

Standard Features Descriptions Options

TEC2000 Series Features

- Control Compartment, double O-Ring Sealed and isolated from incoming power and control wiring.
 - Includes built-in heater and thermostat
 - Multiple port openings for ease of access to up-grades and/or service to the actuator
- Calibration of the actuator is possible by (3) separate means;
 - Use of the **LDM** listed below
 - Yes, No, Back and Next responses will accomplish required configuration
 - Use of a PC (via RS-485) or a PDA device (via IrDA port - not available in England or Japan)
 - Bettis remote control device (Clicker) via IrDA port - not available in England or Japan)
- Electronic Fault Monitor (**EFM**)
 - Monitors all internal modules and shuts down the actuator if an unsafe condition is detected
 - Senses a 95-100% overtorque condition and shuts down the motor control if condition exceeds 10 seconds
- Motor Control Module (**MCM**)
 - Includes an electrical and mechanical interlocked reversing contactor, automatic phase correction and automatic loss of phase detection circuit.
 - (2) secondary automatic reset fuses
 - Various MCM Modules are;
 - Standard with Mechanical R/C - rated 25 amp in-rush current
 - Solid-State reverser, rated 25 amp continuous current (500 amp surge - 1 second)
 - Solid-State reverser, rated 50 amp continuous current (780 amp surge - 1 second)
- Separate Entry Terminal Chamber (**STC**) with Threaded Cover
 - 48-point terminals for all external power and control wiring termination
 - All terminal screws are installed
 - Highly legible terminal numbering identification
 - Internal & External grounding lugs
 - (2) Primary Fuses - do not require opening to main controls compartment for access.



- Position Limiting by use of Absolute Position Detector (**APD**)-Patented
 - Continuous valve stem position even during power failure when manually operated
 - (4) contacts, configurable as N.O. or N.C., 5 amp at 250 VAC or 30 VDC
- Local Display Module (**LDM**)
 - An LCD graphic display for displaying mode of operation, status, position, torque, and alarm conditions.
 - The display is a 32 character alphanumeric message center with graphic icons
 - Local operation via an Open-Close Control Knob, and a Local-Stop-Remote Selector Knob (padlockable)
 - Includes (3) LED pilot lights to indicate, valve open, opening, close, closing, stopped, and alarm conditions
 - Able to be positioned for ease of viewing
- Remote Display Module (**RDM**), option;
 - Provides the same function as the LDM, but can be mounted remotely.
 - Can be mounted up to 4000 ft. (1200 meters) from actuator
 - Each actuator can support up to (2) two RDM's
 - Can be powered from a 24 VDC actuator internal power source, or from an external 115 or 230 VAC power source
 - Communication to the actuator is via 2-wire RS-485 signal
 - Certified for F.M. Type 6P (50 ft head for 7 days) temporary submergence, and Explosion proof, same as Electrical Enclosure



- Computer Control Module (**CCM**), controls all functions for the TEC2000. It is configurable as follows;
- Discrete Outputs (RO#1 to RO#5) are configurable for any of these functions;
 - Valve Opening or closing
 - Loss of control voltage
 - Actuator not available
 - Actuator fail alarm (failed self-diagnostics)
 - Open or close inhibit input active
 - Valve stalled (valve not moving on command)
 - Loss of analog input (Futronic)
 - Fully opened/closed or intermediate position indication
 - Open or close overtorque
 - Selector Switch in Local-Stop-Remote position
 - Lost Phase
 - ESD Active
 - Local ESD input inactive
 - Valve Drift (valve moving without command)
 - Low Battery
 - Motor Overload tripped
 - Generic output (Controlinc)

Factory Defaults are:

- RO#1 - LSO (Valve full open) - N.O.
- RO#2 - LSC (Valve full close) - N.O.
- RO#3 - LSO (Valve full open) - N.C.
- RO#4 - LSC (valve full close) - N.C.
- RO#5 - Monitor (Valve not available)- (1) N.O., (1) N.C.

■ **Optional Extras**

- Auxiliary Control Module (**ACM**), - Analog Controller
 - Solid-state controller with (1) 4-20mA input and (2) 4-20mA outputs
 - (1) output for position feedback, (VPF - Valve Position Feedback)
 - (1) output for actuator torque feedback, (VTF - Valve Torque Feedback)
 - Futronic Controls
 - All Futronic options have the ability to be configured for "Remain in last position" or "Go to preset position"
 - Futronic II, Position Control, +/- **1.0% accurate at minimum of 15 second operating time**
 - 3 Phase or 1 Phase power supply
 - Uses mechanical reversing contactor
 - Rated at 1200 starts per hour for 3 phase and 100 starts per hour for 1 phase
 - Futronic IV, Modulating Control, +/- **0.5% accurate at minimum of 15 second operating time**
 - 3 Phase power supply only
 - Includes a Solid-State reversing controller
 - Suitable for 1200 starts per hour

- Futronic VIII, Precision Control, +/- **0.25% accurate**, independent of speed
 - 3 Phase power supply & 1 Phase / 230 Volt / 60-50 Hz power supply
 - Rated at 1200 starts per hour for 3 phase and 100 starts per hour for 1 phase
 - Includes a VFD (Variable Frequency Drive), no mechanical starter
 - All VFD Drives are mounted in separate Nema 4 enclosure

- Controlinc (Network) Controls

- Based on single RS-485 twisted, shielded wire network
- Communication protocol availability is;
 - Modbus RTU, F.F. (Foundation Fieldbus), ProfiBus DP & DeviceNet
- If used as a positioning control, same as Futronic Controls above
- Controlinc also used for 2-speed pulse timer or anti-hammer control

- Auxiliary Relay Module (**ARM**)

- (4) additional latching relay outputs
- Rated 5 amp/ 30VDC, 5 Amp/ 250 VAC resistive, 5 amp/ 250 VAC inductive
- Can be configured same as RO#1 to RO#5 listed above

- **Factory Defaults are:**

- RO#9 - Lost Power
- RO#10 - Motor Overload
- RO#11 - Lost Phase
- RO#12 - Overtorque

– **Other Options**

- Battery Back-up Module (BBM), for use in powering LDM Module in absence of power supply
 - (2) Lithium Batteries, "Ultralife P/N U9VL-9V, rated 1200mAh
 - Expected life of batteries in typical applications is 5 years
 - Shelf Life is 10 years
- Close-Coupled Circuit Breaker
 - Certified for F.M. Type 6P (50 ft head for 7 days)
 - Certified for F.M. Explosionproof, same as Electrical Enclosure, Group "B" not available
- Motor Overload Relay - senses motor current
- Fire-proof Protection, K-Mass or Fire Jackets
- Special Coating Systems, such as Ceramic Coating, etc.
- Motor Heaters

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