780-781XS VALVES WITH TCR ELECTRICAL ACTUATOR

FEATURES

The stainless steel 3-way 780XS+TCR(L-shaped) and 781XS+TCR (T-shaped) steel and stainless steel ball valves provide the mixing, distribution or automatic discharge functions for pipes with non-loaded industrial fluids. It is a reduced-bore valve with an antistatic device. It is EC- and ATEX-approved. The ISO 5211 mounting pad enables the actuator to be directly assembled. The latter is suitable for S4-type service factor, installed indoors or outdoors under shelter.

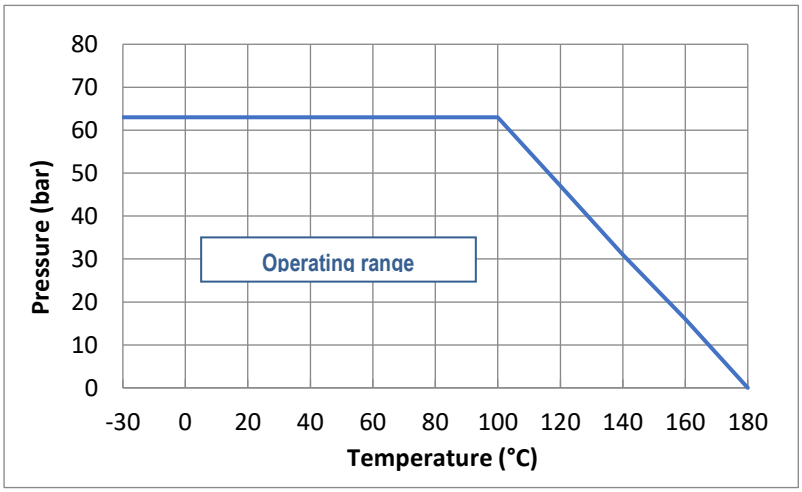
AVAILABLE MODELS

IP 67 | 3.1 Cert. | CE 0035

780 XS: L-shaped / **781 XS**: T-shaped
1.4408 stainless steel body.
1/4'' to 2'' diameters.
G thread connections
Supply voltages: 12 V DC, 24 V DC, 24 V AC and 230 V AC.

LIMITS OF USE

Fluid pressure: PS	63 bar (20°C)
Fluid temperature: WT	- 30°C / +180°C
Ambient temperature	- 20°C / + 60°C
Service factor	S4 – 50%



DIRECTIVES AND MANUFACTURING STANDARDS

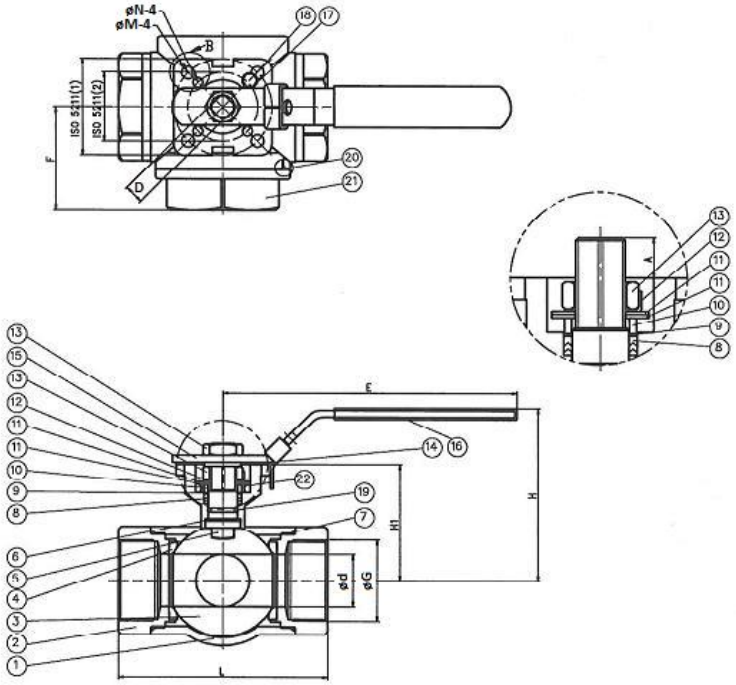
OBJECT	Standard	ON	OBJECT	Standard
Pressure Equipment Directive 2014/68/EC	**1/4'' to 1'':** not subject		Final test	NKS 12266
	1''1/4 to 2'': category III	TÜV 0035	Material certificate	NKS 10204
Size	EN 12516-1		Connection Motorisation	ISO 5211:
Steel grades	EN 1503-1			

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

780-781XS VALVES WITH TCR ELECTRICAL ACTUATOR

CONSTRUCTION

No.	Name	Material	No.	Name	Material
1	Body	1.4408 SS	12	Lock washer	304 SS
2	Lateral ends	1.4408 SS	13	Lever nut	304 SS
3	Ball	1.4408 SS	14	Washer	304 SS
4	Seats	PTFE	15	Lever	304 SS
5	Stem	316 SS	16	Liner	PVC
6	Stem gasket	PTFE	17	Pointer	304 SS
7	Body gaskets	PTFE	18	Nut	304 SS
8	Cable gland gasket	PTFE	19	O-ring	FKM
9	Washer	TFM 1600	20	Body gasket	PTFE
10	Spacer	304 SS	21	Central end	1.4408 SS
11	Bellevile washer	304 SS	22	Spring	304 SS



DIMENSIONS (mm)

DN	1/4“	3/8“	1/2“	3/4“	1“	1“1/4	1“1/2	2“
D	11	11	12.5	16	20	25	32	38
L	75.7	75.7	75.7	86.6	103	118.2	125.8	149
H	64.9	64.9	64.9	71.6	94.3	100	115.7	124.9
F	38.3	38.3	38.3	44.7	50.8	57.7	62.6	74.3
A	8.2	8.2	8.2	9.0	11.5	11.5	15.1	15.1
E	132	132	132	132	180	180	225	225
H1	36.8	36.8	36.8	44.1	55.1	60.7	75.2	84.4
D	9	9	9	9	11	11	14	14
ISO	F03/F04	F03/F04	F03/F04	F03/F04	F04/F05	F04/F05	F05/F07	F05/F07
Weight (kg)	0.33	0.33	0.33	0.5	0.9	1.7	2.2	3.8

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780-781XS VALVES WITH TCR ELECTRICAL ACTUATOR

TCR ELECTRICAL MOTORISATION

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 ΔP=10 bar max.

The actuator's assembly is direct.

DN	Actuator	Power 230V AC / 24V AC-DC	Time 230V AC	Time 24 V AC-DC	Standard equipment of the actuator
1/4''	TCR-02N	15	10s	10s	2 adjustable limit switches 2 dry auxiliary contacts Thermal protection of the motor 2-3W anti-condensation resistance Stand-by manual control with key 3D Position visual indicator Electrical connection: **TRC02**: 1 x PE M10 + 1.5m cable **TCR05**: 1 x PE M20 + 1.5m cable **TCR11**: 2 x PE M14 + 1.5m cable
3/8''	TCR-02N	15	10s	10s	
1/2''	TCR-02N	15	10s	10s	
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-11N	100	10s	10s	

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 ΔP 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 if the ball has an L-shaped or T-shaped hole.
- 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.
- 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.

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.
- Correctly identify the position of the flow directions with regard to the pipe installation.
- 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 installation: the flow directions can be identified with respect to the stem marking.
- 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.
- 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.)
- 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).

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.

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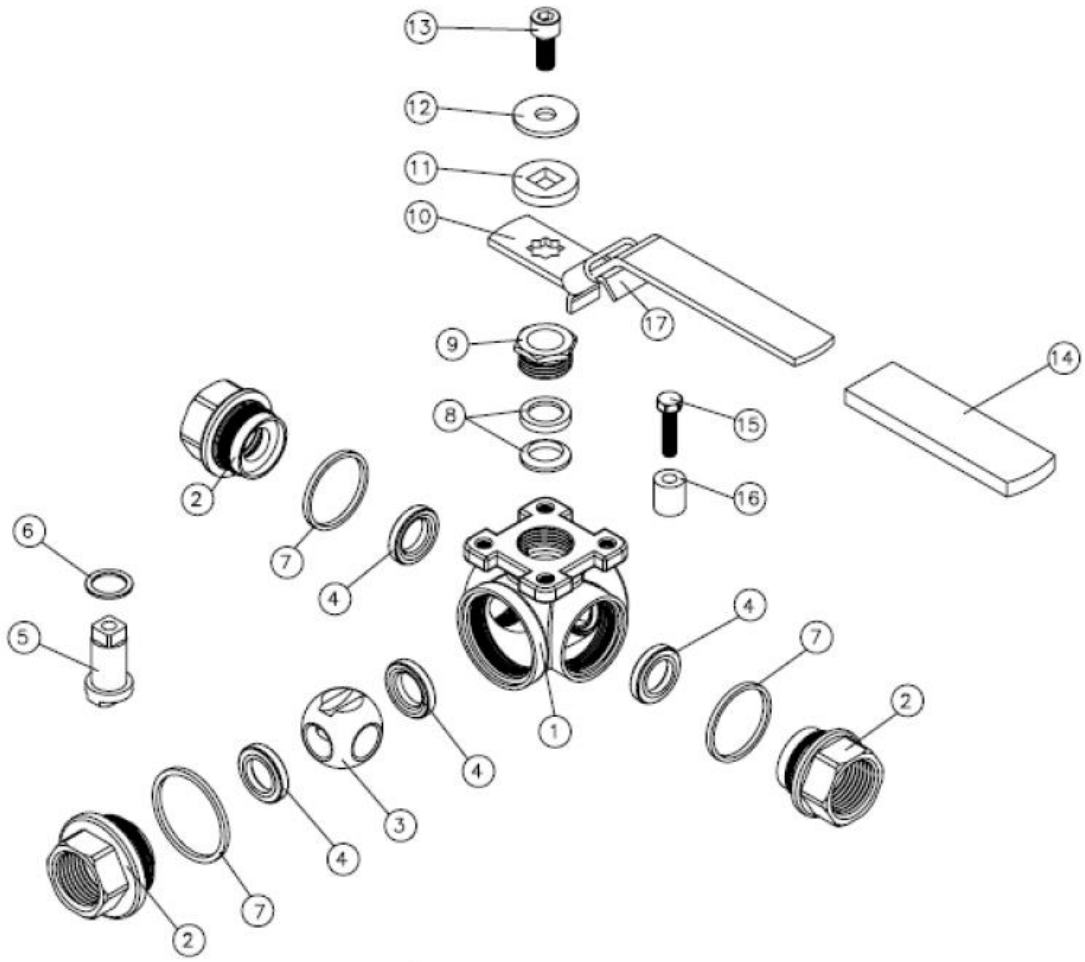
3 - Servicing

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 disassemble the central body, unscrew the lateral ends (items 2). Removal
- To remove the ball from the body, turn the stem by a quarter turn.



3.2 - Inspecting the state of the valve and possible repair

- Check the state of the ball (Item 3): 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 (4.1 and 4.2): 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 (6 and 8): 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 (7.1, 7.2, and 7.3). 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.

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SPARE PARTS

DN	Gasket kit	Ball	Handle
Reference mark	**4-6-7-8**	**3**	**14**
1/4''	Please contact us.	Please contact us.	Please contact us.
3/8''	Please contact us.	Please contact us.	Please contact us.
1/2''	Please contact us.	Please contact us.	Please contact us.
3/4''	Please contact us.	Please contact us.	Please contact us.
1''	Please contact us.	Please contact us.	Please contact us.
1''1/4	Please contact us.	Please contact us.	Please contact us.
1''1/2	Please contact us.	Please contact us.	Please contact us.
2''	Please contact us.	Please contact us.	Please contact us.

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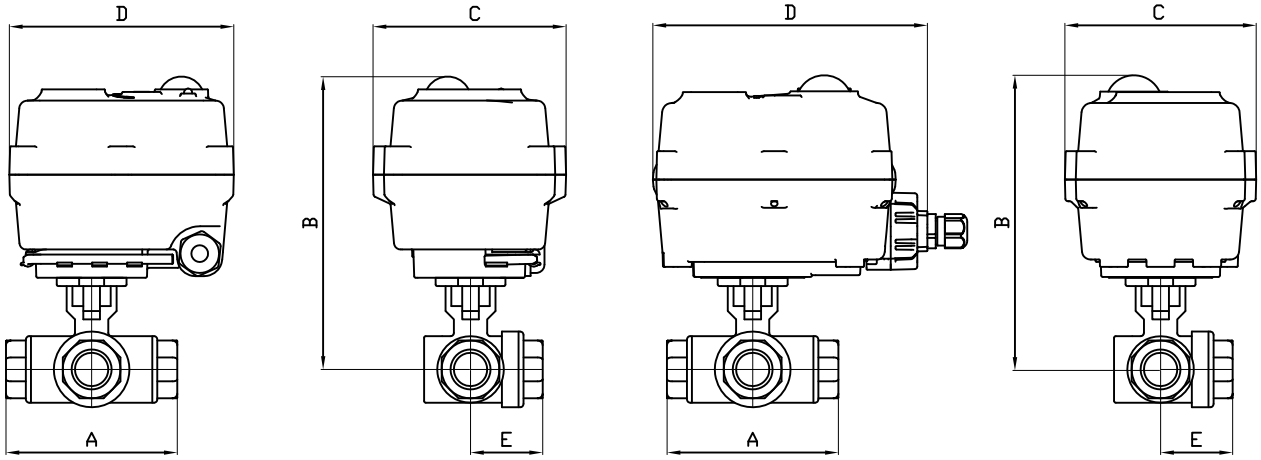


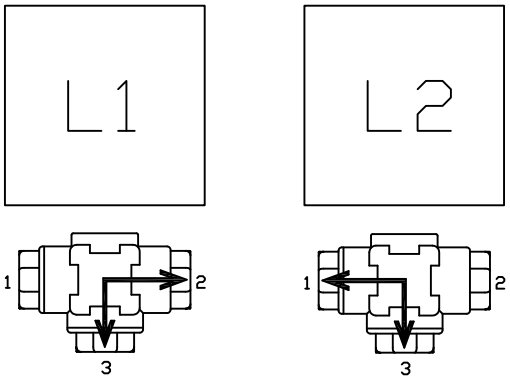
TCR-02-05 TCR-11

DN	1/4"	3/8"	1/2"	3/4"	1"	1"1/4	1"1/2	2"
SERVO	TCR02	TCR02	TCR02	TCR02	TCR02	TCR05	TCR05	TCR11
A	75.7	75.7	75.7	86.6	103	118.2	125.8	149
B	126.8	126.8	126.8	134.1	145.1	181.7	196.2	206.4
C	70	70	70	70	70	111	111	115
D	104	104	104	104	104	132	132	165
E	38.3	38.3	38.3	44.7	50.8	57.7	62.6	74.3
KG	1.35	1.32	1.28	1.64	2.28	4.15	5.4	8.9

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

				Pour 2" TCR11 ald TCR05	23/03/2021	A
Ech:/	Date :10/09/2019	Dessiné par :E.D.	Tolérances générales : +/- 0.2	Modifications	Date	REV.
ROBINET A TOURNANT SPHERIQUE 780-781XS/BALL VALVE 780-781XS + SERVOMOTEUR TCR / ELECTRIC ACTUATOR TCR				Matière :		
				Poids (Kg) :		
SECTORIEL	45, Rue du Ruisseau 38297 SAINT QUENTIN FALLAVIER			Traitement : SANS		
				Plan n° Ens 1389A		

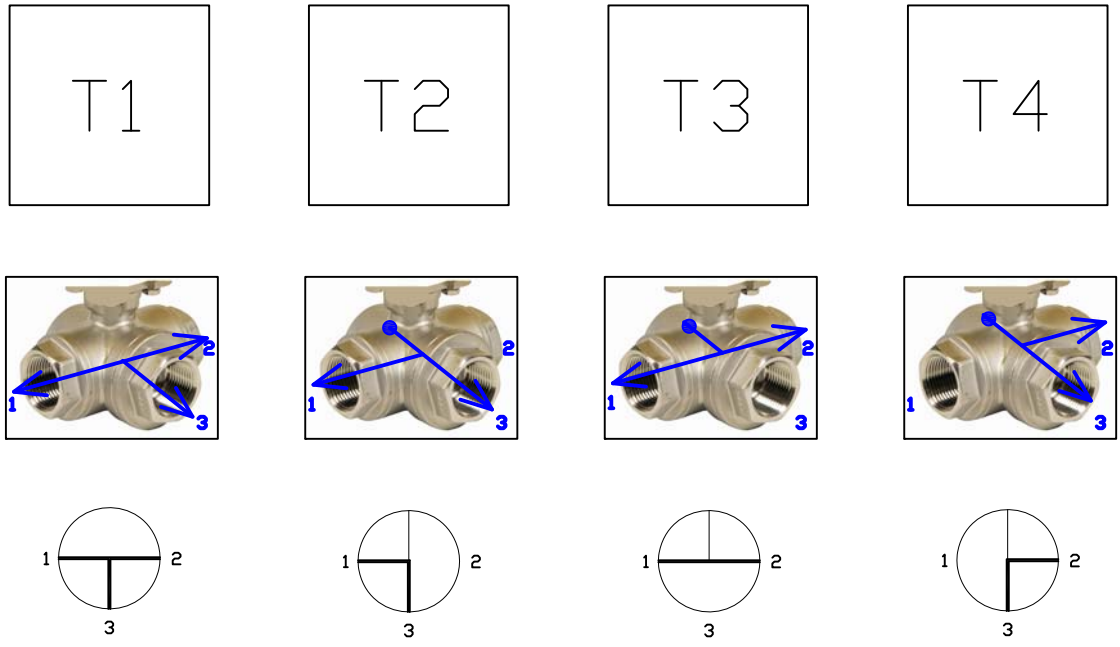
PERÇAGE EN L



Les flèches indiquent les voies en communication

PERÇAGE EN T

Pour commander indiquer 2 positions successives



Les flèches indiquent les voies en communication

Informations données à titre indicatif et sous réserve de modifications éventuelles

Ech: /	Date 06/07/2011	Dessiné par : E.D.	Tolérances générales : +/- 0.2	Modifications	Date	REV.

ROBINET A TOURNANT SPHERIQUE
3 VOIES POSITIONS POUR COMMANDE AVEC SERVOMOTEUR ELECTRIQUE

Matière :

Poids (Kg) :

Traitement : SANS

SECTORIEL
45, Rue du Ruisseau
38297 SAINT QUENTIN FALLAVIER

Plan n° Ens 1117

TCR-N ELECTRICAL ACTUATOR

FEATURES

The TCR-N electric actuators are intended for motorising ¼ turn valves with a torque of 15, 20, 50 or 110 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%
	S3 - 85% (TCR 20 – 40)

MECHANICAL FEATURES

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

IP 67 ISO 9001 CE

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			F05/F07 - star 22			F05/F07 - 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	2		5	2		8

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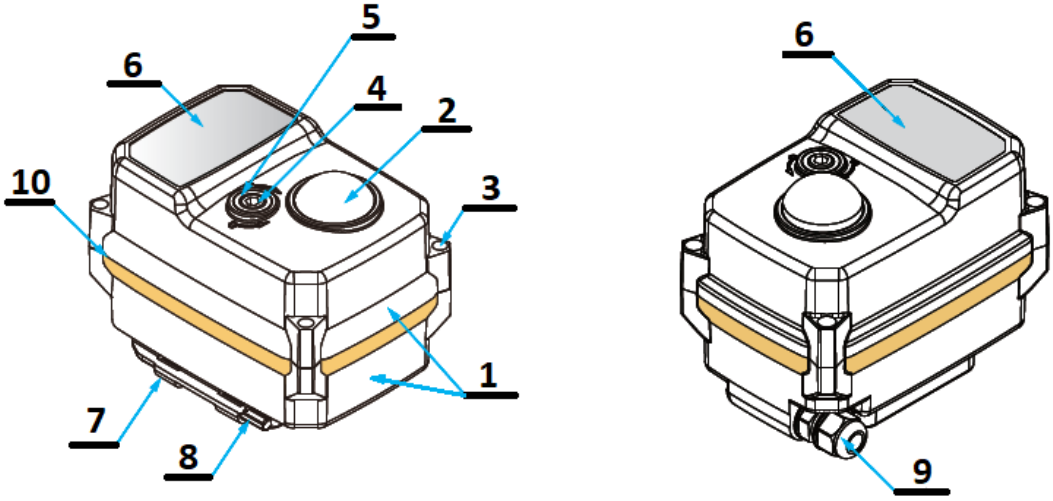
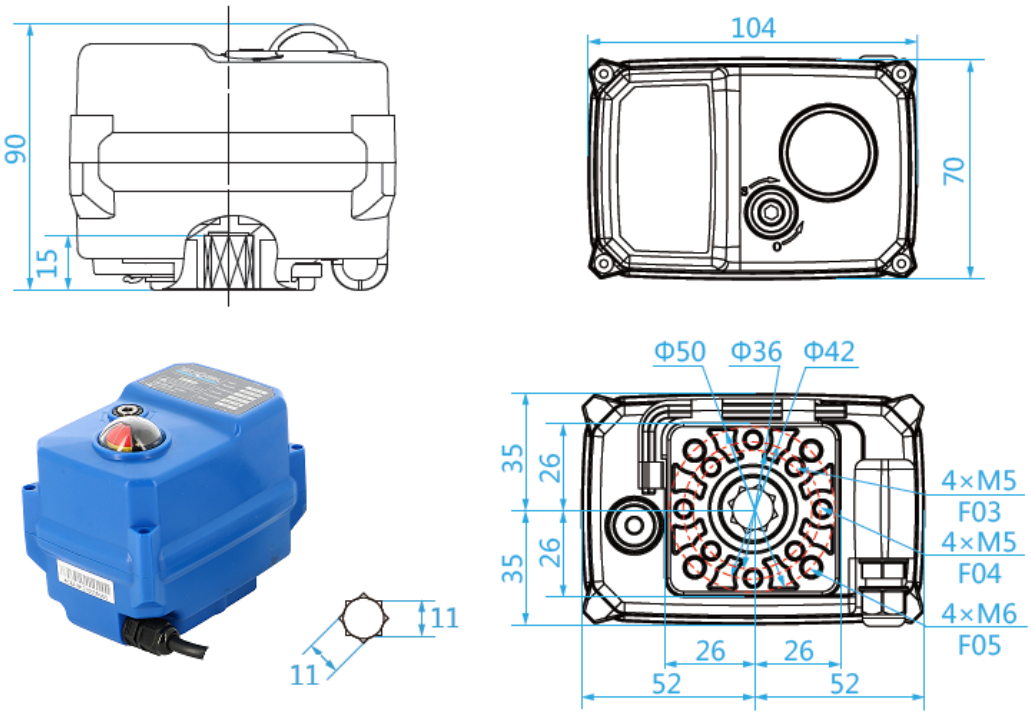
TCR-N ELECTRICAL ACTUATOR

CONSTRUCTION (TCR-02N)

TCR-02N					
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 4	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): 0.620					



DIMENSIONS (mm)



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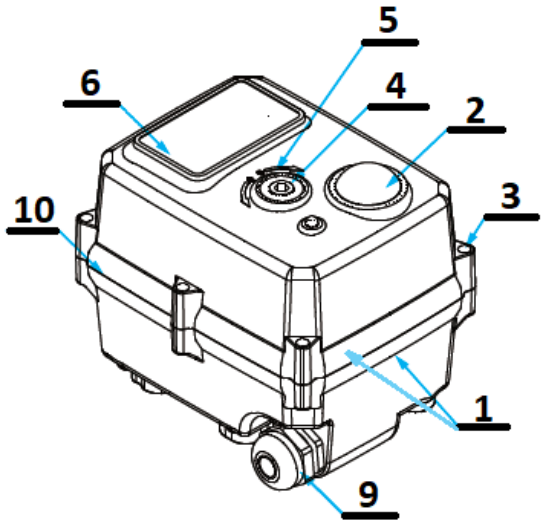
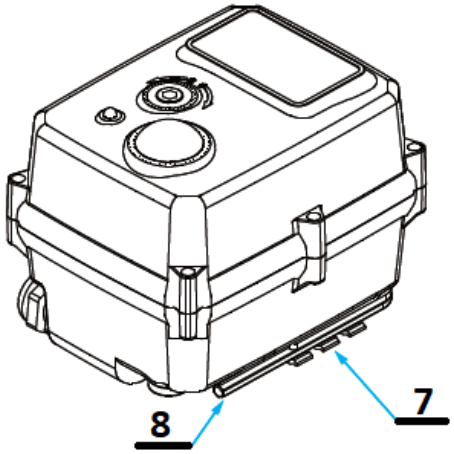
TCR-N ELECTRICAL ACTUATOR

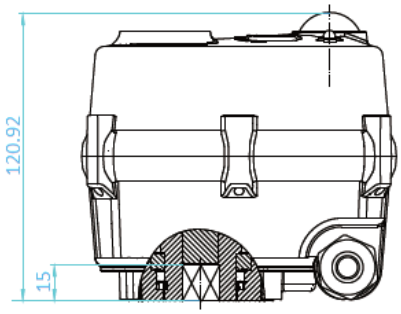
CONSTRUCTION (TCR-05N)

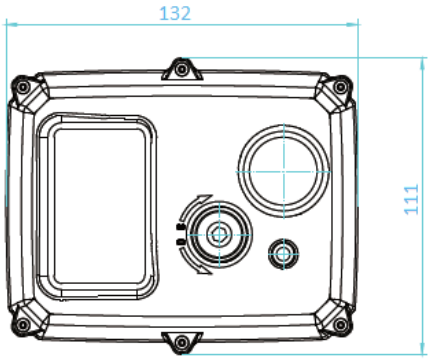
TCR-05N					
No.	**Name**	**Material**	**No.**	**Name**	**Material**
1	Casing + lid	Plastic (ABS)	**6**	Rating plate	PVC
2	Position indicator	Polycarbonate plastic	**7**	Key support	Plastic (ABS)
3	Screw x 6	Aisi 304	**8**	Hex key	Steel
4	Backup control stem	Aisi 304	**9**	Packing gland	Nylon
5	Gasket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

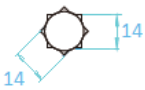


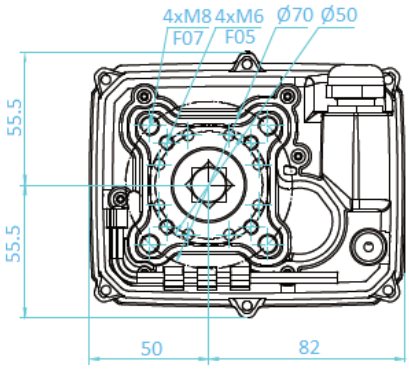


DIMENSIONS (mm)









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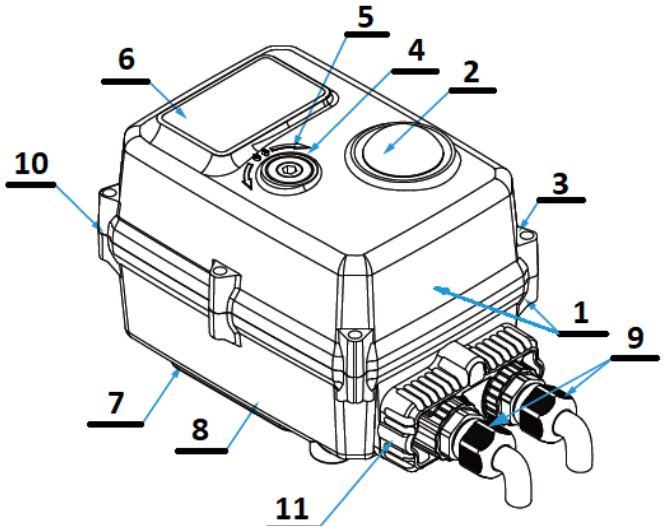
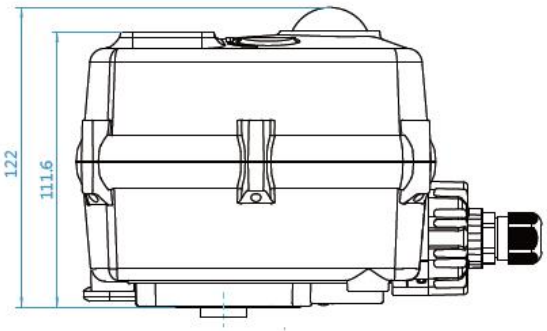
TCR-N ELECTRICAL ACTUATOR

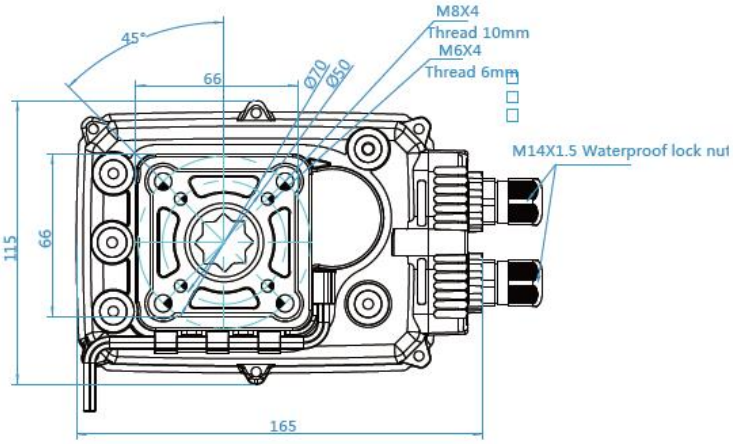
CONSTRUCTION (TCR-11N)

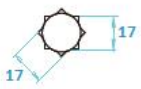
TCR-11N					
No.	**Name**	**Material**	**No.**	**Name**	**Material**
1	Casing + lid	Plastic (ABS)	**6**	Rating plate	PVC
2	Position indicator	Polycarbonate plastic	**7**	Key support	Plastic (ABS)
3	Screw x 6	Aisi 304	**8**	Hex key	Steel
4	Backup control stem	Aisi 304	**9**	X 2Packing gland	Nylon
5	Gasket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



DIMENSIONS (mm)





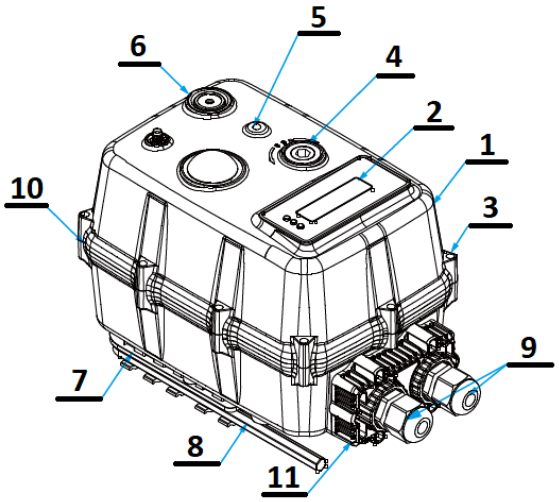


Information given as an indication only, and subject to possible modifications

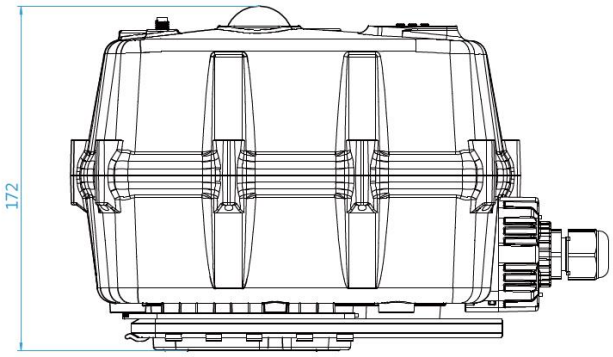
TCR-N ELECTRICAL ACTUATOR

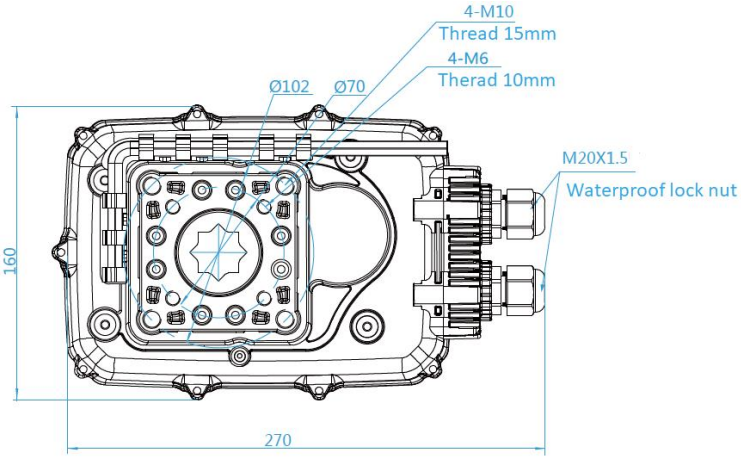
CONSTRUCTION (TCR-20N / TCR-40N)

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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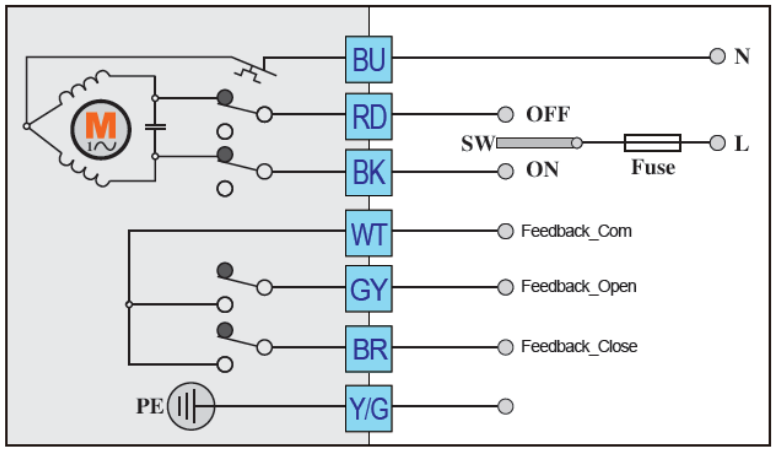
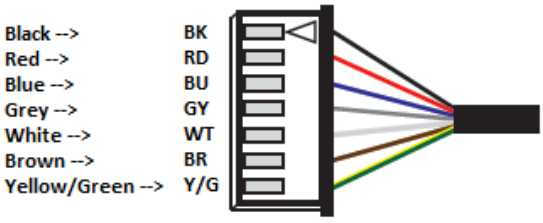
TCR-N ELECTRICAL ACTUATOR

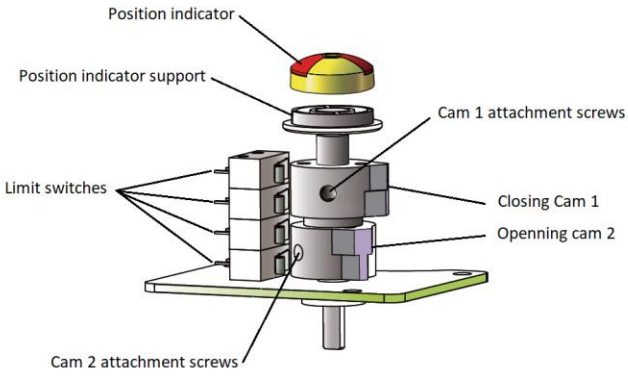
WIRING DIAGRAM

BU	Neutral (Blue)
RD	Closing control (Red)
BK	Opening control (Black)
WT	Information return to common (White) Dry switch: 230V AC max 50 mA 230V DC max 500 mA
GY	Opening return information (Grey) Dry switch: 230V AC max 50 mA 230V DC max 500 mA
BR	Closing return information (Brown) Dry switch: 230V AC max 50 mA 230V DC max 500 mA
Y/G	Earth (Yellow / Green)

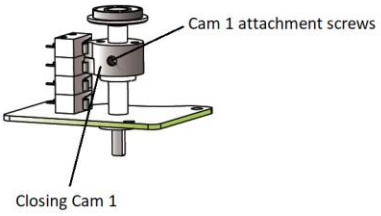




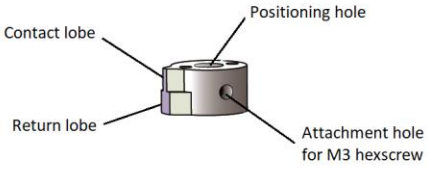
SWITCH SETTING



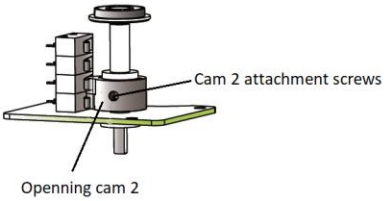
GENERAL VIEW



CLOSING CAM ADJUSTMENT



CAM DETAIL



OPENING CAM ADJUSTMENT

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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. 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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