R 2200 – 42x - … 4-zones heat only controller
R 2200 – 62x - … 6-zones heat only controller
R 2200 – 82x - … 8-zones heat only controller

With serial interface RS232 or RS485
Data transmission: ELOTECH standard protocoll ASCII

DESCRIPTION AND OPERATING MANUAL

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Contents

Type code	Page	3	
System, general		4	
Connection diagram, bist. voltage control outputs		5	
Connection diagram, relay control outputs		6	
Parameter levels, general		7	
Configuration, general (zone 0)		8	General settings
Configuration, zone dependend		11	Individual settings for each zone
Parameter level		14	Individual settings for each zone
Technical data		18	
Installation instructions		19	

Note:

Only trained personnel following the regional safety regulations may operate the hereby discribed instruments.
It is essential, that one has well experience in installing electric devices.

Please read this operating manual carefully, before starting up.
Observe the specific installation and connecting instructions.

The instrument is not suitable for installation in hazardous areas.

Do not open the device while the power lines are connected.

Take care to the separat interface- and data transmission descriptions.

Before operation, the unit must be configurated for its intended purpose under an expert guidance.
E.g. controller type, sensor type and range, alarm adjustment etc.
See: Configuration and Parameter levels.

Attention:
The „heating“- or „cooling“-outputs can be active while programming or configuring the controller.
This can cause a damage either to the plant itself or its contents.

Disclaimer of liability
We have checked the contents of the document for conformity with the hardware and software described. Nevertheless, we are unable to preclude the possibility of deviations so that we are unable to assume warranty for full compliance. The information given in the publication is, however, reviewed regularly. Necessary amendments are incorporated in the following editions.
We would be pleased to receive any improvement proposals which you may have.
This document may not be passed on nor duplicated, nor may its contents be used or disclosed unless expressly permitted. Violations of this clause will necessarily lead to compensation in damages.

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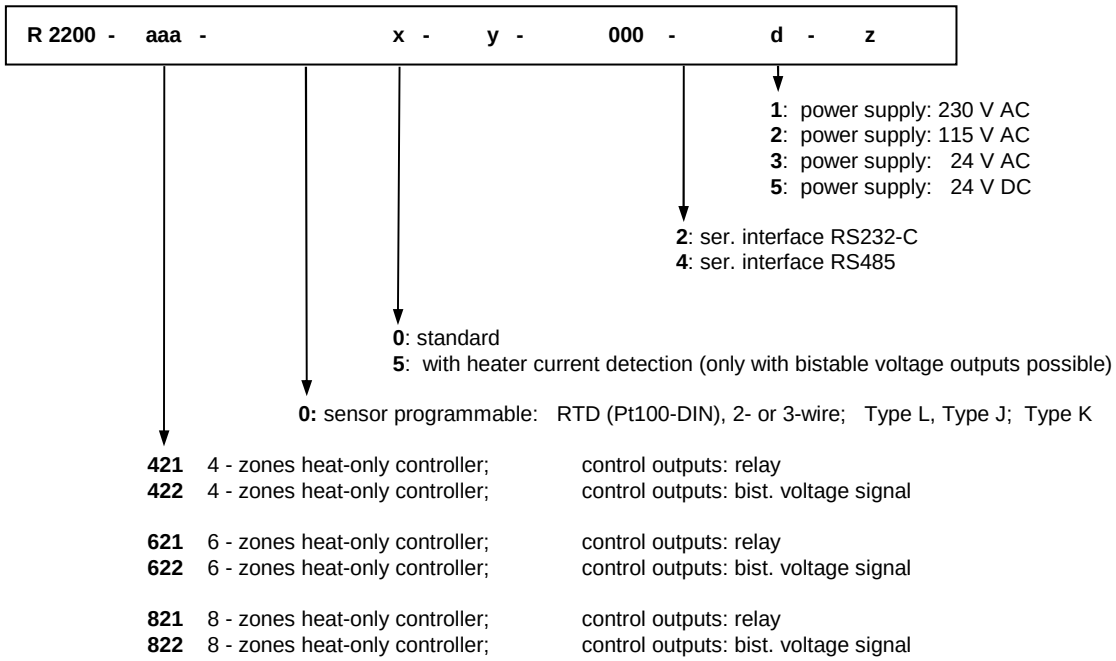


Multizones temperature controller series R2200:

* Contents 4, 6 or 8 independent „heat-only“ - controllers (2-point)

* Temperature sensors programmable for each zone individually.
  Fe-CuNi(L), Type J, NiCr-Ni(K); Pt100/RTD(2- or 3-wire connection).

* Control action programmable: P-, PD-, PI- or PD/I (=PIDmod.).
  PD/I : This means, controlling without deviation and with practically no overshoot during start-up.
* With autotune - algorithm to adjust the PID - Parameters.

* With RS485 or RS232 - interface

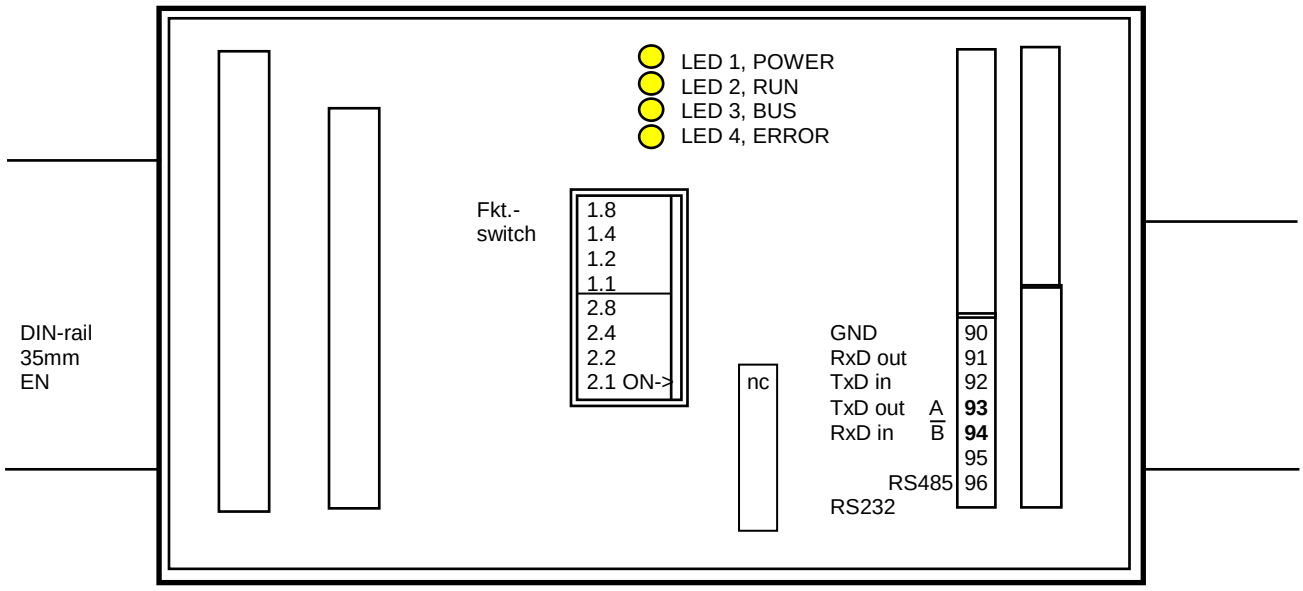
* Sytem monitoring and error codes signalisation via serial interface.

* Heater current monitoring (option).

* Softstart function

* Auto / manual function. E.g. in case of sensor break.

* 2 Alarm relais (collectors).
  Alarm values programmable.



Controller unit: **R2200**

Connection diagram: **see next pages.**

Data transfer: **see „Ser. Interface; Data transfer SST2000E“.**

LED 1: power:	Power on
LED 2: clock:	CPU active
LED 3: clock:	Ser. interface RS232, RS485 active (terminals 90...96).
LED 4: clock or permanent:	System-Error

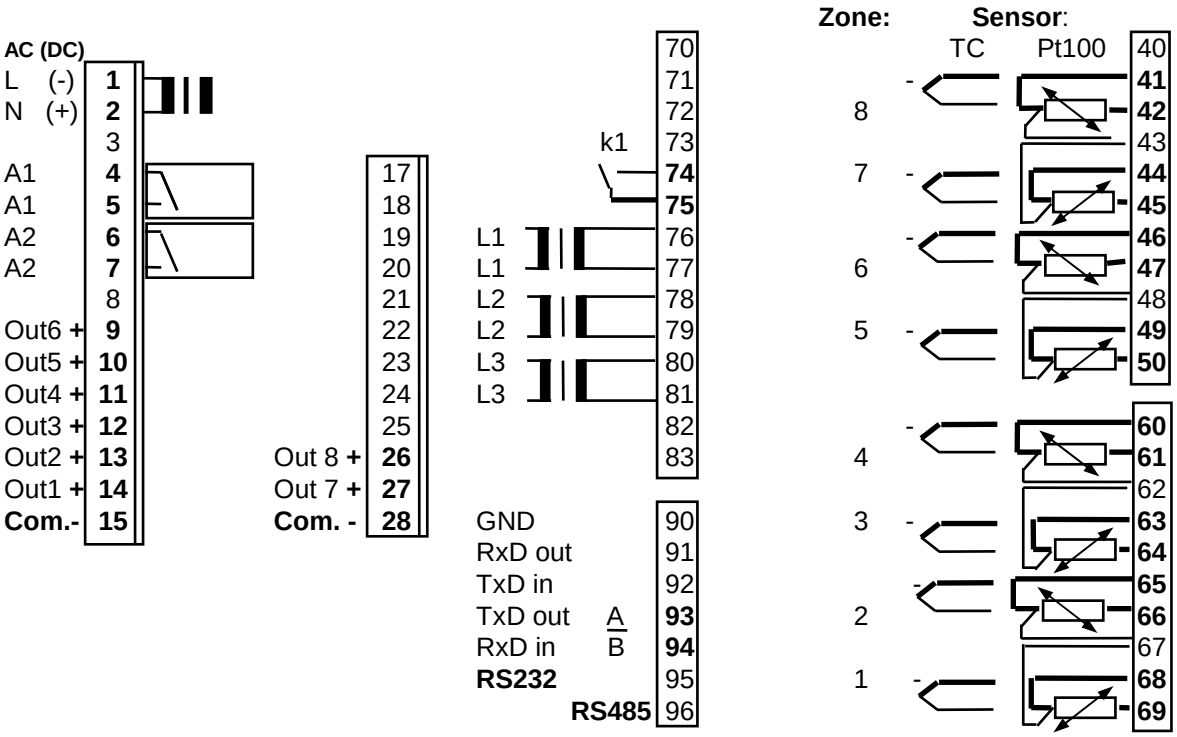
Switch:	**1.8**	**1.4**	**Protocol selection**
	off	off	not allowed
	off	on	not allowed
	on	off	ELOTECH – Standard Protocol; ASCII
	on	on	not allowed

Switch:	**1.2**	**Data transmission rate**
	off	ELOTECH – Standard Protocol; ASCII: 9600Baud
	on	ELOTECH – Standard Protocol; ASCII: 4800Baud

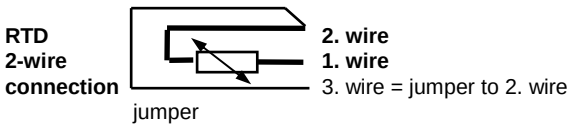
Switch:	**1.1**	**Data transmission format**
	off	ELOTECH – Standard Protocol; ASCII: 7 E 1 (7data bit, even parity, 1 stoppbit)
	on	ELOTECH – Standard Protocol; ASCIII:8 N 1 (8data bit, no parity, 1 stoppbit)

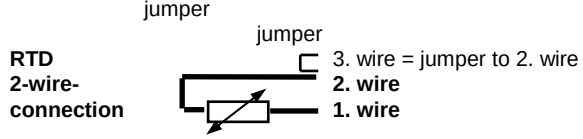
Switch:		**Unit Adress 1**:	**2**:	**3**:	**4**:	**15**:	**16**:
	2.8	off	off	off	off	on	on
	2.4	off	off	off	off	on	on
	2.2	off	off	on	on	on	on
	2.1	off	on	off	on	off	on

Connection Diagram, Voltage Outputs 0/18VDC: R2200-426, R2200-626, R2200-826



It is not permitted to connect the grounds of the sensor-inputs and bist. voltage-outputs with each other.





4 - zones controller	**Control output OUT 1:**	Zone 1;	2-point-controller
	Control output OUT 2:	Zone 2;	2-point-controller
	Control output OUT 3:	Zone 3;	2-point-controller
	Control output OUT 4:	Zone 4;	2-point-controller
6 - zones controller	**Control output OUT 5:**	Zone 5;	2-point-controller
	Control output OUT 6:	Zone 6;	2-point-controller
8 - zones controller	**Control output OUT 7:**	Zone 7;	2-point-controller
	Control output OUT 8:	Zone 8;	2-point-controller

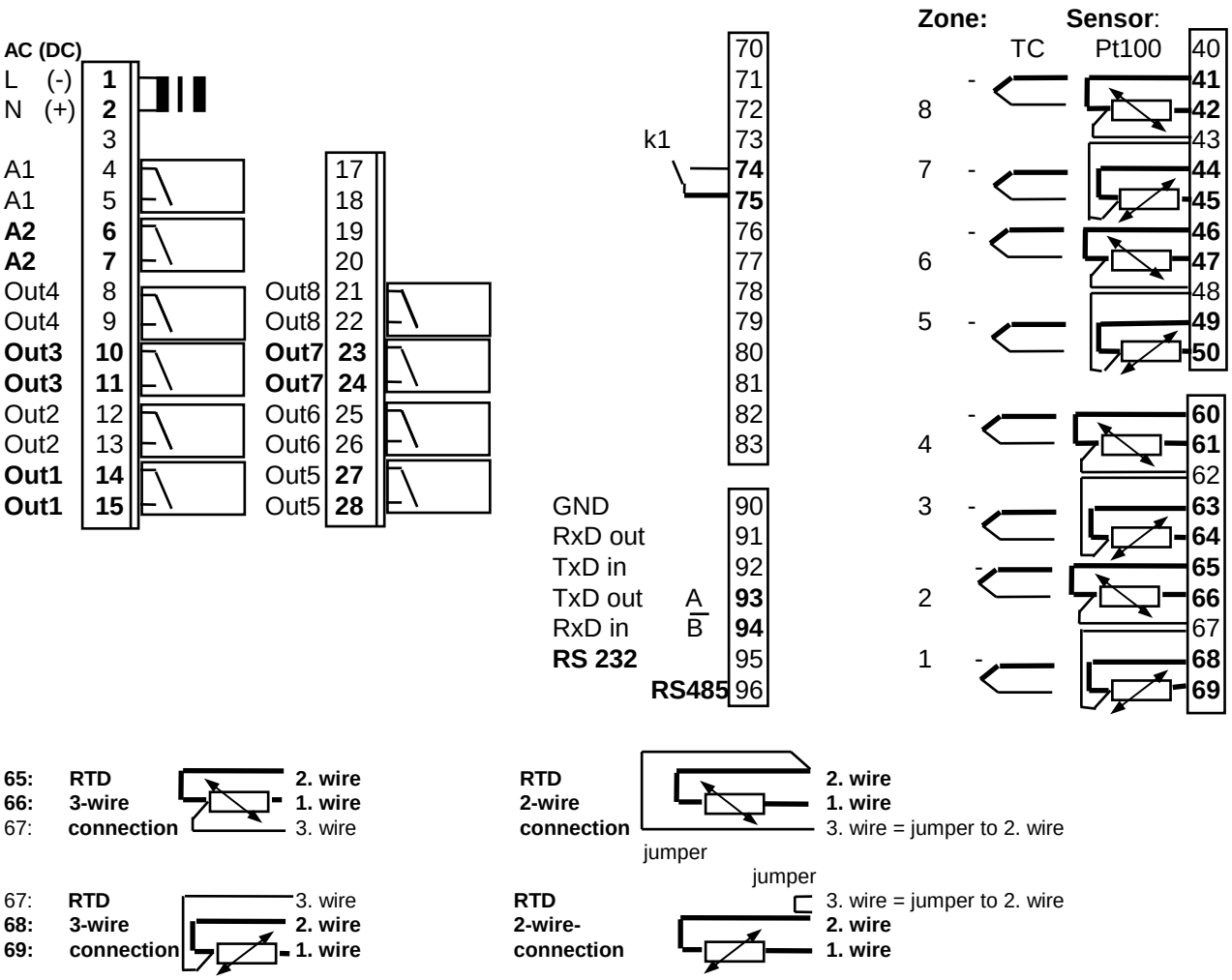
Alarm Output A1: Alarm 1 (Temperature alarm A1 for all zones)
Alarm Output A2: Alarm 2 (Temperature alarm A2 for all zones)

Setpoint Controlling:	K1: open	=	Setpoint 1 (SP1) valid, for all zones
	K1: closed	=	Setpoint 2 (SP2) valid, for all zones

Heater current monitoring: 1 current – transformer / phase

Single phase operation: terminals 76, 77:	L1
Three-phase operation: terminals 76 – 81:	L1, L2, L3

Connection Diagram, Relay Outputs: R2200-421, R2200-621, R2200-821



4 - zones controller	**Control output OUT 1:**	Zone 1;	2-point-controller
	Control output OUT 2:	Zone 2;	2-point-controller
	Control output OUT 3:	Zone 3;	2-point-controller
	Control output OUT 4:	Zone 4;	2-point-controller
6 - zones controller	**Control output OUT 5:**	Zone 5;	2-point-controller
	Control output OUT 6:	Zone 6;	2-point-controller
8 - zones controller	**Control output OUT 7:**	Zone 7;	2-point-controller
	Control output OUT 8:	Zone 8;	2-point-controller

Alarm Output A1: Alarm 1 (Temperature alarm A1 for all zones)
Alarm Output A2: Alarm 2 (Temperature alarm A2 for all zones)

Setpoint Controlling:	K1: open	=	Setpoint 1 (SP1) valid, for all zones
	K1: closed	=	Setpoint 2 (SP2) valid, for all zones

Parameter Levels, general

Primary settings have to be made before taking the instrument into operation.

There are different levels:

CONFIGURATION LEVEL, general: adressed via zone 0

This has to be programmed at first (parameter valid for the complete device):
- Only TC- or RTD-connection for all zones? Or: Mixed connection ?
- Alarm configuration (valid for all zones)
- Heater current detection

CONFIGURATION and PARAMETER LEVEL: adressed via the individual zones

This has to be programmed at second (zone dependent parameters):

- Zone on/off
- Controller type
- Input type (sensor type), sensor range
- Min. and max. setpoint range
- Softstart function
- Auto- / manual mode

- Actual temperature value (read-only)
- Setpoint
- Setpoint ramps
- Alarm values
- Heater current value (read-only)
- Status word 1

- The controller (PID)- parameters have to be set here
- Self tuning function (auto tune)

The single parameters and the parmeter codes of the device are described on the next pages

Parameter-description		Parameter value
Sensor mix (Pt100, RTD / Thermocouple-Mix)	**Code: 8E H** (r/w)	**4-zones controller:** 0 only TC connection 1 Zones 1- 2 : Pt100 - others : TC connection 2 only Pt100 connection (ex works) **6-zones controller:** 0 only TC connection 1 Zones 1- 2 : Pt100 - others : TC connection 2 Zones 1- 4 : Pt100 - others : TC connection 3 only Pt100 connection (ex works) **8-zones controller:** 0 only TC connection 1 Zones 1- 2 : Pt100 - others : TC connection 2 Zones 1- 4 : Pt100 - others : TC connection 3 Zones 1- 6 : Pt100 - others : TC 4 only Pt100 connection (ex works)

ALARM MONITORING: FUNCTION:

There are 2 alarm relays built in.
It is possible to configure this contacts either to monitor a temperature or to monitor the heater-current.

The selected configuration is effective for all control zones.
The individual temperature or heater current alarms A1 (or A2) of all zones are connected to the main, common contact A1 (or A2).

Please note:
In case of sensor error the alarms will react in the same way as range override. The alarm contacts therefore do not offer protection against all types of plant breakdown. With this in mind, we recommend the use of a second, independent monitor unit.
Care should be used to ensure, that the setpoints of the alarm contacts are programmed within the selected measuring range.
If a setpoint ramp has been programmed, the alarms that are relative to the setpoint (signal contact, limit comparator) are following the setpoint up the ramp.

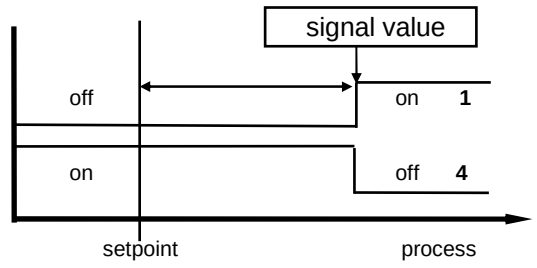
Alarm signalisation to the host: See status word 1.

Alarm value setting: See parameters A1 and A2

Parameter-description		Parameter-value		
Alarm 1-Configuration (switches relay A1)	**Code: 34 H** (r/w)	0	alarm OFF, no alarm signalisation	(ex works)
		1	signal contact, setpoint depentend:	off-on
		2	limit contact, process value dependend:	off-on
		3	limit comparator:	off-on-off
		4	signal contact:	on-off
		5	limit contact:	on-off
		6	limit comparator:	on-off-on
		7	limit comp. with start-up suppression:	off-on-off
		8	**heater current monitoring; limit contact:**	**off-on**
		9	**heater current monitoring; limit contact:**	**on-off**
Relay A1 switching behaviour	**Code: 3C H** (r/w)	0 = dir	on: Relay A1 "activated"	(ex works)
			off: Relay A1 "not active"	
		1 = inv	on: Relay A1 "not active"	
			off: Relay A1 "activated"	
Alarm 2-Configuration (switches relay A2)	**Code: 35 H** (r/w)	0	alarm OFF, no alarm signalisation	(ex works)
		1	signal contact, setpoint depentend:	off-on
		2	limit contact, process value dependend:	off-on
		3	limit comparator:	off-on-off
		4	signal contact:	on-off
		5	limit contact:	on-off
		6	limit comparator:	on-off-on
		7	limit comp. with start-up suppression:	off-on-off
		8	**heater current monitoring; limit contact:**	**off-on**
		9	**heater current monitoring; limit contact:**	**on-off**
Relay A2 switching behaviour	**Code: 3D4 H** (r/w)	0 = dir	on: Relay A2 "activated"	(ex works)
			off: Relay A2 "not active"	
		1 = inv	on: Relay A2 "not active"	
			off: Relay A2 "activated"	

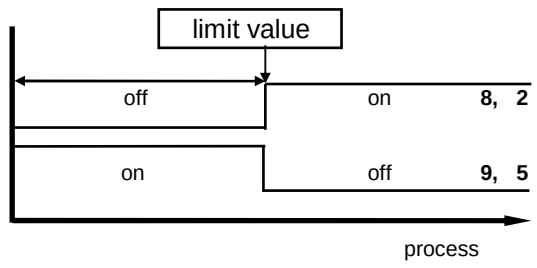
The signal contact is adjusted and displayed relative to the setpoint (deviation alarm).

Switching behaviour: re.Ax=0 **Configuration:**



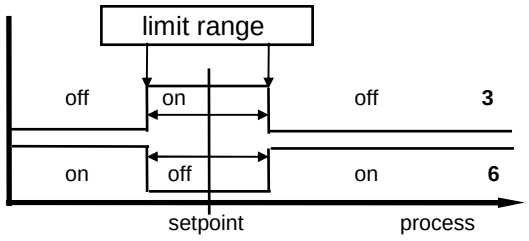
The limit contact is adjusted and displayed as an absolute value (see also heater current monitoring).

Switching behaviour: re.Ax=0 **Configuration:**



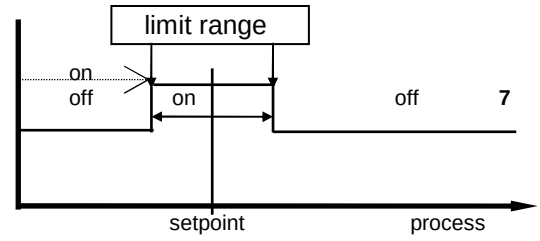
The limit comparator is adjusted and displayed relative to the setpoint. The selected value is effective below and above the setpoint.

Switching behaviour: re.Ax=0 **Configuration:**



The alarm relay of the limit comparator with start-up suppression is activated when the controller is first switched on. It is only then deactivated, when the process value has been within, and left, the o.k. -zone.

Switching behaviour: re.Ax=0 **Configuration:**



Heater current monitoring (option)

The following parameters are only relevant, if the heater current monitoring system is activated as descriped below:

Heater current monitoring via relay A1: Program parameter “Alarm 1, configuration” to number 8 or 9
Heater current monitoring via relay A2: Program parameter “Alarm 2, configuration” to number 8 or 9

The heater current to be monitored, has to be programed as an absolute value into the operating level for both relays A1 and A2.
See Parameter: „alarm value A1 / 38 H“ and/or „alarm value A2 / 39 H“.

Please note:
If the supply voltage is low, the heater current has to be higher than the monitoring value. Otherwise the alarm signal will be activated.
If the heater current value falls below the monitoring value, an alarm signal (the relay switches) will be activated.
With the help of the parameter „delay time relay A1“ or „delay time relay A2“ it is possible, to program a delay time.
If you do so, it is virtually impossible to get an unauthorized alarm signal.
When switching the power-on, the alarm signalisation will be suppressed until the heating current values for all zones has been scanned
and verified.
The monitoring function and all possible adjustments are valid for all connected heating zones.

Parameter-description		Parameter-value	
Delay time, relay A1 (monitoring via relay A1)	**Code: 3E H** (r/w)	0,1,2,3,4,5 0 = no delay time The delay time depends of the current detection intervall time and the number of the active controller zones. It will be calculated as follows. dL=ZnxCu.CYxS (S = 0,1,2,3,4 or 5)	5 steps adjustable (in sec.)
Delay time, relay A2 (monitoring via relay A2)	**Code: 3F H** (r/w)	0,1,2,3,4,5 0 = no delay time The delay time depends of the current detection intervall time and the number of the active controller zones. It will be calculated as follows. dL=ZnxCu.CYxS (S = 0,1,2,3,4 or 5)	5 steps adjustable (in sec.)
Current detection intervall	**Code: 31 H** (r/w)	1 ... 60 sec.	Time between the current measuring of two zones following each other.
Min. leakage current value	**Code: 32 H** (r/w)	OFF; 0,0...99,9 A Adjustment of the allowed min. leakage current value. In operation the min. leakage current value will be subtracted from the measured actual current value to calculate the real heater current value. If a permanent current is detected in one zone, the alarm relay will be activated. **Please note:** SSR`s (especially if they are combined with RC-combinations) normally have small leakage currents. Heaters also have small leakage currents.	
Leakage current	**Code: 12 H** (r/w)	0,0...99,9 A	Actual Leakage current (sum), if no SSR is switched on.

Technical data: Heater current monitoring

Current transformer 1:1000: (Type M2000)	Passive through current transformer with snap-in attachment for DIN rail mounting (EN 50022, 35mm). Connections to the controller: 2 x 6,3mm flat connectors.
Heater current detection and indication range:	0...max. 60,0A. Single-phase operation. 0...max. 99,9 A. Three-phase operation. The sum of the current of all three phases of one controller zone will be monitored. Variations of the power supply voltage have to be considered when the the alarm values are programmed.

Configurations

Individual selectable for zones 1...4, 1...6, 1...8

Parameter description		Parameter value		
Zone on / off	**Code: 8F** H (r/w)	0	OFF:	measuring- or controller zone „off“
		1	on:	measuring- or controller zone „on“
Controller configuration	**Code: 80** H (r/w)	0	2-point-controller „heating-off“	(ex works)
		1	2-point-controller „cooling-off“	
		2	2-point-controller „cooling-off“ with non-linear cooling *)	
			*) non-linear cooling: Cooling action can be pre-selected with either linear or non-linear cooling response curve (e.g. for vapour cooling).	
		6	diSP Zone works as an indicator, no controller action	
Sensor selection	**Code: 1A** H (r/w)	0	Pt 100, 0,0 ...99,9 °C	
		1	Pt 100, 32 ...212 °F	
		2	Pt 100 -100 ... +200 °C	
		3	Pt 100, -148 ... +392 °F	
		4	Pt 100, 0 ... 400 °C	(ex works)
		5	Pt 100, 32 ... 752 °F	
		6	Pt 100, 0 ... 800 °C	
			or, if selected as a thermocouple-input zone (depending on parameter „Code: 8E“ in Zone 0):	
		0	T/C Fe-CuNi (L), 0 ... 400 °C	
		1	T/C Fe-CuNi (L), 32 ... 752 °F	
		2	T/C Fe-CuNi (L), 0 ... 800 °C	
		3	T/C Fe-CuNi (J), 0 ... 800 °C	
		4	T/C NiCr-Ni (K), 0 ... 999 °C	

If the Sensor selection is changed, the following parameters will be set as follows and need to be readjusted:
- Setpoint 1, setpoint 2: SP.Lo
- Process value offset: OFF
- Lower setpoint limitation: Bottom range end
- Higher setpoint limitation: Top range end;
- Setpoint-ramp values: OFF
- Alarm values: OFF

Higher setpoint limitation	**Code: 2C** H (r/w)	programming range: SP.Lo ... top range	(ex works: 400)
Lower setpoint limitation	**Code: 2B** H (r/w)	programming range: bottom range ... SP.Hi	(ex works: 0)

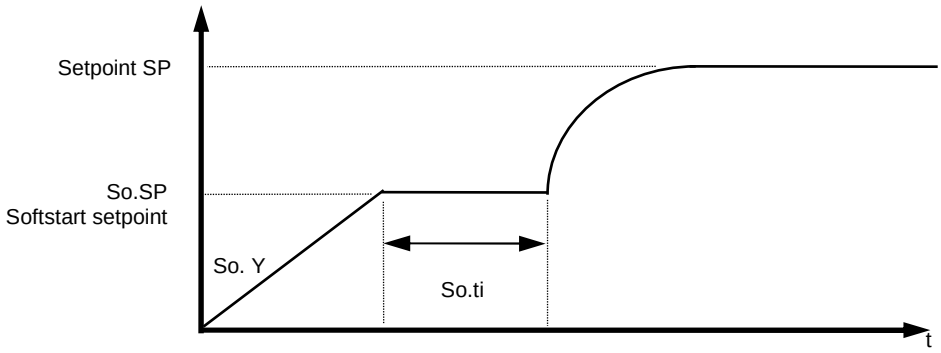
Softstart-function

General function:

During the softstart the controllers' heating output response is limited to a pre-selected ratio, in order to achieve a slow baking out of high performance heat cartridges.
Simultaneously the output clock frequency is quadrupled. Once the process value reaches the softstart setpoint, it remains stable at this value for a pre-selcted hold-duration time.
At the end of this period the process value rises to the valid setpoint.
This results in a slower, more regular heating period.
For this purpose the bistable voltage output must be taken, that actuates SSR relays.
If the softstart is active, the controllers' autotune function can't operated (Er.OP).
If a setpoint-ramp has been programmed, the softstart has priority, and the ramp will only become active after the softstart has been completed.

The softstart only works,
- if the parameter „P" (prop. band, Xp) is programmed > 0,1%.
- if the actual process value is lower than "Softstart setpoint – 5%" of the selected measuring range.

It is possible, to select this function for each zone separatly.



Parameter description		Parameter value	
Softstart-function	**Code: 6D** H (r/w)	0	Softstart not active (ex works) Next parameter So.Y, So.SP, So.ti are not shown.
		1	Softstart in action. The softstart function always runs, if the controller is switched on and / or if the actual temperature is below the softstart setpoint So.SP minus 5% of the range (e.g. range: 400^C -> 5%= 20°C).
Softstart output ratio	**Code: 6A** H (r/w)	10 ... 100%	
Softstart setpoint	**Code: 6B** H (r/w)	range: SP.Lo .... SP.Hi	
Softstart duration time	**Code: 6C** H (r/w)	0 (=OFF); 0,1 ... 9,9 min.	

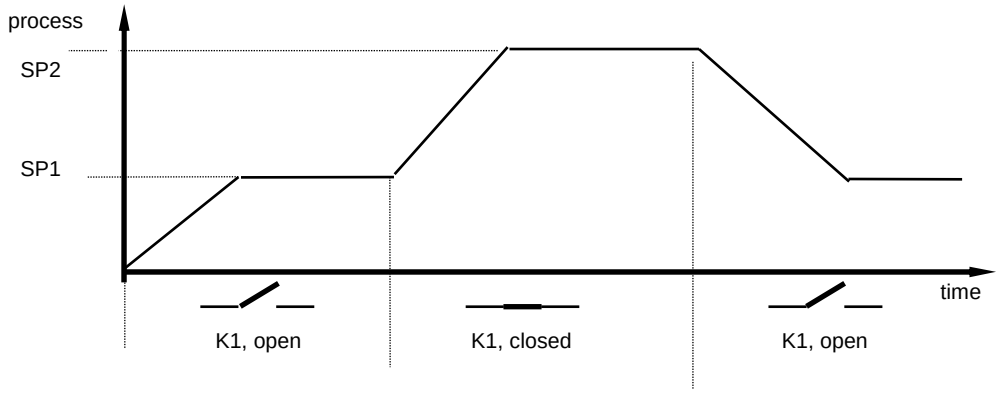
Auto- / Manual mode

It is possible, to select this function for each zone separatly.

Output ratio preselection	**Code: 8B** H (r/w)	0 **=** OFF (ex works) 1 = Auto (Controller mode) 2 = Manual Setting: OFF Function not active **Setting: Auto** **In event of sensor break the controller automatically maintains the last valid output ratio as the actuating signal.** This ratio can be manually altered in steps of 1%. Under the following circumstances, the output ratio will be 0%: - if the output ratio at time of the sensor break was 100%. - if the controller is working along a setpoint-ramp. - if the control deviation was more than 0,25% of the total range at the time of sensor break. - if th prop. band (P; xp) = 0. - if the soft start was active at the time of the sensor break. A few seconds after the sensor break has been rectified, the controller returns to automatic operation and calculates the required output ratio. An additional signal can be issued in the event of sensor break, if the alarm contacts are programmed accordingly. Setting: Man The controller now operates only as an actuator. Within the operation level, a manual output ratio (Index 7412) can be entered. There is no further controlling action.
Manual output ratio	**Code: 62** H (r/w)	0...100%

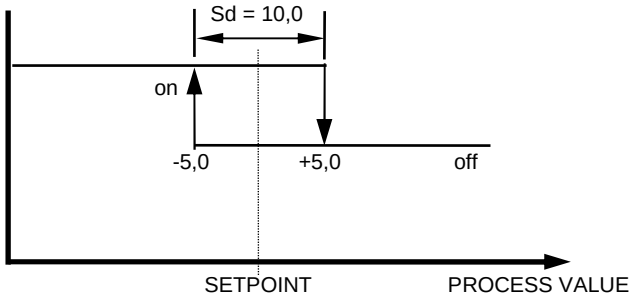
Parameter description		Parameter value		
process value °C / °F	**Code: 10** H (r)	see: measuring range (parameter code: 1A H)		
process value offset	**Code: 18** H (r/w)	-99 ... OFF ...100 Units -9,9 ... OFF ... 10,0		(ex works: OFF) (if range with dec.point)
	This parameter serves to correct the input signal, e.g. for: - the correction of a gradient between the measuring point and the sensor tip, - the line resistance balancing of 2-line RTD (Pt100) sensors and - correction of the control devition when using P- or PD-action. If for example the offset value is set to +5°C, then the real temperature measured by the sensor (when process is balanced) is 5°C less than the setpoint and the displayed process value.			
Actual setpoint	**Code: 20** H (read only)			
Setpoint 1 (set)	**Code: 21** H (r/w)	OFF, SP.Lo...SP.Hi		(ex works: 0)
Setpoint 2 (set)	**Code: 22** H (r/w)	OFF, SP.Lo...SP.Hi Valid, if contact K1 is closed.		(ex works: 0)
Rising ramp	**Code: 2F** H (r/w)	OFF; 0,1...100,0	°C/min. or °F/min.	(ex works: OFF)
Falling ramp	**Code: 2F** H (r/w)	OFF; 0,1...100,0	°C/min. or °F/min.	(ex works: OFF)

A programmed ramp is always activated when the setpoint is altered or when the mains supply is switched on. The ramp constructs itself out of the momentary process value and the pre-selected setpoint. If the ramp is active, the corresponding LED lights up on the faceplate. The ramp can be activated for both setpoint1 and setpoint2. By programming the second setpoint accordingly a setpoint profile can be oblained (please see example below).



Parameter description		Parameter value
Alarm value 1, switching point (switches relay A1)	**Code: 38** H (r/w)	**Temperature monitoring: alarm value adjustment** Signal contact, limit comparator, limit contact OFF; -999... 1000 °C/°F (ex works: OFF=0) OFF; -99,9... 100,0 °C/°F OFF; 0... 1000 °C/°F or **Heater current monitoring: alarm value adjustment** Limit contact OFF: 0,0 ...99,9 A (ex works: OFF=0)
Alarm value 2, switching point (switches relay A2)	**Code: 39** H (r/w)	**Temperature monitoring: alarm value adjustment** Signal contact, limit comparator, limit contact OFF; -999... 1000 °C/°F (ex works: OFF=0) OFF; -99,9... 100,0 °C/°F OFF; 0... 1000 °C/°F or **Heater current monitoring: alarm value adjustment** Limit contact OFF: 0,0 ...99,9 A (ex works: OFF=0) The range of adjustment is dependant on the sensor, the connected current transformers and the alarm configuration. Both have to be set in the configuration level.
Heater current, actual value	**Code: 11** H (r/w)	0,0...99,9 A Read-only parameter Indication of the actaul heater current.
Status word 1	**Code: 70** H	

Parameter description		Parameter value	
Valid output ratio	**Code: 60** H (r)	-100...100 %	The output ratio shows the momentary calculated ratio. It cannot be altered. The display is in percent of the installed performance capability for heating or cooling. Output ratio for cooling is shown as a negative value.
Output ratio limit	**Code: 64** H (r/w)	0...100 %	(ex works: 100) Limitation of the output ratio is only necessary when: the heating or cooling energy supply is grossly over-dimensioned compared to the power required, or to turn off a control output (setting = 0%). Under normal circumstances no limitation is needed (setting = 0%). The limitation becomes effective, when the controllers' calculated output ratio is greater than the maximum permissible (limited) ratio. **Warning!** The output ratio limitation does not work during autotune function.
Xp, prop.-band (P)	**Code: 40** H (r/w)	OFF; 0,1...100,0 %	(ex works: 3,0) If „P" = OFF (control action: on-off, without feedback) see parameter: „Control sensitivity".
Tv, rate (D)	**Code: 41** H (r/w)	OFF; 1...200 secs	(ex works: 30)
Tn, reset (I)	**Code: 42** H (r/w)	OFF; 1...1000 secs	(ex works: 150) Normally the controller works using PD/I control action. This means, controlling without deviation and with practically no overshoot during start-up. The control action can be altered in its structure by making the following adjustments to the parameters: a. no control action, on-off (setting P = OFF) b. P-action (setting D and I = 0) c. PD-action (setting I = 0) d. PI-action (setting D = 0) e. PD/I modified PID-action
Cycle time heating	**Code: 43** H (r/w)	0,5...240,0 secs	(ex works: 10,0) The switching frequency of the actuator can be determined by adjusting the cycle time. This is the total time needed for the controller to switch on and off once. a) Relay outputs: cycle time > 10 secs b) Bistable voltage outputs: cycle time 0,5...10 secs
Control sensitivity	**Code: 47** H (r/w)	Only if: P = OFF (On-off action, without feedback) OFF; 0,1...80,0 °C	(ex works: 0,1)



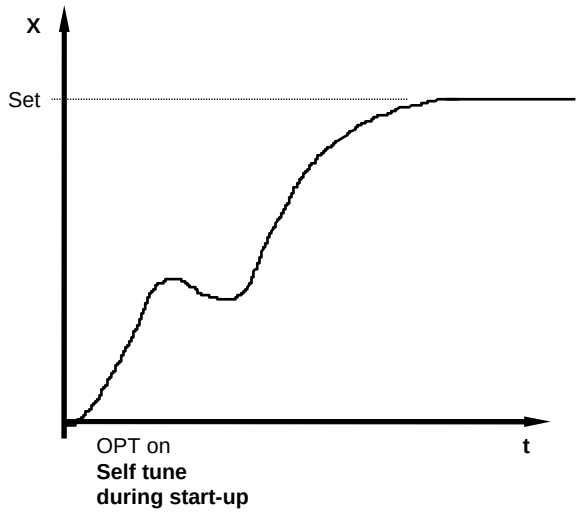
Parameter description		Parameter value	
Self tuning (autotune)	**Code: 88** H (r/w)	0 1	= self tuning out of action = self tuning on request (one time)

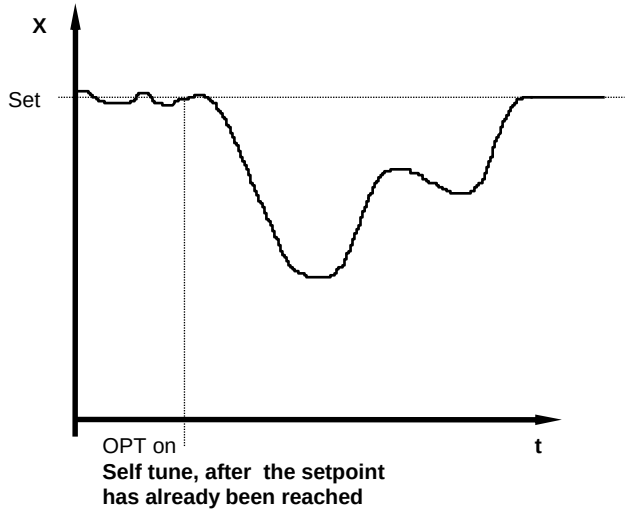
The tuning algorithm determines the characteristic values within the controlled process, and calculates the valid feedback parameters (P,D,I) and the cycle time (C = 0.3 x D) of a PD/I-controller for a wide section of the range.

The self tuning activates during start-up shortly before the setpoint is reached.
The setpoint must amount to the least 5% of the total range.
If activated after the setpoint has already been reached, the temperature will first drop by approx. 5% of the total range, in order to detect the exact amplification of the process.

The tuning algorithm can be activated at any time by selecting the **OPT=on**.

After having calculated the correct feedback parameters, the controller will lead the process value to the setpoint.





Self-tuning can be stopped by selecting the option **OPT = OFF** and pressing the **„E“** - key.

Technical Data

Input RTD, Pt 100 (DIN):
2 - or 3 - wire connection possible.
Built-in protection against sensor breakage and short circuit.
Max. permissible line resistance by 3-wire connection: 80 Ohms
Sensor current: ≤ 1 mA
Calibration accuracy: ≤ 0,2 %
Linear error: ≤ 0,2 %
Influence of the ambient temperature: ≤ 0,01 % / K

Input Thermocouple:
Built-in internal compensation point and protection against sensor breakage and incorrect polarity.
Re-calibration not required for a line resistance of up to 50 Ohms.
Calibration accuracy: ≤ 0,25%
Linear error: ≤ 0,2 %
Influence of the ambient temperature: ≤ 0,01 % / K

Analoge input (Option):
0 ... 10 V DC

Control outputs OUT 1 ... OUT 8:
Bist. voltage signal, 0/18 V DC, max. 10 mA, short-circuit proof
or
Relay, max. 250 V AC, max. 3 A (cos-phi = 1)

Alarm outputs A1 and A2:
Relay, max. 250 V AC, max. 3 A (cos-phi = 1)

Data protection:
EAROM

CE-Mark
Tested according to 2004/108/EC; EN 61326-1, industrial ares
Electr. safety: EN 61010-1

Power supply:
Standard: 230 V AC, ± 10 %, 48...62 Hz

Connections:
Screw terminals, Protection mode IP 20 (DIN 40050), Insulation class C

Permissible operating conditions:
Operating temperature: 0...50 °C / 32...122 °F
Storage temperature: -30...70 °C / -22...158 °F
Climate class: KWF DIN 40040;
equivalent to annual average max. 75 % rel. humidity, no condensation

Case:
Fabr. Phoenix: CE; B=125mm, H= 105mm, D=125mm
For DIN-rail mounting (35mm symetric, EN 50 022)
Material: Polycarbonat (PC); Protection: IP 20 (DIN 40050)

Weight:
app. 850 g

Subject to technical improvments!

Installation Instructions

Make certain that the devices described here are used only for the intended purpose.
They are intended for installation into control desks. The controller must be installed so that it is protected against impermissible humidity
and severe contamination. In addition, make sure that the permitted ambient temperature is not exceeded.

The electrical connections must be made according to the relevant locally applicable regulations.

If using a thermocouple sensor, the compensation cables must be laid directly to the controller terminals.
Transducers must be connected only in compliance with the programmed range.
Transducer cables and signal lines (e.g. logic or linear voltage outputs) must be shielded and laid physically separated from control lines and mains voltage supply cables (power cables).
Spatial separation between controller and inductive loads is recommneded.
Interference from contactor coils must be suppressed by connecting adapted RC-combinations parallel to the coils.
Control circuits (e.g. for contactors) should not be connected to the mains power supply terminals of the controller.

IMPORTANT:
Before operation, the unit must be configurated for its intended purpose
(e.g. controller type, sensor type and range, alarm adjustment etc.)