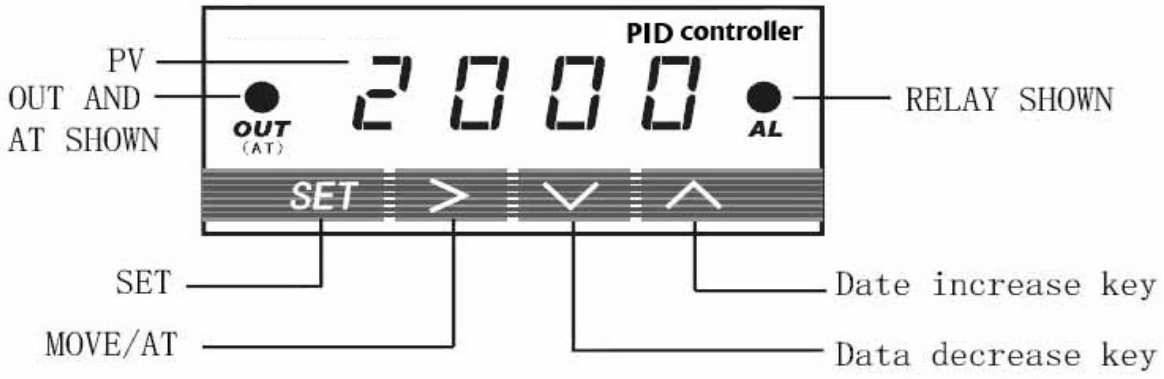
PID-DTM fuzzy logical PID controller

- Resistance temperature Detector: Pt100, Cu50
- Thermocouple: T , R , J , B , K , E , Wre3-Wre25
- Auto-tune function can find the best PID parameter automatically
- Unit of □ or □ are selectable by parameter
- 5 kinds of Control modes

1 Technology parameters

- Power supply voltage rating: 85-264VAC/50-60Hz or 12V (depends on the model#)
- Relay output (NO+NC): 250VAC/3A
- Relay switch life : 1×10^5 cycles
- SSR Voltage : 8V outline，Short line current : 30MA
- Measurement accuracy : 0.2%FS
- There are 4 LED indicator lamp on the front panel
- Out range shown:“EEEE”
- Ambient : Temperature of 0～50℃, humidity of 0～85RH%
- Front panel: out Dimension 48mm×24mm×75mm , cut dimension 45mm×22mm

2 Front Panel And Operation



3 Manual setting the PID parameters

3.1 Setting initial function value（password 0089）

3.1.1Table of initial function

symbol	Code	Description	Parameters	Initial
InTy	Inty	Input type	See table of Description of initial function value	P10.0
outy	outy	Control mode	0, 1, 2, 3, 4	2
HY	hy	Control Hysteresis	0~9999	0.3
PSb	Psb	Input Shift Adjustment	-1000～1000	0.0
rd	rd	Heat cold	0 heat；1 cold	0
CorF	CorF	Unit select	0 ℃；1 F	0
End	End	The End		

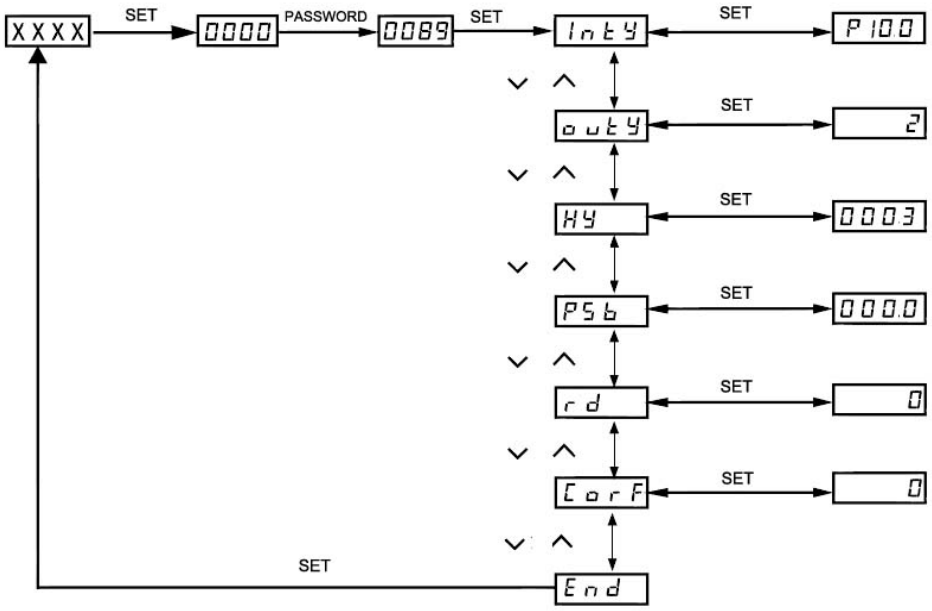
3.1.2 Description of initial function value

symbol	name	Input spec.	Setting Range(□)	
t	t	T type Thermocouple	-200～400	Resistor input 100K
r	r	R type Thermocouple	-50～1600	
J	J	J type Thermocouple	-200～1200	
WrE	W	WRE	0～2300	
b	b	B type Thermocouple	350～1800	
S	S	S type Thermocouple	-50～1600	
K	K	K type Thermocouple	-200～1300	
E	E	E type Thermocouple	-200～900	Current output 0.2mA
P100	Pt100	P100	-199～600	
P10.0	Pt10.0	P100	-199.9～600.0	
Cu50	Cu50	Cu50	-50.0～150.0	

3.1.3 ouTY : out control mode

No.	Out control mode
0	One line relay alarm output
1	one line relay PID output
2	One line relay alarm output；one line SSR PID output
3	One line relay output；one line SSR Hysteresis control
4	one line relay Hysteresis control output

3.1.4 Method of setting parameters



3.2 Setting PID Parameter（Password 0036）

3.2.1 Table of PID parameter

symbol	Name	Description	parameters	Initial
P	P	Proportional band	0.1~99.9%	5.0
I	I	Time of Integral	2~1999（s）	100
d	D	Time of Derivative	0~399（s）	20
SouF	SOUF	Overshoot depressant	0.0~1.0	0.2
ot	OT	Control period	2~199（s）	2
FILt	Flit	Input digital filter	0~3	0
End	End	The End		

3.2.2 PID PARAMETER

P；Proportional band　Smaller P values will make the both integral and derivative action stronger，Larger the P number means the weaker the action

I； Integral time Decrease integral time, if the controller is taking too long to eliminate the temperature offset. When I=0, the system becomes a PD controller.

D；“d”. Derivative time　Derivative action contributes the output power based on the rate of temperature change

Souf, Overshoot depressant

The value of souf is larger; the Overshoot depressant will be smaller. When the value of souf is too large, the Overshoot depressant will be not enough. When the value of souf is smaller, the Overshoot depressant will be stronger.

OT，Control period

OT Small value can improve control accuracy，For SSR, thyristor or linear current output, generally 0.5 to 3 seconds. For Relay output or in a heating/refrigerating dual output control system, generally 15 to 40 seconds, because small value will cause the frequent on-off action of mechanical switch or frequent heating/refrigerating switch, and shorten its service life. When OT is too small，the action is more，the life of relay will be short. If ouTY is set 1,OT is set 2~3 normally；If ouTY is set 2,OT is set 5~15 normally .If OUTY is set other selection ，OT is invalid

Flit; PV input filter.　0 No filter，1little, 2 middle, 3 strong. The value of Flit will determine the ability of filtering noise. When a large value is set, the measurement input is stabilized but the response speed is slow.

Auto tuning; If the result of temperature control is not satisfy, you can start Auto tuning. Press > for more than 3 seconds to active the auto-tuning process. After 2 cycles of on-off action, the instrument will obtain the values of PID control parameters. During auto tuning, “At” will flash at lower display window and the instrument executes on-off control. If you want to escape from auto tuning status, press > and hold for about 3 seconds until the "At" parameter appears again.

Note 1: If the setpoint is different, the parameters obtained from auto-tuning are possibly different. So you’d better set setpoint to an often-used value or middle value first, and then start auto-tuning. For the ovens with good heat preservation, the setpoint can be set to the highest applicable temperature. It is forbidden to change SV during auto tuning. Depending on the system, the auto-tuning time can be from several seconds to several hours.

Note 2: Parameter HY (on-off differential, control hysteresis) has influence on the accuracy of auto-tuning. Generally, the smaller the value of HY, the higher the precision of auto tuning. But the value of HY parameter should be large enough to prevent the instrument from error action around setpoint due to the oscillation of input. HY is recommended to be 2.0.

Note 3: In a heating/refrigerating dual output system, auto tuning should be executed at the main output (OUTP).

3.3 Setting alarm and SV parameters（Password 0001）

3.3.1 Table of Alarm and Control parameter

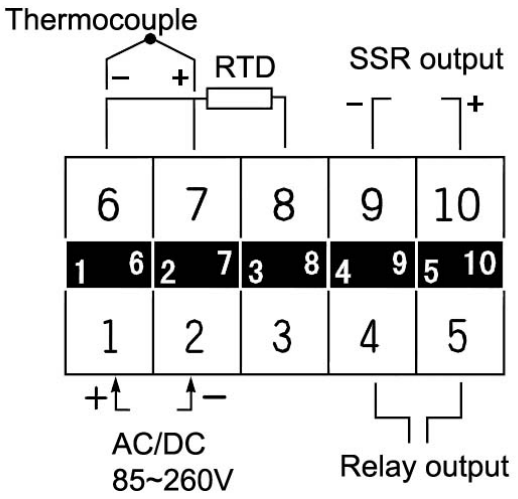
symbol	Code	Description	Setting range	Initial
SV	Sv	Setting value	In testing Range	80.0
AHI	AHI	Connect Value of Relay J1		80.0
AL1	AL1	Open Value of Relay J1		90.0
End	End	The End		

3.3.2 Description of alarm and control parameter

SV；Set value of temperature

SV can be set either in here, or by only pressing "∧∨" to change

4 Wiring graph



PID-DTM Fuzzy Logic Temperature Controller Manual

For current product information, availability, and compatible options, use the verified ThermoMart links below. The preceding pages remain the original manual content.

PRODUCTS USING THIS DOCUMENT

Models: CKP-DTM, DTM-12V-24V, DTM-12V-EGT, DTM-SR-TC, EBP-DTM-J

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