# REGULATING ELECTRICAL ACTUATOR
# + RETURN BY SUPER-CAPACITOR TCR-02T-KT

## FEATURES

The TCR-02T-KT electric actuator is intended for motorising ¼ turn valves with a torque of 15 Nm.
**Double proportional control function 4-20mA + closing manoeuvre provided by a super-capacitor.** With a compact construction and plastic housing, it is especially well suited for motorising small dimensions ball valves. The actuator has many advanced control functions which can be set from the screen. IP67 leak-tightness: to be used indoors and, possibly, outdoors under a shelter. Manual control with a key.

## AVAILABLE MODELS

Supply voltages: 230V AC, 24V AC/DC.
Control: 4-20 mA.
Dual frequency : 50Hz, 60Hz.

## LIMITS OF USE

| | |
|---|---|
| **IP Code** | IP 67 |
| **Ambient temperature** | - 20°C / +60°C |
| **Service factor** | S4 - 50% |

## MECHANICAL FEATURES

| | |
|---|---|
| **Gear box** | treated steel pinions |
| **Torque** | 15 Nm |
| **Angle of rotation** | 90° +/- 2° |
| **Declutching** | without |
| **Override control** | By key |

| | | |
|---|---|---|
| **Torque (Nm)** | 15 | |
| **Voltage** | 24V AC - DC | 95-265V AC-DC |
| **Adjustment signal** | 4-20 mA | |
| **Feedback signal** | 4-20 mA | |
| **Manoeuvring time (s)** | 15 | 15 |
| **ISO 5211:** | F03/F05 - star 11 | |

## ELECTRICAL FEATURES

| | |
|---|---|
| **Motor protection** | Thermal switch |
| **Limit switches** | Without |
| **Auxiliary switches** | Without |
| **Anti-condensation** | integrated |
| **Electrical connection** | PE M10 + 1.5m cable |

| | | |
|---|---|---|
| **Voltage** | 24V AC - DC | 95-265V AC-DC |
| **Power (W)** | 36 | 36 |
| **Current (A)** | 1,5 | 0,035 - 0,09 |
| **Fuse protection (A)** | 5 | 1 |

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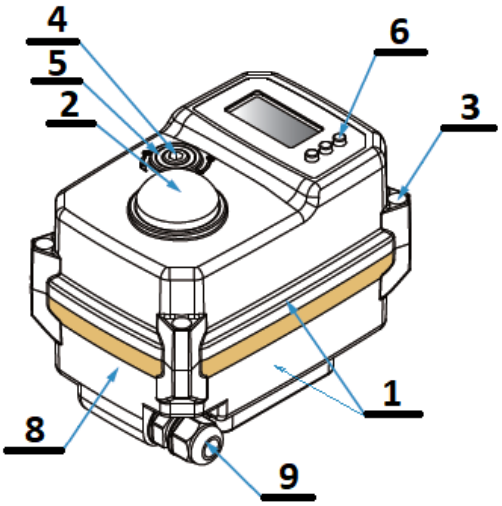
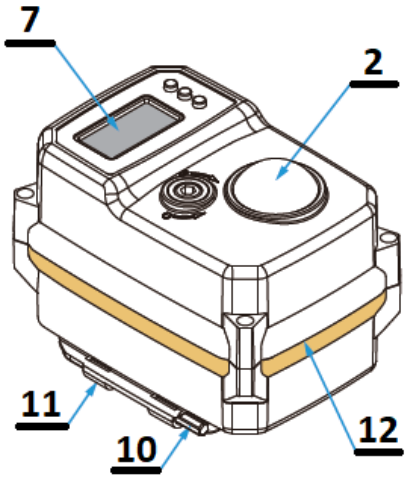
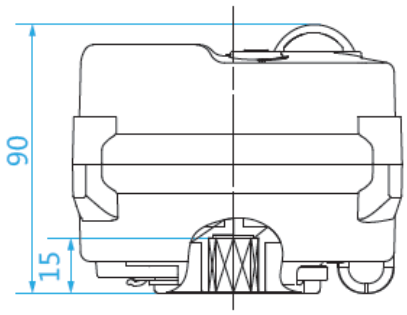
## CONSTRUCTION

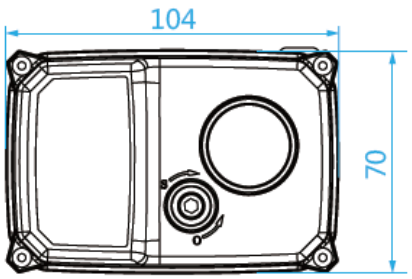
| TCR-02T-KT32 | | | | | |
|---|---|---|---|---|---|
| **No.** | **Name** | **Material** | **No.** | **Name** | **Material** |
| **1** | Casing + lid | Plastic (ABS) | **7** | 1.3" LCD display | OLED |
| **2** | Position indicator | Polycarbonate plastic | **8** | Rating plate | PVC |
| **3** | Screw x 4 | Ansi 304 | **9** | Packing gland | Nylon |
| **4** | Backup control stem | Ansi 304 | **10** | Hex key | Steel |
| **5** | Gasket | NBR | **11** | Key support | Plastic (ABS) |
| **6** | Adjustment button | Rubber | **12** | Cover gasket | NBR |
| **Weight (kg): 0.620** | | | | | |



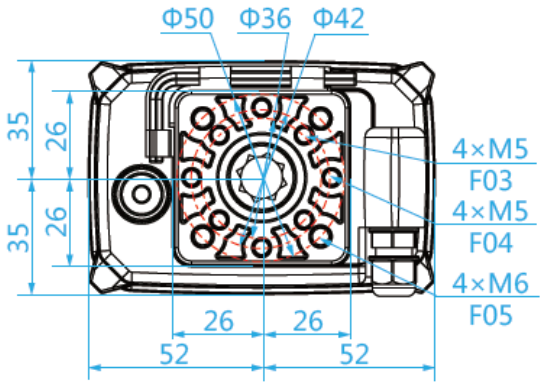




## DIMENSIONS (mm)





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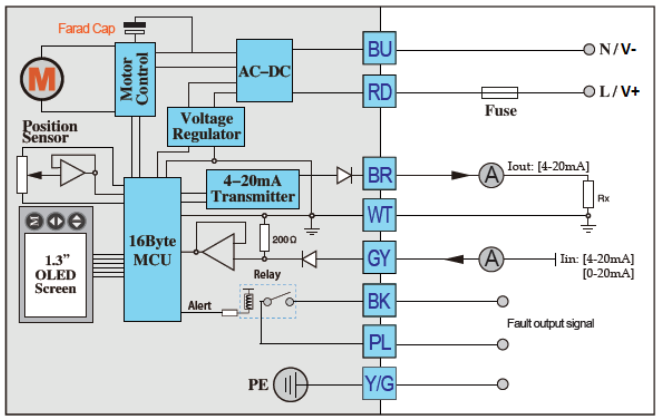
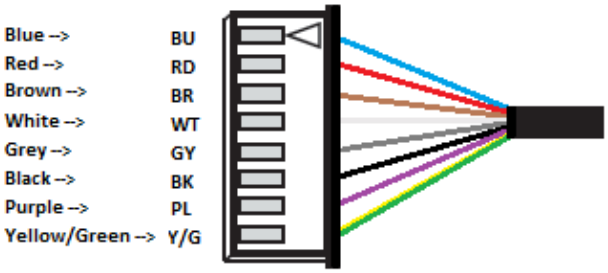
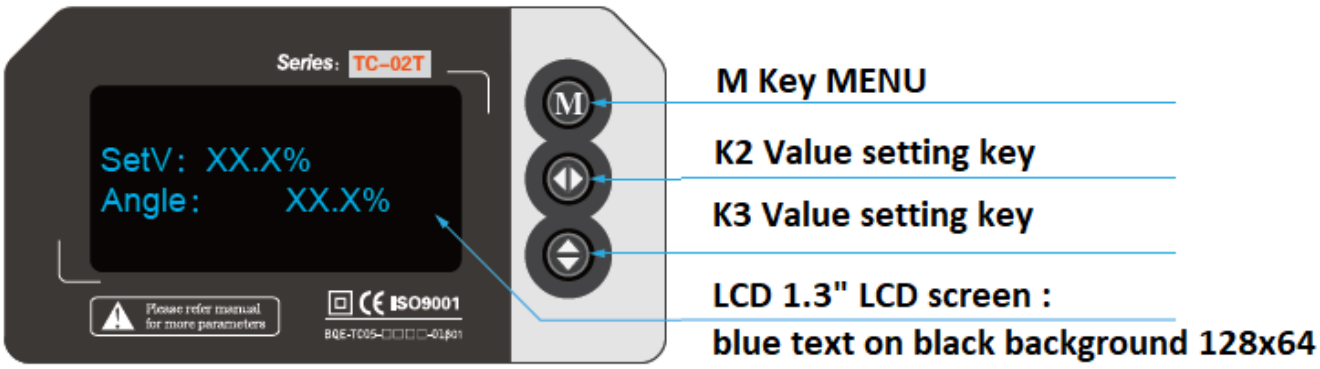
## WIRING DIAGRAM

| | |
|---|---|
| **BU** | Power supply neutral (Blue) |
| **RD** | Power supply phase (Red) |
| **BR** | 4-20 mA signal output + (Brown) |
| **WT** | 4-20 mA signal output - (White) |
| **GY** | 4-20 mA signal input (Grey) |
| **BK** | Input alarm signal (Black) |
| **PL** | Output alarm signal (Purple) |
| **Y/G** | Earth (Yellow / Green) |




## DESCRIPTION OF THE 1.3'' LCD SCREEN




The control screen displays the % of opening and the actuator parameter setting.

1.3'' LCD angle without any blind spot, strong luminosity, automatic switching to the economy saving mode at the end of 5 minutes.

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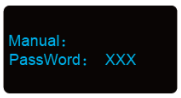
## LOCAL OPERATION

| | | |
|---|---|---|
| **1** | Press the K3 button for 5 seconds, until “K3” flashes at the top right of the screen. | |
| **2** |  | Enter the password “111” |
| **3** | Press the K2 button to manoeuvre clockwise. The screen displays the % of opening. Release when the desired position is reached. | |
| |  | |
| | Press the K3 button to manoeuvre anti-clockwise. The screen displays the % of opening. Release when the desired position is reached. | |

## ACTUATOR SETTINGS

The following functions can have their parameters set from the menu accessible on the screen:

| STEP | TITLE | FUNCTION AND VALUES |
|---|---|---|
| **1** | Entering the menu | Press the “M” button for more than 5 s. |
| **2** | Enter the password | Press the “M” button for more than 5 s.<br>Enter the code “333” (use the keys K2 and K3)<br>Press again the button “M” |
| | |  |
| **3** | Choice of language | English or Mandarin |
| | |  |
| **4** | Choosing the direction of rotation of the actuator | **Direct**: 4mA = valve closed / 20 mA = valve open |
| | |  |
| | | **Inverted**: 4 mA = valve closed / 20 mA = valve open |
| **5** | Position by absence of any control signal | In the absence of a control signal, the valve can take 3 positions: ON, OFF or KEEP |
| | |  |

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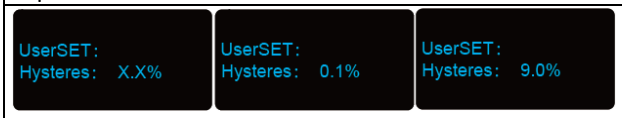
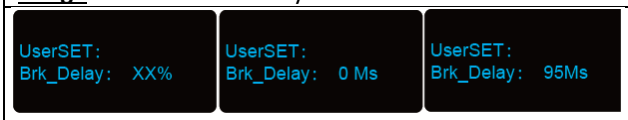
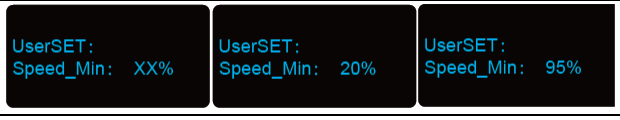
| | | |
|---|---|---|
| **6** | Dead band | This function is used to set the accuracy and the sensitivity of the control: the larger the band, the lower the accuracy; the narrower the band, the more oscillating the system can be.<br>**Setting range:** 0.1 to 9.9% - **Setting by default**: 0.8%<br>  |
| **7** | Hysteresis adjustment | This parameter setting is a prerequisite for the next.<br>YES = adjustment is possible<br>NO = no adjustment is possible (value by default)<br>  |
| **8** | Hysteresis value | If the previous parameter is "YES", it is possible to set the hysteresis value between 0.1 and 9.9%. The value by default is 0.2%. Do not use the function if there is a play between the valve's stem and the actuator's square.<br>  |
| **9** | Manual adjustment of the speed of rotation | This function is used for slowing down the motor.<br>**Range**: 20-100% - Value by default = 100%<br>  |
| **10** | Braking time | In order to increase the stability of the motor, the motor will slow down after a short time before reaching its setpoint value position. During current use, this function is not useful.<br>**Range**: 0-95 ms – Value by default = 1 ms<br>  |
| **11** | Setting the maximum speed | This setting affects the available torque. Without a special need, do not change it.<br>**Range**: 20-100% - Value by default = 100%<br>  |
| **12** | Setting the minimum speed | This setting affects the available torque. Without a special need, do not change it.<br>**Range**: 20-95% - Value by default = 75%<br>  |



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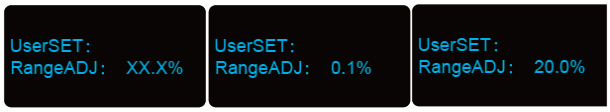
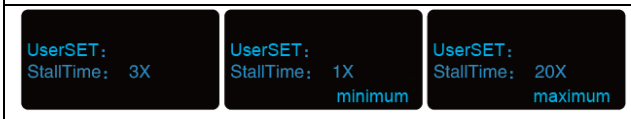
| | | |
|---|---|---|
| **13** | Setting the speed for the stroke | This setting is used for setting a % of the actuator stroke during which it will slow down before reaching the setpoint value position.<br>**Range**: 0.1-20% - Value by default = 10%<br>  |
| **14** | Redefining the 4 mA position | Used to set another position than 0% for the 4 mA value. This function is useful for valves with an opening angle different from 90°.<br>**Range**: -50% +80% - Value by default = 0.0%<br>  |
| **15** | Redefining the 20 mA position | Used to set another position than 100% for the 20 mA value. This function is useful for valves with an opening angle different from 90°.<br>**Range**: 20% +220% - Value by default = 100.0%<br>  |
| **16** | Modification of the 4 mA output signal | If a deviation is found on the 4mA output signal, this function is used to adjust it. If the number is increased, the current is higher. If the number is decreased, the current is lower.<br>**Range**: 000_481_A – Value by default 191_A<br>**NB**: always limit the lower value to 20 mA<br>  |
| **17** | Modification of the 20mA output signal | If a deviation is found on the 20mA output signal, this function is used to adjust it. If the number is increased, the current is higher. If the number is decreased, the current is lower.<br>**Range**: 191_1000_A – Value by default 909_A<br>  |
| **18** | Response time | Used to set the response speed of the valve. The smaller the value, the less sensitive the control. The bigger the value, the more sensitive it is. Increase the value when the response speed is too low.<br>**Setting range:** 1x20x – Value by default 3x<br>  |



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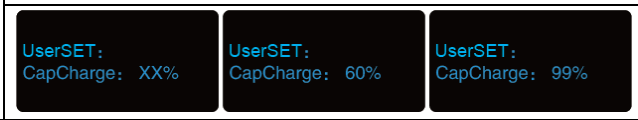
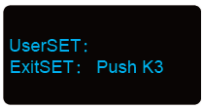
| | | |
|---|---|---|
| **19** | Power supply position by default | Setting the position of the valve in the event of a power cut. This manoeuvre will be carried out if the capacitor is sufficiently charged.<br>**Possible values**:<br>**KEEP**: unchanged position of the valve<br>**ON**: valve opening<br>**OFF**: valve closing<br>**Value by default**: OFF<br>  |
| **20** | Capacitor charge | Setting the % of charge when the feed current is higher than the set value.<br>**Setting range:** 60-99%<br>**Value by default**: 95%<br>Do not set below 80%, the charge will be insufficient and would set off the motor alarm<br>  |
| **21** | Exiting the menu | Press K3 to exit the menu<br>The system will switch back in the automatic checking mode.<br>  |

**TROUBLESHOOTING**

| Defect met | Cause of defect | Method of solving |
|---|---|---|
| Inactive actuator | Non-connected electrical grid. | Connect to the electrical grid. |
| | Wrong voltage. | Check the actuator's voltage. |
| | Motor overheating. | Check the torque on the valve. |
| | Faulty connection. | Check the connection to the terminal box. |
| | Damaged start capacitor. | Contact the supplier for repair. |
| No switch signal | Faulty connection. | Check the connections. |
| | Damaged microswitch | Change the microswitch |
| Valve that is not fully closed | Use the return signal from the actuator check. | Receiving a return signal does not mean that the actuator is fully closed, hence do not cut the power supply. |
| | The hysteresis increases due to wear or between the actuator and the valve's stem. | Readjust the limit cams.<br>Contact the supplier for repair. |
| Presence of humidity or water in the actuator | Unsuitable cable cross-section being used. | Contact the supplier for repair. |
| | The cable connection is not leak-tight. | |
| | Worn sealing gaskets. | |
| | Loose cover screws. | Dry the internal parts and tighten the cover screws. |



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