

# TQ SERIES TQ-SMART SERIES

Quarter-Turn Actuator

Ever - Reliable



KEPCO Trusted Partner  
Korea Power Plant Group Corporate Partner

Ever-Reliable  
**enertork®**

## TQ SERIES : QUARTER-TURN ACTUATOR



# TQ SERIES

## QUARTER-TURN ACTUATOR

TQ Series represents our devoted technology over 30 years of experience in the valve actuation, offering customer the reliable, quality assured, and cost-effective product.





## Features

- Light, compact and corrosion resistant [Aluminum alloy enclosure](#).
- [Double sealed](#) with V-shape ring and gasket to ensure IP68 grade, 8 meters under water for 72 hours.
- [Explosion proof](#) : Exd IIBT4-IEC-60079-0,-1
- Mechanically and electrically interlocked [Reversing Magnetic Contactor](#) to enhance the motor start-up.
- [2-wire fieldbus](#) communication protocols.
- [Non-intrusively set the position limit & torque](#), using remote control kit and push buttons respectively.

## Upgrades of TQ-Smart Series

- Features the same basic function and enclosure as TQ Series
- Non-intrusive Position & Torque setting
  - Easy setting and configuration using remote control kit and push buttons on operating panel
- Large 4-lined LCD display

## Structure

### ① Motor

The squirrel cage induction motor with embedded thermostat. The built-in thermostat accurately detects the increased temperature to prevent form motor damaging.

### ② Position Indicator

Dial indicator ranging from 0 ~ 100%

Option : LCD display is available for the model with integral control unit

### ③ Limit switch

Setting and adjusting is easy by using a screwdriver

### ④ Torque switch

Automatically stops the motor when the torque larger than the set value set is applied to the valve shaft

### ⑤ Potentiometer

Slip mechanism is provided for easy modification of zero points, achieved by rotating the potentiometer shaft with a screwdriver

### ⑥ Integral control unit

※ Non-penetrating push buttons are integrated with the actuator.

※ The inner circuit board is isolated from the remote command signals by the opto-isolator to withstand the surge.

※ Once the torque switch triggers, the actuator responds to no other command signals until the reset button is pushed to protect motor and valve.

### ⑦ Handwheel

Side-mounted for easy access to manual operation

### ⑧ Change lever

Automatically declutches to switch-over from manual to electric operation

### ⑨ Terminal block

9-1 Basic type : located inside the actuator body.

9-2 Integral control unit type : located at the rear of integral control unit which is double sealed with V-ring and gasket to prevent the ingress of foreign objects or substances even when the terminal cover is removed for on-site wiring.

9-3 As an option for basic type : additional double sealed terminal block is available separately.

### ⑩ Space heater : themistor type(PTC - 5)





## Specification

### ■ Standard

|                          |                                                                                               |
|--------------------------|-----------------------------------------------------------------------------------------------|
| Enclosure                | IP68 (under water, depth 8 meters for 72 hours)                                               |
| Main Power               | Single Phase 110/220V, Three Phase 220/380/440/460/480V, 50/60Hz, Direct current 24 ~ 220V    |
| Control Power            | Single Phase 110/220V                                                                         |
| Motor                    | Squirrel caged induction motor, Class F, Duty S2, 10 minutes                                  |
| Limit Switches           | Open/Close 2ea respectively, Silver Alloy Contact 250VAC, 10A                                 |
| Torque Switches          | Open/Close 1ea respectively, Silver Alloy Contact 250VAC, 10A(TQ-010; N/A)                    |
| Rotating Angle           | 90° ± 10°                                                                                     |
| Terminal                 | 26pins (TQ-010; 22pins)                                                                       |
| Position Indicator       | Dial indicator 0~100%                                                                         |
| Space Heater             | PTC thermistor type 5W, 110~240VAC                                                            |
| Cable Entry              | PF 1"X3 (TQ-010, PF3/4"X3)                                                                    |
| Manual/Electric Shifting | Automatic switch-over when motor starts up                                                    |
| Ambient Temperature      | Basic/LED : -25℃~80℃ LCD : -25℃~70℃ (Option for low temperature : -40℃~60℃/-50℃~50℃/-60℃~50℃) |
| Lubricant                | Grease EPO Class                                                                              |
| Vibration/Shock          | 1G within the range of 10~40Hz (0.5G for integral types), Shock : 30G                         |
| Lifespan                 | Minimum 10,000 cycles (EN15714-2)                                                             |
| External Painting        | Polyester powder coating after anodizing (Munsell No. 2.5PB5/2)                               |

### ■ Option

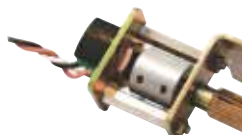
|                                                                    |                                                                                                                                                                                                                                                                                 |
|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Integral Control Unit                                              | Non-penetrating push buttons (Open/Stop/Close/Reset), Local/Off/Remote Selector, Open/Fault/Close LED lights, Reversing Contactor, Reverse phase detector, Monitor Relay, Double Sealed Terminal Block<br>※ Additional Option; Automatic Phase Correcting Function(TQ-010; N/A) |
| Potentiometer                                                      | 1kΩ                                                                                                                                                                                                                                                                             |
| Position Transmitter                                               | Output 4~20mA DC                                                                                                                                                                                                                                                                |
| Additional Switches (TQ-010; N/A)                                  | Limit Switches Open/Close 2ea respectively, Torque Switches Open/Close 1ea respectively                                                                                                                                                                                         |
| Modulation                                                         | Input/Output 4~20mA DC (TQ-010; N/A)                                                                                                                                                                                                                                            |
| Wide Traveling Angel                                               | 120°, 180°, 270° (TQ-010; N/A)                                                                                                                                                                                                                                                  |
| Extra Terminal Box                                                 | Double Sealed Terminal Block for Basic Type (38 pins, TQ-010; N/A)                                                                                                                                                                                                              |
| LCD                                                                | Digital Display of Valve Position, Open/Close/Fault Status                                                                                                                                                                                                                      |
| Self Diagnosis                                                     | Accumulated running times, number of actions, the number of operation of position/torque switch triggered, and thermostat errors                                                                                                                                                |
| Fieldbus Controls                                                  | Profibus-DP, Modbus-RTU, FF-H1, HART                                                                                                                                                                                                                                            |
| Explosion Proof                                                    | Exd II BT4 (FM, CSA, ATEX)                                                                                                                                                                                                                                                      |
| Optional Coating                                                   | Refer to Enertork                                                                                                                                                                                                                                                               |
| Torque Reset                                                       |                                                                                                                                                                                                                                                                                 |
| Non-intrusive position & torque setting, date logging(TQ-010; N/A) |                                                                                                                                                                                                                                                                                 |

## Smart Specification

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>LCD Screen Unit</b>                  | <ul style="list-style-type: none"> <li>▶ Display the valve or damper's open position rate in “%”</li> <li>▶ Indicate the actuator's status by characters <ul style="list-style-type: none"> <li>- Display operating modes and status, open/close rate, torque value, etc.</li> </ul> </li> </ul>                                                                                                                                                                                                                                                           |
| <b>Sensor Unit</b>                      | <ul style="list-style-type: none"> <li>▶ Position Sensing <ul style="list-style-type: none"> <li>- High-resolution absolute encoder based on magnetic hall sensor</li> <li>- Total available rotation range : 13bit</li> <li>- Previous position memory holds when the main power is cut off and without battery</li> </ul> </li> <li>▶ Torque Sensing <ul style="list-style-type: none"> <li>- Maximise life cycle for parts by the use of optical contactless resolver</li> <li>- Torque setting range on actuator is 40% ~ 100%.</li> </ul> </li> </ul> |
| <b>Data Logging &amp; Diagnostics</b>   | <ul style="list-style-type: none"> <li>▶ Display trend curve graph of operating characteristics of the actuator</li> <li>▶ Frequency log of position limit &amp; torque limit reached</li> <li>▶ Indicate the current status of operation mode</li> <li>▶ Easy to set and configure</li> <li>▶ Smart HMI (Human-Machine Interface) app with supplied wireless connection. (Request only)</li> </ul>                                                                                                                                                        |
| <b>Wireless Settings &amp; Controls</b> | <ul style="list-style-type: none"> <li>▶ No need to open up covers to set and modify position/torque and others.</li> <li>▶ Use remote control kit and smart devices (PDA, Smartphone, and others) for setting, controlling and self-diagnosing of actuator.</li> </ul>                                                                                                                                                                                                                                                                                    |



Encoder



Torque Sensing



Remote Controller

## Technical details

### ■ Performance

| Model  | Max. Output Torque | Operating Time(90°)<br>60/50Hz | Max. bore Diameter | Motor |       | Rated Current (A)<br>60/50Hz |           |           |           | Hand Wheel turns | Weight |
|--------|--------------------|--------------------------------|--------------------|-------|-------|------------------------------|-----------|-----------|-----------|------------------|--------|
|        |                    |                                |                    | Power | Frame | 1 Phase                      |           | 3 Phase   |           |                  |        |
|        |                    |                                |                    | W     | F     | 110V                         | 220V      | 380V      | 440V      |                  |        |
| TQ-010 | 10                 | 17/21                          | 18                 | 15    | 70    | 1.03/0.92                    | 0.65/0.56 | 0.18/0.25 | 0.25/0.34 | 10               | 6.5    |
| TQ-020 | 20                 | 17/21                          | 30                 | 40    | 80    | 1.97/1.71                    | 0.95/0.82 | 0.21/0.27 | 0.28/0.43 | 10               | 19     |
| TQ-040 | 40                 | 26/31                          | 40                 | 40    | 90    | 2.86/2.24                    | 1.36/1.00 | 0.23/0.25 | 0.27/0.32 | 12.5             | 25     |
| TQ-060 | 60                 | 26/31                          | 40                 | 90    | 90    | 3.89/3.16                    | 1.82/1.42 | 0.35/0.40 | 0.41/0.56 | 12.5             | 25     |
| TQ-080 | 80                 | 34/41                          | 47                 | 90    | 90    | 3.89/3.16                    | 1.82/1.42 | 0.35/0.40 | 0.41/0.56 | 14.5             | 35     |
| TQ-120 | 120                | 34/41                          | 47                 | 180   | 90    | 4.28/3.53                    | 2.12/1.76 | 0.48/0.53 | 0.55/0.77 | 14.5             | 36     |
| TQ-200 | 200                | 102/123                        | 78                 | 90    | 90    | 3.89/3.16                    | 1.82/1.42 | 0.35/0.40 | 0.41/0.56 | 43.5             | 52     |
| TQ-300 | 300                | 102/123                        | 78                 | 180   | 90    | 4.28/3.53                    | 2.12/1.76 | 0.48/0.53 | 0.55/0.77 | 43.5             | 53     |



#### LTMD-Q Series

Multi-turn actuator 0.2~37kW (Nuclear Power Plant)



#### MW Series

Gear reducer - Worm, Bevel 51 ~ 30,600kgf.m



#### LEC Series

Self-descending actuator (1 ~ 20 Ton) 0.1 ~ 2.2kW



#### TM Series

Multi-turn 0.2~37kW



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