actuator 3 hysteresis

I27: thermal actuator 4 hysteresis

If the operating temperature of zone 1 rises above $WCS1 + (I24 : 2)$ the thermal actuator 1 is enabled. The ❄️ icon turns on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the operating temperature of zone 1 drops below $WCS1 - (I24 : 2)$ the thermal actuator 1 is deactivated and the ❄️ icon turns off if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the operating temperature of zone 1 rises above $WCS2 + (I25 : 2)$ the thermal actuator 2 is enabled. The ❄️ icon turns on if zone of the thermal actuator 2 is displayed ($I72=5$ or [8 alternately with other zones]).

If the operating temperature of zone 1 drops below $WCS2 - (I25 : 2)$ the thermal actuator 2 is deactivated and the ❄️ icon turns off if the zone of thermal actuator 2 is displayed ($I72=5$ or [8 alternately with other zones]).

If the operating temperature of zone 2 rises above $WCS3 + (I26 : 2)$ the thermal actuator 3 is enabled. The ❄️ icon turns on if zone of the thermal actuator 3 is displayed ($I72=6$ or [8 alternately with other zones]).

If the operating temperature of zone 2 drops below $WCS3 - (I26 : 2)$ the thermal actuator 3 is deactivated and the ❄️ icon turns off if the zone of thermal actuator 3 is displayed ($I72=6$ or [8 alternately with other zones]).

If the operating temperature of zone 2 rises above $WCS4 + (I27 : 2)$ the thermal actuator 4 is enabled. The ❄️ icon turns on if zone of the thermal actuator 4 is displayed ($I72=7$ or [8 alternately with other zones]).

If the operating temperature of zone 2 drops below $WCS4 - (I27 : 2)$ the thermal actuator 4 is deactivated and the ❄️ icon turns off if the zone of thermal actuator 4 is displayed ($I72=7$ or [8 alternately with other zones]).

34. Control request indication

The SLAVE_X controllers must indicate a control request to the SLAVE_Y controller or to the MASTER controller to allow the activation of the circulator and column pump.

This indication may be performed in various ways, based on the controller type and selected configuration.

- **Control request indication from the SLAVE_X controller to the MASTER controller via Modbus:**

If the SLAVE_X controller activates one or more thermal actuators or the dehumidifier, a control request is sent, indicated on the Modbus register MASTER_RD_REG_ACTIVATION (8106) which will be read by the MASTER controller.

- **Control request indication from the SLAVE_X controller to the MASTER controller without Modbus:**

Modbus cannot be used, the only way to indicate the control request is by using the contacts.

Set a digital input as control request ($M04=5$ or $M05=5$) on the MASTER controller.

If configuration 13 is selected on the SLAVE controller, upon the activation of a thermal actuator or of the dehumidifier the DO3 relay will be enabled (if $M17=14$). Through a support relay, the MASTER controller can detect the control request with the digital input set as control request ($M04=5$ or $M05=5$).

If one of the configurations 5, 6, 7, 9, 16, 17 is selected on the SLAVE controller, upon the activation of a thermal actuator or of the dehumidifier the DO5 relay will be enabled (if $M19=14$). Through a support relay, the MASTER controller can detect the control request with the digital input set as control request ($M04=5$ or $M05=5$).

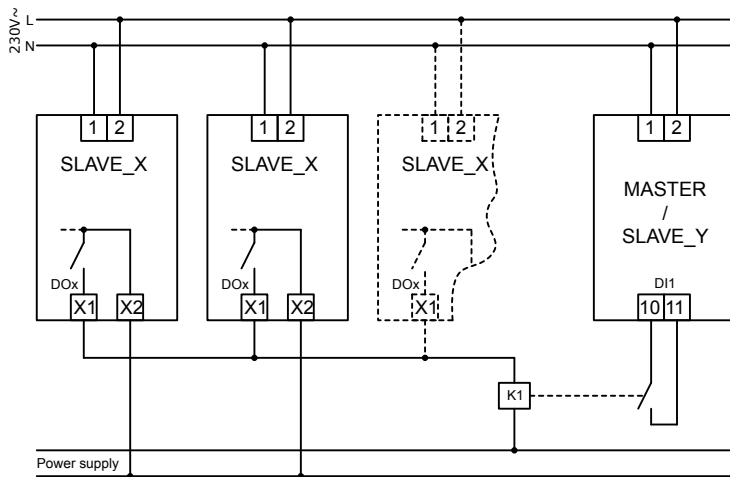


Fig. 1

X1: digital output for control request (terminal 32 for FH-2 model, terminal 34 for FH-4 model)

X2: common digital outputs (terminal 33 for FH-2 model, terminal 35 for FH-4 model)

DOx: for model FH-2xxSH1 = digital output DO3 ($M17 = 14$)

for model FH-4xxSH1 = digital output DO5 ($M19 = 14$)

(with control request it is enabled, without control request, it is disabled)

DI1: digital input 1 ($M04 = 5$)

K1: external relay

Note: the K1 relay coil voltage must correspond to the voltage of other digital outputs of the controller.

If the selected configuration is 8, 10, 11, 12, 14, 15, 18, 19, 20, 21, 22, 23 on the SLAVE controller, all end stroke contacts of the controlled thermal actuators must be connected to the digital input as control request ($M04=5$ or $M05=5$) on the MASTER controller.

- **Control request indication from the SLAVE_X controller to a SLAVE_Y controller:**

Modbus cannot be used, the only way to indicate the control request is by using the contacts.

Set a digital input as control request ($M04=5$ or $M05=5$) on the SLAVE_Y controller.

If configuration 13 is selected on the SLAVE_X controller, upon the activation of a thermal actuator, the DO3 relay will be enabled (if $M17=14$). Through a support relay, the SLAVE_Y controller can detect the control request with the digital input set as control request ($M04=5$ or $M05=5$).

If one of the configurations 5, 6, 7, 9, 16, 17 is selected on the SLAVE_X controller, upon the activation of a thermal actuator or of the dehumidifier, the DO5 relay will be enabled (if $M19=14$). Through a support relay, the SLAVE_Y controller can detect the control request with the digital input set as control request ($M04=5$ or $M05=5$), see Fig. 1 of previous page.

If the selected configuration is 8, 10, 11, 12, 14, 15, 18, 19, 20, 21, 22, 23 on the SLAVE_X controller, all limit contacts of the thermal actuators controlled by SLAVE_X controllers must be connected to the digital input of the SLAVE_Y controller configured as control request ($M04=5$ or $M05=5$).

- **Control request indication from the SLAVE_Y to the MASTER controller via Modbus:**

If a digital contact is configured as control request ($M04=5$ or $M05=5$) on the SLAVE_Y controller, it can be connected in parallel to all limit contacts of the thermal actuators controlled by SLAVE_X controllers. The SLAVE_Y indicates the control request on the Modbus register MASTER_RD_REG_ACTIVATION (8106) which will be read by the MASTER controller.

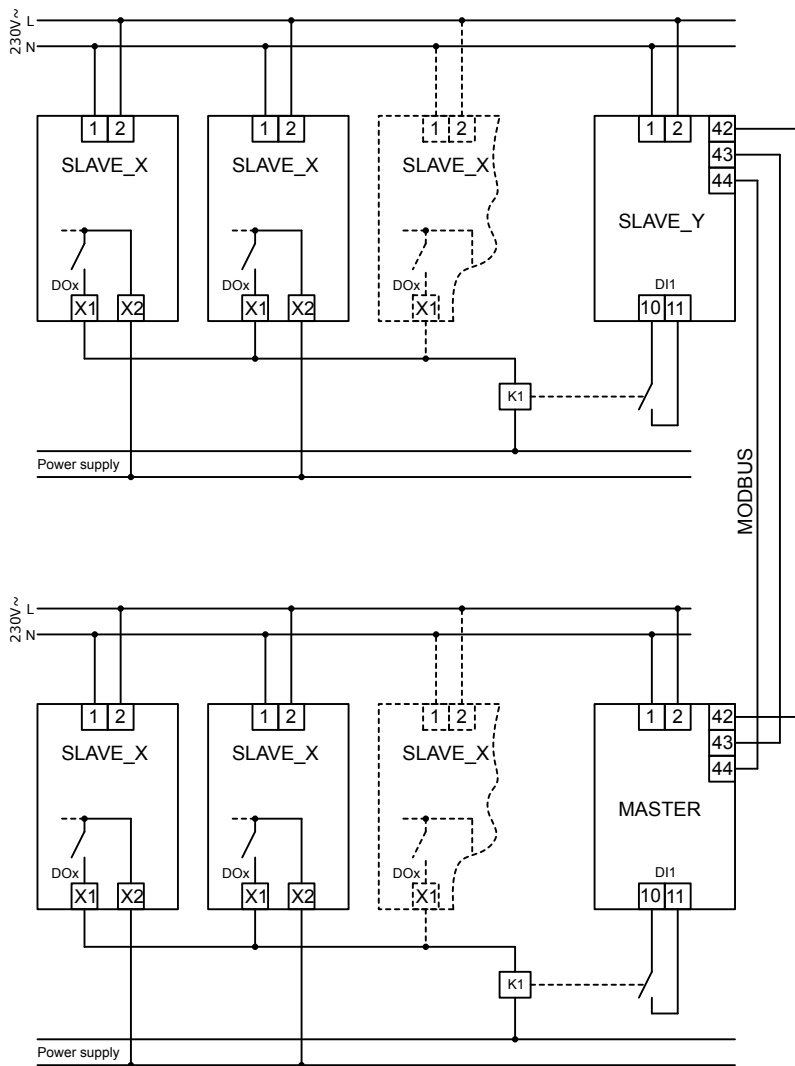


Fig. 2

X1: digital output for control request (terminal 32 for FH-2 model, terminal 34 for FH-4 model)

X2: common digital outputs (terminal 33 for FH-2 model, terminal 35 for FH-4 model)

DOx: for model FH-2xxSH1 = digital output DO3 ($M17 = 14$)

for model FH-4xxSH1 = digital output DO5 ($M19 = 14$)

(with control request it is enabled, without control request, it is disabled)

DI1: digital input 1 ($M04 = 5$)

K1: external relay

Note: the K1 relay coil voltage must correspond to the voltage of other digital outputs of the controller.

35. Fan Coil

Depending on the selected configuration (parameter M^{14}), the SLAVE_X controller is able to control fans with one or three ON/OFF speeds, 0..10 V modulating speeds or no fans.

To select operating with a single-speed ON/OFF fan, configure parameter M^{14} to 9, 10, 11, 19 or 20.

To select operating with a three-speed ON/OFF fan, configure parameter M^{14} to 12.

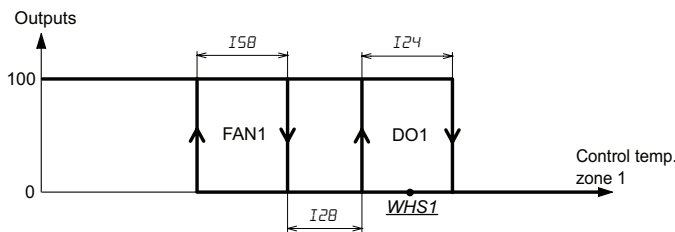
To select operating with EC engine fans, configure parameter M^{14} to 13, 14, 15, 21, 22.

The fan coil is considered as a second stage in relation to the thermal actuator, if the thermal actuator is not disabled.

Depending on the selected configuration, up to 2 fan coils can be controlled (configurations 10 and 19). In these cases, fan coil 1 will operate with the thermal actuator 1 and fan coil 2 will operate with thermal actuator 2.

• The 1 speed fan coil activation logic (configurations 9, 10, 11, 19, 20) in heating mode:

- $I9 \neq 2$ or 3 (thermal actuator 1 enabled to function during the winter season):



WHS1: setpoint of the thermal actuator 1 calculated according to paragraph [“15. Season, operating setpoint, economy, holiday mode” page 53](#)

FAN1: DO2 relay output (conf. 9), DO3 (conf. 10, 19), DO4 (conf 11, 20).

DO1: thermal actuator 1 output.

I24: thermal actuator 1 hysteresis

I2B: differential between the thermal actuator 1 and the fan coil 1

I5B: fan 1 speed hysteresis

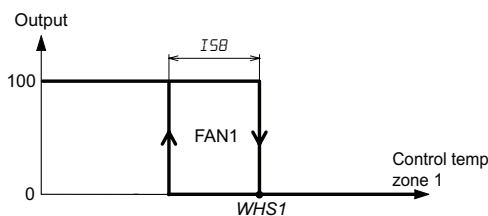
If the operating temperature drops below $WHS1 - (I24 : 2)$ the thermal actuator 1 is enabled. The icon turns on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature falls below $WHS1 - I24 - I2B - I5B$, fan 1 is activated. The icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature rises above $WHS1 - I24 - I2B$, fan 1 is deactivated and icons and turn off.

If the temperature rises above $WHS1 + (I24 : 2)$ the thermal actuator is deactivated and the icon turns off if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

- $I9 = 0$ or 1 (thermal actuator 1 disabled during the winter season):



WHS1: setpoint of the thermal actuator 1 calculated according to paragraph [“15. Season, operating setpoint, economy, holiday mode” page 53](#)

FAN1: DO2 relay output (conf. 9), DO3 (conf. 10, 19), DO4 (conf 11, 20).

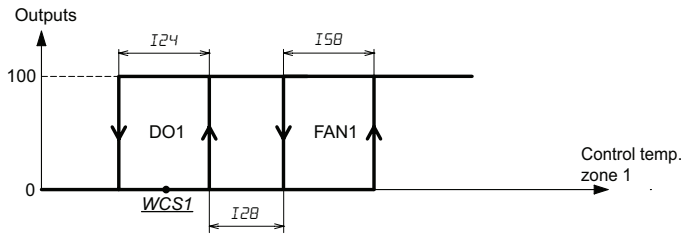
I5B: fan 1 speed hysteresis

If the temperature falls below $WHS1 - I5B$, the fan is activated. The icon turns on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature rises above $WHS1$, fan 1 is disabled and icons and turn off if zone 1 is displayed ($I72=4$ or [8 alternately with the other zones]).

• **The 1 speed fan coil activation logic (configurations 9, 10, 11, 19, 20) in cooling mode:**

- $I9 \neq 1$ or 3 (thermal actuator 1 enabled to function during the summer season):



WCS1: setpoint of the thermal actuator 1 calculated according to paragraph “15. Season, operating setpoint, economy, holiday mode” page 53

FAN1: DO2 relay output (conf. 9), DO3 (conf. 10, 19), DO4 (conf 11, 20).

DO1: thermal actuator 1 output.

I24: thermal actuator 1 hysteresis

I2B: differential between the thermal actuator 1 and the fan coil 1

I5B: fan 1 speed hysteresis

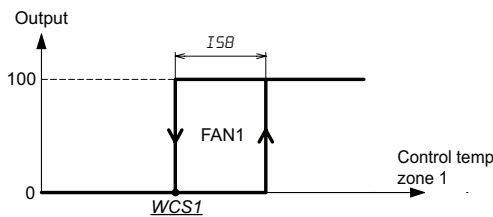
If the operating temperature of zone 1 rises above $WCS1 + (I24 : 2)$ the thermal actuator 1 is enabled. The ❄️ icon turns on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature rises above $WCS1 + (I24 : 2) + I2B + I5B$ fan 1 is enabled. The 🌀 icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature drops below $WCS1 + (I24 : 2) + I2B$ fan 1 is disabled and icons 🌀 and ❄️ turn off.

If the temperature drops below $WCS1 - (I24 : 2)$ the thermal actuator is deactivated and the ❄️ icon turns off if zone 1 is displayed ($I72=4$ or [8 alternately with the other zones]).

- $I9 \neq 0$ or 2 (thermal actuator 1 disabled during the summer season):



WCS1: setpoint of the thermal actuator 1 calculated according to paragraph “15. Season, operating setpoint, economy, holiday mode” page 53

FAN1: DO2 relay output (conf. 9), DO3 (conf. 10, 19), DO4 (conf 11, 20).

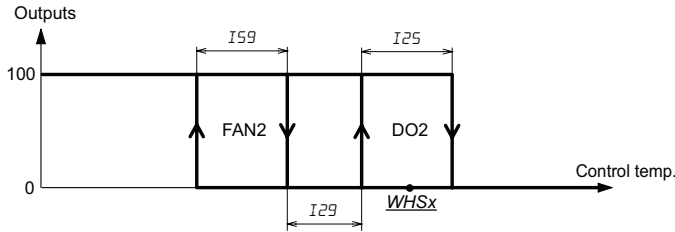
I5B: fan 1 speed hysteresis

If the temperature rises above $WCS1 + I5B$, fan 1 is activated. The 🌀 icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature drops below $WCS1$, fan 1 is disabled and icons 🌀 and ❄️ turn off if zone 1 is displayed ($I72=4$ or [8 alternately with the other zones]).

• The 1 speed fan coil 2 activation logic (configurations 10,19) in heating mode:

- $I92=2$ or 3 (thermal actuator 2 enabled to function during the winter season):



WHS2x: setpoint of the zone 2 (conf. 10) or zone 1 (conf. 19) calculated according to paragraph “15 on page 53”

FAN2: DO4 relay output

DO2: thermal actuator 2 output

I25: thermal actuator 2 hysteresis

I29: differential between the thermal thermal actuator 2 and the fan coil 2

I59: fan 2 speed hysteresis

Control temp.: zone 2 sensor (conf. 10) or zone 1 sensor (conf. 19)

Configuration 10:

If the operating temperature of thermal actuator 2 zone (zone 2) drops below WHS2 - (I25 : 2) the thermal actuator 2 is enabled. The icon turns on if zone 2 is displayed (I72=5 or [8 alternately with other zones]).

If the temperature falls below WHS2 - (I25 : 2) - I29 - I59, fan 2 is activated. The icons turn on if zone 2 is displayed (I72=5 or [8 alternately with other zones]).

If the temperature rises above WHS2 - (I25 : 2) - I29 fan 2 is disabled and icons and turn off.

If the temperature rises above WHS2 + (I25 : 2) the thermal actuator 2 is deactivated and the icon turns off if zone 2 is displayed (I72=5 or [8 alternately with other zones]).

Configuration 19:

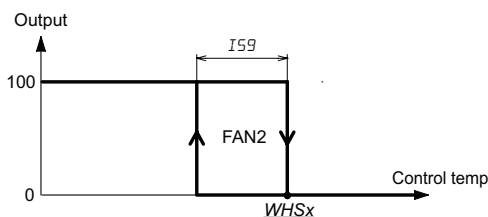
If the operating temperature of thermal actuator 1 zone (zone 1) drops below WHS1 - (I25 : 2) the thermal actuator 2 is enabled. The icon turns on if zone of the thermal actuator 2 is displayed (I72=5 or [8 alternately with other zones]).

If the temperature falls below WHS1 - (I25 : 2) - I29 - I59, fan 2 is activated. The icons turn on if the thermal actuator 2 zone is displayed (I72=5 or [8 alternately with other zones]).

If the temperature rises above WHS1 - (I25 : 2) - I29 fan 2 is disabled and icons and turn off.

If the temperature rises above WHS1 + (I25 : 2) the thermal actuator 2 is deactivated and the icon turns off if the zone of thermal actuator 2 is displayed (I72=5 or [8 alternately with other zones]).

- $I92=0$ or 1 (thermal actuator 2 enabled to function during the winter season):



WHSx: setpoint of the zone 2 (conf. 10) or zone 1 (conf. 19) calculated according to paragraph “15. Season, operating setpoint, economy, holiday mode” page 53

FAN2: DO4 relay output

I59: fan 2 speed hysteresis

Control temp.: zone 2 sensor (conf. 10) or zone 1 sensor (conf. 19)

Configuration 10:

If the temperature of the thermal actuator 2 zone (zone 2) falls below WHS2 - I59, fan 2 is activated. The icons turn on if the thermal actuator 2 zone is displayed (I72=5 or [8 alternately with other zones]).

If the temperature rises above WHS2, fan 2 is deactivated and icons and turn off.

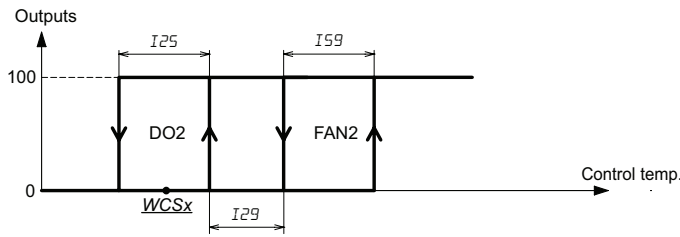
Configuration 19:

If the temperature of the thermal actuator 2 zone (zone 1) falls below WHS1 - I59, fan 2 is activated. The icons turn on if the thermal actuator 2 zone is displayed (I72=5 or [8 alternately with other zones]).

If the temperature rises above WHS1, fan 2 is deactivated and icons and turn off.

• The single speed fan coil 2 activation logic (configurations 10, 19) in cooling mode:

- $I92=1$ or 3 (thermal actuator 1 enabled to function during the summer season):



$WCSx$: setpoint of the zone 2 (conf. 10) or zone 1 (conf. 19) calculated according to paragraph “15. Season, operating setpoint, economy, holiday mode” page 53

FAN2: DO4 relay output

DO2: thermal actuator 2 output

$I25$: thermal actuator 2 hysteresis

$I29$: differential between the thermal actuator 2 and the fan coil 2

$I59$: fan 2 speed hysteresis

Control temp.: zone 2 sensor (conf. 10) or zone 1 sensor (conf. 19)

Configuration 10:

If the operating temperature of thermal actuator 2 zone (zone 2) rises above $WCS2 + (I25 : 2)$ the thermal actuator 2 is enabled. The ❄️ icon turns on if zone of the thermal actuator 2 is displayed ($I72=5$ or [8 alternately with other zones]).

If the temperature rises above $WCS2 + (I25 : 2) + I29 + I59$, fan 2 is activated. The 🌀 icons turn on if zone 2 is displayed ($I72=5$ or [8 alternately with other zones]).

If the temperature drops below $WCS2 + (I25 : 2) + I29$ fan 2 is disabled and icons 🌀 and ❄️ turn off.

If the temperature drops below $WCS2 - (I25 : 2)$ the thermal actuator 2 is deactivated and the ❄️ icon turns off if zone 2 is displayed ($I72=5$ or [8 alternately with other zones]).

Configuration 19:

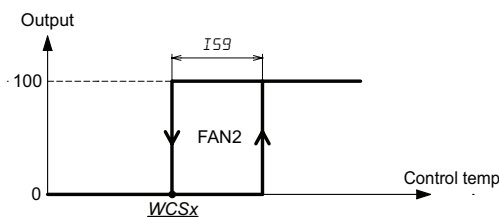
If the operating temperature of thermal actuator 2 zone (zone 1) rises above $WCS1 + (I25 : 2)$ the thermal actuator 2 is enabled. The ❄️ icon turns on if zone of the thermal actuator 2 is displayed ($I72=5$ or [8 alternately with other zones]).

If the temperature rises above $WCS1 + (I25 : 2) + I29 + I59$, fan 2 is activated. The 🌀 icons turn on if zone 2 is displayed ($I72=5$ or [8 alternately with other zones]).

If the temperature drops below $WCS1 + (I25 : 2) + I29$ fan 2 is disabled and icons 🌀 and ❄️ turn off.

If the temperature drops below $WCS1 - (I25 : 2)$ the thermal actuator 2 is deactivated and the ❄️ icon turns off if the zone of thermal actuator 2 is displayed ($I72=5$ or [8 alternately with other zones]).

- $I92=0$ or 2 (thermal actuator 2 disabled during the summer season):



$WCSx$: setpoint of the zone 2 (conf. 10) or zone 1 (conf. 19) calculated according to paragraph “15. Season, operating setpoint, economy, holiday mode” page 53

FAN2: DO4 relay output

$I59$: fan 2 speed hysteresis

Control temp.: zone 2 sensor (conf. 10) or zone 1 sensor (conf. 19)

Configuration 10:

If the temperature of the thermal actuator 2 zone (zone 2) rises above $WCS2 + I59$, fan 2 is activated. The 🌀 icons turn on if the thermal actuator 2 zone is displayed ($I72=5$ or [8 alternately with other zones]).

If the temperature falls below $WCS2$, fan 2 is disabled and the 🌀 and ❄️ icons turn off.

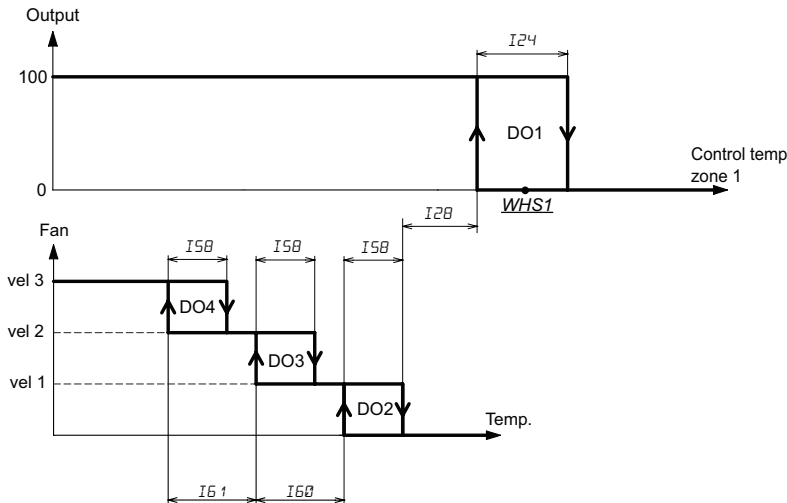
Configuration 19:

If the temperature of the thermal actuator 2 zone (zone 1) rises above $WCS1 + I59$, fan 2 is activated. The 🌀 icons turn on if the thermal actuator 2 zone is displayed ($I72=5$ or [8 alternately with other zones]).

If the temperature falls below $WCS1$, fan 2 is disabled and the 🌀 and ❄️ icons turn off.

• The 3 speed fan coil activation logic (configurations 12) in heating mode:

- $I9 \neq 2$ or 3 (thermal actuator 1 enabled to function during the winter season):



WHS1: setpoint of the thermal actuator 1 calculated according to paragraph “15. Season, operating setpoint, economy, holiday mode” page 53

DO1: thermal actuator 1 output

DO2: speed output 1

DO3: speed output 2

DO4: speed output 3

I24: thermal actuator 1 hysteresis

I2B: differential between the thermal actuator 1 and the fan coil 1

I5B: fan 1 speed hysteresis

I60: differential between speed 1 and 2

I61: differential between speed 2 and 3

Set the 3 speed ON/OFF motor parameters as follows:

- Set parameter $I2B$ to define the differential between the thermal actuator activation and the fan coil deactivation.
- Set parameters $I5B$, $I60$, $I61$ to define the activation points of speeds 1, 2 and 3 (see figure above).


Example: if $I2B=0.5^{\circ}\text{C}$, $I5B=0.3^{\circ}\text{C}$, $I60=0.3^{\circ}\text{C}$, $I61=0.4^{\circ}\text{C}$:


Speed 1 activates at $0.8^{\circ}\text{C} \rightarrow I2B + I5B$ under the thermal actuator activation point,


Speed 2 activates at $0.3^{\circ}\text{C} \rightarrow I60$ under the speed 1 activation point,


Speed 3 activates at $0.4^{\circ}\text{C} \rightarrow I61$ under the speed 2 activation point.


The hysteresis of speeds 1, 2 and 3 corresponds to $I5B$.


If the operating temperature of zone 1 drops below $WHS1 - (I24 : 2)$ the thermal actuator 1 is enabled. The  icon turns on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).


If the operating temperature drops below $WHS1 - (I24 : 2) - I2B - I5B$ the fan is enabled at speed 1. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the operating temperature drops below $WHS1 - (I24 : 2) - I2B - I5B - I60$ the fan is enabled at speed 2. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the operating temperature drops below $WHS1 - (I24 : 2) - I2B - I5B - I60 - I61$ the fan is enabled at speed 3. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).



If the temperature rises above $WHS1 - (I24 : 2) - I2B - I60 - I61$ speed 3 is deactivated and speed 2 is activated. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature rises above $WHS1 - (I24 : 2) - I2B - I60$ speed 2 is deactivated and speed 1 is activated. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

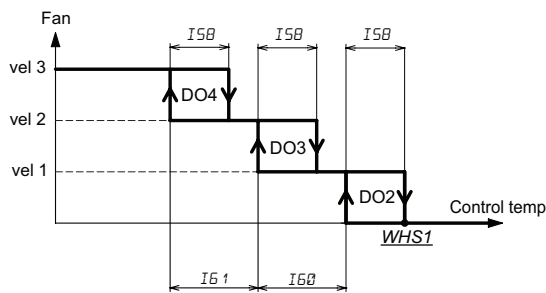
If the temperature rises above $WHS1 - (I24 : 2) - I2B$, the fan is deactivated. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature rises above $WHS1 + (I24 : 2)$, the thermal actuator is deactivated. The  icon turns off.

With $M23=1$ and $M19=10$ the output DO5, set as valve ON/OFF, is activated when the fan is activated and is deactivated when the fan is deactivated.

Note: in case of automatic speed control,  is displayed; otherwise  for manual speed control

■ $I9 \neq 0$ or 1 (thermal actuator 1 enabled to function during the winter season):



WHS1: setpoint of the thermal actuator 1 calculated according to paragraph “15. Season, operating setpoint, economy, holiday mode” page 53

DO1: thermal actuator 1 output

DO2: speed output 1

DO3: speed output 2

DO4: speed output 3

I5B: fan 1 speed hysteresis

I50: differential between speed 1 and 2

I51: differential between speed 2 and 3

Set the 3 speed ON/OFF motor parameters as follows:

- Set parameters $I5B$, $I50$, $I51$ to define the activation points of speeds 1, 2 and 3 (see the attached diagram).

Example: if $I5B=0.3^{\circ}\text{C}$, $I50=0.3^{\circ}\text{C}$, $I51=0.4^{\circ}\text{C}$


Speed 1 is activated at $0.3^{\circ}\text{C} \rightarrow I5B$ under **WHS1**,


Speed 2 activates at $0.3^{\circ}\text{C} \rightarrow I50$ under the speed 1 activation point,


Speed 3 activates at $0.4^{\circ}\text{C} \rightarrow I51$ under the speed 2 activation point.


The hysteresis of speeds 1, 2 and 3 corresponds to $I5B$.

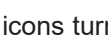
If the temperature falls below $WHS1 - I5B$, the fan is activated at speed 1. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature falls below $WHS1 - I5B - I50$, the fan is activated at speed 2. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature falls below $WHS1 - I5B - I50 - I51$, the fan is activated at speed 3. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature rises above $WHS1 - I50 - I51$, the fan speed 3 is deactivated and speed 2 is activated. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature rises above $WHS1 - I50$, the fan speed 2 is deactivated and speed 1 is activated. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

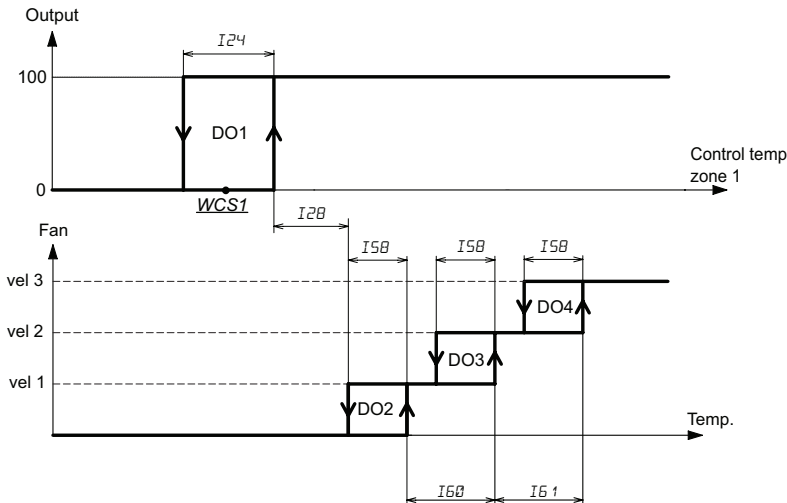
If the temperature rises above $WHS1$, the fan is deactivated. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

With $M23=1$ and $M19=10$ the output DO5, set as valve ON/OFF, is activated when the fan is activated and is deactivated when the fan is deactivated.

Note: in case of automatic speed control,  is displayed; otherwise  for manual speed control.

• The 3 speed fan coil activation logic (configuration 12) in cooling mode:

- $I9=1$ or 3 (thermal actuator 1 enabled to function during the summer season):



WCS1: setpoint of the thermal actuator 1 calculated according to paragraph "15. Season, operating setpoint, economy, holiday mode" page 53

DO1: thermal actuator 1 output

DO2: speed output 1

DO3: speed output 2

DO4: speed output 3

I24: thermal actuator 1 hysteresis

I2B: differential between the thermal thermal actuator 1 and the fan coil 1

I5B: fan 1 speed hysteresis

I60: differential between speed 1 and 2

I61: differential between speed 2 and 3

Set the 3 speed ON/OFF motor parameters as follows:

- Set parameter $I2B$ to define the differential between the thermal thermal actuator activation and the fan coil deactivation.
- Set parameters $I5B$, $I60$, $I61$ to define the activation points of speeds 1, 2 and 3 (see figure above).

Example: if $I2B=0.5^{\circ}\text{C}$, $I5B=0.3^{\circ}\text{C}$, $I60=0.3^{\circ}\text{C}$, $I61=0.4^{\circ}\text{C}$:

Speed 1 activates at $0.8^{\circ}\text{C} \rightarrow I2B + I5B$ above the thermal actuator activation point,

Speed 2 activates at $0.3^{\circ}\text{C} \rightarrow I60$ above the speed 1 activation point,

Speed 3 activates at a $0.4^{\circ}\text{C} \rightarrow I61$ above the speed 2 activation point.

The hysteresis of speeds 1, 2 and 3 corresponds to $I5B$.

If the operating temperature of zone 1 rises above $WCS1 + (I24 : 2)$ the thermal actuator 1 is enabled. The icon turns on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature rises above $WCS1 + (I24 : 2) + I2B + I5B$ the fan is enabled at speed 1. The icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature rises above $WCS1 + (I24 : 2) + I2B + I5B + I60$ the fan is enabled at speed 2. The icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature rises above $WCS1 + (I24 : 2) + I2B + I5B + I60 + I61$ the fan is enabled at speed 3. The icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature drops below $WCS1 + (I24 : 2) + I2B + I60 + I61$ speed 3 is deactivated and speed 2 is activated. The icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).


If the temperature drops below $WCS1 + (I24 : 2) + I2B + I60$ speed 2 is deactivated and speed 1 is activated. The icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature drops below $WCS1 + (I24 : 2) + I2B$ the fan is deactivated. The icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

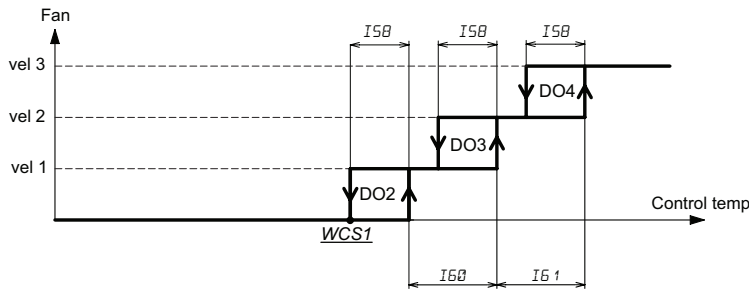
If the temperature drops below $WCS1 - (I24 : 2)$, the thermal thermal actuator is deactivated. The icon turns off.

With $M23=1$ and $M19=10$ the output DO5, set as valve ON/OFF, is activated when the fan is activated and is deactivated

when the fan is deactivated.

Note: in case of automatic speed control,  is displayed; otherwise  for manual speed control.

■ $I9 \neq 0$ or 2 (thermal actuator 1 disabled during the summer season):



WCS1: setpoint of the thermal actuator 1 calculated according to paragraph “15. Season, operating setpoint, economy, holiday mode” page 53

DO2: speed output 1

DO3: speed output 2

DO4: speed output 3

I5B: fan 1 speed hysteresis

I60: differential between speed 1 and 2

I61: differential between speed 2 and 3

Set the 3 speed ON/OFF motor parameters as follows:

- Set parameters I5B, I60, I61 to define the activation points of speeds 1, 2 and 3 (see the attached diagram).


Example: if $I5B=0.3^{\circ}\text{C}$, $I60=0.3^{\circ}\text{C}$, $I61=0.4^{\circ}\text{C}$:


speed 1 is activated at $0.3^{\circ}\text{C} \rightarrow I5B$ above WCS1,


Speed 2 activates at $0.3^{\circ}\text{C} \rightarrow I60$ above the speed 1 activation point,


Speed 3 activates at a $0.4^{\circ}\text{C} \rightarrow I61$ above the speed 2 activation point.


The hysteresis of speeds 1, 2 and 3 corresponds to I5B.


If the temperature rises above WCS1 + I5B fan is activated at speed 1. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature rises above WCS1 + I5B + I60 fan is activated at speed 2. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature rises above WCS1 + I5B + I60 + I61 the fan is activated at speed 3. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature drops below WCS1 + I60 + I61, the fan speed 3 is deactivated and speed 2 is activated. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature drops below WCS1 + I60, the fan speed 2 is deactivated and speed 1 is activated. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

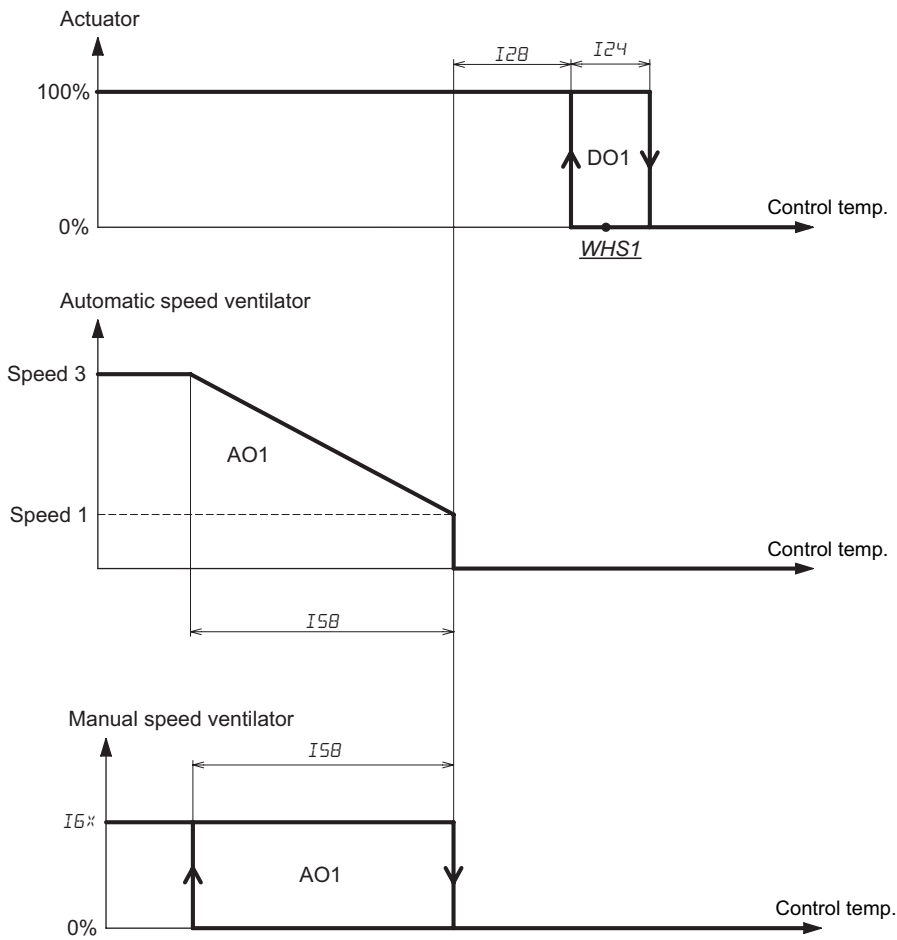
If the temperature falls below WCS1, the fan is deactivated. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

With $M23=1$ and $M19=10$ the output DO5, set as valve ON/OFF, is activated when the fan is activated and is deactivated when the fan is deactivated.

Note: in case of automatic speed control,  is displayed; otherwise  for manual speed control.

• **The EC fan coil activation logic (configurations 13, 14, 15, 21, 22) in heating mode:**

- $I9 \neq 2$ or 3 (thermal actuator 1 enabled to function during the winter season):



WHS1: setpoint of the thermal actuator 1 calculated according to paragraph "15. Season, operating setpoint, economy, holiday mode" page 53

DO1: thermal actuator 1 output

AO1: EC fan output

I24: thermal actuator 1 hysteresis

I2B: differential between the thermal thermal actuator 1 and the fan coil 1

I5B: speed proportional band

I6x: I64 if manual speed 1 is selected

I6x: I65 if manual speed 2 is selected

I6x: I66 if manual speed 3 is selected

Set the EC motor parameters as follows:

- Set parameter $I2B$ to define the differential between the thermal thermal actuator activation and the fan coil deactivation.
- Set the EC fan band by setting $I5B$.
- Set the voltage corresponding to the minimum EC motor speed with parameter $I62$.
- Set the voltage corresponding to the maximum EC motor speed with parameter $I63$.
- Set parameters $I64$, $I65$, $I66$ to define the voltages for speed 1, 2, 3 in manual operation.

Example: if $I62=1$ V, $I63=8$ V, $I64=10\%$, $I65=50\%$, $I66=100\%$:

speed 1 corresponds to 1.7 V $\rightarrow [(I64 \times (I63 - I62)) + I62]$,

speed 2 corresponds to 4.5 V $\rightarrow [(I65 \times (I63 - I62)) + I62]$,


speed 3 corresponds to 8 V $\rightarrow [(I66 \times (I63 - I62)) + I62]$.



Automatic speed control is linear over the range of speeds 1 to 3, while manual control simply sets a given speed.


To set speed 1 to the minimum EC motor speed, set $I64$ to 0.


To set speed 3 to the maximum EC motor speed, set $I66$ to 100.

To set speed 2 to the midpoint between speeds 1 and 3, set $I65$ to 50.

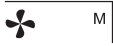
If the operating temperature of zone 1 drops below $WHS1 - (I24 : 2)$ the thermal actuator 1 is enabled. The  icon turns on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the operating temperature drops below $WHS1 - (I24 : 2) - I28$, the fan is enabled at speed 1 and the  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with the other zones]). As the temperature continues to decrease, the speed increases to reach speed 3 when the temperature drops below $WHS1 - (I24 : 2) - I28 - I58$. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with the other zones]).

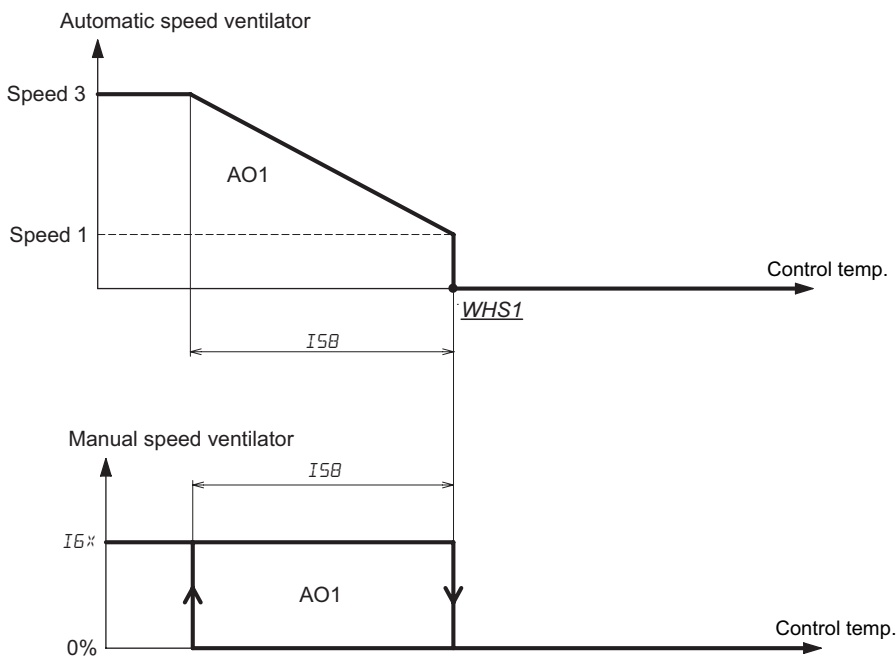
Note: The  icons turn on when the voltage applied to the EC motor reaches the voltage corresponding to speed 2. If the temperature rises above $WHS1 - (I24 : 2) - I28$, the fan is deactivated. The speed icons are off.

If the temperature rises above $WHS1 + (I24 : 2)$, the thermal actuator is deactivated. The  icon turns off.

On the configuration 13 with $M23=1$ and $M16=10$ the output DO2, set as valve ON/OFF, is activated when the fan is activated and is deactivated when the fan is deactivated.

Note: in case of automatic speed control  is displayed, otherwise  for manual speed control.

■ $I94=0$ or 1 (thermal actuator 1 enabled to function during the winter season):



WHS1: setpoint of the thermal actuator1 calculated according to paragraph "15. Season, operating setpoint, economy, holiday mode" page 53

AO1: EC fan output

I58: speed proportional band

I6x: I64 if manual speed 1 is selected

I6x: I65 if manual speed 2 is selected

I6x: I66 if manual speed 3 is selected

Set the EC motor parameters as follows:

- Set the EC fan band by setting $I58$.
- Set the voltage corresponding to the minimum EC motor speed with parameter $I62$.
- Set the voltage corresponding to the maximum EC motor speed with parameter $I63$.
- Set parameters $I64$, $I65$, $I66$ to define the voltages for speed 1, 2, 3 in manual operation.

Example: if $I62=1$ V, $I63=8$ V, $I64=10\%$, $I65=50\%$, $I66=100\%$:

speed 1 corresponds to 1.7 V $\rightarrow [(I64 \times (I63 - I62)) + I62]$,

speed 2 corresponds to 4.5 V $\rightarrow [(I65 \times (I63 - I62)) + I62]$,


speed 3 corresponds to 8 V $\rightarrow [(I66 \times (I63 - I62)) + I62]$.


Automatic speed control is linear over the range of speeds 1 to 3, while manual control simply sets a given speed.


To set speed 1 to the minimum EC motor speed, set $I64$ to 0.

To set speed 3 to the maximum EC motor speed, set $I66$ to 100.



To set speed 2 to the midpoint between speeds 1 and 3, set $I65$ to 50.

If the temperature drops below $WHS1$, the fan is activated at speed 1 and the  icons turn on if zone 1 is displayed

(I72=4 or [8 alternately with the other zones). As the temperature continues to decrease, the speed increases to reach speed 3 when the temperature drops below WHS1 - 158. The  icons turn on if zone 1 is displayed (I72=4 or [8 alternately with the other zones]).

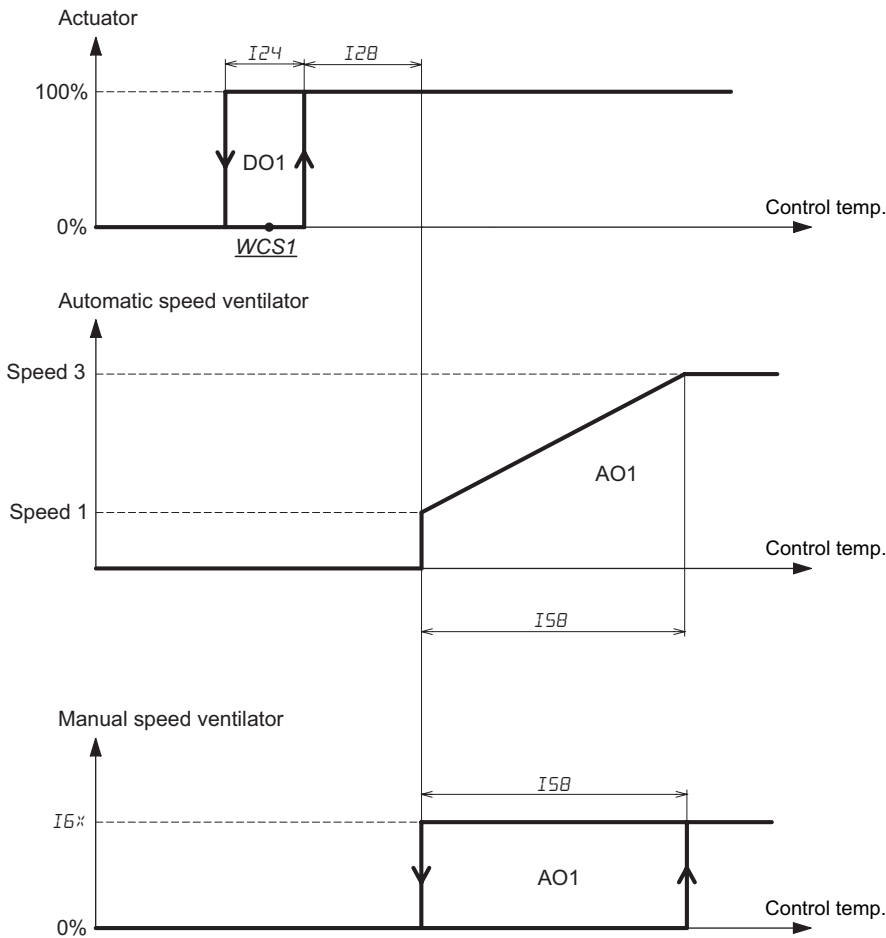
Note: The  icons turn on when the voltage applied to the EC motor reaches the voltage corresponding to speed 2. If the temperature rises above WHS1, the fan is deactivated. The speed icons are off.

On the configuration 13 with M23=1 and M16=10 the output DO2, set as valve ON/OFF, is activated when the fan is activated and is deactivated when the fan is deactivated.

Note: in case of automatic speed control,  is displayed; otherwise , for the manual speed control.

• **The EC fan coil activation logic (configurations 13, 14, 15, 21, 22) in cooling mode:**

- $I9 \neq 1$ or 3 (thermal actuator 1 enabled to function during the summer season):



$WCS1$: setpoint of the thermal actuator 1 calculated according to paragraph "15. Season, operating setpoint, economy, holiday mode" page 53

$DO1$: thermal actuator 1 output

$AO1$: EC fan output

$I24$: thermal actuator 1 hysteresis

$I28$: differential between the thermal actuator 1 and the fan coil 1

$I58$: manual speed hysteresis

$I6x$: $I64$ if manual speed 1 is selected

$I6x$: $I65$ if manual speed 2 is selected

$I6x$: $I66$ if manual speed 3 is selected

Set the EC motor parameters as follows:

- Set parameter $I28$ to define the differential between the thermal actuator activation and the fan coil deactivation.

- Set the EC fan band by setting $I58$.

- Set the voltage corresponding to the minimum EC motor speed with parameter $I62$.

- Set the voltage corresponding to the maximum EC motor speed with parameter $I63$.

- Set parameters $I64$, $I65$, $I66$ to define the voltages for speed 1, 2, 3 in manual operation.

Example: if $I62=1$ V, $I63=8$ V, $I64=10\%$, $I65=50\%$, $I66=100\%$,

speed 1 corresponds to 1.7 V $\rightarrow [(I64 \times (I63 - I62)) + I62]$,

speed 2 corresponds to 4.5 V $\rightarrow [(I65 \times (I63 - I62)) + I62]$,


speed 3 corresponds to 8 V $\rightarrow [(I66 \times (I63 - I62)) + I62]$.



Automatic speed control is linear over the range of speeds 1 to 3, while manual control simply sets a given speed.

To set speed 1 to the minimum EC motor speed, set $I64$ to 0.

To set speed 3 to the maximum EC motor speed, set $I66$ to 100.


To set speed 2 to the midpoint between speeds 1 and 3, set $I65$ to 50.

If the operating temperature of zone 1 rises above $WCS1 + (I24 : 2)$ the thermal actuator 1 is enabled. The  icon turns on if zone 1 is displayed ($I72=4$ or [8 alternately with other zones]).

If the temperature rises above $WCS1 + (I24 : 2) + I2B$, the fan is enabled at speed 1 and the  icons turn on if zone 1 is displayed ($I72=4$ or [alternately with the other zones]). As the temperature continues to decrease, the speed increases to reach speed 3 when the temperature rises above $WCS1 + (I24 : 2) + I2B + I5B$. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with the other zones]).

Note: the  icons turn on when the voltage from the EC motor reaches the voltage corresponding to speed 2

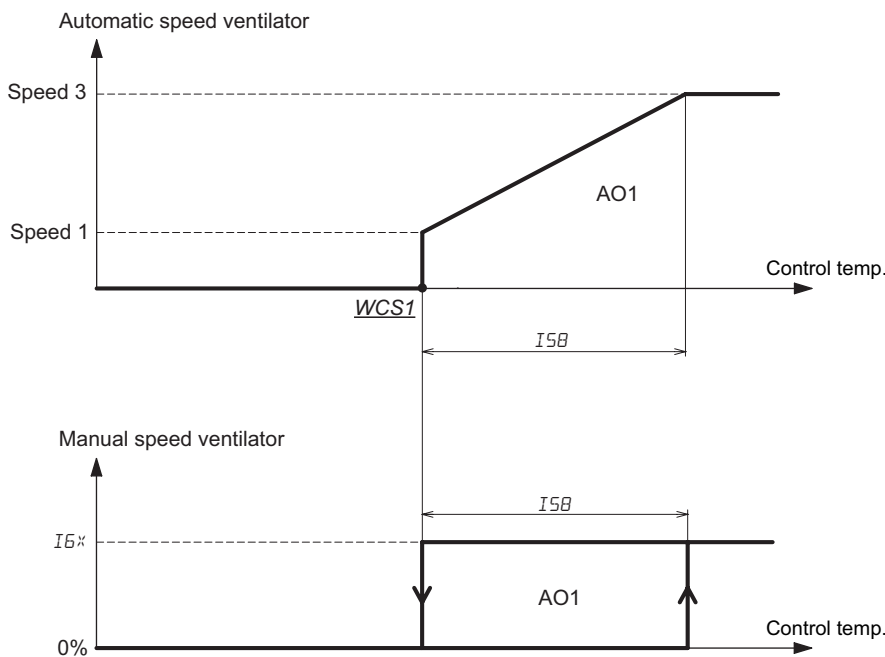
If the temperature drops below $WCS1 + (I24 : 2) + I2B$, the fan is deactivated and the speed icons turn off.

If the temperature drops below $WCS1 - (I24 : 2)$, the thermal actuator is deactivated. The  icon turns off.

On the configuration 13 with $M23=1$ and $M15=10$ the output DO2, set as valve ON/OFF, is activated when the fan is activated and is deactivated when the fan is deactivated.

Note: in case of automatic speed control  is displayed, otherwise  for manual speed control.

■ $I9 \neq 0$ or 2 (thermal actuator 1 disabled during the summer season):



$WCS1$: setpoint of the thermal actuator 1 calculated according to paragraph "15. Season, operating setpoint, economy, holiday mode" page 53

AO1: EC fan output

$I5B$: manual speed hysteresis

$I6x$: $I64$ if manual speed 1 is selected

$I6x$: $I65$ if manual speed 2 is selected

$I6x$: $I66$ if manual speed 3 is selected

Set the EC motor parameters as follows:

- Set the EC fan band by setting $I5B$.
- Set the voltage corresponding to the minimum EC motor speed with parameter $I62$.
- Set the voltage corresponding to the maximum EC motor speed with parameter $I63$.
- Set parameters $I64$, $I65$, $I66$ to define the voltages for speed 1, 2, 3 in manual operation.

Example: if $I62=1$ V, $I63=8$ V, $I64=10\%$, $I65=50\%$, $I66=100\%$,

speed 1 corresponds to 1.7 V $\rightarrow [(I64 \times (I63 - I62)) + I62]$,

speed 2 corresponds to 4.5 V $\rightarrow [(I65 \times (I63 - I62)) + I62]$,



speed 3 corresponds to 8 V $\rightarrow [(I66 \times (I63 - I62)) + I62]$.


Automatic speed control is linear over the range of speeds 1 to 3, while manual control simply sets a given speed.

To set speed 1 to the minimum EC motor speed, set $I64$ to 0.

To set speed 3 to the maximum EC motor speed, set $I66$ to 100.

To set speed 2 to the midpoint between speeds 1 and 3, set $I65$ to 50.

If the temperature rises above $WCS1$, the fan is activated at speed 1 and the  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with the other zones]). As the temperature continues to rise, the speed increases to reach speed 3 when the temperature rises above $WCS1 + I5B$. The  icons turn on if zone 1 is displayed ($I72=4$ or [8 alternately with the other zones]).

Note: the  icons turn on when the voltage from the EC motor reaches the voltage corresponding to speed 2. If the temperature falls below $WCS1$, the fan is disabled and speed icons turn off.

On the configuration 13 with $M23=1$ and $M16=10$ the output DO2, set as valve ON/OFF, is activated when the fan is activated and is deactivated when the fan is deactivated.

Note: in case of automatic speed control  is displayed, otherwise  for manual speed control.

• Fan coil deactivation logic

One of the following conditions deactivates the fan coil, regardless of the control:

- Controller OFF or fan zone OFF.
- Control sensor open or in short circuit or not defined ($M08=15$ and $M10=15$ and $M12=15$)
- Condensation alarm
- Dew point alarm (if the dew point control function is enabled $I44\neq0$ and $I44\neq5$ and $I44\neq10$)
- Low temperature alarm in cooling mode from the MASTER controller.
- High temperature alarm in heating mode from the MASTER controller.
- High temperature alarm from contact (if a digital input was configured as high temperature contact $M04=7$, $M05=7$).


36. Destratification cycle

This function prevents stratification of the air and a better temperature reading from the remote sensor on the fan's return. If there is no control and the fan is off, you can start the destratification function in relation to the season.


To start the destratification function in both heating and cooling modes, set parameter *I68* a 1.

To start the destratification cycle in heating mode only, set parameter *I68* to 2.

To start the destratification cycle in cooling mode only, set parameter *I68* to 3.

When the destratification function is active, the fan starts at speed 1 and the  icon flashes for the time set in *I69* at every interval set with parameter *I70*.


37. Dirty filter

The dirty filter function counts the hours of operation of the fan coil and displays a warning message with the icon  when the counter exceeds the number of hours set by parameter *I71*.

The filter is then considered to be dirty and must be changed.

To activate the dirty filter function, set the maximum number of hours with parameter *I71* to a value other than 0.

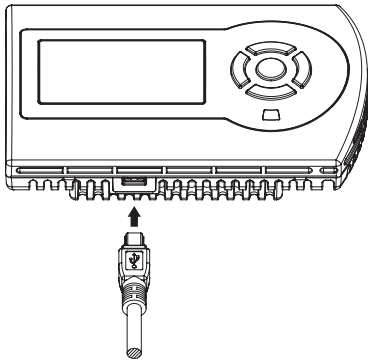
To deactivate this function, set the maximum number of hours with *I71* to 0.

When the function is active, the fan coil hour counter is saved to memory every 2 hours. To reset the counter of fan coil 1, set parameter *I82* to 1. To reset the counter of the fan coil 2, set parameter *I82* to 2. To reset the counters of fan coils 1 and 2, set *I82* to 3. After the counter is reset, parameter *I82* changes to 0 automatically and the  icon stops flashing, until the counter again exceeds the value *I71*.

Note: When the function is deactivated, the fan coil operating hours are not counted.

38. USB connection

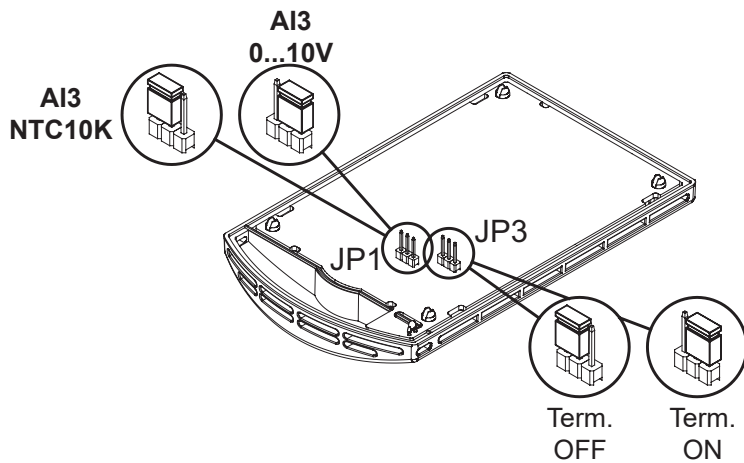
The device is equipped with a USB “device” interface which can be used to configure parameters or update the software. To connect the controller to a PC via the USB connection, use a cable with Type A connector on one end and Mini B connector on the other.



The connection can be made when the device is switched on or off.

When the USB cable is connected to the appliance, the display switches off and the appliance is ready for configuration or software updates.

39. Jumper configuration



JP3=Term. ON → 120 ohm termination resistor of the Modbus line INSERTED (model **FH-xMxSH1**).

JP3=OFF → 120 ohm termination resistor of the Modbus line NOT INSERTED (model **FH-xMxSH1**).

JP1 = position “1-2” → a third NTC10K remote sensor can be used for all models except for **FH-3xxSH1** models

JP1=position “3-2” → the third remote sensor is 0...10 V type

40. Modbus (for FH-xMxSH1 models)

The controller implements a Modbus Slave type communication protocol if the controller is configured as SLAVE_X or SLAVE_Y with Modbus ($M01=0$ and $M03=1$) and can communicate remotely with the Modbus Master unit ($M01=1$). The default communication values are: baud=19200, parity=equal, address=1.

All parameters and variables are accessible as holding registers and R/W operations can be implemented using function codes FC=03, 06, 16.

Considering the large number of parameters, the protocol can read up to 125 variables at a time.

Select a suitable timeout between readings, in relation to the baud rate.

A timeout of 1.5 is sufficient for baud rates of 19200 and 9600. For other baud rates, increase the timeout value to 2 seconds.

Values in °C for the temperatures and setpoint are sent on the Modbus network multiplied by 10.

Example: a -150 value on Modbus corresponds to a real temperature of -15.0°C.

Values in °F for temperatures and **SET_DEW_PT_CALCULATED** are sent on the Modbus network multiplied by 10.

Values in °F for the temperatures and setpoints are sent on the Modbus network multiplied by 10.

Registers	Description	Min	Max.	R/W	
8000	STATE_DI1 → 0=Contact DI1 open, 1=Contact DI1 closed	0	1	R	
8001	STATE_DI2 → 0=Contact DI2 open, 1=Contact DI2 closed	0	1	R	
8002	INT_TEMP_COMP → internal sensor temperature (°C [°F]) ^(Note1)	-150 [5]	900 [195]	R	
8003	TEMP_AI1 → remote sensor 1 temperature (°C [°F]) ^(Note1)	-150 [5]	900 [195]	R	
8004	TEMP_AI2 → remote sensor 2 temperature (°C [°F]) ^(Note1)	-150 [5]	900 [195]	R	
8005	TEMP_AI3 → remote sensor 3 temperature (°C [°F]) ^(Note1)	-150 [5]	900 [195]	R	
8006	INT_HUM_COMP → internal humidity sensor (% R.H.)	0	100	R	
8007	0_10V_AI3 → value connected to the 0...10 V input AI3 ^(Note6)	-999	9999	R	
8008	STATE_REL1 → 0=Relay 1 deactivated, 1=Relay 1 activated	0	1	R/W	
8009	STATE_REL2 → 0=Relay 2 deactivated, 1=Relay 2 activated	0	1	R/W	
8010	STATE_REL3 → 0=Relay 3 deactivated, 1=Relay 3 activated	0	1	R/W	
8011	STATE_REL4 → 0=Relay 4 deactivated, 1=Relay 4 activated	0	1	R/W	
8012	STATE_REL5 → 0=Relay 5 deactivated, 1=Relay 5 activated	0	1	R/W	
8013	OUT_A → output value AO1 (volts) ^(Note5)	0	100	R/W	
8014	OUT_B → output value AO2 (volts) ^(Note5)	0	100	R/W	
8015	OUT_C → output value AO3 (volts) ^(Note5)	0	100	R/W	
8016	WORKING_TEMP_ZONE_1 → operating temperature zone 1 ^(Note1)	-200 [-4]	900 [195]	R	
8017	WORKING_SET_ACTUATOR_1 → operating setpoint WHS or WCS zone 1 ^(Note2)	see parameters	see parameters	R	
8018	WORKING_TEMP_ZONE_2 → operating temperature zone 2 ^(Note1)	-200 [-4]	900 [195]	R	
8019	WORKING_SET_ACTUATOR_2 → operating setpoint WHS or WCS zone 2 ^(Note2)	see parameters	see parameters	R	
8020	WORKING_TEMP_ZONE_3 → operating temperature zone 3 ^(Note1)	-200 [-4]	900 [195]	R	
8021	WORKING_SET_ACTUATOR_3 → operating setpoint WHS or WCS zone 3 ^(Note2)	see parameters	see parameters	R	
8022	WORKING_TEMP_ZONE_4 → operating temperature zone 4 ^(Note1)	-200 [-4]	900 [195]	R	
8023	WORKING_SET_ACTUATOR_4 → operating setpoint WHS or WCS zone 4 ^(Note2)	see parameters	see parameters	R	
8024	SET_COMP_CALC_COOL → calculated compensated setpoint for the compensation control in cooling mode ^(Note3)	see controllers.	see controllers.	R	
8025	SET_COMP_CALC_HEAT → calculated compensated setpoint for the compensation control in heating mode ^(Note3)	see controllers.	see controllers.	R	
8026	SET_DEW_PT_CALCULATED → calculated dew point added to the dew point offset (parameter $I45$ see paragraph "20. Dew point function in cooling mode" page 59) ^(Note4)	see controllers.	see controllers.	R	
8027	VISU_CONF_CHOOSER → is used to view the selected configuration (see paragraph "10. Parameter factory settings (level 1 password)" page 36)	$M14$	0	23	R
8028	YEAR → current year	2012	2100	R	
8029	MONTH → current month	1	12	R	
8030	DAY → current day	1	31	R	

Registers	Description	Min	Max.	R/W
8031	DAY_NAME → name of current day 0=Sunday 1=Monday 2=Tuesday 3=Wednesday 4=Thursday 5=Friday 6=Saturday	0	6	R
8032	HOUR → current hour	0	23	R
8033	MIN → current time	0	59	R
8034	SEC → current time	0	59	R
8035	TOTAL_HOUR_OF_FAN_1 → total hours of fan 1 operation	0	9999	R
8036	TOTAL_HOUR_OF_FAN_2 → total hours of fan 2 operation	0	9999	R
8037	FLAG_GLOBAL_ON_OFF → general ON/OFF status 0=Appliance off from external contact 1=Appliance off manually 2=Appliance off from Modbus 3=Appliance on from external contact 4=Appliance on manually 5=Appliance on from Modbus	0	5	R
8038	FLAG_LOCAL_ZONE1_ON_OFF → zone 1 local ON/OFF status 0=zone 1 off 1=zone 1 on	0	1	R
8039	FLAG_LOCAL_ZONE2_ON_OFF → zone 2 local ON/OFF status 0=zone 2 off 1=zone 2 on	0	1	R
8040	FLAG_LOCAL_ZONE3_ON_OFF → zone 3 local ON/OFF status 0=zone 3 off 1=zone 3 on	0	1	R
8041	FLAG_LOCAL_ZONE4_ON_OFF → zone 4 local ON/OFF status 0=zone 4 off 1=zone 4 on	0	1	R
8042	FLAG_CURRENT_MODE_REG_Z1 → zone 1 control status 0=Control without taking into account the time slots 1=Normal control (within time slots if $I_{TB}=0$) 2=Normal control forced manually ("Oc" for the I_{TT} timer duration) 3=Economy control 4=Non-occupied holiday mode control	0	4	R
8043	FLAG_CURRENT_MODE_REG_Z2 → zone 2 control status 0=Control without taking into account the time slots 1=Normal control (within a time slots interval if $I_{TB}=0$) 2=Normal control forced manually ("Oc" for the I_{TT} timer duration) 3=Economy control 4=Non-occupied holiday mode control	0	4	R
8044	FLAG_CURRENT_MODE_REG_Z3 → zone 3 control status 0=Control without taking into account the time slots 1=Normal control (within a time slots interval if $I_{TB}=0$) 2=Normal control forced manually ("Oc" for the I_{TT} timer duration) 3=Economy control 4=Non-occupied holiday mode control	0	4	R
8045	FLAG_CURRENT_MODE_REG_Z4 → zone 4 control status 0=Control without taking into account the time slots 1=Normal control (within a time slots interval if $I_{TB}=0$) 2=Normal control forced manually ("Oc" for the I_{TT} timer duration) 3=Economy control 4=Non-occupied holiday mode control	0	4	R
8046	FLAG_STA_WORKING → operating season status 0=Heating 1=Cooling	0	1	R
8047	FLAG_CURRENT_SPEED → 3-speed on/off fan or EC status 0=Fan coil off 1=Fan coil at speed 1 for ON/OFF 3-speed fan coil 2=Fan coil at speed 2 for ON/OFF 3-speed fan coil 3=Fan coil at speed 3 for ON/OFF 3-speed fan coil xx=PWM value applied to the EC fan coil	0	3	R
8048	FLAG_FAN_ON_OFF_1 → single-speed on/off fan 1 status 0=Fan coil 1 off 1=Fan coil 1 on	0	1	R
8049	FLAG_FAN_ON_OFF_2 → single-speed on/off fan 2 status 0=Fan coil 2 off 1=Fan coil 2 on	0	1	R

Registers	Description	Min	Max.	R/W
8050	FLAG_LIM_ALARM → limit alarm status (at the SLAVE_Y controller) 0=No limit alarm 1=Upper heating limit exceeded, pre-alarm 2=Upper heating limit exceeded, alarm 3=Lower cooling limit exceeded 4=Lower cooling limit exceeded, alarm	0	4	R
8051	FLAG_ALARM_HIGH_CONTACT → high temperature alarm from a digital contact configured as high temperature alarm (<i>M04=7</i> or <i>M06=7</i>) 0=No high temperature alarm 1=High temperature alarm	0	1	R
8052	FLAG_ALARM_CONDENSATION 0=No condensation alarm 1=Condensation alarm	0	1	R
8053	FLAG_ALARM_TSUPPLY_TOO_LOW 0=No alarm for supply temperature lower than the [Dew setpoint + Dew offset I45] 1=Alarm for supply temperature lower than the [Dew setpoint + Dew offset I45]	0	1	R
8054	FLAG_ALARM_DEW_POINT 0=No alarm for temperature lower than the [Dew setpoint + Dew offset I45] 1=Alarm for temperature lower or equal to the [Dew setpoint + Dew offset I45]	0	1	R
8055	FLAG_GEN_ALARM 0=No alarm 1=General alarm	0	1	R
8056	FLAG_DIRTY_FILTER_1 0=Clean filter of zone 1 fan coil 1=Dirty filter of zone 1 fan coil	0	1	R
8057	FLAG_DIRTY_FILTER_2 0=Clean filter of zone 2 fan coil 1=Dirty filter of zone 2 fan coil	0	1	R
8058	FLAG_STATE_DEHUMIDIFICATOR 0=Dehumidifier off 1=Dehumidifier on	0	1	R
8059	FLAG_DESTRAT_1 0=Fan coil 1 destratification cycle not running 1=Fan coil 1 destratification cycle running	0	1	R
8060	FLAG_DESTRAT_2 0=Fan coil 2 destratification cycle not running 1=Fan coil 2 destratification cycle running	0	1	R
from 8061 to 8094	Reserved registers			R
8095	FORCED_OUTPUTS_KEY → key for forced outputs selection	0 / 26112	26367	R/W
8096	MASTER_WR_ON_OFF → ON/OFF status received from the MASTER controller 0=OFF 1=ON	0	1	R
8097	MASTER_WR_EXT_TEMP → temperature of the external sensor connected to the MASTER (°C [°F]) ^(Note1)	-150 [5]	900 [195]	R
8098	MASTER_WR_SEASON → season received from the MASTER controller 0=Heating 1=Cooling	0	1	R
8099	MASTER_WR_SUPPLY_T → temperature of the supply sensor of the MASTER(°C [°F]) ^(Note1)	-150 [5]	900 [195]	R
8100	MASTER_WR_ALARM_DEWPOINT → dew point alarm received from the MASTER controller 0=No alarm 1=Alarm active	0	1	R
8101	MASTER_WR_ALARM_CONDENS → condensation alarm received from the MASTER controller 0=No alarm 1=Alarm active	0	1	R
8102	MASTER_WR_ALARM_GEN → general alarm received from the MASTER controller 0=No alarm 1=Alarm active	0	1	R
8103	MASTER_WR_ALARM_LIM → limit alarm received from the MASTER controller 0=No limit alarm 1=Upper heating limit pre-alarm 2=Upper heating limit alarm 3=Lower cooling limit pre-alarm 4=Lower cooling limit alarm	0	4	R
8104	MASTER_WR_ALARM_TEMP_CT → upper limit alarm from contact received from the MASTER controller 0=No alarm 11=Alarm active	0	11	R

Registers	Description	Min	Max.	R/W
8105	MASTER_WR_AUTHORIZATION → message validation code from the MASTER controller 32478= valid data package sent by the MASTER other values= invalid data package sent by the MASTER	0	65535	R
8106	MASTER_RD_REG_ACTIVATION → control request from the slave (active actuator or fan coil) 0=No control request 1=Control request from the SLAVE_X controller 2=Control request from the SLAVE_Y controller	0	2	R
8107	MASTER_RD_DEHUM_REQUEST → dehumidification request from the slave (dehumidifier active on the slave) 0=No dehumidification request 1=Dehumidification request	0	1	R
8108	MOD_MASTER_RD_DEWPOINT_SLAVE → dew temperature + Dew offset I_{45} of the slave controller (Note7)	-40 [-40]	60 [140]	R
8109	MOD_MASTER_RD_ALARM_DEWPOINT → dew point alarm from the SLAVE_X 0=No alarm 1=Alarm active	0	1	R
8110	MASTER_RD_ALARM_CONDENS → condensation alarm from the SLAVE_X 0=No alarm 1=Alarm active	0	1	R

TO OBTAIN THE REAL ADDRESS OF A REGISTER, SUBTRACT NUMBER 1 FROM THE REGISTER NUMBER

Example: the address of the STATE_DI1 register is: 8000 - 1 = 7999.

Note 1: If a fault sensor is used, the temperature of the zone refers to the one shown in the table below:

Sensor temperature with units in °C ($I_{75}=0$)	Value read	Corresponding value °C
Sensor open	-200	-20.0°C
Sensor in short circuit	970	97.0°C
Sensor temperature with units in °F ($I_{75}=1$)	Value read	Corresponding value °F
Sensor open	-40	-4.0°F
Sensor in short circuit	2066	206.6°F

The temperature of the zone that is not used is forced to the value 2000.

If the floor sensor is used excluding the control sensor, the control temperature becomes the value of the floor sensor.

Note 2: the operating setpoint displayed is calculated on the basis of the operating parameters (see "[15. Season, operating setpoint, economy, holiday mode](#)" [page 53](#)). If the operating temperature of the considered zone is in alarm or the zone is not used, the operating setpoint is forced to:

Operating setpoint with units in °C ($I_{75}=0$)	Value read	Corresponding value °C
Operating temperature in fault mode (heating)	-300	-30.0°C
Operating temperature in fault mode (cooling)	980	98.0°C
Operating setpoint with units in °F ($I_{75}=1$)	Value read	Corresponding value °F
Operating temperature in fault mode (heating)	-22	-22°F
Operating temperature in fault mode (cooling)	209	209°F

If the floor sensor is used excluding the control sensor, the control temperature is equal to the value of the parameter I_{41} in heating mode and the value 98.0°C (209°F) in cooling mode.

Note 3: If the compensated setpoint cannot be calculated due to deactivated compensation function, or the external sensor is not defined, the value of the set sent in the Modbus network is 2000.

Note 4: If the dew point cannot be calculated, the value of the set sent in the Modbus network is 2000.

Note 5: The value displayed corresponds with the value in Volts, multiplied by 10 (for example: value of 80 = 8.0 V).

Note 6: For input **AI3** configured as 0...10 V input, if the input voltage exceeds around 13.5 V, the off-the-scale value of 15000 is displayed

Note 7: If the dew point temperature cannot be calculated, the indicated value is 2000.

Registers	Description	Default	Min	Max.	R/W
7000	SUN_Z1_HOUR_ON_1 → Start time of time slot 1, zone 1, Sunday	6	0	23	R/W
7001	SUN_Z1_MIN_ON_1 → Start time (minutes) of time slot 1, zone 1, Sunday	0	0	59	R/W
7002	SUN_Z1_HOUR_OFF_1 → End time of time slot 1, zone 1, Sunday	8	0	23	R/W
7003	SUN_Z1_MIN_OFF_1 → End time (minutes) of time slot 1, zone 1, Sunday	0	0	59	R/W
7004	SUN_Z1_HOUR_ON_2 → Start time of time slot 2, zone 1, Sunday	11	0	23	R/W
7005	SUN_Z1_MIN_ON_2 → Start time (minutes) of time slot 2, zone 1	0	0	59	R/W

Registers	Description	Default	Min	Max.	R/W
7006	SUN_Z1_HOUR_OFF_2 → End time of time slot 2, zone 1, Sunday	13	0	23	R/W
7007	SUN_Z1_MIN_OFF_2 → End time (minutes) of time slot 2, zone 1	0	0	59	R/W
7008	SUN_Z1_HOUR_ON_3 → Start time of time slot 3, zone 1, Sunday	17	0	23	R/W
7009	SUN_Z1_MIN_ON_3 → Start time (minutes) of time slot 3, zone 1, Sunday	0	0	59	R/W
7010	SUN_Z1_HOUR_OFF_3 → End time of time slot 3, zone 1, Sunday	19	0	23	R/W
7011	SUN_Z1_MIN_OFF_3 → End time (minutes) of time slot 3, zone 1, Sunday	0	0	59	R/W
7012	SUN_Z1_HOUR_ON_4 → Start time of time slot 4, zone 1, Sunday	21	0	23	R/W
7013	SUN_Z1_MIN_ON_4 → Start time (minutes) of time slot 4, zone 1, Sunday	0	0	59	R/W
7014	SUN_Z1_HOUR_OFF_4 → End time of time slot 4, zone 1, Sunday	23	0	23	R/W
7015	SUN_Z1_MIN_OFF_4 → End time (minutes) of time slot 4, zone 1, Sunday	0	0	59	R/W
7016	MON_Z1_HOUR_ON_1 → Start time (hours) of time slot 1, zone 1, Monday	6	0	23	R/W
7017	MON_Z1_MIN_ON_1 → Start time (minutes) of time slot 1, zone 1, Monday	0	0	59	R/W
7018	MON_Z1_HOUR_OFF_1 → End time (hours) of time slot 1, zone 1, Monday	8	0	23	R/W
7019	MON_Z1_MIN_OFF_1 → End time (minutes) of time slot 1, zone 1, Monday	0	0	59	R/W
7020	MON_Z1_HOUR_ON_2 → Start time (hours) of time slot 2, zone 1, Monday	11	0	23	R/W
7021	MON_Z1_MIN_ON_2 → Start time (minutes) of time slot 2, zone 1, Monday	0	0	59	R/W
7022	MON_Z1_HOUR_OFF_2 → End time (hours) of time slot 2, zone 1, Monday	13	0	23	R/W
7023	MON_Z1_MIN_OFF_2 → End time (minutes) of time slot 2, zone 1, Monday	0	0	59	R/W
7024	MON_Z1_HOUR_ON_3 → Start time (hours) of time slot 2, zone 1, Monday	17	0	23	R/W
7025	MON_Z1_MIN_ON_3 → Start time (minutes) of time slot 3, zone 1, Monday	0	0	59	R/W
7026	MON_Z1_HOUR_OFF_3 → End time (hours) of time slot 3, zone 1, Monday	19	0	23	R/W
7027	MON_Z1_MIN_OFF_3 → End time (minutes) of time slot 3, zone 1, Monday	0	0	59	R/W
7028	MON_Z1_HOUR_ON_4 → Start time (hours) of time slot 4, zone 1, Monday	21	0	23	R/W
7029	MON_Z1_MIN_ON_4 → Start time (minutes) of time slot 4, zone 1, Monday	0	0	59	R/W
7030	MON_Z1_HOUR_OFF_4 → End time (hours) of time slot 4, zone 1, Monday	23	0	23	R/W
7031	MON_Z1_MIN_OFF_4 → End time (minutes) of time slot 4, zone 1, Monday	0	0	59	R/W
7032	TUE_Z1_HOUR_ON_1 → Start time (hours) of time slot 1, zone 1, Tuesday	6	0	23	R/W
7033	TUE_Z1_MIN_ON_1 → Start time (minutes) of time slot 1, zone 1, Tuesday	0	0	59	R/W
7034	TUE_Z1_HOUR_OFF_1 → End time (hours) of time slot 1, zone 1, Tuesday	8	0	23	R/W
7035	TUE_Z1_MIN_OFF_1 → End time (minutes) of time slot 1, zone 1, Tuesday	0	0	59	R/W
7036	TUE_Z1_HOUR_ON_2 → Start time (hours) of time slot 2, zone 1, Tuesday	11	0	23	R/W
7037	TUE_Z1_MIN_ON_2 → Start time (minutes) of time slot 2, zone 1, Tuesday	0	0	59	R/W
7038	TUE_Z1_HOUR_OFF_2 → End time (hours) of time slot 2, zone 1, Tuesday	13	0	23	R/W
7039	TUE_Z1_MIN_OFF_2 → End time (minutes) of time slot 2, zone 1, Tuesday	0	0	59	R/W
7040	TUE_Z1_HOUR_ON_3 → Start time (hours) of time slot 3, zone 1, Tuesday	17	0	23	R/W
7041	TUE_Z1_MIN_ON_3 → Start time (minutes) of time slot 3, zone 1, Tuesday	0	0	59	R/W
7042	TUE_Z1_HOUR_OFF_3 → End time (hours) of time slot 3, zone 1, Tuesday	19	0	23	R/W
7043	TUE_Z1_MIN_OFF_3 → End time (minutes) of time slot 3, zone 1, Tuesday	0	0	59	R/W
7044	TUE_Z1_HOUR_ON_4 → Start time (hours) of time slot 4, zone 1, Tuesday	21	0	23	R/W
7045	TUE_Z1_MIN_ON_4 → Start time (minutes) of time slot 4, zone 1, Tuesday	0	0	59	R/W
7046	TUE_Z1_HOUR_OFF_4 → End time (hours) of time slot 4, zone 1, Tuesday	23	0	23	R/W
7047	TUE_Z1_MIN_OFF_4 → End time (minutes) of time slot 4, zone 1, Tuesday	0	0	59	R/W
7048	WED_Z1_HOUR_ON_1 → Start time (hours) of time slot 1, zone 1, Wednesday	6	0	23	R/W
7049	WED_Z1_MIN_ON_1 → Start time (minutes) of time slot 1, zone 1, Wednesday	0	0	59	R/W
7050	WED_Z1_HOUR_OFF_1 → End time (hours) of time slot 1, zone 1, Wednesday	8	0	23	R/W
7051	WED_Z1_MIN_OFF_1 → End time (minutes) of time slot 1, zone 1, Wednesday	0	0	59	R/W
7052	WED_Z1_HOUR_ON_2 → Start time (hours) of time slot 2, zone 1, Wednesday	11	0	23	R/W
7053	WED_Z1_MIN_ON_2 → Start time (minutes) of time slot 2, zone 1, Wednesday	0	0	59	R/W
7054	WED_Z1_HOUR_OFF_2 → End time (hours) of time slot 2, zone 1, Wednesday	13	0	23	R/W
7055	WED_Z1_MIN_OFF_2 → End time (minutes) of time slot 2, zone 1, Wednesday	0	0	59	R/W
7056	WED_Z1_HOUR_ON_3 → Start time (hours) of time slot 3, zone 1, Wednesday	17	0	23	R/W
7057	WED_Z1_MIN_ON_3 → Start time (minutes) of time slot 3, zone 1, Wednesday	0	0	59	R/W
7058	WED_Z1_HOUR_OFF_3 → End time (hours) of time slot 3, zone 1, Wednesday	19	0	23	R/W
7059	WED_Z1_MIN_OFF_3 → End time (minutes) of time slot 3, zone 1, Wednesday	0	0	59	R/W
7060	WED_Z1_HOUR_ON_4 → Start time (hours) of time slot 4, zone 1, Wednesday	21	0	23	R/W

Registers	Description	Default	Min	Max.	R/W
7061	WED_Z1_MIN_ON_4 → Start time (minutes) of time slot 4, zone 1, Wednesday	0	0	59	R/W
7062	WED_Z1_HOUR_OFF_4 → End time (hours) of time slot 4, zone 1, Wednesday	23	0	23	R/W
7063	WED_Z1_MIN_OFF_4 → End time (minutes) of time slot 4, zone 1, Wednesday	0	0	59	R/W
7064	THU_Z1_HOUR_ON_1 → Start time (hours) of time slot 1, zone 1, Thursday	6	0	23	R/W
7065	THU_Z1_MIN_ON_1 → Start time (minutes) of time slot 1, zone 1, Thursday	0	0	59	R/W
7066	THU_Z1_HOUR_OFF_1 → End time (minutes) of time slot 1, zone 1, Thursday	8	0	23	R/W
7067	THU_Z1_MIN_OFF_1 → End time (minutes) of time slot 1, zone 1, Thursday	0	0	59	R/W
7068	THU_Z1_HOUR_ON_2 → Start time (hours) of time slot 2, zone 1, Thursday	11	0	23	R/W
7069	THU_Z1_MIN_ON_2 → Start time (minutes) of time slot 2, zone 1, Thursday	0	0	59	R/W
7070	THU_Z1_HOUR_OFF_2 → End time (hours) of time slot 2, zone 1, Thursday	13	0	23	R/W
7071	THU_Z1_MIN_OFF_2 → End time (minutes) of time slot 2, zone 1, Thursday	0	0	59	R/W
7072	THU_Z1_HOUR_ON_3 → Start time (hours) of time slot 3, zone 1, Thursday	17	0	23	R/W
7073	THU_Z1_MIN_ON_3 → Start time (minutes) of time slot 3, zone 1, Thursday	0	0	59	R/W
7074	THU_Z1_HOUR_OFF_3 → End time (hours) of time slot 3, zone 1, Thursday	19	0	23	R/W
7075	THU_Z1_MIN_OFF_3 → End time (minutes) of time slot 3, zone 1, Thursday	0	0	59	R/W
7076	THU_Z1_HOUR_ON_4 → Start time (hours) of time slot 4, zone 1, Thursday	21	0	23	R/W
7077	THU_Z1_MIN_ON_4 → Start time (minutes) of time slot 4, zone 1, Thursday	0	0	59	R/W
7078	THU_Z1_HOUR_OFF_4 → End time (hours) of time slot 4, zone 1, Thursday	23	0	23	R/W
7079	THU_Z1_MIN_OFF_4 → End time (minutes) of time slot 4, zone 1, Thursday	0	0	59	R/W
7080	FRI_Z1_HOUR_ON_1 → Start time (hours) of time slot 1, zone 1, Friday	6	0	23	R/W
7081	FRI_Z1_MIN_ON_1 → Start time (minutes) of time slot 1, zone 1, Friday	0	0	59	R/W
7082	FRI_Z1_HOUR_OFF_1 → End time (hours) of time slot 1, zone 1, Friday	8	0	23	R/W
7083	FRI_Z1_MIN_OFF_1 → End time (minutes) of time slot 1, zone 1, Friday	0	0	59	R/W
7084	FRI_Z1_HOUR_ON_2 → Start time (hours) of time slot 2, zone 1, Friday	11	0	23	R/W
7085	FRI_Z1_MIN_ON_2 → Start time (minutes) of time slot 2, zone 1, Friday	0	0	59	R/W
7086	FRI_Z1_HOUR_OFF_2 → End time (hours) of time slot 2, zone 1, Friday	13	0	23	R/W
7087	FRI_Z1_MIN_OFF_2 → End time (minutes) of time slot 2, zone 1, Friday	0	0	59	R/W
7088	FRI_Z1_HOUR_ON_3 → Start time (hours) of time slot 3, zone 1, Friday	17	0	23	R/W
7089	FRI_Z1_MIN_ON_3 → Start time (minutes) of time slot 3, zone 1, Friday	0	0	59	R/W
7090	FRI_Z1_HOUR_OFF_3 → End time (hours) of time slot 3, zone 1, Friday	19	0	23	R/W
7091	FRI_Z1_MIN_OFF_3 → End time (minutes) of time slot 3, zone 1, Friday	0	0	59	R/W
7092	FRI_Z1_HOUR_ON_4 → Start time (hours) of time slot 4, zone 1, Friday	21	0	23	R/W
7093	FRI_Z1_MIN_ON_4 → Start time (minutes) of time slot 4, zone 1, Friday	0	0	59	R/W
7094	FRI_Z1_HOUR_OFF_4 → End time (hours) of time slot 4, zone 1, Friday	23	0	23	R/W
7095	FRI_Z1_MIN_OFF_4 → End time (minutes) of time slot 4, zone 1, Friday	0	0	59	R/W
7096	SAT_Z1_HOUR_ON_1 → Start time (hours) of time slot 1, zone 1, Saturday	6	0	23	R/W
7097	SAT_Z1_MIN_ON_1 → Start time (minutes) of time slot 1, zone 1, Saturday	0	0	59	R/W
7098	SAT_Z1_HOUR_OFF_1 → End time (hours) of time slot 1, zone 1, Saturday	8	0	23	R/W
7099	SAT_Z1_MIN_OFF_1 → End time (minutes) of time slot 1, zone 1, Saturday	0	0	59	R/W
7100	SAT_Z1_HOUR_ON_2 → Start time (hours) of time slot 2, zone 1, Saturday	11	0	23	R/W
7101	SAT_Z1_MIN_ON_2 → Start time (minutes) of time slot 2, zone 1, Saturday	0	0	59	R/W
7102	SAT_Z1_HOUR_OFF_2 → End time (hours) of time slot 2, zone 1, Saturday	13	0	23	R/W
7103	SAT_Z1_MIN_OFF_2 → End time (minutes) of time slot 2, zone 1, Saturday	0	0	59	R/W
7104	SAT_Z1_HOUR_ON_3 → Start time (hours) of time slot 3, zone 1, Saturday	17	0	23	R/W
7105	SAT_Z1_MIN_ON_3 → Start time (minutes) of time slot 3, zone 1, Saturday	0	0	59	R/W
7106	SAT_Z1_HOUR_OFF_3 → End time (hours) of time slot 3, zone 1, Saturday	19	0	23	R/W
7107	SAT_Z1_MIN_OFF_3 → End time (minutes) of time slot 3, zone 1, Saturday	0	0	59	R/W
7108	SAT_Z1_HOUR_ON_4 → Start time (hours) of time slot 4, zone 1, Saturday	21	0	23	R/W
7109	SAT_Z1_MIN_ON_4 → Start time (minutes) of time slot 4, zone 1, Saturday	0	0	59	R/W
7110	SAT_Z1_HOUR_OFF_4 → End time (hours) of time slot 4, zone 1, Saturday	23	0	23	R/W
7111	SAT_Z1_MIN_OFF_4 → End time (minutes) of time slot 4, zone 1, Saturday	0	0	59	R/W
7112	SUN_Z2_HOUR_ON_1 → Start time of time slot 1, zone 2, Sunday	6	0	23	R/W
7113	SUN_Z2_MIN_ON_1 → Start time (minutes) of time slot 1, zone 2, Sunday	0	0	59	R/W
7114	SUN_Z2_HOUR_OFF_1 → End time of time slot 1, zone 2, Sunday	8	0	23	R/W
7115	SUN_Z2_MIN_OFF_1 → End time (minutes) of time slot 1, zone 2, Sunday	0	0	59	R/W

Registers	Description	Default	Min	Max.	R/W
7116	SUN_Z2_HOUR_ON_2 → Start time (hours) of time slot 2, zone 2, Sunday	11	0	23	R/W
7117	SUN_Z2_MIN_ON_2 → Start time (minutes) of time slot 2, zone 2, Sunday	0	0	59	R/W
7118	SUN_Z2_HOUR_OFF_2 → End time (hours) of time slot 2, zone 2, Sunday	13	0	23	R/W
7119	SUN_Z2_MIN_OFF_2 → End time (minutes) of time slot 2, zone 2, Sunday	0	0	59	R/W
7120	SUN_Z2_HOUR_ON_3 → Start time of time slot 3, zone 2, Sunday	17	0	23	R/W
7121	SUN_Z2_MIN_ON_3 → Start time (minutes) of time slot 3, zone 2, Sunday	0	0	59	R/W
7122	SUN_Z2_HOUR_OFF_3 → End time of time slot 3, zone 2, Sunday	19	0	23	R/W
7123	SUN_Z2_MIN_OFF_3 → End time (minutes) of time slot 3, zone 2, Sunday	0	0	59	R/W
7124	SUN_Z2_HOUR_ON_4 → Start time of time slot 4, zone 2, Sunday	21	0	23	R/W
7125	SUN_Z2_MIN_ON_4 → Start time (minutes) of time slot 4, zone 2, Sunday	0	0	59	R/W
7126	SUN_Z2_HOUR_OFF_4 → End time of time slot 4, zone 2, Sunday	23	0	23	R/W
7127	SUN_Z2_MIN_OFF_4 → End time (minutes) of time slot 4, zone 2, Sunday	0	0	59	R/W
7128	MON_Z2_HOUR_ON_1 → Start time (hours) of time slot 1, zone 2, Monday	6	0	23	R/W
7129	MON_Z2_MIN_ON_1 → Start time (minutes) of time slot 1, zone 2, Monday	0	0	59	R/W
7130	MON_Z2_HOUR_OFF_1 → End time (hours) of time slot 1, zone 2, Monday	8	0	23	R/W
7131	MON_Z2_MIN_OFF_1 → End time (minutes) of time slot 1, zone 2, Monday	0	0	59	R/W
7132	MON_Z2_HOUR_ON_2 → Start time (hours) of time slot 2, zone 2, Monday	11	0	23	R/W
7133	MON_Z2_MIN_ON_2 → Start time (minutes) of time slot 2, zone 2, Monday	0	0	59	R/W
7134	MON_Z2_HOUR_OFF_2 → End time (hours) of time slot 2, zone 2, Monday	13	0	23	R/W
7135	MON_Z2_MIN_OFF_2 → End time (minutes) of time slot 2, zone 2, Monday	0	0	59	R/W
7136	MON_Z2_HOUR_ON_3 → Start time (hours) of time slot 3, zone 2, Monday	17	0	23	R/W
7137	MON_Z2_MIN_ON_3 → Start time (minutes) of time slot 3, zone 2, Monday	0	0	59	R/W
7138	MON_Z2_HOUR_OFF_3 → End time (hours) of time slot 3, zone 2, Monday	19	0	23	R/W
7139	MON_Z2_MIN_OFF_3 → End time (minutes) of time slot 3, zone 2, Monday	0	0	59	R/W
7140	MON_Z2_HOUR_ON_4 → Start time (hours) of time slot 4, zone 2, Monday	21	0	23	R/W
7141	MON_Z2_MIN_ON_4 → Start time (minutes) of time slot 4, zone 2, Monday	0	0	59	R/W
7142	MON_Z2_HOUR_OFF_4 → End time (hours) of time slot 4, zone 2, Monday	23	0	23	R/W
7143	MON_Z2_MIN_OFF_4 → End time (minutes) of time slot 4, zone 2, Monday	0	0	59	R/W
7144	TUE_Z2_HOUR_ON_1 → Start time (hours) of time slot 1, zone 2, Tuesday	6	0	23	R/W
7145	TUE_Z2_MIN_ON_1 → Start time (minutes) of time slot 1, zone 2, Tuesday	0	0	59	R/W
7146	TUE_Z2_HOUR_OFF_1 → End time (hours) of time slot 1, zone 2, Tuesday	8	0	23	R/W
7147	TUE_Z2_MIN_OFF_1 → End time (minutes) of time slot 1, zone 2, Tuesday	0	0	59	R/W
7148	TUE_Z2_HOUR_ON_2 → Start time (hours) of time slot 2, zone 2, Tuesday	11	0	23	R/W
7149	TUE_Z2_MIN_ON_2 → Start time (minutes) of time slot 2, zone 2, Tuesday	0	0	59	R/W
7150	TUE_Z2_HOUR_OFF_2 → End time (hours) of time slot 2, zone 2, Tuesday	13	0	23	R/W
7151	TUE_Z2_MIN_OFF_2 → End time (minutes) of time slot 2, zone 2, Tuesday	0	0	59	R/W
7152	TUE_Z2_HOUR_ON_3 → Start time (hours) of time slot 3, zone 2, Tuesday	17	0	23	R/W
7153	TUE_Z2_MIN_ON_3 → Start time (minutes) of time slot 3, zone 2, Tuesday	0	0	59	R/W
7154	TUE_Z2_HOUR_OFF_3 → End time (hours) of time slot 3, zone 2, Tuesday	19	0	23	R/W
7155	TUE_Z2_MIN_OFF_3 → End time (minutes) of time slot 3, zone 2, Tuesday	0	0	59	R/W
7156	TUE_Z2_HOUR_ON_4 → Start time (hours) of time slot 4, zone 2, Tuesday	21	0	23	R/W
7157	TUE_Z2_MIN_ON_4 → Start time (minutes) of time slot 4, zone 2, Tuesday	0	0	59	R/W
7158	TUE_Z2_HOUR_OFF_4 → End time (hours) of time slot 4, zone 2, Tuesday	23	0	23	R/W
7159	TUE_Z2_MIN_OFF_4 → End time (minutes) of time slot 4, zone 2, Tuesday	0	0	59	R/W
7160	WED_Z2_HOUR_ON_1 → Start time (hours) of time slot 1, zone 2, Wednesday	6	0	23	R/W
7161	WED_Z2_MIN_ON_1 → Start time (minutes) of time slot 1, zone 2, Wednesday	0	0	59	R/W
7162	WED_Z2_HOUR_OFF_1 → End time (hours) of time slot 1, zone 2, Wednesday	8	0	23	R/W
7163	WED_Z2_MIN_OFF_1 → End time (minutes) of time slot 1, zone 2, Wednesday	0	0	59	R/W
7164	WED_Z2_HOUR_ON_2 → Start time (hours) of time slot 2, zone 2, Wednesday	11	0	23	R/W
7165	WED_Z2_MIN_ON_2 → Start time (minutes) of time slot 2, zone 2, Wednesday	0	0	59	R/W
7166	WED_Z2_HOUR_OFF_2 → End time (hours) of time slot 2, zone 2, Wednesday	13	0	23	R/W
7167	WED_Z2_MIN_OFF_2 → End time (minutes) of time slot 2, zone 2, Wednesday	0	0	59	R/W
7168	WED_Z2_HOUR_ON_3 → Start time (hours) of time slot 3, zone 2, Wednesday	17	0	23	R/W
7169	WED_Z2_MIN_ON_3 → Start time (minutes) of time slot 3, zone 2, Wednesday	0	0	59	R/W
7170	WED_Z2_HOUR_OFF_3 → End time (hours) of time slot 3, zone 2, Wednesday	19	0	23	R/W

Registers	Description	Default	Min	Max.	R/W
7171	WED_Z2_MIN_OFF_3 → End time (minutes) of time slot 3, zone 2, Wednesday	0	0	59	R/W
7172	WED_Z2_HOUR_ON_4 → Start time (hours) of time slot 4, zone 2, Wednesday	21	0	23	R/W
7173	WED_Z2_MIN_ON_4 → Start time (minutes) of time slot 4, zone 2, Wednesday	0	0	59	R/W
7174	WED_Z2_HOUR_OFF_4 → End time (hours) of time slot 4, zone 2, Wednesday	23	0	23	R/W
7175	WED_Z2_MIN_OFF_4 → End time (minutes) of time slot 4, zone 1, Wednesday	0	0	59	R/W
7176	THU_Z2_HOUR_ON_1 → Start time (hours) of time slot 1, zone 2, Thursday	6	0	23	R/W
7177	THU_Z2_MIN_ON_1 → Start time (minutes) of time slot 1, zone 2, Thursday	0	0	59	R/W
7178	THU_Z2_HOUR_OFF_1 → End time (minutes) of time slot 1, zone 2, Thursday	8	0	23	R/W
7179	THU_Z2_MIN_OFF_1 → End time (minutes) of time slot 1, zone 2, Thursday	0	0	59	R/W
7180	THU_Z2_HOUR_ON_2 → Start time (hours) of time slot 2, zone 2, Thursday	11	0	23	R/W
7181	THU_Z2_MIN_ON_2 → Start time (minutes) of time slot 2, zone 2, Thursday	0	0	59	R/W
7182	THU_Z2_HOUR_OFF_2 → End time (hours) of time slot 2, zone 2, Thursday	13	0	23	R/W
7183	THU_Z2_MIN_OFF_2 → End time (minutes) of time slot 2, zone 2, Thursday	0	0	59	R/W
7184	THU_Z2_HOUR_ON_3 → Start time (hours) of time slot 3, zone 2, Thursday	17	0	23	R/W
7185	THU_Z1_MIN_ON_3 → Start time (minutes) of time slot 3, zone 2, Thursday	0	0	59	R/W
7186	THU_Z2_HOUR_OFF_3 → End time (hours) of time slot 3, zone 2, Thursday	19	0	23	R/W
7187	THU_Z2_MIN_OFF_3 → End time (minutes) of time slot 3, zone 2, Thursday	0	0	59	R/W
7188	THU_Z2_HOUR_ON_4 → Start time (hours) of time slot 4, zone 2, Thursday	21	0	23	R/W
7189	THU_Z2_MIN_ON_4 → Start time (minutes) of time slot 4, zone 2, Thursday	0	0	59	R/W
7190	THU_Z2_HOUR_OFF_4 → End time (hours) of time slot 4, zone 2, Thursday	23	0	23	R/W
7191	THU_Z2_MIN_OFF_4 → End time (minutes) of time slot 4, zone 2, Thursday	0	0	59	R/W
7192	FRI_Z2_HOUR_ON_1 → Start time (hours) of time slot 1, zone 2, Friday	6	0	23	R/W
7193	FRI_Z2_MIN_ON_1 → Start time (minutes) of time slot 1, zone 2, Friday	0	0	59	R/W
7194	FRI_Z2_HOUR_OFF_1 → End time (hours) of time slot 1, zone 2, Friday	8	0	23	R/W
7195	FRI_Z2_MIN_OFF_1 → End time (minutes) of time slot 1, zone 2, Friday	0	0	59	R/W
7196	FRI_Z2_HOUR_ON_2 → Start time (hours) of time slot 2, zone 2 Friday	11	0	23	R/W
7197	FRI_Z2_MIN_ON_2 → Start time (minutes) of time slot 2, zone 2, Friday	0	0	59	R/W
7198	FRI_Z2_HOUR_OFF_2 → End time (hours) of time slot 2, zone 2, Friday	13	0	23	R/W
7199	FRI_Z2_MIN_OFF_2 → End time (minutes) of time slot 2, zone 2, Friday	0	0	59	R/W
7200	FRI_Z2_HOUR_ON_3 → Start time (hours) of time slot 3, zone 2, Friday	17	0	23	R/W
7201	FRI_Z2_MIN_ON_3 → Start time (minutes) of time slot 3, zone 2, Friday	0	0	59	R/W
7202	FRI_Z2_HOUR_OFF_3 → End time (hours) of time slot 3, zone 2, Friday	19	0	23	R/W
7203	FRI_Z2_MIN_OFF_3 → End time (minutes) of time slot 3, zone 2, Friday	0	0	59	R/W
7204	FRI_Z2_HOUR_ON_4 → Start time (hours) of time slot 4, zone 2, Friday	21	0	23	R/W
7205	FRI_Z2_MIN_ON_4 → Start time (minutes) of time slot 4, zone 2, Friday	0	0	59	R/W
7206	FRI_Z2_HOUR_OFF_4 → End time (hours) of time slot 4, zone 2, Friday	23	0	23	R/W
7207	FRI_Z2_MIN_OFF_4 → End time (minutes) of time slot 4, zone 2, Friday	0	0	59	R/W
7208	SAT_Z2_HOUR_ON_1 → Start time (hours) of time slot 1, zone 2, Saturday	6	0	23	R/W
7209	SAT_Z2_MIN_ON_1 → Start time (minutes) of time slot 1, zone 2, Saturday	0	0	59	R/W
7210	SAT_Z2_HOUR_OFF_1 → End time (hours) of time slot 1, zone 2, Saturday	8	0	23	R/W
7211	SAT_Z2_MIN_OFF_1 → End time (minutes) of time slot 1, zone 2, Saturday	0	0	59	R/W
7212	SAT_Z2_HOUR_ON_2 → Start time (hours) of time slot 2, zone 2, Saturday	11	0	23	R/W
7213	SAT_Z2_MIN_ON_2 → Start time (minutes) of time slot 2, zone 2, Saturday	0	0	59	R/W
7214	SAT_Z2_HOUR_OFF_2 → End time (hours) of time slot 2, zone 2, Saturday	13	0	23	R/W
7215	SAT_Z2_MIN_OFF_2 → End time (minutes) of time slot 2, zone 2, Saturday	0	0	59	R/W
7216	SAT_Z2_HOUR_ON_3 → Start time (hours) of time slot 3, zone 2, Saturday	17	0	23	R/W
7217	SAT_Z2_MIN_ON_3 → Start time (minutes) of time slot 3, zone 2, Saturday	0	0	59	R/W
7218	SAT_Z2_HOUR_OFF_3 → End time (hours) of time slot 3, zone 2, Saturday	19	0	23	R/W
7219	SAT_Z2_MIN_OFF_3 → End time (minutes) of time slot 3, zone 2, Saturday	0	0	59	R/W
7220	SAT_Z2_HOUR_ON_4 → Start time (hours) of time slot 4, zone 2, Saturday	21	0	23	R/W
7221	SAT_Z2_MIN_ON_4 → Start time (minutes) of time slot 4, zone 2, Saturday	0	0	59	R/W
7222	SAT_Z2_HOUR_OFF_4 → End time (hours) of time slot 4, zone 2, Saturday	23	0	23	R/W
7223	SAT_Z2_MIN_OFF_4 → End time (minutes) of time slot 4, zone 2, Saturday	0	0	59	R/W
7224	SUN_Z3_HOUR_ON_1 → Start time of time slot 1, zone 3, Sunday	6	0	23	R/W
7225	SUN_Z3_MIN_ON_1 → Start time (minutes) of time slot 1, zone 3, Sunday	0	0	59	R/W

Registers	Description	Default	Min	Max.	R/W
7226	SUN_Z3_HOUR_OFF_1 → End time of time slot 1, zone 3, Sunday	8	0	23	R/W
7227	SUN_Z3_MIN_OFF_1 → End time (minutes) of time slot 1, zone 3, Sunday	0	0	59	R/W
7228	SUN_Z3_HOUR_ON_2 → Start time of time slot 2, zone 3, Sunday	11	0	23	R/W
7229	SUN_Z3_MIN_ON_2 → Start time (minutes) of time slot 2, zone 3, Sunday	0	0	59	R/W
7230	SUN_Z3_HOUR_OFF_2 → End time of time slot 2, zone 3, Sunday	13	0	23	R/W
7231	SUN_Z3_MIN_OFF_2 → End time (minutes) of time slot 2, zone 3, Sunday	0	0	59	R/W
7232	SUN_Z3_HOUR_ON_3 → Start time of time slot 3, zone 3, Sunday	17	0	23	R/W
7233	SUN_Z3_MIN_ON_3 → Start time (minutes) of time slot 3, zone 3, Sunday	0	0	59	R/W
7234	SUN_Z3_HOUR_OFF_3 → End time of time slot 3, zone 3, Sunday	19	0	23	R/W
7235	SUN_Z3_MIN_OFF_3 → End time (minutes) of time slot 3, zone 3, Sunday	0	0	59	R/W
7236	SUN_Z3_HOUR_ON_4 → Start time of time slot 4, zone 3, Sunday	21	0	23	R/W
7237	SUN_Z3_MIN_ON_4 → Start time (minutes) of time slot 4, zone 3, Sunday	0	0	59	R/W
7238	SUN_Z3_HOUR_OFF_4 → End time of time slot 4, zone 3, Sunday	23	0	23	R/W
7239	SUN_Z3_MIN_OFF_4 → End time (minutes) of time slot 4, zone 3, Sunday	0	0	59	R/W
7240	MON_Z3_HOUR_ON_1 → Start time (hours) of time slot 1, zone 3, Monday	6	0	23	R/W
7241	MON_Z3_MIN_ON_1 → Start time (minutes) of time slot 1, zone 3, Monday	0	0	59	R/W
7242	MON_Z3_HOUR_OFF_1 → End time (hours) of time slot 1, zone 3, Monday	8	0	23	R/W
7243	MON_Z3_MIN_OFF_1 → End time (minutes) of time slot 1, zone 3, Monday	0	0	59	R/W
7244	MON_Z3_HOUR_ON_2 → Start time (hours) of time slot 2, zone 3, Monday	11	0	23	R/W
7245	MON_Z3_MIN_ON_2 → Start time (minutes) of time slot 2, zone 3, Monday	0	0	59	R/W
7246	MON_Z3_HOUR_OFF_2 → End time (hours) of time slot 2, zone 3, Monday	13	0	23	R/W
7247	MON_Z3_MIN_OFF_2 → End time (minutes) of time slot 2, zone 3, Monday	0	0	59	R/W
7248	MON_Z3_HOUR_ON_3 → Start time (hours) of time slot 3, zone 3, Monday	17	0	23	R/W
7249	MON_Z3_MIN_ON_3 → Start time (minutes) of time slot 3, zone 3, Monday	0	0	59	R/W
7250	MON_Z3_HOUR_OFF_3 → End time (hours) of time slot 3, zone 3, Monday	19	0	23	R/W
7251	MON_Z3_MIN_OFF_3 → End time (minutes) of time slot 3, zone 3, Monday	0	0	59	R/W
7252	MON_Z3_HOUR_ON_4 → Start time (hours) of time slot 4, zone 1, Monday	21	0	23	R/W
7253	MON_Z3_MIN_ON_4 → Start time (minutes) of time slot 4, zone 3, Monday	0	0	59	R/W
7254	MON_Z3_HOUR_OFF_4 → End time (hours) of time slot 4, zone 3, Monday	23	0	23	R/W
7255	MON_Z3_MIN_OFF_4 → End time (minutes) of time slot 4, zone 3, Monday	0	0	59	R/W
7256	TUE_Z3_HOUR_ON_1 → Start time (hours) of time slot 1, zone 3, Tuesday	6	0	23	R/W
7257	TUE_Z3_MIN_ON_1 → Start time (minutes) of time slot 1, zone 3, Tuesday	0	0	59	R/W
7258	TUE_Z3_HOUR_OFF_1 → End time (hours) of time slot 1, zone 1, Tuesday	8	0	23	R/W
7259	TUE_Z3_MIN_OFF_1 → End time (minutes) of time slot 1, zone 3, Tuesday	0	0	59	R/W
7260	TUE_Z3_HOUR_ON_2 → Start time (hours) of time slot 2, zone 3, Tuesday	11	0	23	R/W
7261	TUE_Z3_MIN_ON_2 → Start time (minutes) of time slot 2, zone 3, Tuesday	0	0	59	R/W
7262	TUE_Z3_HOUR_OFF_2 → End time (hours) of time slot 2, zone 3, Tuesday	13	0	23	R/W
7263	TUE_Z3_MIN_OFF_2 → End time (minutes) of time slot 2, zone 3, Tuesday	0	0	59	R/W
7264	TUE_Z3_HOUR_ON_3 → Start time (hours) of time slot 3, zone 3, Tuesday	17	0	23	R/W
7265	TUE_Z3_MIN_ON_3 → Start time (minutes) of time slot 3, zone 3, Tuesday	0	0	59	R/W
7266	TUE_Z3_HOUR_OFF_3 → End time (hours) of time slot 3, zone 3, Tuesday	19	0	23	R/W
7267	TUE_Z3_MIN_OFF_3 → End time (minutes) of time slot 3, zone 3, Tuesday	0	0	59	R/W
7268	TUE_Z3_HOUR_ON_4 → Start time (hours) of time slot 4, zone 3, Tuesday	21	0	23	R/W
7269	TUE_Z3_MIN_ON_4 → Start time (minutes) of time slot 4, zone 3, Tuesday	0	0	59	R/W
7270	TUE_Z3_HOUR_OFF_4 → End time (hours) of time slot 4, zone 3, Tuesday	23	0	23	R/W
7271	TUE_Z3_MIN_OFF_4 → End time (minutes) of time slot 4, zone 3, Tuesday	0	0	59	R/W
7272	WED_Z3_HOUR_ON_1 → Start time (hours) of time slot 1, zone 3, Wednesday	6	0	23	R/W
7273	WED_Z3_MIN_ON_1 → Start time (minutes) of time slot 1, zone 3, Wednesday	0	0	59	R/W
7274	WED_Z3_HOUR_OFF_1 → End time (hours) of time slot 1, zone 1, Wednesday	8	0	23	R/W
7275	WED_Z3_MIN_OFF_1 → End time (minutes) of time slot 1, zone 3, Wednesday	0	0	59	R/W
7276	WED_Z3_HOUR_ON_2 → Start time (hours) of time slot 2, zone 3, Wednesday	11	0	23	R/W
7277	WED_Z3_MIN_ON_2 → Start time (minutes) of time slot 2, zone 3, Wednesday	0	0	59	R/W
7278	WED_Z3_HOUR_OFF_2 → End time (hours) of time slot 2, zone 3, Wednesday	13	0	23	R/W
7279	WED_Z3_MIN_OFF_2 → End time (minutes) of time slot 2, zone 3, Wednesday	0	0	59	R/W
7280	WED_Z3_HOUR_ON_3 → Start time (hours) of time slot 3, zone 3, Wednesday	17	0	23	R/W

Registers	Description	Default	Min	Max.	R/W
7281	WED_Z3_MIN_ON_3 → Start time (minutes) of time slot 3, zone 3, Wednesday	0	0	59	R/W
7282	WED_Z3_HOUR_OFF_3 → End time (hours) of time slot 3, zone 3, Wednesday	19	0	23	R/W
7283	WED_Z3_MIN_OFF_3 → End time (minutes) of time slot 3, zone 3, Wednesday	0	0	59	R/W
7284	WED_Z3_HOUR_ON_4 → Start time (hours) of time slot 4, zone 3, Wednesday	21	0	23	R/W
7285	WED_Z3_MIN_ON_4 → Start time (minutes) of time slot 4, zone 3, Wednesday	0	0	59	R/W
7286	WED_Z3_HOUR_OFF_4 → End time (hours) of time slot 4, zone 3, Wednesday	23	0	23	R/W
7287	WED_Z3_MIN_OFF_4 → End time (minutes) of time slot 4, zone 3, Wednesday	0	0	59	R/W
7288	THU_Z3_HOUR_ON_1 → Start time (hours) of time slot 1, zone 3, Thursday	6	0	23	R/W
7289	THU_Z3_MIN_ON_1 → Start time (minutes) of time slot 1, zone 3, Thursday	0	0	59	R/W
7290	THU_Z3_HOUR_OFF_1 → End time (minutes) of time slot 1, zone 3, Thursday	8	0	23	R/W
7291	THU_Z3_MIN_OFF_1 → End time (minutes) of time slot 1, zone 3, Thursday	0	0	59	R/W
7292	THU_Z3_HOUR_ON_2 → Start time (hours) of time slot 2, zone 3, Thursday	11	0	23	R/W
7293	THU_Z3_MIN_ON_2 → Start time (minutes) of time slot 2, zone 3, Thursday	0	0	59	R/W
7294	THU_Z3_HOUR_OFF_2 → End time (hours) of time slot 2, zone 3, Thursday	13	0	23	R/W
7295	THU_Z3_MIN_OFF_2 → End time (minutes) of time slot 2, zone 3, Thursday	0	0	59	R/W
7296	THU_Z3_HOUR_ON_3 → Start time (hours) of time slot 3, zone 3, Thursday	17	0	23	R/W
7297	THU_Z3_MIN_ON_3 → Start time (minutes) of time slot 3, zone 3, Thursday	0	0	59	R/W
7298	THU_Z3_HOUR_OFF_3 → End time (hours) of time slot 3, zone 3, Thursday	19	0	23	R/W
7299	THU_Z3_MIN_OFF_3 → End time (minutes) of time slot 3, zone 3, Thursday	0	0	59	R/W
7300	THU_Z3_HOUR_ON_4 → Start time (hours) of time slot 4, zone 3, Thursday	21	0	23	R/W
7301	THU_Z3_MIN_ON_4 → Start time (minutes) of time slot 4, zone 3, Thursday	0	0	59	R/W
7302	THU_Z3_HOUR_OFF_4 → End time (hours) of time slot 4, zone 3, Thursday	23	0	23	R/W
7303	THU_Z3_MIN_OFF_4 → End time (minutes) of time slot 4, zone 3, Thursday	0	0	59	R/W
7304	FRI_Z3_HOUR_ON_1 → Start time (hours) of time slot 1, zone 3, Friday	6	0	23	R/W
7305	FRI_Z3_MIN_ON_1 → Start time (minutes) of time slot 1, zone 3, Friday	0	0	59	R/W
7306	FRI_Z3_HOUR_OFF_1 → End time (hours) of time slot 1, zone 3, Friday	8	0	23	R/W
7307	FRI_Z3_MIN_OFF_1 → End time (minutes) of time slot 1, zone 3, Friday	0	0	59	R/W
7308	FRI_Z3_HOUR_ON_2 → Start time (hours) of time slot 2, zone 3 Friday	11	0	23	R/W
7309	FRI_Z3_MIN_ON_2 → Start time (minutes) of time slot 2, zone 3, Friday	0	0	59	R/W
7310	FRI_Z3_HOUR_OFF_2 → End time (hours) of time slot 2, zone 3, Friday	13	0	23	R/W
7311	FRI_Z3_MIN_OFF_2 → End time (minutes) of time slot 2, zone 3, Friday	0	0	59	R/W
7312	FRI_Z3_HOUR_ON_3 → Start time (hours) of time slot 3, zone 3, Friday	17	0	23	R/W
7313	FRI_Z3_MIN_ON_3 → Start time (minutes) of time slot 3, zone 3, Friday	0	0	59	R/W
7314	FRI_Z3_HOUR_OFF_3 → End time (hours) of time slot 3, zone 3, Friday	19	0	23	R/W
7315	FRI_Z3_MIN_OFF_3 → End time (minutes) of time slot 3, zone 3, Friday	0	0	59	R/W
7316	FRI_Z3_HOUR_ON_4 → Start time (hours) of time slot 4, zone 3, Friday	21	0	23	R/W
7317	FRI_Z3_MIN_ON_4 → Start time (minutes) of time slot 4, zone 3, Friday	0	0	59	R/W
7318	FRI_Z3_HOUR_OFF_4 → End time (hours) of time slot 4, zone 3, Friday	23	0	23	R/W
7319	FRI_Z3_MIN_OFF_4 → End time (minutes) of time slot 4, zone 3, Friday	0	0	59	R/W
7320	SAT_Z3_HOUR_ON_1 → Start time (hours) of time slot 1, zone 3, Saturday	6	0	23	R/W
7321	SAT_Z3_MIN_ON_1 → Start time (minutes) of time slot 1, zone 3, Saturday	0	0	59	R/W
7322	SAT_Z3_HOUR_OFF_1 → End time (hours) of time slot 1, zone 3, Saturday	8	0	23	R/W
7323	SAT_Z3_MIN_OFF_1 → End time (minutes) of time slot 1, zone 3, Saturday	0	0	59	R/W
7324	SAT_Z3_HOUR_ON_2 → Start time (hours) of time slot 2, zone 3, Saturday	11	0	23	R/W
7325	SAT_Z3_MIN_ON_2 → Start time (minutes) of time slot 2, zone 3, Saturday	0	0	59	R/W
7326	SAT_Z3_HOUR_OFF_2 → End time (hours) of time slot 2, zone 3, Saturday	13	0	23	R/W
7327	SAT_Z3_MIN_OFF_2 → End time (minutes) of time slot 2, zone 3, Saturday	0	0	59	R/W
7328	SAT_Z3_HOUR_ON_3 → Start time (hours) of time slot 3, zone 3, Saturday	17	0	23	R/W
7329	SAT_Z3_MIN_ON_3 → Start time (minutes) of time slot 3, zone 3, Saturday	0	0	59	R/W
7330	SAT_Z3_HOUR_OFF_3 → End time (hours) of time slot 3, zone 3, Saturday	19	0	23	R/W
7331	SAT_Z3_MIN_OFF_3 → End time (minutes) of time slot 3, zone 3, Saturday	0	0	59	R/W
7332	SAT_Z3_HOUR_ON_4 → Start time (hours) of time slot 4, zone 3, Saturday	21	0	23	R/W
7333	SAT_Z3_MIN_ON_4 → Start time (minutes) of time slot 4, zone 3, Saturday	0	0	59	R/W
7334	SAT_Z3_HOUR_OFF_4 → End time (hours) of time slot 4, zone 3, Saturday	23	0	23	R/W
7335	SAT_Z3_MIN_OFF_4 → End time (minutes) of time slot 4, zone 3, Saturday	0	0	59	R/W

Registers	Description	Default	Min	Max.	R/W
7336	SUN_Z4_HOUR_ON_1 → Start time of time slot 1, zone 4, Sunday	6	0	23	R/W
7337	SUN_Z4_MIN_ON_1 → Start time (minutes) of time slot 1, zone 4, Sunday	0	0	59	R/W
7338	SUN_Z4_HOUR_OFF_1 → End time of time slot 1, zone 4, Sunday	8	0	23	R/W
7339	SUN_Z4_MIN_OFF_1 → End time (minutes) of time slot 1, zone 4, Sunday	0	0	59	R/W
7340	SUN_Z4_HOUR_ON_2 → Start time of time slot 2, zone 4, Sunday	11	0	23	R/W
7341	SUN_Z4_MIN_ON_2 → Start time (minutes) of time slot 2, zone 4, Sunday	0	0	59	R/W
7342	SUN_Z4_HOUR_OFF_2 → End time of time slot 2, zone 4, Sunday	13	0	23	R/W
7343	SUN_Z4_MIN_OFF_2 → End time (minutes) of time slot 2, zone 4, Sunday	0	0	59	R/W
7344	SUN_Z4_HOUR_ON_3 → Start time of time slot 3, zone 4, Sunday	17	0	23	R/W
7345	SUN_Z4_MIN_ON_3 → Start time (minutes) of time slot 3, zone 4, Sunday	0	0	59	R/W
7346	SUN_Z4_HOUR_OFF_3 → End time of time slot 3, zone 4, Sunday	19	0	23	R/W
7347	SUN_Z4_MIN_OFF_3 → End time (minutes) of time slot 3, zone 4, Sunday	0	0	59	R/W
7348	SUN_Z4_HOUR_ON_4 → Start time of time slot 4, zone 4, Sunday	21	0	23	R/W
7349	SUN_Z4_MIN_ON_4 → Start time (minutes) of time slot 4, zone 4, Sunday	0	0	59	R/W
7350	SUN_Z4_HOUR_OFF_4 → End time of time slot 4, zone 4, Sunday	23	0	23	R/W
7351	SUN_Z4_MIN_OFF_4 → End time (minutes) of time slot 4, zone 4, Sunday	0	0	59	R/W
7352	MON_Z4_HOUR_ON_1 → Start time (hours) of time slot 1, zone 4, Monday	6	0	23	R/W
7353	MON_Z4_MIN_ON_1 → Start time (minutes) of time slot 1, zone 4, Monday	0	0	59	R/W
7354	MON_Z4_HOUR_OFF_1 → End time (hours) of time slot 1, zone 4, Monday	8	0	23	R/W
7355	MON_Z4_MIN_OFF_1 → End time (minutes) of time slot 1, zone 4, Monday	0	0	59	R/W
7356	MON_Z4_HOUR_ON_2 → Start time (hours) of time slot 2, zone 4, Monday	11	0	23	R/W
7357	MON_Z4_MIN_ON_2 → Start time (minutes) of time slot 2, zone 4, Monday	0	0	59	R/W
7358	MON_Z4_HOUR_OFF_2 → End time (hours) of time slot 2, zone 4, Monday	13	0	23	R/W
7359	MON_Z4_MIN_OFF_2 → End time (minutes) of time slot 2, zone 4, Monday	0	0	59	R/W
7360	MON_Z4_HOUR_ON_3 → Start time (hours) of time slot 3, zone 4, Monday	17	0	23	R/W
7361	MON_Z4_MIN_ON_3 → Start time (minutes) of time slot 3, zone 4, Monday	0	0	59	R/W
7362	MON_Z4_HOUR_OFF_3 → End time (hours) of time slot 3, zone 4, Monday	19	0	23	R/W
7363	MON_Z4_MIN_OFF_3 → End time (minutes) of time slot 3, zone 4, Monday	0	0	59	R/W
7364	MON_Z4_HOUR_ON_4 → Start time (hours) of time slot 4, zone 4, Monday	21	0	23	R/W
7365	MON_Z4_MIN_ON_4 → Start time (minutes) of time slot 4, zone 4, Monday	0	0	59	R/W
7366	MON_Z4_HOUR_OFF_4 → End time (hours) of time slot 4, zone 4, Monday	23	0	23	R/W
7367	MON_Z4_MIN_OFF_4 → End time (minutes) of time slot 4, zone 4, Monday	0	0	59	R/W
7368	TUE_Z4_HOUR_ON_1 → Start time (hours) of time slot 1, zone 4, Tuesday	6	0	23	R/W
7369	TUE_Z4_MIN_ON_1 → Start time (minutes) of time slot 1, zone 4, Tuesday	0	0	59	R/W
7370	TUE_Z4_HOUR_OFF_1 → End time (hours) of time slot 1, zone 4, Tuesday	8	0	23	R/W
7371	TUE_Z4_MIN_OFF_1 → End time (minutes) of time slot 1, zone 4, Tuesday	0	0	59	R/W
7372	TUE_Z4_HOUR_ON_2 → Start time (hours) of time slot 2, zone 4, Tuesday	11	0	23	R/W
7373	TUE_Z4_MIN_ON_2 → Start time (minutes) of time slot 2, zone 4, Tuesday	0	0	59	R/W
7374	TUE_Z4_HOUR_OFF_2 → End time (hours) of time slot 2, zone 4, Tuesday	13	0	23	R/W
7375	TUE_Z4_MIN_OFF_2 → End time (minutes) of time slot 2, zone 4, Tuesday	0	0	59	R/W
7376	TUE_Z4_HOUR_ON_3 → Start time (hours) of time slot 3, zone 4, Tuesday	17	0	23	R/W
7377	TUE_Z4_MIN_ON_3 → Start time (minutes) of time slot 3, zone 4, Tuesday	0	0	59	R/W
7378	TUE_Z4_HOUR_OFF_3 → End time (hours) of time slot 3, zone 4, Tuesday	19	0	23	R/W
7379	TUE_Z4_MIN_OFF_3 → End time (minutes) of time slot 3, zone 4, Tuesday	0	0	59	R/W
7380	TUE_Z4_HOUR_ON_4 → Start time (hours) of time slot 4, zone 4, Tuesday	21	0	23	R/W
7381	TUE_Z4_MIN_ON_4 → Start time (minutes) of time slot 4, zone 4, Tuesday	0	0	59	R/W
7382	TUE_Z4_HOUR_OFF_4 → End time (hours) of time slot 4, zone 4, Tuesday	23	0	23	R/W
7383	TUE_Z4_MIN_OFF_4 → End time (minutes) of time slot 4, zone 4, Tuesday	0	0	59	R/W
7384	WED_Z4_HOUR_ON_1 → Start time (hours) of time slot 1, zone 4, Wednesday	6	0	23	R/W
7385	WED_Z4_MIN_ON_1 → Start time (minutes) of time slot 1, zone 4, Wednesday	0	0	59	R/W
7386	WED_Z4_HOUR_OFF_1 → End time (hours) of time slot 1, zone 4, Wednesday	8	0	23	R/W
7387	WED_Z4_MIN_OFF_1 → End time (minutes) of time slot 1, zone 4, Wednesday	0	0	59	R/W
7388	WED_Z4_HOUR_ON_2 → Start time (hours) of time slot 2, zone 4, Wednesday	11	0	23	R/W
7389	WED_Z4_MIN_ON_2 → Start time (minutes) of time slot 2, zone 4, Wednesday	0	0	59	R/W
7390	WED_Z4_HOUR_OFF_2 → End time (hours) of time slot 2, zone 4, Wednesday	13	0	23	R/W

Registers	Description	Default	Min	Max.	R/W
7391	WED_Z4_MIN_OFF_2 → End time (minutes) of time slot 2, zone 4, Wednesday	0	0	59	R/W
7392	WED_Z4_HOUR_ON_3 → Start time (hours) of time slot 3, zone 4, Wednesday	17	0	23	R/W
7393	WED_Z4_MIN_ON_3 → Start time (minutes) of time slot 3, zone 4, Wednesday	0	0	59	R/W
7394	WED_Z4_HOUR_OFF_3 → End time (hours) of time slot 3, zone 4, Wednesday	19	0	23	R/W
7395	WED_Z3_MIN_OFF_3 → End time (minutes) of time slot 3, zone 4, Wednesday	0	0	59	R/W
7396	WED_Z4_HOUR_ON_4 → Start time (hours) of time slot 4, zone 4, Wednesday	21	0	23	R/W
7397	WED_Z4_MIN_ON_4 → Start time (minutes) of time slot 4, zone 4, Wednesday	0	0	59	R/W
7398	WED_Z4_HOUR_OFF_4 → End time (hours) of time slot 4, zone 4, Wednesday	23	0	23	R/W
7399	WED_Z4_MIN_OFF_4 → End time (minutes) of time slot 4, zone 4, Wednesday	0	0	59	R/W
7400	THU_Z4_HOUR_ON_1 → Start time (hours) of time slot 1, zone 4, Thursday	6	0	23	R/W
7401	THU_Z4_MIN_ON_1 → Start time (minutes) of time slot 1, zone 4, Thursday	0	0	59	R/W
7402	THU_Z4_HOUR_OFF_1 → End time (minutes) of time slot 1, zone 4, Thursday	8	0	23	R/W
7403	THU_Z4_MIN_OFF_1 → End time (minutes) of time slot 1, zone 4, Thursday	0	0	59	R/W
7404	THU_Z4_HOUR_ON_2 → Start time (hours) of time slot 2, zone 4, Thursday	11	0	23	R/W
7405	THU_Z4_MIN_ON_2 → Start time (minutes) of time slot 2, zone 4, Thursday	0	0	59	R/W
7406	THU_Z4_HOUR_OFF_2 → End time (hours) of time slot 2, zone 4, Thursday	13	0	23	R/W
7407	THU_Z4_MIN_OFF_2 → End time (minutes) of time slot 2, zone 4, Thursday	0	0	59	R/W
7408	THU_Z4_HOUR_ON_3 → Start time (hours) of time slot 3, zone 4, Thursday	17	0	23	R/W
7409	THU_Z4_MIN_ON_3 → Start time (minutes) of time slot 3, zone 4, Thursday	0	0	59	R/W
7410	THU_Z4_HOUR_OFF_3 → End time (hours) of time slot 3, zone 4, Thursday	19	0	23	R/W
7411	THU_Z4_MIN_OFF_3 → End time (minutes) of time slot 3, zone 4, Thursday	0	0	59	R/W
7412	THU_Z4_HOUR_ON_4 → Start time (hours) of time slot 4, zone 4, Thursday	21	0	23	R/W
7413	THU_Z4_MIN_ON_4 → Start time (minutes) of time slot 4, zone 4, Thursday	0	0	59	R/W
7414	THU_Z4_HOUR_OFF_4 → End time (hours) of time slot 4, zone 4, Thursday	23	0	23	R/W
7415	THU_Z4_MIN_OFF_4 → End time (minutes) of time slot 4, zone 4, Thursday	0	0	59	R/W
7416	FRI_Z4_HOUR_ON_1 → Start time (hours) of time slot 1, zone 1, Friday	6	0	23	R/W
7417	FRI_Z4_MIN_ON_1 → Start time (minutes) of time slot 1, zone 4, Friday	0	0	59	R/W
7418	FRI_Z4_HOUR_OFF_1 → End time (hours) of time slot 1, zone 4, Friday	8	0	23	R/W
7419	FRI_Z4_MIN_OFF_1 → End time (minutes) of time slot 1, zone 4, Friday	0	0	59	R/W
7420	FRI_Z4_HOUR_ON_2 → Start time (hours) of time slot 2, zone 4, Friday	11	0	23	R/W
7421	FRI_Z4_MIN_ON_2 → Start time (minutes) of time slot 2, zone 4, Friday	0	0	59	R/W
7422	FRI_Z4_HOUR_OFF_2 → End time (hours) of time slot 2, zone 4, Friday	13	0	23	R/W
7423	FRI_Z4_MIN_OFF_2 → End time (minutes) of time slot 2, zone 4, Friday	0	0	59	R/W
7424	FRI_Z4_HOUR_ON_3 → Start time (hours) of time slot 3, zone 4, Friday	17	0	23	R/W
7425	FRI_Z4_MIN_ON_3 → Start time (minutes) of time slot 3, zone 4, Friday	0	0	59	R/W
7426	FRI_Z4_HOUR_OFF_3 → End time (hours) of time slot 3, zone 4, Friday	19	0	23	R/W
7427	FRI_Z4_MIN_OFF_3 → End time (minutes) of time slot 3, zone 4, Friday	0	0	59	R/W
7428	FRI_Z4_HOUR_ON_4 → Start time (hours) of time slot 4, zone 4, Friday	21	0	23	R/W
7429	FRI_Z4_MIN_ON_4 → Start time (minutes) of time slot 4, zone 4, Friday	0	0	59	R/W
7430	FRI_Z4_HOUR_OFF_4 → End time (hours) of time slot 4, zone 4, Friday	23	0	23	R/W
7431	FRI_Z4_MIN_OFF_4 → End time (minutes) of time slot 4, zone 4, Friday	0	0	59	R/W
7432	SAT_Z4_HOUR_ON_1 → Start time (hours) of time slot 1, zone 4, Saturday	6	0	23	R/W
7433	SAT_Z4_MIN_ON_1 → Start time (minutes) of time slot 1, zone 4, Saturday	0	0	59	R/W
7434	SAT_Z4_HOUR_OFF_1 → End time (hours) of time slot 1, zone 4, Saturday	8	0	23	R/W
7435	SAT_Z4_MIN_OFF_1 → End time (minutes) of time slot 1, zone 4, Saturday	0	0	59	R/W
7436	SAT_Z4_HOUR_ON_2 → Start time (hours) of time slot 2, zone 4, Saturday	11	0	23	R/W
7437	SAT_Z4_MIN_ON_2 → Start time (minutes) of time slot 2, zone 4, Saturday	0	0	59	R/W
7438	SAT_Z4_HOUR_OFF_2 → End time (hours) of time slot 2, zone 4, Saturday	13	0	23	R/W
7439	SAT_Z4_MIN_OFF_2 → End time (minutes) of time slot 2, zone 4, Saturday	0	0	59	R/W
7440	SAT_Z4_HOUR_ON_3 → Start time (hours) of time slot 3, zone 4, Saturday	17	0	23	R/W
7441	SAT_Z4_MIN_ON_3 → Start time (minutes) of time slot 3, zone 4, Saturday	0	0	59	R/W
7442	SAT_Z4_HOUR_OFF_3 → End time (hours) of time slot 3, zone 4, Saturday	19	0	23	R/W
7443	SAT_Z4_MIN_OFF_3 → End time (minutes) of time slot 3, zone 4, Saturday	0	0	59	R/W
7444	SAT_Z4_HOUR_ON_4 → Start time (hours) of time slot 4, zone 4, Saturday	21	0	23	R/W
7445	SAT_Z4_MIN_ON_4 → Start time (minutes) of time slot 4, zone 4, Saturday	0	0	59	R/W

Registers	Description		Default	Min	Max.	R/W
7446	SAT_Z4_HOUR_OFF_4 → End time (hours) of time slot 4, zone 4, Saturday		23	0	23	R/W
7447	SAT_Z4_MIN_OFF_4 → End time (minutes) of time slot 4, zone 4, Saturday		0	0	59	R/W
7448	TYPE_OF_HARDWARE 0 = 1 digital output, 3 analogue outputs 1 = 2 digital outputs, 2 analogue outputs 2 = 3 digital outputs, 1 analogue output 3 = 3 digital outputs, 2 analogue outputs 4 = 5 digital outputs	MB1		0	4	R
7449	RTC_PRESENCE 0 = Not present 1 = Present	MB2		0	1	R
7450	IR_PRESENCE 0 = Not present 1 = Present	MB3		0	1	R
7451	HUM_PRESENCE 0 = Not present 1 = Present	MB4		0	1	R
7452	TYPE_COMMUNICATION 0 = Not present 1 = MODBUS	MB5		0	1	R
7453	TYPE_UNIT (see table pag.36) 0=Secondary SLAVE controller 1=MASTER controller	MB1	0	0	1	R/W
7454	TYPE_REGULATION (see table pag.36) 0=Fixed point control for 2-pipe operation 1=Control with compensated setpoint for 2-pipe operation 2=Control with fixed point in heating mode, with compensated setpoint in cooling mode 3=Fixed point control in heating mode, on the dew point in cooling mode 4=Control with compensated setpoint in heating mode, with fixed point in cooling mode 5=Control with compensated setpoint in heating mode, on the dew point in cooling mode	MB2	0	0	5	R/W
7455	TYPE_SLAVE_MODBUS 0=Without Modbus 1=With Modbus	MB3	1	0	1	R/W
7456	DIG_INPUT1_FUNC (see table pag. 36) 0=Remote season changeover (INPUT ON=Winter, INPUT OFF=Summer) 1=Remote On/Off (INPUT ON=OFF, INPUT OFF=ON) 2=Economy (INPUT ON=Economy on) 3=Non-occupied holiday (INPUT ON=Occupied) 4=Condensation contact (INPUT ON=Condensation present) 5=Control request (INPUT ON=Control requested) 6=General alarm (INPUT ON=Active alarm) 7=High temperature alarm (INPUT ON=High temperature) 8=Not used	MB4	8	0	8	R/W
7457	DIG_INPUT1_LOG (see table pag. 36) 0=Normally open (open=INPUT OFF, closed=INPUT ON) 1=Normally closed (closed=INPUT OFF, open=INPUT ON)	MB5	0	0	1	R/W
7458	DIG_INPUT2_FUNC (see table pag. 36) 0=Remote season changeover (INPUT ON=Winter, INPUT OFF=Summer) 1=Remote On/Off (INPUT ON=OFF, INPUT OFF=ON) 2=Economy (INPUT ON=Economy on) 3=Non-occupied holiday (INPUT ON=Occupied) 4=Condensation contact (INPUT ON=Condensation present) 5=Control request (INPUT ON=Control requested) 6=General alarm (INPUT ON=Active alarm) 7=High temperature alarm (INPUT ON=High temperature) 8=Not used	MB6	8	0	8	R/W
7459	DIG_INPUT2_LOG (see table pag. 36): 0=Normally open (open=INPUT OFF, closed=INPUT ON) 1=Normally closed (closed=INPUT OFF, open=INPUT ON)	MB7	0	0	1	R/W

Registers	Description		Default	Min	Max.	R/W
7460	ANALOG_INPUT1_FUNC (see table pag. 36) 0=Remote control sensor for zone 1 1=Remote control sensor for zone 2 2=Remote control sensor for zone 3 3=Remote control sensor for zone 4 4=External sensor 5=Floor sensor for zone 1 6=Floor sensor for zone 2 7=Floor sensor for zone 3 8=Floor sensor for zone 4 9=Season changeover remote contact (INPUT ON=Winter, INPUT OFF=Summer) 10=On/Off remote contact (INPUT ON=OFF, INPUT OFF=ON) 11=Non-occupied holiday remote contact (INPUT ON=Occupied) 12=Economy remote contact (INPUT ON=Economy on) 13=Sensor for dew point calculation (only for MASTER or SLAVE_Y controller) 14=Limit sensor (used by the MASTER or SLAVE_Y controller) 15=Not used	M08	15	0	15	R/W
7461	ANALOG_INPUT1_LOG (see table pag. 36): 0=Normally open (open=INPUT OFF, closed=INPUT ON) 1=Normally closed (closed=INPUT OFF, open=INPUT ON)	M09	0	0	1	R/W
7462	ANALOG_INPUT2_FUNC (see table pag. 36) 0=Remote control sensor for zone 1 1=Remote control sensor for zone 2 2=Remote control sensor for zone 3 3=Remote control sensor for zone 4 4=External sensor 5=Floor sensor for zone 1 6=Floor sensor for zone 2 7=Floor sensor for zone 3 8=Floor sensor for zone 4 9=Season changeover remote contact (INPUT ON=Winter, INPUT OFF=Summer) 10=On/Off remote contact (INPUT ON=OFF, INPUT OFF=ON) 11=Non-occupied holiday remote contact (INPUT ON=Occupied) 12=Economy remote contact (INPUT ON=Economy on) 13=Sensor for dew point calculation (only for MASTER or SLAVE_Y controller) 14=Limit sensor (used by the MASTER or SLAVE_Y controller) 15=Not used	M10	15	0	15	R/W
7463	ANALOG_INPUT2_LOG (see table pag. 36) : 0=Normally open (open=INPUT OFF, closed=INPUT ON) 1=Normally closed (closed=INPUT OFF, open=INPUT ON)	M11	0	0	1	R/W
7464	ANALOG_INPUT3_FUNC (see table pag. 36) 0=Remote control sensor for zone 1 1=Remote control sensor for zone 2 2=Remote control sensor for zone 3 3=Remote control sensor for zone 4 4=External sensor 5=Floor sensor for zone 1 6=Floor sensor for zone 2 7=Floor sensor for zone 3 8=Floor sensor for zone 4 9=Season changeover remote contact (INPUT ON=Winter, INPUT OFF=Summer) 10=On/Off remote contact (INPUT ON=OFF, INPUT OFF=ON) 11=Non-occupied holiday remote contact (INPUT ON=Occupied) 12=Economy remote contact (INPUT ON=Economy on) 13=Sensor for dew point calculation (only for MASTER or SLAVE_Y controller) 14=Limit sensor (used by the MASTER or SLAVE_Y controller) 15=Not used 16 = 0....10 V input for humidity sensor	M12	15	0	16	R/W
7465	ANALOG_INPUT3_LOG (see table pag. 36) 0=Normally open (open=INPUT OFF, closed=INPUT ON) 1=Normally closed (closed=INPUT OFF, open=INPUT ON)	M13	0	0	1	R/W
7466	CONF_OUTPUTS (see table pag. 36) 0=No configuration -4 to 4=Configuration for MASTER controller or SLAVE_Y controller 5 to 23=Configuration for SLAVE_X controller	M14	0	0	23	R/W

Registers	Description		Default	Min	Max.	R/W
7467	DIGITAL_OUTPUT1_FUNC (see table pag. 36) 0=Speed 1 of the ON/OFF fan 2=Speed 2 of the ON/OFF fan 2=Speed 3 of the ON/OFF fan 3=ON/OFF fan 1 4=ON/OFF fan 2 5=Dehumidifier 6=ON/OFF thermal actuator output 1 7=ON/OFF thermal actuator output 2 8=ON/OFF thermal actuator output 3 9=ON/OFF thermal actuator output 4 10=ON/OFF valve 11=Local pump 12=Column pump 13=Dew point or condensation alarm ^(Note3) 14=Control request ^(Note3) 15=Season changeover ^(Note3) 16=Not used	M 15	16	0	16	R
7468	DIGITAL_OUTPUT2_FUNC (see table pag. 36) 0=Speed 1 of the ON/OFF fan 2=Speed 2 of the ON/OFF fan 2=Speed 3 of the ON/OFF fan 3=ON/OFF fan 1 4=ON/OFF fan 2 5=Dehumidifier 6=ON/OFF thermal actuator output 1 7=ON/OFF thermal actuator output 2 8=ON/OFF thermal actuator output 3 9=ON/OFF thermal actuator output 4 10=ON/OFF valve 11=Local pump 12=Column pump 13=Dew point or condensation alarm ^(Note3) 14=Control request ^(Note3) 15=Season changeover ^(Note3) 16=Not used	M 15	16	0	16	R
7469	DIGITAL_OUTPUT3_FUNC (see table pag. 36) 0=Speed 1 of the ON/OFF fan 2=Speed 2 of the ON/OFF fan 2=Speed 3 of the ON/OFF fan 3=ON/OFF fan 1 4=ON/OFF fan 2 5=Dehumidifier 6=ON/OFF thermal actuator output 1 7=ON/OFF thermal actuator output 2 8=ON/OFF thermal actuator output 3 9=ON/OFF thermal actuator output 4 10=ON/OFF valve 11=Local pump 12=Column pump 13=Dew point or condensation alarm ^(Note3) 14=Control request ^(Note3) 15=Season changeover ^(Note3) 16=Not used	M 17	16	0	16	R or R/W ^(Note3)
7470	DIGITAL_OUTPUT4_FUNC (see table pag. 36) (not for models FH-2xxSH1) 0=Speed 1 of the ON/OFF fan 2=Speed 2 of the ON/OFF fan 2=Speed 3 of the ON/OFF fan 3=ON/OFF fan 1 4=ON/OFF fan 2 5=Dehumidifier 6=ON/OFF thermal actuator output 1 7=ON/OFF thermal actuator output 2 8=ON/OFF thermal actuator output 3 9=ON/OFF thermal actuator output 4 10=ON/OFF valve 11=Local pump 12=Column pump 13=Dew point or condensation alarm ^(Note3) 14=Control request ^(Note3) 15=Season changeover ^(Note3) 16=Not used	M 18	16	0	16	R

Registers	Description		Default	Min	Max.	R/W
7471	DIGITAL_OUTPUT5_FUNC (see table pag. 36) (not for models FH-2xxSH1) 0=Speed 1 of the ON/OFF fan 2=Speed 2 of the ON/OFF fan 2=Speed 3 of the ON/OFF fan 3=ON/OFF fan 1 4=ON/OFF fan 2 5=Dehumidifier 6=ON/OFF thermal actuator output 1 7=ON/OFF thermal actuator output 2 8=ON/OFF thermal actuator output 3 9=ON/OFF thermal actuator output 4 10=ON/OFF valve 11=Local pump 12=Column pump 13=Dew point or condensation alarm (Note3) 14=Control request (Note3) 15=Season changeover (Note3) 16=Not used	M19	16	0	16	R or R/W (Note3)
7472	ANALOG_OUTPUT1_FUNC (not for models FH-4xxSH1) 0=Fan output 1=Valve output 0..10 V 2=Not used	M20	2	0	2	R
7473	ANALOG_OUTPUT2_FUNC (see table pag. 36) not used	-	2	0	2	R
7474	ANALOG_OUTPUT3_FUNC (see table pag. 36) not used	-	2	0	2	R
7475	COR_INT_TEMP (see table pag. 40) ($\Delta^{\circ}\text{C}$ [$\Delta^{\circ}\text{F}$]) (Note1)	I01	0	-50 [-90]	50 [90]	R/W
7476	COR_INT_HUM (see table pag. 40)	I02	0	-100	100	R/W
7477	COR_REM_AI1 (see table pag. 40) ($\Delta^{\circ}\text{C}$ [$\Delta^{\circ}\text{F}$]) (Note1)	I03	0	-50 [-90]	50 [90]	R/W
7478	COR_REM_AI2 (see table pag. 40) ($\Delta^{\circ}\text{C}$ [$\Delta^{\circ}\text{F}$]) (Note1)	I04	0	-50 [-90]	50 [90]	R/W
7479	COR_REM_AI3 (see table pag. 40) ($\Delta^{\circ}\text{C}$ [$\Delta^{\circ}\text{F}$]) (Note1)	I05	0	-50 [-90]	50 [90]	R/W
7480	BASIC_HEAT_SET1 (see table pag. 40) ($^{\circ}\text{C}$ [$^{\circ}\text{F}$]) (Note1)	I06	200 [68]	I15	I14	R/W
7481	BASIC_COOL_SET1 (see table pag. 40) ($^{\circ}\text{C}$ [$^{\circ}\text{F}$]) (Note1)	I07	250 [77]	I17	I16	R/W
7482	BASIC_HEAT_SET2 (see table pag. 40) ($^{\circ}\text{C}$ [$^{\circ}\text{F}$]) (Note1)	I08	200 [68]	I15	I14	R/W
7483	BASIC_COOL_SET2 (see table pag. 40) ($^{\circ}\text{C}$ [$^{\circ}\text{F}$]) (Note1)	I09	250 [77]	I17	I16	R/W
7484	BASIC_HEAT_SET3 (see table pag. 40) ($^{\circ}\text{C}$ [$^{\circ}\text{F}$]) (Note1)	I10	200 [68]	I15	I14	R/W
7485	BASIC_COOL_SET3 (see table pag. 40) ($^{\circ}\text{C}$ [$^{\circ}\text{F}$]) (Note1)	I11	250 [77]	I17	I16	R/W
7486	BASIC_HEAT_SET4 (see table pag. 40) ($^{\circ}\text{C}$ [$^{\circ}\text{F}$]) (Note1)	I12	200 [68]	I15	I14	R/W
7487	BASIC_COOL_SET4 (see table pag. 40) ($^{\circ}\text{C}$ [$^{\circ}\text{F}$]) (Note1)	I13	250 [77]	I17	I16	R/W
7488	DEV_SET_UPWARD_HEAT (see table pag. 40) ($^{\circ}\text{C}$ [$^{\circ}\text{F}$]) (Note1)	I14	400 [104]	I15	500 [122]	R/W
7489	DEV_SET_DOWNWARD_HEAT (see table pag. 40) ($^{\circ}\text{C}$ [$^{\circ}\text{F}$]) (Note1)	I15	60 [43]	60 [43]	I14	R/W
7490	DEV_SET_UPWARD_COOL (see table pag. 40) ($^{\circ}\text{C}$ [$^{\circ}\text{F}$]) (Note1)	I16	400 [104]	I17	500 [122]	R/W
7491	DEV_SET_DOWNWARD_COOL (see table pag. 40) ($^{\circ}\text{C}$ [$^{\circ}\text{F}$]) (Note1)	I17	6.0 [43]	6.0 [43]	I16	R/W
7492	PROP_BAND_REG_HEAT (see table pag. 40) ($\Delta^{\circ}\text{C}$ [$\Delta^{\circ}\text{F}$]) (Note1)	I18	20 [36]	10 [18]	200 [360]	R/W
7493	INTEGRAL_TIME_REG_HEAT (see table pag. 40)	I19	0	0	999	R/W
7494	DERIVATIVE_TIME_REG_HEAT (see table pag. 40)	I20	0	0	999	R/W
7495	PROP_BAND_REG_COOL (see table pag. 40) ($\Delta^{\circ}\text{C}$ [$\Delta^{\circ}\text{F}$]) (Note1)	I21	20 [36]	10 [18]	200 [360]	R/W
7496	INTEGRAL_TIME_REG_COOL (see table pag. 40)	I22	0	0	999	R/W
7497	DERIVATIVE_TIME_REG_COOL (see table pag. 40)	I23	0	0	999	R/W
7498	DO_HYST1 (see table pag. 40) ($\Delta^{\circ}\text{C}$ [$\Delta^{\circ}\text{F}$]) (Note1)	I24	10 [18]	2 [4]	20 [36]	R/W
7499	DO_HYST2 (see table pag. 40) ($\Delta^{\circ}\text{C}$ [$\Delta^{\circ}\text{F}$]) (Note1)	I25	10 [18]	2 [4]	20 [36]	R/W
7500	DO_HYST3 (see table pag. 40) ($\Delta^{\circ}\text{C}$ [$\Delta^{\circ}\text{F}$]) (Note1)	I26	10 [18]	2 [4]	20 [36]	R/W
7501	DO_HYST4 (see table pag. 40) ($\Delta^{\circ}\text{C}$ [$\Delta^{\circ}\text{F}$]) (Note1)	I27	10 [18]	2 [4]	20 [36]	R/W
7502	DIFF_ACTUATOR1_FAN1 (see table pag. 40) ($\Delta^{\circ}\text{C}$ [$\Delta^{\circ}\text{F}$]) (Note1)	I28	10 [18]	0 [0]	30 [54]	R/W
7503	DIFF_ACTUATOR2_FAN2 (see table pag. 40) ($\Delta^{\circ}\text{C}$ [$\Delta^{\circ}\text{F}$]) (Note1)	I29	10 [18]	0 [0]	30 [54]	R/W
7504	ECO_SET_ADJUST (see table pag. 40) ($\Delta^{\circ}\text{C}$ [$\Delta^{\circ}\text{F}$]) (Note1)	I30	30 [5]	10 [2]	60 [11]	R/W
7505	HOL_SET_ADJUST (see table pag. 40) ($\Delta^{\circ}\text{C}$ [$\Delta^{\circ}\text{F}$]) (Note1)	I31	50 [9]	10 [2]	100 [18]	R/W
7506	AUTHORIZE_LIM_SUPPLY_LOW (see table pag. 40) 0=Not enabled 1=Enabled	I32	0	0	1	R/W
7507	SET_LIM_LOW (see table pag. 40) ($^{\circ}\text{C}$ [$^{\circ}\text{F}$]) (Note1)	I33	100 [50]	60 [43]	I35	R/W
7508	AUTHORIZE_LIM_SUPPLY_HIGH (see table pag. 40) 0=Not enabled 1=Enabled	I34	0	0	1	R/W

Registers	Description		Default	Min	Max.	R/W
7509	SET_LIM_HIGH (see table pag. 40) (°C [°F]) ^(Note1)	I35	300 [86]	I33	500 [122]	R/W
7510	PROP_BAND_LIM (see table pag. 40) (Δ°C [Δ°F]) ^(Note1)	I36	20 [36]	10 [18]	200 [360]	R/W
7511	AUTHORIZE_FLOOR_CTRL_ZONE_1 (see table pag. 40) 0=Floor temperature not controlled 1=Limit control with room sensor control 2=Limit control, room sensor control excluded	I37	0	0	2	R/W
7512	AUTHORIZE_FLOOR_CTRL_ZONE_2 (see table pag. 40) 0=Floor temperature not controlled 1=Limit control with room sensor control 2=Limit control, room sensor control excluded	I38	0	0	2	R/W
7513	AUTHORIZE_FLOOR_CTRL_ZONE_3 (see table pag. 40) 0=Floor temperature not controlled 1=Limit control with room sensor control 2=Limit control, room sensor control excluded	I39	0	0	2	R/W
7514	AUTHORIZE_FLOOR_CTRL_ZONE_4 (see table pag. 40) 0=Floor temperature not controlled 1=Limit control with room sensor control 2=Limit control, room sensor control excluded	I40	0	0	2	R/W
7515	SET_MIN_FLOOR_HEAT (°C [°F]) ^(Note1)	I41	150 [59]	15 [59]	350 [95]	R/W
7516	SET_MAX_FLOOR_HEAT (°C [°F]) ^(Note1)	I42	320 [90]	15 [59]	350 [95]	R/W
7517	HYST_FLOOR (see table pag. 40) (Δ°C [Δ°F]) ^(Note1)	I43	5 [9]	2 [4]	20 [36]	R/W
7518	AUTHORIZE_DEW_POINT_CTRL (see table pag. 40) 0=Not enabled 1=Dew point controller activation with humidity sensor in the appliance for zone 1 2=Dew point controller activation with humidity sensor in the appliance for zone 2 3=Dew point controller activation with humidity sensor in the appliance for zone 3 4=Dew point controller activation with humidity sensor in the appliance for zone 4 5=Dew point controller activation with humidity sensor in the appliance for the MASTER or SLAVE_Y controller 6=Dew point controller activation with remote humidity sensor in the appliance for zone 1 7=Dew point controller activation with remote humidity sensor in the appliance for zone 2 8=Dew point controller activation with remote humidity sensor in the appliance for zone 3 9=Dew point controller activation with remote humidity sensor in the appliance for zone 4 10=Dew point controller activation with remote humidity sensor in the appliance for the MASTER or SLAVE_Y controller	I44	0	0	10	R/W
7519	OFFSET_DEW_POINT_CTRL (see table pag. 40) (Δ°C [Δ°F]) ^(Note1)	I45	20 [36]	-100 [-180]	100 [180]	R/W
7520	STATE_LOC_PUMP_IN_ALARM (see table pag. 40) 0=Circulator and valve switched off in case of condensation or dew point alarm 1=Circulator and valve switch on in case of condensation or dew point alarm	I46	1	0	1	R/W
7521	TEMP_EXT_MIN_HEAT (see table pag. 40) (°C [°F]) ^(Note1)	I47	-100 [140]	-100 [140]	I48	R/W
7522	TEMP_EXT_MAX_HEAT (see table pag. 40) (°C [°F]) ^(Note1)	I48	200 [68]	I47	500 [122]	R/W
7523	SET_TEXT_MIN_HEAT (see table pag. 40) (°C [°F]) ^(Note1)	I49	350 [95]	50 [41]	800 [176]	R/W
7524	SET_TEXT_MAX_HEAT (see table pag. 40) (°C [°F]) ^(Note1)	I50	280 [82]	50 [41]	800 [176]	R/W
7525	TEMP_EXT_MIN_COOL (see table pag. 40) (°C [°F]) ^(Note1)	I51	240 [75]	-100 [140]	I52	R/W
7526	TEMP_EXT_MAX_COOL (see table pag. 40) (°C [°F]) ^(Note1)	I52	350 [95]	I51	500 [122]	R/W
7527	SET_TEXT_MIN_COOL (see table pag. 40) (°C [°F]) ^(Note1)	I53	200 [68]	50 [41]	800 [176]	R/W
7528	SET_TEXT_MAX_COOL (see table pag. 40) (°C [°F]) ^(Note1)	I54	160 [61]	50 [41]	800 [176]	R/W
7529	AUTHORIZE_DEHUMIDIFICATION (see table pag. 40) 0=Not enabled 1=Enabled with internal humidity sensor 2=Enabled with remote humidity sensor 3=Enabled with internal humidity sensor only in summer operation 4=Enabled with remote humidity sensor only in summer operation	I55	0	0	4	R/W
7530	SETPOINT_DEHUMIDIFICATION (see table pag. 40)	I56	500	0	1000	R/W
7531	PROP_BAND_DEHUMIDIFICATION (see table pag. 40)	I57	50	10	1000	R/W
7532	HYST_FAN_1 (see table pag. 40) (Δ°C [Δ°F]) ^(Note1)	I58	10 [18]	2 [4]	50 [90]	R/W
7533	HYST_FAN_2 (see table pag. 40) (Δ°C [Δ°F]) ^(Note1)	I59	10 [18]	2 [4]	50 [90]	R/W
7534	DIFF_S1_S2 (see table pag. 40)	I60	2 [4]	2 [4]	50 [90]	R/W
7535	DIFF_S2_S3 (see table pag. 40)	I61	2 [4]	2 [4]	50 [90]	R/W

Registers	Description		Default	Min	Max.	R/W
7536	MIN_VOLT_SUPPLY_FAN (see table pag. 40) ^(Note2)	I62	0	0	I63	R/W
7537	MAX_VOLT_SUPPLY_FAN (see table pag. 40) ^(Note2)	I63	100	I62	100	R/W
7538	SPEED_1_MODULATING (see table pag. 40)	I64	10	0	I65	R/W
7539	SPEED_2_MODULATING (see table pag. 40)	I65	65	I64	I66	R/W
7540	SPEED_3_MODULATING (see table pag. 40)	I66	100	I65	100	R/W
7541	FAN_START_BOOSTER (see table pag. 40) 0=Fan starts at set speed 1=Fan starts at maximum speed for 1 s and then goes to set speed	I67	1	0	1	R/W
7542	AIR_DESTRAT_ACTIVATE (see table pag. 40) 0=OFF 1=ON 2=ON in heating only 3=ON in cooling only	I68	1	0	3	R/W
7543	TIME_DELAY_ON_DESTRAT (see table pag. 40)	I69	1	1	5	R/W
7544	TIME_DELAY_OFF_DESTRAT (see table pag. 40)	I70	10	1	60	R/W
7545	MAX_HOUR_FAN_RUN (see table pag. 40)	I71	2000	0	9990	R/W
7546	VISU_TYPE_FIST_DISP (see table pag. 40) 0=Internal sensor temperature 1=Temperature of external sensor AI1 2=Temperature of external sensor AI2 3=Temperature of external sensor AI3 4=Zone 1 control temperature (paragraph 13 on page 51) 5=Actuator 2 zone control temperature (par. 13 on page 51) 6=Actuator 3 zone control temperature (par. 13 on page 51) 7=Actuator 4 zone control temperature (par. 13 on page 51) 8=Control temperature for all zones, alternately 9=Internal humidity reading (for FH-xxxSH1 models only) 10=thermal actuator 1 operating setpoint (paragraph 15 on page 53) 11=operating setpoint thermal actuator 2 (paragraph 15 on page 53) 12=operating setpoint thermal actuator 3 (paragraph 15 on page 53) 13=operating setpoint thermal actuator 4 (paragraph 15 on page 53) 14=Control setpoint for all zones, alternately 15=Dew point 16=MASTER controller flow temperature 17=Value of 0..10 V output AO1 (V) 18=Value of 0..10 V output AO2 (V) 19=Value of 0..10 V output AO3 (V)	I72	0	0	19	R/W
7547	VISU_TYPE_SECOND_DISP (see table pag. 40) 0=Internal sensor temperature 1=Temperature of external sensor AI1 2=Temperature of external sensor AI2 3=Temperature of external sensor AI3 4=Zone 1 control temperature (paragraph 13 on page 51) 5=Actuator 2 zone control temperature (par. 13 on page 51) 6=Actuator 3 zone control temperature (par. 13 on page 51) 7=Actuator 4 zone control temperature (par. 13 on page 51) 8=Control temperature for all zones, alternately 9=Internal humidity reading (for FH-xxxSH1 models only) 10=thermal actuator 1 operating setpoint (paragraph 15 on page 53) 11=operating setpoint thermal actuator 2 (paragraph 15 on page 53) 12=operating setpoint thermal actuator 3 (paragraph 15 on page 53) 13=operating setpoint thermal actuator 4 (paragraph 15 on page 53) 14=Control setpoint for all zones, alternately 15=Dew point 16=MASTER controller flow temperature 17=Value of 0..10 V output AO1 (V) 18=Value of 0..10 V output AO2 (V) 19=Value of 0..10 V output AO3 (V) 20=Current hours:minutes 21=Total hours of fan 1 operation 22=Total hours of fan 1 operation 23=Value of input AI3 configured as 0...10 V input 24=display B off	I73	19	0	24	R/W
7548	FUNCTION_RIGHT_KEY (see table pag. 40) 0=Local season changeover if a season changeover contact is not used. 1=Timer extension zone 1 2=Timer extension zone 2 3=Timer extension zone 3 4=Timer extension zone 4 5=Operating mode (normal, using the time slots or "non-occupied holiday")	I74	1	0	5	R/W

Registers	Description		Default	Min	Max.	R/W
7549	UNIT_C_F (see table pag. 40) ^(Note1) 0=°C 1=°F	I75	0	0	1	R/W
7550	DAYLIGHT_SAVING_TIME (see table pag. 40) 0=No automatic update of summertime changeover 1=Automatic summertime changeover in Europe 2=Automatic summertime changeover in the USA	I76	1	0	2	R/W
7551	TIME_TIMER_PROLUNG (see table pag. 40)	I77	60	1	480	R/W
7552	TIME_BAND_FUNCTION (see table pag. 40) 0=Time slots for normal/economy operation 1=Time slots for switching on/off the appliance	I78	0	0	1	R/W
7553	MODBUS_BAUD (see table pag. 40)	I79	4	1	5	R/W
7554	MODBUS_PARITY (see table pag. 40)	I80	2	0	2	R/W
7555	MODBUS_ADDRESS (see table pag. 40)	I81	1	1	247	R/W
7556	CANCEL_HOURS_FAN_RUN (see table pag. 40)	I82	0	0	1	R/W
7557	COMFORT_FUNCTION (see table pag. 40) 0=Current setpoint, modifiable via quick access 1=Setpoint offset, modified via quick access See paragraph " <i>Setpoint and setpoint offset configuration</i> " page 21 for further information	I83	0	0	1	R/W
7558	OFFSET_RANGE ($\Delta^{\circ}\text{C}$ [$\Delta^{\circ}\text{F}$]) ^(Note1)	I84	30 [5]	0[0]	100 [18]	R/W
7559	MAX_SLAVE_NUMBER (see table pag. 40)	I85	31	1	31	R/W
7560	RANGE_MIN_VOLT_INPUT (see table pag. 40) ^(Note4)	I86	0	-50	I87	R/W
7561	RANGE_MAX_VOLT_INPUT (see table pag. 40) ^(Note4)	I87	100	I85	9999	R/W
7562	UNIT_VOLT_INPUT (see table pag. 40) 0=ppm 1=%r.h. 2=No unit	I88	1	0	2	R/W
7563	COR_AI3_VOLT_INPUT (see table pag. 40) ^(Note5)	I89	0	-980	980	R/W
7564	TRASM_ON_OFF_SOURCE_FROM_MASTER (see table pag. 40)	I90	7	0	7	R/W
7565	AUTHORIZE_ACTUATOR_1 (see table pag. 40) 0=Actuator disabled 1=Actuator enabled only during summer season 2=Actuator enabled only during winter season 3=Actuator enabled in all seasons	I91	3	0	3	R/W
7566	AUTHORIZE_ACTUATOR_2 (see table pag. 40) 0=Actuator disabled 1=Actuator enabled only during the summer season 2=Actuator enabled only during winter season 3=Actuator enabled in all seasons	I92	3	0	3	R/W
7567	AUTHORIZE_ACTUATOR_3 (see table pag. 40) 0=Actuator disabled 1=Actuator enabled only during the summer season 2=Actuator enabled only during winter season 3=Actuator enabled in all seasons	I93	3	0	3	R/W
7568	AUTHORIZE_ACTUATOR_4 (see table pag. 40) 0=Actuator disabled 1=Actuator enabled only during the summer season 2=Actuator enabled only during winter season 3=Actuator enabled in all seasons	I94	3	0	3	R/W
7569	DELAY_LIM_ALARM (see table pag. 40)	I95	5	0	60	R/W
7570	DELAY_CONDENSATION_RISK (see table pag. 40)	I96	30	0	240	R/W
7571	OFFSET_SETPOINT ($\Delta^{\circ}\text{C}$ [$\Delta^{\circ}\text{F}$]) ^(Note1)		0 [0]	-I84	I84	R/W
7572	MODE_FASCE Operating mode with I78=0: 0=Operation without time slots 1=Operation using the time slots 2=Economy/holiday mode operation		0	0	2	R/W
	Operating mode with I78=1: 0=Normal operation with base setpoints 2=Economy/holiday mode operation		0	0	2	R/W
7573	MANUAL_OCCUPANCY_ZONE_1 0=Timer extension off 1=Timer extension on 2=zone 1 off		0	0	2	R/W

Registers	Description	Default	Min	Max.	R/W
7574	MANUAL_OCCUPANCY_ZONE_2 0=Timer extension off 1=Timer extension on 2=zone 2 off	0	0	2	R/W
7575	MANUAL_OCCUPANCY_ZONE_3 0=Timer extension off 1=Timer extension on 2=zone 3 off	0	0	2	R/W
7576	MANUAL_OCCUPANCY_ZONE_4 0=Timer extension off 1=Timer extension on 2=zone 4 off	0	0	2	R/W
7577	STA_MANUAL 0=Winter 1=Summer	0	0	1	R/W
7578	FAN_SPEED_MODE 0=Manual speed 1 1=Manual speed 2 2=Manual speed 3 3=Automatic speed	0	0	3	R/W
7579	ON_OFF_VIA_MODBUS 0=OFF, 1=ON	1	0	1	R/W
7580	YEAR_SET → year to be set	2012	2012	2100	R/W
7581	MONTH_SET → month to be set	1	1	12	R/W
7582	DAY_SET → day to be set	1	1	31	R/W
7583	HOUR_SET → time to be set (hour)	0	0	23	R/W
7584	MIN_SET → time to be set (min)	0	0	59	R/W
7585	ABI_CLOCK_SET_FROM_MODBUS → to update the clock via Modbus, set the year, month, day, hour, minutes in order with registries 7580 to 7584. Then set the variable ABI_CLOCK_SET_FROM_MODBUS to 1. The settings are automatically loaded to the target appliance and the variable ABI_CLOCK_SET_FROM_MODBUS is automatically reset to 0.	0	0	1	R/W
7586	RESET_PARAM_TO_DEFAULT → set parameter to 1 to reload the default settings. Once this has been completed, the parameter automatically resets to 0	0	0	1	R/W
7587	LOCK_KEYBOARD 0=Keypad unlocked 1=Keypad locked	0	0	1	R/W
from 7588 to 7596	Reserved registers (DEBUG)				R/W
7597	Higher software version (factory setting)	-	-	-	R
7598	Lower software version (factory setting)	-	-	-	R
7599	Software revision number (factory setting)	-	-	-	R
7600	DEHUM_VALVE_SELECT (only for configurations 12 and 13) 0=Dehumidifier used 1=ON/OFF valve used to supply fan-coil	0	0	1	R/W
7601	ABIL_FAN 0=Fan disabled 1=Fan enabled only during the summer season 2=Fan enabled only during winter season 3=Fan enabled in all seasons	3	0	3	R/W

TO OBTAIN THE REAL ADDRESS, SUBTRACT NUMBER 1 FROM THE REGISTER NUMBER

Example: the address of the SUN_Z1_HOUR_ON register is: 7000 - 1 = 6999.

Note 1: Set all temperature parameters using the same unit, as defined by the parameter UNIT_C_F.

The values of variables BASIC_HEAT_SETx, BASIC_COOL_SETx, DEV_SET_UPWARD_HEAT, DEV_SET_DOWNWARD_HEAT, DEV_SET_UPWARD_COOL, DEV_SET_DOWNWARD_COOL, ECO_SET_ADJUST, HOL_SET_ADJUST, SEL_LIM_LOW, SET_LIM_HIGH, SET_MIN_FLOOR_HEAT, SET_MAX_FLOOR_HEAT, TEMP_EXT_MIN_HEAT, TEMP_EXT_MAX_HEAT, SET_EXT_MIN_HEAT, SET_EXT_MAX_HEAT, TEMP_EXT_MIN_COOL, TEMP_EXT_MAX_COOL, SET_EXT_MIN_COOL, SET_EXT_MAX_COOL, OFFSET_RANGE, OFFSET_SETPOINT can be set in °C if multiple of 5. The SETPOINT_DEHUMIDIFICATION variable cannot be set in %rH if multiple of 5.

The variable values COR_INT_TEMP, COR_REM_AI1, COR_REM_AI2, COR_REM_AI3, PROP_BAND_REG_HEAT, PROP_BAND_REG_COOL, DO_HYST1, DO_HYST2, DO_HYST3, DO_HYST4, DIFF_ACTUATOR1_FAN1, DIFF_ACTUATOR2_FAN2, PROP_BAND_LIM, HYST_FLOOR, OFFSET_DEW_POINT_CTRL, HYST_FAN_1, HYST_FAN_2, DIFF_S1_S2, DIFF_S2_S3 in °F can be changed if the value to be set is multiple of 2.

The values are displayed, multiplied by 10, except for the setpoint in °F, parameters 133, 135, 147, 148, 151, 152, 184 in °F, OFFSET SETPOINT in °F.

Note 2: The value displayed corresponds with the value in Volts, multiplied by 10 (for example: value of 80 = 8.0 V).

Note 3: Parameters M15 to M19 are automatically saved, based on the selected configuration and cannot be modified except for the ones indicated in paragraph "Configurable digital output set up" page 17.

Note 4: If variables RANGE_MAX_VOLT_INPUT and/or RANGE_MIN_VOLT_INPUT are modified, the COR_AI3_VOLT_INPUT parameter value is reset to zero.

Note 5: the correction value COR_AI3_VOLT_INPUT set via Modbus is rounded with step 10, if the difference between RANGE_MAX_VOLT_INPUT - RANGE_MIN_VOLT_INPUT is higher or equal to 800.

• Restoration of default parameters via MODBUS

It is possible to reload the initial configuration of the default parameters by carrying out the following procedure:

Set the REST_PARAM_TO_DEFAULT (register 7586) to 1.

The default parameter loading procedure begins. The display shows the following messages:



Loading of default parameters



Default parameters loaded

When the default parameters are loaded, the controller returns to control mode and the register RESET_PARAM_TO_DEFAULT (register 7586) resets to 0.


• Clock setting from MODBUS

To set the clock via the Modbus, carry out the following procedure:

set the variables of registries 7580 to 7584 (“YEAR_SET” to “MIN_SET”). Then set the variable of register 7585 (enable clock update) to 1.

Once the clock has been updated, the variable resets to 0 automatically.

• MODBUS communications alarm

If there are frequent parity or checksum errors relating to exchanged messages, the alarm is signalled on the display and the  icon flashes. Contact technical support.

• MODBUS connection diagram

These diagrams refer to the **FH-xMxSH1** models.

The RS485-MODBUS line has a long main bus to which the appliances are connected directly (max 31 SLAVE appliances with 1 MASTER appliance).

Use cables with a braided pair + 1 ground wire + shield.

Use the braided pair to connect **A+** and **B-** and the single wire for **GND** which must be connected to each device. Connect the shield to ground at a single point on the cable, preferably close to the MASTER.

The cable must comply with the properties specified for data transmission on the MODBUS RS485 protocol.

The two ends of the cable must be connected with a 120 ohm termination resistor.

To fit the 120 ohm to the regulator, see *"39. Jumper configuration" page 102*.

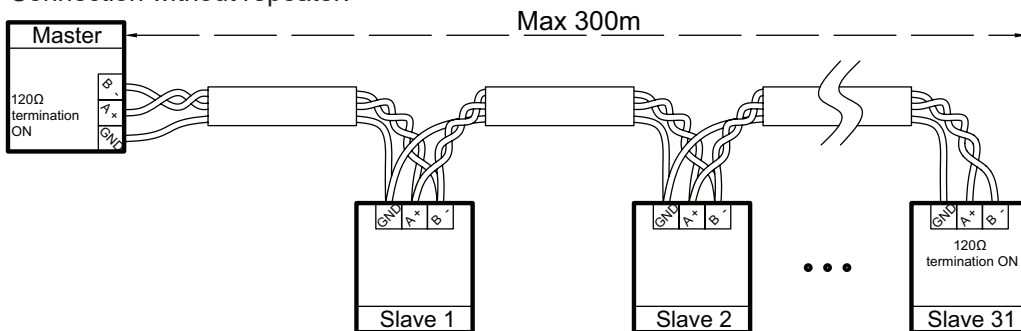
The maximum length of the bus depends on the baud rate and the cable itself.

For a baud rate of 9600, the maximum length of the cable can be up to 1000 m using an AVG26 cable.

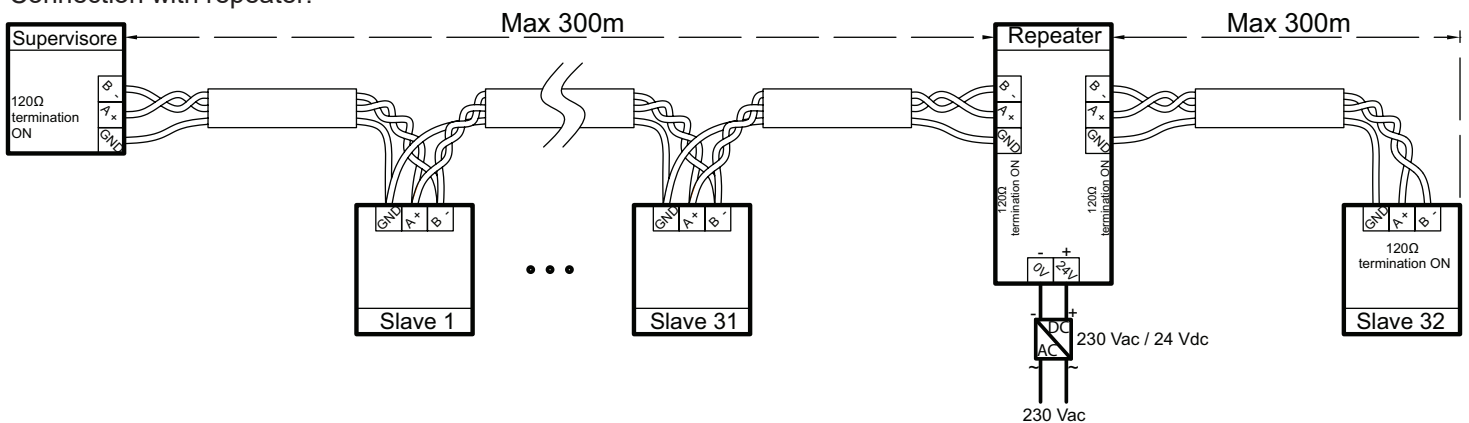
Any branch lines to be used must be short, at most 20 m long. If you use a multi-port tap for n branches, each branch can be up to 40 m divided by n.

To increase the number of appliances connected to the line if a monitoring system is used or to increase the length of the cables, you must install a signal repeater.


Connection without repeater:



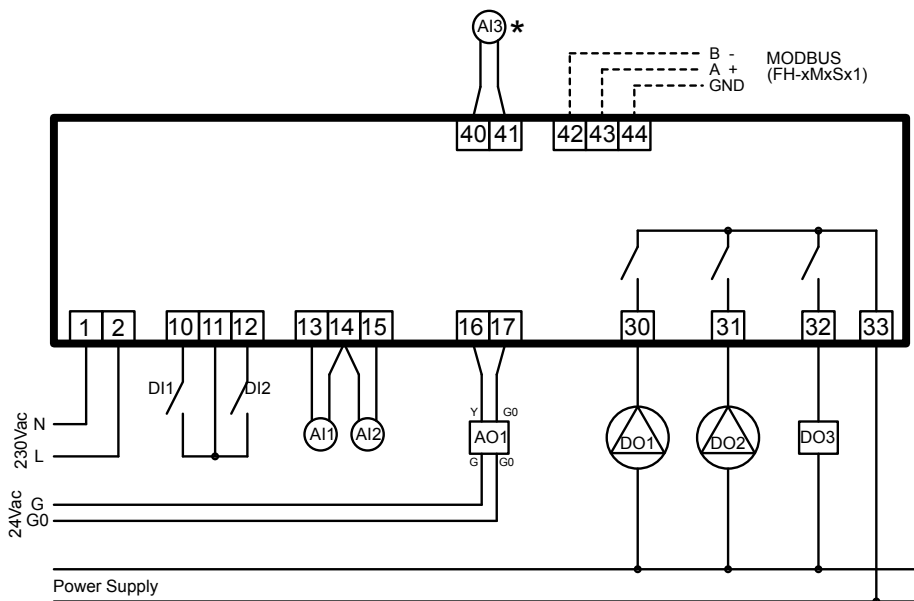
Connection with repeater:



41. Electrical connections

 The installation and maintenance operations must be carried out by skilled personnel, with the appliance disconnected from the power supply and from external loads. Industrietechnik shall not be responsible for any damage caused by inadequate installation and/or from the unauthorised opening or removal of safety devices.

• Configuration -1 or 1 - (model FH-2xxSH1)



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph [“42. Terminal blocks connection” page 138](#)

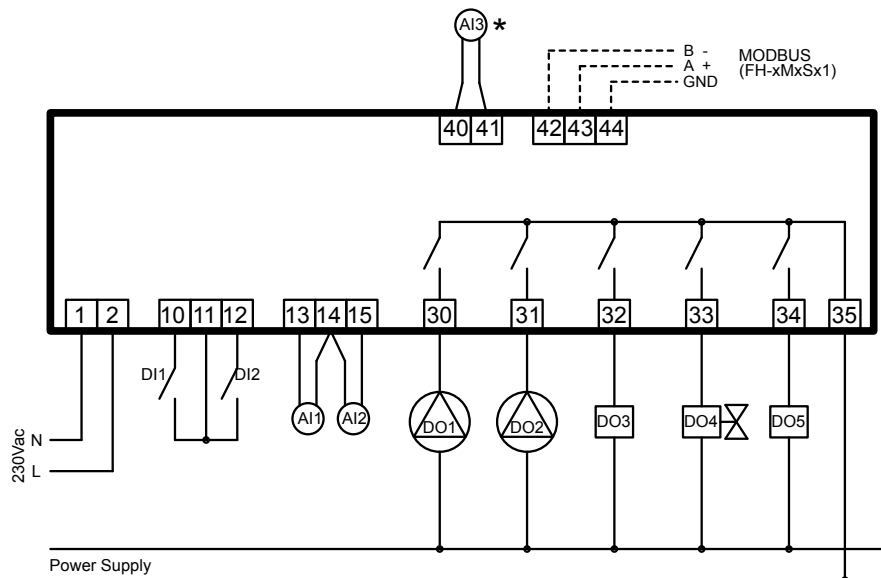
AO1=Valve 0..10 V

DO1=Column pump

DO2=Thermal actuator (configuration -1), circulator (configuration 1)

DO3=Dehumidifier

• Configuration -2 or 2 - (model FH-4xxSH1)



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph [“42. Terminal blocks connection” page 138](#)

DO1=Column pump

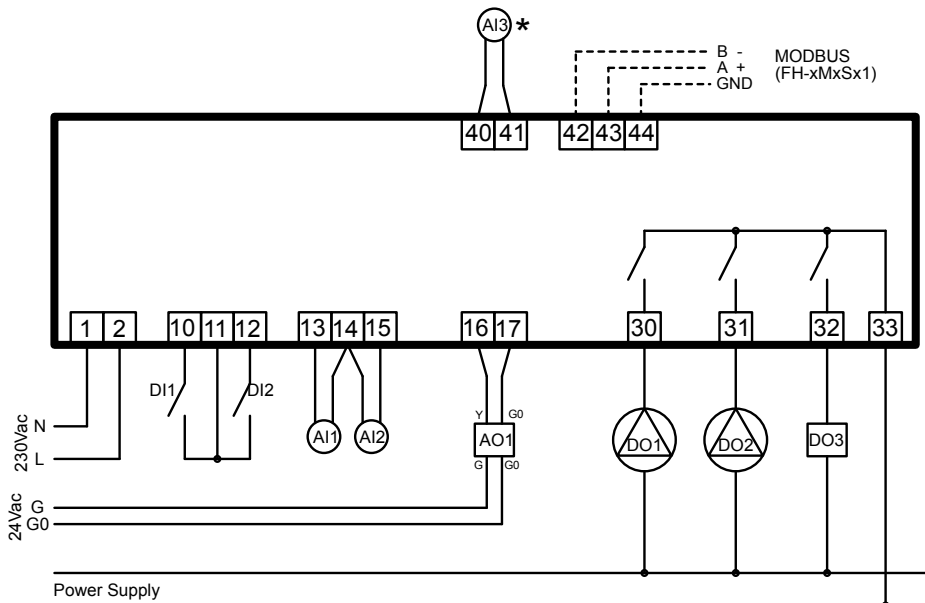
DO2=Thermal actuator (configuration -1), circulator (configuration 1)

DO3=Dehumidifier

DO4=On/off valve

DO5=Configurable output

• **Configuration -3 and 3 - (model FH-2xxSH1)**



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph "42. Terminal blocks connection" page 138

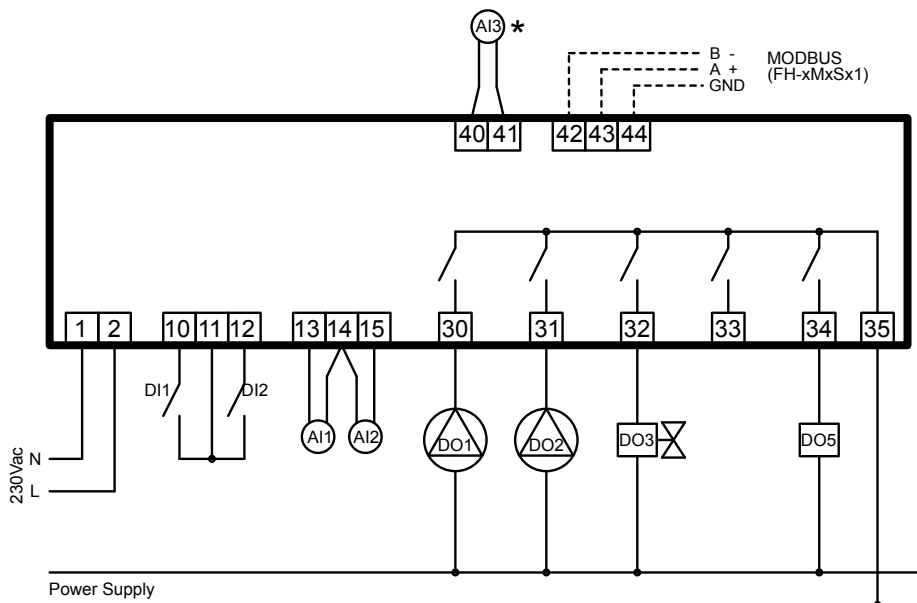
AO1=Valve 0..10 V

DO1=Column pump

DO2=Thermal actuator (configuration -1), circulator (configuration 1)

DO3=Configurable output

• **Configuration -4 and 4 - (model FH-4xxSH1)**



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph "42. Terminal blocks connection" page 138

AO1=On/off valve

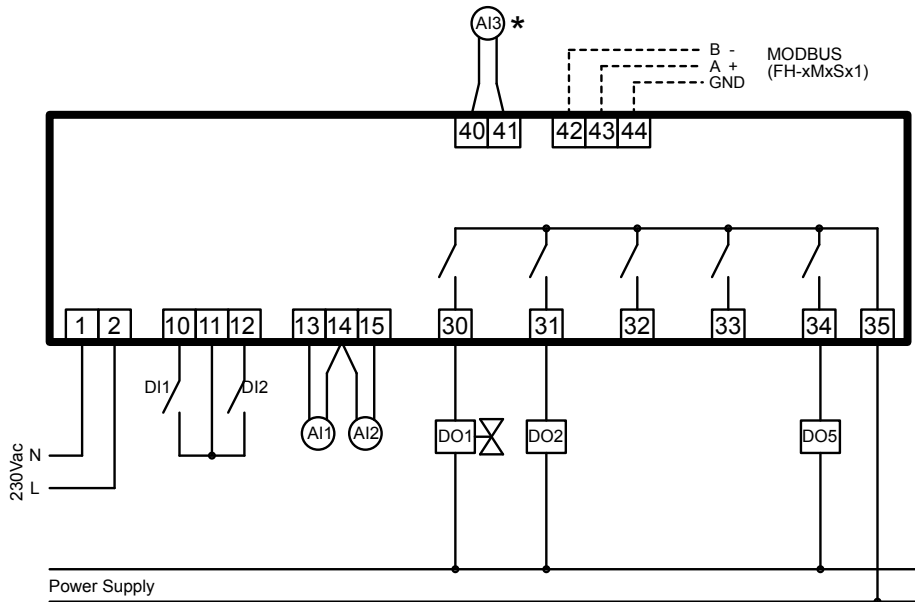
DO1=Column pump

DO2=Thermal actuator (configuration -1), circulator (configuration 1)

DO3=On/off valve

DO5=Configurable output

• **Configuration 5 - (model FH-4xxSH1)**



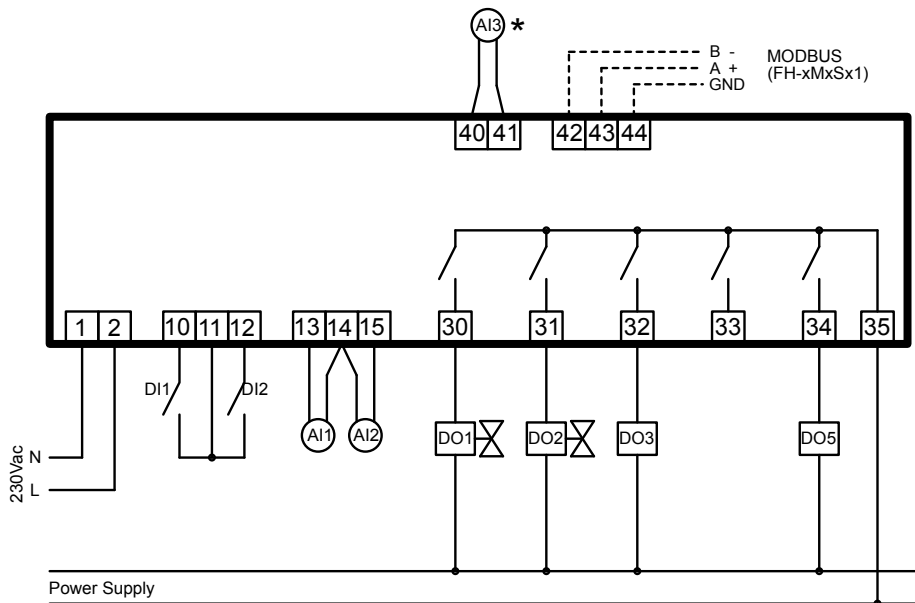
AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph "42. Terminal blocks connection" page 138

DO1=Thermal actuator 1

DO2=Dehumidifier

DO5=Configurable output

• **Configuration 6 - (model FH-4xxSH1)**



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph "42. Terminal blocks connection" page 138

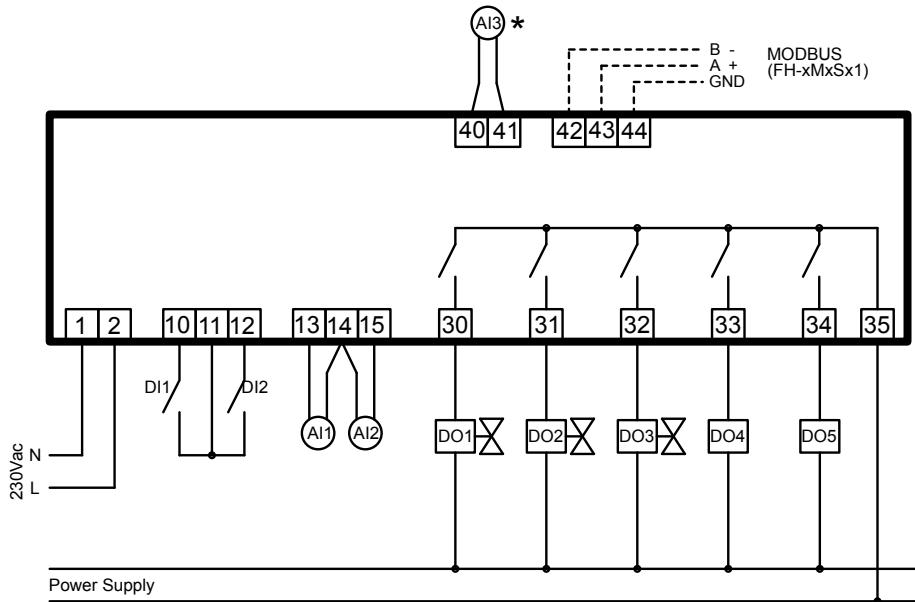
DO1=Thermal actuator 1

DO2=Thermal actuator 2

DO3=Dehumidifier

DO5=Configurable output

• **Configuration 7 - (model FH-4xxSH1)**



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph *"42. Terminal blocks connection"* page 138

DO1=Thermal actuator 1

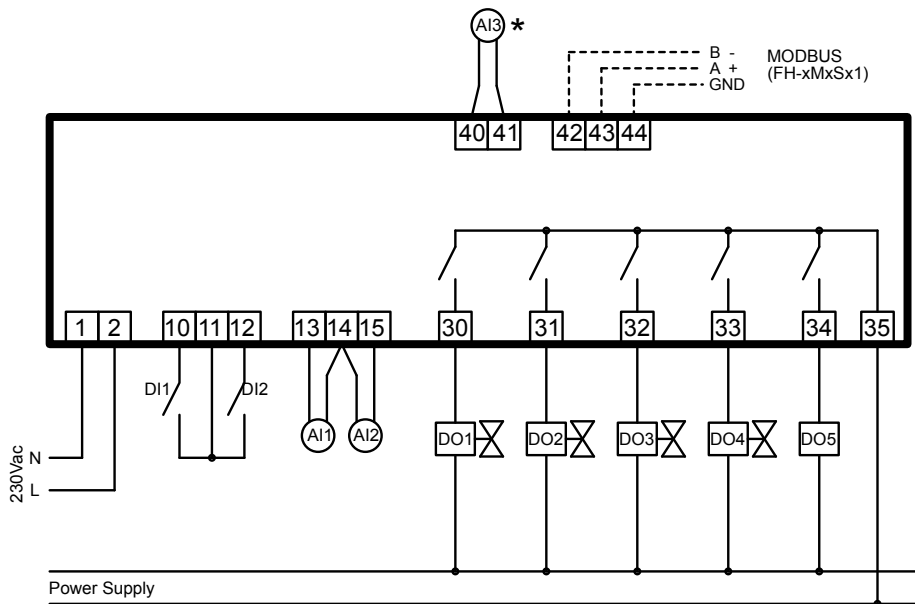
DO2=Thermal actuator 2

DO3=Thermal actuator 3

DO4=Dehumidifier

DO5=Configurable output

• **Configuration 8 - (model FH-4xxSH1)**



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph *"42. Terminal blocks connection"* page 138

DO1=Thermal actuator 1

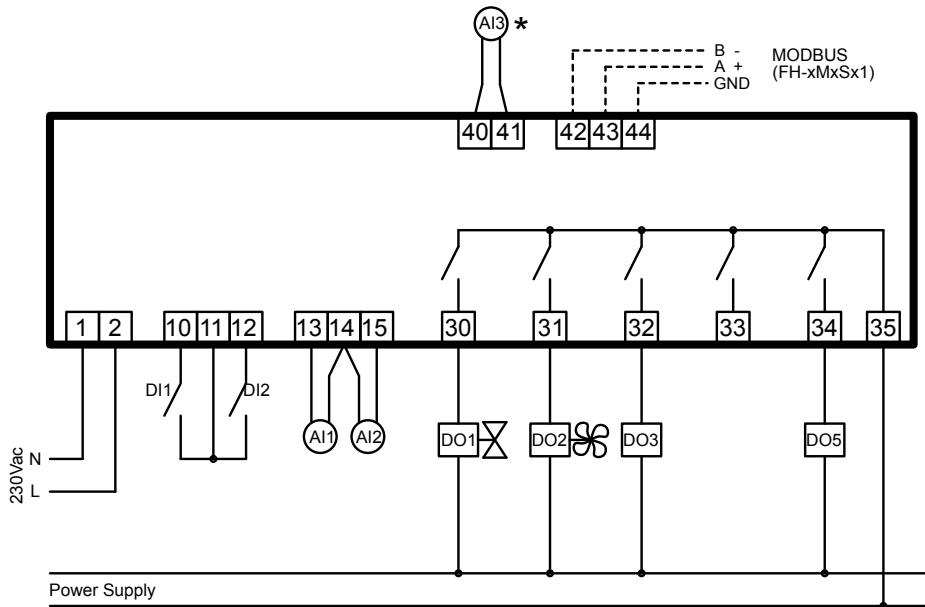
DO2=Thermal actuator 2

DO3=Thermal actuator 3

DO4=Thermal actuator 4

DO5=Dehumidifier

• **Configuration 9 - (model FH-4xxSH1)**



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph "42. Terminal blocks connection" page 138

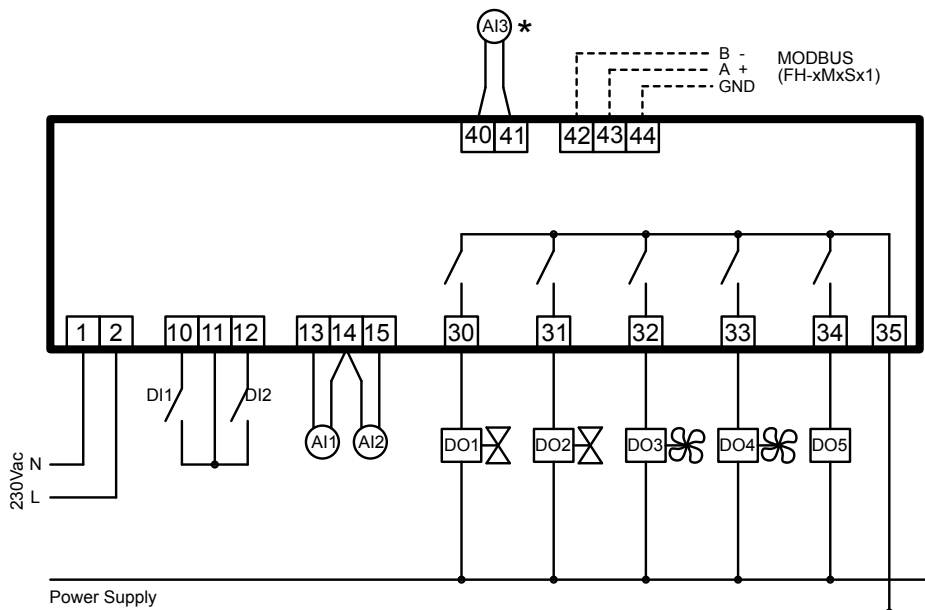
DO1=Thermal actuator 1

DO2=Fancoil 1

DO3=Dehumidifier

DO5=Configurable output

• **Configuration 10 - (model FH-4xxSH1)**



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph "42. Terminal blocks connection" page 138

DO1=Thermal actuator 1

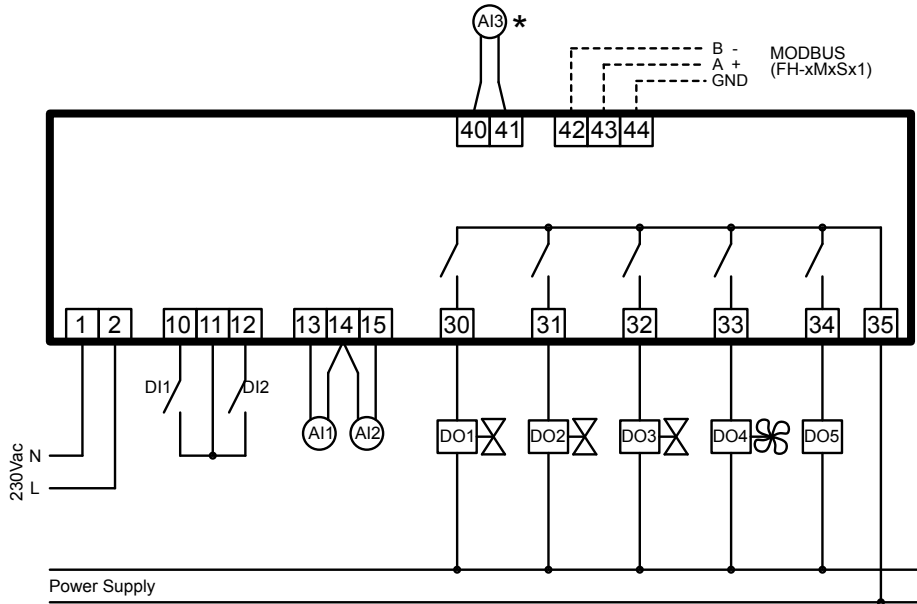
DO2=Thermal actuator 2

DO3=Fancoil 1

DO4=Fancoil 2

DO5=Dehumidifier

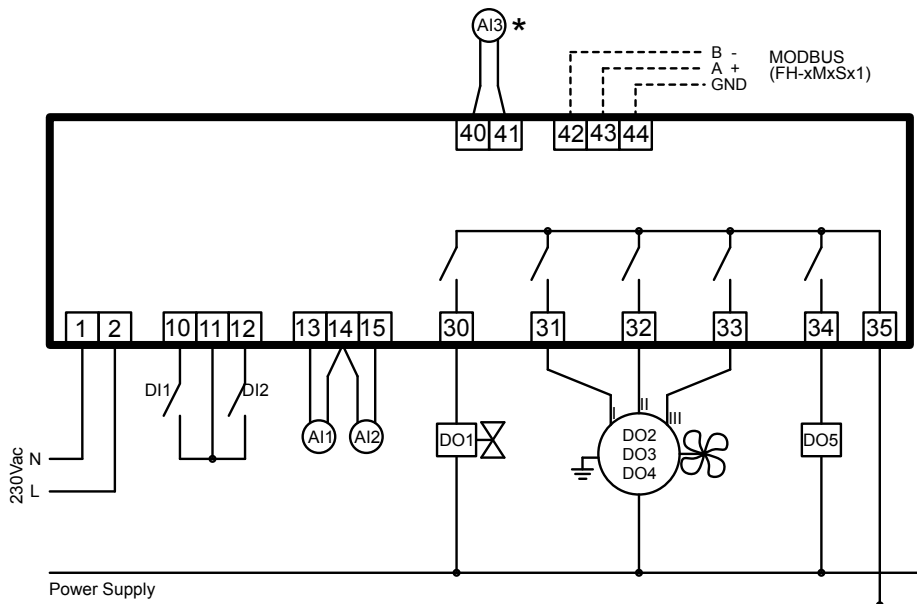
• **Configuration 11 - (model FH-4xxSH1)**



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph "42. Terminal blocks connection" page 138

- DO1=Thermal actuator 1
- DO2=Thermal actuator 2
- DO3=Thermal actuator 3
- DO4=Fancoil 1
- DO5=Configurable output

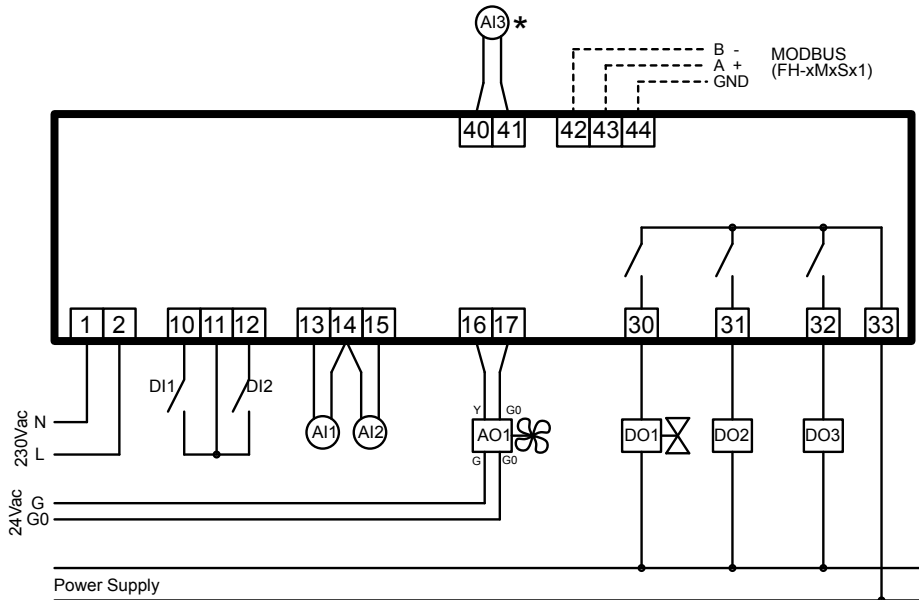
• **Configuration 12 - (model FH-4xxSH1)**



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph "42. Terminal blocks connection" page 138

- DO1=Thermal actuator 1
- DO2=Speed 1 of 3-speed on/off fancoil
- DO3=Speed 2 of 3-speed on/off fancoil
- DO4=Speed 3 of 3-speed on/off fancoil
- DO5=Dehumidifier

• **Configuration 13 - model (FH-2xxSH1)**



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph "42. Terminal blocks connection" page 138

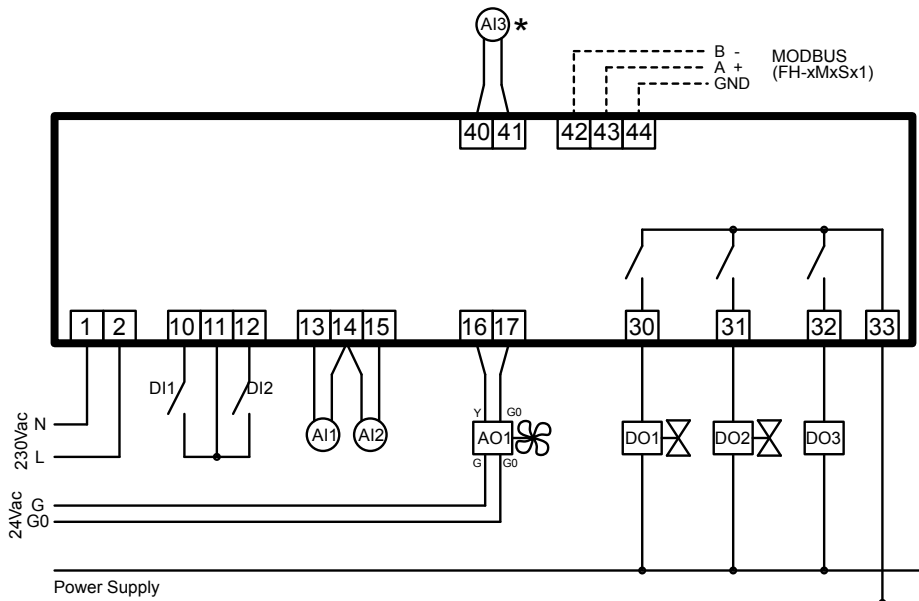
DO1=Thermal actuator 1

DO2=Dehumidifier

AO1=EC fancoil

DO3=Configurable output

• **Configuration 14 - (model FH-2xxSH1)**



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph "42. Terminal blocks connection" page 138

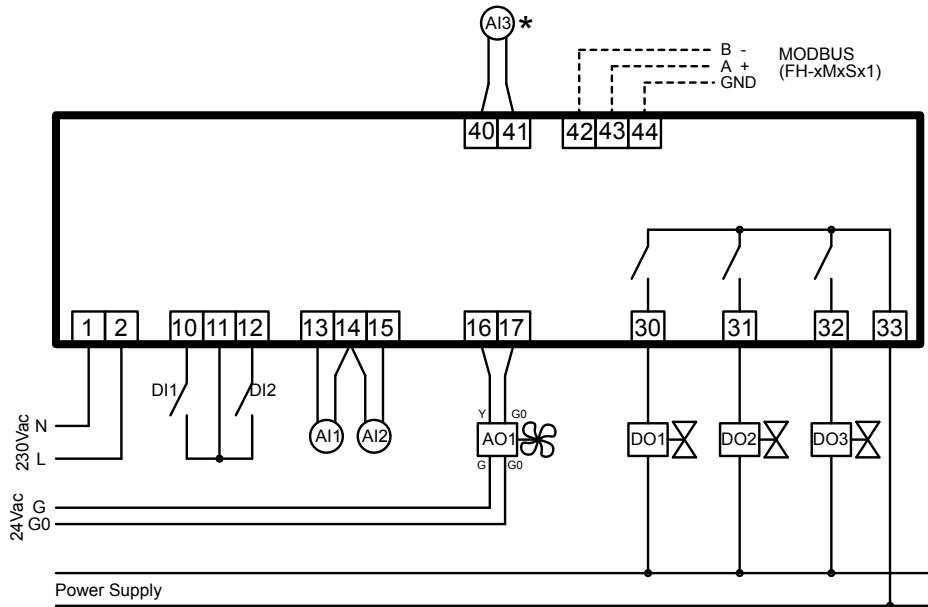
DO1=Thermal actuator 1

DO2=Thermal actuator 2

DO3=Dehumidifier

AO1=EC fancoil

Configuration 15 - (model FH-2xxSH1)



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph [“42. Terminal blocks connection” page 138](#)

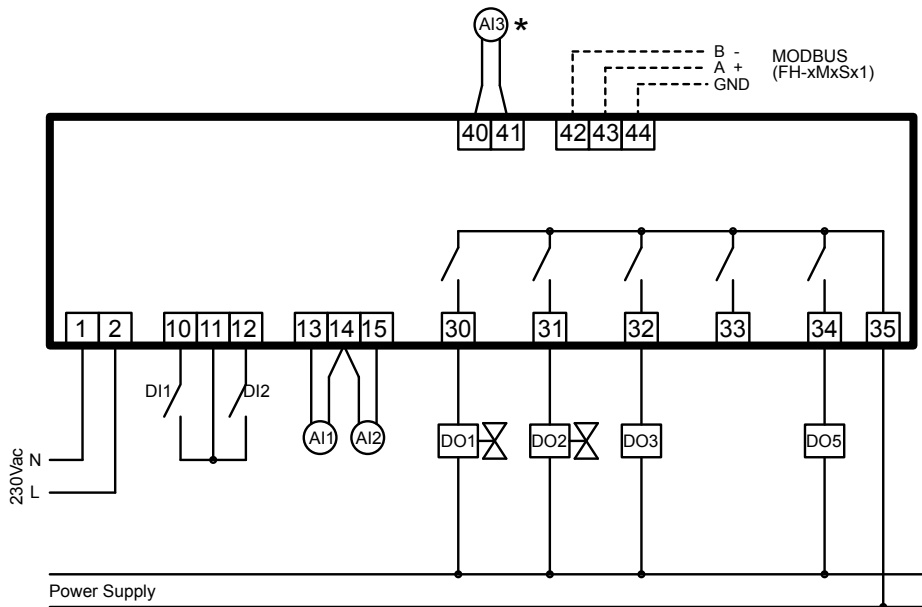
DO1=Thermal actuator 1

DO2=Thermal actuator 2

DO3=Thermal actuator 3

AO1=EC fancoil

• Configuration 16 - (model FH-4xxSH1)



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph [“42. Terminal blocks connection” page 138](#)

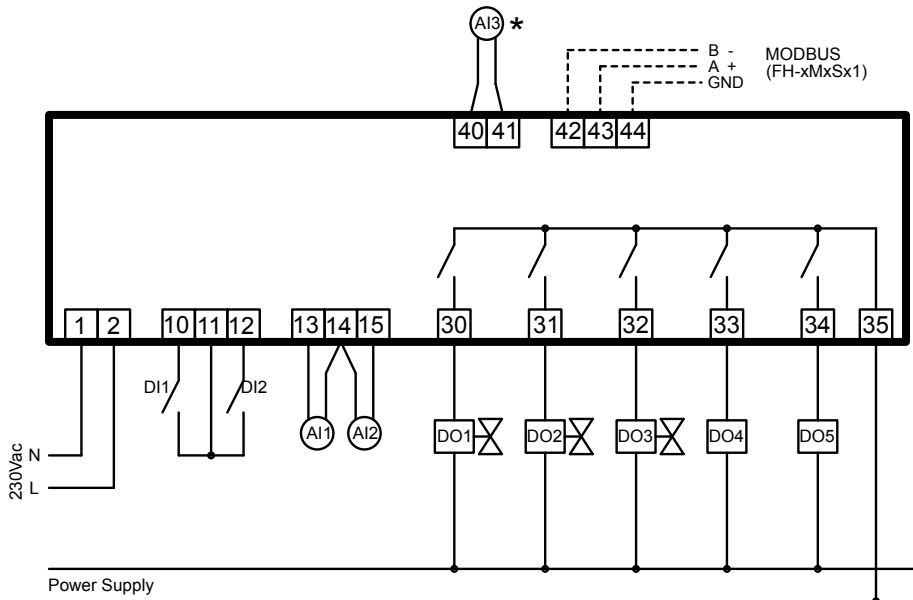
DO1=Thermal actuator 1

DO2=Thermal actuator 2

DO3=Dehumidifier

DO5=Configurable output

• **Configuration 17 - (model FH-4xxSH1)**



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph "42. Terminal blocks connection" page 138

DO1=Thermal actuator 1

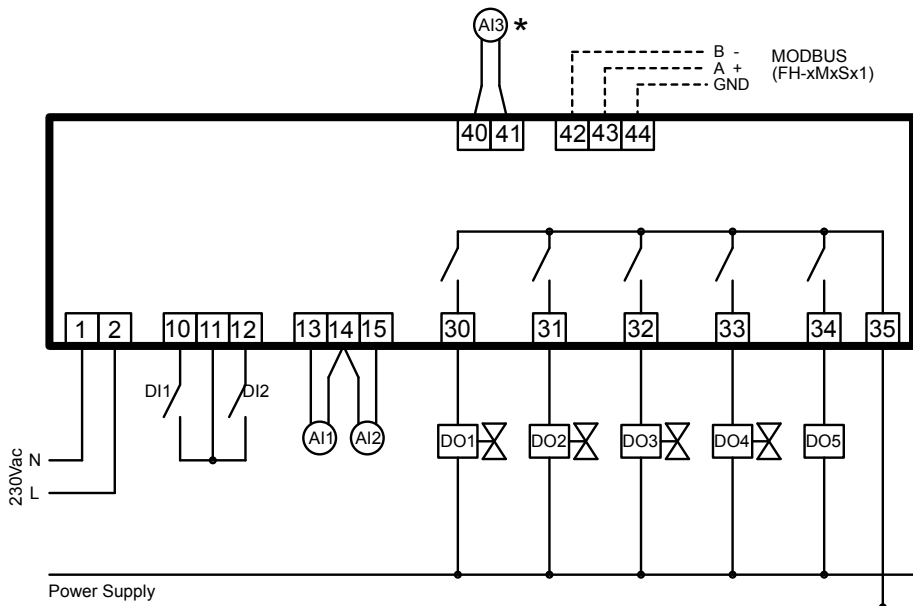
DO2=Thermal actuator 2

DO3=Thermal actuator 3

DO4=Dehumidifier

DO5=Configurable output

• **Configuration 18 - (model FH-4xxSH1)**



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph "42. Terminal blocks connection" page 138

DO1=Thermal actuator 1

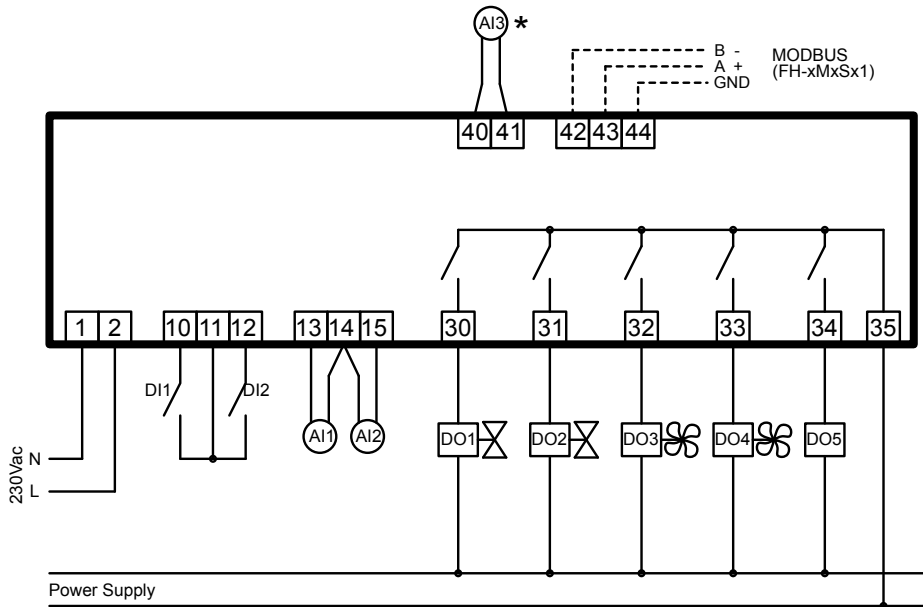
DO2=Thermal actuator 2

DO3=Thermal actuator 3

DO4=Thermal actuator 4

DO5=Dehumidifier

• **Configuration 19 - (model FH-4xxSH1)**



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph "42. Terminal blocks connection" page 138

DO1=Thermal actuator 1

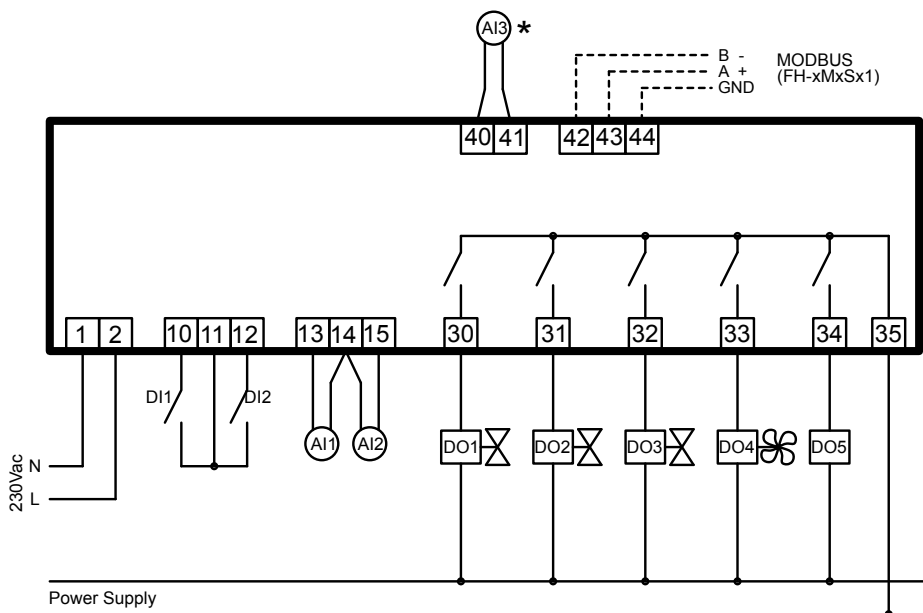
DO2=Thermal actuator 2

DO3=Fancoil 1

DO4=Fancoil 2

DO5=Dehumidifier

• **Configuration 20 - (model FH-4xxSH1)**



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph "42. Terminal blocks connection" page 138

DO1=Thermal actuator 1

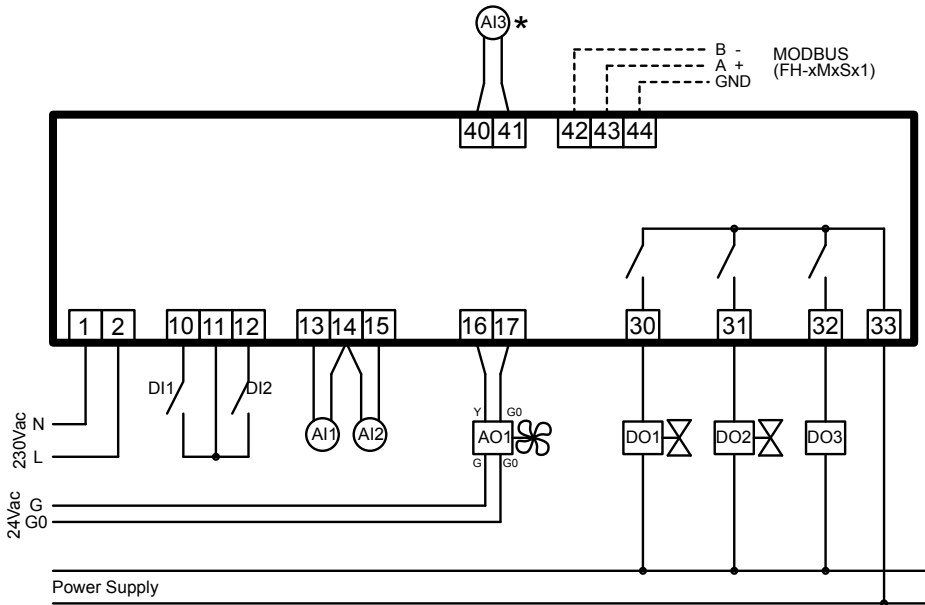
DO2=Thermal actuator 2

DO3=Thermal actuator 3

DO4=Fancoil 1

DO5=Dehumidifier

• **Configuration 21 - (model FH-2xxSH1)**



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph "42. Terminal blocks connection" page 138

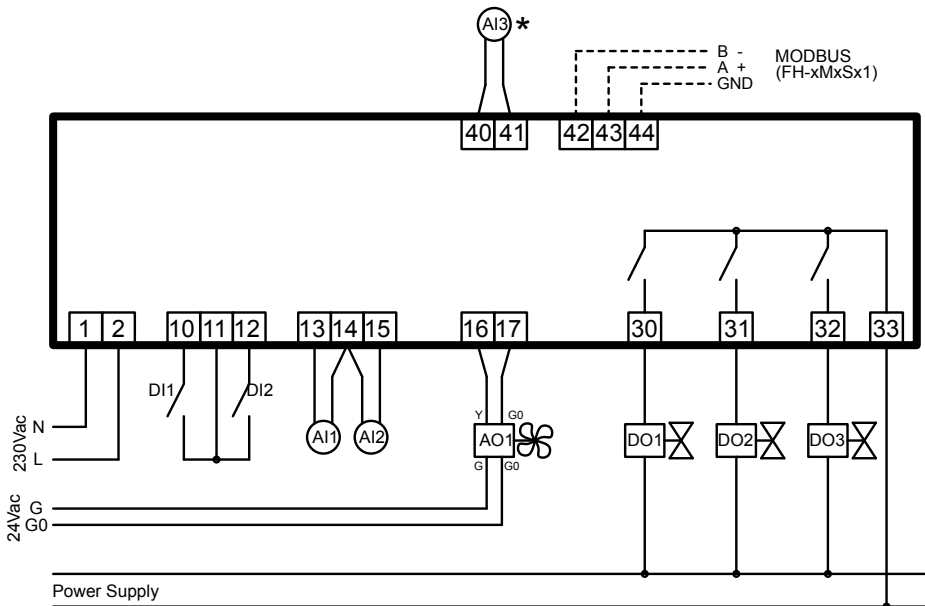
DO1=Thermal actuator 1

DO2=Thermal actuator 2

DO3=Dehumidifier

AO1=EC fan

• **Configuration 22 - (model FH-2xxSH1)**



AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph "42. Terminal blocks connection" page 138

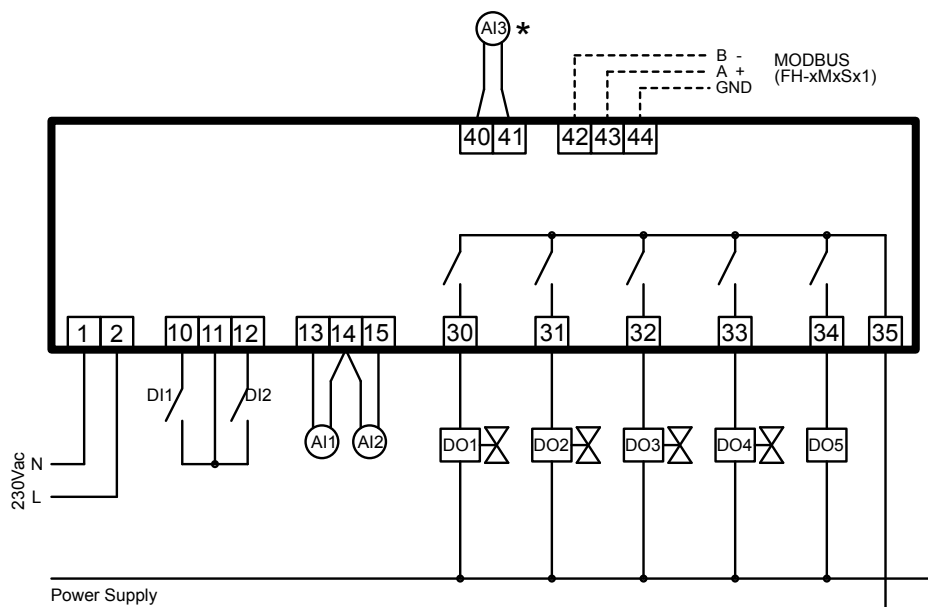
DO1=Thermal actuator 1

DO2=Thermal actuator 2

DO3=Thermal actuator 3

AO1=EC fan

• **Configuration 23 - (model FH-4xxSH1)**

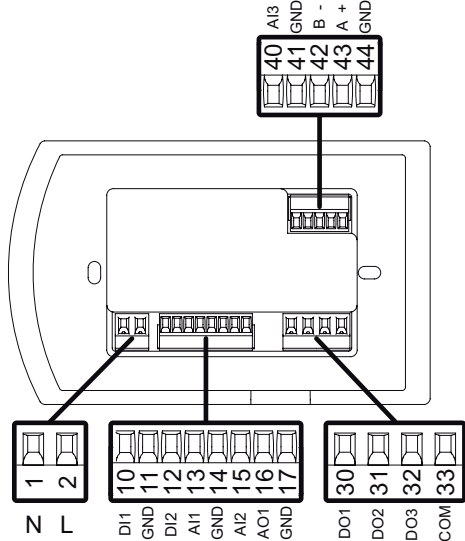


AI1, AI2, AI3, DI1, DI2 and note * -> see paragraph *"42. Terminal blocks connection"* page 138

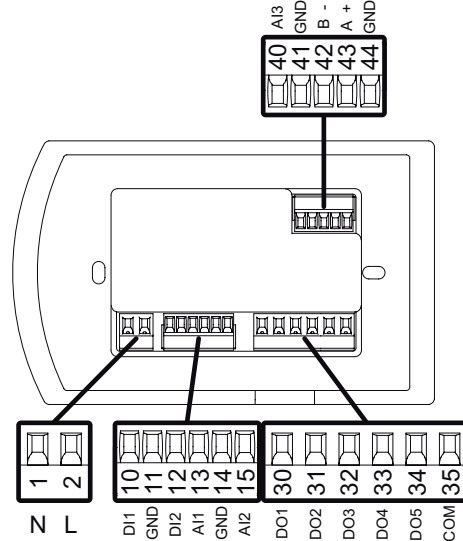
- DO1=Thermal actuator 1
- DO2=Thermal actuator 2
- DO3=Thermal actuator 3
- DO4=Thermal actuator 4
- DO5=Dehumidifier

42. Terminal blocks connection

Connection of FH-2xxSH1 model



Connection of FH-4xxSH1 model



*If the humidity transmitter with 0... 10 V is used, connect as per figure 2.
In other cases (temperature sensor), make the connections as per figure 1.

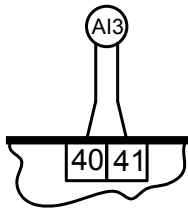


Figure 1

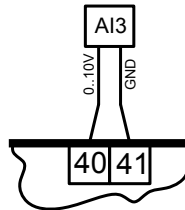


Figure 2

Terminal blocks:

N - L = 230 V AC power supply

DI1 - DI2 = Digital inputs 1 and 2

AI1 - AI2 - AI3 = Analogue inputs 1-3

AO1 = Analogue output 1

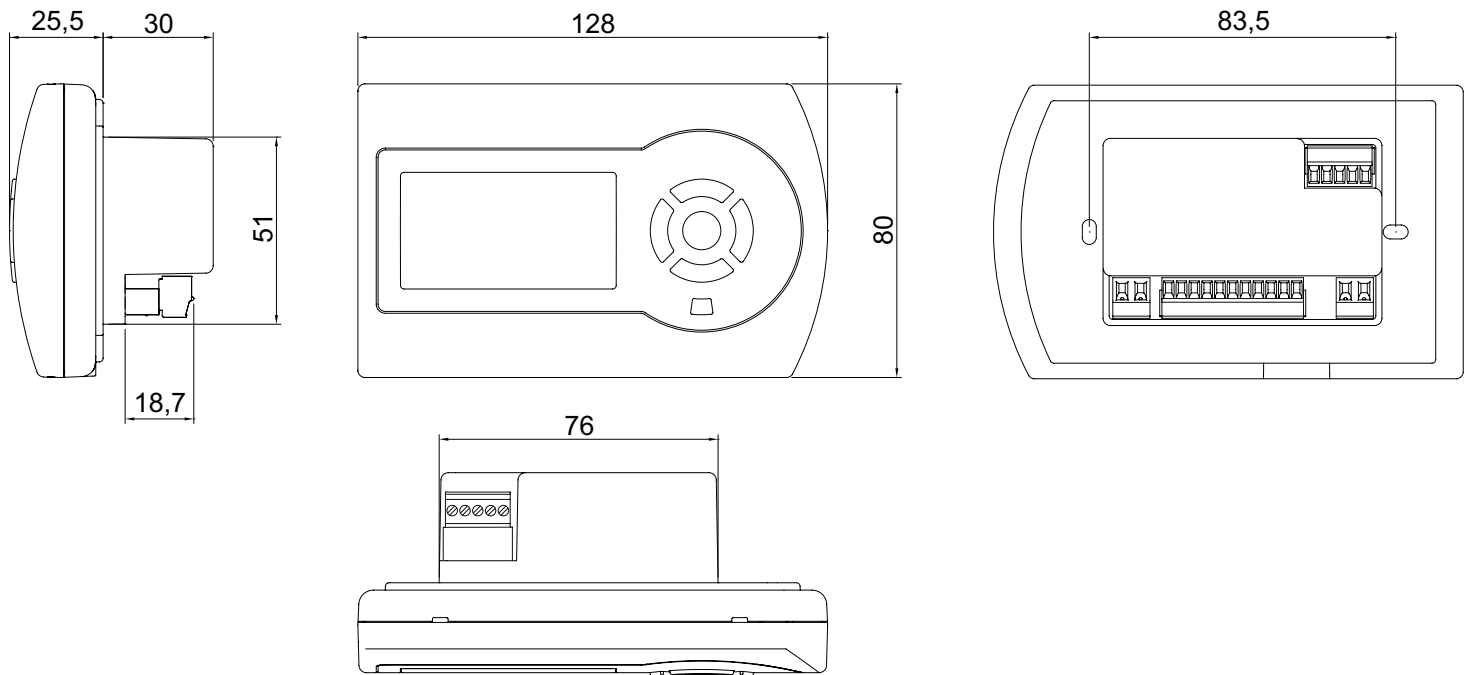
DO1 - DO2 - DO3 - DO4 - DO5 = Digital outputs 1-5

COM = Common for digital outputs

A + / B - = Modbus (only for versions **FH-xMxSH1**)

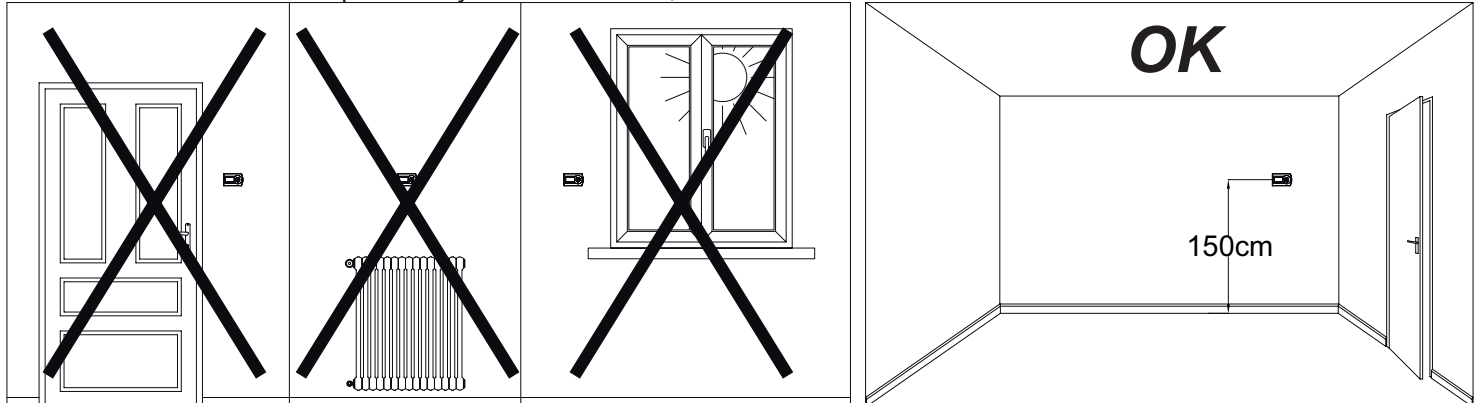
GND = Common for digital inputs, analogue inputs, analogue outputs and modbus

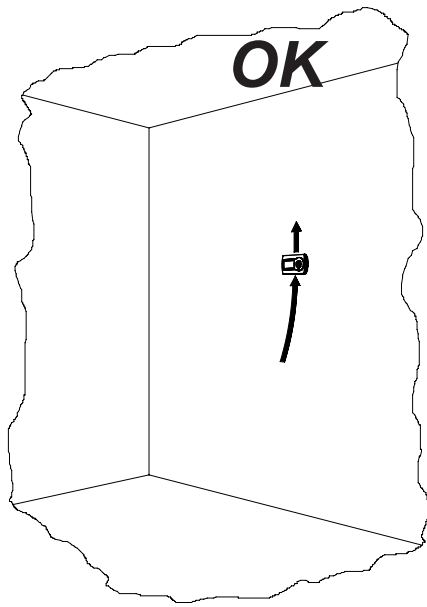
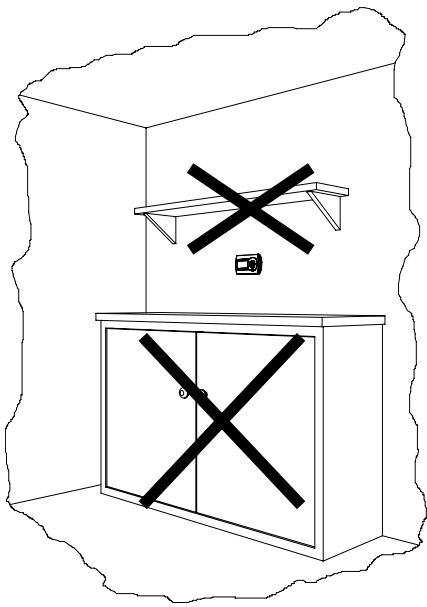
43. Dimensions



44. Mounting instructions

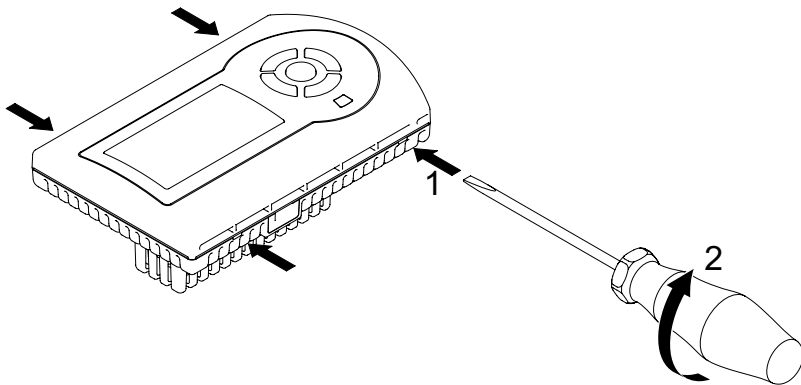
Install the appliance in a location away from sources of heat and away from direct airflow, at around 1.5 m above the floor. Do not install the thermostat on particularly cold or hot walls, or outside.



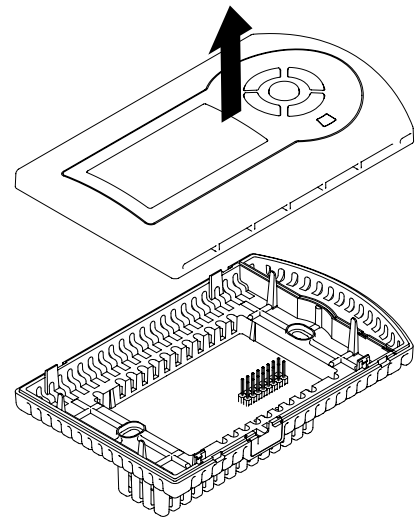


Installation for 3 module flush-mounted housing.
E.g.: Bticino 503E (available on request).
Spacing between mounting holes 83.5 mm.

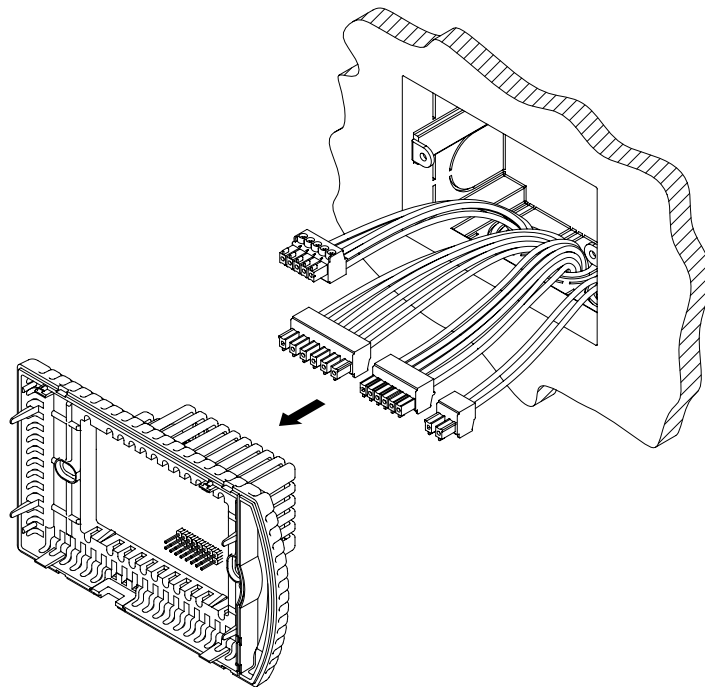
1



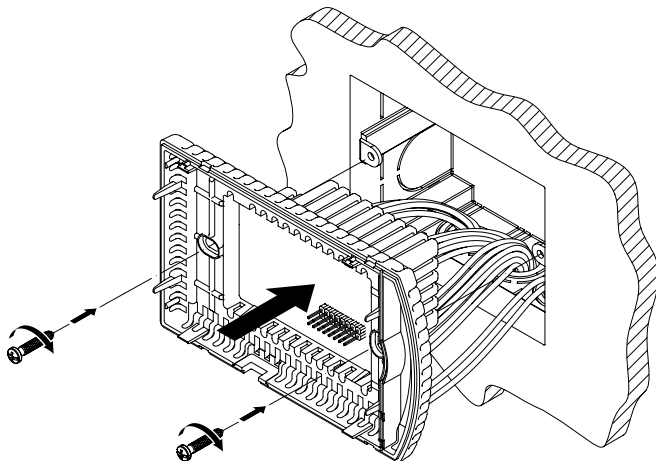
2



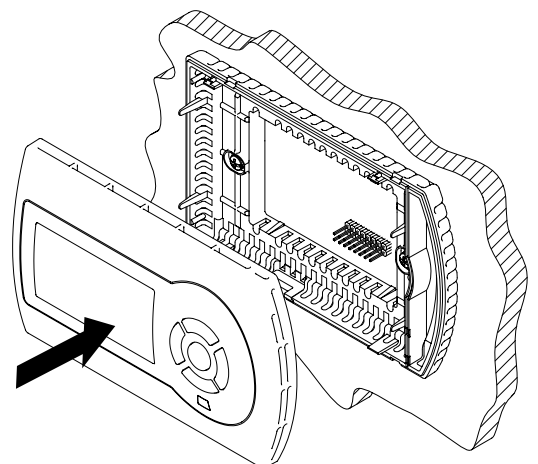
3



4



5





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