

Electro hydraulic thrusters
THE ORIGINAL. BE SAFE.

ELDRO® Series ED



Function

Mode of operation

In our EMG ELDRO®, all elements of a hydraulic actuation system are combined into a compact unit. In the switched-off state, the hydraulic piston with the piston rod is in its lower end position, and the brake is thus closed. ELDRO OFF = BRAKE CLOSED

In the switched-on state, the hydraulic pump delivers the operating fluid under the the piston and creates hydraulic pressure. This moves the piston to the maximum stroke.

ELDRO ON = BRAKE OPEN

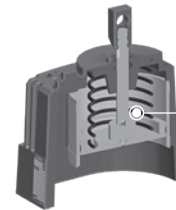
In case of a fault (power outage or pressure drop in the EMG ELDRO®), the brake closes and prevents uncontrolled load movement.

FAULT = BRAKE CLOSED.

We call this "FAILSAFE principle".

Due to the hydrodynamic operating principle of EMG ELDRO®, the stroke can be limited externally as required. At the respective piston end position, the power consumption of the motor decreases due to the hydraulic law compared to the power consumption during the lifting process. The pressure in the thruster reaches its maximum value.

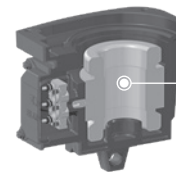
The power consumption of a switched-on EMG ELDRO® is only a few hundred watts thanks to the energy-efficient motors of the IE4 class. Mechanical overload of the EMG ELDRO® thruster is not possible.



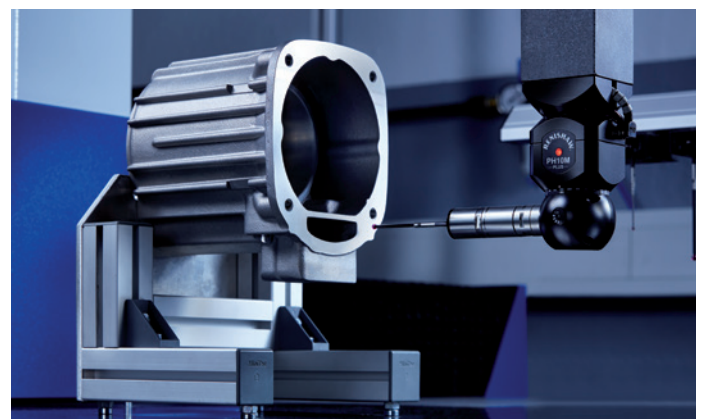
Hydraulic assembly



Pump system



Motor assembly



Characteristic features & Advantages

The electro-hydraulic system of the EMG ELDRO® thrusters in combination with the easy integration into brake systems and simple electrical commissioning results in the following characteristics for the diverse operating conditions:

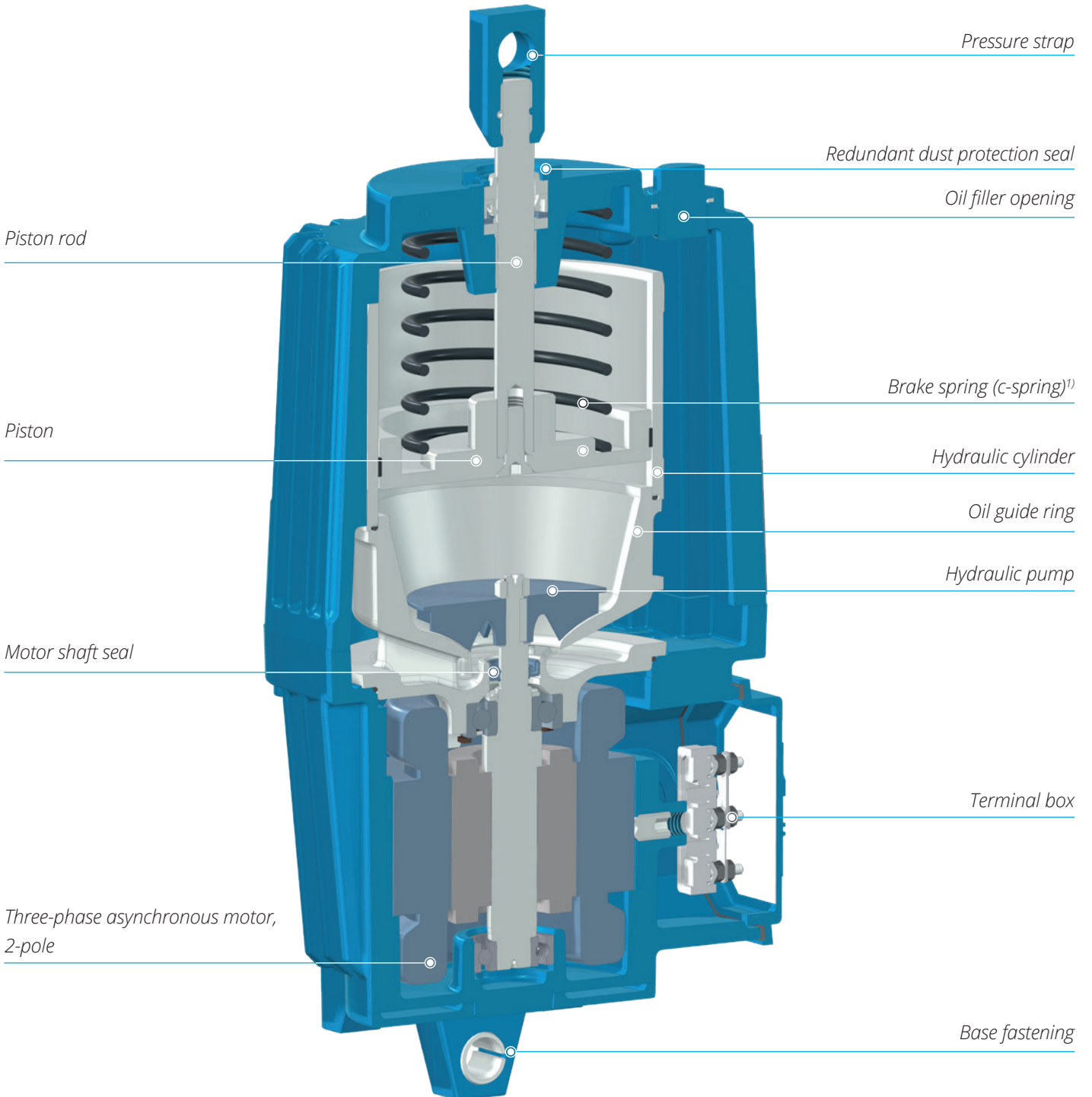
- » Long service life due to wear-free operation with constant self-lubrication
- » Soft and shock-free operation, system-related by the hydraulic operating principle
- » Short setting times
- » Approved continuous operation S1 in the standard temperature range -25°C to +50°C
- » High switching frequency of up to 2,000 switching cycles per hour in switching mode S3
- » Reversing operation without restriction
- » Overloading during operation is not possible
- » External limitation of the stroke as required
- » The fill level of the operating medium is optimised according to the operating conditions and no longer needs to be checked

Advantages for your application

- » High operational reliability, long service life
- » FAILSAFE principle - automatic return of the piston to the starting position in the switched-off state or in case of a fault
- » Large standard temperature range from -25 °C to +50 °C, expandable to -45 °C to +80 °C with additional equipment
- » Fluctuations in mains voltage have only a limited influence on the function of the thrusters, as the motor speed is primarily frequency-dependent and less voltage-dependent
- » No thermal protection circuit required
- » Linear lifting and lowering speeds
- » No sensitive electronic and sensory components
- » Long maintenance intervals, long service life
- » Continuously variable extension of lifting and/or lowering times by installing valves
- » Any motor rotation direction, therefore no reversing contactor required
- » Easy installation and removal
- » Simple design due to integral construction and easy to repair



Design and function



¹⁾ Auxiliary equipment

ED thruster overview



ED 120
ED 220



ED 300
ED 500

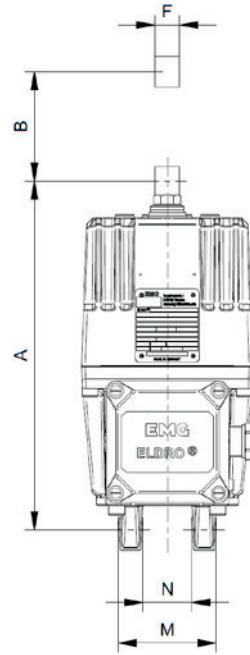
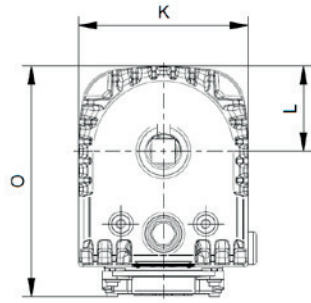
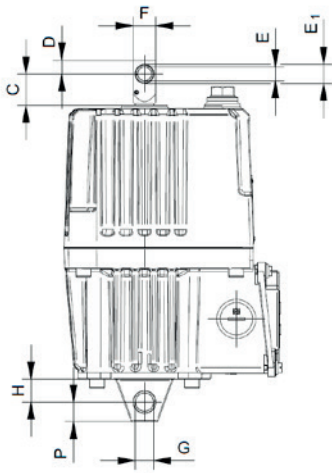
Technical values

Type	Lifting force [N]	Stroke path [mm]*	Power consumption [W]	Current consumption [A] at 400 V/50 Hz	Switching frequency with S3 operation [c/h]	Weight [kg]
ED 120	120	40 – 50	95	0.25	2,000	9.5
ED 220	220	50	103	0.25	2,000	9.5
ED 300	300	50 – 60	117	0.30	2,000	17
ED 500	500	50 – 60	167	0.35	2,000	17

**further on request*

EMG ELDRO® Series ED

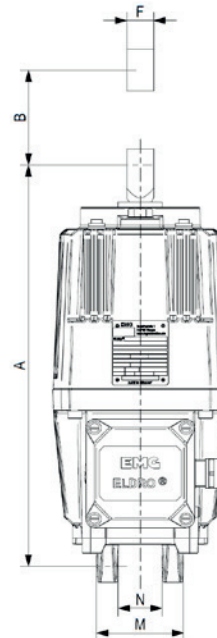
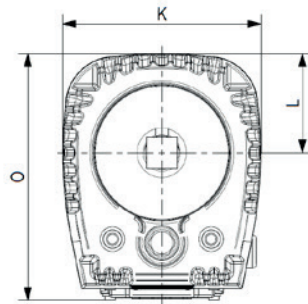
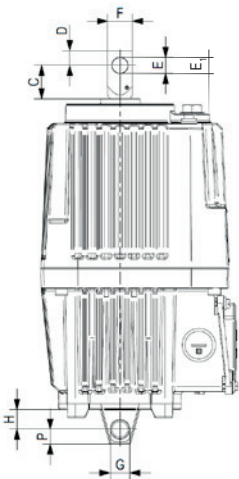
ED 120 / ED 220



Type	A	C	D	E	E ₁	F	G	H	K	L	M	N	O	P
ED 120	286	27	12	12	16	20	16	20	140	70	80	40	190	17
ED 220	286	27	12	12	16	20	16	20	140	70	80	40	190	17

EMG ELDRO® Series ED

ED 300 / ED 500

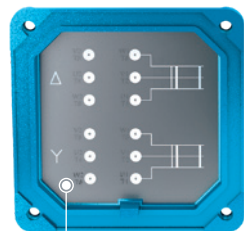


Type	A	C	D	E	E ₁	F	G	H	K	L	M	N	O	P
ED 300	370	34	15	16	16	25	16	20	160	80	80	40	199	15
ED 300	380	34	15	12	12	21.5	20,2	31	160	80	80	40	199	20
ED 500	370	34	15	16	16	25	16	20	140	80	80	40	199	15
ED 500	400	53	17	12	12	21.5	20	31	160	80	80	40	199	20

All dimensions in mm

General information

- » See thruster nameplate for specifications
- » The thrusters are ready for operation upon delivery, operating fluid is filled
- » When installing into the brake, the swiveling of the thruster must be ensured
- » No transverse forces may act on the piston rod
- » A connection diagram can be found in the terminal box cover
- » Motor can be switched between delta (Δ) or star (Y) connection
- » The thrusters are shipped in star (Y) connection. Phase sequence during connection is arbitrary



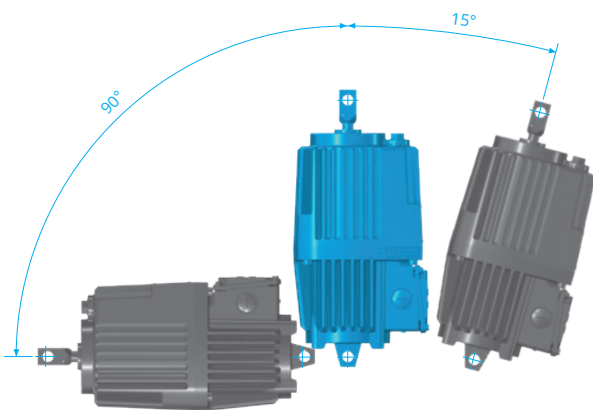
Connection diagram



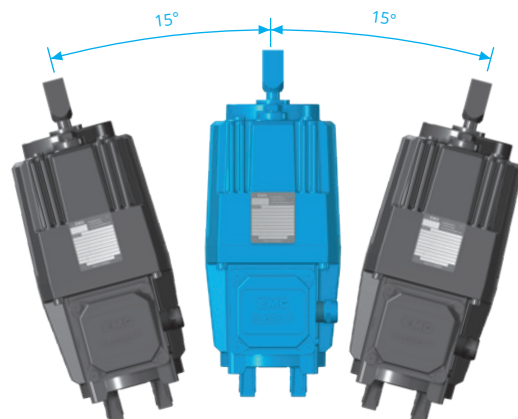
Terminal box cover



Installation position



The pivoting of the device must be ensured at the installation into the brake



There must be no transverse forces on the piston bar

Electrical & mechanical auxiliary equipment

Motor

- » Three-phase asynchronous motor, 2-pole
- » See "Technical Data" for performance data
- » Standard insulation according to insulation class F
- » Special design in insulation class H
- » Efficiency class IE4

Voltages and frequencies

- » Standard: 230/400 V, 50 Hz, 3 ~, 220/380 V, 50 Hz, 3 ~, 290/500 V, 50 Hz, 3 ~, 400/690 V, 50 Hz, 3 ~
- » Special versions 110 V to 690 V, 3 ~, 50 Hz and 60 Hz possible
- » All thrusters are shipped in star (Y) connection.
- » AC versions (with capacitor for Steinmetz circuit) available upon request
- » DC version see separate brochure

Cable entry

- » Cable gland M 25 x 1.5 for conductor cross-sections up to 4 x 2.5 mm² (Ø 12 to 18 mm)

Terminal box

- » Terminal block 6-pole, 9-pole for thrusters with heating
- » Supply line connection M4
- » Protective earth connection inside: M4
- » Protective earth connection outside: M6

Installation variants

- » The foot mounting can be mounted offset by 90° for all sizes.
- » The pressure plate at the top is rotatable for all sizes.

Operating fluid

- » Mineral hydraulic oil or silicone oil, factory filled depending on operating conditions, e.g. ambient temperature

Protection class

- » Standard IP 66,
- » Optional up to IP 68 (underwater operation)

Paint according to DIN EN ISO 12944

- » Standard for corrosion exposure C1, layer thickness 70 µm
- » Special coating up to corrosion exposure C5-M, layer thickness up to 280 µm
- » Standard color RAL 7022 (umbra grey)



Electrical & mechanical auxiliary equipment

Brake spring (c-spring)

Built-in C-spring to generate braking force. The specified braking force of the C-spring is achieved at 1/3 of the nominal stroke.

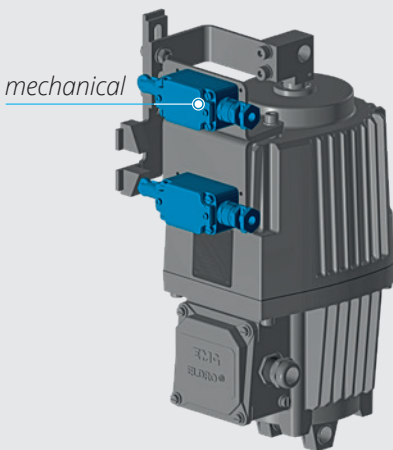
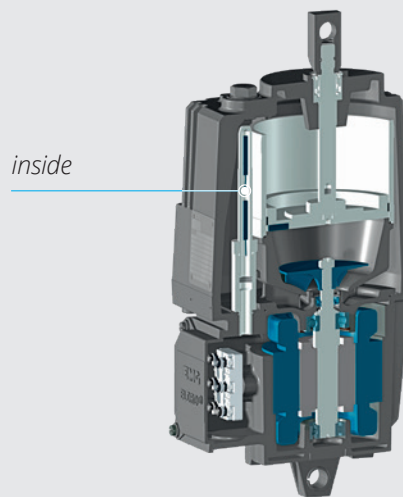
In normal operation, the spring force corresponds to the normal stroke force of the EMG ELDRO® thruster. The spring rate can also be chosen variably if EMG ELDRO® is used as an adjuster.

Versions with brake spring

Type	Brake spring force (C-spring) [N]
ED 220	210
ED 300	100 / 130 / 180 / 220 / 270
ED 500	400 / 500

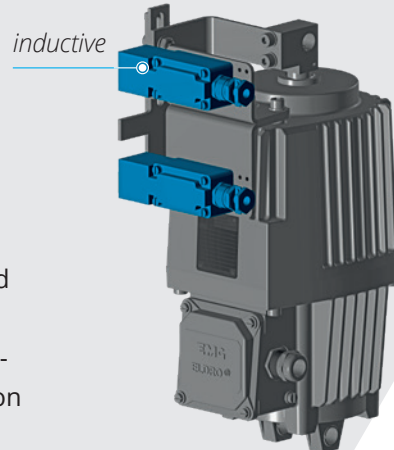
Possible position monitoring

- » Brake open
- » Brake open - Brake closed
- » Brake open - Rest stroke reached (indication of critical wear of brake pads)
- » Complete continuous stroke monitoring with the position measuring system



Limit switch

- » Mechanically external
- » Inductive external
- » Magnetic internal (Reed switch)
- » Analog position measuring system (available on request)



Detailed information on the limit switches that can be used is available in individual data sheets.

Electrical & mechanical auxiliary equipment

Lifting and/or lowering valve (H, S, HS)

- » With a built-in stroke and/or lowering valve, the stroke and/or lowering times can be extended continuously. The adjustable minimum values reach 10 to 20 times the normal values.
- » Built-in valves in "open position" result in an extension of the stroke and lowering times for short-stroke thrusters of approx. 0.1 to 0.2 seconds and for long-stroke thrusters of approx. 0.2 to 0.4 seconds.
- » The desired stroke and/or lowering time is set from the outside of the thruster.

Heating

- » Low-temperature heating:
The task of the heating system is to keep the operating fluid in the appropriate viscosity range.
- » Standby heating:
To prevent condensation in the engine, the EMG ELDRO® thrusters can be equipped with a parking heater in case of high humidity. The temperature of the EMG ELDRO® thruster is kept slightly above the ambient temperature to prevent the formation of condensation.

Increased corrosion protection

- » Increased corrosion protection is necessary when using EMG ELDRO® thrusters in environments with aggressive media and/or high humidity resulting in condensation.
- » Increased protection in the engine:
 - » Use of a parking heater to prevent condensation formation
 - » Increased protection outside:
 - » By using a special paint coating. Different corrosion classes up to C5-M according to DIN EN ISO 12944-5 are possible.



The logo for EMG, consisting of the letters 'EMG' in a bold, white, sans-serif font.

an **eLEXIS** company

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