



400 Series

Electric Actuators – DC Supply

Low Power Consumption Electric Actuator

400 Series DC electrical actuators use the reliable Planetary Torque Control System (PTCS), providing a highly efficient, low consumption actuator optimised for solar energy supply.

The robust 400 Series actuator enclosure ensures reliable operation in varied industries such as Water, Waste Water, Irrigation and Power Generation.

The low power consumption characteristic enables automation of valves in remote locations where conventional electrical supply is not possible.

Features of 400 Series actuators

- Electric actuators designed to meet the needs of diverse actuation applications:
 - Multi-turn torque from 15 to 4,000 Nm
 - Part-turn torque from 280 to 350,000 Nm
 - Linear thrust from 7 to 200 kN
- PTCS patented planetary gearing system controlling the applied torque with high mechanical efficiency
- Mechanically configurable torque, 60-100% of rated torque
- Mechanical switch mechanism (MSM)
 - Adjustable stroke: 2 - 1,500 turns
 - Extended stroke: 2 - 15,000 turns
- 2 DPDT torque switches
- 2 DPDT position limit switches
- 1 moving status blinker switch
- Additional signal options providing extra switches, potentiometer or 4-20 mA position transmitter
- Integral manual override with padlock mode restriction and motor drive priority
- Modular design, to accommodate only the necessary functions required for the application
- Watertight and dustproof to IP67 according to EN60529

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Key benefits

- Highly efficient drive train reduces power consumption, greatly reducing environmental impact
- DC supply compatible with low energy sources
- High torque output achieved with the same low power concept
- Lubricated for life to reduce maintenance requirements
- Electrical torque and position limit protection in addition to mechanical PTCS protection to prevent valve damage
- Designed to work efficiently and effectively under harsh conditions
- Compact size and low weight, ideal for installation in confined spaces
- User friendly commissioning and operation

Motor design

400 Series DC actuators include a low inertia, high torque motor, designed specifically for precise and reliable positioning.

12 VDC or 24 VDC supply

Position and torque measurement

400 Series actuators are fitted with a mechanical switch mechanism (MSM) that measures torque and position mechanically. The MSM includes IP67 rated micro switches for end of travel position indication plus torque trip indication.



400 DC Series

PTCS – the patented planetary gearing system

- High mechanical efficiency (>95%)
- Precise control of the applied output torque/thrust
- Highly compact, light weight design
- Reliable mechanical protection against:
 - Overloading the valve
 - Failure of electrical torque or limit switch
 - Delays or failure in the switching control system

Environmental sealing and protection

- Actuators are IP67 certified (optional IP68 6m / 72 hours)
- Paint protection coatings suitable for use up to C5-M
- Double sealing option to maintain IP rating when cover is removed
- Operating temperature range:
 - Standard: -25 to +70 °C (-13 to +158 °F)
 - High temperature option: 0 to 120 °C (+32 to +248 °F)
 - Low temperature option: -40 to +60 °C (-40 to +140 °F)

Mounting coupling

400 Series actuators meet attachment standards ISO 5210, 5211 and DIN 3338. This ensures compatibility with a wide variety of valve shafts.

Electrical connection

Wiring connections on 400 Series actuators have been simplified for fast and efficient installation. Tension clamp connectors are used to guarantee a robust wiring connection during excessive vibration. Three conduit entries are provided as standard to suit various gland requirements:

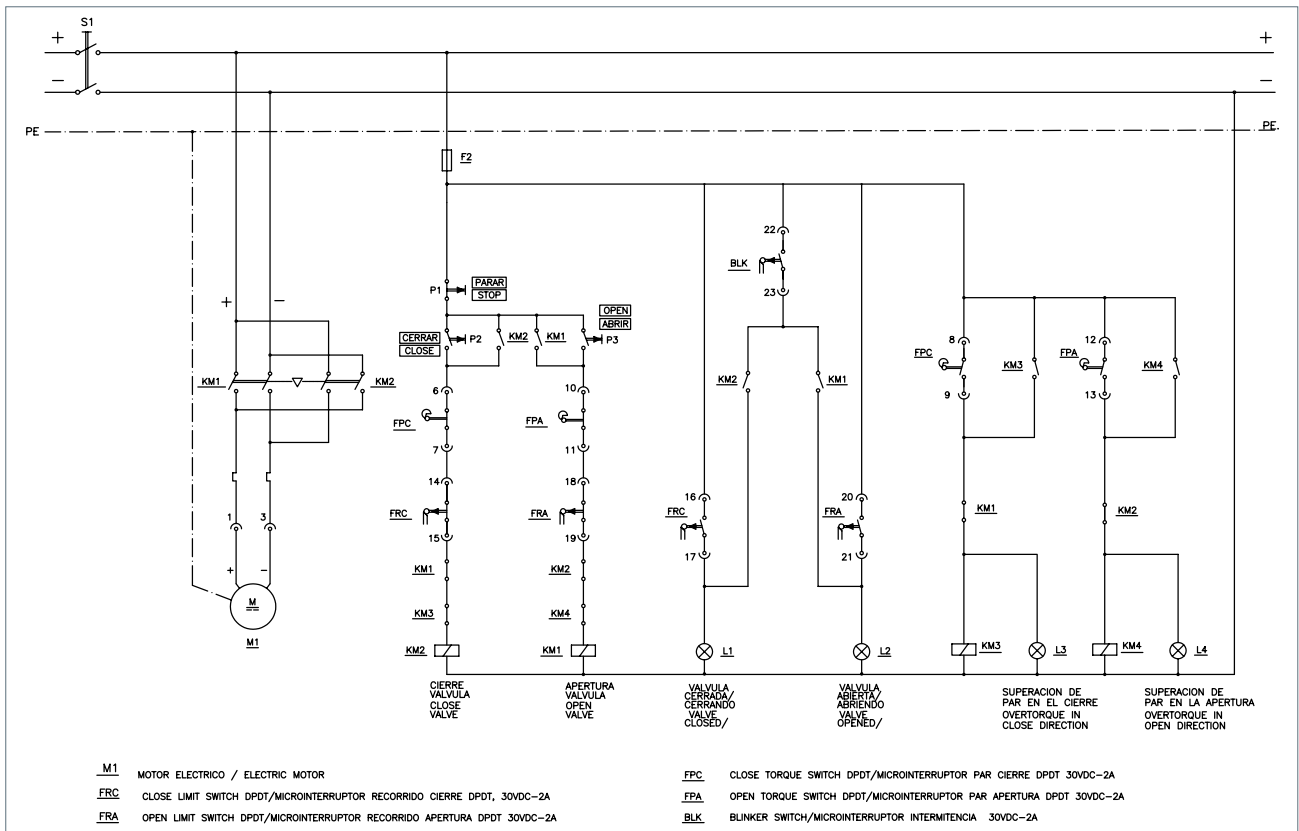
- Standard: 2 x M25 x 1.5p, 1 x M20 x 1.5p
- Optional: 2 x ¾" NPT, 1 x ½" NPT
- Special conduit entry thread sizes are available

Manual operation

The integral manual handwheel facilitates override operation during emergency conditions. Motor drive will automatically re-engage and take priority after manual operation occurs. Unauthorised manual operation can be prevented by using a padlock on the engagement lever.

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Wiring diagram



400 Series applications

Valve types	Movement	
Knife valve Gate valve Globe valves Diaphragm valves Pinch valve	Multi-turn direct drive Multi-turn with Spur Gearbox Multi-turn with Bevel Gearbox	
Plug valves Ball valves Butterfly valves	Multi-turn + Linear Adaption Multi-turn + Spur Gearbox Multi-turn + Bevel Gearbox	
	Multi-turn + Worm Gearbox	

Performance

Electric Actuator Model	Output Speed – rpm		Maximum Torque Nm (lbf.in)	Maximum Thrust kN (lbf)	Flange
	Standard	High Speed*			
400-001	7 – 110	-	15 (11)	40 (8,992)	F10
400-003	5 – 80	-	30 (22)	40 (8,992)	F10
400-006	4 – 40	205	60 (44)	40 (8,992)	F10
400-012	1 – 13	70	120 (89)	70 (15,737)	F10
400-025	6	35	250 (184)	160 (35,969)	F14

Electric Actuator Model	Output Speed – rpm		Maximum Torque Nm (lbf.in)	Maximum Thrust kN (lbf)	Flange
	Standard	High Speed*			
401-003	3 – 54	110	15 (11)	40 (8,992)	F10
401-006	3 – 27	55 – 138	30 (22)	40 (8,992)	F10
401-012	2 – 13	27 – 69	60 (44)	40 (8,992)	F10
401-025	5 – 9	16 – 49	120 (89)	70 (15,737)	F14
401-050	3	17	250 (184)	160 (35,969)	F14

*Available for 24 VDC supply only, enclosure rating IP54.

Coupling details

		Flange Size – ISO 5210 (F) & MSS P-102 (FA) – mm (in)	
		F10 / FA10	F14 / FA14
Type 'A' Coupling	Rising Stem*	40 (1 5/8)	57 (2 1/4)
Type 'B' Coupling	Type 'B3' (Fixed bore)	20 (3/4)	30 (1 1/8)
	Type 'B4' (Blank)*	28 (1 1/8)	45 (1 3/4)

* This coupling type requires machining to match the valve or gearbox stem. Dimensions given for this coupling are maximum values.

Electrical consumption data

Nominal power shows the range across all applicable operating speeds for each actuator model.

Actuator Model	Nominal power (W)	
	12 VDC	24 VDC
400-001	21 – 248	11 – 172
400-003	27 – 374	20 – 250
400-006	32 – 374	26 – 1290
400-012	28 – 319	18 – 876
400-025	332	170 – 908

Actuator Model	Nominal power (W)	
	12 VDC	24 VDC
401-003	23 – 272	11 – 347
401-006	33 – 272	20 – 870
401-012	33 – 272	20 – 870
401-025	299 – 453	135 – 1287
401-050	397	174 – 888

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