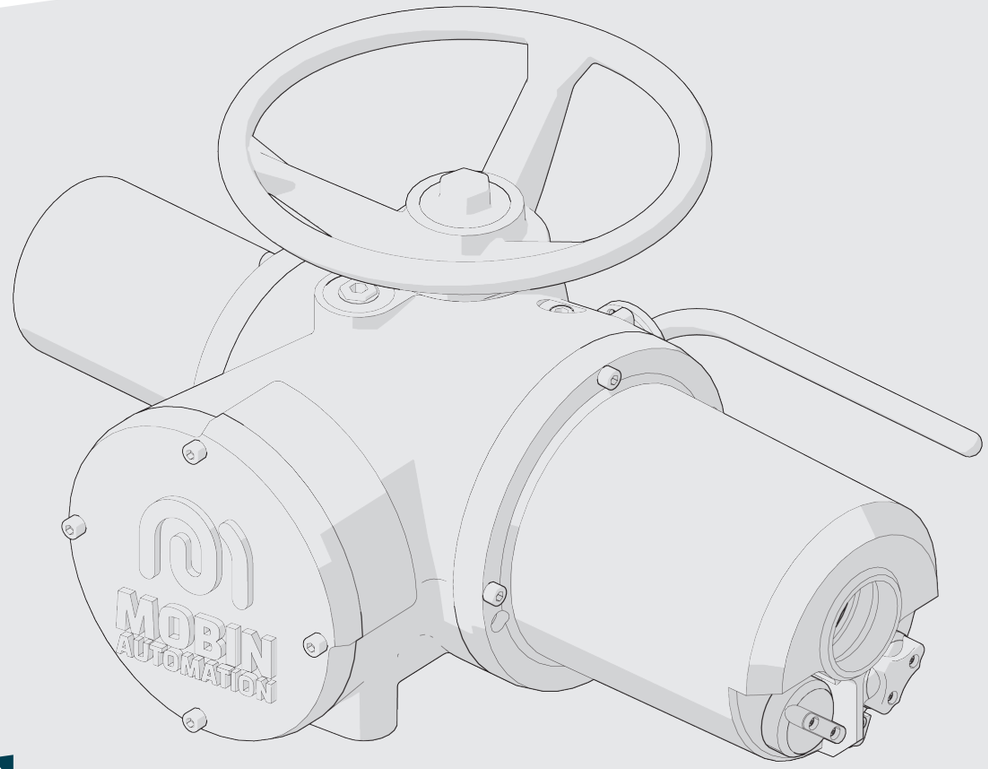
Reliable and Flexible MOBIN Electric actuator (MEA)

Due to the absence of a prestigious international brand in Iran and high demand in the domestic market, MOBIN AUTOMATION decided to manufacture electric actuators. Since in these devices the driving force of an electric motor empowers the gearbox and a complex of electric boards govern all the operations and protection features, an interdisciplinary task has been carried out with the emphasis on electrical, mechanical, computer and network engineering fields to manufacturing electric actuators.

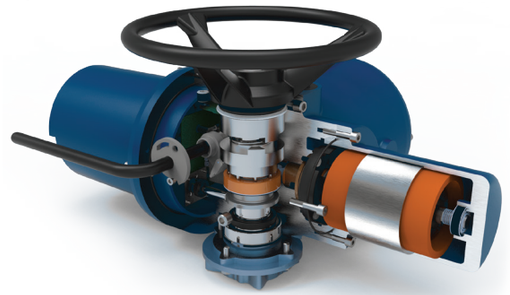
Electric Actuators are mostly utilized in power plants, oil and gas refinery plants and petrochemical units. Using a versatile electrical controller ensures a reliable and intelligence performance for working in environments requiring a high level of safety and security. the power and efficiency of electric motors provide high value of output torques in a smaller size in comparison with other types of actuators.



SPECIFICATIONS

Output torque

- Up to 2000 N.m in multi-turn models.
- For Higher values as well as quarter turn movement.
- Suitable for part-turn valves, a gearbox should be added to MEA.
- Different torque values in a range of output speed are available.
- Sizing should be calculated based on the valve torques and operating time.



WORKING TEMPERATURE

- Standard Range: -30°C to +70°C

Extended range can be manufactured on request

POWER SUPPLIES

- Actuators are suitable for operation with the following three type supply.

Supply	Name	Material
3-phase	200, 220, 240, 400, 415, 440, 480, 500, 550, 660,690	50
	208, 220, 230, 240,380, 440, 460, 480, 575 ,600	60
Single phase (AC)	110, 220, 240	50
	110, 220, 230	60
DC	24, 48, 110	-

MOTOR

3-phase

MEA are equipped with three-phase asynchronous, Squirrel cage, induction motors. In their motor standard 3-phase form they are Class F insulated and 15 minute at average load. A thermostat is sensing the motor windings thermal and tripping actuator control system.

- Class F insulated, squirrel cage motor of special high torque low inertia design
- 15 minute rated with cyclic duration factor of 25% at 33% of actuator output rated torque giving a temperature rise not exceeding that permitted for Class B insulation at standard nominal voltage
- Actuator rated up to 60 starts per hour at a rate not exceeding 600 starts per hour
- Burnout protection by embedded thermostats, with facility for bypassing under emergency shutdown control
- Motors conform to IEC34

Single-phase

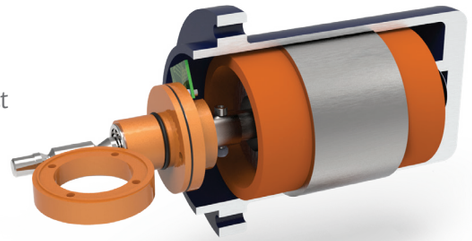
- Single-phase capacitor start/run squirrel cage induction motor
- Class F insulated, special high torque, low inertia design.
- Rating, protection and compliance as per 3-phase specification above.

DC

- Class F insulated, permanent magnet DC motor.
- Rating, protection and compliance as per 3-phase specification above.

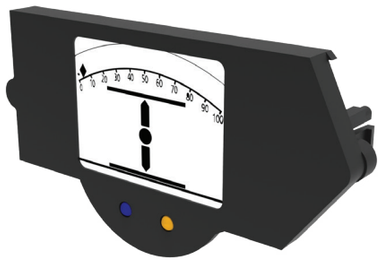
Output Torques

- Reliable and accurate torque measuring method
- Using piezo sensor to measure motor shaft thrust
- ensuring overload protection of actuators
- being independent of variations in frequency,
voltage and temperature
- Adjustable setting for limiting torque
- Real time torque indication and recording valve
operating force profiles by the data logger



POSITION MEASUREMENT

- Using Contact-less hall effect sensors to measure actuator output position
- Being direction sensitive
- Reliable and accurate sensor (resolution is less than 1₀)
- using movement reading with mechanical link on the output shaft
- In case of power failure, the position is updated stored and displayed locally using battery
supply



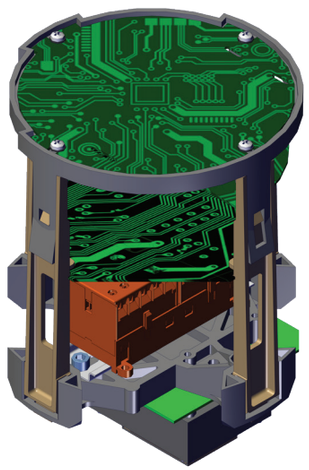
LCD

- using color TFT LCD (2.8') for user interface
- brightness up to 500 cd/m2(typical value)
- operating at temperatures from -20°C to +70°C
- storage temperatures range from -30°C to +80°C

BATTERY

A backup battery is installed to activate window displaying of valve status and recording valve position when power is off. When power to the actuator is isolated, all settings are retained in an EEPROM. The battery also powers the following capability:

- LCD display (low brightness)
- Bluetooth module
- Four latching relays



CONTROL SYSTEM FEATURES

Feature	Specification
Local Control	Magnetically operated switches No penetration of covers Open/Close/Stop and Local/Remote selection
Remote Control	Open/Close/Stop/ESD/Interlock signals Optocoupler-isolated for protection
Position Sensor	Incremental encoder with resolution less than 1° Remains available whilst power is off
Torque Sensor	Using piezo sensor Measuring the output torque directly Converts torque value to a voltage signal
Set-Up	Set-up over Bluetooth All settings can be configured using MOBIN Setting Tool Non-intrusive; No need to remove the covers
Data Logger	Capturing and storing system information in a non-volatile memory with date and time Capable of saving data to PC Remains available whilst power is off
LCD Indication	Presenting position, torque, and set-up displays for configuration Remains available with reduced contrast whilst power is off
Micro-Controller	ARM Family; Widely used in industry Providing all control signals Providing all protection signals Critical functions remain available whilst power is off.
Memory	All settings and records are stored in a micro SD card Non-volatile; Remains available whilst power is off

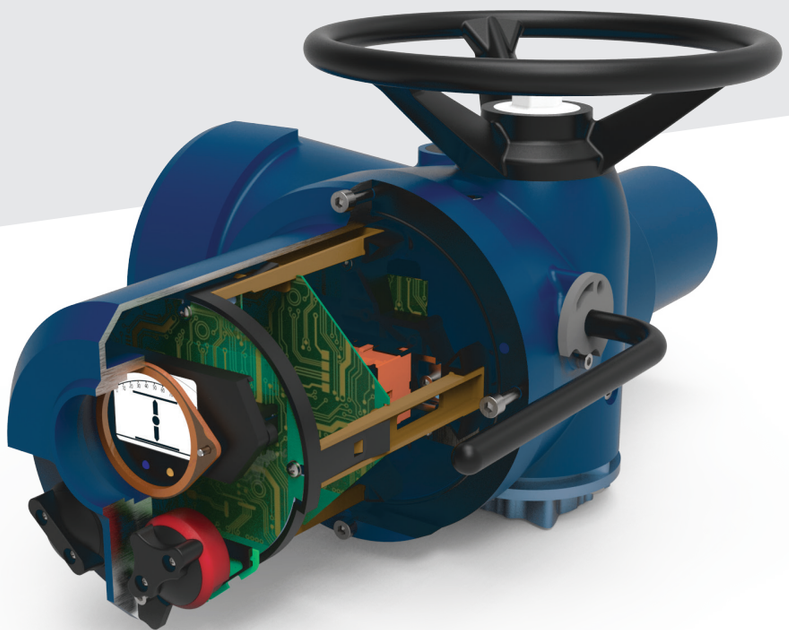
MANDATORY NON-HAZARDOUS/ HAZARDOUS AREA ENCLOSURES

Standard Watertight		
Standard	Rating	Standard temperature
IEC 60529 (1989-11)	IP68 - 7metres / 72 Hrs	-30°C to +70°C

European Hazardous Area Directive -ATEX		
Directive Code	Enclosure code	Standard temper-ature
ATEX II 2GD	Exd IIB T4 Exd IIC T4	-20°C to +70°C (-4°F to +158°F)

PROTECTION AND OPERATING FEATURES

Fault/ Feature	Function
Incorrect Phase (for 3-Phase Actuators)	Ensures that the actuator always runs in the required direction
Lost Phase	Preventing operation of the actuator in case of 1 or 2 phase loss
Motor Overheating	Motor temperature is being sensed continuously using a thermostat The operation will be terminated in case of overheat detection
Obstructed Valve	The operation will be terminated when the valve meets obstructions Torque switch range can be set using the MOBIN setting tool
Jammed Valve	The motor will be de-energized if the control system detects no output movement after the receipt of open/close signal
Torque Switch Hammer	Prevents the actuator to operate in the same direction in case of meeting an obstruction. Actuator will operate in the opposite direction to move away from the obstruction.
Torque Switch Bypass	Torque switch can be bypassed in the first 5% of travel. Ensures that sticky valves will not result in torque trip.
Instantaneous Reversal	Prevents instantaneous reversals to protect the system from current surges
Emergency Shut Down	Terminates operation of the actuator. Emergency shut down has priority over any existing or applied local or remote control signal



NETWORK SYSTEM CONNECTIVITY

With the addition of an appropriate option card, the MEA can be incorporated into a number of different fieldbus control systems. The MEA can be utilized within the major open fieldbus protocols including DeviceNet and Modbus.

Modbus

- RS485, 2 wire RTU communication
- International open standard
- Single and Dual Redundant options
- Integral Repeater modules included
- Up to 115 kB

DeviceNet

- Up to 63 devices on each network
- 2 wire communication (+ 2 power wires)
- Trunk line and Drop line permitted

ACTUATOR COUPLING

For convenient valve adaptation to the actuator, the machining of the actuator attachment is in accordance with below standards:

- ISO 5210 or MSS SP-102 for multi-turn valves
- ISO 5211 or MSS SP-101 for part-turn valves