

Electric actuators type EA25–250



Product description

The electric actuators type EA25, EA45, EA120 and EA250 are not only excellent equipped, they also feature very high torques ranging from 25 Nm to 250 Nm. This makes it possible to automate a wide range of valves.

Function

Electric actuators are used to operate valves with a swiveling movement from 90° to 180°. The actuator can be installed on any common valves with an ISO 5211 interface.

The addition of accessories allows the actuator to be used not only as an open/close actuator, but also in continuously controlled operation.

Applications

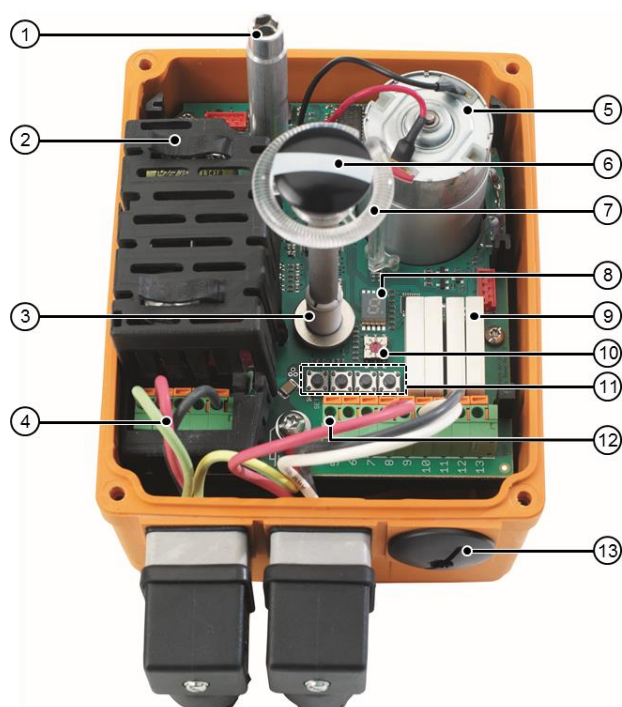
- Chemical process industry
- Water treatment
- Refrigeration

Benefits/features

- Position feedback via relays (open/close/middle)
- Adjustable heating element to prevent condensation
- Optical position indicator with LED status monitoring
- Third position between "open" and "closed" optional
- Relay output for "ready to operate" and 7-segment error display
- Integrated emergency manual override with magnetic lock
- Robust PP-GF housing with very good chemical resistance
- Long service life due to robust design and superior electronics
- Flexible configuration thanks to modular concept
- Numerous monitoring and control options
- Simple handling
- Can be used anywhere thanks to universal power supply and standard interfaces

Technical data

The standard version of the EA25/45/120/250 electric actuator consists of the following elements:



Nr.	Description
1	Shaft for emergency manual override
2	Power supply unit with contact-protection installed at 230 V version
3	Digital position detection
4	Control for OPEN/CLOSED/MIDDLE
5	DC motor
6	Optical position indicator
7	Light tube for LED status feedback
8	7-segment error display
9	Feedback via relay for OPEN/CLOSED/MIDDLE
10	Heating element (temperature threshold regulator)
11	Button for end stop adjustment
12	Signal output "Ready to operate"
13	Connection options for DIN plugs or cable glands

Specification

Combinations	EA25	2-way ball valve type 546 to DN50 3-way ball valve type 543 up to DN50
	EA45	2-way ball valve type 546 up to DN65 Butterfly valve types 567 and 578, types 038/ 039 up to DN65
	EA120	2-way ball valve type 546 up to DN100 Butterfly valve types 567 and 578, types 038/ 039 up to DN150
	EA250	Butterfly valve types 567 and 578, types 038/ 039 up to DN300
Rated voltage	AC	100 – 230 V, 50/60 Hz
	AC/DC	24 V, 50/60 Hz
Rated voltage tolerance		± 15%
Protection class		IP 65 (IP67) ¹⁾ per EN 60529/ IK06 per IEC62262
Contamination level		2 according to EN 61010-1
Overload protection		Current/time-dependent (resetting)
Overvoltage category		II
Ambient temperature		-10 °C to +45 °C
Allowable humidity		Max. 90 % relative humidity, non-condensing
Housing material		PP GF for very good chemical resistance

¹⁾ When used with cable glands and vertical installation.

	EA25	EA45	EA120	EA250
Rated output	AC: 40 VA at 100 – 230 V AC/DC: 24 VA at 24 V	AC: 40 VA at 100 – 230 V AC/DC: 32 VA at 24 V	AC: 40 VA at 100 – 230 V AC/DC: 32 VA at 24 V	AC: 60 VA at 100 – 230 V AC/DC: 40 VA at 24 V
Nominal current (calculated)	0.35A at 100V 0.15A at 230V 1.7A at 24V	0.55A at 100V 0.24A at 230V 2.5A at 24V	0.5A at 100V 0.22A at 230V 2.3A at 24V	0.55A at 100V 0.26A at 230V 2.7A at 24V
Rated torque Mdn. (peak)	10 (25)	20 (45)	60 (120)	100 (250)
Duty cycle at 25 °C / 15 min	100 %	50 %	50 %	35 %
Cycle time s/90° at Mdn.	5 s	6 s	15 s	20 s
Connection	F05	F05	F07	F07
Tested cycles (at 20 °C and Mdn.)	250 000	100 000	100 000	75 000
Weight	2,193 kg	2,193 kg	3,356 kg	4,995 kg
Actuating angle	Max. 355°, set to 90°			
Feedback Relays	Monostable/ Changeover contacts 250V AC/ 6A			

Options

Electrical ball valves

Type 179 – 184

Type 179 – 184 ball valves are based on the type 546 ball valve and the EA25 (DN10 – DN50), EA45 (DN65 – DN80) or EA120 (DN90 – DN100) electric actuator. The 179 – 184 series is designed for applications with special process requirements.

Ball valve, electric	Actuator, electric	Ball valve, hand-operated	Dimensions	Materials	Standards
Type 179	EA25/45/120	Type 546	DN10 – DN100	PVC-U, PVC-C, ABS	ISO/DIN
Type 180	EA25/45/120	Type 546	DN10 – DN100	PP	ISO/DIN
Type 181	EA25/45/120	Type 546	DN10 – DN100	PVDF	ISO/DIN
Type 182	EA25/45/120	Type 546	DN10 – DN100	PVC-U, PVC-C	ASTM/ANSI
Type 183	EA25/45/120	Type 546	DN10 – DN100	PVC-U	BS
Type 184	EA25/45/120	Type 546	DN10 – DN100	PVC-U	JIS

Type 167 – 170

Type 167 – 170 ball valves are based on the type 543 ball valve and the EA25 electric actuator.

Ball valve, electric	Actuator, electric	Ball valve, hand-operated	Dimensions	Materials	Standards
Type 167	EA25	Type 543, horizontal	DN10 – DN50	PVC-U, ABS	ISO/DIN, ATSM/ANSI, JIS
Type 168	EA25	Type 543, horizontal	DN10 – DN50	PP	ISO/DIN
Type 170	EA25	Type 543, vertical	DN10 – DN50	PVC-U	ISO/DIN, JIS

Electric butterfly valves

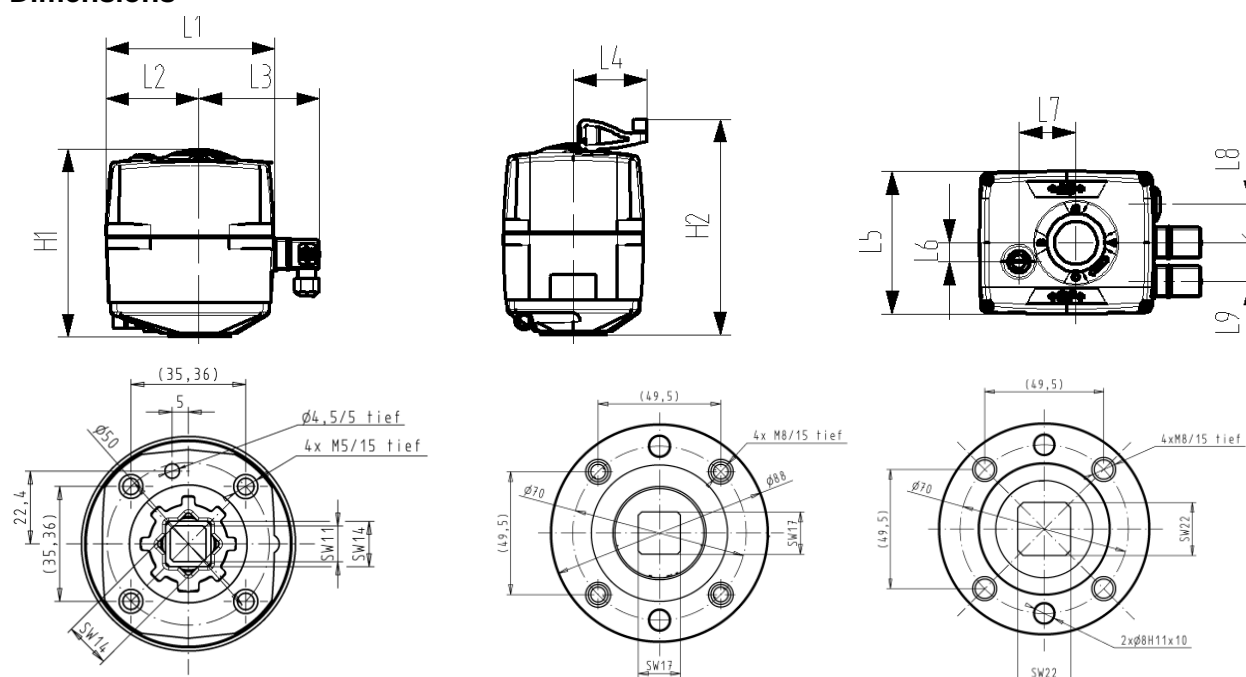
Type 145 – 147

The type 145 electric butterfly valve is intended for wafer style installation and is adaptable to a variety of applications. With the optional positioner, its functional options range from a simple open/close valve to a precise flow control device.

The type 146/147 electric butterfly valve is intended for lug type or wafer style installation and is adaptable to a variety of applications. With the optional positioner, its functional options range from a simple open/close valve to a precise flow control device.

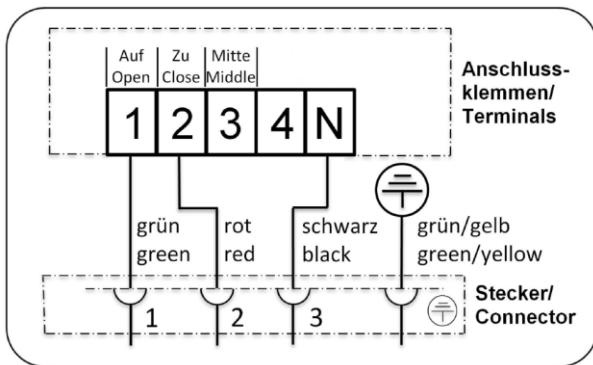
Butterfly valve, electric	Actuator, electric	Butterfly valve, hand-operated	Dimensions	Materials	Standards
Type 145	EA45/120/250	Type 567	DN50 – DN300	All	All standards
Type 146	EA45/120/250	Type 578	DN50 – DN300	All	ISO/DIN
Type 147	EA45/120/250	Type 578	DN50 – DN300	All	ASTM/ANSI

Dimensions

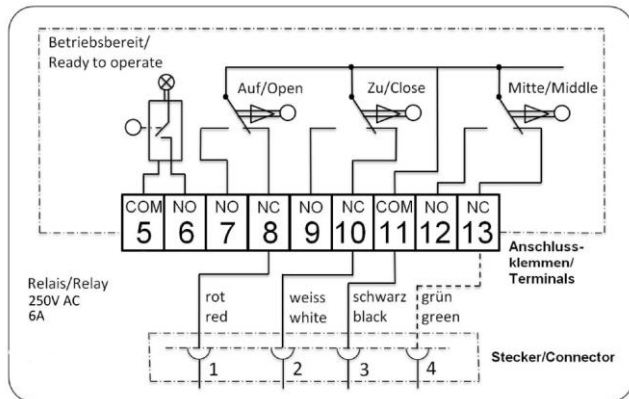


EA	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	L8 (mm)	L9 (mm)	H1 (mm)	H2 (mm)
EA25	150	83	108	64	122	16	49	33	33	167	189
EA45	150	83	108	64	122	16	49	33	33	167	189
EA120	150	83	108	64	122	16	49	33	33	190	212
EA250	150	83	108	64	122	16	49	33	33	200	221

Wiring diagram for standard version



Actuator activation



Feedback signals

Position indicator

The position indicator shows the valve position. The valve positions can be read on the fitted cover. When the cover is fitted, the following image can be seen (Example ball valve):

	2-way	3-way horizontal (L)	3-way vertical (L)
Image of position indicator in valve position 1			
Valve function			
Actuating angle	0° - 90°	0° - 90°	0° - 180°
Valve position 1	A – B (OPEN) See image	A – C (Flow right side, outlet to the front) See image	B – C (Flow left side, bottom outlet) See image
Valve position 2	C – D (CLOSE)	B – C (Flow left side, outlet to the front)	A – C (Flow right side, bottom outlet)

By teaching in a „Middle position“ different possibilities can be achieved depending on the valve and the application. For example:

- 2-way ball valve: Middle position describes a position, permitting no 100% flow but for instance only half as strong.
- 3-way ball valve: Middle position describes a position of the ball in which both passages are slightly opened.
- 3-way ball valve: Middle position describes a position of the ball which closes both passages.

Ball valve and ball-type	3-way horizontal (L-ball)	3-way horizontal (L-ball)	3-way vertikal (L-ball)
Function of the middle position	CLOSE (on both sides no flow)	„Mixing“ (both passages slightly opened)	CLOSE (on both sides no flow)
Actuating angle	0° – 180°	0° - 90°	0° - 180°
Position 1	A – C (OPEN right)	A – C (OPEN right)	B (-C) (OPEN left)
Position 2	B – C (OPEN left) 90°	A/C – B/C (partly opened) 45°	(C-) D (CLOSE) 90°
Position 3	B – D (CLOSE) 180°	B – C (OPEN left) 90°	A (-C) (OPEN right) 180°

(Function of the middle position as „Mixing“ with the 3-way ball valve vertical is only possible with the T-ball)

LED status feedback

The LED status feedback shows the valve positions and the current status of the actuator.

The following table shows the colour assignment of the LED:

	Color	Meaning
	Red	Open
	Green	Closed
	White	Middle
	Flashes white	Actuator moves
	Flashes yellow	Error
	Flashes blue	Adjustment mode
	Green/yellow	Setpoint value reached (at positioner)
	Turquoise	Adjustment run / operation of colour inversion

If the plant standard requires an inversion of the colour assignment, the customer can adjust this afterwards.

Accessories

- Failsafe return unit
Battery incorporated into the housing for moving to a safe position in case of power outage (open or closed). Optional available, PCB for use with external 24V DC Power supply.
- Positioner
For continuous valve control with 4 – 20 mA or 0 – 10 V and 4-20mA Feedback
- Monitoring board
 - Cycle time extension
 - Cycle time monitoring
 - Cycle counter
 - Motor current monitoring
- Fieldbus connection
 - Profibus DP auxiliary card
 - AS interface module



For further information on accessories, refer to Planning Fundamentals, chapter on "Accessories for Electrical Actuators", and the online product catalog at www.gfps.com

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