PID controller

TRM212

PID controller

Short guide

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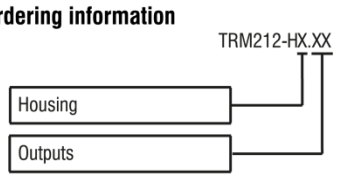
1. Scope of delivery

TRM212	- 1
Short guide	- 1
Mounting kit	- 1
Gasket	- 1

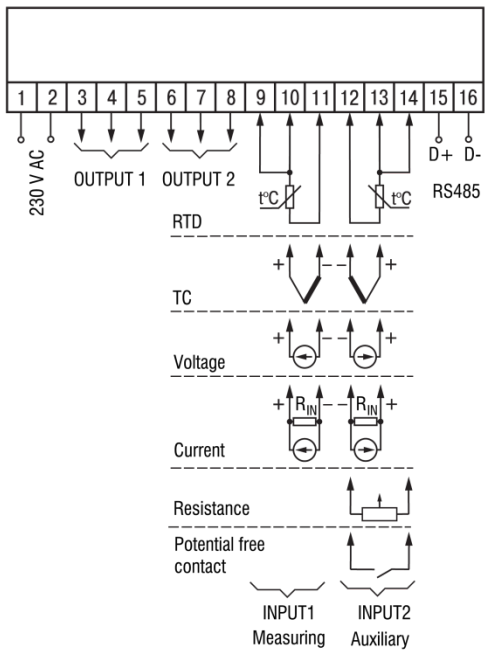
2. Ordering information

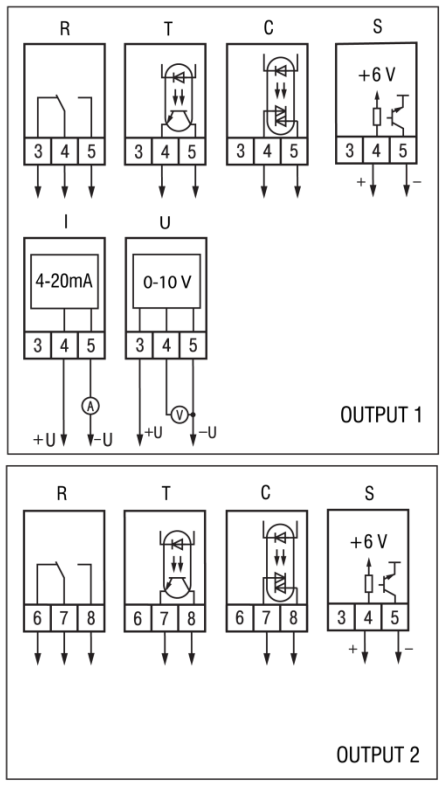


Housing:
- H1 – panel mount (96 x 96 x 70 mm)
- H2 – panel mount (96 x 48 x 100 mm)
- H3 – wall mount (105 x 130 x 65 mm)

Outputs:
- R – Relay
- T – NPN transistor
- C – TRIAC
- S – Solid state relay
- I – 4-20 mA
- U – 0-10 V

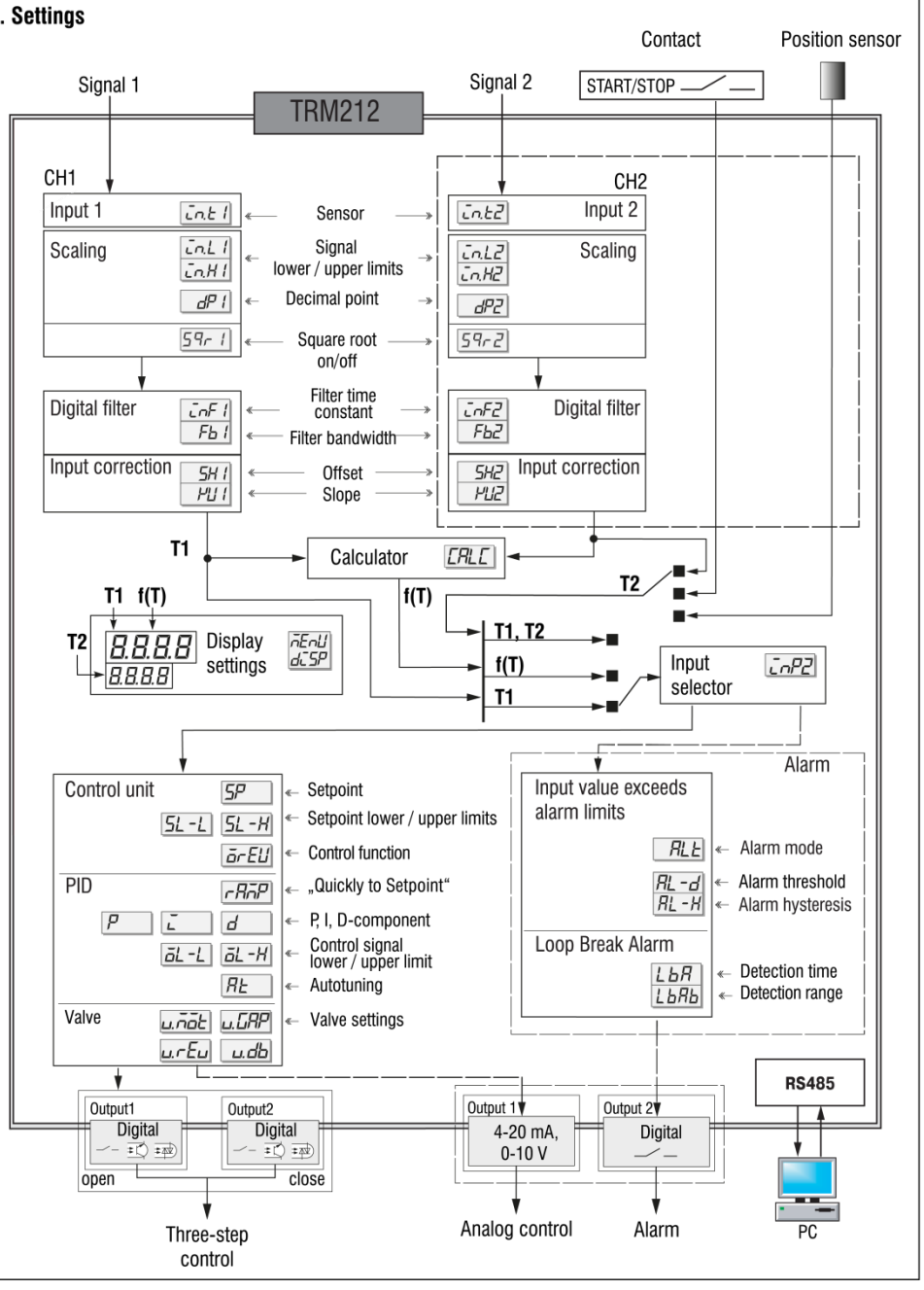
3. Wiring





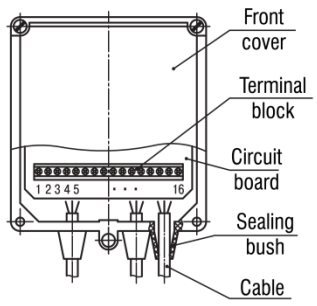
- Signal cables should be routed separately or screened from the supply cables.
- Only a shielded cable may be used for signal lines.
- Use wires of equal length and cross section when connecting RTD.
- Use a thermocouple cable when connecting TC.
- Themocouple sensing junctions of both channels must be isolated from each other and from the grounded equipment.
- Cold junction compensation (CJC) is provided.
- To measure a current signal a shunt resistor R_{IN} = 100 ohm (±1%) should be connected in parallel.

4. Settings

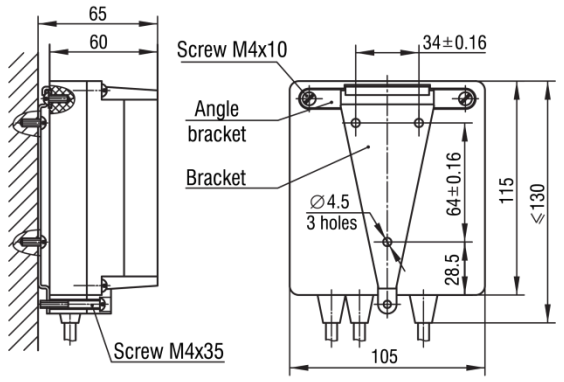


5. Dimensions

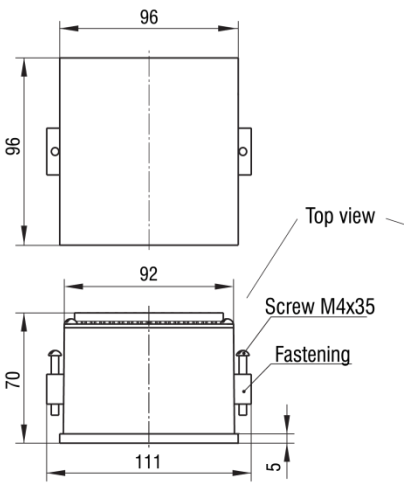
- To access the terminal block remove the front cover and disconnect the ribbon cable.
- Sealing rubber bushes should be trimmed to match the cable diameter.



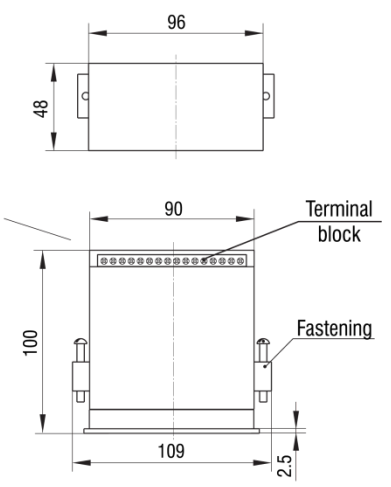
TRM212-H3



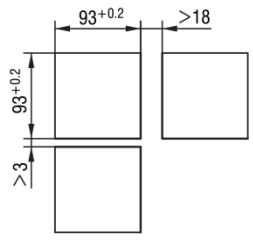
TRM212-H1



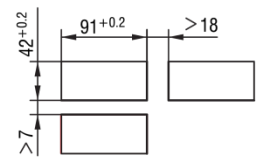
TRM212-H2



Panel cutout TRM212-H1



Panel cutout TRM212-H2



Max. panel thickness 15 mm

6. Safety

- Ensure that the device is provided with its own power supply line and electric fuse
- Ensure that the mains voltage matches the rated voltage specified on the nameplate
- Connect the power supply only after the wiring of inputs and outputs has been completed
- Do not use the device where it is subjected to flammable or explosive gases

7. Specifications

Table 1

Power supply		230 (90…245) V AC, (47…63 Hz)
Power consumption, max.		6 VA
Inputs		
Optional inputs		2
Sampling rate, max.		1 s
Input resistance	4-20 mA	external resistor R_{IN} = 100 ohm (in parallel)
	0-1 V	≥ 100 kohm
Basic error	RTD	±0.25%
	TC	±0.5%
	Linear signals	±0.5%
Digital input		1
	ON resistance	< 1 kohm
	OFF resistance	> 100 kohm
Outputs		
Optional output		2
Digital	Relay	1 A (PID control) / 8 A (alarm) 30 V DC / 230 V AC, cos φ ≥ 0.4
	NPN transistor	200 mA, 40 V DC
	TRIAC	50 mA, 240 V AC (constant operation) 0.5A (f≤50 Hz, pulse duration ≤5 ms)
	Solid state relay	100 mA, 4…6 V DC
Analog	4-20 mA	10…36 V, max. 1 kohm
	0-10 V	15…36 V, min 2 kohm
Network		
RS485 interface	Terminals	D+, D-
	Protocols	Modbus RTU/ASCII, akYtec
	Baud rate	2.4…115.2 kbit/s
	Cable	Shielded twisted pair (STP)

Housing			
Enclosure	H1	H2	H3
Dimension, mm	96 x 96 x 70	96 x 48 x 100	105 x 130 x 65
IP Code	front IP54	front IP54	IP44

Environmental conditions	
Ambient temperature	+1…+50°C
Storage temperature	-25…+55°C
Relative humidity	up to 80% (at +35°C, non-condensing)
Altitude	up to 2000 m above sea level

8. Inputs (parametrs in.t1, in.t2)

Table 2

Display	Input signal	Measurement range
Linear signals		
0-5	0 - 5 mA	0…100 %
0.20	0 - 20 mA	0…100 %
4.20	4 - 20 mA	0…100 %
U-50	-50…+50 mV	0…100 %
U0_1	0 - 1 V	0…100 %
RTD according to IEC 60751:2008		
r385	Pt50	-200…+750 °C
r.385	Pt100	-200…+750 °C
RTD according to GOST 6651		
r391	50P	-200…+750 °C
r428	50M	-190…+200 °C
r426	Cu50	-50…+200 °C
r.391	100P	-200…+750 °C
r.428	100M	190…+200 °C
r.426	Cu100	-50…+200 °C
r-23	53M	-50…+200 °C
r-46	46P	-200…+750 °C
TC according to IEC 60584-1:2013		
E_J	J	-200…+1200 °C
E_n	N	-200…+1300 °C
E_K	K	-200…+1300 °C
E_S	S	0…+1750 °C
E_r	R	0…+1750 °C
E-A1	A	0…+2500 °C
E_t	T	-200…+400 °C
E_b	B	+200…+1800 °C
TC according to GOST 8.585		
E_L	L	-200…+800 °C
E-A2	A-2	0…+1800 °C
E-A3	A-3	0…+1800 °C

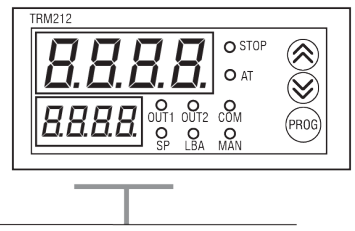
PID controller

9. Configuration

Upper display (red):
— Process value (Operation)
— Parameter name (Configuration)
— "MENU" (Menu)
— Error name (Error)

Lower display (green):
— Setpoint (Operation)
— Parameter value (Configuration)
— Parameter group (Menu)

Control elements (H2)



LEDs:

„OUT1" - lights if Output 1 is ON
„OUT2" - lights if Output 2 is ON
„SP" - lights if setpoint manual setting is activated
„LBA" - blinks when Loop Break Alarm is activated

„STOP" - lights when control is stopped by user
- blinks when control is stopped due to a hardware error or LBA
„AT" - lights when autotuning in progress
- blinks when autotuning failure
„COM" - flashes for 0.1 s on data transmission
„MAN" - lights when manual control is activated

Functional keys

- Increase value or menu navigation
- Decrease value or menu navigation
PROG - press > 3 s
  - enter the configuration mode
  - exit the parameter group
PROG - press < 1 s
  - enter the parameter group
  - save the parameter and go the next one

Key combinations

PROG + ▲ + ▼ - passcode access

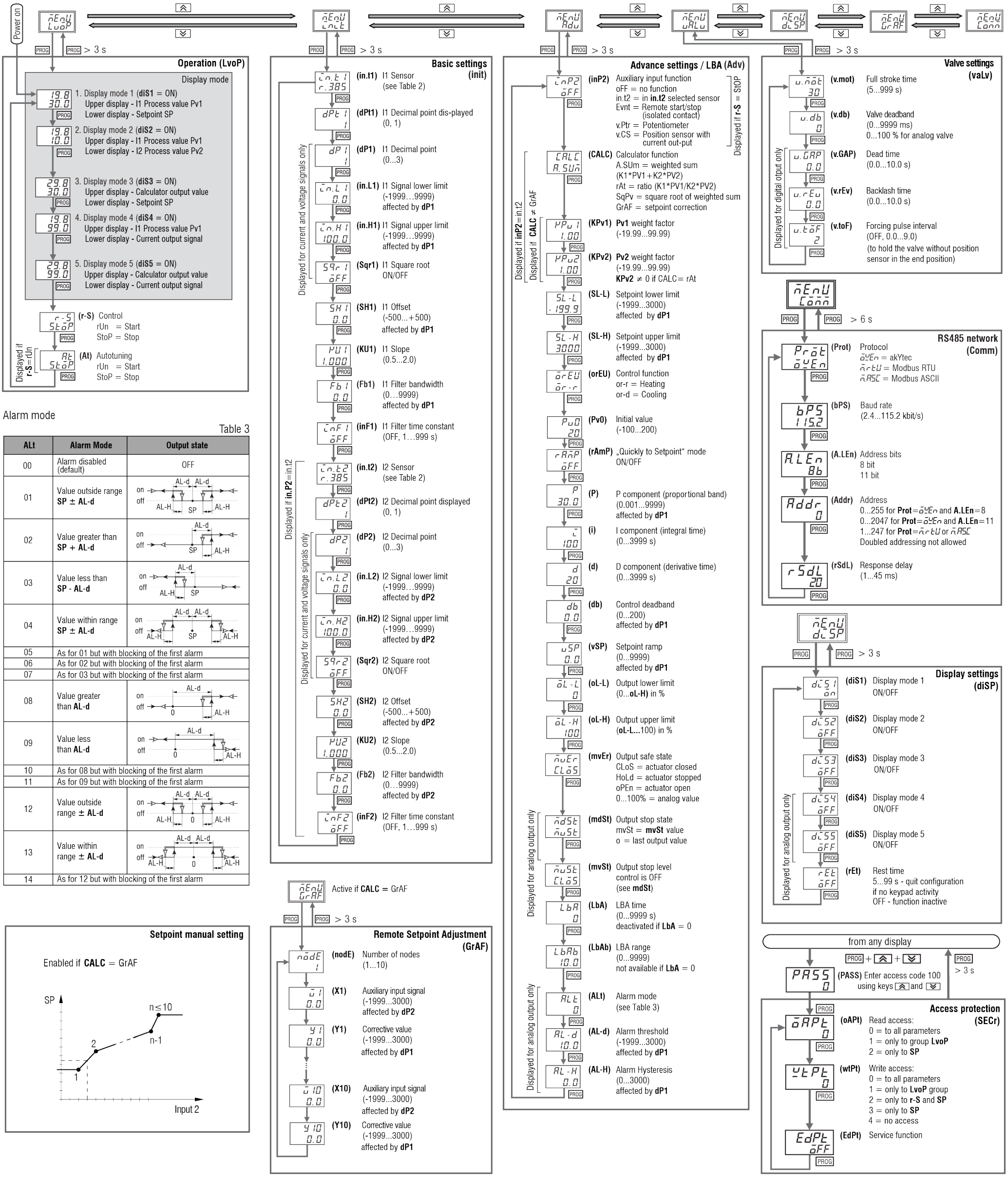
PROG + ▲ - manual control

Error messages

Upper display	Description
Err.S	Input error (sensor break)
Err.P	Position sensor error
Err.C	Calculation error
Er.Rd	Convertion error

Autotuning

To start the Auotuning set **r-S**=rUn and **At**=rUn.
The approximate values of coefficients **P**, **i**, **d** and the parameters **inF**, **CP**, **rAmP** will be calculated. After the autotuning is successfully completed, the parameter **At** is set to StoP. The LED „AT" lights during the Autotuning. The autotuning should be carried out after the parameter **rAmP**, **P**, **i**, or **d** is changed.



Alarm mode

Table 3

ALt	Alarm Mode	Output state
00	Alarm disabled (default)	OFF
01	Value outside range **SP ± AL-d**	
02	Value greater than **SP + AL-d**	
03	Value less than **SP - AL-d**	
04	Value within range **SP ± AL-d**	
05	As for 01 but with blocking of the first alarm	
06	As for 02 but with blocking of the first alarm	
07	As for 03 but with blocking of the first alarm	
08	Value greater than **AL-d**	
09	Value less than **AL-d**	
10	As for 08 but with blocking of the first alarm	
11	As for 09 but with blocking of the first alarm	
12	Value outside range **± AL-d**	
13	Value within range **± AL-d**	
14	As for 12 but with blocking of the first alarm	

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