TECHNICAL DATA SHEET

Multi-turn actuator ELEPHANT
MT-N-xEM-O2-x-U1 five cam actuator

+34 900 433 073, sales@valveelephant.com
Carrer d'Aragó,264,3-1,08007 Barcelona, Spain

1. GENERAL PRODUCT INFORMATION

1.1. Product name. Multi-turn actuator ELEPHANT MT-N-xEM-O2-x-U1 five cam actuator.
1.2. Purpose. The multi-turn actuator is designed for automation of industrial valve control process as well as for determining the position of the valve shut-off body.
1.3. Operating principle. The principle of operation of the actuator is to convert the electrical signal from the control device into rotary motion of the output shaft.

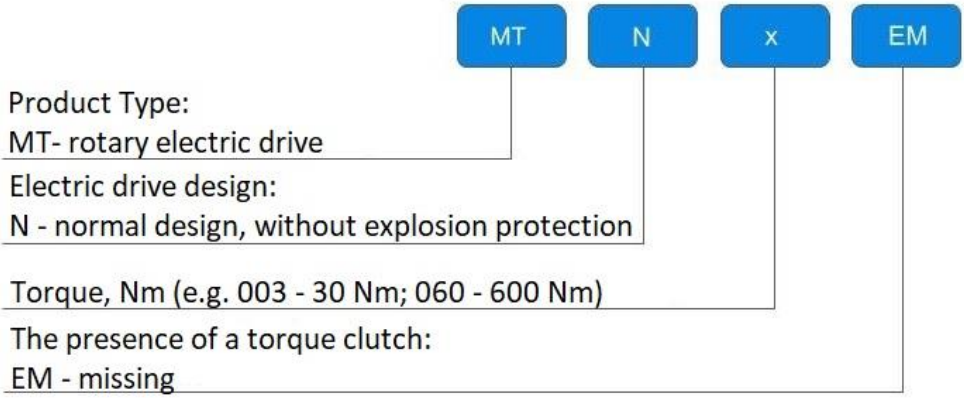
Attention!

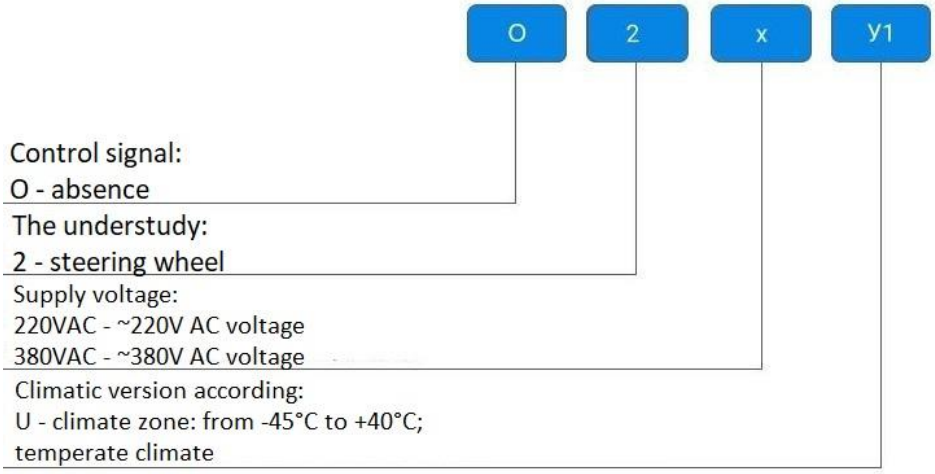
The indicated marking MT-N-xEM-O2-x-U1 is equivalent to the markings

MTV (50-300) 220-5 A/B/V

MTV (50-600) 380 5 A/B/V

1.4. Deciphering of the designation:





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2. BASIC TECHNICAL DATA AND CHARACTERISTICS

Table 1

Electric drive type	multiturn
Motor type	asynchronous
Supply voltage	220V/AC, 50Hz, 1 phase 380V/AC, 50Hz, 3 phases winding scheme - “star” Y
Cable gland	waterproof G1/2
Automatic shut-off in open, closed and jammed positions	have
Enclosure protection class	IP67
Winding insulation type	F
Ambient temperature, ° C	-30 to +70
Ambient humidity	≤95% (25°C)
Enclosure explosion protection	no

3. CONSTRUCTION

3.1. The actuator consists of six main components:

- electric motor;
- A gearbox that transmits the force from the electric motor to the output shaft;
- torque, travel and adjustment control mechanism;
- a mechanism for switching from electric to manual operation (to switch from electric to manual operation, the switch lever must be pulled);
- handwheel for opening and closing the valve when switching to manual operation;
- electrical part.

3.2. Schematic diagram of the electric drive:

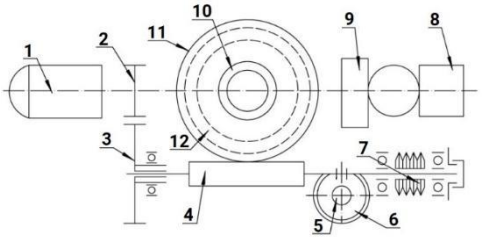

Table 2

№	Name
1	Electric motor
2	Gearmotor
3	Worm gearbox
4	Worm
5	Handle
6	Torque mechanism
7	Disc spring set
8	Opening indicator
9	Moving mechanism
10	Output shaft
11	Worm gearbox
12	Bevel gear

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3.3. Torque control mechanism:

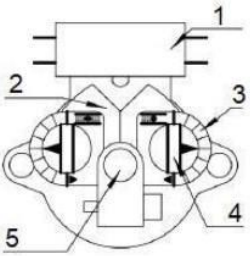

Table 3

№	Name
1	Microswitch
2	Support plate
3	Winding knob
4	Separation disk
5	Adjustment shaft

3.4. Travel control mechanism:

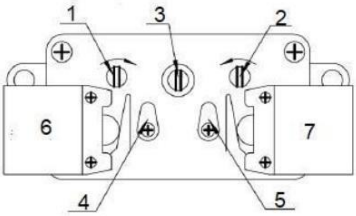

Table 4

№	Name
1	Closing adjusting screw
2	Opening adjusting screw
3	Intermediate gear bushing
4	Closing cam
5	Opening cam
6	Closing limit switch
7	Opening limit switch

4. TECHNICAL CHARACTERISTICS

Table 5.1.

Model	Maximum torque on output shaft, Nm	Output shaft speed, rpm	Manual drive gear ratio	Weight, kg
MT-N-005EM-O2-220-U1	50	18/24	1:1	15,2
MT-N-010EM-O2-220-U1	100			15,8
MT-N-015EM-O2-220-U1	150			16,2
MT-N-020EM-O2-220-U1	200			24,2
MT-N-030EM-O2-220-U1	300			25,8
MT-N-005EM-O2-380-U1	50			15,2
MT-N-010EM-O2-380-U1	100			15,8
MT-N-015EM-O2-380-U1	150			16,2
MT-N-020EM-O2-380-U1	200			24,2
MT-N-030EM-O2-380-U1	300			25,8
MT-N-045EM-O2-380-U1	450			63,0
MT-N-060EM-O2-380-U1	600			65,2

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Table 5.2.

Model	Rated current, A	Power, kW	Voltage, V
MT-N-005EM-O2-220-U1	0,82	0,18	220
MT-N-010EM-O2-220-U1	1,14	0,25	220
MT-N-015EM-O2-220-U1	1,68	0,37	220
MT-N-020EM-O2-220-U1	1,68	0,37	220
MT-N-030EM-O2-220-U1	2,5	0,55	220
MT-N-005EM-O2-380-U1	0,45	0,12	380
MT-N-010EM-O2-380-U1	0,6	0,18	380
MT-N-015EM-O2-380-U1	0,85	0,25	380
MT-N-020EM-O2-380-U1	1,05	0,37	380
MT-N-030EM-O2-380-U1	1,3	0,55	380
MT-N-045EM-O2-380-U1	2,5	1,1	380
MT-N-060EM-O2-380-U1	3,2	1,5	380

5. OVERALL AND CONNECTION DIMENSIONS

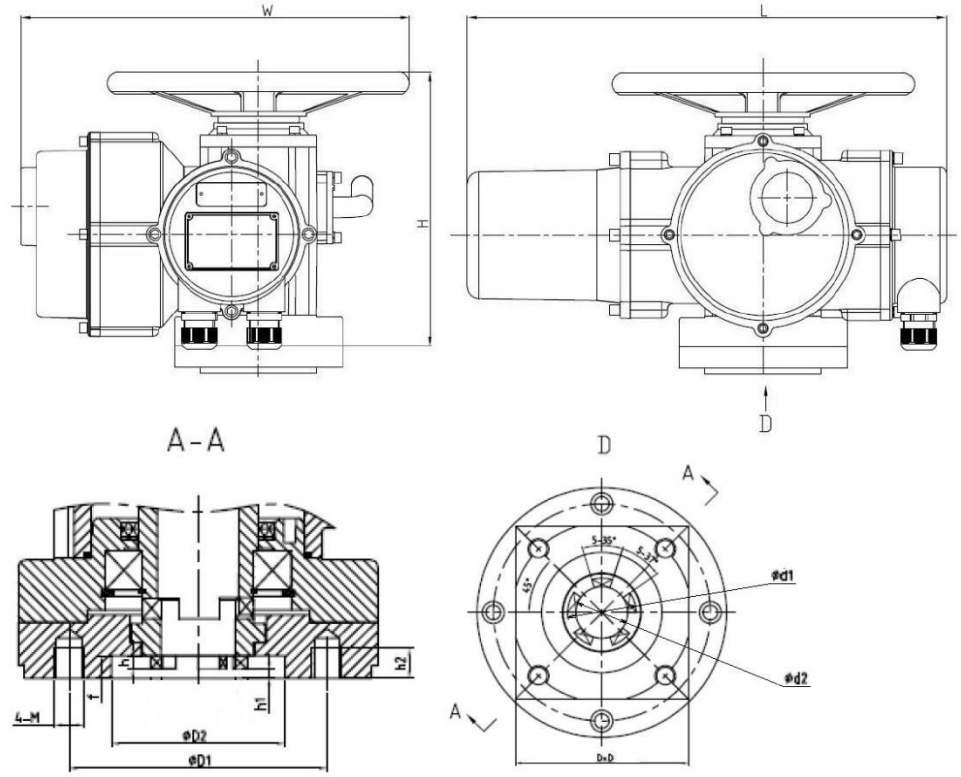

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Table 6.1.

Model	W, mm	H, mm	L, mm	DxD, мммм	D1, mm	D2, mm	Connection type
MT-N-005EM-O2-220-U1	334	258	411	100x100	104	70	A
MT-N-010EM-O2-220-U1	334	258	411	100x100	104	70	A
MT-N-015EM-O2-220-U1	334	258	411	100x100	104	70	A
MT-N-020EM-O2-220-U1	365	290	470	122x122	135	108	Б
MT-N-030EM-O2-220-U1	365	290	470	122x122	135	108	Б
MT-N-005EM-O2-380-U1	334	258	411	100x100	104	70	A
MT-N-010EM-O2-380-U1	334	258	411	100x100	104	70	A
MT-N-015EM-O2-380-U1	334	258	411	100x100	104	70	A
MT-N-020EM-O2-380-U1	365	290	470	122x122	135	108	Б
MT-N-030EM-O2-380-U1	365	290	470	122x122	135	108	Б
MT-N-045EM-O2-380-U1	433	337	564	200x200	220	155	B
MT-N-060EM-O2-380-U1	433	337	564	200x200	220	155	B

Table 6.2.

Model	d1, mm	d2, mm	f, mm	h, mm	h1, mm	h2, mm	4–M
MT-N-005EM-O2-220-U1	32	44	8	5	3	18	4–M12
MT-N-010EM-O2-220-U1	32	44	8	5	3	18	4–M12
MT-N-015EM-O2-220-U1	32	44	8	5	3	18	4–M12
MT-N-020EM-O2-220-U1	45	57	15	8	7	22	4–M12
MT-N-030EM-O2-220-U1	45	57	15	8	7	22	4–M12
MT-N-005EM-O2-380-U1	32	44	8	5	3	18	4–M12
MT-N-010EM-O2-380-U1	32	44	8	5	3	18	4–M12
MT-N-015EM-O2-380-U1	32	44	8	5	3	18	4–M12
MT-N-020EM-O2-380-U1	45	57	15	8	7	22	4–M12
MT-N-030EM-O2-380-U1	45	57	15	8	7	22	4–M12
MT-N-045EM-O2-380-U1	70	84	22	11	11	28	4–M20
MT-N-060EM-O2-380-U1	70	84	22	11	11	28	4–M20

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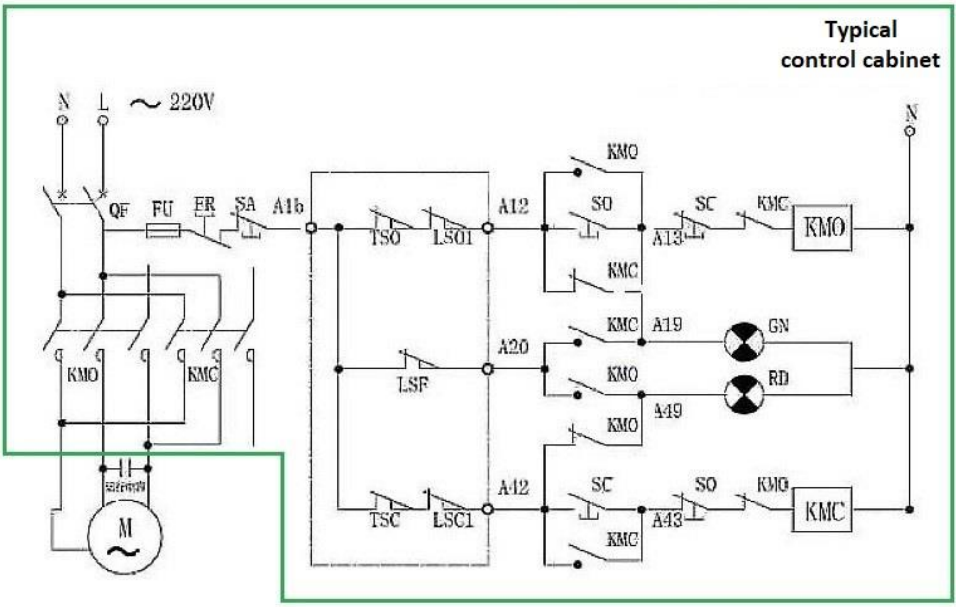
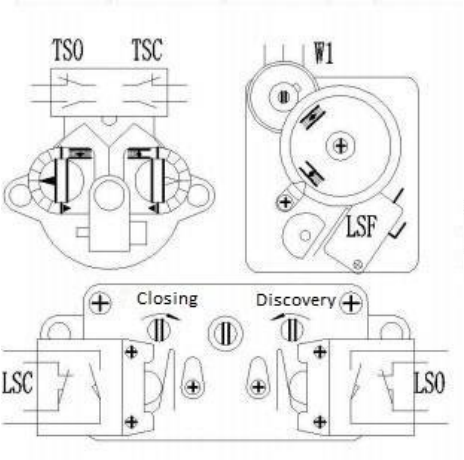
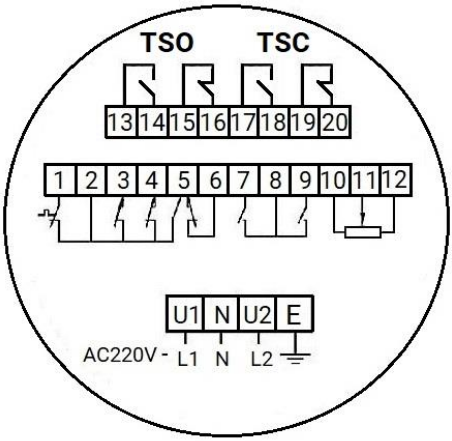
6. WIRING DIAGRAM 220V







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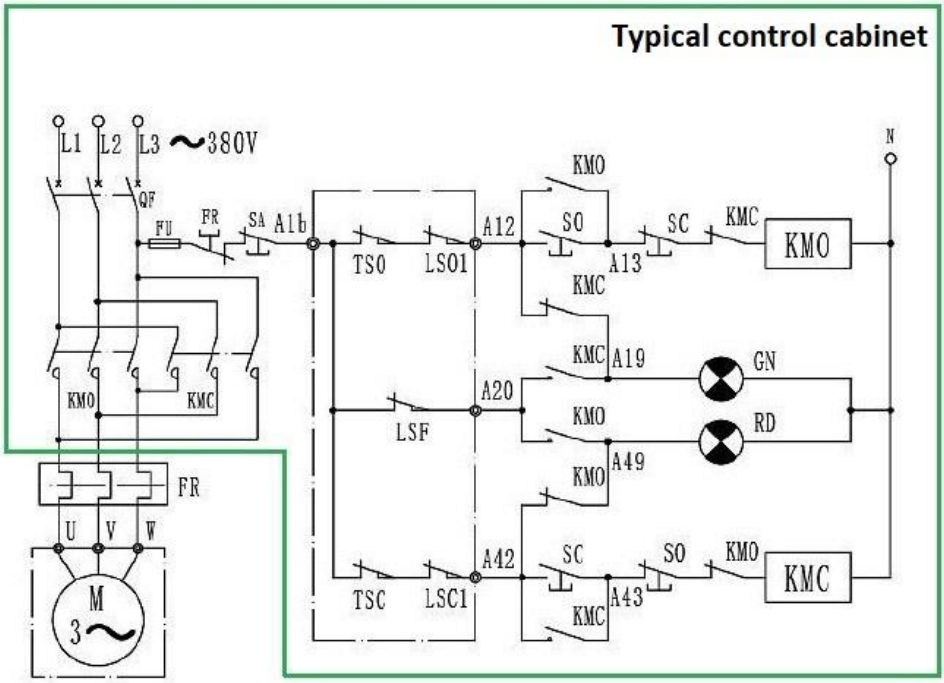
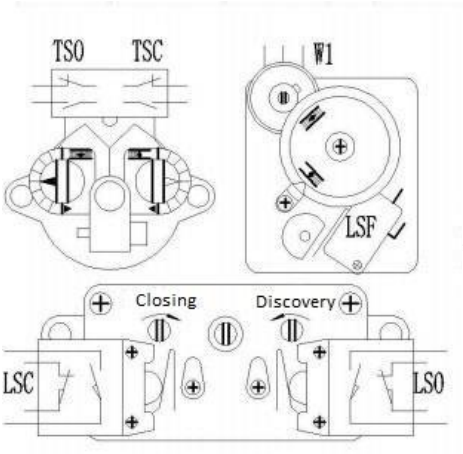
7. WIRING DIAGRAM 380V





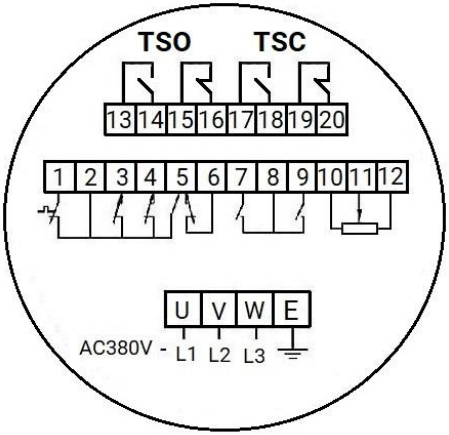


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Table 7

Code	Name	Quantity	Note
FR	Thermostat relay	1	Set by user
KMO KMC	AC contactor	1	Set by user
SA SO SC	Button	3	Set by user
TSO TSC	Rotary switch	1	
LSO LSA	Ring switch	1	

Table 8.1.

Connection	
1	Hold
4	Close/Off
10, 11, 12	Potentiometer
13, 14, 15	Opening limit adjustment

Table 8.2.

Indication	
5-6	Warning indication (reboot)
7-8	Open indication
8-9	Close indication

8. INSTALLATION INSTRUCTIONS

8.1. Safety precautions during installation and operation of the actuators must be observed in accordance with the procedure established at the enterprise.
8.2 The actuators may be installed, operated and serviced by personnel who have studied the actuator design, safety rules and requirements of this data sheet.
8.3 The actuator should be preserved immediately before its installation on the valve. Installation position of the actuator is any.
8.4 Before mounting, check the actuator appearance and the ease of movement of the actuator moving parts from the mode changeover lever (in manual mode).
8.5 Mounting of the actuator is performed directly on the shut-off valve. During mounting pay attention to the correct alignment of the actuator seating flange and the mating seating flange on the actuator. Tight fit, backlashes, gaps between the actuator and the 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.
8.6 Attention should be paid to the alignment of the output shaft of the shut-off valve and the seating hole in the output shaft of the actuator. Looseness is not allowed - it leads to rapid wear of actuator parts and shut-off valves.
8.7 After installation check:

- insulation resistance of electrical circuits relative to the case at 20 ° C and humidity up to 80% should be not less than 20 megohms;
- grounding resistance, which should be no more than 0.1 Ohm;
- operation of the actuator in the manual mode: by turning the lever of the mode switch make sure that the valve gate moves smoothly;
- operation of the actuator from the electric motor: setting for opening, closing and clearness of operation of the output shaft stroke limiter (for this purpose 2-3 cycles OPEN - CLOSED should be performed).).

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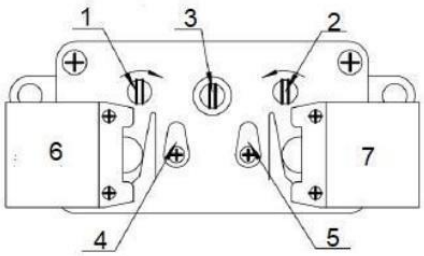
9. SETUP INSTRUCTIONS

9.1. Adjustment of the torque control mechanism should be carried out with no pressure in the system and by checking the potentiometer disconnection on the position indicator (to do this, loosen the gear set screw on the potentiometer shaft so that it comes out of engagement):

- adjust the closing torque (starting with a low torque value, gradually increase the torque value until the valve is tightly closed;
- after applying pressure to the system, check the tightness of the valve closure (if there is no tightness, increase the torque value to a value that ensures full opening and tightness when the valve closes)).

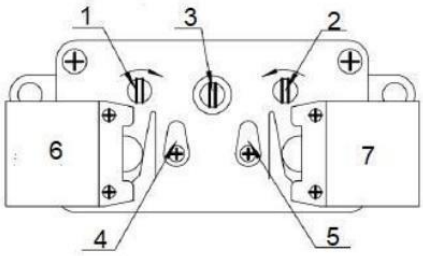
9.2. Adjusting the stroke control mechanism.

9.2.1 Adjusting the closing stroke:



- close the valve manually;
- disconnect the travel control mechanism (use a screwdriver to press the intermediate gear bushing (3) in the travel control mechanism and turn it 90 degrees to separate the drive gear from the countermeasure gear;
- pre-adjust the closing stroke (using a screwdriver, turn the closing adjustment shaft (1) in the direction of the arrow until the closing cam (4) presses on the spring pressure plate to operate the closing limit switch (6);
- press and turn the intermediate gear bushing (3) so that the drive gear and gears on both sides engage correctly (turn the adjusting shaft slightly left-right with a screwdriver);
- open the bolt for a few turns, then close it and, depending on whether the closing stroke meets the requirements, adjust the closing stroke.

9.2.2. Opening stroke adjustment:



- Open the valve manually (note that the stroke control mechanism must be switched on at this time, otherwise the closing stroke adjustment will be disturbed);
- disconnect the stroke control mechanism (use a screwdriver to press the intermediate gear bushing (3) in the stroke control mechanism and turn it 90 degrees to separate the drive gear from the countermeasure gear;
- pre-adjust the opening stroke (using a screwdriver, turn the opening adjustment shaft (2) in the direction of the arrow until the opening cam (5) presses on the spring pressure plate to trigger the opening limit switch (7);
- press and turn the intermediate pinion sleeve (3) so that the drive pinion and pinions on both sides engage correctly (turn the adjusting shaft slightly left-right with a screwdriver);
- close the bolt for a few turns, then open it and, depending on whether the opening stroke meets the requirements, adjust the opening stroke.

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10. OPERATING INSTRUCTIONS

10.1. The operating personnel is allowed to operate the actuator only after passing the appropriate safety briefing.

10.2 The following rules must be observed when servicing the actuator:

- the actuator must be serviced in accordance with the established “Rules of technical operation of electrical installations of consumers”;
- the place of installation of the actuator must be sufficiently illuminated;
- the actuator housing must be earthed;
- installation work on the actuator must be carried out only with serviceable tools;
- when starting preventive maintenance work, make sure that the actuator is disconnected from the mains supply.

10.3. During operation it is necessary to carry out periodic inspections of the actuator within the terms established by the schedule, depending on the operating mode of the actuator, but at least once every three months. During inspection pay attention to: integrity of the enclosure, presence of all fasteners and their elements, warning inscriptions, grounding devices, plugs in unused input devices, sealing of input cables. During preventive inspection measure insulation resistance.

11. POSSIBLE MALFUNCTIONS AND REMEDIES

Fault	Possible cause	Remedial action
When the start buttons are pressed, the drive does not operate. does not operate.	1.Power power circuit or magnetic starter. 2.No power supply to the control panel.	1.Check the power circuit and magnetic starter and correct the fault. 2.Energize the control panel.
When the valve gate reaches CLOSED or OPEN position the electric motor is not is not switched off.	1.The set positions of the closing (opening) limit or coupling microswitches have been adjusted. 2.The closing (opening) limit or coupling microswitch has failed.	1.Adjust the positions of the limit or coupling microswitches closing (opening) and securely fasten them. 2.Replace the closing (opening) limit or coupling microswitches.
During the valve closing/opening stroke the actuator stopped and the “ Overload” lamp illuminated.	Stem jamming Clamping of the valve stem or moving parts actuator.	Switch off the actuator and check the start-up of the actuator in the direction in which the jamming occurred. If the actuator stops when restarting, the fault must be identified and eliminated.
The CLOSED or OPEN lamps are not illuminated in the end positions of the valve gate.	1.The bulbs burned out. 2.The limit microswitches have been adjusted. 3.No power supply to the actuator display circuit.	1.Replace the lamps. 2.Adjust the contacts of the limit microswitches and fix them securely. 3.Check the indication circuit by the electric actuator, eliminate correct any faults and supply power supply to the indication circuit.
The CLOSED and OPEN lamps light up simultaneously.	1. Short circuit short circuit between the wires of the limit microswitches. 2. Incorrect incorrect setting of the limit microswitches.	1. Locate the short-circuit point of the actuator and correct the fault. 2. Fine tune the microswitches.
Incomplete closure The valve gate is not fully closed.	1.Insufficient torque. 2. Solid particles between the sealing surfaces of the valve gate. 3. The limit switches have not been set accurately	1.Select a suitable actuator. 2.Clean the internal cavity of the valve. 3.Adjust the limit microswitches.

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12. TRANSPORTATION AND STORAGE CONDITIONS

12.1. Storage of actuators should be carried out in accordance with the procedure established at the enterprise.
12.2 Transportation of pneumatic actuators is carried out in the manufacturer's packing in accordance with the procedure established at the enterprise.

13. UTILIZATION

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

14. WARRANTY OBLIGATIONS

14.1. Warranty period - 12 months from the date of commissioning, but not more than 18 months from the date of sale.
14.2. The warranty applies to equipment installed and used in accordance with the installation instructions and product specifications described in this data sheet.
14.3. The manufacturer guarantees compliance of the product with safety requirements, provided that the consumer complies with the rules of transport, storage, installation and operation.
14.4. The warranty covers all defects caused by the fault of the manufacturer.
14.5. 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.

15. WARRANTY TERMS

15.1. Claims to the quality of the goods may be made during the warranty period.
15.2. 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'.
15.3. Costs related to dismantling, installation and transport of the defective product during the warranty period shall not be reimbursed to the Buyer.
15.4. If the claim is unfounded, the Buyer shall pay the costs of diagnostics and expertise of the product.
15.5. Products are accepted for warranty repair (as well as for return) fully assembled.

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WARRANTY CARD №____

№	Product Name	Packs

Name and address of the trading organisation

_____

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 _____

Date: «___»_____202__yr. Caption _____