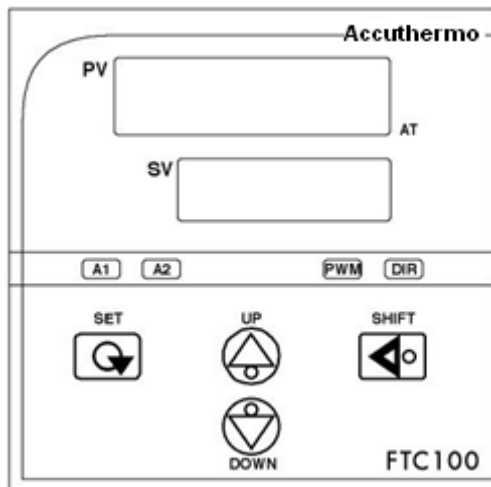








Using the Panel Interface to Access the FTC100 TE Temperature Controller

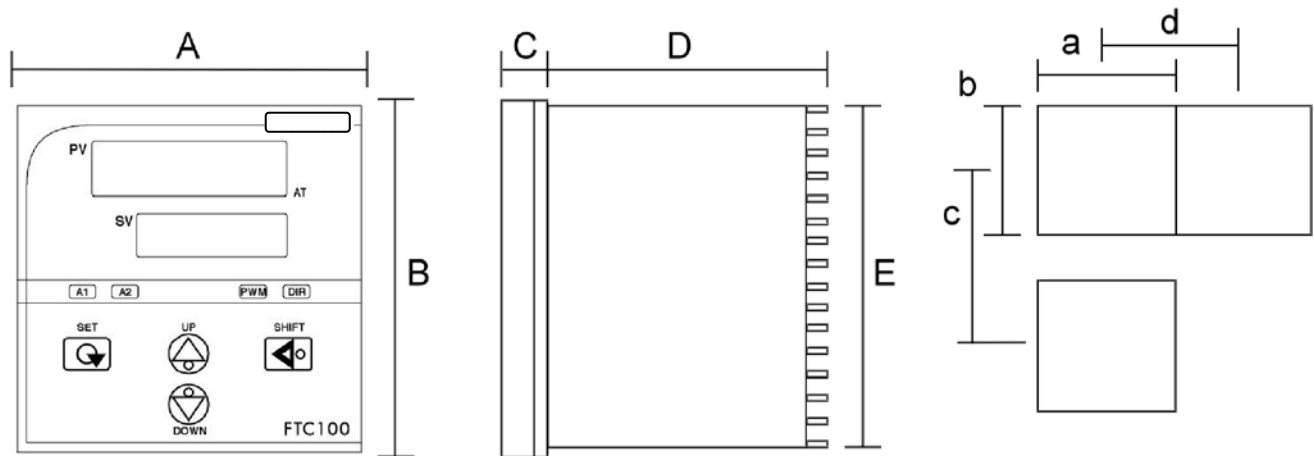
Front Panel Description :



- (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.

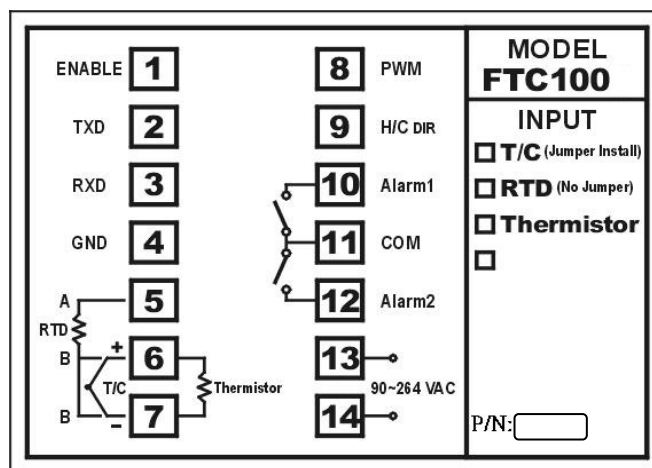
Panel Cutout:



| Model | A | B | C | D | E | A | b | c | d |
|--------|----|----|---|----|----|--------------|--------------|----|----|
| FTC100 | 72 | 72 | 9 | 80 | 67 | 68 \pm 0.5 | 68 \pm 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

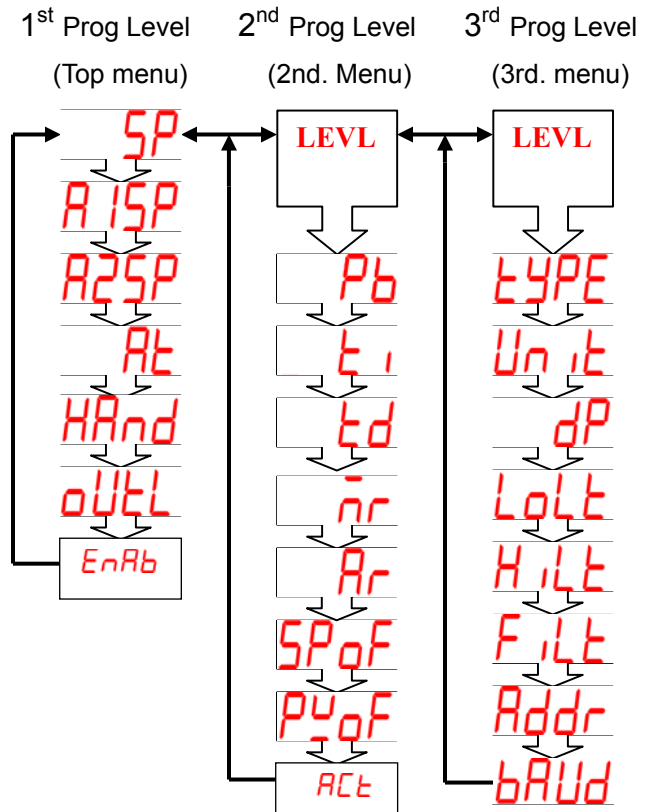
Hold   for more than 5 seconds to get to 2nd and 3rd level menu

Use  or  to select parameters,

Use  to select menu item at each level,

  Press to go back to normal operation



1. The CPb , Et , Ed , $HYS2$, db will not appear if no Output 2(Cooling)
2. The $HYS1$ parameters will not appear if parameter $Pb \neq 0.0$. The $HYS2$ parameters will not appear if parameter $CPb \neq 0.0$.
3. The Et , Ed will not appear in the parameter list if parameter $Pb = 0.0$. The Et , Ed 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:

| | | | |
|-------|------------------|---|--|
| LEVEL | LEVEL selection. | | |
| | Press |   | keys for at least 5 seconds to access the PID level. |
| | LEVEL | DESCRIPTION | |
| | Pid | PID Level (2 nd menu) | |
| | opt1 | Option Level (3 rd 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 |
| HRnd | 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 |
|-------------|--|----------------------------------|------------|
| <i>Pb</i> | Proportional band variable. Set to 0.0 for ON/OFF control mode. | 0.0 ~ 300.0 | 5.0% |
| <i>ti</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 |
| <i>td</i> | 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 |
| <i>Ar</i> | Anti-reset | 0.0 ~ 50.0 | 50.0% |
| <i>SPoF</i> | 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 |
| <i>PVoF</i> | Process value offset. Permits the user to offset the PV indication from the actual PV. | -1000 ~ 2000 (-100.0 ~ 200.0) | 0 |
| <i>Act</i> | 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. <i>rev</i> : Reverse action for heating. <i>dir</i> : Direct action for cooling. | <i>rev</i> <i>dir</i> | <i>rev</i> |

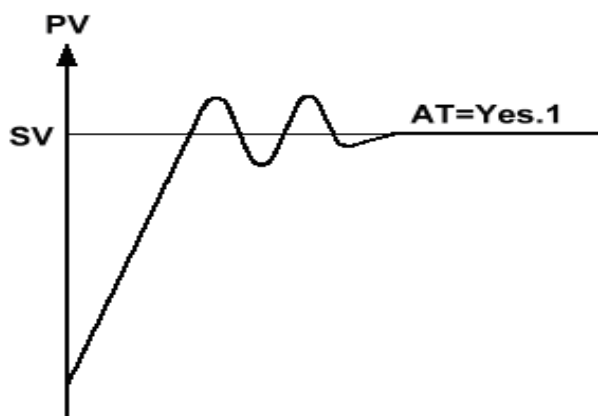
Option Level (3rd menu)

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

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 " **AL**" 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 " **AL**" parameter to " **no**".



Contact Information

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