T80/T90

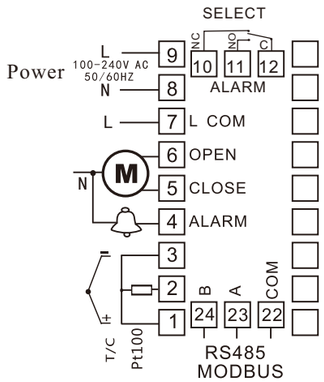
Device manual

1. Function overview

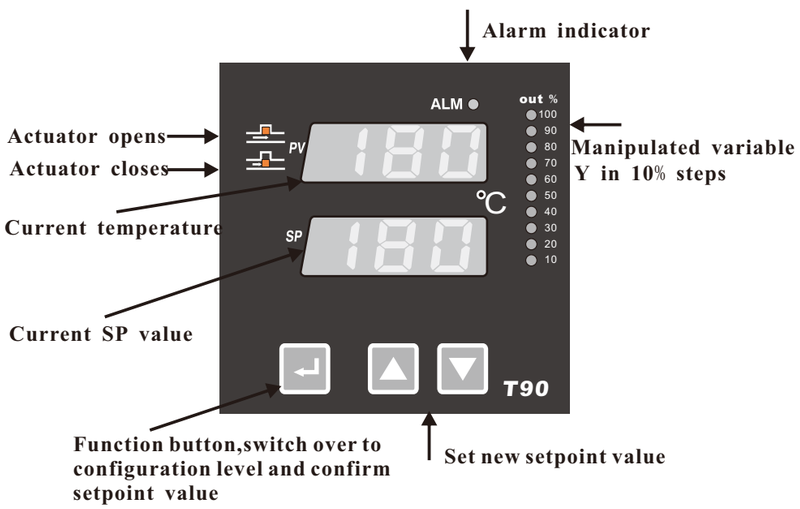
- ☐ Analog imput Pt100,high-precision temperature control
- ☐ Resolution:12Bit A/D
- ☐ Controller output:5A 250V AC max
- ☐ Setpoint control and Setpoint ramp control
- ☐ PID step controller algorithm without overshoot
- ☐ Digital displays for process variable and setpoint SP
- ☐ Alarm functions
- ☐ Serial interface Rs485 with MODBUS-RTU protocol
- ☐ Two-position controller (ON-OFF)
  and Three-position controller (ON-OFF/OFF-ON)

2. Electrical connection

⚠ **The device should be installed by special technicians and the electrical connection has to conform to the given national rules and the connection diagram of the device.**

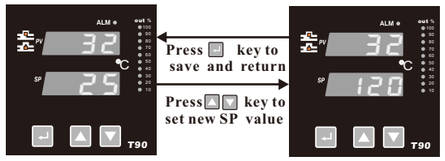


3. Operating level

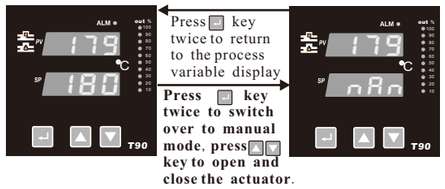


4. Operating and setting

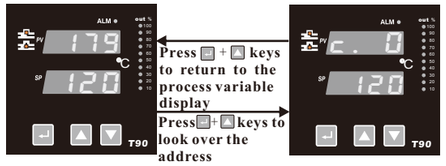
4.1 Setting setpoint in automatic mode



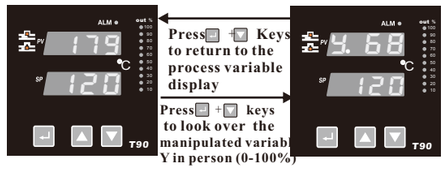
4. 2 Opening/closing the actuator in manual mode when NAN=0, the manual mode is activated.



4. 3 Modbus communication display via PV-display

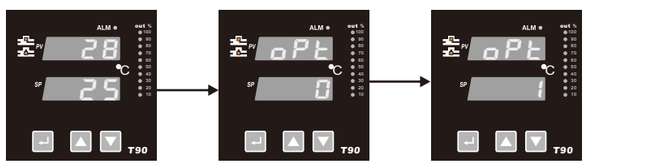


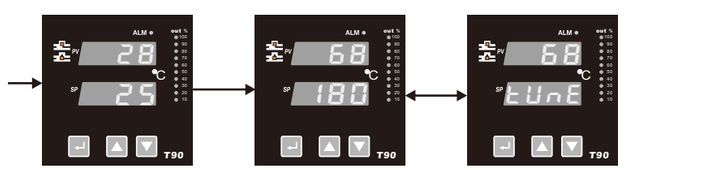
4. 4 Displaying the manipulated variable Y via PV-display



4. 5 Switch over to configuration level

In automatic mode, Press ↵ key>2S to switch over to configuration level,set opt=1, press ↵ key>2S to return. Press ▲ key to set SP value (SP>PV), press ↵ key,optimisation is active.





P. S: If you want to get a better result,you can reset it.

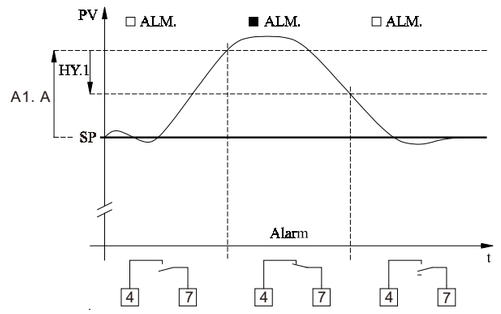
5. Cofiguration level

In automatic mode, press ↵ key to switch over to configuation level

Display	Configuation point	Remarks
cod	Setting code	When PAS=1 valid, Orginal code=1500; when PAS=0 no display
OPt	Optimisation	0: No optimisation; 1: Optimisation active
Pb	Proportional band	1. 0%-999. 9% (PB=0 and tn>0 ON-OFF/OFF-ON control)
tn	Intergral action time	1-2600s, when tn=0, ON-OFF control
td	Derivative action time	1-255s,PI control at td=0
db	Dead band	0 to + scope of the measuring range
tP	Valve actuating time	5s-300s
AL. 1	Alarm type	0: No alarm selected 1: Alarm A 2: Alarm B 3: Alarm C 4: Alarm B
A1.A	Alarm 1, type A	Alarm value: AL=0 no display AL=1 display A1.A AL=2/4 display A1.B AL=3 display A1.C/A1.C.
A1.b	Alarm 1, type B	
A1.c	Alarm 1, type C lower limit	
A1.c.	Alarm 1, type C upper limit	
hy. 1	Hysteresis, lower limit for A1.C	0 to + scope of the measuring range
hy. 1.	Hysteresis, upper limit for A1.C	Display when alarm type C
dP	Decimal point	0: Display without decimal point 1/2/3: Display with 1/2/3 decimals
dI.L	Scaling low	Displayed value at start of scale, -999 to dI.H-1,factory setting, do not change
dI.h	Scaling high	Displayed value at full scale, dI.L+1 to 9999,factory setting, do no change
SP.L	Setpoint limiting low	Setting range: dI.L to SP.H
SP.h	Setpoint limiting high	Setting range:SP.L to dI.H
SP.2	Second setpoint	Setting range:dI.L to dI.H,switch over via digital input SP.2
SP.r	Setpoint ramp	0 to scope of measuring range,unit: °C/min or °C/hr,=0,ramp deactivated
rA.d	Ramp direction, time unit	0:rising and falling setpoint ramp,unit:°C/min; 1:only rising setpoint ramp,unit:°C/min;2:only falling setpoint ramp,unit: °C/min;3:Ramp deactivated; 4/5/6: same with 0/1/2
dSP	Delta setpoint	0 to ± scope of measuring range
P.G	Process gain	1%-255%;
F IL	Measured value filter	0 to 255, complies with 0ms to 10s
SE.b	Sensor break PV	0: Actuator closes 1: Actuator opens 2: Actuator persists in its current position
nAn	Manual/automatic switch over	0: Switch over via front keyboard; 1: Interlocking in the current status
d Ir	Direction of effect of controller	0: Heating controller; 1: Cooling controller
S2.d	Second setpoint	Digital input
oP.d	OPEN	Digital input
cL.d	CLOSE	Digital input
St.d	STOP	Digital input
c.co	Calibration correction	0 to ± scope of measuring range
y.SY	Y-synchronization	0: Y-bargraph is displayed,actuator closes,internal Y-position = 0%,actual Y-position is not saved; 1:Y-bargraph is displayed,actuator does not close, internal Y-position= 0% actual Y-position is not saved ;2:Y-bargraph is displayed,actuator does not close,actual Y-position is saved,lastest saved Y-position is displayed;3:Y-bargraph is displayed,actuator does not close,actual Y-position is not saved,lastest saved Y-position is displayed;4:Y-bargraph is not displayed, synchronization like at Y.SY = 0;5:Y-bargraph is not displayed, synchronization like at Y.SY = 1;6:Y-bargraph is not displayed, synchronization like at Y.SY = 2; 7:Y-bargraph is not displayed, synchronization like at Y.SY = 3
bd	Baud rate	0: 19200bps 1: 9600bps 2: 4800bps 3: 2400bps 4: 1200bps
Adr	Address	Range: 1-247
S.c	Serial communication	0: Operation of the controller via front keyboard and modbus-master is possible; 1 Operation of the controller is only possible via modbus-master except configuration point S.C
oL.2	Second operating level	0: No second operating level 1: Optimisation 2: Alarm functions and their hysteresis 4: No function 8: Second setpoint SP.2* 16: Setpoint ramp SP.r
PAS	Interlock	0: No interlocking 1: Access only after entry via password (code:1500)

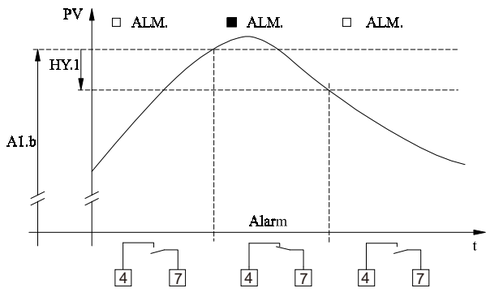
6. Alarm type

6.1 Alarm type A AL.1=1



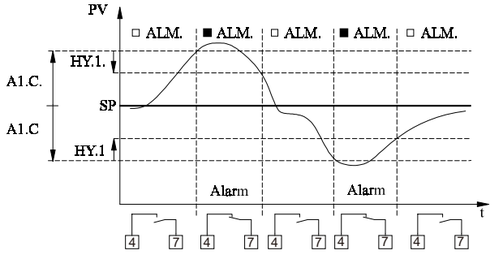
When A1. A>0 is positive setting: the alarm is triggered if the PV is bigger than SP+A1. A, returning to normal state is at SP+A1.A-HY.1 (HY.1 is hysteresis). When A1.A＜0 is negative setting, the alarm is triggered if PV is smaller than SP- |A1.A| , returning to normal state is at SP-|A1.A|+HY. 1(HY.1 is hysteresis).

6.2 Alarm type B AL 1=2 AL 1=4



When AL. 1=2, PV>A1. B, the alarm is triggered, returning to normal state is at A1.B-HY.1; When AL. 1=4, PV>A1. B, the alarm is triggered, returning to normal state is at A1.b+HY.1.

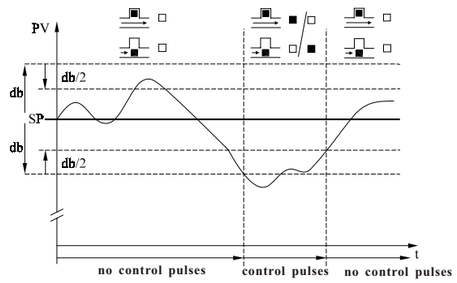
6.3 Alarm type C AL.1=3



When PV>SP+A1. C. , the alarm is trigger, returning to normal state is at SP+A1.C.-HY.1; When PV<SP-|A1. C|, the alarm is triggered, returning to normal state is at SP-|A1.C|+HY.1.

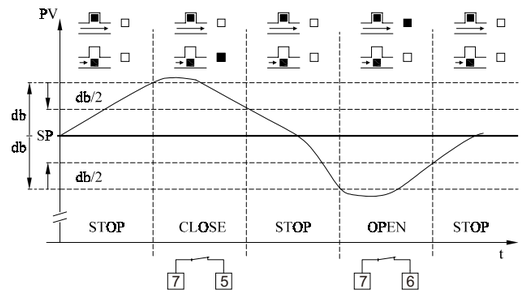
7.Dean Band

Dead band db: this design can make the motors avoid overworking and extend its service life.
Setting the db value in a right way can get a high-precision temperature control and prolong its service life.

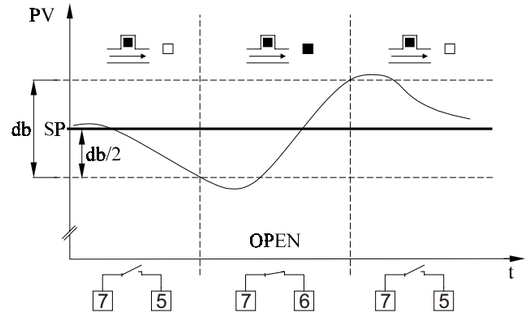


Dead band

The following diagrams are the two ways of controller by dead band .



7. 1: Three-position controller



7. 2: Two-position controller

8.Technical data

Line voltage: 100-240V AC 50HZ/60HZ
Power consumption approx.: 5VA max
Analog inputs: pt100 three-wire system/themocouple
Input relosution: 12bit D/A
Output: Relay 5A max/4-20mA
Permissible ambient temperature : -25°C--60°C
Design For control panel installation: 96*96*120mm (T90)
48*96*120mm (T80)
Serial interface: RS485 MODBUS-RTU
Baud rate: 1200 2400 4800
9600 19200bps

9. Product model

Ordering number T x0 X X X X X X

MODEL
T80 T90

INPUT	
3WIRE RTD	1
THEMOCOUPLE	2
DC mA	3
DC VOLTAGE	4

OUT 1	
NONE	0
RELAY	1
OUTPUT VOLTAGE:SSR DRIVER	2
OUTPUT LINEAR CURRENT:4-20mA	3

OUT 2	
NONE	0
RELAY	1
OUTPUT VOLTAGE:SSR DRIVER	2

OUT 3	
0	NONE
1	RELAY

OUT-A	
0	NONE
1	Rs485

POWER	
0	24-48V AC OR DC
2	100-240V AC