tork
valve & automation

TREAE SERIES ELECTRICAL ACTUATOR

USER MANUAL

AUGUST / 2019
PLEASE READ THE INSTRUCTIONS BEFORE USE

www.smstork.com

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1. PURPOSE OF DOCUMENT

This document is prepared for showing TORK brand named TREAE series electrical actuators' installation, operation and maintenance information.

Security Notifications:

Warning: This sign show personal and product's security notifications. It warns user about probably dangers. If cautions are not regarded personal injuring or product damaged is become unavoidable.

2. PRODUCT OVERVIEW

Electrical actuators are equipment converting electrical power to mechanical power used for valve control. Electric motor's torque is transmitted to valve shaft through the electrical actuator gearbox. This torque makes the valve open or close. Gearbox provides a steady torque while turning.

TREAE series electric actuators are produced as "On / Off Controlled Electric Actuator ". Electrical actuators manufactured by SMS-TORK do not use asbestos, PCB, mercury and other prohibited chemicals.

a. Intended Use of the Product

Electrical actuator is one the most used valve control equipment. The purpose of an electrical actuator is poening or closing the valve. This opening or closing can be full open/close or proportional open/close. This can be changed according to process application. Electrical actuators can be used on ball valve, butterfly valve, plug valve and other proper valve types.

Advantages of electrical actuators are,

- Electric power is accessible.
- High output torque can be produced with low energy.
- Products have longer life.
- Products are compact and have light weight.
- Sensitive control.
- High protection class.
- Wide power supply range.
- Wide turn angle range.

b. Product Coding System

There may not be all the variations at the product coding table. For more details, please contact us.

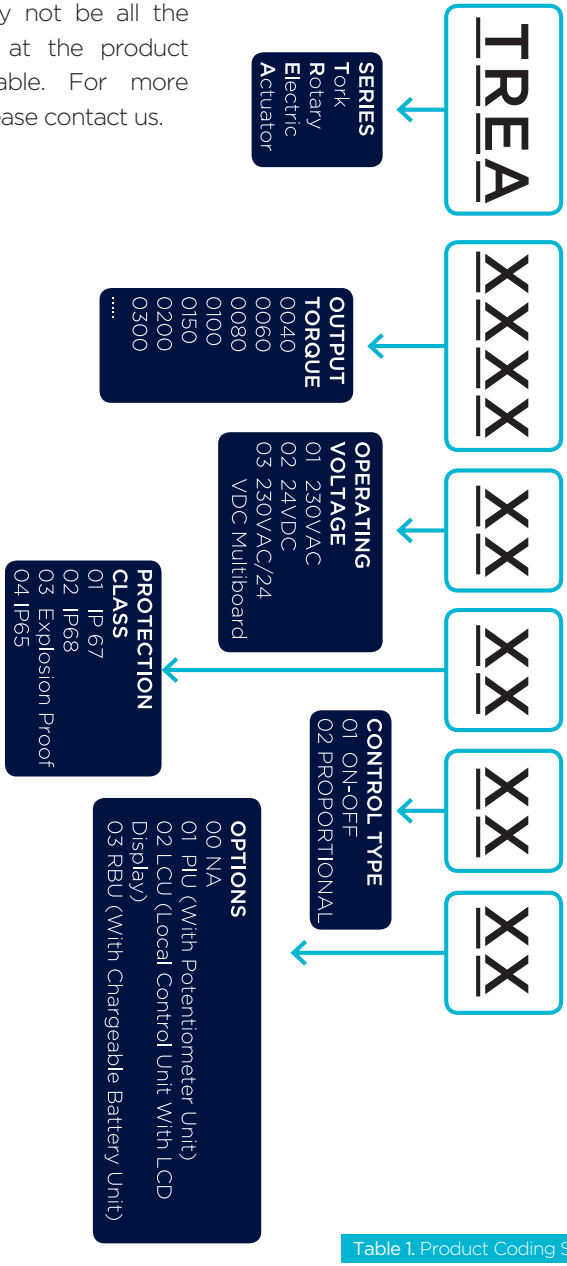


Table 1. Product Coding System

c. Product and Part Pictures

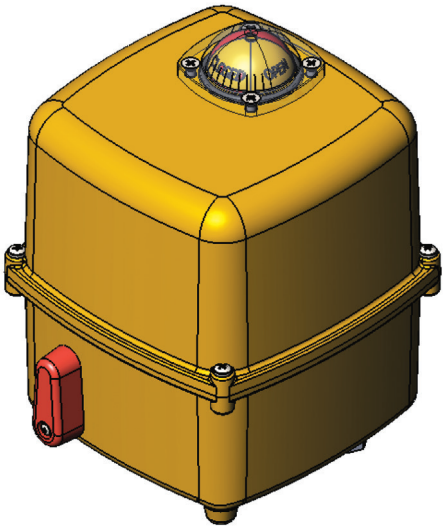


Fig 1. TREAE Electrical Actuator

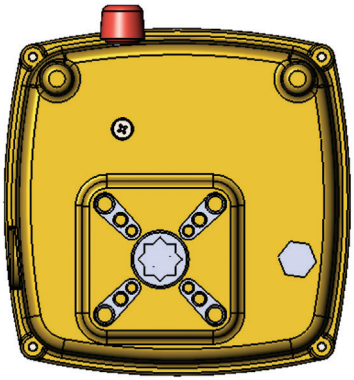


Fig 2. TREAE Electrical Actuator Valve Connection Point

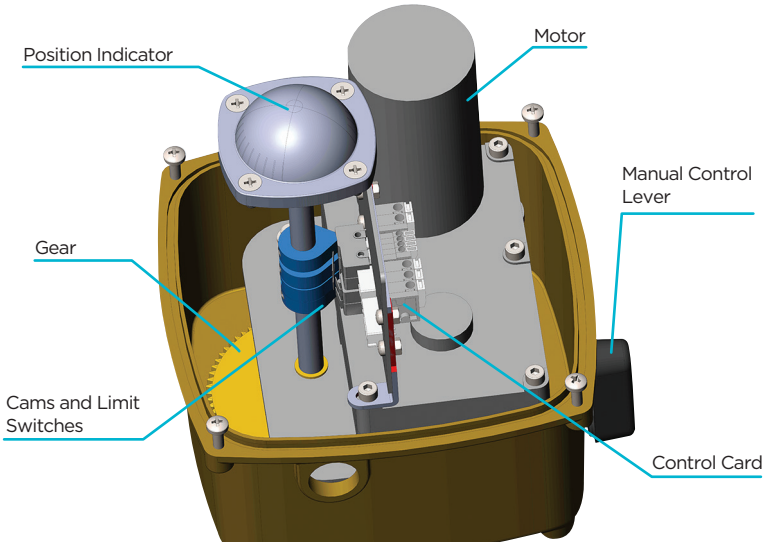


Fig 3. Electrical Actuator Parts

d. Labeling Details

Electrical actuators' general information must be written on their labels. Fig 3 shows a sample label and the information it contains. For more detailed information, the user manual, technical support department or sales department can be helpful.

Electrical actuator label contains these informations:

- Model
- Type
- Serial No
- Protection Class
- Ambient Temperature
- Output Torque
- Operation Voltage
- Power
- Operation Time
- Optional Units

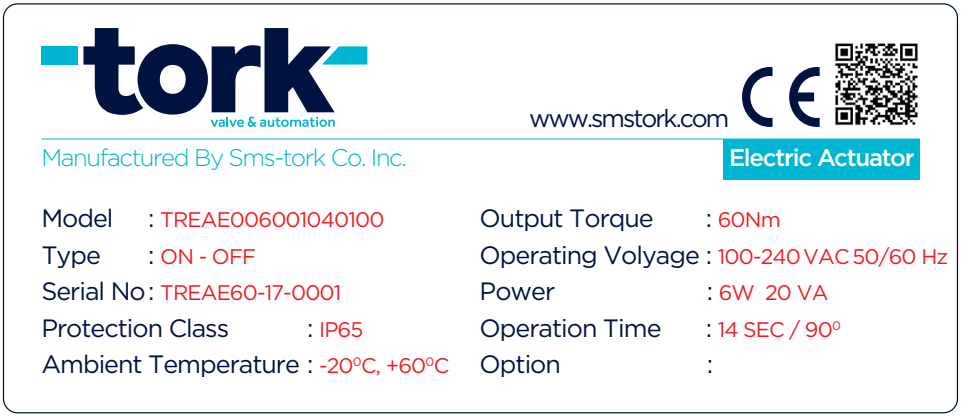


Fig 4. Label Details

3. PRODUCT OPERATION

When supply voltage (100 - 240 VAC or 24VAC/DC) applied to the electrical actuator, motor and gearbox produce a rotary force. This force makes the valve acting. According to this act valve is opened or closed.

a. Storage Conditions

Electrical actuators must be stored in clean, dry and cool ambient. Electrical actuators' cover screws must be tightened up and cable entries must be closed. When electrical actuators are stored in an open ambient, they must be protected from weather conditions.

b. Operation Conditions

- Small, light and compact design
- On/Off control
- 60 Nm torque value
- High moment with low energy consumption
- Mechanically manual control
- Manual control by electronic card
- 14 sec. opening and closing time
- 90^0 rotation angle
- Torque limiter with current control
- Body Ingress Protection: IP65
- Body Material: Plastic Injection
- Ambient Temperature: -20 ^{0}C...+60 ^{0}C
- Electric Supply: 100-240VAC, 24VDC, 24VAC
- Limit Switches: 2x OPEN/CLOSE SPDT, 250VAC 3A, 125 VAC 5A
- Aux. Limit Switches : 2x OPEN/CLOSE SPDT, 250VAC 3A, 125 VAC 5A
- Position Indicator : Continuous, as OPEN/CLOSE
- Manual Control: With no 15 switches
- Cable Entrances : M20x1,5
- Greasing : Gear Oil
- Motor operation class: S2 %100 30 min
- Adjustable at different angles

4. PRODUCT INSTALLATION

Before installation, it must be checked if there is any damage on the product and there is any missing part. If there is any damage or missing part, product must not be accepted.

Before the installation inform on the labels and the boxes must be checked.

Before the installation, line voltage and voltage written on the label must be checked if they are in the same range. Before the installation product's suitability to the system must be checked.

Before the installation, the line voltage must be switched OFF. Be careful about during the installation if anybody can switch it ON. This probability must be prevented and must be sure about it.

a. Valve Mounting

Electrical actuators are manufactured so that the valve can be mounted according to ISO 5211 standard.

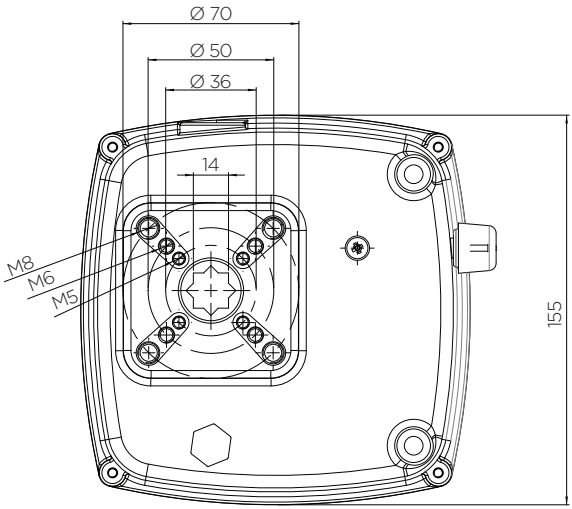


Fig 5. ISO5211 Mounting Surface

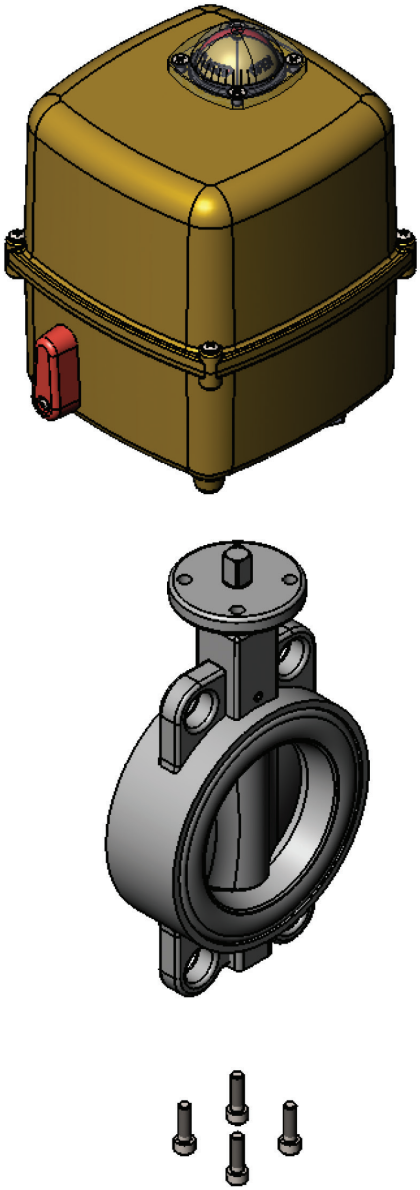


Fig 6. Valve Mounting

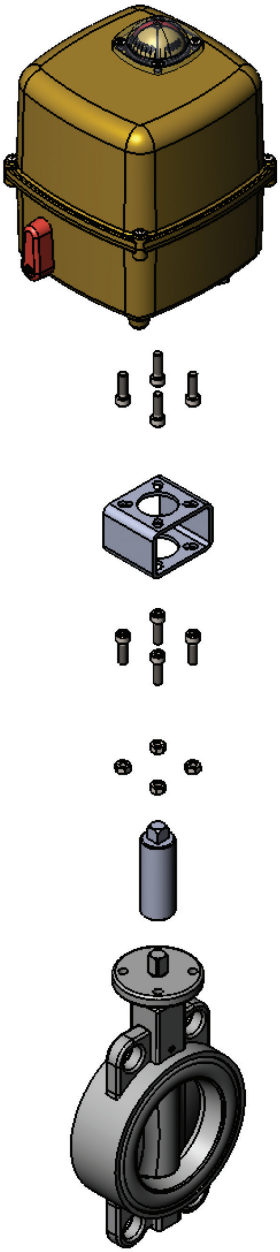


Fig 7. Valve Mounting with Bracket

b. Manual Control

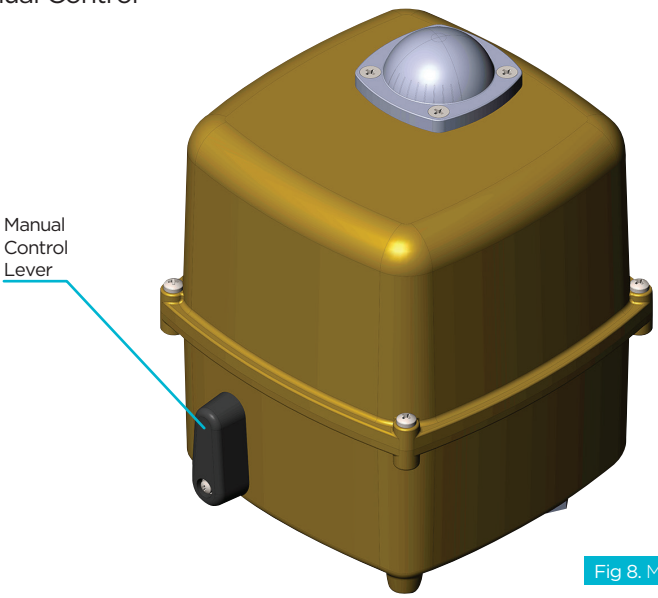


Fig 8. Manual Control Lever

There are two different manual control ways. First way is with manual control lever, and the second way is by buttons on PCB card.

1) Controlling with manual control lever is only recommended to use in case of emergency as power failure or interreptuion of the control signal. The reason for this is, even the valve's position changed with manual control lever while there is control signal on electric actuator. In this control system, manual control lever which is located near to the body is pull down. By this way, motor's connection with gears is cut. Switch under the body is opened and closed by no 15 switch. For switch to automatic control mode, manual control lever is pull up, then motor will activated and actuator will be controlled automatically.

2) When card is on energy, press both direction buttons on the card. Red LEDs next to buttons on and off 3 times and be on continuosly; and switch to manual control. After that, on and off process is controlled by direction butttons. Information coming from control signal information do not take into account at the manual mode. To exit manual mode, press both direction buttons. After LEDs on and off 3 times, it be off and switch to automatic mode. Control can be done by control signals. By doing on and off process, one of the LEDs work.

c. Adjusting Cams and Limit Switches

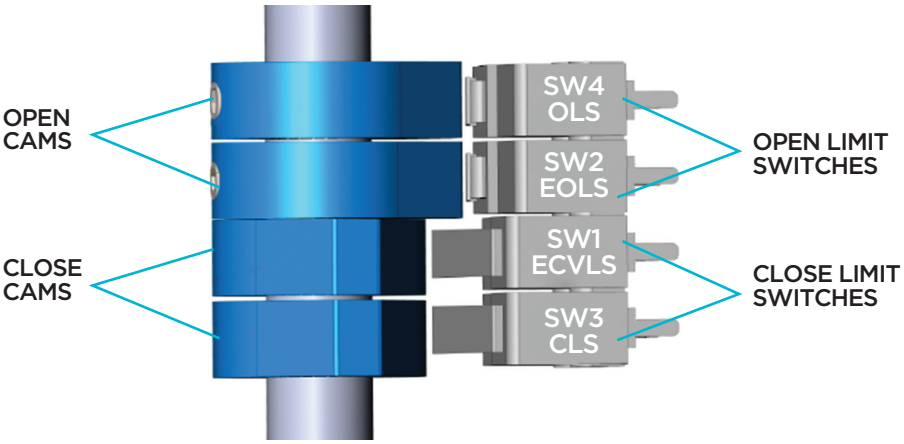


Fig 8. Cams and Limit Switches

Firstly, loosen the setscrew on cams, so they can move easily. Bring the valve to CLOSE position manually. While it is in CLOSE position, the cams are turned by pressing cams to CLOSE LIMIT SWITCHES 3.(SW1) and 4. (SW3), and press the CLOSE switch. After that, 3. and 4. cams are squeezed and fastened. Follow same instructions for OPEN position. At this time, 1. (SW4) and 2. (SW2) cams position are adjusted.

d. Technical Dimensions

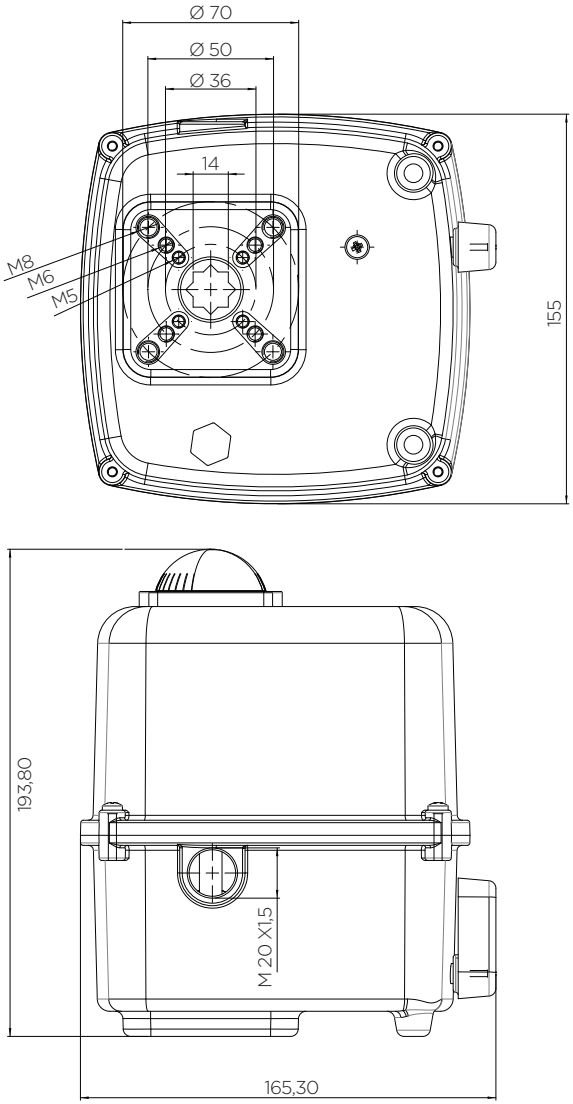


Fig 10. TREAE Electrical Actuator ABC Measures

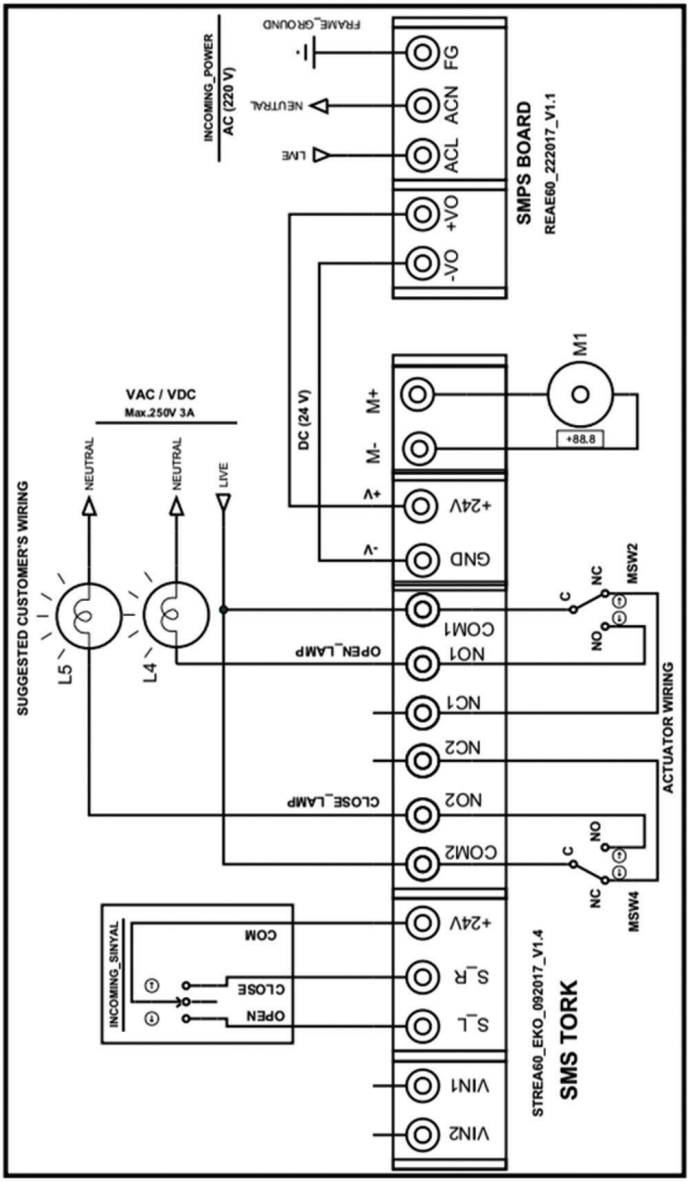
LED Meanings

LED NAME	LED POSITION	EXPLANATION
Left	Open	1) There is valve open control signal. 2) It works on manual mode, if it light up with right LED.
	Close	1) No energy on card. 2) No First Control Signal
Right	Open	1) There is valve close control signal. 2)It works on manual mode, if it light up with left LED.
	Close	1) No energy on card. 2) No First Control Signal
Switch 1 Stop	Open	Valve way is open.
	Close	Valve way is in the middle.
Switch 2 Stop	Open	Valve way is close.
	Close	Valve way is in the middle.

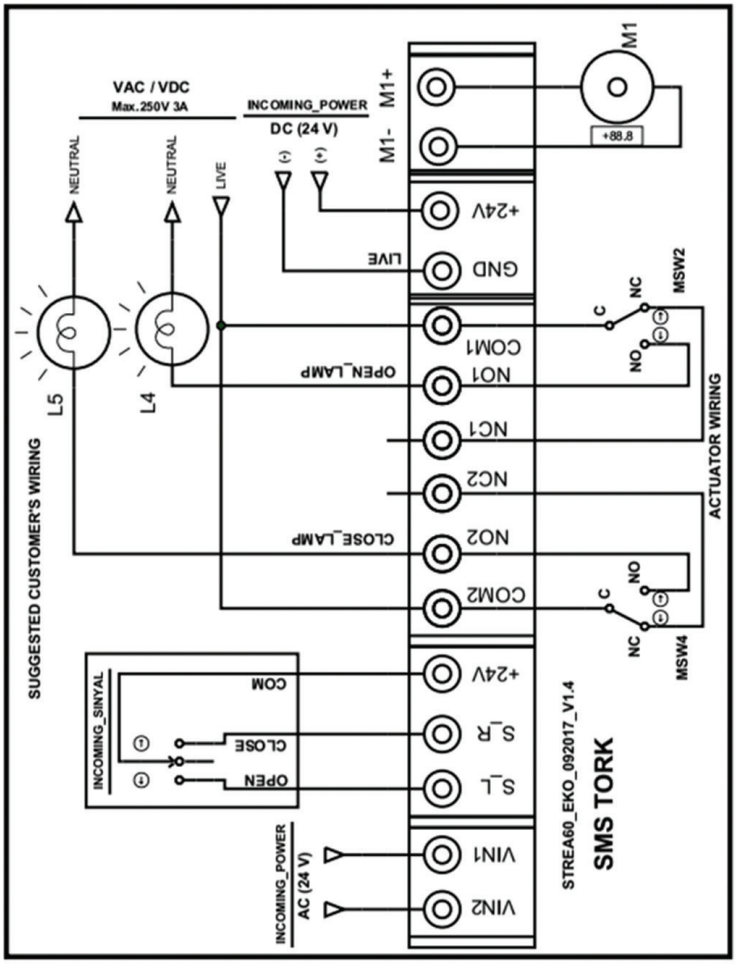
Table 2. LED meanings

e. Wiring Schemes

100 - 240 VAC On-Off Wiring Schemes



24 VDC / VAC On-Off Wiring Schemes



h. Warnings

If electrical actuator's wiring is damaged, it must be changed by producer company, certificated service or someone having technical qualification, for preventing any dangerous conditions,

If the product is to be used in outdoor, explosive or in environments where harmful animals such as mice live, It is necessary that the supply cables and the connection materials have the appropriate specifications (armor-plated, atex, etc.).

Preventing from any short circuit fault, a 4A B type automat fuse must be used in the power line that electrical actuator connected.

Every electrical actuator must be supplied with voltage written on it. Every electrical actuator must be mounted the proper valve according the output torque written on it.

When it is necessary in some fluid applications, a filter must be used. Because, some sediments gathered in the valve cause corrosion and forcing the electrical actuator. This forcing makes difficult to open or close the valve and can damage the electrical actuator.

When manual hand wheel has traced to its limits, it must not be turned over more.

Preventing from any short circuit or open circuit fault, the electrical actuator cables must not have any damage(twisting, smashing) on them.Moreover, the cable twisting on the cable entries can cause to moisture or water entrance to the body. To prevent from this, proper cable diameter must be selected according to the cable entries.

Used cable must have minimum 3x 0.75 mm^2 section.

5. PRODUCT LIFE

Electrical actuators' operating times change according to their models. Product's life changes according to application and ambient conditions. Periodic preventative maintenance extends the product's operating life.

The duty class level of the motors used in our electric actuators is S4. Therefore, in AC ON-OFF electrical actuators, the motors can be operated continuously for up to 30 minutes, then the motor must not run until the motor temperature is equal to ambient temperature.

6. PRODUCT CARE AND MAINTENANCE

Under normal conditions, the electrical actuator must be checked in every 6 months. For more hazardous conditions, it must be checked more frequently.

Before electrical actuator displaced from the system, the power on the electrical actuator must be switched OFF and pressure in the pipe must be zero.

- Be sure about valve and actuator mounting is right.
- Be sure about all electrical wiring is isolated and wired regularly.
- Be sure about all screws are mounted and tightened up.
- Be sure about the parts in the electrical actuator is clean.
- Be sure about cable glands and blind plugs are mounted and dry.
- Be sure about if there is no humidity in actuator.
- Be sure about inner heater is working. The internal heater prevents the formation of moisture inside the actuator and prevents the electronic parts from breaking down.
- Be sure about is manual hand wheel is operating.
- Be sure about actuator's position indicator and valve position are correlate.
- Be sure about label is readable. If it is necessary request to change the label with more readable one.

During both installation and maintenance be careful about sensitive inner parts. They must not be damaged. Before and after any maintenance electrical wirings must be controlled, electrical precautions must be taken; valve must be tested if it is working proper with actuator.

a. Troubleshooting

Problem	Probably Case	Corrective/Preventive Action
The motor is not spinning.	There is an open in control circuit.	Wiring scheme must be checked.
	Motor isolation is damaged.	Motor windings must be checked with Megger Test.
There is no energy on the product.	There is no supply voltage.	Supply voltage and insurance must be checked.
Manual on / off handle turns hardly.	Valve shaft does not greased enough.	Valve shaft must be greased.
	Actuator gear greased has problem.	Gears must be geared with proper one.
	Valve has jammed.	Valve maintenance must be repeated.
Valve only opens or closes.	Limit siwtch adjusting has gone off.	Limit switches must be checked and must be adjusted again if it necessary.
Manual on / off handle does not control the valve.	Gears turn useless.	Stripped gears must be changed with proper one
	Manuel handwheel's shaft has broken down.	Broken shaft must be changed with proper one.
	Valve shaft has broken down.	Valve shaft must be changed.
The motor is turning but the valve is not opening / closing.	Gears turn useless.	Stripped gears must be changed with proper ones.

7. PRODUCT SPARE PARTS

Electrical actuators' spare parts are;

- Gears
- Motor
- Electronic Control Cards
- Position Indicator
- AC-DC Converter

You must choose spare parts according to your actuator model. For supplying spare parts and detailed information please contact to SMS TORK.

8. GENERAL CARE, REPAIR AND CLEANING

The device must be checked by the user before used. All cables must be checked for breakage, crushing, cracking etc; whether device's connections are applicable according to use manual; whether taking protection for leakage. Before cleaning the device, cut off the electricity. Use soft cleaning solution and dry cloth. Do not use abrasive materials.

8. PRODUCT SHIPMENT

During transportation be careful about electrical actuator's not falling down and not being subjected hard knocks. Don't put any weight damaging the product on electrical actuator boxes. Electrical actuators must be carried on their carton boxes.

9. WARRANTY CONDITIONS

1) The period of warranty shall start from the date of delivery of the product to the customer and shall cover a period of 2 years.

2) Every and all parts of the product are under SMS Sanayi Malzemeleri Üretim ve Satışı A.Ş. warranty coverage. (against any defect that may occur during production, assembly and/or defective parts)

3) In the case that the product fails within warranty period, the time spent on the repair work is added to the warranty period. Repair time of the product is maximum 20 (twenty) working days. This time starts from the date on which the failure concerning the product is notified to the service station and to seller of the product, dealer, agency, representative, importer or producer. It is possible to make the consumer failure notification by telephone, fax, e-mail, registered mail or similar. However, in case of disagreement, the obligation of proof belongs to the consumer.

4) Product replacement or refund is mandatory depending on the choice of the consumer in case one of the conditions below:

a) If failure occurs in the product at least four times in one year or six times with the condition of being within the warranty period.

b) If the maximum time for its repair is exceeded.

c) In case a service station is not exist by a report issued by seller, dealer, agency, representative, importer or producer respectively that, repair of the failure is not possible, exchange process will be carried out free of charge.

d)The warranty period of the products changed during the warranty condition is limited

to the remaining warranty period of the purchased products.

5)Free repair and product exchange obligations will be annulled under the following conditions:

a) If the product becomes faulty due to use contrary to the terms or conditions stated in the user guide,

b) If the product serial number has been altered or removed

c)The warranty labels have been destroyed,

d) If the product has been opened, used, or previously repaired by unauthorized persons,

e) Use of the product by plugging into inappropriate voltages or with faulty electric installation without the prior knowledge of our authorized services,

f) If the fault or damage to the product occurred during the transportation outside of the responsibility of SMS Sanayi Malzemeleri Üretim ve Satışı A.Ş.,

g) When our product is damaged due to use with accessories or devices purchased from other firms or unauthorized services,

h) Those damages caused by natural disasters such as fire, lightning, flood, earthquake, etc.

6) A report prepared by the SMS Sanayi Malzemeleri Üretim ve Satışı A.Ş. will determine whether the damage was caused by improper use.

7) The warranty certificate should be kept throughout the warranty period. The customer must provide the warranty certificate during request for repair. Otherwise, the cost of repair will be charged.

8) The warranty certificate attached to the product during sale should be fully completed by the retailer and customer, signed and stamped. The customer copy must be immediately provided to the customer, followed by the other piece to be mailed out to SMS Sanayi Malzemeleri Üretim ve Satışı A.Ş. by the retailer.

9) In the case when you send the product via courier, please remember to add a description your complaint, the photocopy of your warranty certificate, your address and telephone number.

10) For possible problems which may arise concerning the warranty certificate, it can be applied to the Ministry of Customs and Trade, Directorate General of Consumer Protection and Market Surveillance.

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For and on behalf of BSI:
Frank Lee, EMEA Compliance & Risk Director
Original Registration Date: 04/06/2013
Latest Revision Date: 31/05/2016
Effective Date: 31/05/2016
Expiry Date: 14/09/2018
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