The new Tempco TBC-41 PID board temperature controller has been designed to be built into equipment by OEMs. This highly accurate electronic controller can easily be installed behind an overlay or control panel to allow for a very smooth and built-in look. Its many features can easily control electric or gas heating & cooling devices.

The fuzzy logic plus PID microprocessor-based controller series incorporates two bright, easy to read 4-digit LED displays, indicating process value and setpoint value. The fuzzy logic technology enables a process to reach a predetermined setpoint in the shortest time with the minimum of overshoot during power-up or external load disturbance.

The unit is powered by 11-26 or 90-250 VDC /VAC supply.

The second output can be used as cooling control or an alarm. Both outputs can select relay, triac, 5V logic output, linear current or linear voltage to drive an external device. There are six types of alarms, plus a dwell timer, that can be configured for the third output. The units are fully programmable for PT100 and thermocouple types J, K, T, E, B, R, S, N and L. The input signal is digitized by using an 18-bit A to D converter. Its fast sampling rate allows the unit to control fast processes.

Optional digital communications via RS-485 or RS-232 are available. These options allow the units to be integrated with supervisory control systems and software.

A programming port is available for automatic configuration, calibration and testing without the need to access the keys on the front panel.

By using proprietary fuzzy logic modified PID technology, this control will minimize the overshoot and undershoot in the shortest time.

High Accuracy
The TBC series controls are manufactured with custom designed ASIC (Application Specific Integrated Circuit) technology which contains an 18-bit A to D converter for high resolution measurement (true 0.1°F resolution for thermocouple and PT100) and a 15-bit D to A converter for linear current or voltage control output. The ASIC technology provides improved operating performance, low cost, enhanced reliability and higher density.

Stock and Common Part Numbers

Part Number	Signal Input	Output 1	Output 2	Alarm
TBC10001	tc	relay	none	none
TBC10002	tc	relay	relay	none
TBC10003	tc	relay	relay	relay
TBC10010	tc	5VDC Pulse	none	none

Fast Sampling Rate
The sampling rate of the input A to D converter is 5 samples/second. The fast sampling rate allows this series to control fast processes.

Fuzzy Control
The function of fuzzy logic control is to continually vary the PID parameters in a slight manner to allow for a more precise control of your process, over time. Also, this allows your process to reach the setpoint in the shortest amount of time with minimal overshoot during initial heat-up or setpoint and load changes.

Digital Communication
Optional RS-232 or RS-485 interface modules allow for Modbus RTU digital communications. The RS-485 interface allows for a maximum of 247 controllers to be connected to a host computer.

Programming Port
A programming port is used to connect the unit to a PC for quick configuration.

Auto-tune
The auto-tune function allows the user to simplify initial setup for a new system. A clever algorithm is provided to obtain an optimal set of control parameters for the process, it can be applied either as the process is warming up (cold start) or if the process has been in steady state (warm start).

Lockout Protection
According to the actual security requirement, one of four lock-out levels can be selected to prevent the unit from being changed by unauthorized persons.

Bumpless Transfer
Bumpless transfer allows the controller to continue to control by using its previous value if the sensor breaks. Hence, the process can be well controlled temporarily.

Soft-start Ramp
The ramping function can be performed during power-up as well as any time the setpoint is changed. The ramp function works during heat-up and cool-down.

Digital Filter
A first order low pass filter with a programmable time constant is used to improve the stability of process value. This is particularly useful in certain applications where the process value is too unstable to read.

SEL Function
The units have the flexibility for the user to move as many as 8 parameters, which are the most significant, from the set-up menu and place them in the front of the display sequence in the user menu.