TEC Family of Controllers — Common Design Features for the Models Listed

1/32 DIN: TEC-220, TEC-2400, TEC-2500
1/16 DIN: TEC-920, TEC-9100, TEC-9090, TEC-9300, TEC-9400
1/8 DIN: TEC-8100, TEC-8300, TEC-8400, TEC-8450
3/16 DIN: TEC-7100, TEC-7400
1/4 DIN: TEC-4100, TEC-4300, TEC-4400
DIN Rail Mount: TEC-6400

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

Auto-Tune
The auto-tune function allows the user to simplify initial setup for a new system by automatically determining the optimum set of PID settings for the thermodynamic system. A unique algorithm is programmed into the microprocessor to obtain an optimal set of control parameters for the process, and it can be applied either as the process is warming up (cold start) or if the process has been in a steady state (warm start).

Fuzzy Logic Control
The function of Fuzzy Logic Control is to adjust the PID parameters from time to time in order to make the modulated output value more flexible and adaptive to various processes. The result is to enable a process to reach a predetermined setpoint in the shortest time, with the minimum of overshoot and undershoot during power-up or external load disturbances.

Digital Filter
A first-order low-pass digital filter with a programmable time constant is a standard function of the software developed for the TEC controllers. It is used to improve the stability of the process value, especially in electrically noisy environments.

Lockout Protection
According to the actual security requirements, one of four lockout levels can be selected to prevent the unit from being changed erroneously.
None: No parameter is locked.
Set: User data is accessible, but setup data is locked.
User: All user and setup parameters are locked, except setpoint.
All: All user and setup parameters are locked, including setpoint.

Bumpless Transfer
Bumpless transfer allows the controller to continue to control the process by using the last known good output percentage value if the temperature sensor should fail. Hence, the process transfers from feedback closed loop control to open loop control and the process can be kept running until the sensor can be replaced.

Soft Start Ramp
The ramping function is performed during power up as well as any time the setpoint is changed. It can be ramping up or ramping down. The process value will reach the setpoint with a predetermined constant rate of rise or fall.

Digital Communications
The units can be equipped with a RS-485 or RS-232 interface card to provide digital communications. By using only twisted pair wires, up to 247 controllers can be connected together via the RS-485 interface to a host computer.

Table of Input Range and Sensor Accuracy

Type	Range	Accuracy @ 25°C	Input Impedance
J	-184 to 1832°F -120 to 1000°C	±3.6°F ±2.0°C	2.2MΩ
K	-328 to 2498°F -200 to 1370°C	±3.6°F ±2.0°C	2.2MΩ
T	-418 to 752°F -250 to 400°C	±3.6°F ±2.0°C	2.2MΩ
E	-148 to 1652°F -100 to 900°C	±3.6°F ±2.0°C	2.2MΩ
B	32 to 3272°F 0 to 1800°C	±3.6°F ±2.0°C	2.2MΩ
R	32 to 3214°F 0 to 1767°C	±3.6°F ±2.0°C	2.2MΩ
S	32 to 3214°F 0 to 1767°C	±3.6°F ±2.0°C	2.2MΩ
N	-418 to 2372°F -250 to 1300°C	±3.6°F ±2.0°C	2.2MΩ
L	-328 to 1652°F -200 to 900°C	±3.6°F ±2.0°C	2.2MΩ
PT100 (DIN)	-346 to 1292°F -210 to 700°C	±0.7°F ±0.4°C	1.3KΩ
PT100 (JIS)	-328 to 1112°F -200 to 600°C	±0.7°F ±0.4°C	1.3KΩ
mV	-8 to 70mV	±0.05%	2.2MΩ
mA	-3 to 27mA	±0.05%	70.5Ω
VDC	-1.3 to 11.5Vdc	±0.05%	650KΩ