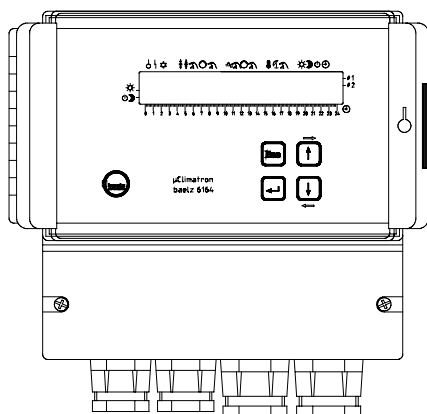
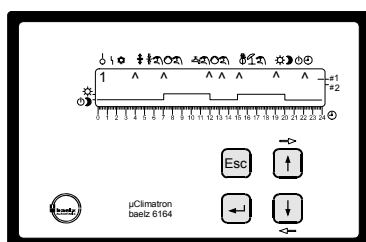
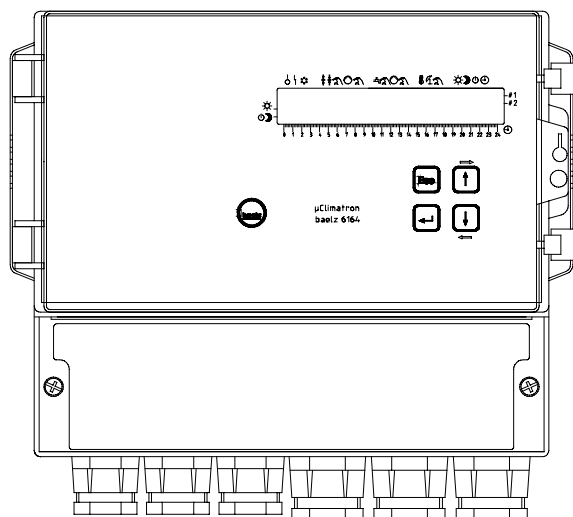


Operating Instructions

OI 6164

Operating instructions for microprocessor heating controller µClimatron baelz 6164


baelz 6164-...-W1 for wall mounting

baelz 6164-... for front panel mounting

baelz 6164- ...-W2 for wall mounting and rail mounting

Functions

- Max. 2 control loops
- **Controller output three point (step)/on-off/analog**
- Supply temperature control depending on the weather or constant
- With/without room temperature add-on by adjustable displacement of the supply temperature
- With/without min./max. limiting of return temperature by adjustable displacement of the supply temperature, fixed or sliding
- Heating curve with max. 5 vertexes, by that any run of the curve possible
- Occupational times with 3x switch-on times and 3x switch-off times per weekday
- Max. 16 legal holidays, 4 special times, 10 holiday dates
- Correction potentiometer for displacement of supply temperature can be added on
- **Summer/Winter mode, i.e. switch-on and switch-off of the heating installation depending on outside temperature and period of time**
- **Max. 2 alarms fixed or sliding with the setpoint**
- Automatic changeover to summer/winter time
- Pump blocking when installation is switched off to start pump every day for a short time
- D.H.W. temperature control possible via thermostat, one or two temperature sensor(s), via positioning device or load pump
- D.H.W. priority circuit by increase of the supply to a value that can be entered, above the D.H.W. temperature
- Time program for circulation pump
- Supervision of sensor with alarm message on LCD
- Overall view with manual operation via keyboard
- Analog outputs as copy of the measured value or of the resulting setpoint
- Adjustable delay of the outside temperature
- D.H.W. disinfection possible when loading via sensor
- Block setting of the switching times
- Displacement of the switching time depending on the outside temperature

Operating Instructions**OI 6164**

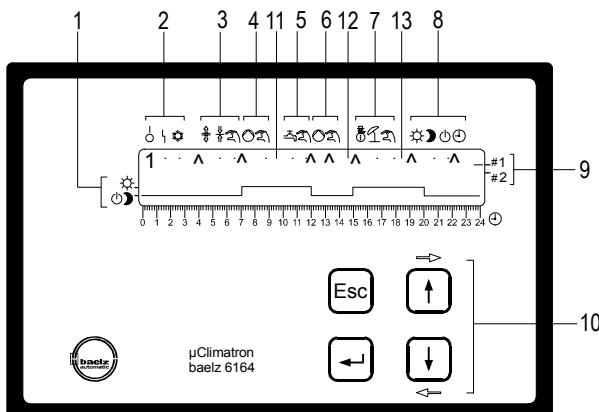
A.	GENERAL INFORMATION.....	3
A.1	FRONT VIEW WITH OPERATING ELEMENTS.....	3
A.2	TECHNICAL DATA.....	3
A.3	MOUNTING.....	3
A.4	ELECTRICAL WIRING DIAGRAM.....	5
A.5	LIST OF PARAMETERS, FACTORY SETTING.....	6
B.	OPERATING AND CONFIGURATION LEVEL	9
B.1	OVERVIEW	9
B.2	OPERATING LEVEL	10
B.2.1	<i>Inquiry of measured values</i>	10
B.2.2	<i>Times</i>	10
B.2.2.1	Entry/Inquiry of occupational times, holidays, legal holidays, date/hour	10
B.2.2.1.1	Entry/Inquiry of occupational times.....	10
B.2.2.1.2	Entry/Inquiry of holidays.....	11
B.2.2.1.3	Entry/Inquiry of special times.....	11
B.2.2.1.4	Entry/Inquiry of legal holidays.....	11
B.2.2.2	Inquiry of date and hour	11
B.2.3	<i>Entry/Inquiry of setpoints</i>	12
B.2.3.1	Entry/Inquiry of setpoints, heating curve	12
B.2.3.2	Entry/Inquiry of night setback, return heating curve	13
B.2.3.3	Entry/Inquiry of the room temperature	14
B.2.3.4	Entry/Inquiry of the D.h.w. loading (water heating WH)	15
B.2.4	<i>Miscellaneous</i>	16
B.2.4.1	Display of status and manual override	16
B.2.4.2	Inquiry of the status of digital input	17
B.2.4.3	Selection of control loop	17
B.3	CONFIGURATION LEVEL	18
B.3.1	MEASURED VALUES	18
B.3.1.1	FUNCTION	18
B.3.1.2	MODULE TYPE	21
B.3.1.3	RANGE	21
B.3.1.4	CALIBRATION CORRECTION	21
B.3.2	TIMES	21
B.3.2.1	OCCUPATIONAL TIMES	21
B.3.2.2	CLOCK	22
B.3.3	SETPOINTS	22
B.3.3.1	SETPOINT	22
B.3.3.2	CORR./SETBACK	23
B.3.3.3	ROOM TEMP.	23
B.3.3.4	D.H.W. LOADING	24
B.3.4	MISCELLANEOUS	25
B.3.4.1	STATUS/MANU	25
B.3.4.2	DIGITAL IN	28
B.3.4.3	BLOCKING	28
B.3.4.4	MISCELLANEOUS	29
B.3.4.4.1	CONTROL PARAMETERS.....	29
B.3.4.4.2	JET-LOGIC.....	30
B.3.4.4.3	COMMUNICATION.....	31
B.3.4.4.4	EEPROM.....	31
C.	EXAMPLES FOR APPLICATION.....	32
C.1	STEAM-CONDENSATE HEAT TRANSFER STATION.....	32
C.2	STEAM-CONDENSATE HEAT TRANSFER STATION WITH D.H.W. LOADING VIA SENSOR AND DIVERTING VALVE.....	33

Operating Instructions

OI 6164

A. General information

A.1 Front view with operating elements



- 1 Graphical display of the switching times
- 2 Operating switch/Fault message
- 3 Control valve
- 4 Heating pump
- 5 Water heating WH
- 6 Circulation pump
- 7 Summer / winter mode
- 8 Nominal- / Reduced- / Support mode
- 9 Selected control loop
- 10 Operating keys
- 11 Display alarm 1
- 12 Display alarm 2
- 13 Display switching time optimization

A.2 Technical data

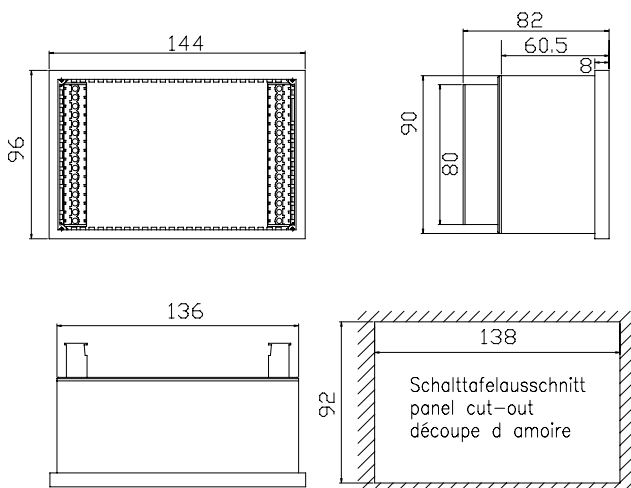
- Supply voltage 230 V AC -15% / +10% , 50 / 60 Hz
- Safety fuse 115 V AC -15% / +10% , 50 / 60 Hz
- Power consumption external 0.63 A
- Ambient temperature approx. 7 VA
- operation 0 to 50 °C
- transportation / storage - 25° to + 65° C
- Ambient humidity 5 to 90 % r.h.
- Protection class IP 55 face
- Design
- for front panel mounting baelz 6164, WxHxD 144x96x82 mm
- for wall mounting baelz 6164-W1, WxHxD 194x162x104 mm
baelz 6164-W2, WxHxD 242x185x120 mm
- Mounting position any
- Supply voltage of DI and transmitter 24 V DC, I_{max} = 60 mA
- Digital input Re = 4 kΩ
(low = 0 V DC; high = 15 ... 24 V DC)
- Analog output 0 / 2 to 10 V, I_{max} = 5 mA
- Meas. accuracy 0.3 % of measuring range
- Analog inputs NTC 3.11 (-40°C to +60°C)
3.12 (0°C to +60°C)
3.13 (0°C to +140°C)
PT100 2.49 (-40°C to +120°C)
Current 0/4 to 20 mA, Re = 5.9 Ω
Voltage 0/2 to 10 V, Re = 160 kΩ
Potentiometer 1 - 5 kΩ
- Display LCD with 2x24 characters
- Function keyboard 4 keys
- Relay with potential-free contact
breaking capacity 250 V AC / 3 A
spark extinguishing element 10 nF + 100 Ω
- Interface as option RS 232 or RS 485 Modbus RTU
- Data protection non-volatile semiconductor memory
- Time buffering Lithium battery 3.0 V

A.3 Mounting



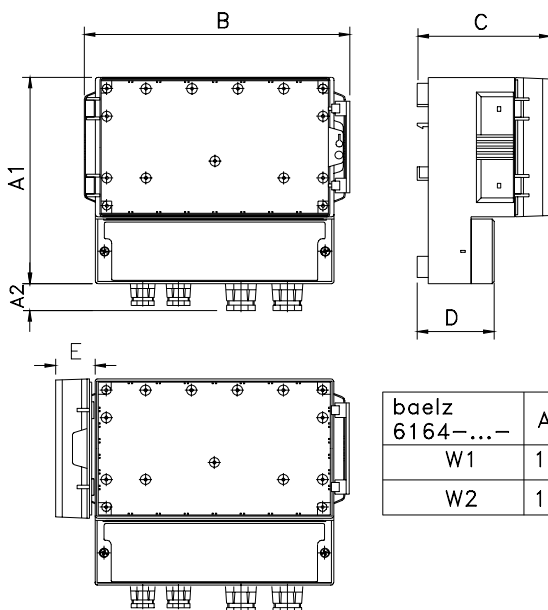
- Ambient temperature and ambient relative humidity at the mounting point may not exceed the admissible limits of +50 °C and 90 % r.h.
- Ensure sufficient ventilation.
- The device may only be mounted in a dry room, and not within hazardous zones.

baelz 6164 for front panel mounting: Insert the device from the front into the panel cut-out (92 mm x 138 mm) which is provided for this and fasten it by means of the accompanying tongs.

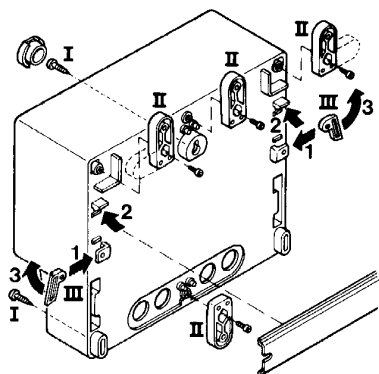


Operating Instructions**OI 6164**

baelz 6164 -W ... for wall mounting: The device is hung centrally on the wall and is fastened with screws in the 2 elongated holes (at the bottom left and right) which are provided for this.



baelz 6164-...-	A1	A2	B	C	D	E
W1	162	31	194	104	59	26
W2	185	31	242	120	69	23

Possible mountings for wall housing baelz 6164-....-W2

The wall housing W2 can be mounted in 3 different ways:

- I. With screws through the lower part of the housing
- II. With mounting straps* at the edges or in the middle
- III. Mounting on the DIN rail
 1. Press the locking* into the marked bore hole.
 2. Hang the housing on the DIN rail
 3. Turn the locking upwards, behind the DIN rail

* as accessories

Operating Instructions

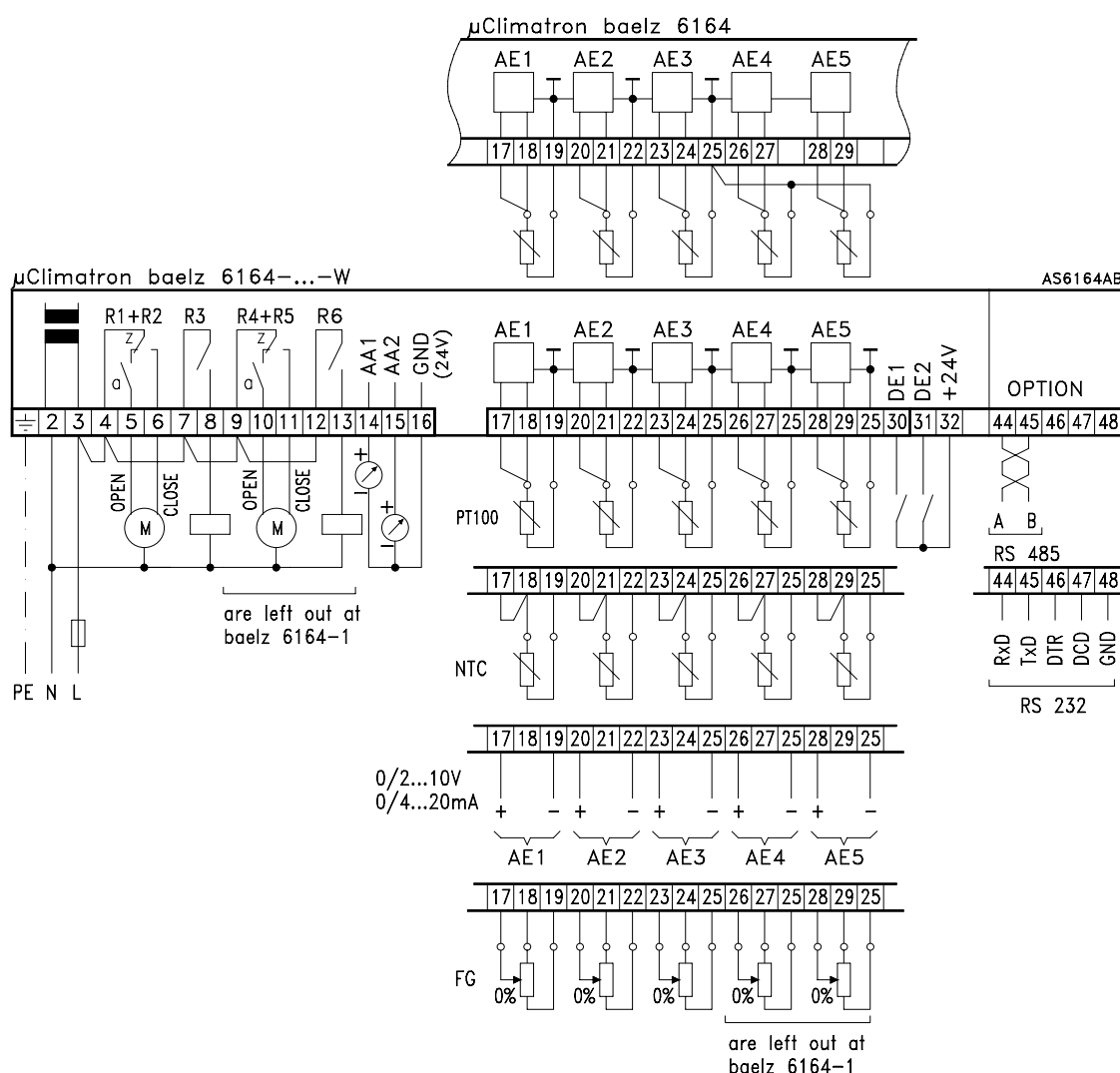
OI 6164

A.4 Electrical wiring diagram

The connecting terminals are at the back or in the terminal box of the device. As the measuring inputs are always pre-set order-related, the connection must be done according to the wiring diagram drawn up for the order.



- When installing, please observe the relevant national regulations (in Germany DIN VDE 0100).
- The electrical connection is done according to the wiring diagrams of the device.
- For measuring and control lines (digital inputs), **screened** cable has to be used and for bus lines, **twisted** data cable **screened by pairs** has to be used. They have to be laid separately from the high tension lines also in the switch cabinet.
- Before connecting, please ensure that the service voltage indicated on the name plate corresponds to the line voltage.
- The connecting terminals with connected lines may only be pulled off from the device when no current flows.
- When electrical devices are in operation, some parts of this device carry inevitably a dangerous current. In case of inexpert handling, grievous bodily harm or material damage can occur.
- Please observe therefore exactly the warnings in the following paragraphs of these operating instructions. The staff working with this device should have got the necessary qualifications and should be familiarized with the content of these operating instructions.
- A perfect and safe functioning of this device requires a proper transportation, a skilled storage, mounting and operation.



Relay

R1 Open, loop 1

R2 Closed, loop 1

R3 free¹⁾

R4 Open, loop 2

R5 Closed, loop 2 or free¹⁾

R6 free¹⁾

Analog input

AI1 Supply temperature, loop 1

AI2 free²⁾

AI3 Outside temperature

AI4 Supply temperature, loop 2

AI5 free²⁾

Analog output

AO1 Copy of AI 1 ... 5 / Resulting set-point / Controller output selectable as AO1

¹⁾ Heating- / Circulation- / Load pump (diverting valve) / Alarm1 / Alarm2 selectable, but max. 1 circulation- / load pump (diverting valve)

²⁾ Room- / Return- / D.H.W. temperature / Correction potentiometer selectable

Digital input

DI1 Open/Closed/Utilization/D.H.W. thermostat/Limit switch Closed Jetomat selectable as DI1

DI2 as DI1

Operating Instructions

OI 6164

A.5 List of parameters, factory setting

All numerical values refer to the measuring range 2.49. If a measuring module range is modified, the associated parameters are modified by percentage.

Mask	Parameter	Factory setting		Table	Table 1
		loop 1	loop 2		MEASURED VALUE
FUNCTION	FUNCTION ONTO AI2	NOT USED		1	NOT USED
	FUNCTION ONTO AI4	NOT USED			RETURN LIMITATION #1
	FUNCTION ONTO AI5	NOT USED			SUPPLY CORRECT. POT. #1
	OUTSIDE TEMPERATURE	ACTIVE / NOT OPERATIVE			ROOM CORRECTION POT. #1
	DELAYED AI3(°K/h)	0.0		ROOM CONTROL #1	
	FROST PROTEC.AI3 H.PUMP	0.0		MIN.ROOM TEMPERATURE #1	
	FROST PROTECTION SUPPLY	5.0	5.0	MIN.ROOM + ROOM CTRL.#1	
	AO1 IS COPY OF	AI1 (0-10V)		2	MIN.ROOM + OPTILIMIT #1*)
AO2 IS COPY OF	AI3 (0-10V)		MIN.R.+OPTI.+R.CTRL. #1*)		
MODULE TYPE	MEASURING MODULE AI1	PT100 2.49		3	RETURN EJECTOR #12)
	MEASURING MODULE AI2	PT100 2.49			D.H.W.LOADING ON
	MEASURING MODULE AI3	PT100 2.49			D.H.W.LOADING OFF
	MEASURING MODULE AI4	PT100 2.49			RETURN LIMITATION #2
	MEASURING MODULE AI5	PT100 2.49			SUPPLY CORRECT. POT. #2
RANGE	AI1 ZERO- END OF SCALE	-40.0 ... 120.0			ROOM CORRECTION POT. #2
	AI2 ZERO- END OF SCALE	-40.0 ... 120.0			ROOM CONTROL #2
	AI3 ZERO- END OF SCALE	-40.0 ... 120.0			MIN.ROOM TEMPERATURE #2
	AI4 ZERO- END OF SCALE	-40.0 ... 120.0			MIN.ROOM + ROOM CTRL.#2
	AI5 ZERO- END OF SCALE	-40.0 ... 120.0			MIN.ROOM + OPTILIMIT #2*)
CALIBR.CORREC	AI1	0.0			MIN.R.+OPTI.+R.CTRL. #2*)
	AI2	0.0			RETURN EJECTOR #2
	AI3	0.0			Table 2
	AI4	0.0			AI1 (0-10V)
	AI5	0.0			AI1 (2-10V)
OCCUP.PERIODS	SETTING OF SWITCH.TIME	SINGLE SETTING	SINGLE SETTING	4	AI2 (0-10V)
	SWITCH-TIME SHIFTING	0.0	0.0		AI2 (2-10V)
	AT OUTSIDE TEMP. LIMIT	-20.0	-20.0		AI3 (0-10V)
	DISABLE FROM OUTS.TEMP	18	18		AI3 (2-10V)
CLOCK	WEEKDAY	MO/TU/WE/TH/FR/SA/SU			AI4 (0-10V)
	DATE (DAY.MONTH)				AI4 (2-10V)
	DATE (YEAR)				AI5 (0-10V)
	TIME (HOUR:MINUTE)				AI5 (2-10V)
	DAYLIGHT SAVING TIME	AUTOMAT./NO CHANGE-OVER			RESULT.SETP.#1 (0-10V)
SETPOINT	CONTROLLER TYPE (#1)	OUTSIDE TEMP.C./CONSTANT	NOT USED	5	RESULT.SETP.#1 (2-10V)
	REPLACE SETP. AI3 ERROR	55.0	55.0		RESULT.SETP.#2 (0-10V)
CORR./SETBACK	SETP.CORRECTION POT. ±	15.0	15.0		RESULT.SETP.#2 (2-10V)
	MAX.SUPPLY INC.(RTN.)	15.0	15.0		MANIPUL.VAR.#1 (0-10V)
	RETURN RATIO 1:	2.0	2.0		MANIPUL.VAR.#1 (2-10V)
	MAX.SUPPLY SETBK.(RTN.)	15.0	15.0		MANIPUL.VAR.#2 (0-10V)
ROOMTEMP.	MAX.SUPPLY INC.(ROOM)	10.0	10.0		MANIPUL.VAR.#2 (2-10V)
	ROOM RATIO 1:	4.0	4.0		Table 3
	MAX.SUPPLY SETBK.(ROOM)	10.0	10.0		NTC 3.11 -40..60
	ROOM CORRECTION POT. ±	3.0	3.0		NTC 3.12 0..60
					NTC 3.13 0..140
D.H.W.LOADING	D.H.W.DESINFECTION	OFF/ MO / TU / WE / TH / FR / SA / SU / MO-SU			PT100 2.49 -40..120
	SETPOINT LOADING TEMP.	NOT OPERATIVE / ON LOOP #1 / ON LOOP #2			FG 5K 4.2 0..100
	SETPOINT LOADING TEMP.	70.0			I 0-20 7.1 0..100
	REACTION HEATING PUMP	AUTOMATIC / OFF / ON	AUTOMATIC / OFF / ON		U 0-10 8.1 0..100
	REACTION CONTROL VALVE	AUTOMATIC / CLOSED	AUTOMATIC / CLOSED		I 4-20 7.2 0..100
	TEMP. DIFFERENTIAL	10.0			U 2-10 8.2 0..100
	SWITCH.TIME DELAY (MIN)	10.0			SPECIAL 0..100
					Table 4
STATUS / MAN	FUNCTION ONTO DO3	NOT USED		6	SINGLE SETTING
	FUNCTION ONTO DO5	NOT USED			BLOCK SETTING MO-SU
	FUNCTION ONTO DO6	NOT USED			BLOCK SETTING MO-FR
	PUMP ON DELAY (MIN)	15.0	15.0		Table 5
	PUMP DEBLOCKING (MIN)	5.0	5.0		NOT USED
	SUMMER/WINTER-MODE	DIRECT AI3/1-DAILY AVERAGE AI3/2-DAILY AVERAGE AI3			CONSTANT WITH TIME #2
	OUTSIDE TEMP. WINTER	18.0			OUTSIDE T.C.WITH TIME #2
	OUTSIDE TEMP. SUMMER	19.0			CONSTANT WITH TIME #1
	PERIOD SUMMER MODE	FROM 16.05 TO 20.09		OUTSIDE T.C.WITH TIME #1	
	OUT OF NOMINAL MODE	REDUCED MODE	REDUCED MODE	Table 6	
	ERROR SUPPLY TEMP.	VALVE STOP/VALVE CLOSE	VALVE STOP/VALVE CLOSE	NOT USED	
	ALARM1 TYP.AE	A,AI1/ A.AI4/ B.AI1/ B.AI2/ B.AI3/ B.AI4/ B.AI5			HEATING PUMP #1
	ALARM1 LIMIT	10.0			HEATING PUMP #2
	ALARM1 HYST.	2.0			CIRC. PUMP WITH TIME #1
	ALARM1 SUPPRESS (MIN)	0.0			CIRC. PUMP WITH TIME #2
	ALARM2 TYP.AE	A,AI1/ A.AI4/ B.AI1/ B.AI2/ B.AI3/ B.AI4/ B.AI5			LOADING PUMP W.TIME #1
	ALARM2 LIMIT	10.0			LOADING PUMP W.TIME #2
	ALARM2 HYST.	2.0			ALARM1
	ALARM2 SUPPRESS (MIN)	0.0			ALARM2
	DA-LOGIC INVERTED	0		Table 7	
			REDUCED MODE		
			STANDBY		

Operating Instructions

OI 6164

Mask	Parameter	Factory setting		Table
		loop 1	loop 2	
DIGITAL I.	FUNCTION ONTO DI1	NOT USED		8
	FUNCTION ONTO DI2	NOT USED		
	DI LOGIC	DI1 NORMAL DI2 NORMAL		9
BLOCKING	CONFIGURATIONLEVEL	RELEASED	RELEASED	10
	BLOCKING OPERATINGLEVEL	0	0	
CONTROL PAR.	PROPORTIONALBAND (%)	15.0	15.0 %	
	INTEGRAL ACTION TIME(S)	120.0	120.0 S	
	DEAD BAND	1.0	1.0	
	ACTUATOR STROKE TIME	60.0	60.0	
	LIMITATION DEVIATION	160.0 (NO LIMIT)	160.0 (NO LIMIT)	
JET-LOGIC	JET LOGIC	NOT OPERATIVE	NOT OPERATIVE	11
	CLOSE-DELAY (MIN)	10.0		
	ACTUATOR-TO-OPEN (SEC)	10.0		
	ACTUATOR-TO-STOP (SEC)	10.0		
COMMUNICA.	TRANSFER RATE	19200 / 9600 / 4800 / 2400		
	MODBUS ADDRESS	1		
	AI'S BY MODBUS	0		
EEPROM	EEPROM ADRESSE	0		

Table 8
NOT USED
D.H.W.LOADING
NORMAL MODE #1
CLOSE #1
OPEN #1
ENDSWITCH JET CLOSED #1
NORMAL MODE #2
CLOSE #2
OPEN #2
ENDSWITCH JET CLOSED #2
Table 9
DI1 NORMAL DI2 NORMAL
DI1 INVERT. DI2 NORMAL
DI1 NORMAL DI2 INVERT.
DI1 INVERT. DI2 INVERT
Table 10
RELEASED

Table 8
NOT USED
D.H.W.LOADING
NORMAL MODE #1
CLOSE #1
OPEN #1
ENDSWITCH JET CLOSED #1
NORMAL MODE #2
CLOSE #2
OPEN #2
ENDSWITCH JET CLOSED #2
Table 9
DI1 NORMAL DI2 NORMAL
DI1 INVERT. DI2 NORMAL
DI1 NORMAL DI2 INVERT.
DI1 INVERT. DI2 INVERT
Table 10
RELEASED
WITH PASSWORD PROTECT.
Table 11
NOT OPERATIVE
CIRCULATION INTERRUPTED

Mask	Parameter	Factory setting		Table
		loop 1	loop 2	
Actual Val	Cyclic rotation or step-by-step			
Occup.periods	MO 1	06:30 -22:30	06:30 -22:30	
	MO 2			
	MO 3			
	TU 1	06:30 -22:30	06:30 -22:30	
	TU 2			
	TU 3			
	WE 1	06:30 -22:30	06:30 -22:30	
	WE 2			
	WE 3			
	TH 1	06:30 -22:30	06:30 -22:30	
	TH 2			
	TH 3			
	FR 1	06:30 -22:30	06:30 -22:30	
	FR 2			
	FR 3			
	SA 1	06:30 -22:30	06:30 -22:30	
	SA 2			
	SA 3			
	SU 1	06:30 -22:30	06:30 -22:30	
	SU 2			
	SU 3			
Holidays	Hold. 01	Not used / for #1/ for #2/ for #1+#2 from --.-- to --.--		
	Hold. 02	Not used / for #1/ for #2/ for #1+#2 from --.-- to --.--		
	Hold. 03	Not used / for #1/ for #2/ for #1+#2 from --.-- to --.--		
	Hold. 04	Not used / for #1/ for #2/ for #1+#2 from --.-- to --.--		
	Hold. 05	Not used / for #1/ for #2/ for #1+#2 from --.-- to --.--		
	Hold. 06	Not used / for #1/ for #2/ for #1+#2 from --.-- to --.--		
	Hold. 07	Not used / for #1/ for #2/ for #1+#2 from --.-- to --.--		
	Hold. 08	Not used / for #1/ for #2/ for #1+#2 from --.-- to --.--		
	Hold. 09	Not used / for #1/ for #2/ for #1+#2 from --.-- to --.--		
	Hold. 10	Not used / for #1/ for #2/ for #1+#2 from --.-- to --.--		
Spec.time	Spec.time 1	the--.- from --:-- to --:--	the--.- from --:-- to --:--	
	Spec.time 2	the--.- from --:-- to --:--	the--.- from --:-- to --:--	
	Spec.time 3	the--.- from --:-- to --:--	the--.- from --:-- to --:--	
	Spec.time 4	the--.- from --:-- to --:--	the--.- from --:-- to --:--	

Operating Instructions
OI 6164

Mask	Parameter	Factory setting		Table
		loop 1	loop 2	
Legal hol.	Legal holiday 01	--.--		
	Legal holiday 02	--.--		
	Legal holiday 03	--.--		
	Legal holiday 04	--.--		
	Legal holiday 05	--.--		
	Legal holiday 06	--.--		
	Legal holiday 07	--.--		
	Legal holiday 08	--.--		
	Legal holiday 09	--.--		
	Legal holiday 10	--.--		
	Legal holiday 11	--.--		
	Legal holiday 12	--.--		
	Legal holiday 13	--.--		
	Legal holiday 14	--.--		
	Legal holiday 15	--.--		
	Legal holiday 16	--.--		
Clock		Actual date and clock		
Info				
Setpoint	Setpoint (constant)	55.0	55.0	
	Resulting setpoint			
	Maximum setpoint	85.0	85.0	
	Outside 1 / Supply 1	-15.0 / 80.0	-15.0 / 80.0	
	Outside 2 / Supply 2	0.0 / 65.0	0.0 / 65.0	
	Outside 3 / Supply 3	5.0 / 55.0	5.0 / 55.0	
	Outside 4 / Supply 4	20.0 / 30.0	20.0 / 30.0	
	Outside 5 / Supply 5	----- / -----	----- / -----	
	Minimum setpoint	0.0	0.0	
	Setpoint correction ±	0.0	0.0	
Corr/Setback	Setback range	15.0	15.0	
	Outside 1 / Return 1	-15.0 / 60.0	-15.0 / 60.0	
	Outside 2 / Return 2	0.0 / 54.0	0.0 / 54.0	
	Outside 3 / Return 3	5.0 / 46.0	5.0 / 46.0	
	Outside 4 / Return 4	20.0 / 30.0	20.0 / 30.0	
	Outside 5 / Return 5	----- / -----	----- / -----	
Room Temp	Setpoint room temp.	21.0	21.0	
	Min.room temp.	15.0	15.0	
D.h.w.	D.h.w. loading release	Time dependent / On / Off		
	D.h.w.temp. on	45.0		
	Switch hysteresis off	4.0		
	D.h.w.temp. off	48.0		
Status/Man.	On/Off-switch	1		
	Control valve	Automatic		
	Loading pump	Automatic		
	Circ. pump	Automatic		
	Nominal mode	Clock (Automatic)		
	Heating pump	Automatic		
	Summer/Winter mode	Automatic (Begin at Winter)	Automatic (Begin at Winter)	
Digital i.	DI1	Status		
	DI2	Status		

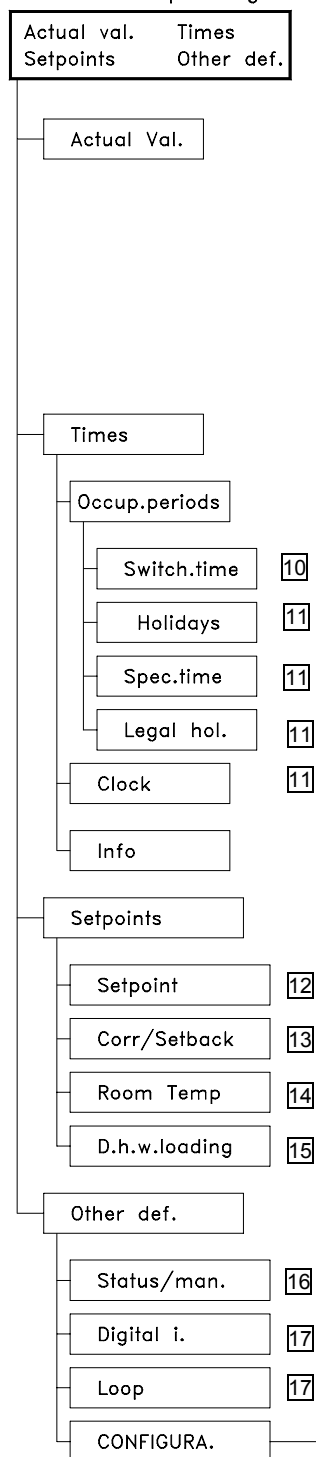
Operating Instructions

OI 6164

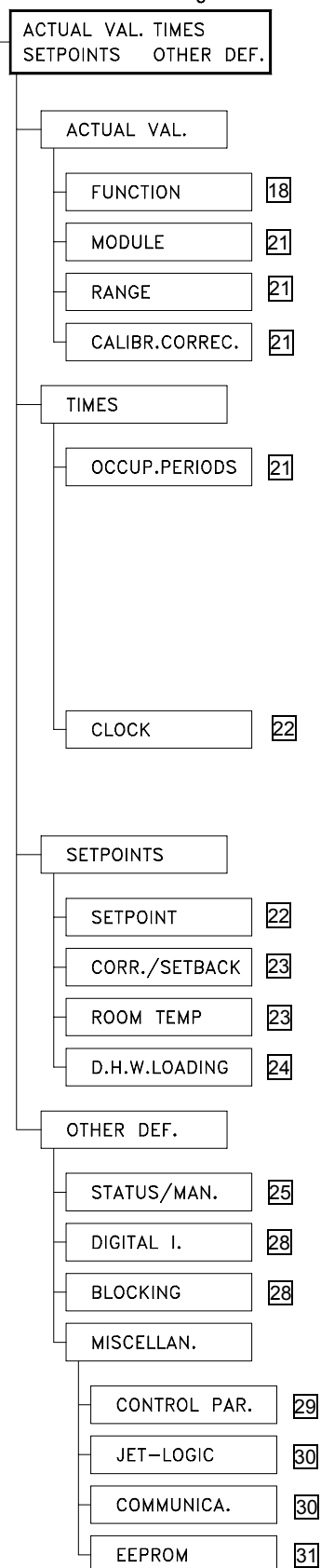
B. Operating and configuration level

B.1 Overview

Main menu Operating level



Main menu configuration level


☐ Page no.

Operating Instructions

OI 6164

B.2 Operating level

The starting screen appears shortly after having connected the supply voltage.

Baelz 6164 Version 1.3
W.Bälz & Sohn GmbH & Co.

After approx. 3 seconds, the display switches to the main menu.

→Actual val. Times
Setpoints Other def.

Selection of a menu line / Back to the previous menu

- With the arrow keys ↑ and ↓, you move the arrow within the display and place it in front of the desired menu line.
- The selection will be confirmed by the key ↵ and the selected submenu will become visible.
- With the key **Esc**, you get one step back.

Entry/Modify

- With the arrow keys ↑ and ↓, you place the arrow → in front of the desired parameter.
- Open Entry/Modify with ↵, the arrow symbol → begins to flash, i.e. the entry can take place, otherwise the entry is locked.
- With the arrow keys ↑ and ↓, set the new value/parameter with single or sustained depression.
- The selection will be confirmed by the key ↵ or cancelled by **Esc** (the old value/parameter is displayed again).

Selection of parameters within a menu

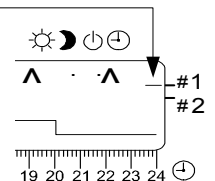
- If several parameters are available in one menu, you can scroll them with the arrow keys ↑ and ↓.

Selection of a control loop

By a sustained depression of **Esc** (> 5 s). The selected control loop is displayed here.



Are you sure that the desired control loop is displayed here?



B.2.1 Inquiry of measured values

Call: Main menu → Actual values

→Actual val. Times
Setpoints Other def.

AI1 -20.0
Supply temperature #1

- Cyclic display of all dedicated measured values
 - Stop with ↵ and scroll with the arrow keys ↑ and ↓ until desired measured value
 - Change to the cyclic display with ↵
- The indication "Error" instead of displaying the actual value means failure of the sensor.**

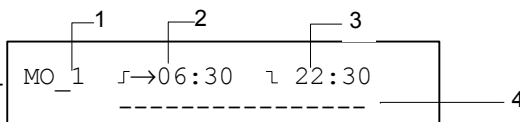
B.2.2 Times

B.2.2.1 Entry/Inquiry of occupational times, holidays, legal holidays, date/hour

B.2.2.1.1 Entry/Inquiry of occupational times

Call: Main menu → Times → occup.periods → Switch.time

→Switch.time Holidays
Spec.time Legal hol.



- If the bloc setting is activated, the occupational times will be copied from one weekday to others.
- Please bear in mind that, according to the configuration, several components (load-, circulation pump, control loop) can eventually have common occupational times.

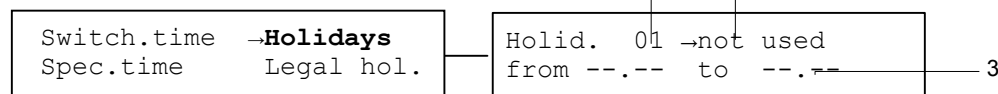
- 3 occupational times are possible per weekday 3x On → and 3x Off ↵
- Start of service (On): - - - - , 00:00 to 24:00
'- - - -' means unoccupied
- End of service (Off): - - - - , 00:00 to 24:00
'- - - -' means 24:00
- Graphical display of all defined occupational times of the day

Operating Instructions

OI 6164

B.2.2.1.2 Entry/Inquiry of holidays

Call: Main menu → Times → occup.periods → Holidays

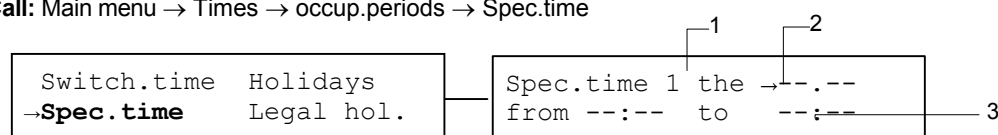


- The occupational times of the weekdays are not valid during the holidays.
- The holiday dates can be entered with a change of the year, e.g. from 23.12 to 06.01
- Holidays have a higher priority than legal holidays, occupational times.

- 1 max. 10 holiday dates are possible
- 2 for which control loop¹⁾ is this valid?
not used / for #1 / for #2 / for #1+#2
- 3 Holiday dates: --.--, 01.01 to 31.12
from '---:--' means unoccupied
to '---:--' means until 31.12

B.2.2.1.3 Entry/Inquiry of special times

Call: Main menu → Times → occup.periods → Spec.time

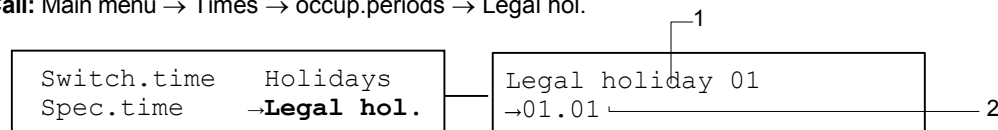


- Special time works like occupational time.
- Special time has a higher priority than holidays, legal holidays, occupational times.
- 'from' must be less than 'to', otherwise there is no use.

- 1 Per control loop, max. 4 special times are possible, within the special time, the control loop¹⁾ is used.
- 2 which day the defined special day is valid?
--.--, 01.01 to 31.12
- 3 Period of the special time: --.--, 00:00 to 24:00
from '---:--' means unoccupied
to '---:--' means until 24:00

B.2.2.1.4 Entry/Inquiry of legal holidays

Call: Main menu → Times → occup.periods → Legal hol.

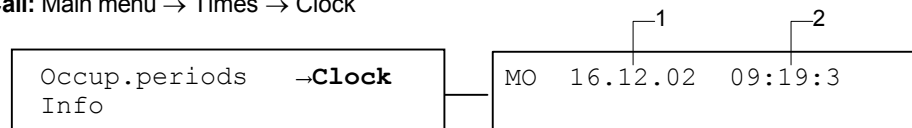


- The occupational times of the weekdays are not valid on legal holidays
- Legal holidays are valid for both control loops
- Legal holidays have a higher priority than occupational times

- 1 max. 16 legal holidays are possible, on a legal holiday the control loop¹⁾ is not used
- 2 Legal holiday: --.--, 01.01 to 31.12
'---:--' means unoccupied

B.2.2.2 Inquiry of date and hour

Call: Main menu → Times → Clock



- Modifications are not possible in the configuration level.

- 1 Display date (DD.MM.YY)
- 2 Display hour

1) according to the configuration, it is also valid for loading pump, circulation pump or even for another control loop

Operating Instructions

OI 6164

B.2.3 Entry/Inquiry of setpoints

B.2.3.1 Entry/Inquiry of setpoints, heating curve

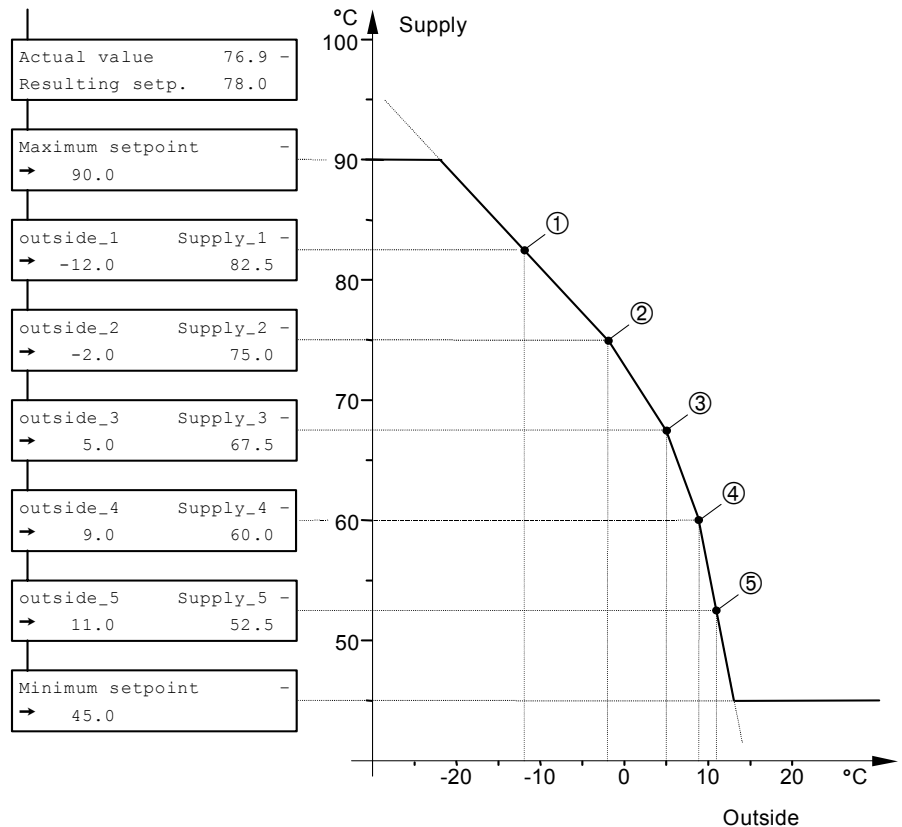
Call: Main menu → Setpoints → Setpoint

→ **Setpoint** Corr./Setback
Room temp D.h.w.loading

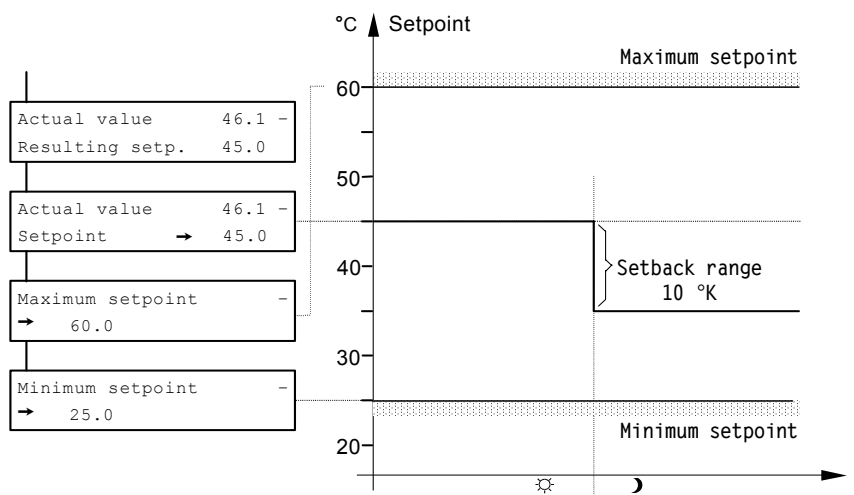
Actual value 60.8
Resulting setp. 60.9

Controller type: OUTSIDE TEMP.COMPENSAT. (set in configuration level 'SETPOINT')

- The heating curve is made up of max. 5 vertexes (Outside_1/ Supply_1 to Outside_5/Supply_5).
- The values for Outside_1 ... 5 must be in **ascending** order, i.e. **Outside_1 < ... < Outside_5**.
- The heating curve can also have less than 5 vertexes.
- A vertex with '**Outside_X (X=2...5)** = - - - - -' means **unoccupied**, the following vertexes are ignored then.
- '**Supply_X (X=1,...,5)** = - - - - -' = zero point of the measuring range -0,1.
- The heating curve is prolonged by a straight line until the beginning or the end of the measuring range (see curve).



Controller type: CONSTANT (set in the configuration level 'SETPOINT')



Operating Instructions

OI 6164

B.2.3.2 Entry/Inquiry of night setback, return heating curve

Call: Main menu → Setpoints → Corr./Setback

Setpoint → Corr./Setback
Room temp D.h.w.loading

Setpoint correction ±
→ 10.0

Setpoint correction, night setback

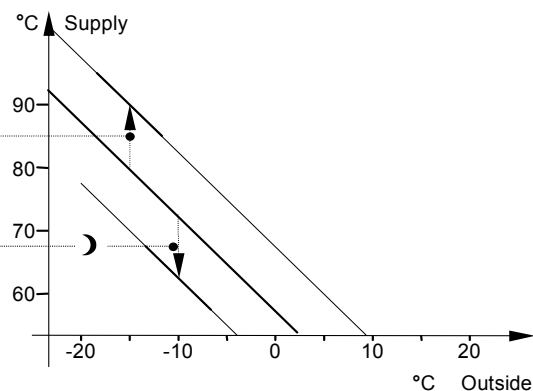
- The current supply temperature setpoint is corrected by this value.

- Outside the occupational time, the supply temperature setpoint is set back (reduced) by this value (night setback) if 'REDUCED MODE' is selected.

Setpoint correction ±
→ 10.0

(night setback)

Setback range
→ 10.0



- The setpoint curve of the return temperature is created with max. 5 vertexes (Outside_1/Return_1 to Outside_5/Return_5).
- otherwise as under 'Heating curve', see page 8.

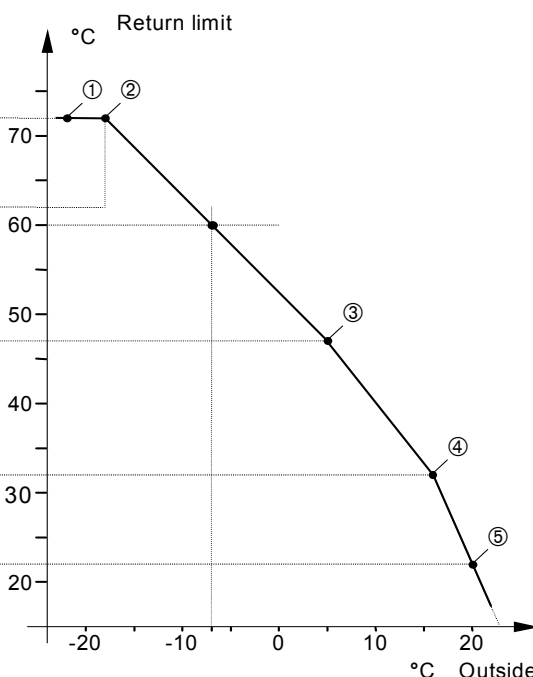
Outside_1 Return_1 -
→ -22.0 72.0

Outside_2 Return_2 -
→ -18.0 72.0

Outside_3 Return_3 -
→ 5.0 47.0

Outside_4 Return_4 -
→ 16.0 32.0

Outside_5 Return_5 -
→ 20.0 22.0



Setpoint curve of the return temperature

Influence of the return temperature

Call: Main menu → Other def. → CONFIGURA. → SETPOINTS → CORR./SETBACK

- If the return temperature differs from the adjusted setpoint, the supply temperature setpoint is displaced accordingly.

RETURN RATIO 1:

-100 0 100

'-' : inverse action

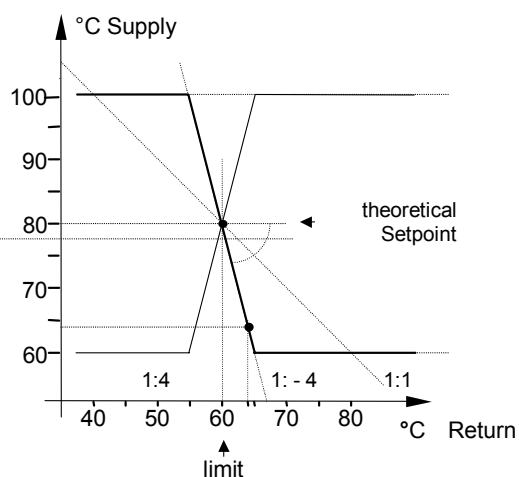
'+' : direct-action

- RETURN RATIO 1 : 0 means no influence

MAX.SUPPLY INC.(RTN.) -
→ 20.0

RETURN RATIO 1:
→ -4.0

MAX.SUPPLY.SETBK.(RTN.) -
→ 20.0



Operating Instructions

OI 6164

B.2.3.3 Entry/Inquiry of the room temperature

Call: Main menu → Setpoints → Room temp

Setpoint	Corr./Setback	Room temp.	20.1
→ Room temp	D.h.w.loading	Setpoint	→ 20.0

According to the configuration (see 'FUNCTION ONTO Alx', page 18), the room temperature serves for:

- room temperature control
- supervision of the minimum room temperature
- room temperature control and supervision of the minimum room temperature
- self-learning optimization of the switching times with supervision of the minimum room temperature
- as above, but with room temperature control

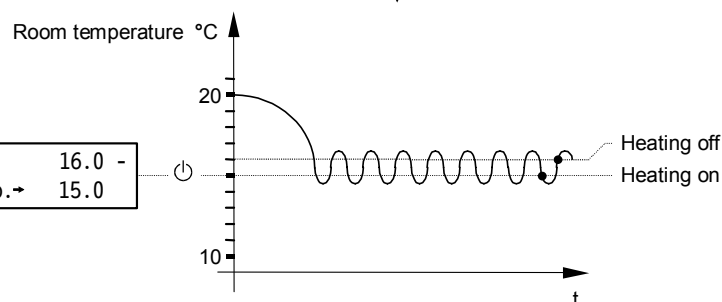
Room temperature setpoint

Room temp.	20.1 -
Setpoint	→ 20.0

Minimum room temperature

In stand-by mode, the heating is switched off (control and pump Off), whereas the room temperature is supervised at a minimum temperature. The heating is switched on as soon as the minimum temperature is fallen below.

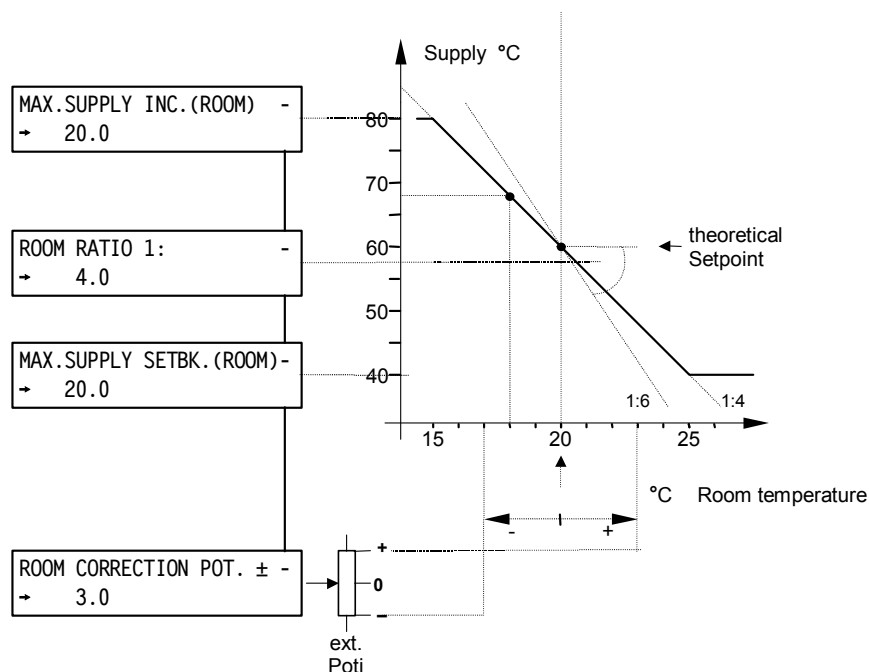
Room temp	16.0 -
Min.room temp.→	15.0



Influence of the room temperature

Call: Main menu → Other def. → CONFIGURA. → SETPOINTS → ROOM TEMP.

- If the room temperature differs from the adjusted setpoint, the supply temperature setpoint is displaced accordingly.
- **ROOM RATIO 1:**
-100 0 100
'-' : inverse action
'+' : direct-action
- **ROOM RATIO 1 : 0** means no influence



Operating Instructions

OI 6164

B.2.3.4 Entry/Inquiry of the D.h.w. loading (water heating WH)

Call: Main menu → Setpoints → D.h.w. loading



Release of the D.h.w. loading

D.h.w. loading release -
→On

Time dependent Release takes only place in the occupational time of the associated heating circuit

On Release permanently On
Off Release permanently Off

According to the configuration, the D.h.w. loading takes place via

- a thermostat (see 'FUNCTION ONTO DIx', page) or
- one (two) sensors (see 'FUNCTION ONTO AIx', page)

D.h.w. loading via thermostat

Configuration at FUNCTION ONTO DI.

FUNCTION ONTO DI1 -
→D.H.W.LOADING

Configuration at FUNCTION ONTO AI.

D.h.w. loading via temperature sensor

FUNCTION ONTO AI2 -
→D.H.W.LOADING ON

FUNCTION ONTO AI5 -
→ D.H.W.LOADING ON

Configuration at STATUS/MAN.:

FUNCTION ONTO D06 -
→CIRC. POMP WITH TIME #1
→CIRC. POMP WITH TIME #2

FUNCTION ONTO D05 -
→LOADING PUMP W. TIME #1
→LOADING PUMP W. TIME #2

Configuration at D.H.W.LOADING:

SETPOINT LOADING TEMP -
→ONTO LOOP #1
→ONTO LOOP #2
→NOT OPERATIVE

SETPOINT LOADING TEMP -
→ 70.0

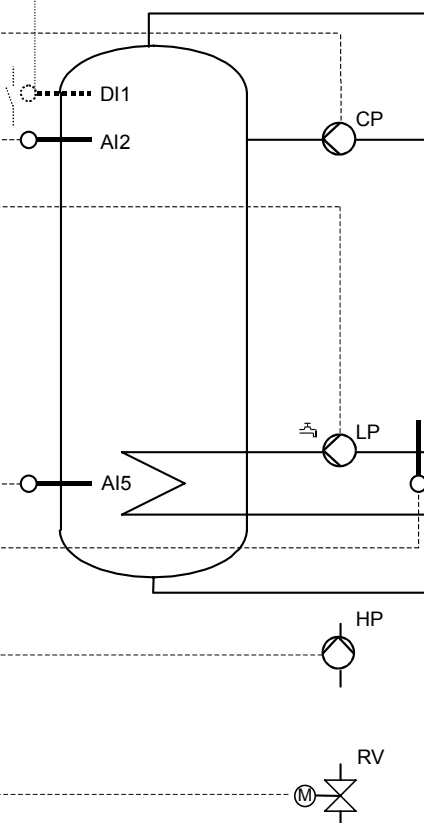
REACTION HEATING PUMP -
→OFF
→ON
→AUTOMATIC

REACTION CONTROL VALVE -
→AUTOMATIC
→CLOSED

D.h.w.temp. On 46.2 -
Setpoint → 45.0

Switch hysteresis off -
→ 5.0

alternative
D.h.w.temp. off 44.3 -
Setpoint → 50.0



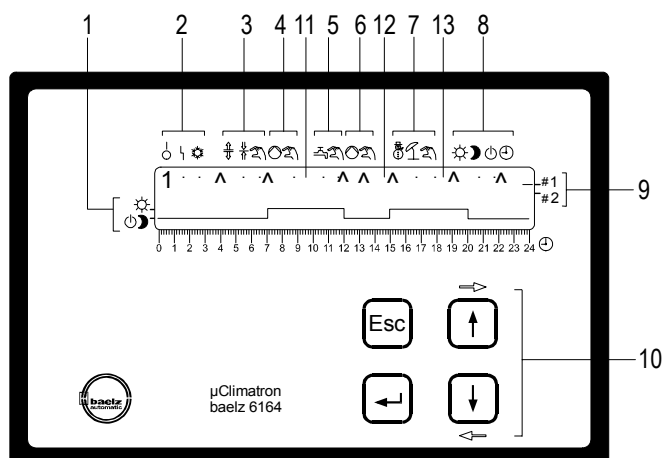
Operating Instructions

OI 6164

B.2.4 Miscellaneous

B.2.4.1 Display of status and manual override

Call: Main menu → Other def. → Status/man.



1 Graphical display of the switching times

- Nominal operation (upper line)
- Support- or reduced operation (lower line)

2 Operating switch/Fault message

- 0 : Off (all relays are released)
- 1 : Automatic
- : normal
- : Failure of sensor with blinking
- : normal
- : Frost danger with blinking

3 Control valve

- Automatic 'CLOSED'
- Automatic 'OPEN'
- Automatic 'STOP'
- Manu 'CLOSED'
- Manu 'OPEN'
- Manu 'STOP'
- 0-100 : Correcting variable Y, Automatic
- 0-100 Correcting variable Y, Manu

4 Heating pump

- Automatic 'ON'
- Automatic 'OFF'
- Manu 'ON'
- Manu 'OFF'

5 Water heating WH

- Automatic 'ON'
- Automatic 'OFF'
- Manu 'ON'
- Manu 'OFF'

6 Circulation pump

- Automatic 'ON'
- Automatic 'OFF'
- Manu 'ON'
- Manu 'OFF'

7 Summer / Winter mode

- Automatic 'Winter'
- Automatic 'Summer'
- Manu 'Winter'
- Manu 'Summer'

8 Nominal- / Reduced- / Support service

- Automatic 'Nominal service'
- Automatic 'Reduced service'
- Automatic 'Support service'
- Manu 'Nominal service'
- Manu 'Reduced service'
- Manu 'Support service'

9 Selected control loop

- #1 Display and operation for loop 1
- #2 Display and operation for loop 2

10 Manual override

- With the key or set the arrow below the desired symbol
- Start entry with , the arrow blinks
- Modify with or
- Finish entry with
- Back to status or cancel with

11 Display alarm 1

- A status: alarm
- no alarm

12 Display alarm 2

- a status: alarm
- no alarm

13 Display optimization of the switching time*

- O optimised switch-on with self-adaption
- o optimised switch-off without self-adaption
- h Status is hold until end of use
- Heating Off, support service

* no standard version



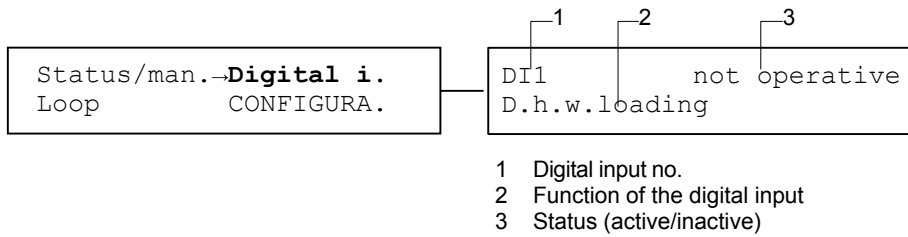
The manual override has always priority compared with normal operation and stays active until it is set back by the operator.

Operating Instructions

OI 6164

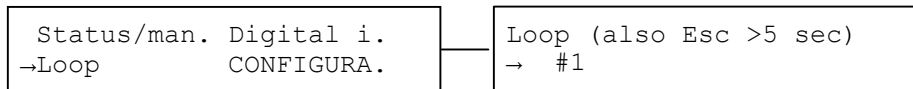
B.2.4.2 Inquiry of the status of digital input

Call: Main menu → Other def. → Digital i.



B.2.4.3 Selection of control loop

Call: Main menu → Other def. → Loop



This is always possible as well by a sustained depression (approx. 3 s with the new version) of the key .

Operating Instructions

OI 6164

B.3 Configuration level

B.3.1 MEASURED VALUES

Here is mainly configured, which functions and physical properties the different measured values have.

B.3.1.1 FUNCTION

Call: Main menu → Other def. → CONFIGURA. → ACTUAL VAL. → FUNCTION

→ FUNCTION	MODULE
RANGE	CALIBR. CORREC

FUNCTION ONTO AI2
→ NOT USED

FUNCTION ONTO AI 4
→ NOT USED

FUNCTION ONTO AI 5
→ NOT USED

→ NOT USED
→ RETURN LIMITATION #1
→ SUPPLY CORRECT. POT. #1
→ ROOM CORRECTION POT. #1
→ ROOM CONTROL #1
→ MIN. ROOM TEMPERATURE #1
→ MIN. ROOM + ROOM CTRL. #1
→ MIN. ROOM + OPTILIMIT #1
→ MIN. R. + OPTI. + R. CTRL. #1
→ RETURN EJECTOR #1
→ D.H.W. LOADING ON
→ D.H.W. LOADING OFF
→ RETURN LIMITATION #2
→ SUPPLY CORRECT. POT. #2
→ ROOM CORRECTION POT. #2
→ ROOM CONTROL #2
→ MIN. ROOM TEMPERATURE #2
→ MIN. ROOM + ROOM CTRL. #2
→ MIN. ROOM + OPTILIMIT #2
→ MIN. R. + OPTI. + R. CTRL. #2
→ RETURN EJECTOR #2

Parameter	Example	Explication
NOT USED		
RETURN LIMITATION #1		If the return temperature T_{RL} differs from its setpoint W_{RL}, the supply temperature setpoint W_{VL} is displaced accordingly.
SUPPLY CORRECT. POT. #1		- corrects the supply temperature setpoint W_{VL}. - The correction range is defined under CORR./SETBACK (page 23)
ROOM CORRECTION POT. #1		- corrects the room temperature setpoint W_{RT}. - The correction range is defined under ROOM TEMP (page 23)
ROOM CONTROL #1		If the room temperature T_{RL} differs from its setpoint W_{RT} within the occupational time, the supply temperature setpoint W_{VL} is displaced accordingly.

Operating Instructions

OI 6164

MIN.ROOM TEMPERATURE #1	A = Regelbetrieb/control mode	Supervision of the minimum room temperature outside the occupational time
MIN.ROOM + ROOM CTRL.#1		- Supervision of the minimum room temperature outside the occupational time <u>and</u> - Room temperature control within the occupational time.
MIN.ROOM + OPTILIMIT #1	A = Regelbetrieb/control mode	- Self-adapted optimised switch-on before start of service (OPTIMUM-START) - Optimised switch-off before end of service (OPTIMUM-STOP) - Supervision of the minimum room temperature outside the occupational time Attention: This function is only valid for the version with 'OPTIMISATION'.
MIN.R.+OPTI.+R.CTRL. #1		as above, but with room temperature control within the occupational time
RETURN EJECTOR #1		- Supervision of return temperature T_{RL} in order to discover an interruption of the circulation - Cyclic opening of the ejector if necessary
D.H.W.LOADING ON		D.h.w. loading takes place via one or two temperature sensor(s)
D.H.W.LOADING OFF		
RETURN LIMITATION #2		Same functions as above, but for control loop 2
SUPPLY CORRECT. POT. #2		
ROOM CORRECTION POT #2		
ROOM CONTROL #2		
MIN.ROOM TEMPERATURE #2		
MIN.ROOM+ ROOM CTRL. #2		
MIN.ROOM+ OPTILIMIT #2		
MIN.R.+OPTI.+R.CTRL. #2		
RETURN EJECTOR #2		

Operating Instructions

OI 6164

Is outside temperature sensor available?

When deactivating the outside temperature, all functions which depend on the outside temperature are deactivated:

- Frost protection heating pump
- Summer-/Winter mode
- Setpoint curve

Delay of the outside temperature

To avoid unnecessary

- overheating due to 'Influence by foehn' or
- inferior heating capacity due to short solar radiation

an outside temperature, whose course is copied with delay to the real one, is calculated internally.

OUTSIDE TEMPERATURE AI3
→ACTIVE

ACTIVE

NOT OPERATIVE

At AI 3, an outside temperature sensor will be connected.
an outside temperature sensor does not exist

DELAYED AI3 (°K/h)
→0.0

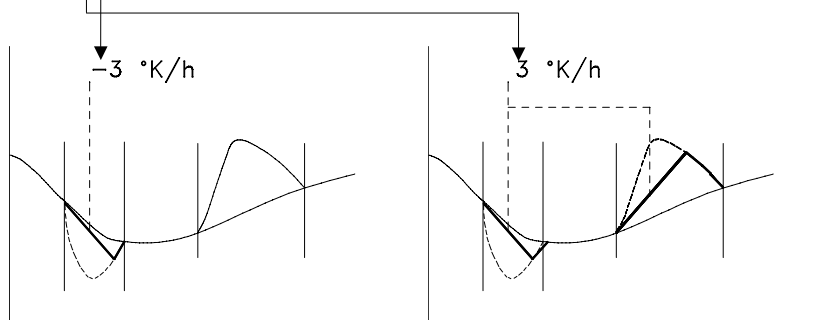
The sign of the here defined max. rate of increase of the calculated outside temperature determines the direction of action:

negative

delay when outside temperature decreases

positive

delay when outside temperature decreases and increases



Frost protection heating pump

If the outside temperature falls below the here defined lower limit, the heating pump will be switched on (endurance run).

FROST PROTECT.AI3 H.PUMP
→ 0.0

Frost protection supply temperature

If the supply temperature falls below the here defined lower limit, the heating pump will be switched on (endurance run) and the positioning device will be opened (Open).

FROST PROTECTION SUPPLY
→ 5.0

Allocation of analog outputs

AO1 IS COPY OF
→AI1 (0-10V)

AI1 (0-10V)

AI1 (2-10V)

AI2 (0-10V)

AI2 (2-10V)

AI3 (0-10V)

AI3 (2-10V)

AI4 (0-10V)

AI4 (2-10V)

AI5 (0-10V)

AI5 (2-10V)

RESULT SETP.#1 (0-10V)

RESULT SETP.#1 (2-10V)

RESULT SETP.#2 (0-10V)

RESULT SETP.#2 (2-10V)

CORR. VARIAB.#1 (0-10V)

CORR. VARIAB.#1 (2-10V)

CORR. VARIAB.#2 (0-10V)

CORR. VARIAB.#2 (2-10V)

AI1 → AO1 (0-10 V)

AI1 → AO1 (2-10 V)

AI2 → AO1 (0-10 V)

AI2 → AO1 (2-10 V)

AI3 → AO1 (0-10 V)

AI3 → AO1 (2-10 V)

AI4 → AO1 (0-10 V)

AI4 → AO1 (2-10 V)

AI5 → AO1 (0-10 V)

AI5 → AO1 (2-10 V)

Resulting setpoint of loop 1 → AO1 (0-10V)

Resulting setpoint of loop 1 → AO1 (2-10V)

Resulting setpoint of loop 2 → AO1 (0-10V)

Resulting setpoint of loop 2 → AO1 (2-10V)

Correcting variable of loop 1 → AO1 (0-10V)

Correcting variable of loop 1 → AO1 (2-10V)

Correcting variable of loop 2 → AO1 (0-10V)

Correcting variable of loop 2 → AO1 (2-10V)

With this setting, the control loop works as continuous controller. The unoccupied relays 1, 2 as well as 3, 4 cannot be used for other objects.

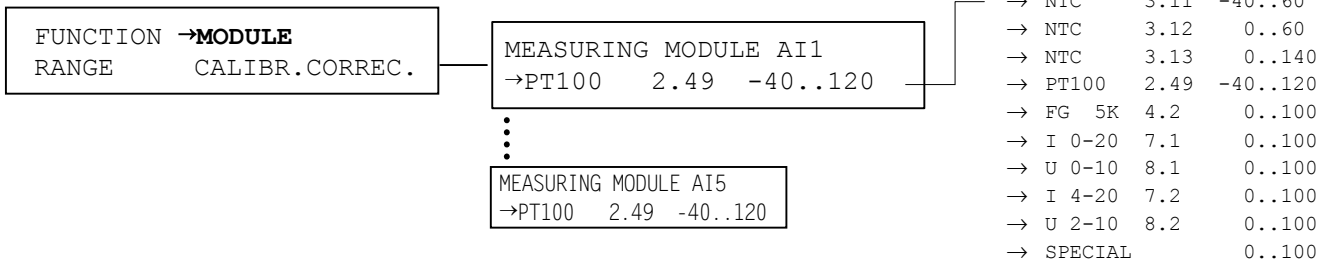
AO2 IS COPY OF
→AI1 (0-10V)

as above, but for AO2

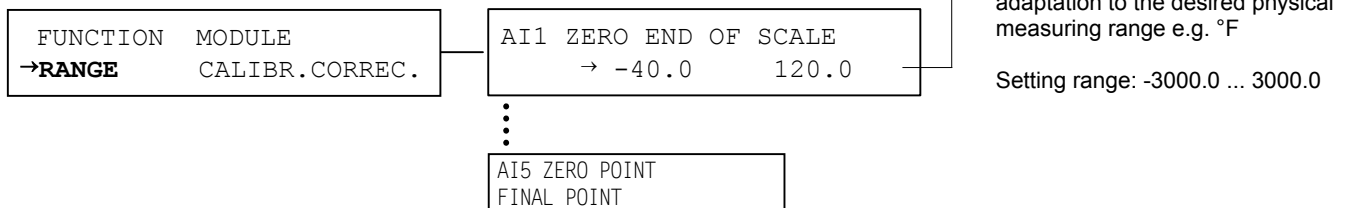
Operating Instructions

OI 6164

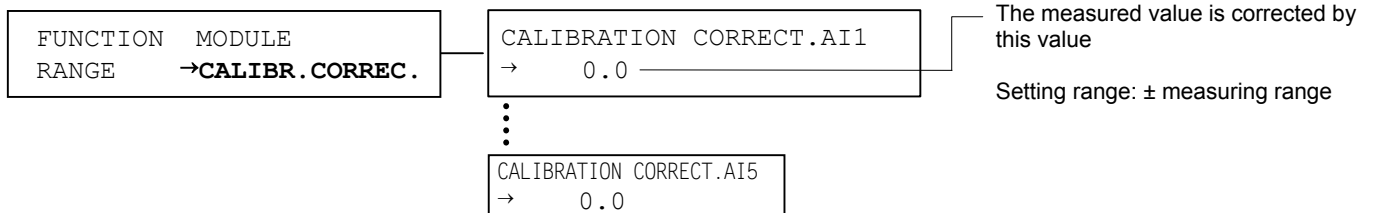
B.3.1.2 MODULE TYPE

Call: Main menu → Other def. → CONFIGURA. → ACTUAL VAL. → MODULE


B.3.1.3 RANGE

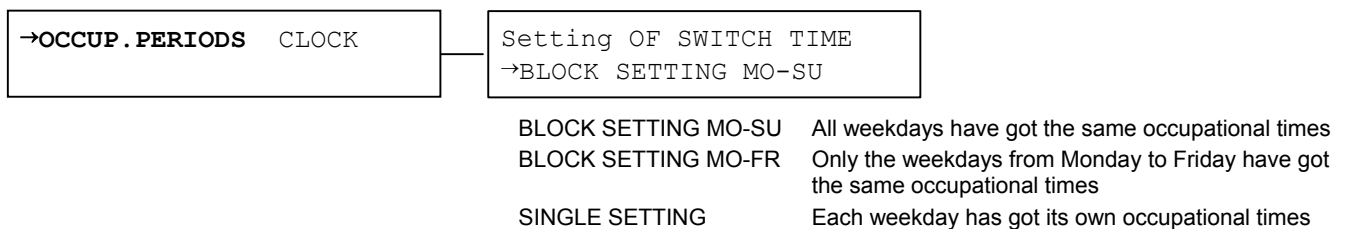
Call: Main menu → Other def. → CONFIGURA. → ACTUAL VAL. → RANGE


B.3.1.4 CALIBRATION CORRECTION

Call: Main menu → Other def. → CONFIGURA. → ACTUAL VAL. → CALIBR.CORREC.


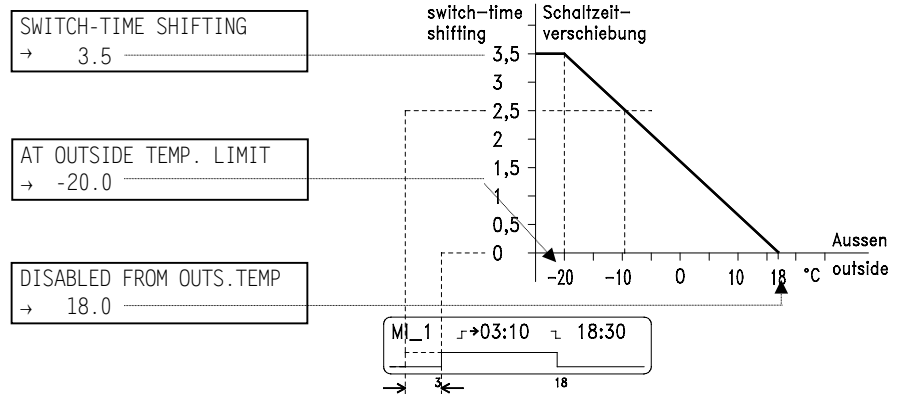
B.3.2 TIMES

B.3.2.1 OCCUPATIONAL TIMES

Call: Main menu → Other def. → CONFIGURA. → TIMES → OCCUP.PERIODS


Switch-time shifting

- Depending on the outside temperature, the start of service can be advanced.
- At the version with 'OPTIMISATION' this function is left out.



Operating Instructions

OI 6164

Switch-time optimisation

Self-learning optimisation of the switching times, i.e. switch-on of the heating installation as late as possible and switch-off as early as possible

 At the standard version, this function is left out.

OPTI-ADAPTION
→ INACTIVE

ACTIVE Self-adapted switch-on optimisation is active
INACTIVE Self-adapted switch-on optimisation is inactive, i.e. the result achieved up to now is frozen

SWITCH-OFF-OPTI
→ INACTIVE

ACTIVE Heating can be switch-off early if a residual heat is available
INACTIVE no early switch-off

Fast heating-up

During the heating-up phase, the setpoint is increased by this figure, until the room temperature will have achieved its setpoint.

FAST HEATING-UP
→ 0.0

B.3.2.2 CLOCK

Call: Main menu → Other def. → CONFIGURA. → TIMES → CLOCK

OCCUP. PERIODS → **CLOCK**

WEEKDAY
→ MO

→ MO
→ TU
→ WE
→ TH
→ FR
→ SA
→ SU

DATE (DAY.MONTH)
→ 10.07

DATE (YEAR)
→ 3

TIME (HOUR:MINUTE)
→ 09:35

DAYLIGHT SAVING TIME
→ AUTOMATIC

AUTOMATIC Summer- and winter time is changed over automatically
NO CHANGE-OVER for countries that do not allow a change-over

B.3.3 SETPOINTS

B.3.3.1 SETPOINT

Call: Main menu → Other def. → CONFIGURA. → SETPOINTS → SETPOINT

→ **SETPOINT** CORR./SETBACK
ROOM TEMP D.H.W.LOADING

CONTROLLER TYPE
→ OUTSIDE TEMP.COMPENSAT.

Loop 1

always active

OUTSIDE
TEMP.COMPENSAT.

The setpoint depends on the outside temperature, it is calculated on the basis of the setpoint curve.

CONSTANT

The setpoint is constant.

Loop 2

optionally active/unoccupied

NOT USED

CONSTANT WITH TIME #2
OUTSIDE T.C.WITH TIME #2

The setpoint is constant, it has its own occupational time. as above, but the setpoint depends on the outside temperature

CONSTANT WITH TIME #1

The setpoint is constant, it uses the occupational times of loop 1

OUTSIDE T.C.WITH TIME #1

as above, but the setpoint depends on the outside temperature

REPLACE SETP. AI3 ERROR
→ 65.0

Constant substitute setpoint in case of failure of the outside temperature sensor

Operating Instructions

OI 6164

B.3.3.2 CORR./SETBACK

Call: Main menu → Other def. → CONFIGURA. → SETPOINTS → CORR./SETBACK

SETPOINT → CORR./SETBACK
ROOM TEMP D.H.W.LOADING

SETP. CORRECTION POT. ±
→ 15.0

SETP. CORRECTION POT ±
→ 10.0

Influence of the return temperature

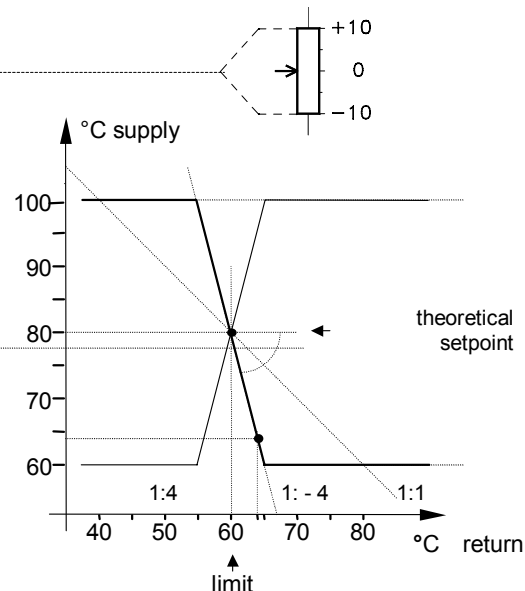


- If the return temperature differs from the adjusted setpoint, the supply temperature setpoint is displaced accordingly.
- RETURN RATIO 1:
-100 0 100
'-': inverse action
'+' : direct-action
- RETURN RATIO 1: 0 means no influence

MAX.SUPPLY INC. (RTN) -
→ 20.0

RETURN RATIO 1: -
→ -4.0

MAX.SUPPLY SETBK. (RTN) -
→ 20.0



B.3.3.3 ROOM TEMP.

Call: Main menu → Other def. → CONFIGURA. → SETPOINTS → ROOM TEMP

Influence of the room temperature

SETPOINT CORR./SETBACK
→ ROOM TEMP D.H.W.LOADING

MAX.SUPPLY INC. (ROOM)
→ 0.0



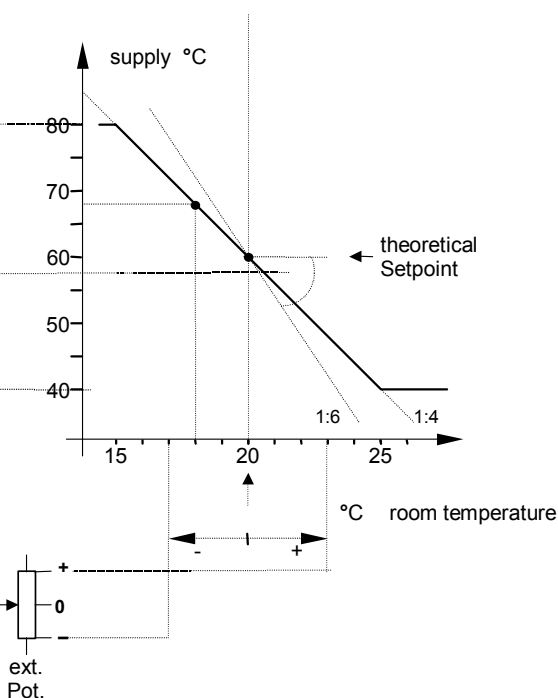
- If the room temperature differs from the adjusted setpoint, the supply temperature setpoint is displaced accordingly.
- ROOM RATIO 1:
-100 0 100
'-': inverse action
'+' : direct-action
- ROOM RATIO 1: 0 means no influence

MAX.SUPPLY INC. (ROOM) -
→ 20.0

ROOM RATIO 1: -
→ 4.0

MAX.SUPPLY SETBK. (ROOM) -
→ 20.0

ROOM CORRECTION POT. ± -
→ 3.0



Operating Instructions

OI 6164

B.3.3.4 D.H.W. LOADING

Call: Main menu → Other def. → CONFIGURA. → SETPOINTS → D.H.W.LOADING

SETPOINT CORR./SETBACK
ROOM TEMP → **D.H.W. LOADING**

D.H.W. DESINFECTION
→ MO-SU

D.H.W. disinfection

- is only possible if there is at least one D.H.W. sensor.
- With a D.H.W. with 2 sensors, the sensor 'D.H.W.LOADING OFF' is decisive because it is normally located at the bottom.
- The disinfection always starts at 0 o'clock and ends with reaching the set D.H.W. temperature. Factory setting:
Supply temperature: 75 °C
D.H.W. temperature: 65 °C
- The circulation pump should run as well during the disinfection (if necessary, extend the time program).

OFF
MO, TU, WE, TH, FR, SA, SU
MO-SU

no D.H.W. disinfection
Disinfection is realised on the selected weekday
Disinfection is realised every day

Supplying heating circuit

Here it is defined, which heating circuit supplies the D.H.W., i.e. the allocated heating circuit is then switched on and its setpoint is changed over if necessary.

SETPOINT LOADING TEMP.
→ ONTO LOOP #1

ONTO LOOP #1	Heat supply takes place via loop 1
ONTO LOOP #2	Heat supply takes place via loop 2
NOT OPERATIVE	independent heat supply

Setpoint of loading temperature

- The supply temperature setpoint of the supplying heating circuit.
- Always the maximum setpoint of the one which is entered here and of the one of the heating circuit is changed over.

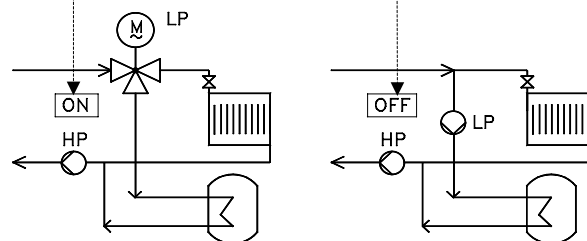
SETPOINT LOADING TEMP.
→ 70.0

Reaction of the heating pump

- According to the installation design, you can choose here, how the heating pump shall be switched in case of the D.H.W. loading.

REACTION HEATING PUMP
→ AUTOMATIC

AUTOMATIC	The heating pump works independently of the D.H.W. loading
OFF	The heating pump is switched off inevitably
ON	The heating pump is switched on inevitably



Reaction of the control valve

According to the installation design, you can choose here, how the control valve shall be actuated in case of the D.H.W. loading.

REACTION CONTROL VALVE
→ AUTOMATIC

AUTOMATIC	The control valve works like in automatic mode
CLOSED	The control valve is closed inevitably (e.g. in long-distance energy installations with limited amount of water)

Operating Instructions

OI 6164

Behaviour after the D.H.W. loading

- If the D.H.W. loading takes place via a thermostat, it is changed over to the heating mode without delay (loading pump Off, heating pump On, the supply setpoint depends on that of the heating circuit).
- If the D.H.W. loading takes place via one/two sensor(s), the setback can take place with delay.
- After the D.H.W. loading, the setpoint is changed over immediately, the load- and heating pumps are changed over with delay, until one of the two following conditions is fulfilled.

Temperature difference

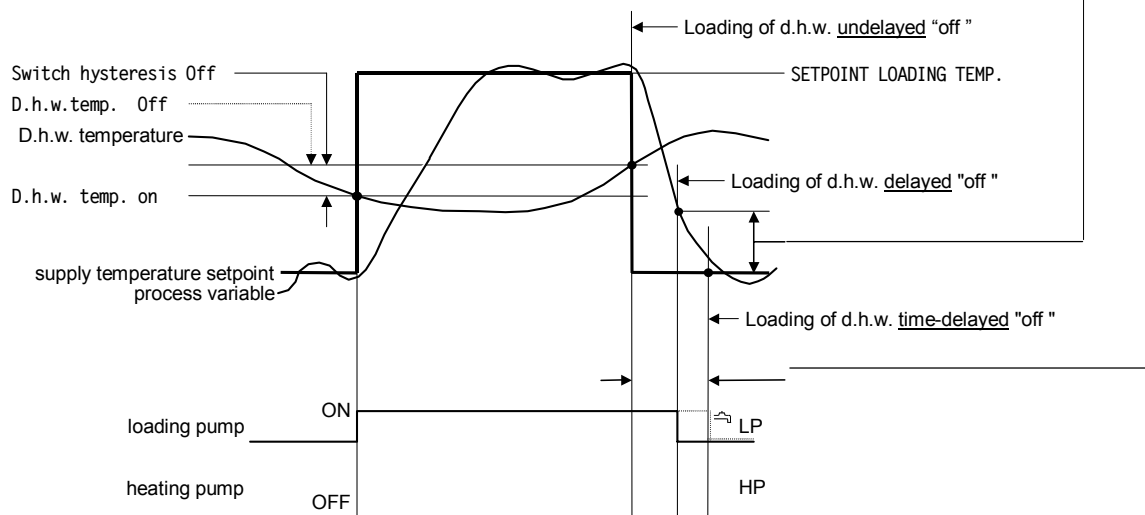
If the temperature difference between actual value and setpoint reaches the value which is set here, the setback will be activated.

TEMPERATURE DIFFERENTIAL
→ 10.0

Delay of switch-time

Then the setback takes place after this time at the latest.

SWITCH TIME-DELAY (MIN)
→ 10.0



B.3.4 MISCELLANEOUS

B.3.4.1 STATUS/MANU

Call: Main menu → Other def. → CONFIGURA. → OTHER DEF. → STATUS/MAN.

→STATUS/MAN. DIGITAL I.
BLOCKING MISCELLAN.

FUNCTION ONTO DO3
→NOT USED

Function onto digital output

- Control loop 1 occupies DO1 and DO2
- Control loop 2 occupies DO4 and DO5. DO5 will stay free when control loop 2 is not used.
- DO3 and DO6 can be allocated freely.
- Please bear in mind that the same function was not defined for several DO.
- Max. 1 circulation pump
- Max. 1 loading pump

NOT USED

HEATING PUMP #1
HEATING PUMP #1
CIRC. PUMP WITH TIME #1
CIRC. PUMP WITH TIME #2
LOADING PUMP W.TIME #1
LOADING PUMP W.TIME #2
ALARM1
ALARM2

evident

Heating pump control loop 1
Heating pump control loop 2
Circulation pump according to occupational time of loop 1
Circulation pump according to occupational time of loop 2
Loading pump according to occupational time of loop 1
Loading pump according to occupational time of loop 2
as alarm output 1
as alarm output 2

Operating Instructions

OI 6164

Function onto DO5 and DO6

as for DO3

FUNCTION ONTO DO5
→NOT USED

FUNCTION ONTO DO6
→NOT USED

Pump on delay (0.0 –25.0 Min.)

- Delay time of pump for heating pump.
- No delay after deblocking

PUMP ON DELAY (MIN)
→ 0.0

Pump deblocking (0.0 –25.0 Min.)

- Prevention against getting stuck of pumps
- Deblocking switches pump shortly on, every day at 12:48 if the pump has not run for 24 hours.

PUMP DEBLOCKING (MIN)
→ 0.0

Summer/Winter mode

- The heating is released in winter, in summer the heating is out of operation.
- Deblocking switches pump on, shortly every day at 12:48 if the pump has not run for 24 hours.

SUMMER/WINTER-MODE
→1-DAILY AVERAGE AI3

1-DAILY AVERAGE AI3

A daily average value of the outside temperature is created out of 6 values (always at 0:00 h, 4:16 h, 8:32 h, 12:48 h, 17:04 h, 21:20 h). The switch-time is always 21:20 h.

1-DAILIES AVERAGE AI3

as above, but an average value of a sequence of 2 days is applied

DIRECT AI3

it is changed over according to the current outside temperature

Outside temperature winter

Limiting value to change over to winter mode

OUTSIDE TEMP. WINTER
→ 18.0

Outside temperature summer

Limiting value to change over to summer mode

OUTSIDE TEMP. SUMMER
→ 19.0

Admissible periods for summer mode

Summer mode is only admissible during this period, i.e. outside this period there is inevitably winter mode.

PERIODS SUMMER MODE
FROM→16.05 TO 20.09

Behaviour outside the occupational time

OUT OF NORMINAL MODE
→STANDBY

STANDBY

Heating Off (valve Closed, pump Off)

REDUCED MODE

Heating remains in operation, only the setpoint is decreased. The room influence is deactivated.

Failure of supply temperature

ERROR SUPPLY TEMP.
→VALVE CLOSE

VALVE CLOSE Control valve closes

VALVE STOP Control valve is stopped

Definition alarm type, canal

ALARM1 TYPE, AI
→A, AI1

A, AI1	Alarm type A: Limiting value changes with the setpoint of loop 1
A, AI4	Alarm type A: Limiting value changes with the setpoint of loop 2
B, AI1	Alarm type B, fixed limiting value of analog input 1
B, AI2	Alarm type B, fixed limiting value of analog input 2
B, AI3	Alarm type B, fixed limiting value of analog input 3
B, AI4	Alarm type B, fixed limiting value of analog input 4
B, AI5	Alarm type B, fixed limiting value of analog input 5

Operating Instructions

OI 6164

Limiting value of alarm

determines the switching point of the alarm:

- Type A: relative limit to the setpoint
- Type B: absolute limit

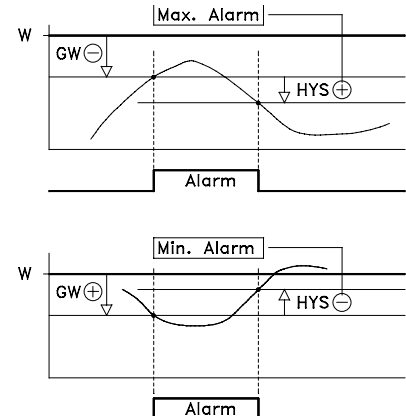
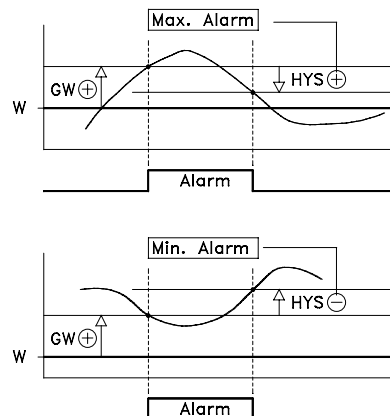
ALARM1 LIMIT
→ 10.0

Alarm switch-back hysteresis

The sign of the hysteresis has a special meaning:

- positive : max. alarm
- negative : min. alarm

ALARM1 HYST.
→ 10.0



Alarm suppression

An arriving alarm is only output if it is permanently available within this period. 0.0 means no suppression.

ALARM1 SUPPRESS. (MIN).
→ 10.0

DO-LOGIC INVERTED

- Normal DO-Logic means:
DO=0/1 Relay is released/picks up
- Inverted DO-Logic means:
DO=0/1 Relay picks up/is released
- DO1 and DO2 shall not be inverted as with status 'STOP', both Open- and Closed-relays pick up, which can lead to a malfunction.
- as above, but for DO4 and DO5 if control loop 2 is used

DO-LOGIC INVERTED
→ 0

The sum of all codes of the inverted relays. 0 means that all relays are not inverted.

	Code	DO
	1	1
	2	2
4	4	3
	8	4
	16	5
32	32	6

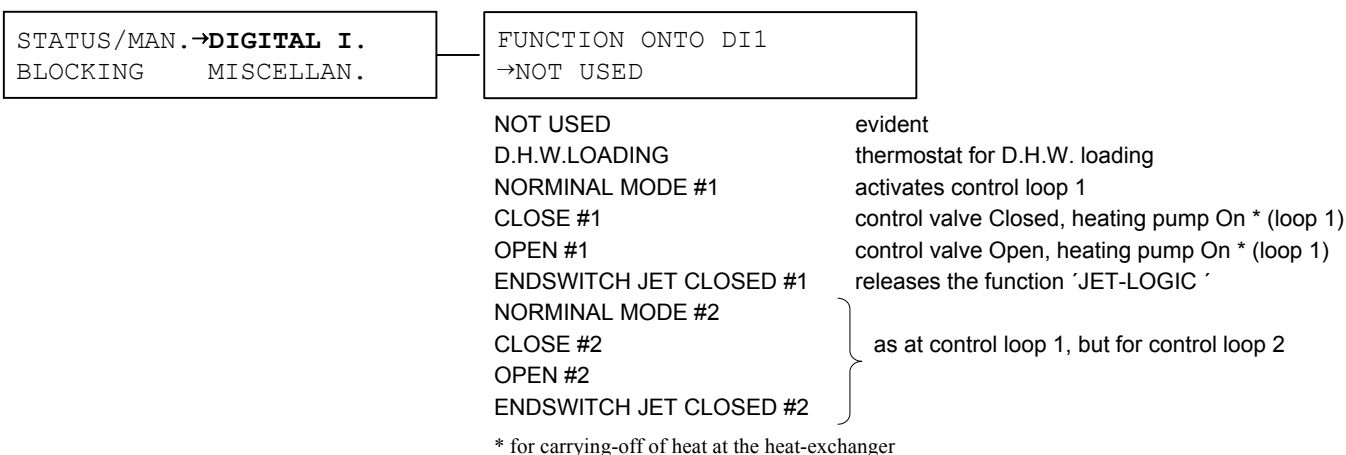
—36 Sum of all codes (Example: Relays 3 and 6 will be inverted)

Operating Instructions

OI 6164

B.3.4.2 DIGITAL IN

Call: Main menu → Other def. → CONFIGURA. → OTHER DEF. → DIGITAL I.



DI-Logic

determines the active status of the digital input

NORMAL active at status 1 (contact closes)
INVERT. active at status 0 (contact opens)

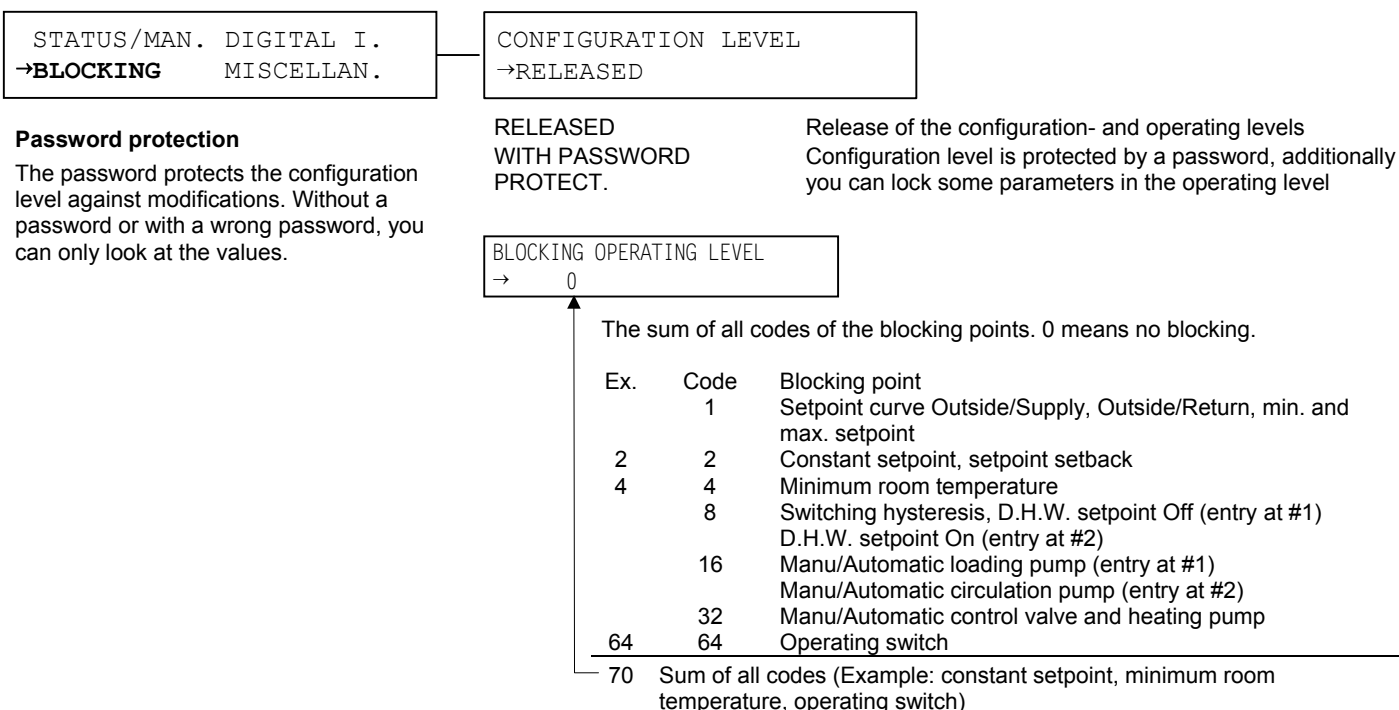
FUNCTION ONTO DI2
→ NOT USED

DI LOGIC
→ DI1 NORMAL DI2 NORMAL

DI1 NORMAL DI2 NORMAL
DI1 INVERT. DI2 NORMAL
DI1 NORMAL. DI2 INVERT
DI1 INVERT. DI2 INVERT.

B.3.4.3 BLOCKING

Call: Main menu → Other def. → CONFIGURA. → OTHER DEF. → BLOCKING



Operating Instructions

OI 6164

B.3.4.4 MISCELLANEOUS

B.3.4.4.1 CONTROL PARAMETERS

Call: Main menu → Other def. → CONFIGURA. → OTHER DEF. → MISCELLAN. → CONTROL PAR.

→ **CONTROL PAR.** JET-LOGIC
COMMUNICA. EEPROM

PROPORTIONAL BAND PB (%)
→0.0

P-part

- The P-part of a PI controller reacts to a sudden deviation with a shifting of the correcting variable without delay.
- With a big PB, the controller reacts more slowly to a deviation.
- With a small PB, the controller reacts faster to a deviation. If the PB is too small, the control loop tends to oscillate.
- The proportional band PB is the deviation which is necessary to get a shifting of the correcting variable of 100 %.
- Setting range: 0 ... 1000%
- **PB = 0%** changes the controller to three-point behaviour

I-part

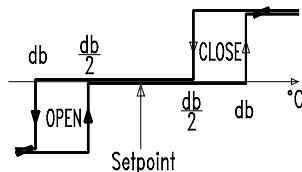
- The I-part of a PI controller reacts to a permanent deviation until it is eliminated.
- A fault can only be adjusted with the I-part.

INTEGRAL ACTION TIME(S)
→ 120.0

- The setback time T_n is the time which is necessary to get the same shifting of the correcting variable which is released by the P-part.
- Setting range: 0 ... 3000.0 sec.
- **Tn = 0%** changes the controller to two point behaviour.

Dead band db

- If the controller oscillates constantly between an Open- and a Close-instruction, the dead band db should be increased.



DEAD BAND
→ 1.0

- The dead band is the switching hysteresis between the Open- and Close-instruction of a three-point(step)controller.
- Setting range: 0 ... measuring range

ACTUATOR STROKE TIME
→ 60.0

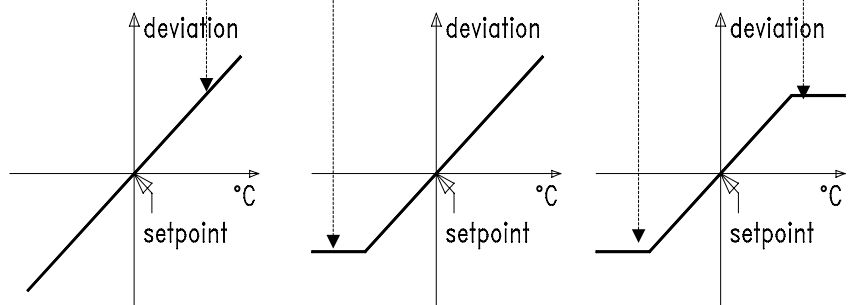
- is the opening time of the valve for the total stroke
- Setting range: 0 ... 600 s

Limitation of the deviation

- With a big deviation, the controller reacts as if deviation = limitation.
- The limitation has a special influence on the control behaviour during start-up because in this phase, the deviation normally is very big.

LIMITATION DEVIATION
→ 160.0

- limits the deviation to a defined value in order to get a gentle start-up behaviour
- setting range: 0 ... measuring range
- positive value: bilateral limitation
- negative value: unilateral negative limitation when actual value < setpoint
- measuring range: no limitation



Operating Instructions

OI 6164

B.3.4.4.2 JET-LOGIC

Call: Main menu → Other def. → CONFIGURA. → OTHER DEF. → MISCELLAN. → JET-LOGIC

CONTROL PAR. → **JET-LOGIC**
COMMUNICA. EEPROM

JET LOGIC
→ NOT OPERATIVE

NOT OPERATIVE

deactivates the function JET-LOGIC

CIRCULATION INTERRUPT

activates the function JET-LOGIC

JET-LOGIC

monitors the installation with a (water) ejector as positioning device for the following conditions:

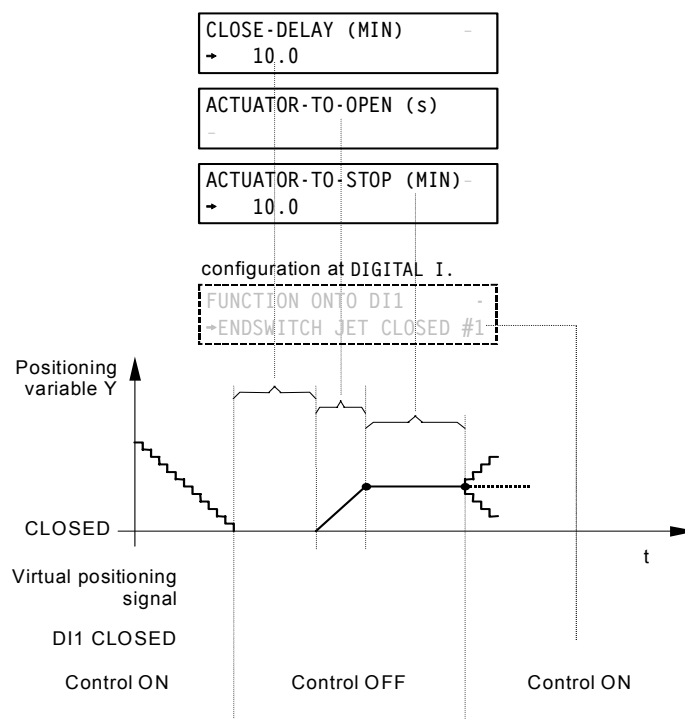
1. Absent circulation

If the supply sensor is located too close to the ejector, it can happen that the ejector is completely closed during the control mode because the controller closes the ejector slowly due to the too hot temperature which only cools down slowly because of the thick insulation. The installation remains cold, only the sensor is warm and there is no reason for the controller to open the ejector.

2. Return temperature > supply temperature

In installations with radiator thermostatic valves, the circulation can be interrupted; then the hot water in 01 forces directly into return 03; the temperature in return 03 exceeds that in the supply 04.

In both cases, the controller tries to bring the ejector - as shown below - back to a normal status. The adjustable times are adapted if necessary.



Operating Instructions

OI 6164

B.3.4.4.3 COMMUNICATION

Call: Main menu → Other def. → CONFIGURA. → OTHER DEF. → MISCELLAN. → COMMUNICA.

CONTROL PAR. JET-LOGIC
→ **COMMUNICA.** EEPROM

TRANSFER RATE
→ 19200

19200/9600/4800/2400 Transfer rate with protocol Modbus RTU
8 BIT, 1 STOPBIT, NONE. are fix, not adjustable

MODBUS ADDRESS
→ 1

Modbus address (1 ... 250)

AI'S BY MODBUS
→ 0

0...31

Sum of the codes of analog inputs whose values are taken via Modbus:

Analog input	Code
AI1	1
AI2	2
AI3	4
AI4	8
AI5	16

Sum of the corresponding codes **XX**

B.3.4.4.4 EEPROM

Call: Main menu → Other def. → CONFIGURA. → OTHER DEF. → MISCELLAN. → EEPROM

CONTROL PAR. JET-LOGIC
COMMUNICA. → **EEPROM**

ADDRESS EEPROM → 0
DATA VALUE

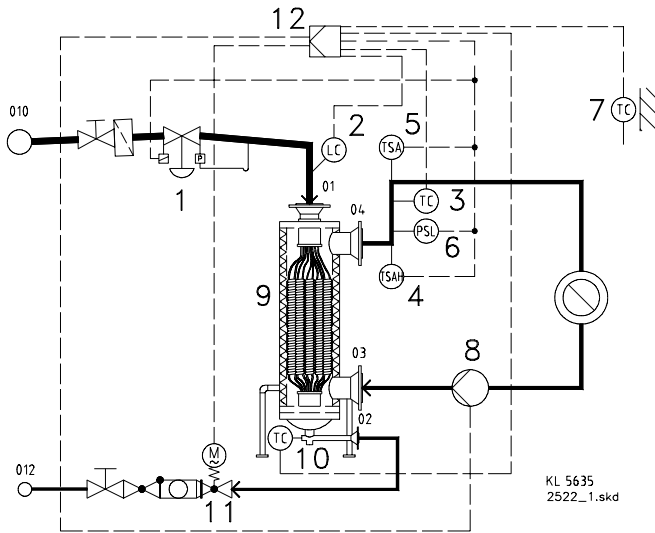
1 0-8191 EEPROM address
2 Data value

Operating Instructions

OI 6164

C. Examples for application

C.1 Steam-condensate heat transfer station



Legend

- 1 Steam quick-acting stop valve
- 2 Level probe (DI1) [1]
- 3 Supply temperature (AI1)
- 4 Safety temperature limiter STB [2]
- 5 Temperature guard TW [2]
- 6 Pressure switch [2]
- 7 Outside temperature (AI3)
- 8 Circulation pump (DO3) [3]
- 9 Steam-condensate heat transfer station
- 10 Condensate temperature (AI2) [4]
- 11 Motorised control valve (DO1, 2)
- 12 µClimatron baelz 6164-1-W

() Allocation of the canals baelz 6164 see

Function

- Supply temperature control controlled by atmospheric conditions [5] with maximum limiting of the condensate temperature by constant setback of the supply temperature setpoint [16]
- Steam mains drainage by opening the condensate valve
- Safety functions have to be realised by the customer, according to the regulations and instructions.

Determination:

- Occupational times: Mo.-Fr. 6 6:30 – 12:00 and 13:00 – 16:00 [7]
- Heating curve: Outside temp. Supply temp. [8]

-20°C	85°C
0°C	65°C
10°C	45°C
- Night setback: 10°C [9]
- max. setpoint: 85°C [10]; min. setpoint : 25°C [11]
- max. condensate temp.: 70°C [12]
- Outside temp.: baelz 23-3.1 [13]
- Supply temp.: baelz 24-3.3 [14]
- Condensate temp.: baelz 24-3.3 [15]

Configuration level:

FUNCTION ONTO AI2 [4]	RETURN LIMITATION #1
MEASURING MODULE AI1 [14]	NTC 3.13 0 ... 140
MEASURING MODULE AI2 [15]	NTC 3.13 0 ... 140
MEASURING MODULE AI3 [13]	NTC 3.11 -40 ... 60
SETTING OF SWITCH.TIME [6]	BLOCK SETTING MO-FR
CONTROLLER TYPE [5]	OUTSIDE TEMP. COMPENSAT.
MAX. SUPPLY INC..(RTN) [16]	0.0
RETURN RATIO 1: [16]	2
MAX.SUPPLY SETBK. (RTN) [16]	140.0
FUNCTION ONTO DO3 [3]	HEATING PUMP #1
OUT OF NOMINAL MODE [9]	REDUCED MODE
FUNCTION ONTO DI1 [1]	OPEN #1
FUNCTION ONTO DI2 [2]	CLOSE #1

Operating level:

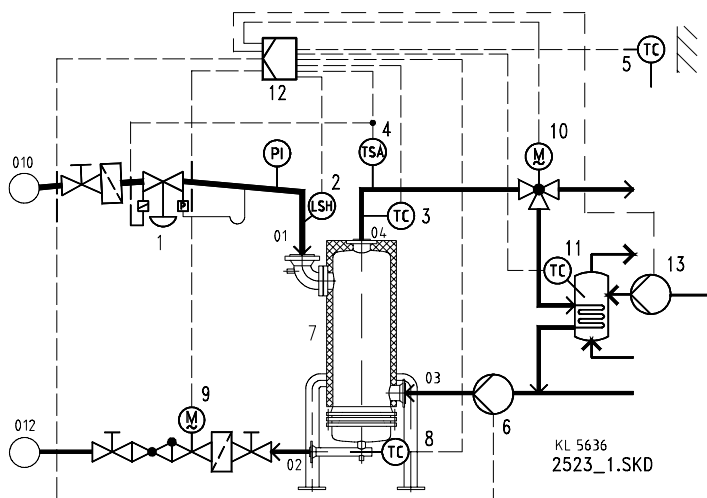
Switch time for #1	
MO_1 [7]	06:30 – 12:00
MO_2	13:00 – 16:00
Occupational times for Th. – Fr. by block setting [6]	
Setpoint for #1	
Maximum setpoint [10]	85.0
Outside_1 / Supply_1 [8]	-20.0 / 85.0
Outside_2 / Supply_2	0.0 / 65.0
Outside_3 / Supply_3	10.0 / 45.0
Outside_4 / Supply_4	--- / ---
Outside_5 / Supply_5	--- / ---
Minimum setpoint [11]	25.0
Corr./Setback for #1	
Setback range [9]	10.0
Outside_1 / Return_1 [12]	-20.0 / 70.0
Outside_2 / Return_2	--- / ---
Outside_3 / Return_3	--- / ---
Outside_4 / Return_4	--- / ---
Outside_5 / Return_5	--- / ---

The other parameters remain like the factory setting.

Operating Instructions

OI 6164

C.2 Steam-condensate heat transfer station with D.H.W. loading via sensor and diverting valve



Legend

- 1 Steam quick-acting stop valve
- 2 Level probe (DI1) [1]
- 3 Supply temperature (AI1)
- 4 Safety temperature limiter STB (DE2) [2]
- 5 Outside temperature (AI3)
- 6 Circulation pump (DO3) [3]
- 7 Steam-condensate heat transfer station
- 8 Condensate temperature (AI2) [4]
- 9 Motorised control valve (DO1, 2)
- 10 Diverting valve for D.H.W. loading (DO5) [5]
- 11 D.H.W. temperature (AI5) [6]
- 12 µClimatron baelz 6164-2-
- 13 Circulation pump (DO6) [7]

() Allocation of the canals baelz 6164 see

Function

- Supply temperature control controlled by atmospheric conditions [22] with maximum limiting of the condensate temperature by constant setback of the supply temperature setpoint [26]
- Steam mains drainage by opening the condensate valve
- D.H.W. temperature control via D.H.W. sensor and diverting valve with priority circuit. Time program for circulation pump
- Safety functions have to realised by the customer, according to the regulations and instructions.

Determination:

- Occupational times
 - for heat. circuit (#1): Mo.-Fr. [25] 6:30 – 12:00 and 13:00 – 16:00 [8]
 - for circ. pump (#2): Mo.-Fr. [25] 7:00 – 8:00 and 14:00 – 16:00 [9]
- Heating curve: Outside temp. Supply temp. [10]
 - 20°C 85°C
 - 0°C 65°C
 - 10°C 45°C
- Outside the occupational time: standby [11]
- max. setpoint: 85°C [12]; min. setpoint: 25°C [13]
- max. condensate temp.: 70°C [14]
- Outside temp.: baelz 23-PT [15]
- Supply temp.: baelz 24-PT [16]
- Condensate temp.: baelz 24-PT [17]
- D.H.W. temp.: baelz 24-PT [25]
- Loading temperature setpoint: 60°C [18]; supplied of loop 1 [23] [24]
 - D.H.W. temperature setpoint : 55°C [19]
 - Hysteresis: 2°C [20]
 - Delay time for switch-back: 5 Min. [21]

Configuration level:

FUNCTION ONTO AI2 [4]	RETURN LIMITATION #1
FUNCTION ONTO AI 5 [6]	D.H.W. LOADING ON
MEASURING MODULE AI1 [16]	PT100 2.49 -40 ... 120
MEASURING MODULE AI2 [17]	PT100 2.49 -40 ... 120
MEASURING MODULE AI3 [15]	PT100 2.49 -40 ... 120
MEASURING MODULE AI5 [25]	PT100 2.49 -40 ... 120
SETTING OF SWITCH.TIME 1) [25]	BLOCK SETTING MO-FR
CONTROLLER TYPE [22]	OUTSIDE TEMP. COMPENSAT.
MAX. SUPPLY INC..(RTN) [26]	0.0
RETURN RATIO 1: [26]	2
MAX. SUPPLY SETBK..(RTN) [26]	160.0
SETPOINT LOADING TEMP. [23]	ONTO LOOP #1
SETPOINT LOADING TEMP. [18]	60°C
REACTION HEATING PUMP [24]	ON
REACTION CONTROL VALVE [24]	AUTOMATIC
SWITCH.TIME DELAY(MIN) [21]	5.0
FUNCTION ONTO DO 3 [3]	HEATING PUMP #1
FUNCTION ONTO DO 5 [5]	LOADING PUMP W.TIME #1
FUNCTION ONTO DO 6 [7]	CIRC. PUMP WITH TIME #2
OUT OF NOMINAL MODE [11]	STANDBY
FUNCTION ONTO DI1 [1]	OPEN #1
FUNCTION ONTO DI2 [2]	CLOSE #1

Operating level:

Switch. time for #1 (heating circuit)	
MO_12) [8]	06:30 – 12:00
MO_22) [8]	13:00 – 16:00
Switch. time for #2 (circulation pump)	
MO_12) [9]	07:00 – 08:00
MO_22) [9]	14:00 – 16:00
Setpoint for #1 (heating circuit)	
Maximum setpoint [12]	85.0
Outside_1 / Supply_1 [10]	-20.0 / 85.0
Outside_2 / Supply_2	0.0 / 65.0
Outside_3 / Supply_3	10.0 / 45.0
Outside_4 / Supply_4	--- / ---
Outside_5 / Supply_5	--- / ---
Minimum setpoint [13]	25.0
Corr./Setback #1 (heating circuit)	
Outside_1 / Return_1 [14]	-20.0 / 70.0
Outside_2 / Return_2	--- / ---
Outside_2 / Return_3	--- / ---
Outside_2 / Return_4	--- / ---
Outside_2 / Return_5	--- / ---
D.H.W. loading	
D.h.w.loading Release [24]	Time dependent
D.h.w.temp. on [19]	55.0
Switch hysteresis off [20]	2.0

1) for #1 and #2 2) occupational times for Th. – Fr. by block setting

The other parameters remain like the factory setting.