

# 737XS VALVE WITH TCR ELECTRICAL ACTUATOR

## FEATURES

The 737XS + TCR 2-way steel ball valve is intended for automatic disconnection of common industrial fluid networks. With their 3-piece and external bolts construction, they are easy to dismantle for maintenance. This full-bore ball valve has an antistatic device, a gland pack double tightness. It is CE approved, fire safety and TA-LUFT. The ISO 5211 pad enables the direct mounting of the SA03 electric actuator. It is suitable for type S2 service factors and is perfectly suited for industrial use with indoor or outdoor installation under shelter.

## AVAILABLE MODELS

Diameters 1/2" to 2".

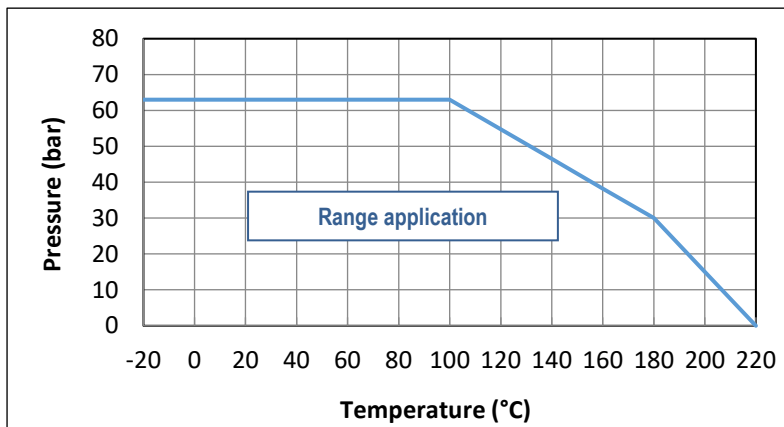
**Supply voltages** : 24 Vca/cc and 230 Vca.



| Connection   | G      | BW     | SW     |
|--------------|--------|--------|--------|
| Carbon steel | 737 XS | 738 XS | 739 XS |

## LIMITS OF USE

|                         |                 |
|-------------------------|-----------------|
| Fluid pressure : PS     | 63 bar (20°C)   |
| Fluid temperature : WT° | -25°C / +180°C  |
| Ambiant temperature     | - 10°C / + 60°C |
| Service factor          | S4 - 50%        |



## DIRECTIVES AND MANUFACTURING STANDARDS

| OBJET                                   | Standard                   | ON       | OBJET                   | Standard                |
|-----------------------------------------|----------------------------|----------|-------------------------|-------------------------|
| Pressure Equipment Directive 2014/68/EC | 1/2" to 1": not subject    |          | Final test              | EN 12266                |
|                                         | 1 1/4" to 2": category III | TÜV 0035 | Material certificate    | EN 10204                |
| Size                                    | EN 12516-1                 |          | Motorisation connection | ISO 5211                |
| Steel grade                             | EN 1503-1                  |          | Fire safety             | REI 607/5 – ISO 10497-5 |

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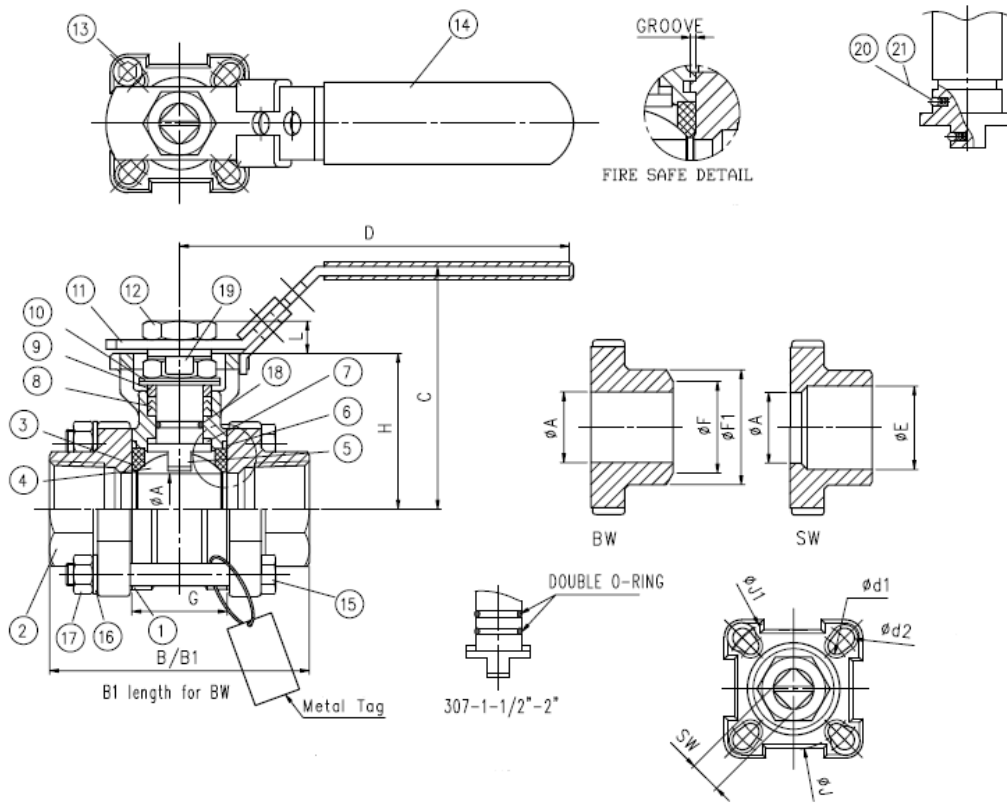
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| Ref.  | TD737XS+TCR-D ENG |
| Rev.  | 03                |
| Date  | 03/2024           |

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## CONSTRUCTION

| No. | Name        | Carbon steel | Stainless steel | No.                                    | Name           | Carbon steel | Stainless steel |
|-----|-------------|--------------|-----------------|----------------------------------------|----------------|--------------|-----------------|
| 1   | Body        | 1.0619       | 1.4408          | 12                                     | Nut            | 304 SS       | 304 SS          |
| 2   | Ends        | 1.0619       | 1.4408          | 13                                     | End stop       | 304 SS       | 304 SS          |
| 3*  | Seats       | PTFE+15%GF   | PTFE+15%GF      | 14                                     | Sleeve         | PVC          | PVC             |
| 4   | Ball        | CF8M / 316   | CF8M / 316      | 15                                     | Bolts          | 304 SS       | 304 SS          |
| 5   | Stem        | 316 SS       | 316 SS          | 16                                     | Washer         | 304 SS       | 304 SS          |
| 6*  | Body gasket | PTFE         | PTFE            | 17                                     | Nuts           | 304 SS       | 304 SS          |
| 7*  | Washer      | PTFE+15%GF   | PTFE+15%GF      | 18*                                    | O-ring         | FPM          | FPM             |
| 8*  | Packing     | PTFE         | PTFE            | 19                                     | Retaining ring | 304 SS       | 304 SS          |
| 9   | Spacer      | 304 SS       | 304 SS          | 20                                     | Antistatic     | 316 SS       | 316 SS          |
| 10  | B washer    | 301 SS       | 301 SS          | 21                                     | Spring         | 304 SS       | 304 Ss          |
| 11  | Lever       | Inox 304     | 304 SS          | *Items provided in the maintenance kit |                |              |                 |



## DIMENSIONS (mm)

| DN    | A    | B<br>(G) | B<br>(SW) | B1<br>(BW) | C     | D   | E    | F  | F1   | G    | H    | J1 | SW |
|-------|------|----------|-----------|------------|-------|-----|------|----|------|------|------|----|----|
| 1/2"  | 16   | 75       | 75        | 75         | 70,9  | 110 | 21,9 | 17 | 22,4 | 25,2 | 42,3 | 42 | 9  |
| 3/4"  | 20   | 80       | 80        | 90         | 73,4  | 110 | 27,2 | 22 | 28,2 | 27,7 | 44,8 | 42 | 9  |
| 1"    | 24,5 | 90       | 90        | 100        | 84,1  | 135 | 34,0 | 28 | 33,7 | 33,0 | 54,0 | 50 | 11 |
| 1"1/4 | 32   | 110      | 110       | 110        | 89,3  | 135 | 42,7 | 37 | 44,0 | 41,2 | 59,2 | 50 | 11 |
| 1"1/2 | 38   | 120      | 120       | 125        | 109,5 | 165 | 48,8 | 43 | 50,8 | 49,3 | 73,5 | 70 | 14 |
| 2"    | 50   | 140      | 140       | 150        | 118,9 | 165 | 61,3 | 54 | 62,6 | 63,6 | 82,9 | 70 | 14 |

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# 737XS VALVE WITH TCR ELECTRICAL ACTUATOR

## MOTORISATION ELECTRIQUE TCR

The TCR motorisation proposed as standard comprises:

- IP67 plastic housing for actuator and steel gear box,
- a safety coefficient of 1.3 minimum compared to the nominal torque of the valve,
- an upstream / downstream pressure difference  $\Delta P=10$  bar max.

The actuator's assembly is direct.

| DN    | Actuator | Power<br>230V ac / 24V ac-dc | Time<br>230V ac | Time<br>24V ca-cc | Standard equipment of the actuator                                                                                                                                                                                                                                                                              |
|-------|----------|------------------------------|-----------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1/2"  | TCR-02N  | 15                           | 10s             | 10s               | 2 adjustable limit switches<br>2 dry auxiliary contacts<br>Thermal protection of the motor<br>2-3W anti-condensation resistance<br>Stand-by manual control with key<br>3D Position visual indicator<br>Electrical connection:<br><b>TRC02:</b> 1 x PE M10 + 1.5m cable<br><b>TCR05:</b> 1 x PE M20 + 1.5m cable |
| 3/4"  | TCR-02N  | 15                           | 10s             | 10s               |                                                                                                                                                                                                                                                                                                                 |
| 1"    | TCR-02N  | 15                           | 10s             | 10s               |                                                                                                                                                                                                                                                                                                                 |
| 1"1/4 | TCR-05N  | 25                           | 12s             | 12s               |                                                                                                                                                                                                                                                                                                                 |
| 1"1/2 | TCR-05N  | 25                           | 12s             | 12s               |                                                                                                                                                                                                                                                                                                                 |
| 2"    | TCR-05N  | 25                           | 12s             | 12s               |                                                                                                                                                                                                                                                                                                                 |

For any other operating conditions, please contact us.

\* indicative time for actuator running empty

## MOTORISATION OPTIONS

There are many options, so please contact our sales service for more information on these:

|    |                                                                                                      |
|----|------------------------------------------------------------------------------------------------------|
| 1  | 100mm high height adjustment for installing thermal insulation                                       |
| 2  | Actuator dimensioned for an upstream / downstream pressure difference $\Delta P$ greater than 10 bar |
| 3  | NF actuator – return via condenser – TCR-KT32                                                        |
| 4  | High-speed actuator - TRC-NH                                                                         |
| 5  | Smart actuator with manoeuvring time adjustment - TCR-C                                              |
| 6  | Control actuator – TCR-T                                                                             |
| 7  | NF control actuator – return via condenser – TCR-T-KT32                                              |
| 8  | Field bus actuator - TCR-B                                                                           |
| 9  | Actuator with in-built timer – TCR-D                                                                 |
| 10 | Wireless actuator – TCR-R                                                                            |

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## ASSEMBLY AND MAINTAINANCE INSTRUCTIONS

### 1 – Installation

#### 1.1 - Checks

- Check that the material of the valve body is chemically compatible with the fluid.
- Check that the pressure and service conditions are compatible with the (P, T) diagram of the valve. See § “Service limits”
- Check that the fluid is clean and free of particles. The latter could scratch the ball and damage the seats, hence causing the valve to leak. If need be, install an upstream filter.
- Check that there is no risk of thermal expansion of the fluid, which could damage the seats. In the open position, a hole at the top of the ball balances the pressures between the body cavity and the flow of the fluid. As an option, we recommend a relief hole upstream of the valve for equalising the pressures for fluids such as ammonia, LPG, chlorine, etc.
- Check that the valve is not used for flow or pressure control since it is not intended for this use and there is a risk of premature wear of the seats, in particular in the event of high pressure and/or temperature. For this special application, preferably use our “V-port” version with a V-shaped hole in the ball. Please contact us.
- Check that the valve is not used on a gas which might condense at certain times during the process. In such a case, the pressure within the body cavity could become negative, which could lead to a significant deformation of the seats. Please contact us.
- Static electricity: the valve will be supplied with a ball-stem-body internal electrical continuity tester. If the service conditions require the electrical continuity of the installation, check its earthing.
- If the valve is installed in an explosive zone, you must follow the additional “IMEVMATEX” instructions.

#### 1.2 - Storage before installation

- Follow our general “IMESTOCK” instructions for storage.
- Check that the tie-bolts of the valves were not loosen during transport.

#### 1.3 - Installation

- Before any installation, isolate the piping upstream and downstream, depressurize the piping and bring the installation to ambient temperature. Carefully clean the piping of any particle (foreign body, dust, rust, etc.) or shavings by water rinsing or air blowing.
- Remove the protective tips from the valve ends.
- Check the cleanliness of the internal surfaces of the valve and if need be, clean them.
- Direction of mounting: the valves do not have a preferred direction of mounting, unless a relief hole was drilled into the ball.
- Check the perfect alignment and the proper support of the pipe installation upstream and downstream of the valve. Alignment defects cause mechanical deformations which can block the valve or lead to leaks at the body gaskets.

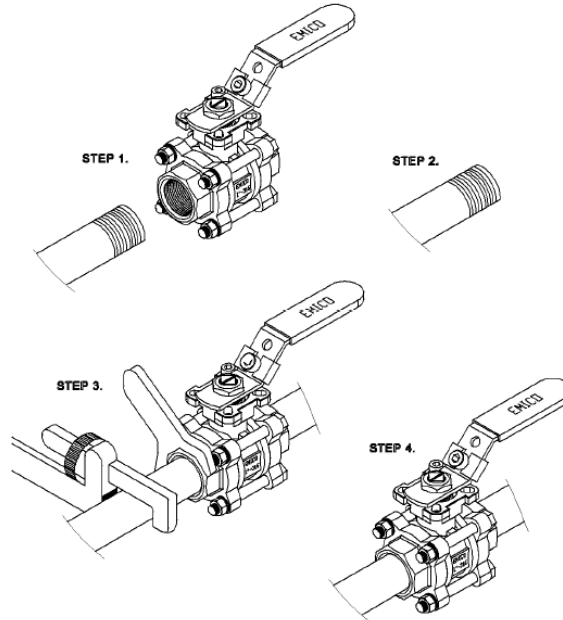
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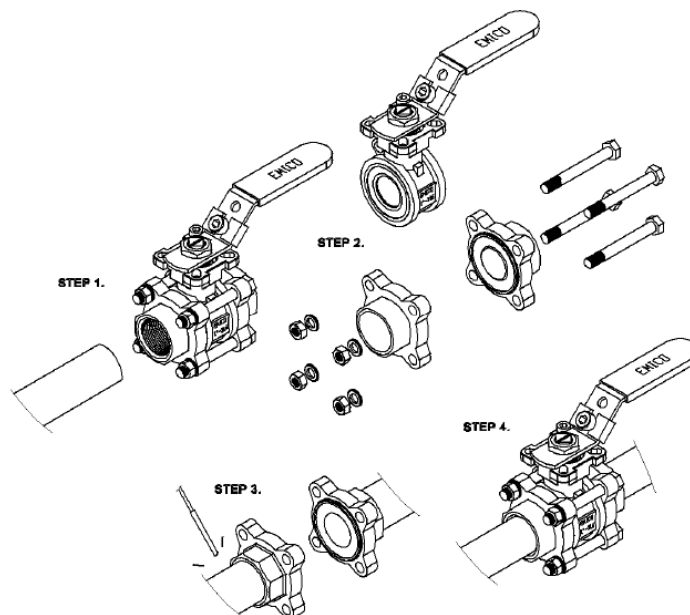
## ○ Threaded valve connection:

- Check that the standards for the valve internal thread and pipe thread are the same.
- Cover the pipe threads using a sealing material (tow, PTFE tape, sealing glue, etc.) which is suitable for the fluid.
- Screw the tube into the valve end clockwise, as shown in the diagram below.
- Check the sealing of the connection using a suitable test (hydrostatic test or leak detection spray).



## ○ Connection of weld-on valves:

- Remove the end (items 2) by unscrewing the tie-bolts, and remove the central body.
- Weld each end onto the upstream or downstream pipe, following the alignment of the tie-bolt holes.
- Cool down to the room temperature the welded ends, then put back the central body complying with the tightening torques shown in the table below.
- Check the sealing of the connection using a suitable test (hydrostatic test or leak detection spray).



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- Hydraulic test of the installation
  - Valves were tested at the factory at 1.5 x WP.
  - If a hydrostatic test is carried out on the installation, do not exceed the authorised pressure.

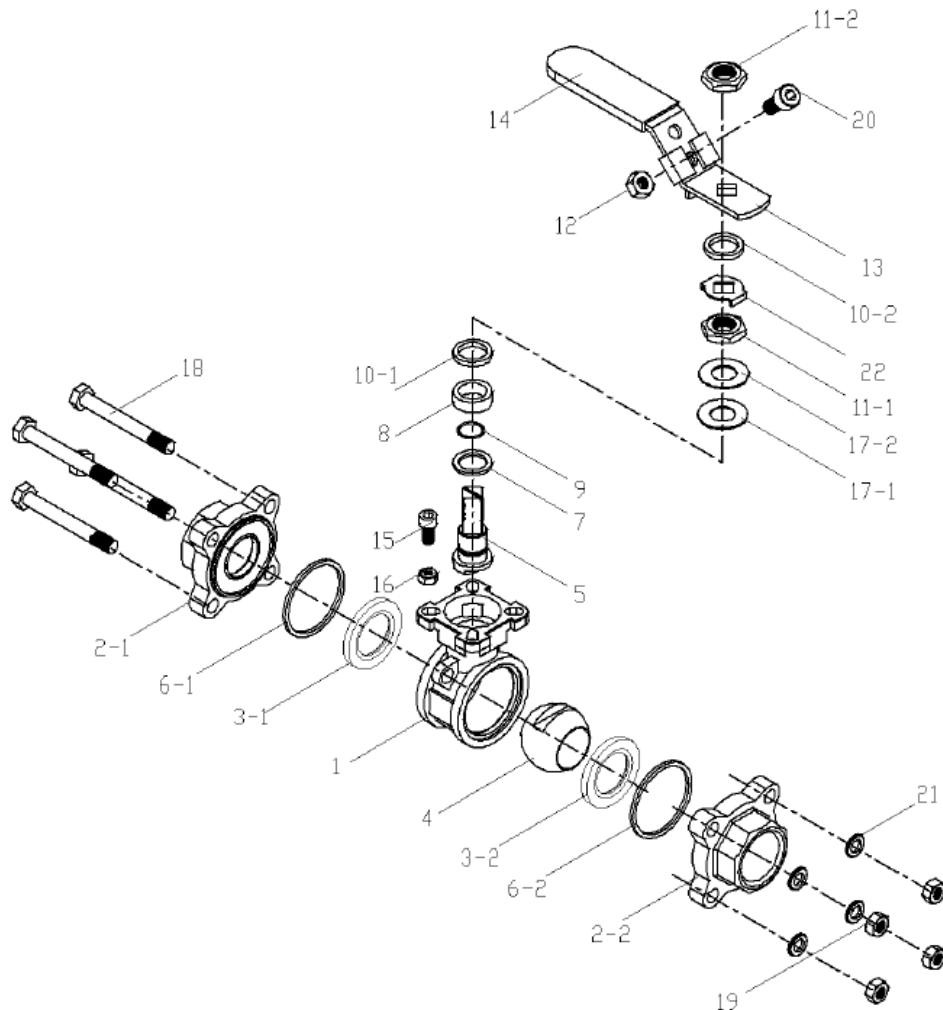
## 2 - Service

- If a hot fluid flows across the valve, do not touch the valve surface.
- Always operate the valve slowly and smoothly.
- Opening clockwise, closing anti-clockwise.

## 3 - Servicing

### 3.1 - Frequency of servicing

- The servicing frequency depends upon the use of the valve, of the type of fluid, of its velocity, of its frequency of operation, of the cycles of rise and fall in pressure and temperature.
- Before any intervention, isolate the upstream and downstream pipe installation using the valves provided for this purpose. Depressurize the pipe installation and bring it to ambient temperature.
- If the lever has to be removed, do that before disassembling the body.
- To remove the central body, unscrew the tie-bolts symmetrically. Then gently remove the central part avoiding to drop the ball.
- To remove the ball from the body, turn the stem by a quarter turn.



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# 737XS VALVE WITH TCR ELECTRICAL ACTUATOR

## 3.2 - Inspecting the state of the valve and possible repair

- Check the state of the ball (Item 4): it has to be clean and unscratched. If the cleaning or polishing is not possible, replace it (see the § on spare parts).
- Check the state of the seats (3.1 and 3.2): they must not be deformed, nor scratched, nor worn, or dirty. Otherwise, replace them with parts from the gasket kit.
- Check the state of the packing gland (7.8 and 9): no leak should be found at the stem and the rings should not be excessively worn. If need be, replace the gaskets.
- Check the state of the body gaskets (6.1 and 6.2). Replace them if necessary.
- Reassemble the different parts of the valve, following the tightening torques shown in the table below.
- Check that the stem manoeuvring is smooth. Perform about ten manoeuvres.

**TABLE OF THE TIGHTENING TORQUES OF THE TIE-BOLTS AND OF THE LEVER NUT**

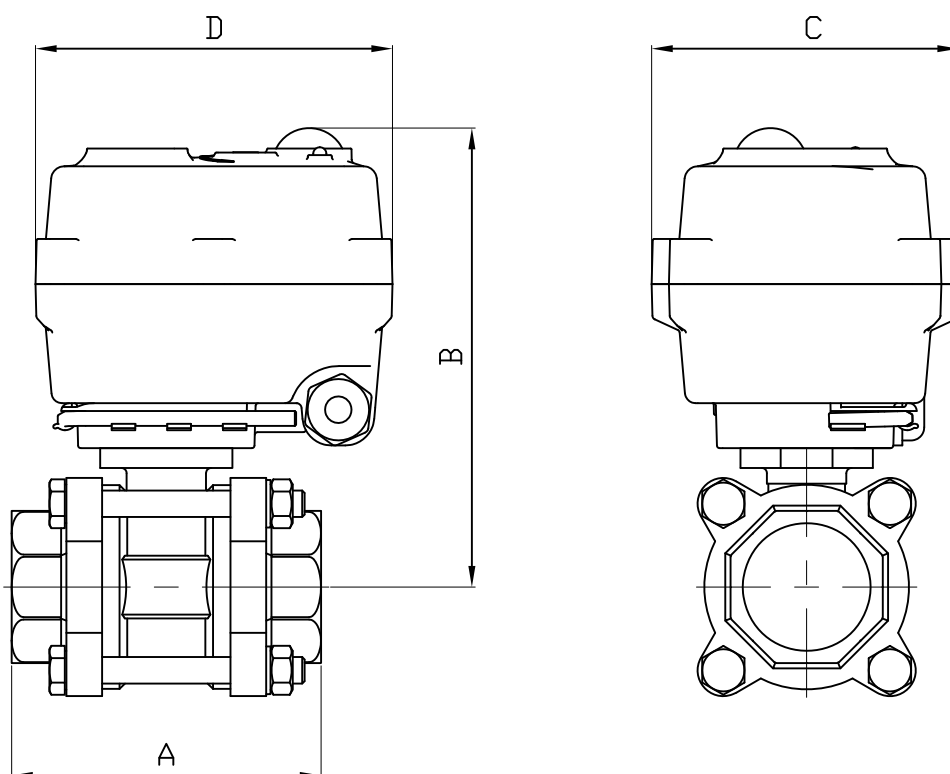
| DN         | Tie-bolts | Torque (Nm) | Lever nut (Nm) |
|------------|-----------|-------------|----------------|
| 1/2" - 15  | M6        | 10          | 4              |
| 3/4" - 20  | M8        | 20          | 4              |
| 1" - 25    | M8        | 20          | 4.5            |
| 1"1/4 - 32 | M10       | 35          | 4.5            |
| 1"1/2 - 40 | M10       | 35          | 5.5            |
| 2" - 50    | M10       | 40          | 5.5            |

## SPARE PARTS

| DN             | Gasket kit | Ball   | V30° ball | V60° ball | Tie-bolt kit | Handle |
|----------------|------------|--------|-----------|-----------|--------------|--------|
| Reference mark | 6-7-8-18   | 4      | 4         | 4         | 15-16-17     | 11     |
| 1/2" - 15      | 982872     | 980032 | 980042    | 980052    | 982832       | 982802 |
| 3/4" - 20      | 982873     | 980033 | 980043    | 980053    | 982833       | 982802 |
| 1" - 25        | 982874     | 980034 | 980044    | 980054    | 982834       | 982804 |
| 1"1/4 - 32     | 982875     | 980035 | 980045    | 980055    | 982835       | 982804 |
| 1"1/2 - 40     | 982876     | 980036 | 980046    | 980056    | 982836       | 982806 |
| 2" - 50        | 982877     | 980037 | 980047    | 980057    | 982837       | 982806 |

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TCR-02-05

| DN    | 1/2"  | 3/4"  | 1"    | 1 1/4" | 1 1/2" | 2"    |
|-------|-------|-------|-------|--------|--------|-------|
| SERVO | TCR02 | TCR02 | TCR02 | TCR05  | TCR05  | TCR05 |
| A     | 75    | 80    | 90    | 110    | 120    | 140   |
| B     | 132.3 | 132.8 | 144   | 180.2  | 194.5  | 204   |
| C     | 70    | 70    | 70    | 111    | 111    | 111   |
| D     | 104   | 104   | 104   | 132    | 132    | 132   |
| KG    | 1.3   | 1.56  | 2.1   | 3.9    | 4.9    | 6.5   |

Informations données à titre indicatif et sous réserve de modifications éventuelles  
data subject to alteration

|                                                                                                                           |                  |                    |                                |                   |      |      |
|---------------------------------------------------------------------------------------------------------------------------|------------------|--------------------|--------------------------------|-------------------|------|------|
|                                                                                                                           |                  |                    |                                |                   |      |      |
| Ech: /                                                                                                                    | Date :06/09/2019 | Dessiné par : E.D. | Tolérances générales : +/- 0.2 | Modifications     | Date | REV. |
| <b>ROBINET A TOURNANT SPHERIQUE 737XSD/BALL</b><br><b>VALVE 737XSD + SERVOMOTEUR TCR/ ELECTRIC</b><br><b>ACTUATOR TCR</b> |                  |                    |                                | Matière :         |      |      |
|                                                                                                                           |                  |                    |                                | Poids (Kg) :      |      |      |
|                                                                                                                           |                  |                    |                                | Traitement : SANS |      |      |
|                                        |                  |                    |                                | Plan n° Ens 1381  |      |      |

45, Rue du Ruisseau  
38297 SAINT QUENTIN FALLAVIER



# TCR-N ELECTRICAL ACTUATOR

## FEATURES

The TCR-N electric actuators are intended for motorising  $\frac{1}{4}$  turn valves with a torque of 15, 20, 50, 110, 200 or 400 Nm. With a compact construction and plastic housing, they are especially well suited for motorising ball valves and butterfly valves. Several variants offer advanced functions. IP67 leak-tightness: to be used indoors and, possibly, outdoors under a shelter. Possible installation in parallel. Manual control with a key.

## AVAILABLE MODELS

Supply voltages: 230V AC, 24V AC/DC, 12V DC.

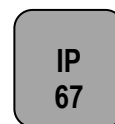
## LIMITS OF USE

|                     |                         |
|---------------------|-------------------------|
| IP Code             | IP 67                   |
| Ambient temperature | - 20°C / +60°C          |
| Service factor      | S4 - 50% (TCR 02-05-11) |
|                     | S3 - 85% (TCR 20-40)    |



## MECHANICAL FEATURES

|                   |                                   |
|-------------------|-----------------------------------|
| Gear box          | treated steel pinions             |
| Torques           | 15 - 20 - 50 - 110 - 200 - 400 Nm |
| Angle of rotation | 90° +/- 2°                        |
| Declutching       | Without (TCR 02-05-11)            |
|                   | With (TCR 20-40)                  |
| Override control  | By key                            |



| Actuator             | TCR 02N           |           |               | TCR 05N           |           |               |
|----------------------|-------------------|-----------|---------------|-------------------|-----------|---------------|
| Torques (Nm)         | 15                | 20        | 20            | 50                |           |               |
| Voltage              | 12V DC            | 24V AC-DC | 95-265V AC-DC | 12VDC             | 24V AC-DC | 95-265V AC-DC |
| Manoeuvring time (s) | 15                | 10        | 10            | 12                | 12        | 12            |
| ISO 5211:            | F03/F05 - star 11 |           |               | F05/F07 - star 14 |           |               |

| Actuator             | TCR 11N           |           |               | TCR 20N           |           |               | TCR 40N           |           |               |
|----------------------|-------------------|-----------|---------------|-------------------|-----------|---------------|-------------------|-----------|---------------|
| Torques (Nm)         | 110               |           |               | 200               |           |               | 400               |           |               |
| Voltage              | 12V DC            | 24V AC-DC | 95-265V AC-DC | 12VDC             | 24V AC-DC | 95-265V AC-DC | 12V DC            | 24V AC-DC | 95-265V AC-DC |
| Manoeuvring time (s) | 10                | 10        | 10            | 25                | 25        | 25            | 25                | 25        | 25            |
| ISO 5211:            | F05/F07 - star 17 |           |               | F07/F10 - star 22 |           |               | F07/F10 - star 22 |           |               |

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# TCR-N ELECTRICAL ACTUATOR

## ELECTRICAL FEATURES

| Actuator              | TCR 02N                   | TCR 05N             |
|-----------------------|---------------------------|---------------------|
| Motor protection      | Thermal switch            |                     |
| Limit switches        | 2 adjustable switches     |                     |
| Auxiliary switches    | 2 adjustable dry switches |                     |
| Anti-condensation     | integrated                |                     |
| Electrical connection | PE M10 + 1.5m cable       | PE M20 + 1.5m cable |

| Actuator            | TCR 02N |           |               | TCR 05N |             |               |
|---------------------|---------|-----------|---------------|---------|-------------|---------------|
| Voltage             | 12V DC  | 24V AC-DC | 95-265V AC-DC | 12V DC  | 24V AC-DC   | 95-265V AC-DC |
| Power (W)           | 15      | 15        | 15            | 25      | 25          | 25            |
| Current (A)         | 1,5     | 1,5       | 0,09          | 1,67    | 0,18 - 0,37 |               |
| Fuse Protection (A) | 5       | 5         | 1             | 8       | 1 - 2       |               |

| Actuator              | TCR 11N                   | TCR 20N                 | TCR 40N                 |
|-----------------------|---------------------------|-------------------------|-------------------------|
| Motor protection      | Thermal switch            |                         |                         |
| Limit switches        | 2 adjustable switches     |                         |                         |
| Auxiliary switches    | 2 adjustable dry switches |                         |                         |
| Anti-condensation     | Integrated                |                         |                         |
| Electrical connection | 2 x PE M14 + 1,5m cable   | 2 x PE M20 + 1.5m cable | 2 x PE M20 + 1,5m cable |

| Actuator            | TCR 11N |           |               | TCR 20N |           |               | TCR 40N |           |               |
|---------------------|---------|-----------|---------------|---------|-----------|---------------|---------|-----------|---------------|
| Voltage             | 12V DC  | 24V AC-DC | 95-265V AC-DC | 12V DC  | 24V AC-DC | 95-265V AC-DC | 12V DC  | 24V AC-DC | 95-265V AC-DC |
| Power (W)           | 100     | 100       | 100           | 50      | 50        | 50            | 80      | 80        | 80            |
| Current (A)         | 2,5     |           | 0,3 - 0,6     | 2       |           | 0,22          | 3,3     |           | 0,36          |
| Fuse Protection (A) | 5       |           | 2 - 3         | 3       |           | 5             | 8       |           | 2             |

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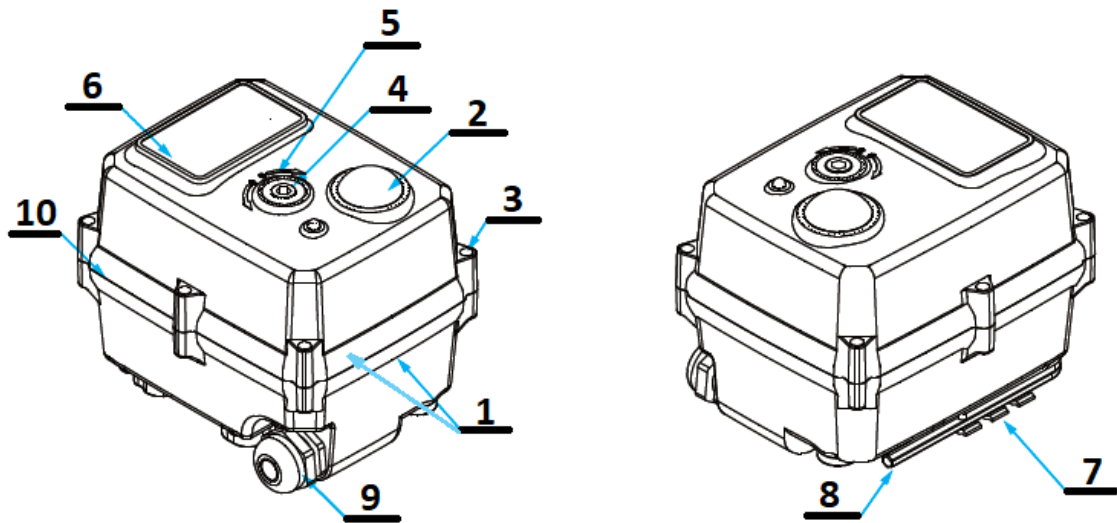
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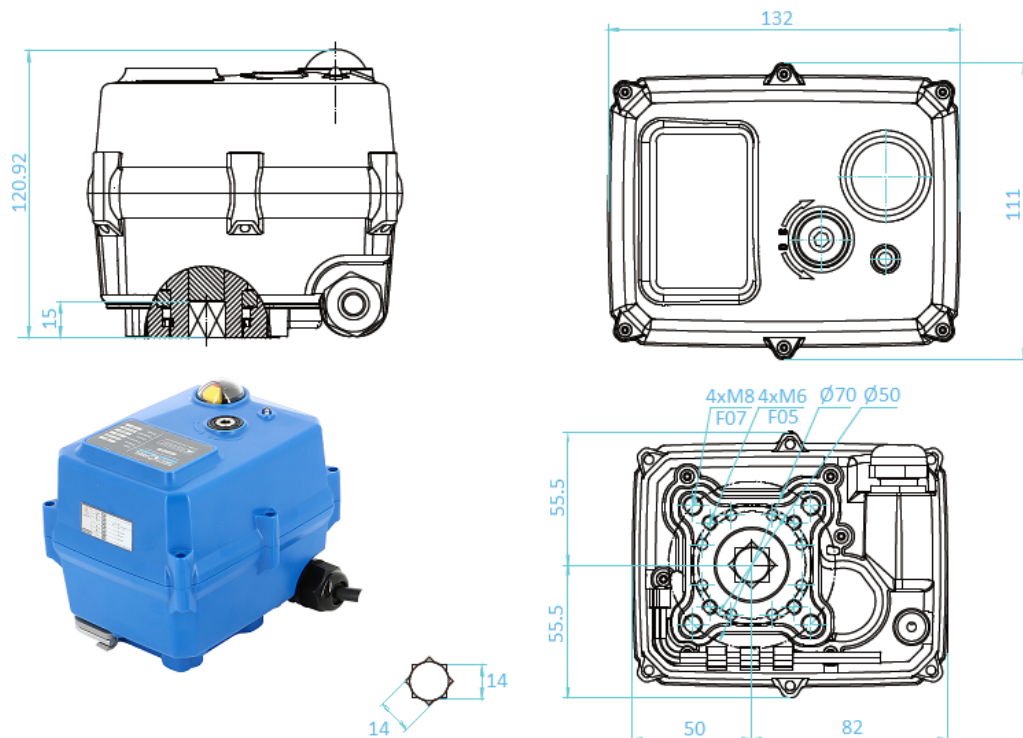
# TCR-N ELECTRICAL ACTUATOR

## CONSTRUCTION (TCR-05N)

| TCR-05N            |                     |                       |     |               |               |
|--------------------|---------------------|-----------------------|-----|---------------|---------------|
| No.                | Name                | Material              | No. | Name          | Material      |
| 1                  | Casing + lid        | Plastic (ABS)         | 6   | Rating plate  | PVC           |
| 2                  | Position indicator  | Polycarbonate plastic | 7   | Key support   | Plastic (ABS) |
| 3                  | Screw x 6           | Aisi 304              | 8   | Hex key       | Steel         |
| 4                  | Backup control stem | Aisi 304              | 9   | Packing gland | Nylon         |
| 5                  | Gasket              | NBR                   | 10  | Cover gasket  | NBR           |
| Weight (kg): 1.800 |                     |                       |     |               |               |



## DIMENSIONS (mm)



Information given as an indication only, and subject to possible modifications



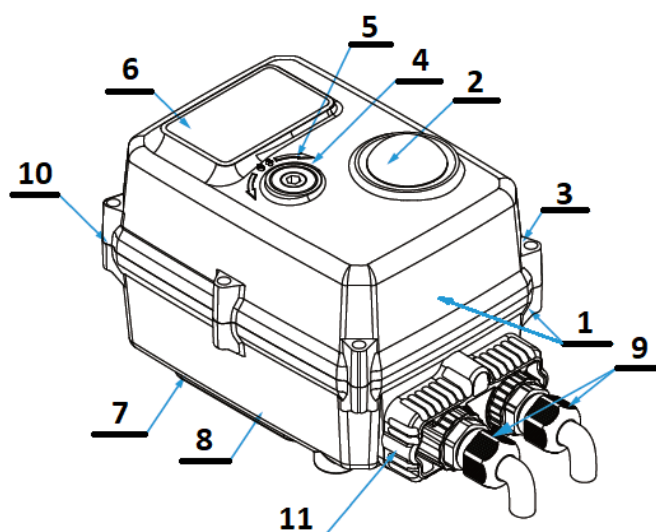
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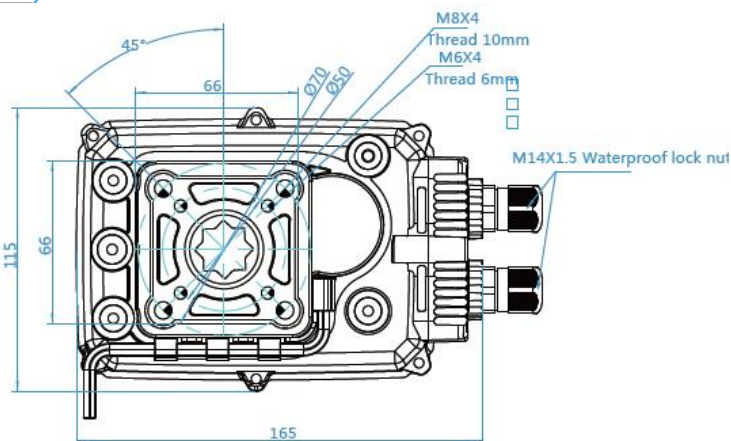
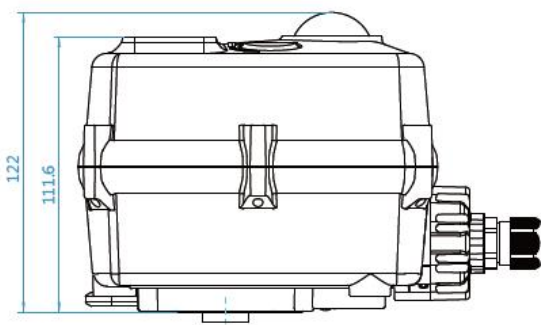
# TCR-N ELECTRICAL ACTUATOR

## CONSTRUCTION (TCR-11N)

| TCR-11N            |                     |                       |     |                  |               |
|--------------------|---------------------|-----------------------|-----|------------------|---------------|
| No.                | Name                | Material              | No. | Name             | Material      |
| 1                  | Casing + lid        | Plastic (ABS)         | 6   | Rating plate     | PVC           |
| 2                  | Position indicator  | Polycarbonate plastic | 7   | Key support      | Plastic (ABS) |
| 3                  | Screw x 6           | Aisi 304              | 8   | Hex key          | Steel         |
| 4                  | Backup control stem | Aisi 304              | 9   | X 2Packing gland | Nylon         |
| 5                  | Gasket              | NBR                   | 10  | Cover gasket     | NBR           |
| Weight (kg): 2.200 |                     |                       | 11  | Cable gland unit | Plastic (ABS) |



## DIMENSIONS (mm)



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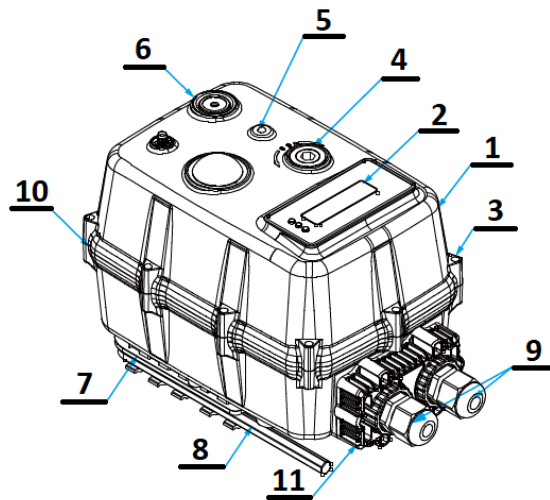
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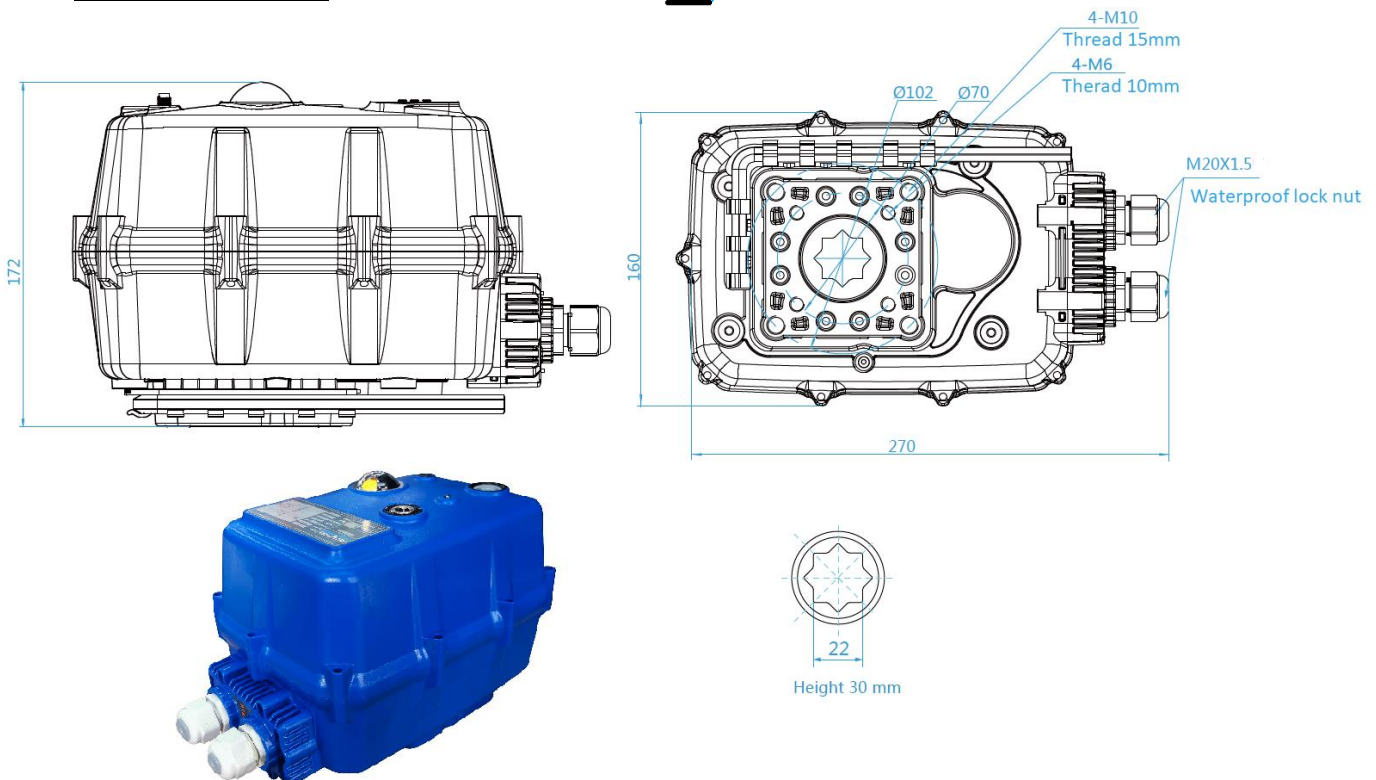
# TCR-N ELECTRICAL ACTUATOR

## CONSTRUCTION (TCR-20N / TCR-40N)

| TCR-20N / TCR-40N   |                     |                       |     |                  |                      |
|---------------------|---------------------|-----------------------|-----|------------------|----------------------|
| No.                 | Name                | Material              | No. | Name             | Material             |
| 1                   | Casing + lid        | PC + PET              | 6   | Clutch           | Polyoxymethylene POM |
| 2                   | Position indicator  | Polycarbonate plastic | 7   | Key support      | Plastic ABS          |
| 3                   | Screw x 6           | Aisi 304              | 8   | Hex key          | Steel                |
| 4                   | Backup control stem | Aisi 304              | 9   | X 2Packing gland | Nylon                |
| 5                   | LED                 | Transparent PC        | 10  | Cover gasket     | NBR                  |
| Weight (Kg) : 6,000 |                     |                       | 11  | Cable gland unit | Plastic ABS          |



## DIMENSIONS (mm)

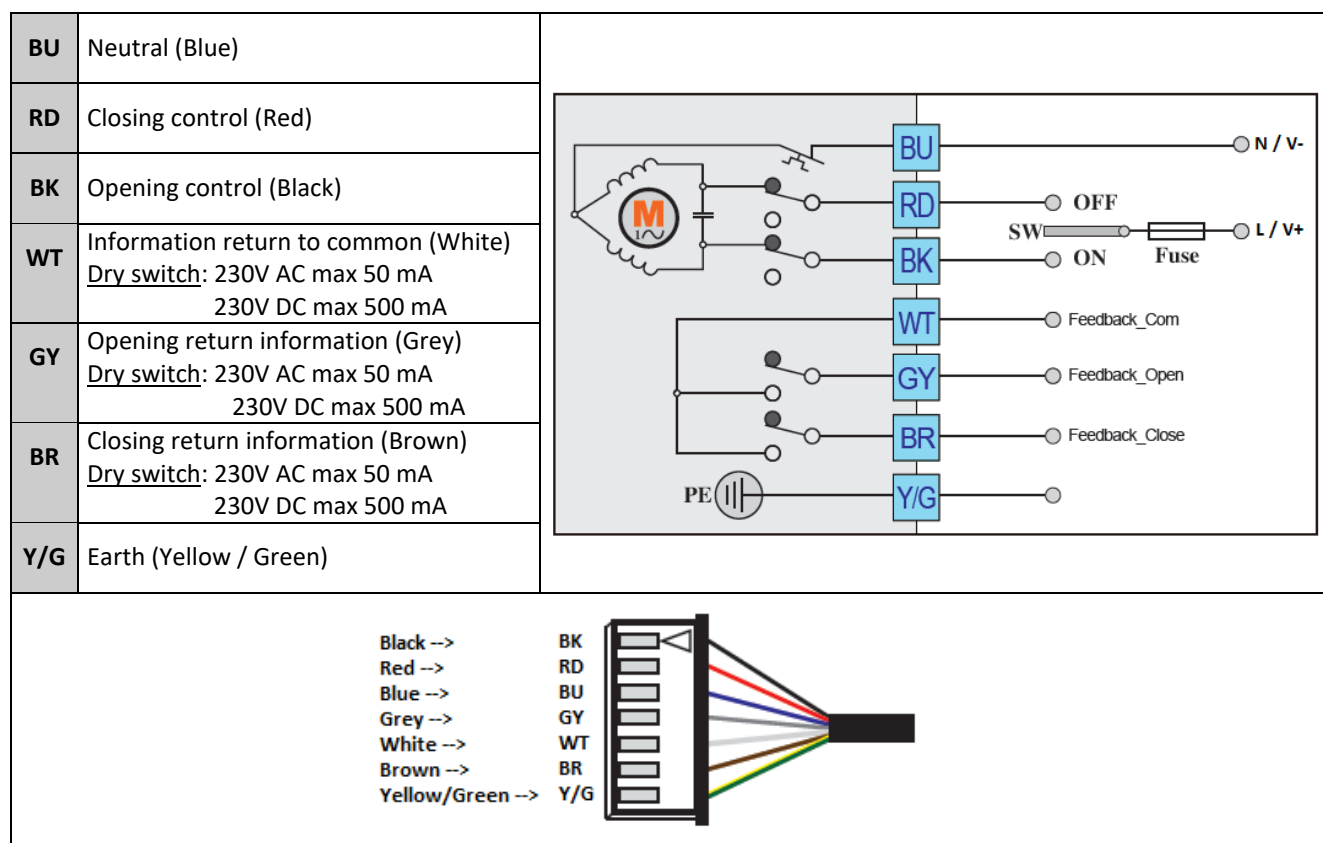


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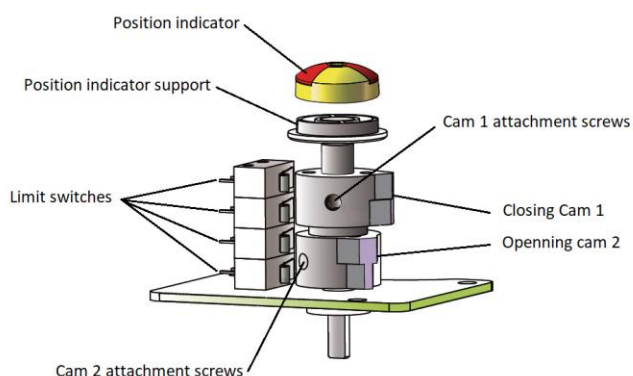
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# TCR-N ELECTRICAL ACTUATOR

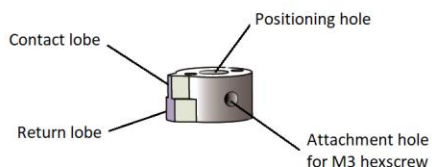
## WIRING DIAGRAM



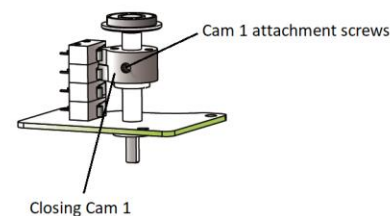
## SWITCH SETTING



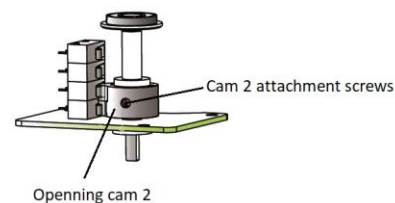
### GENERAL VIEW



### CAM DETAIL



### CLOSING CAM ADJUSTMENT



### OPENING CAM ADJUSTMENT

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# TCR-N ELECTRICAL ACTUATOR

## 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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