

TEC2000:

First came intelligent actuators. Now comes one with common sense.



It's Already Proven.



TEC2000 mounted on gear box for heavy-duty quarter-turn use. No auxiliary gear drive is required for quarter-turn valve torques up to 2,200 ft-lbs.

When the time was right for EIM to develop non-intrusive, Total Electronic Control valve actuators, we carefully applied our 50+ years of knowledge of what customers truly need in valve control. The result is TEC2000, an actuator with a whole array of common sense attributes.

Based on proven technology, TEC2000 is an actuator built for the demands of multi-turn and quarter-turn applications like yours.

To start with, we didn't reinvent the wheel. Instead of devising a completely new actuator, we simply equipped our well-established Series 2000 actuator with all the features needed to offer Total Electronic Control (TEC) in a truly non-intrusive package.

This means that with the TEC2000, you get the latest standards of control and performance ... coupled with power transmission technology that has a 30-year history of reliability in thousands of installations worldwide. The Series 2000 heritage ensures that the TEC2000 is an electronic actuator that's built for hard work and easy maintenance.

Quarter-turn and multi-turn control in one truly non-intrusive actuator.

The TEC2000 series can handle both quarter-turn and multi-turn applications across an extremely broad torque range—using either three-phase or single-phase power.

While some manufacturers claim to offer non-intrusive actuators, take a closer look at their products. You'll discover electric control compartments that have to be opened to replace fuses (which defeats the purpose of non-intrusiveness, and can even void some manufacturers' warranties).

EIM's TEC2000 is truly non-intrusive; its separate, dual-sealed terminal chamber houses the unit's primary fuses, so the control compartment doesn't need to be opened for setup or for routine maintenance and operation. Local control knobs don't penetrate the housing.

Exclusive Tri-Set feature provides three setup choices.

TEC2000 gives you the freedom to choose from any of three configuration methods:

1. Control knobs on the LDM (Local Display Module), and on the optional RDM (Remote Display Module), which can be mounted up to 4,000 feet (1.2 km) away!
2. PCs and PDAs via RS-485, or IrDA port; or
3. EIM's exclusive key chain-sized Clicker IrDA remote. You can complete the entire actuator configuration process with this compact tool. (Clicker not available in Japan or England.)



Common-Sense Features that Set a New Standard for Smart Actuators.

Retains established technology.

Mechanical torque sensing

EIM's spring pack mechanism doesn't rely on electronics or algorithms to estimate torque. It reliably measures the actual torque load with a sliding worm gear method proven in more than 70 years of service. The rotation of the worm-gear drives an adjacent rotary gear, the movement of which is converted into an electronic signal by Hall-effect sensors. This direct-sensing method provides supremely accurate, reliable torque monitoring.

Motor flexibility

The TEC2000's motor is not used in any load sensing or measurement functions, so it requires no calibration. As a result, the motor can be easily replaced or rewound. Interchangeable motor gear-ratio sets allow easy speed changes in the field.



The ideal terminal chamber:

Our Separate Terminal Chamber design offers several distinct, common-sense advantages:

- Cover is threaded instead of bolted, for easy access.
- Terminal block helps avoid field-wiring errors by providing highly visible labeling for every connection ... with all screws already installed!
- User-replaceable primary fuses are easily accessible in the terminal chamber. Secondary fuses reset themselves automatically—so you don't have to open the control compartment to change fuses!
- Four conduit entries provide convenient wiring paths.



An LCD that's easy to see, read and understand.



The Local Display Module's large IconoText screen communicates in plain language and simple icons, enabling users to handle non-intrusive setup and diagnostics quickly and easily, and to check parameters at a glance.

RDMs ensure controls are easy to reach.



EIM's patented Remote Display Module puts the TEC2000's controls within easy reach, no matter where the actuator is installed. You can network two modules up to 4,000 feet (1.2 km) away and perform the same configuration and diagnostic tasks that can be accomplished on the actuator's local controls. The RDMs may be powered from either the actuator's 24VDC power supply or independent 115/220VAC. (Requires only four wires for both power and communication!) Whether the actuator is

mounted far away or up high, the RDM conveniently brings control right to the operator's level.

The handwheel that's not a wheel.

TEC2000's gear box uses reduction gearing to reduce the effort needed to manually open or close a valve. Its distinctive "fold-up" spinner handle provides a compact profile and keeps the handle out of the way until needed.



Effortless declutching!



Another practical innovation: shift to manual operation with minimum effort! No "cheater" bar is needed—even on tightly sealed valves. The lever can also be padlocked for safety in either Hand or Motor position.

Three setup options.

Configure TEC2000 in any of three ways:

- selector switches on the Local Display Module;
- CE Windows PC or PDA device;
- the Clicker, a key-chain sized IrDA controller.

Absolute Position Detector (APD)

The TEC2000's patented APD uses Hall-effect sensors to continuously monitor valve position and torque. This geared system requires no battery and is therefore able to detect the valve's actual position even during a power failure.



A Microprocessor-Based Actuator that's Built on a Solid Mechanical Foundation.

We retained all the strengths that earned EIM's actuators a reputation for longevity, reliability, and ease of operation—then we added the exact features you need for dependable, high performance digital valve control.

- ① The industry's largest, easiest-to-see and easiest to-read LCD screen.
- ② Non-penetrating, vibration-resistant Hall effect switches enable setup without opening control compartments.
- ③ 316-stainless-steel fasteners throughout
- ④ Convenient, multiple mounting options for local display module.
- ⑤ Separate Terminal Chamber, dual sealed, allows installation wiring to be performed without exposing control components.
- ⑥ Optional battery backup allows LCD to remain powered during electrical outages; no battery required to maintain any data or position calibration.
- ⑦ Control enclosure is low-copper aluminum alloy, and is powder-coated, salt resistant, and certified by F.M., C.S.A., Cenelec, and TSA for all gas groups in explosion-proof environments. Also rated for IP68 submersible service.



- ⑧ The industry's most convenient declutch lever is padlockable in either Hand or Motor position.
- ⑨ Twin access ports gives users the freedom to easily access internal components.
- ⑩ Rugged ductile iron gear housing is shock- and vibration-resistant.

Other key features:

- *Absolute Position Detector* (patented) requires no battery and provides consistent accuracy—with no loss of calibration during power failures.
- *Space heater* prevents internal condensation (thermostatically controlled; turns off at 105°F [40°C]).

- *Emergency shutdown*—independent safety circuits ("stay-put" mode) monitor all modules and shut down the actuator if an unsafe condition is detected.
- *Internal wiring uses no insulation-displacement connectors*. All terminals are crimped, gold pin-and-socket contacts; every connector is uniquely polarity-keyed and locked, so you cannot plug two incompatible cables together.



TEC2000 means Total Electronic Control.

TEC2000 is equipped to meet virtually any control requirements, including:

- Discrete, two-wire, three-wire, and four-wire controls
- Wired interlocks, open or close inhibits
- Independent emergency shutdown (ESD)
- Independent close-loop wired emergency stop
- Modulating service (with analog input and analog position/torque feedback)
- Multiport valve control (up to four ports)
- Network control with a wide range of network topologies and protocols, including Modbus, Profibus, Foundation Fieldbus, Device Net, and Ethernet.

Take a look at the IconoText screen:



Actual size.

The TEC2000's Local Display Module (LDM) is designed around a large, IconoText LCD message screen with two 16-character text lines. Non-penetrating control knobs serve two functions: local control (open/stop/close) and actuator setup.

During setup, the screen displays prompts; operators use a local control knob (or the hand-held Clicker or PDA) to make "Yes" or "No" responses. The other local knob controls Next/Back functions to scroll through prompts.

LED lights indicate valve status, including opening, closing, stopped, and alarm. Graphics indicate:

- mode of operation (local/stop/remote)
- valve position (% open, expressed numerically and graphically)
- continuous torque indication (5% increments)
- setup prompts and diagnostics via two, 16-character lines of user-configurable messages
- animated valve symbol



Large, easy-to-read LCD IconoText screen displays user-friendly messages for setup or status. Language is user-configurable.

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Class I, II, III Div. 1
Groups B, C, D, E, F, G
T4 & T4A @ Ta 60°C, Type 6P



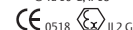
Class I, II, III Div. 1
Groups B, C, D, E, F, G
T4 & T4A @ Ta 60°C, Type 6P



EEx d IIB T4 & 120° (T4)
@ Ta 60°C, IP68
EEx d IIB + H2 T4 @ 120° (T4)
@ Ta 60°C, IP68



Ex d IIB T4 & 120° (T4)
@ Ta 60°C, IP68
Ex d IIB + H2 T4 & 120° (T4)
@ Ta 60°C, IP68



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