

# Electric actuators type EA15 – 250



## Product description

The electric actuators type EA15, EA25, EA45, EA120 and EA250 are not only excellent equipped, they also feature very high torques ranging from 20 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

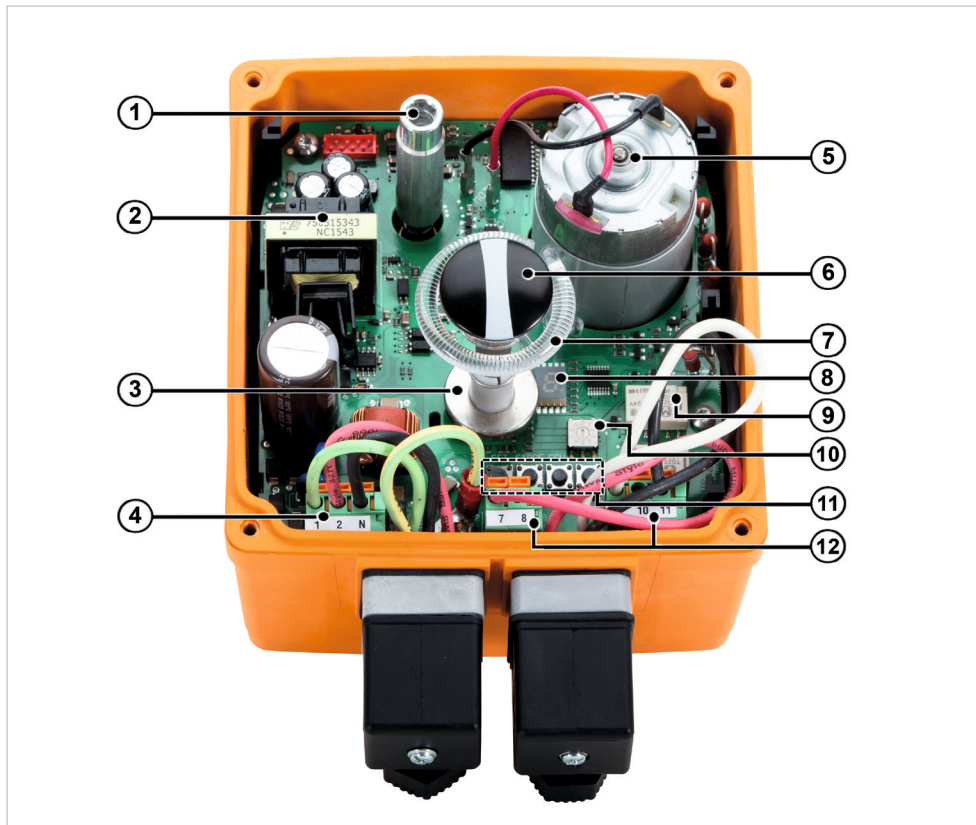
- Chemical process industry
- Water treatment
- Refrigeration

### Benefits/features

- Position feedback via relays (open/close/middle)
- Integrated 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

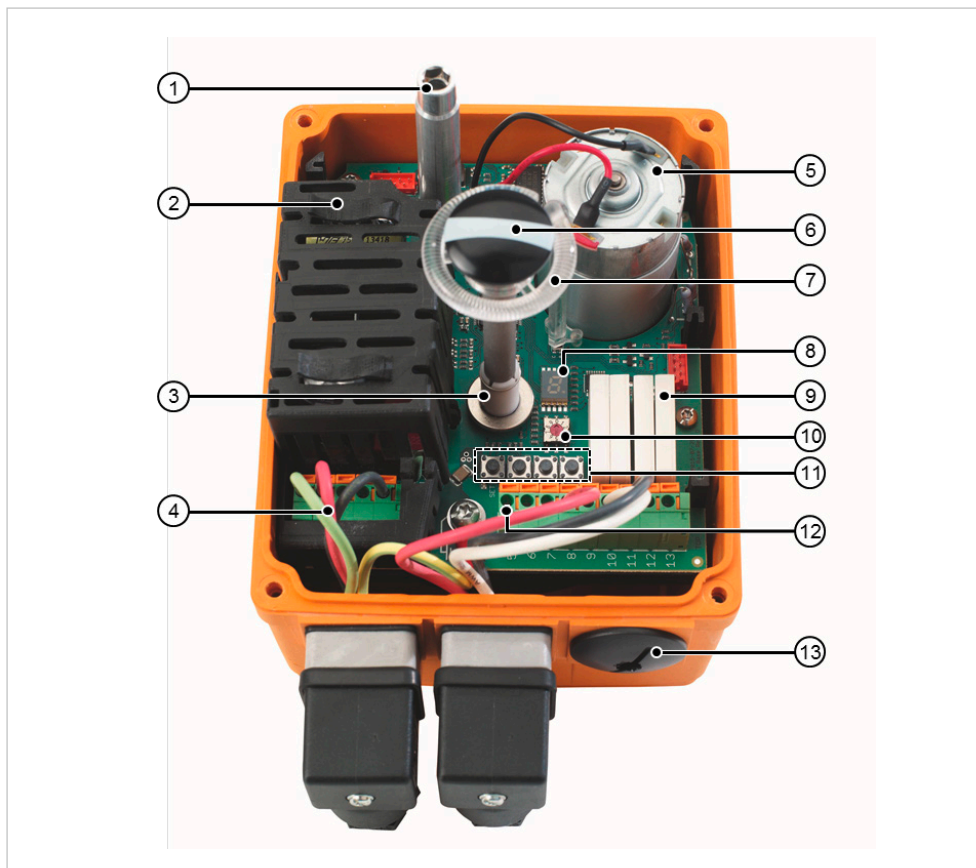
## Technical data

The standard version of the EA15 electric actuator consists of the following elements:



- 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
- 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
- ⑩ Heating element (temperature threshold regulator)
- ⑪ Button for end stop adjustment
- ⑫ Signal output „ready-to-operate“ connection options for DIN plugs (Standard types only) & Cable glands (Standard & cULus types)

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



- 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 position
- 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 position adjustment
- ⑫ Terminal block to connect position feedback
- ⑬ Connection options for DIN plugs (standard types only) or cable glands (standard & cULus types)

| Specifications                   | EA15  | EA25  | EA45          | EA120        | EA250         |
|----------------------------------|---|---|---------------|--------------|---------------|
| Power input max.                 | 45 VA   | 45 VA   | 65 VA         | 60 VA        | 70 VA         |
| Current (calculated)             | 0.3A at 100V  | 0.35A at 100V   | 0.55A at 100V | 0.5A at 100V | 0.55A at 100V |
|                                  | 0.13A at 230V   | 0.15A at 230V   | 0.24A at 230V | 0.22A v 230V | 0.26A at 230V |
|                                  | 1.7A at 24V   | 1.7A at 24V   | 2.5A at 24V   | 2.3A at 24V  | 2.7A at 24V   |
| Nominal torque Mdn (peak)        | 10 (20) Nm  | 10 (25) Nm  | 20 (45) Nm    | 60 (120) Nm  | 100 (250) Nm  |
| Duty cycle                       | 40% @ 25°C/<br>15min  | 100 %   | 50 %          | 50 %         | 35 %          |
| Cycle time s/90° at Mdn          | 5 s   | 5 s   | 6 s           | 15 s         | 20 s          |
| Flange fitting                   | F05   | F05   | F05           | F07          | F07           |
| Tested cycles (at 20 °C and Mdn) | 150 000   | 250 000   | 100 000       | 100 000      | 75 000        |
| Weight                           | 1.9 kg  | 2.1 kg  | 2.2 kg        | 3.3 kg       | 5.0 kg        |
| Feedback relays                  | Bistable change-over contacts; max. 2A at 30V DC  | Mono-stable change-over contacts<br>Either max 6A @ 230VAC or 24VDC, no mixed voltage potentials allowed! |               |              |               |
| Actuating angle                  | Max. 355°, set to 90°   |   |               |              |               |
| Power Supply                     | AC: 100 – 230 V, 50/60 Hz<br>AC/DC: 24 V, 50/60 Hz  |   |               |              |               |
| Supply voltage tolerance         | +15 % / -10 %   |   |               |              |               |
| Protection class                 | IP65 <sup>1)</sup> / IP67 <sup>2)</sup> per EN 60529<br>Designed for wet & dry locations (NEC), designed for indoor use (UV light may cause discoloration)  |   |               |              |               |
| Pollution degree                 | Operation: Pollution Level 3<br>Commissioning (open cover):<br>Only in controlled environments of pollution level 2   |   |               |              |               |
| Overload protection              | Current/time dependent, resetting   |   |               |              |               |
| Overvoltage category             | II  |   |               |              |               |
| Fuse                             | Internal: SMD fuse 2 A, not replaceable.<br>Req. external breakers on all live wires:<br>Rated Current: max. 16A<br>Trip Curve: C,<br>Standards Compliance: cUL 489, CSA C22.2 No. 5.1, IEC 60947-2 |   |               |              |               |
| Ambient temp.                    | -10 °C to +50 °C (14°F to 122°F)  |   |               |              |               |
| Max. installation altitude       | 2000m above sea level (AMSL)  |   |               |              |               |
| Recommended connecting cable     | AWG 18-16, UL/cUL AWM 4486 min. 125°C 1000V , outside diameter 8-13mm (cable glands), 4-9mm (DIN-connectors)  |   |               |              |               |
| Allowable humidity               | Max. 90 % relative humidity, non condensing   |   |               |              |               |
| Housing material                 | Housing: PP-GF (POLYFLAM, RPP 4225 CS1)<br>Inspection glass: Udel P-1700 (CL2611)   |   |               |              |               |

<sup>1)</sup> Connection type DIN-plug

<sup>2)</sup> Connection type cable glands and vertical installation.

## Compatibility with valves

The actuators have a standard ISO 5211 interface, and can therefore be mounted on all valves that are provided with this interface and the appropriate torques. The assembly using valves from GF Piping Systems with suitable coupling piece and adapter is possible in accordance with the following table:

| Valve type                              | Nominal diameter (mm) | d (mm)  | Nominal diameter (inch) | EA15 | EA25 | EA45 | EA120 | EA250 |
|---|-----------------------|---------|-------------------------|------|------|------|-------|-------|
| 2-way ball valve<br>Type 546 Pro        | DN10-50               | 20-63   | ¾"-2"                   | X    | X    |      |       |       |
|   | DN65                  | 75      | 2½"                     |      |      | X    |       |       |
|   | DN80                  | 90      | 3"                      |      |      |      | X     |       |
|   | DN100                 | 110     | 4"                      |      |      |      | X     |       |
| 3-way ball valve<br>Type 543            | DN10-50               | 20-63   | ¾"-2"                   | X    | X    |      |       |       |
| Plastic butterfly valve<br>Type 565     | DN50                  | 63      | 2"                      |      |      | X    |       |       |
|   | DN50-125              | 63-140  | 2"-5"                   |      |      |      | X     |       |
|   | DN150-300             | 160-315 | 6"-12"                  |      |      |      |       | X     |
| Plastic butterfly valve<br>Type 567/578 | DN50-65               | 63-75   | 2"-2½"                  |      |      | X    |       |       |
|   | DN80-150              | 90-160  | 3"-6"                   |      |      |      | X     |       |
|   | DN200-300             | 225-315 | 8"-12"                  |      |      |      |       | X     |
| Metal butterfly valve<br>Type 038/039   | DN50-65               | 63-75   | 2"-2½"                  |      |      | X    |       |       |
|   | DN80-125              | 90-140  | 3"-5"                   |      |      |      | X     |       |
|   | DN150-300             | 160-315 | 6"-12"                  |      |      |      |       | X     |



## Electric actuated ball valve types

### Type 127

Type 127 ball valves are based on the type 546 Pro ball valve and the EA15 (DN10 – DN50).

| Ball valve, electric | Actuator, electric | Ball valve, manually operated | Dimensions  | Materials                     | Standards                  |
|----------------------|--------------------|-------------------------------|-------------|-------------------------------|----------------------------|
| Type 127             | EA15               | Type 546 Pro                  | DN10 – DN50 | PVC-U, PVC-C, PP-h, ABS, PVDF | ISO/DIN, BS ASTM/ANSI, JIS |

### Type 179 – 184

Type 179 – 184 ball valves are based on the type 546 Pro 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, manually operated | Dimensions   | Materials         | Standards |
|----------------------|--------------------|-------------------------------|--------------|-------------------|-----------|
| Type 179             | EA25/45/120        | Type 546 Pro                  | DN10 – DN100 | PVC-U, PVC-C, ABS | ISO/DIN   |
| Type 180             | EA25/45/120        | Type 546 Pro                  | DN10 – DN100 | PP                | ISO/DIN   |
| Type 181             | EA25/45/120        | Type 546 Pro                  | DN10 – DN100 | PVDF              | ISO/DIN   |
| Type 182             | EA25/45/120        | Type 546 Pro                  | DN10 – DN100 | PVC-U, PVC-C      | ASTM/ANSI |
| Type 183             | EA25/45/120        | Type 546 Pro                  | DN10 – DN100 | PVC-U             | BS        |
| Type 184             | EA25/45/120        | Type 546 Pro                  | 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, manually operated | Dimensions  | Materials  | Standards               |
|----------------------|--------------------|-------------------------------|-------------|------------|-------------------------|
| Type 167             | EA25               | Type 543, horizontal          | DN10 – DN50 | PVC-U, ABS | ISO/DIN, ASTM/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 actuated butterfly valve types

### Type 145 – 147

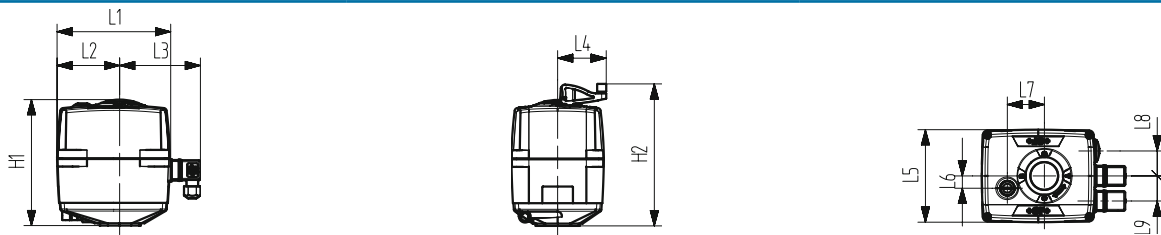
The type 145 electric butterfly valve is intended for wafer style installation and is adaptable to a variety of applications. With the optional positioner, its functional options range from a simple open/close valve to a precise flow control device.

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, manually 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

Actuator dimensions

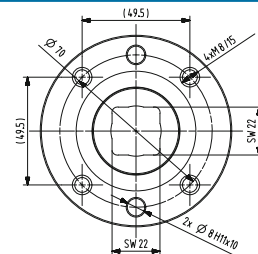
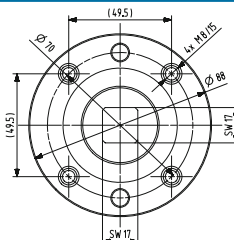
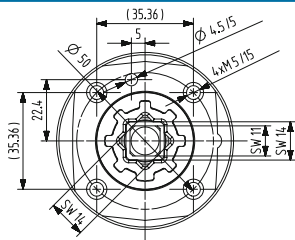


| EA    | L1 (mm) | L2 (mm) | L3 (mm) | L4 (mm) | L5 (mm) | L6 (mm) | L7 (mm) | L8 (mm) | L9 (mm) | H1 (mm) | H2 (mm) |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| EA15  | 122     | 83      | 77      | 64      | 122     | 16      | 49      |         | 33      | 137     | 158     |
| 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     |

EA15-EA45

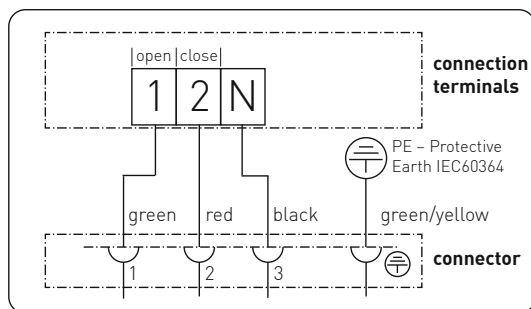
EA120

EA250

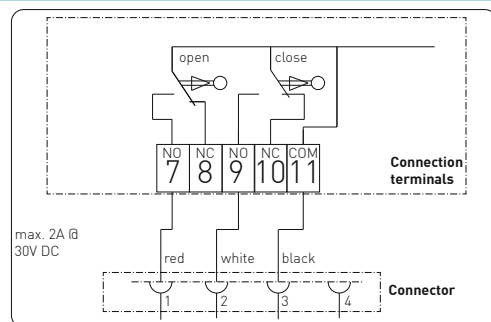


Connection diagram for standard version

EA15

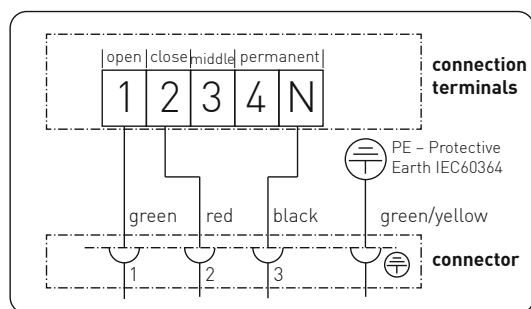


Actuator power

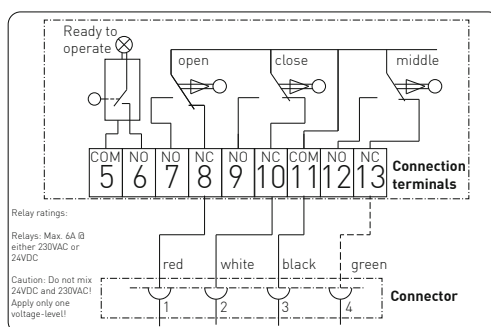


Feedback signals

EA25/45/120/250



Actuator power



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)<br>See image | A – C (Flow right side, outlet to the front)<br>See image | B – C (Flow left side, bottom outlet)<br>See image |
| Valve position 2                                | C – D<br>(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.

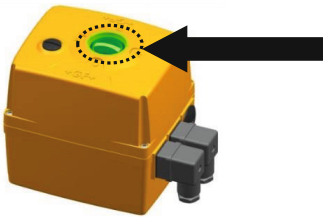
| Ball valve and ball-type        | 3-way horizontal (L-ball)     | 3-way horizontal (L-ball)                | 3-way vertikal (L-ball)       |
|---------------------------------|-------------------------------|--|-------------------------------|
| Function of the middle position | CLOSE (on both sides 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

#### EA15 / EA25 / EA45 / EA120 / EA250:

- Failsafe return unit  
Battery incorporated into the housing for moving to a safe position in case of power outage (open or closed).

#### EA25 / EA45 / EA120 / EA250:

- 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
  - Modbus RTU Interface board
  - Profibus DP auxiliary card
  - AS interface module

**i** For further information on accessories, refer to Planning Fundamentals, chapter on “Accessories for Electrical Actuators”, and the online product catalog at [www.gfps.com](http://www.gfps.com)

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