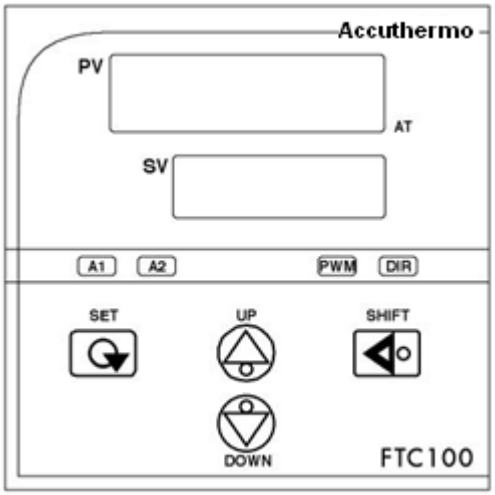
Using the Panel Interface to Access the FTC100D TE Temperature Controller

Front Panel Description：



(1) PV — Process Value
(2) SV — Set Value
(3) AT — Auto tuning LED
(4) A1 — Alarm 1 LED
(5) A2 — Alarm 2 LED
(6) PWM — PWM LED
(7) DIR — Heat/Cool Direction LED

(1)

— SET KEY: Press once to access the next programmable parameter.

(2)

— UP KEY: Press to increase the set point or parameter value.

(3)

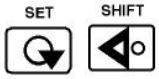
— DOWN KEY: Press to decrease the set point or parameter value.

(4)

— SHIFT KEY

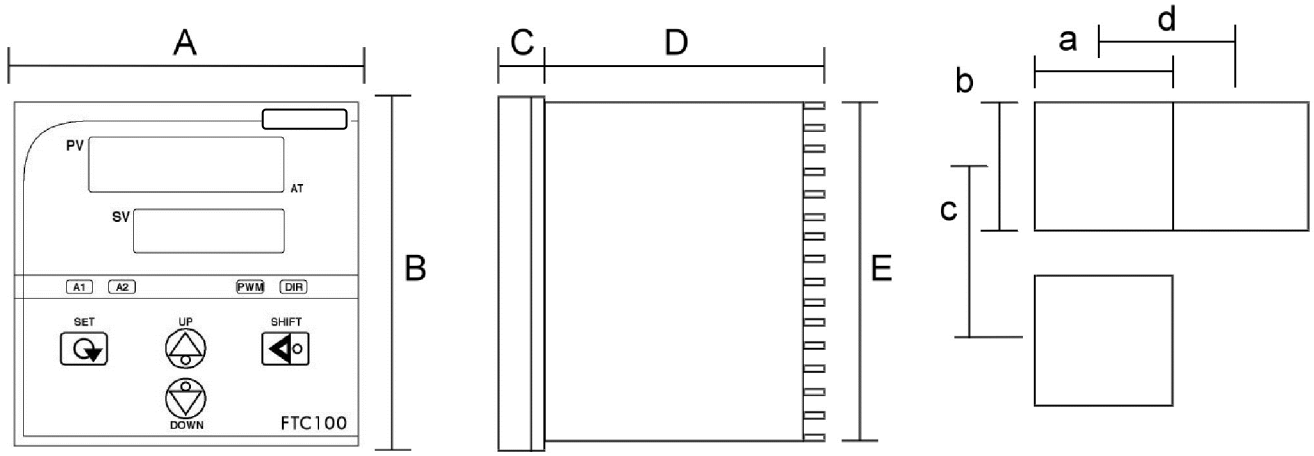
(5)

— Press the SET and UP keys once to return the normal operation.

(6) 

— LEVEL KEY. Press the SET and SHIFT keys simultaneously for 5 seconds to select programming level, press SET key to the selected level.

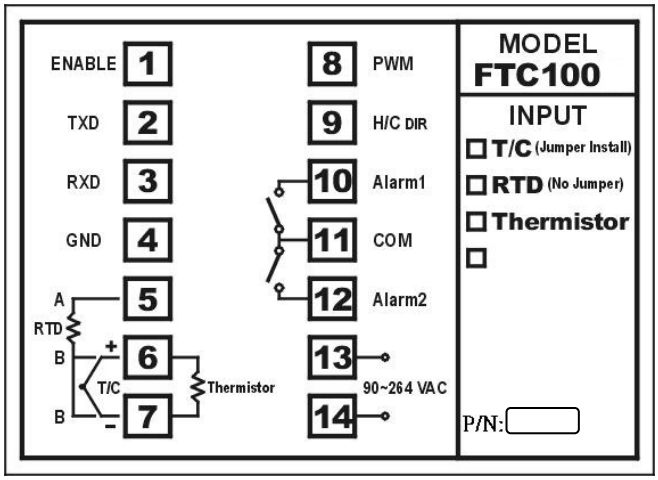
Panel Cutout:



Model	A	B	C	D	E	A	b	c	d
FTC100	72	72	9	80	67	$68^{+0.5}$	$68^{+0.5}$	90	72

(Unit:mm)

Wiring Diagram:



Wiring Precautions:

1. There is an internal jumper that determines whether the controller is configured for a thermocouple or RTD sensor. The default jumper position is set for thermocouple sensors. To change the jumper setting, reference the Jumper Read Me file in the controller documentation for more information.
2. Before wiring, confirm the wiring layout using the indication on the side of the controller.
3. For thermocouple input, use the appropriate compensation wire. Also, note the polarity of the input signal.
4. To avoid noise induction, keep the input signal wire away from the instrument power line, the load lines and the power lines of other electric equipment.

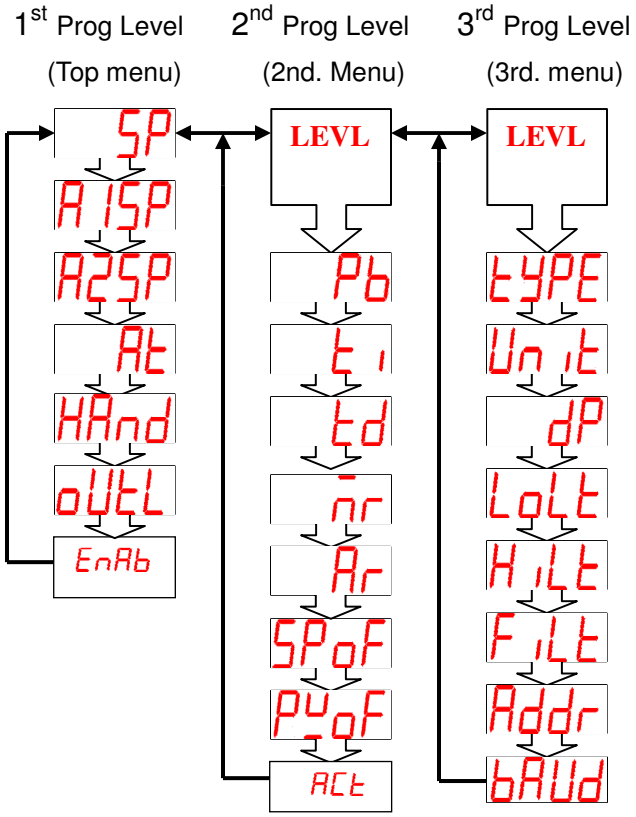
Programming Level Parameters

Hold SET SHIFT for more than 5 seconds to get to 2nd and 3rd level menu

Use UP or DOWN to select parameters,

Use SET to select menu item at each level,

SET UP Press to go back to normal operation

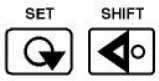


1. The CPb, Cti, Ctd, HYS2, db will not appear if no Output 2(Cooling)
2. The HYS1 parameters will not appear if parameter Pb ≠ 0.0. The HYS2 parameters will not appear if parameter CPb ≠ 0.0.
3. The ti, td will not appear in the parameter list if parameter Pb = 0.0. The Cti Ctd will not appear in the parameter list if parameter CPb = 0.0.

Quick Notes:

1. For selecting different sensor type, use “TYPE” menu
2. Auto tune(At) can only be turned on after “EnAb” is on(Enon).

Parameter Description:

LEVL	LEVEL selection. Press  keys for at least 5 seconds to access the PID level. LEVEL: PID Level (2nd menu); Option Level (3rd menu)

User Level (Top Menu)

CODE	DESCRIPTION	RANGE	Default
SP	Set point value of control	LoLt ~ HiLt	10
A1SP	Alarm 1 set point value	-50 ~ 200 (-50.0 ~ 200.0)	20
A2SP	Alarm 2 set point value	-50 ~ 200 (-50.0 ~ 200.0)	20
At	no : Auto-tuning is disable YES.1 : Standard type auto-tuning. Autotune: PV is compared wit SV during auto tuning.	no YES.1	no
HAnd	Manually Control the output power level	on oFF	oFF
oUtL	Output percentage. Adjustable when “Hand” is set to “Yes”	-100.0 ~ 100.0	0.0%
EnAb	Enable amplifier power out to TE	**oFF ProG Enon**	oFF

PID Level (2nd Menu)

CODE	DESCRIPTION	RANGE	Default
Pb	Proportional band variable. Set to 0.0 for ON/OFF control mode.	0.0 ~ 300.0	5.0%
t i	Integral time (Reset). This value is automatically calculated by activating the Autotune function. If desired, the user can later adjust this parameter to better suit for the application. When PB=0.0, this parameter will be not available. When set to zero, Pb & td ≠ 0 for PD control.	0 ~ 3600sec	240
td	Derivative (Rate). This value is automatically calculated by activating the Auto tune function. If desired, the user can later adjust this parameter to better suit the application. When PB=0.0, this parameter will be not available. When set to zero, Pb & td ≠ 0 for PI control.	0 ~ 900sec	60
Ar	Anti-reset	0.0 ~ 50.0	50.0%
SPoF	Set point offset. This value will be added to SV to perform control. It mainly used to eliminate offset error during P control.	-1000 ~ 1000 (-100.0 ~ 100.0)	0
PVoF	Process value offset. Permits the user to offset the PV indication from the actual PV.	-1000 ~ 2000 (-100.0 ~ 200.0)	0
ACt	Output 1 control action. It change the Hot/Cold direction logic. Change the Hot/Cold direction if TE wiring is reversed and cause the temperature move to other direction. rEV: Reverse action for heating. dir: Direct action for cooling.	rEV dir	rEV

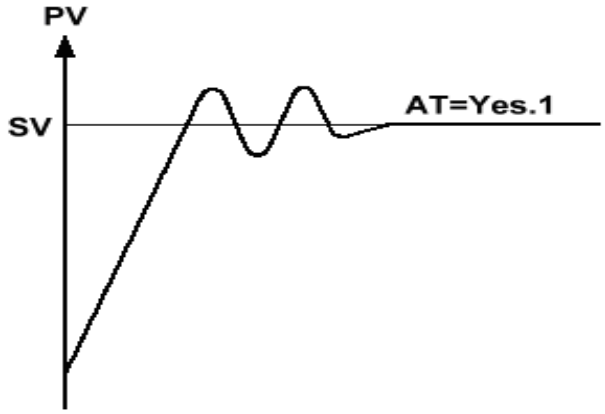
Option Level (3rd menu)

<table>
<tr><th>CODE</th><th>DESCRIPTION</th><th>RANGE</th><th>Default</th></tr>
<tr><td>tYPE</td><td>Input type selection. (*T/C-E,B,R,S,N,C not supported)
<table>
<tr><th>TYPE</th><th>RANGE(□)</th><th>RANGE(□)</th></tr>
<tr><td>J</td><td>-50 ~ 200</td><td>-58 ~ 392</td></tr>
<tr><td>K</td><td>-50 ~ 200</td><td>-58 ~ 392</td></tr>
<tr><td>T</td><td>-50 ~ 200</td><td>-58 ~ 392</td></tr>
<tr><td>E</td><td>-50 ~ 200</td><td>-58 ~ 392</td></tr>
<tr><td>B</td><td>-50 ~ 200</td><td>-58 ~ 392</td></tr>
<tr><td>R</td><td>-50 ~ 200</td><td>-58 ~ 392</td></tr>
<tr><td>S</td><td>-50 ~ 200</td><td>-58 ~ 392</td></tr>
<tr><td>N</td><td>-50 ~ 200</td><td>-58 ~ 392</td></tr>
<tr><td>C</td><td>-50 ~ 200</td><td>-58 ~ 392</td></tr>
<tr><td>D-PT</td><td>-50 ~ 200</td><td>-58 ~ 392</td></tr>
<tr><td>J-PT</td><td>-50 ~ 200</td><td>-58 ~ 392</td></tr>
<tr><td>TR-1</td><td>-5 ~ 100</td><td>-58 ~ 212</td></tr>
</table></td><td>Refer to figure.</td><td>TR-1</td></tr>
<tr><td>Unit</td><td>Unit of process value
°C : Degrees C.
°F : Degrees F.</td><td>°C
°F</td><td>°C</td></tr>
<tr><td>dP</td><td>Decimal point selection.
0000. : No decimal point.
000.0 : 0.1 resolution
After change decimal point, please reconfirm the parameter.</td><td>0000.
000.0</td><td>0000.</td></tr>
<tr><td>LoLt</td><td>Low limit of span or range. Set the low limit lower than the lowest expected SV and PV display.</td><td>Full range</td><td>0</td></tr>
<tr><td>HiLt</td><td>High limit of span or range. Set the high limit higher than highest expected SV and PV display.</td><td>Full range</td><td>200</td></tr>
<tr><td>FiLt</td><td>Software filter. The higher the number will take longer time to do filter function. Increase the number when reading is unstable.</td><td>0.0 ~ 9.9</td><td>0.0</td></tr>
<tr><td>Addr</td><td>Address of controller when communication with master device.</td><td>N/A</td><td>1</td></tr>
<tr><td>bAUd</td><td>Communication baud rate. 2.4k=2400bps, 4.8k=4800 bps, 9.6k=9600 bps, 19.2k=19200 bps, 38.4k=38400 bps</td><td>2.4k, 4.8k, 9.6k, 19.2k, 38.4K</td><td>38.4K</td></tr>
</table>

Auto Tune

Auto Tune can only be turned on after the enable(Enab) is on(Enon). The proper way to do autotune is to set your system at ambient condition then run auto tune. Turning on auto tune half way running cannot achieve the optimized PID value. In order to automatically set the PID parameter in PID level (“Pb” proportional band, “ti: integral time or reset and “td” derivative time or rate), first adjust the controller’s set point to a value, which closely approximates your application. Set the “ AT ” parameter to “YES.1” for standard type auto tune. The right-most decimal point (AT) on the PV display begins flashing. The auto tune procedure will take two cycle oscillations. After that, the controller performs PID control with the “learned” PID value to verify the results. Finally the PID values will be entered into the nonvolatile memory and then start the Fuzzy enhanced PID control. The auto tune process can last from several minutes up to two hours, depending on the system’s parameter. A time out error will occur if the auto tune process can not be completed within two hours, in this case, try to set the PID parameters manually.

To abort an auto tune process, simply set the “ AT ” parameter to “ no ”.



Contact Information

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www.accuthermo.com