

# TECHNICAL DATA SHEET

**Electric quarter-turn actuator**

**ELEPHANT QT-EX-xEM-O2-x-U1**

**explosion-proof**



## 1. GENERAL PRODUCT INFORMATION

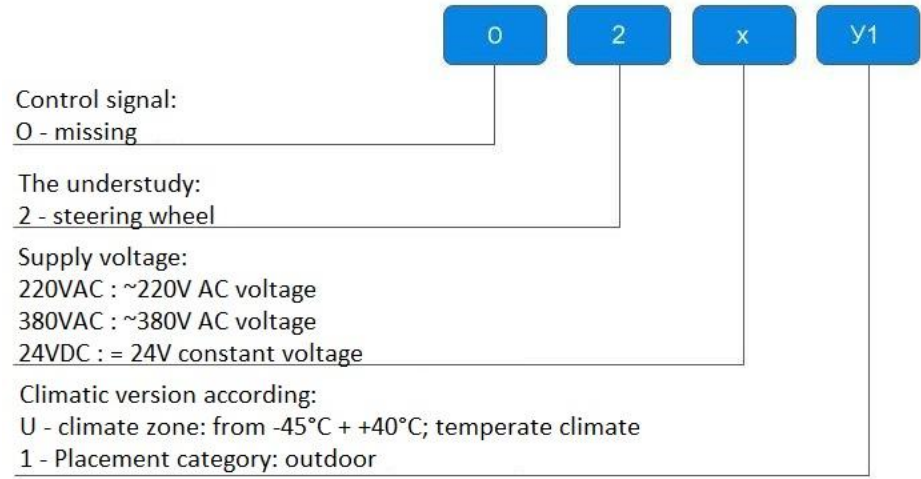
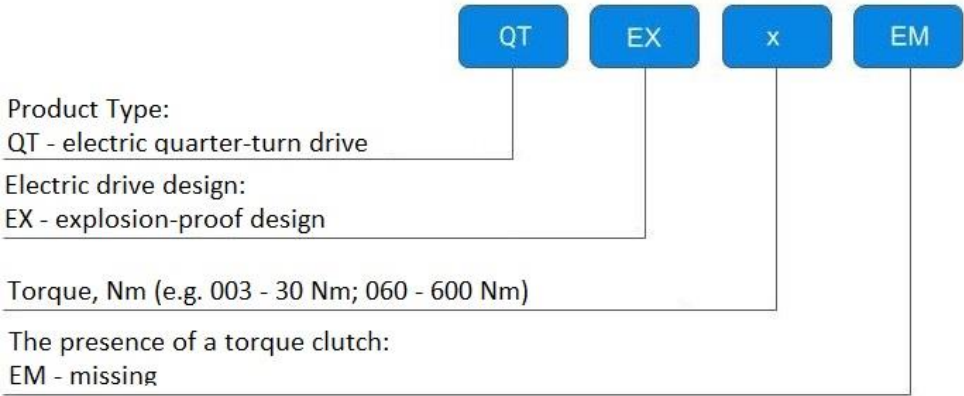
1.1 Product name: Quarter-turn actuator ELEPHANT QT-EX-xEM-O2-x-U1 explosion-proof.

1.2. Purpose: Electric quarter-turn actuators of explosion-proof version are designed for remote and local control of 90° rotation of a shut-off valve of such types as ball valve, etc. They are widely used in various branches of national economy: in gas, oil, metallurgical, food industry, in housing and communal services, etc. They are suitable for use in industrial explosive zones.

1.3 Principle of operation: this actuator is applicable in repeated-short-time mode S2 with the duration of switching on 10 minutes. Depending on the version, the actuators are powered by AC 50Hz 220V 1 phase or 380V 3 phases, as well as by DC voltage 24V.



1.4. Deciphering of the designation:



## 2. BASIC TECHNICAL DATA AND CHARACTERISTICS

Table 1: Basic parameters

Enclosure protection class	IP67
Control type	ON / OFF
Angle of rotation, °	90±10
Power supply voltage	220 VAC, 380 VAC, 24 VDC
Motor type	squirrel cage induction motor
Limit switches	1xOpen/Close, SPDT, 250VAC 10A
Auxiliary limit switches	1xOpen/Close, SPDT, 250VAC 10A
Torque switch	1xOpen/Close, SPDT, 250VAC 10A (except QT-EX-010EM-O2-x-U1)
Internal thermal protection	switch off at 115° C ± 5° C, switch on at 97° C ± 5° C
Visual indicator of the current position	have
Manual override	helm
Auto-locking of actuator position	worm gear auto-locking worm gear
Mechanical limiter	two external adjustable stops
Cable connection	M20x1.5 and M36x2
Ambient temperature, ° C	-20 to +70
Lubrication	aluminum-based (type EP)
Explosion protection standard	ExdIICT4
Enclosure	aluminum alloy with powder epoxy anti-corrosion coating
Maximum ambient humidity, %	90 (non-condensing)
Average life, opening/closing cycles	60 000



### 3. BASIC MATERIALS

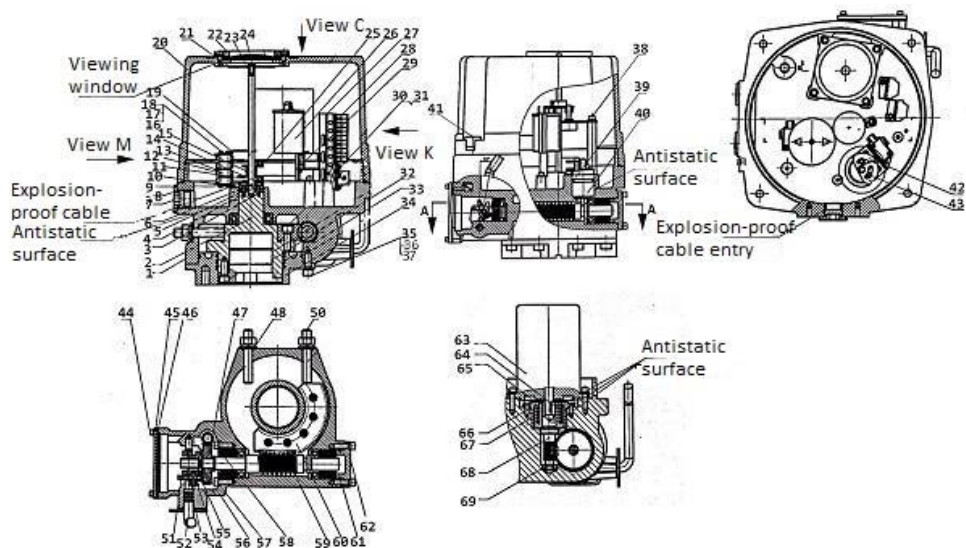


Figure 1 - Detail



Table 2. Material specification

№	Name	Material	№	Name	Material
1	Drive cover	aluminum	29	Heating element	NTA-1/005
2,23,33, 38,40,64	Shaft	steel 45	31,36	Washer	stainless steel
3,39, 46,48, 51,66	Sealing ring	oil-resistant rubber	34	Through cover	MHQ50
4,27	Bracket	Q235 steel	37,39	Lock washer, sealing ring	1Cr18Ni9Ti steel
5	Insulating gasket	textolite	42	Torque switch group	XK06-101-2530
6,9, 16	Bracket mounting screw	1Cr18Ni9Ti steel	43,48	Torque switch mechanism	Q235 steel
7,10	plate	Q235 steel	45	Flywheel cover	aluminum
8	cover screw	aluminum	47,69	First stage gear	zinc alloy ZQAL10-5-5
11,14	Limit switch cam	steel Q235	49	Limiting screw	steel 35
12,13	Limit switch group	XK06-101- 2530	50	Stud	1Cr18Ni9Ti steel
15,32	Bushing	brass H62	52	Hitch handle	steel 45
16,30, 35,41, 44,61	Screw	1Cr18Ni9Ti steel	53	Fork block	aluminum
17,18	Disk	steel Q235	54	Thrust washer	zinc alloy ZQAL10-5-5
19	Mechanical limiting cam	steel Q235	55,56	Cage fork	zinc alloy ZQAL10-5-5
20	Drive cover	aluminum	57	Retaining ring	1Cr18Ni9Ti steel
21,25	Fixing screw	steel 35	58,60	Disc, main gear	zinc alloy ZQAL10-5-5
22	Sight glass gland	1Cr18Ni9Ti steel	59,68	Second and first stage worm	40Cr steel
24	Indicator plate	aluminum	62,67	Gland	aluminum
26	Capacitor	CEM 2GR 220nJ	63	Motor	-
28	Terminal block	1Pcs TX-1502 6	65	Clutch	ZG20 steel



#### 4. BASIC DIMENSIONS OF ACTUATORS

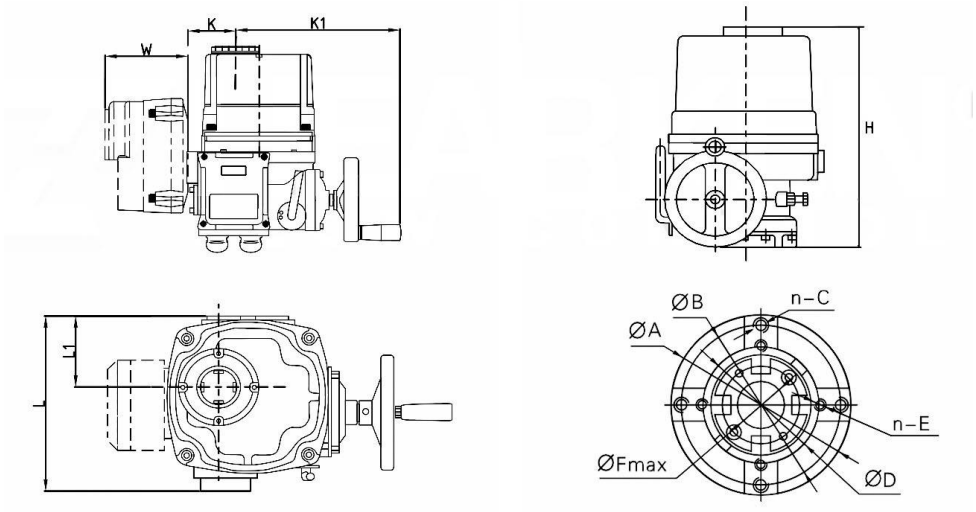


Figure 2 – Dimensions

Table 3: Dimensional characteristics

Model	W	K	K1	A	B	D
	mm					
QT-EX-010EM-O2-x-U1	160	70	230	Ø90	Ø70	Ø50
QT-EX-015EM-O2-x-U1	160	70	230	Ø90	Ø70	Ø50
QT-EX-020EM-O2-x-U1	160	80	250	Ø120	Ø102	Ø70
QT-EX-030EM-O2-x-Y1	160	72	298	Ø150	Ø102	Ø70
QT-EX-050EM-O2-x-U1	160	72	298	Ø150	Ø102	Ø70
QT-EX-080EM-O2-x-U1	160	104	296	Ø180	Ø125	Ø102
QT-EX-100EM-O2-x-U1	160	104	296	Ø180	Ø125	Ø102
QT-EX-160EM-O2-x-U1	160	104	296	Ø210	Ø165	Ø125
QT-EX-200EM-O2-x-U1	160	104	296	Ø210	Ø165	Ø125



Table continuation 3

Model	F	L	L1	H	n-C	n-E
	mm					
QT-EX-010EM-O2-x-U1	Ø16	240	68	270	4-M8	4-M6
QT-EX-015EM-O2-x-U1	Ø16	240	68	270	4-M8	4-M6
QT-EX-020EM-O2-x-U1	Ø30	260	75	280	4-M10	4-M8
QT-EX-030EM-O2-x-U1	Ø30	290	82	320	4-M12	4-M8
QT-EX-050EM-O2-x-U1	Ø30	290	82	320	4-M12	4-M8
QT-EX-080EM-O2-x-U1	Ø40	333	82	320	4-M14	4-M12
QT-EX-100EM-O2-x-U1	Ø40	333	93	350	4-M14	4-M12
QT-EX-160EM-O2-x-U1	Ø60	333	93	350	4-M16	4-M14
QT-EX-200EM-O2-x-U1	Ø60	333	93	350	4-M16	4-M14





## 5. TECHNICAL PARAMETERS OF ACTUATORS

Table 4. ISO flange type, stem square and weight

Model	ISO 5211	Stem square, mm	Weight, kg
QT-EX-010EM-O2-x-U1	F05/F07	14x14	13
QT-EX-015EM-O2-x-U1	F05/F07	14x14	15
QT-EX-020EM-O2-x-U1	F07/F10	22x22	15
QT-EX-030EM-O2-x-U1	F07/F10	22x22	22
QT-EX-050EM-O2-x-U1	F07/F10	22x22	23
QT-EX-080EM-O2-x-U1	F10/F12	36x36	30
QT-EX-100EM-O2-x-U1	F10/F12	36x36	30
QT-EX-160EM-O2-x-U1	F12/F16	45x45	75
QT-EX-200EM-O2-x-U1	F12/F16	45x45	75

Table 5. Torques and handwheel force

Модель	Максимальный выходной крутящий момент, Н*м	Усилие для вращения штурвала, Н
QT-EX-010EM-O2-x-U1	100	10
QT-EX-015EM-O2-x-U1	150	10
QT-EX-020EM-O2-x-U1	200	11
QT-EX-030EM-O2-x-U1	300	13,5
QT-EX-050EM-O2-x-U1	500	13,5
QT-EX-080EM-O2-x-U1	800	16,5
QT-EX-100EM-O2-x-U1	1000	16,5
QT-EX-160EM-O2-x-U1	1600	49,5
QT-EX-200EM-O2-x-U1	2000	49,5



**Table 6. Electromechanical parameters of 24 V actuators**

Model	Rated current for 24 V, A	Power, W	Cycle time (90° rotation), sec
QT-EX-010EM-O2-x-U1	6	25	15
QT-EX-015EM-O2-x-U1	8	40	15
QT-EX-020EM-O2-x-U1	8	40	18
QT-EX-030EM-O2-x-U1	10	120	20
QT-EX-050EM-O2-x-U1	10	120	20
QT-EX-080EM-O2-x-U1	14	180	25
QT-EX-100EM-O2-x-U1	14	180	25
QT-EX-160EM-O2-x-U1	14	180	75
QT-EX-200EM-O2-x-U1	14	180	75

**Table 7: Electromechanical parameters of electric drives for 220 and 380 V**

Модель	Rated current for 220 V, A	Rated current for 380 V, A	Power, W	Cycle time (90° rotation), sec
QT-EX-010EM-O2-x-U1	0,35	0,2	15	18
QT-EX-015EM-O2-x-U1	0,48	0,3	40	18
QT-EX-020EM-O2-x-U1	0,48	0,3	40	20
QT-EX-030EM-O2-x-U1	0,6	0,4	60	23
QT-EX-050EM-O2-x-U1	1	0,8	120	23
QT-EX-080EM-O2-x-U1	1,5	1	180	27
QT-EX-100EM-O2-x-U1	1,5	1	180	27
QT-EX-160EM-O2-x-U1	1,5	1	180	81
QT-EX-200EM-O2-x-U1	1,5	1	180	81



6. WIRING DIAGRAMS

6.1. 220 V

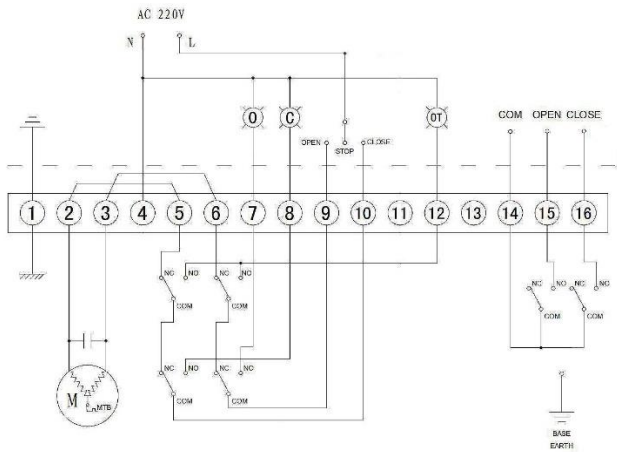


Figure 3 - Circuit diagram of connection of the actuator for 220 V

6.3. 380 V

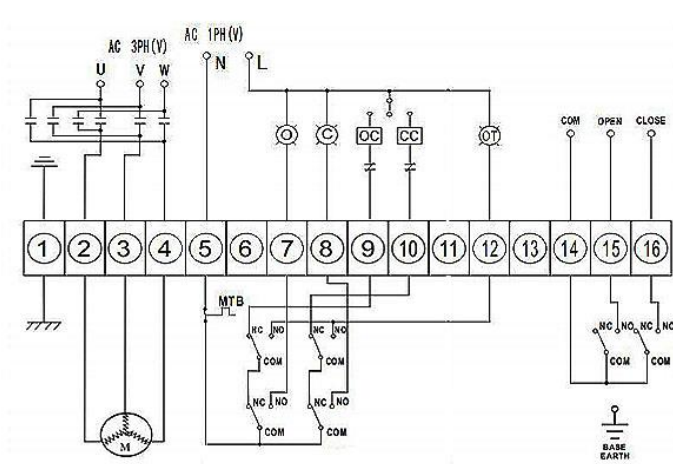
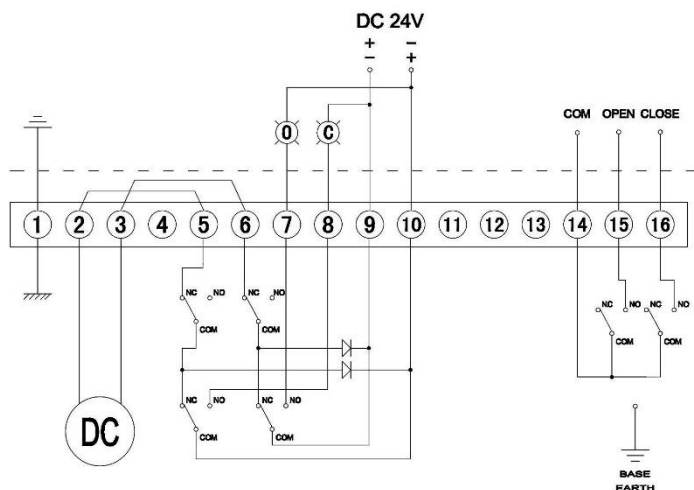


Figure 6 - Circuit diagram of electric actuator connection for 380 V

## 6.4. 24 V



**Figure 7 - 24 V actuator wiring diagram**

## 7. INSTALLATION AND OPERATING INSTRUCTIONS

7.1. When the actuator is used as an actuating control element on valves conveying contaminated and/or abrasive media with solid particles, in order to prevent the actuator and/or valve from malfunctioning, it is necessary to eliminate the possibility of jamming of the valve shut-off body due to the ingress of solid particles/body parts between the shut-off body and the valve body and/or seal, or to provide for electrical protection and current disconnection of the actuator consumption.

7.2. Before starting the actuator it is necessary to perform several cycles of test opening-closing of the gate valve by means of the actuator's handwheel. If the valve opens-closes normally when opened by the manual override, the valve should be connected to the supply and control networks and several test opening-closing cycles should be performed with the actuator.

7.3. The actuator may be installed by personnel who have studied the actuator design, safety rules and requirements of this data sheet.

7.4 When installing the actuator it is necessary to provide space for cable repair, manual work.



- 7.5. Before starting the actuator operation it is necessary to make sure that the manual mode is deactivated (the socket of the handwheel is fully depressed).
- 7.6 The actuator is mounted directly on the shut-off valve. When mounting, attention should be paid to correct alignment of the actuator seating flange and the mating seating flange on the actuator. Tight fit, backlash, clearances between actuator and shut-off valve are not allowed. This leads to increased load on the actuator units and parts, accelerated wear and rapid failure of the actuator.
- 7.7 The actuator must have its own supports in case of its installation on the valve in a position other than horizontal. The actuator housing must be grounded.
- 7.8 Before starting the actuator, several cycles of valve opening-closing test operation should be performed using the actuator's handwheel. If the valve opens-closes normally when opened by the manual override, connect it to the supply and control networks and perform several test opening-closing cycles with the actuator.
- WARNING** The use of the handwheel with the supply voltage applied is strictly prohibited. Violation of this rule may result in personal injury as well as damage to parts.
- 7.9 Maintenance and operation of the actuator should be carried out in accordance with the established “Rules of Technical Operation of Electrical Installations of Consumers” .

## 8. POSSIBLE MALFUNCTIONS AND REMEDIES

Table 8: Faults and remedies

Fault	Possible cause	Remedial action
Drive does not run	No power supply	Check the connection to the power supply
	Damaged wire, weak terminal fastening	Replace the wire, tighten the terminal fastener
	Supply voltage does not match the required drive voltage	Match the applied voltage to the drive characteristics
	Overheating protection tripped	Eliminate the reasons why the protection was triggered
	Limit switch not working correctly	Replace the limit switch
	Destruction of the start capacitor	Replace the start capacitor and check the operating temperature of the drive
Drive does not stop	Incorrect supply voltage	Check and adjust the applied voltage according to the actuator specifications
	Potentiometer fastening is loose	Check and tighten potentiometer screws



## **9. TRANSPORTATION AND STORAGE CONDITIONS**

9.1. The actuators can be transported by any type of transport in a way that prevents damage to the actuator.

9.2 Storage of actuators is carried out in the manufacturer's packing in the storage rooms ensuring safety and serviceability of the actuators.

## **10. UTILIZATION**

10.1. The product is disposed of in accordance with the procedure established at the enterprise (remelting, burial, resale).



## **11. WARRANTY OBLIGATIONS**

11.1. Warranty period - 12 months from the date of commissioning, but not more than 18 months from the date of sale.

11.2. The warranty applies to equipment installed and used in accordance with the installation instructions and product specifications described in this data sheet.

11.3. The manufacturer guarantees compliance of the product with safety requirements, provided that the consumer complies with the rules of transport, storage, installation and operation.

11.4. The warranty covers all defects caused by the fault of the manufacturer.

11.5. The warranty does not apply:

- parts and materials of the product subject to wear and tear;
- for cases of damage caused by:
  - modifications to the original design of the product;
  - violation of general installation recommendations;
  - faults caused by improper maintenance and storage; improper operation and use of the equipment.

## **12. WARRANTY TERMS**

12.1. Claims to the quality of the goods may be made during the warranty period.

12.2. Defective products are repaired or exchanged for new ones free of charge during the warranty period. ELEPHANT decides whether to replace or repair the product. The replaced product or its parts resulting from the repair shall become the property of 'ELEPHANT'.

12.3. Costs related to dismantling, installation and transport of the defective product during the warranty period shall not be reimbursed to the Buyer.

12.4. If the claim is unfounded, the Buyer shall pay the costs of diagnostics and expertise of the product.

12.5. Products are accepted for warranty repair (as well as for return) fully assembled.



## WARRANTY CARD №\_\_\_\_\_

№	Product Name	Packs

Name and address of the trading organisation

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Date of sale \_\_\_\_\_ Seller's signature \_\_\_\_\_

Stamp or seal of the trading organisation

Acceptance stamp

I agree with the terms and conditions of the warranty:

Buyer \_\_\_\_\_ (signature)

Warranty period - 12 months from the date of commissioning, but not more than 18 months from the date of sale.

For warranty repairs, complaints and product quality claims, please contact ELEPHANT at: Carrer d'Aragó,264,3-1,08007 Barcelona, Spain. E-mail address: sales@valveelephant.com.

When making a complaint about the quality of goods, the buyer shall present the following documents:

1. A free-form application, which shall specify:

- name of the organisation or full name of the buyer, actual address, contact telephone numbers;
- name and address of the organisation that carried out the installation;
- basic parameters of the system in which the product was used;
- a brief description of the defect.

2. Document confirming the purchase of the product (delivery note, receipt)..

3. Act of hydraulic test of the system in which the product was installed.

4. This completed warranty card.

A note on the return or exchange of goods \_\_\_\_\_

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