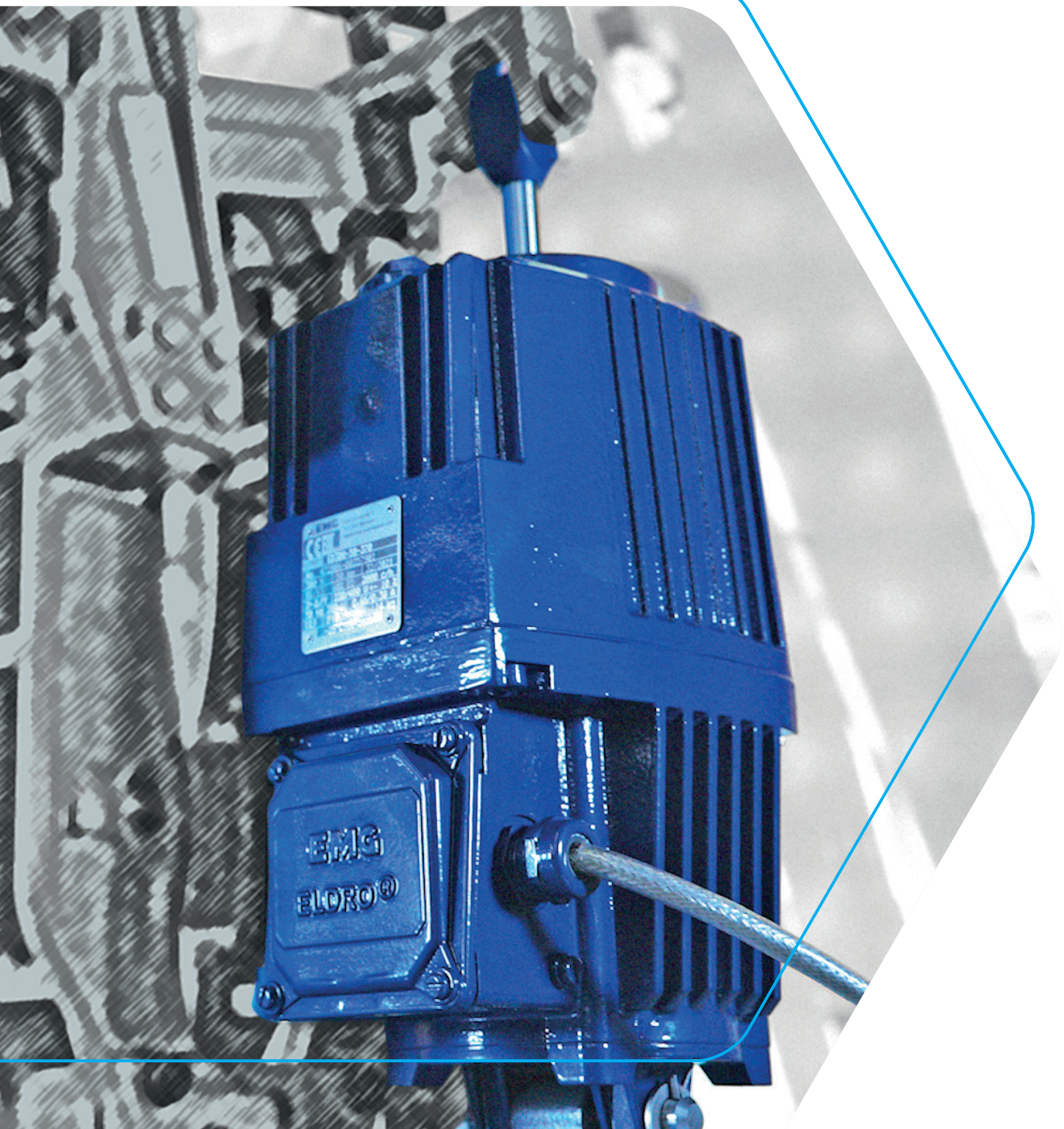
EMG
an ELEXIS company

Safety component - New series ED

EMG ELDRO®
THE ORIGINAL. BE SAFE.



EMG ELDRO® Series ED

Electro hydraulic thrusters

EMG Automation GmbH has been developing and producing safety components for industrial brakes for over 90 years for various industrial applications, from low ambient temperatures to very harsh environments.

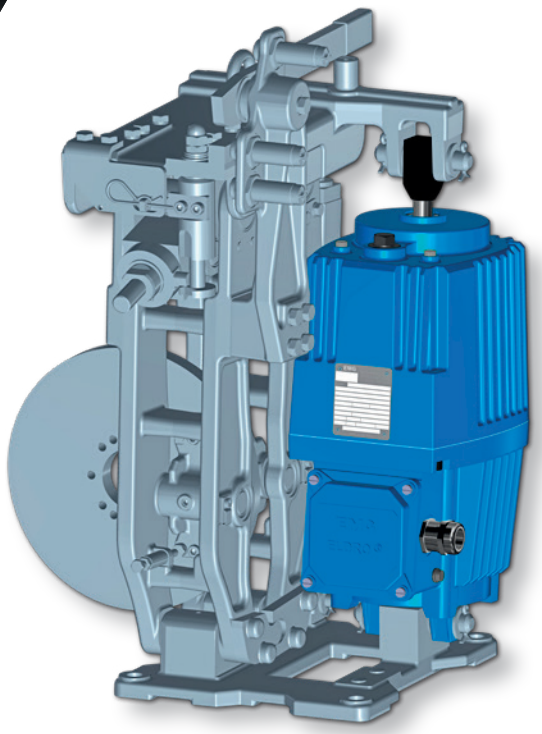
Every day, our customers entrust us with the safety of their equipment and goods, but more importantly, they entrust us with the safety of the people who work with crane systems and suspended loads.

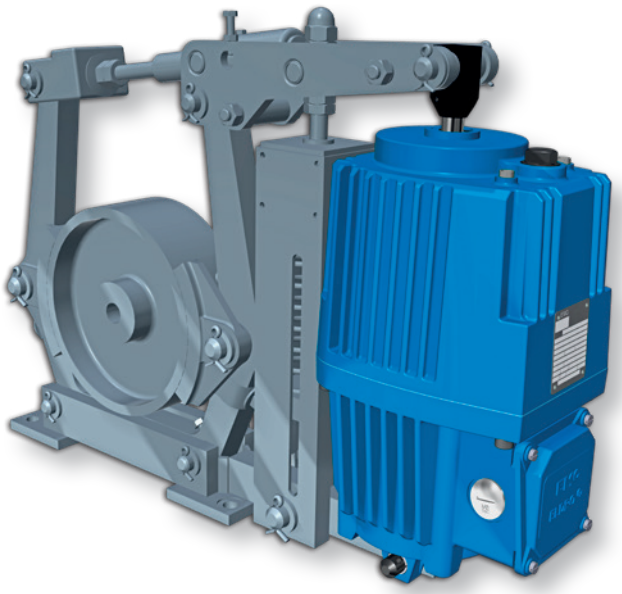
EMG's ELDRO® and ELHY® electro-hydraulic thrusters provide safe and smooth braking in combination with modern drum and disc brakes, ensuring the safety of both operators and machines.

Our markets include ports, steel and metallurgy, mining, and raw material extraction.

With more than 90 years of experience and over 2 million thrusters delivered and with thousands of satisfied customers worldwide, we are the ideal partner for all your processes

THE ORIGINAL. BE SAFE.





EMG ELDRO® Series ED

Successful for more than 90 years

The EMG ELDRO® thruster has been a registered trademark since 1931 and has therefore been successful on the market for more than 90 years!

Over 2 million thrusters delivered and thousands of satisfied customers worldwide.

Today we are pleased to present our new generation of EMG ELDRO® thrusters.

Based on flow numerical calculations and simulations – know-how that we now have in-house – we have perfected the proven technology of EMG thrusters in a new series:

The best of two success stories ELDRO®Classic and ELHY® brands EMG ELDRO® – THE Thruster.

We remain true to the purely mechanical functional principle, which does not include any electric valves or electronic components in the basic functionality.

Thus, as always, we ensure 100 % brake failure safety and maximum ease of maintenance.

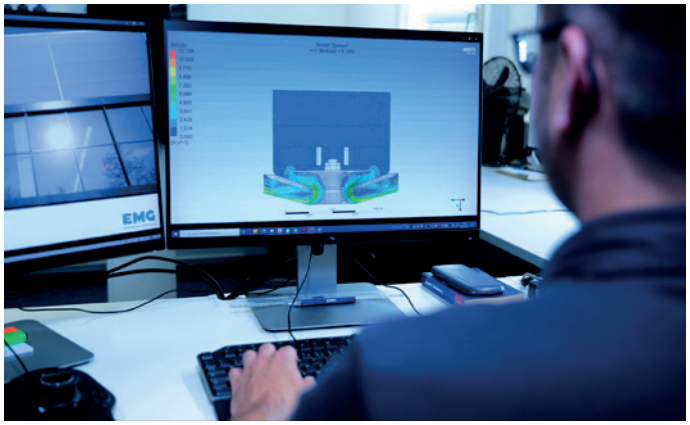
The result is:
- Better performance
- Higher force and
- Faster actuating times, with lower power consumption.

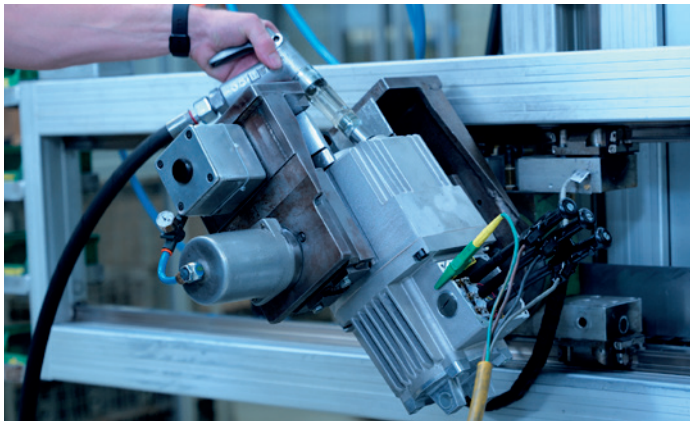
EMG ELDRO® meets all your requirements, increases the safety of your brakes and is 100 % tested.

EMG ELDRO® is ALWAYS much more than just a brand.

Reliability and safety is our mission. Innovation is our drive. With this claim we STILL set the industry standard for electro-hydraulic thrusters.

- **We are EMG.**
- **We are Innovation.**
- **We are Made in Germany.**
- **We are ELDRO®.**





EMG ELDRO® Series ED

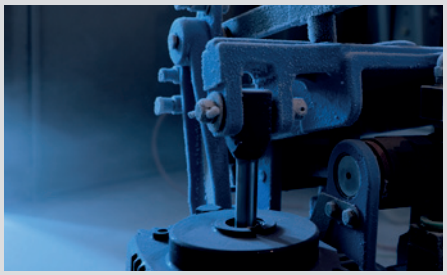
WHAT IS NEW?

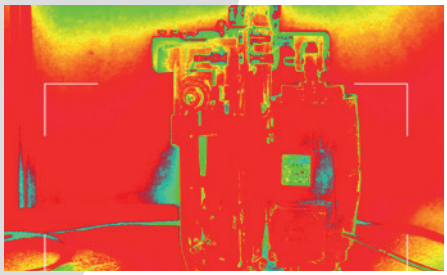
1. Optimal flow dynamics of the operating medium with the aid of fluid dynamics flow simulation

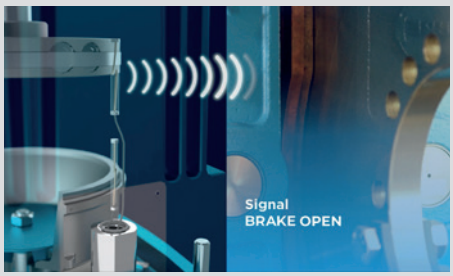
The result is:

» Higher forces with smaller installation dimensions

» Faster operating times with up to 25 % lower power consumption







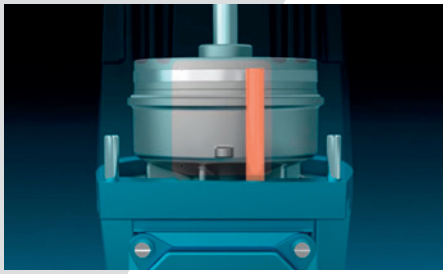
2. Internal display

The internal sensors offer the following advantages:

» Pre-setting according to customer requirements on delivery.

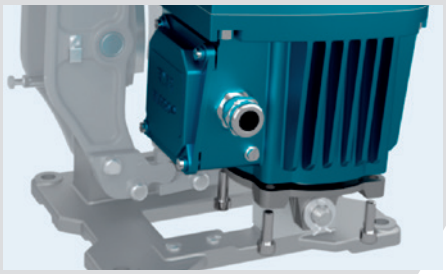
» No possibility of manipulation.

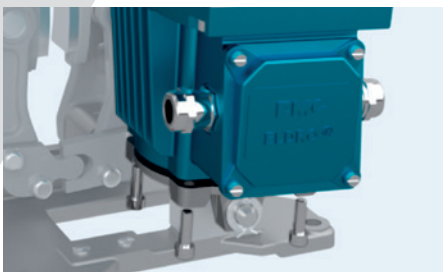
» Secure protection against external damage.



3. Intelligent heating

Very fast low-temperature heating with automatic switch-off means faster readiness for use of the thruster.





4. Flexibility

» Rotatable base - flexible positioning on site at any time

» 3x cable connection
Three freely selectable positions of the cable connection on the housing allow flexible installation even in confined areas.

EMG ELDRO® Series ED

Function

Mode of operation

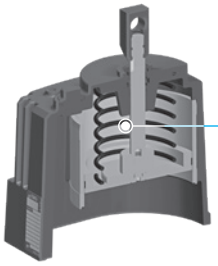
In our EMG ELDRO®, all elements of a hydraulic actuation system are combined into a compact unit. In the switched-off state, the hydraulic piston with the piston rod is in its lower end position, and the brake is thus closed.
ELDRO OFF = BRAKE CLOSED

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

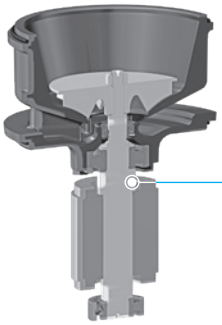
In case of a fault (power outage or pressure drop in the EMG ELDRO®), the brake closes and prevents uncontrolled load movement.
FAULT = BRAKE CLOSED.
We call this "FAILSAFE principle".

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.

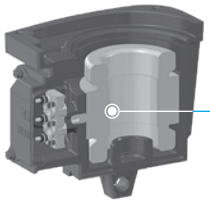
The power consumption of a switched-on EMG ELDRO® is only a few hundred watts thanks to the energy-efficient motors of the IE4 class. Mechanical overload of the EMG ELDRO® thruster is not possible.



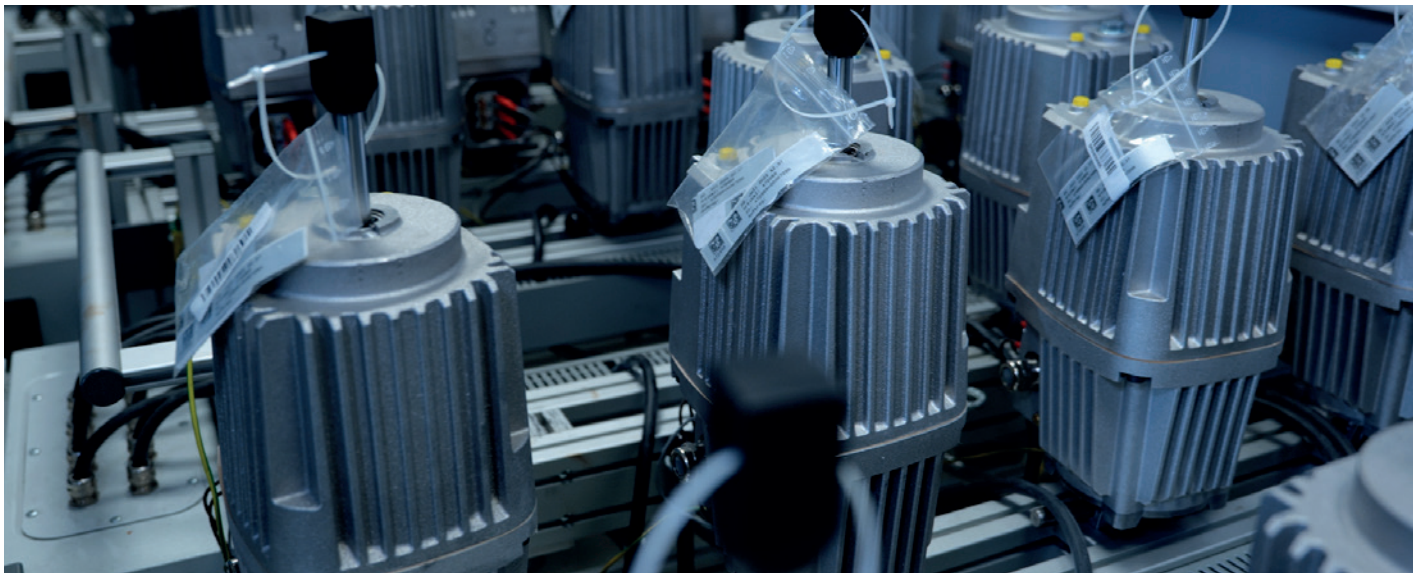
Hydraulic assembly



Pump system



Motor assembly



EMG ELDRO® Series ED

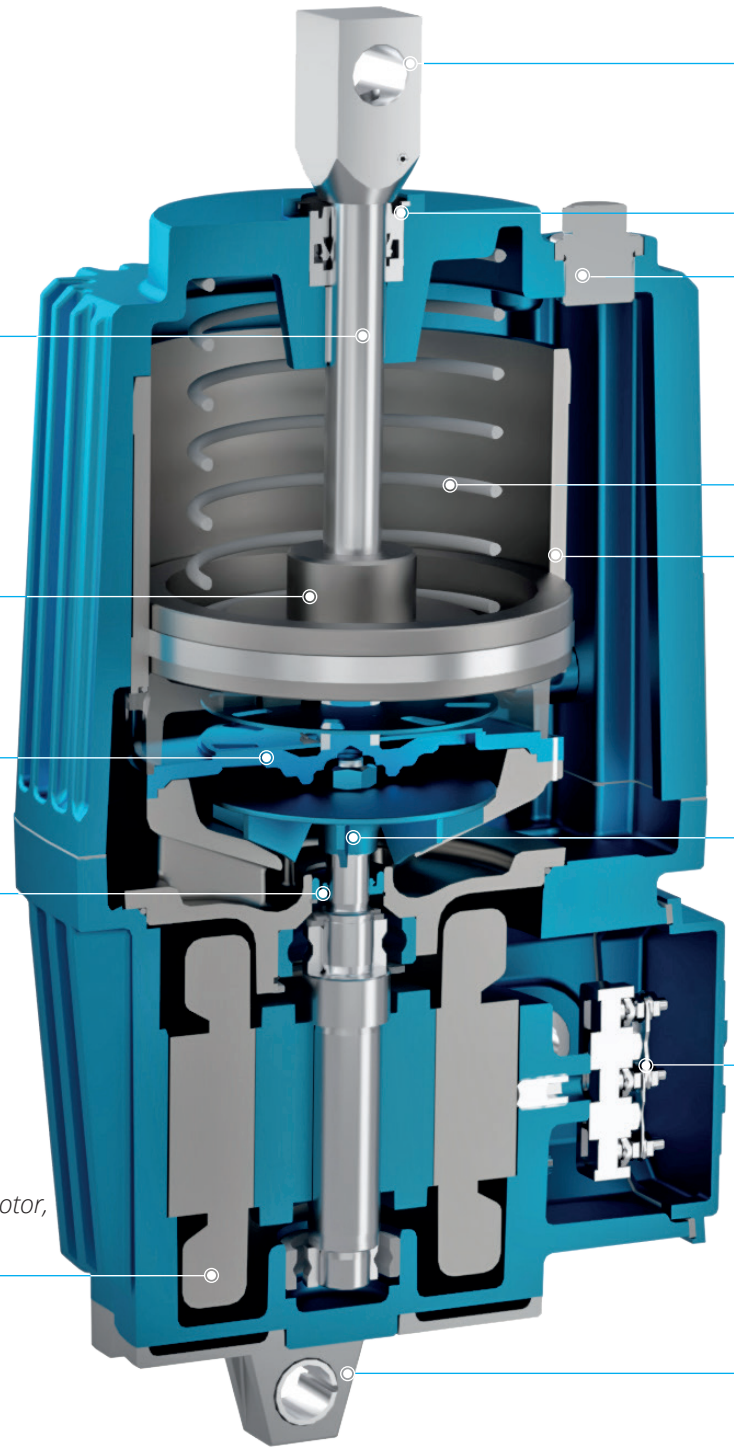
Characteristic features & Advantages

Characteristics	Advantages
Simple assembly due to integral design	Easy to service and repair
Installation dimensions according to industry standard DIN15430 and TGL 35886	Easy installation and removal as well as exchangeability
Reversing operation without restriction	» Simple electrical commissioning » Any direction of motor rotation, therefore no changeover contactors required
Wear-free operation under constant self-lubrication	High operational reliability, long service life, long maintenance intervals
Hydrodynamic operating principle Linear lifting and lowering speeds	» Smooth and shock-free operation » Overload during operation is not possible » No thermal protection circuit required » Arbitrary limitation of the stroke path from the outside
No sensitive electronic and sensory installation parts necessary for the operating principle	» FAILSAFE principle - automatic return of the piston to the initial position when switched off or in the event of a mal-function » Easy maintenance and service
High switching frequency of up to 2,000 switching operations per hour in switching mode S3	Faste cycle times when opening and closing the brake
The level of the operating medium is optimised for the desired operating conditions and no longer needs to be checked.	No maintenance required
Wide standard temperature range from -25 °C to +50 °C, extendable to -50 °C to +40 °C or to 0°C to +90 °C with additional equipment	Suitable EMG ELDRO® for all applications
Lift and lowering valves	Stepless extension of stroke and/or lowering times, externally adjustable
NEW:	
Smaller installation dimensions or smaller units with the same performance as today's units.	Higher braking torques with smaller brakes
Optimum flow dynamics of the operating medium	» Customer optimised thruster: Configurations designed for temperature resistance, power or speed - HOT POWER and FAST » Same performance in smaller sizes as larger units of previous design
Internal position indicator	» Preset according to customer requirements on delivery. » No possibility of manipulation. » Safe protection against external damage.
Fast heating directly in the operating medium, with switch-off function	Faster operational readiness of the thruster without additional control of the heater
Rotatable base for all sizes	Flexible positioning on site at any time.
Three freely selectable cable connection positions	Flexible installation even in confined spaces
High-quality disc bellows	Protection of the piston rod surface against aggressive atmosphere

Every single EMG ELDRO® thruster that leaves our factory is tested for you with a 100 % test:
» Automated function test and endurance run with certificate and follow-up
» In-house development test field to simulate operating conditions in temperature ranges from -70 to +120 °C for particularly demanding applications

EMG ELDRO® Series ED

Design and function



[1)] Auxiliary equipment

EMG ELDRO® Series ED

ED thruster overview

ED 120
ED 220

ED 300
ED 500

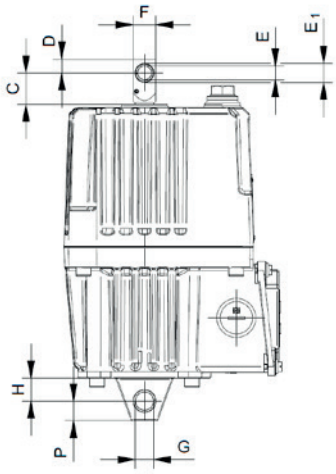
Technical values

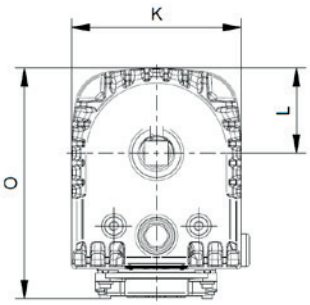
Type	Lifting force [N]	Stroke path [mm]*	Power consumption [W]	Current consumption [A] at 400 V/50 Hz	Switching frequency with S3 operation [c/h]	Weight [kg]
ED 120	120	40 – 50	140	0.25	2000	9.5
ED 220	220	50	140	0.25	2000	9.5
ED 300	300	50 – 60	200	0.30	2000	17
ED 500	500	50 – 60	200	0.35	2000	17

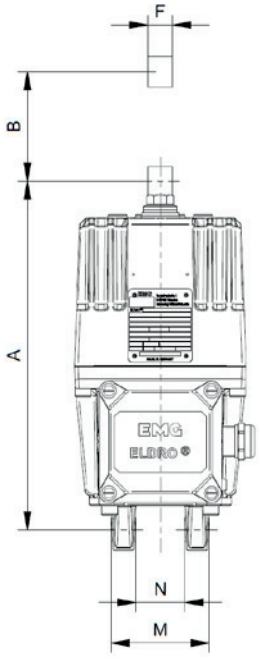
**further on request*

EMG ELDRO® Series ED

ED 120 / ED 220



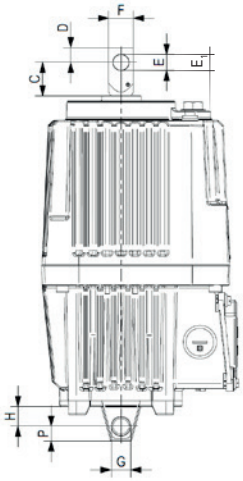


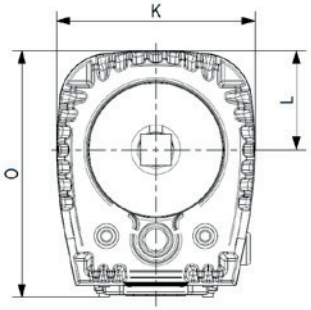


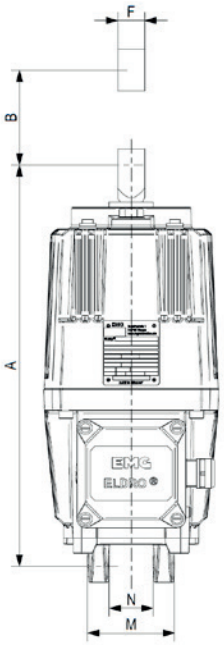
Type	A	C	D	E	E_1	F	G	H	K	L	M	N	O	P
ED 120	286	27	12	12	16	20	16	20	140	70	80	40	190	17
ED 220	286	27	12	12	16	20	16	20	140	70	80	40	190	17

EMG ELDRO® Series ED

ED 300 / ED 500







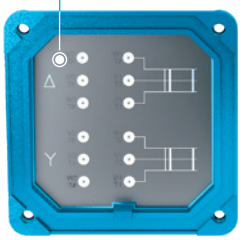
Type	A	C	D	E	E_1	F	G	H	K	L	M	N	O	P
ED 300	370	34	15	16	16	25	16	20	160	80	80	40	200	15
ED 300	380	33	17	12	12	21.5	20.2	31	160	80	80	40	200	20
ED 500	370	34	15	16	16	25	16	20	140	80	80	40	200	15
ED 500	400	53	17	12	12	21.5	20.2	31	160	80	80	40	200	20

All dimensions in mm

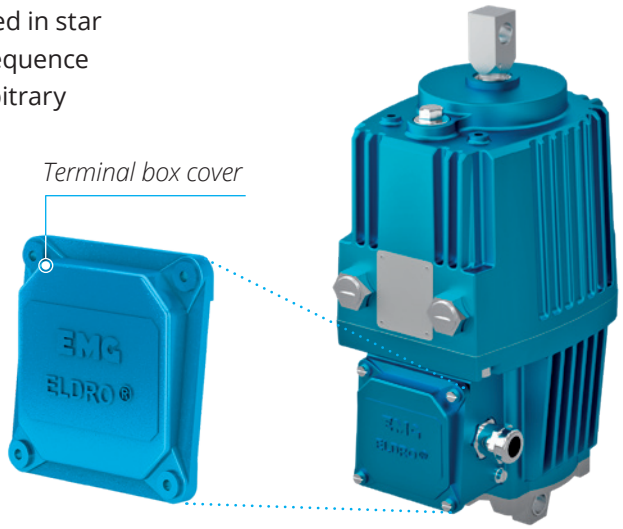
General information

- See thruster nameplate for specifications
- The thrusters are ready for operation and oil filled upon delivery
- When installing into the brake, free movement 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

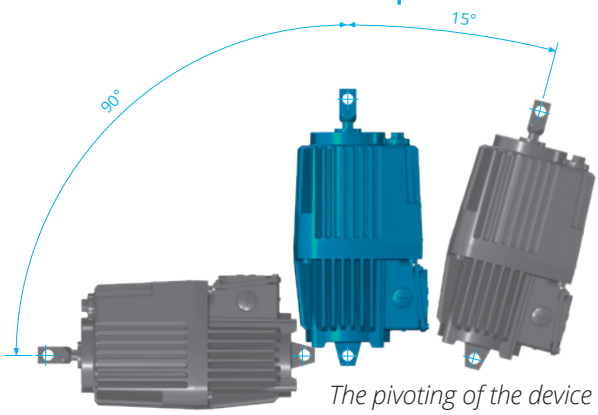
Connection diagram



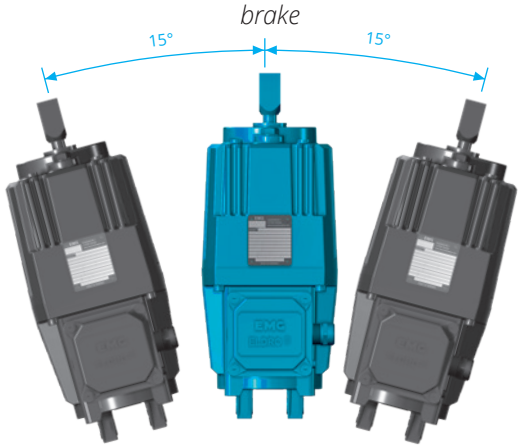
Terminal box cover



Installation position

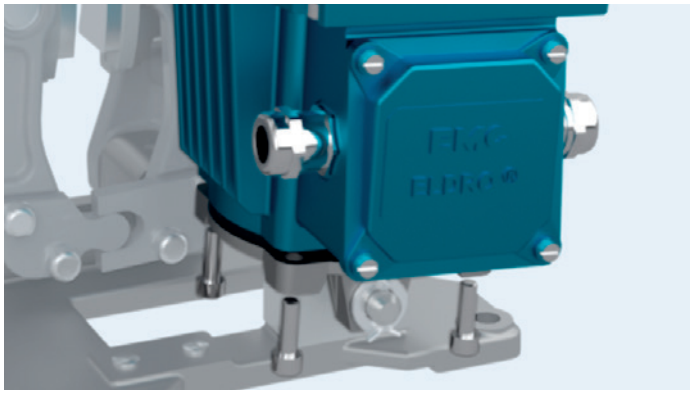


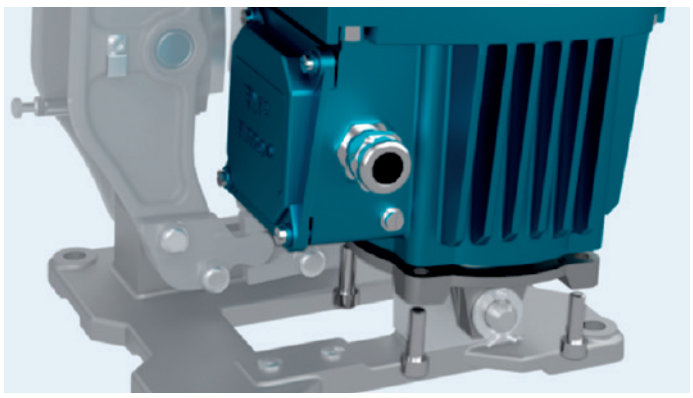
The pivoting of the device must be ensured at the installation into the brake



There must be no transverse forces on the piston bar

Rotatable base





EMG ELDRO® Series ED

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

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 mm^2 (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 acc. to ISO 12944
» 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)

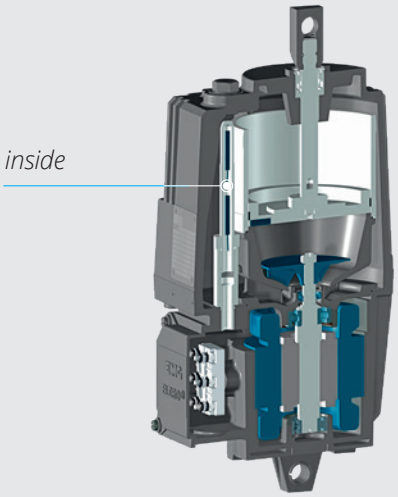
Built-in C-spring to generate braking force. The specified braking force of the C-spring is achieved at 1/3 of the nominal stroke.
In normal operation, the spring force corresponds to the normal stroke force of the EMG ELDRO® thruster.
The spring rate can also be chosen variably if EMG ELDRO® is used as an adjuster.

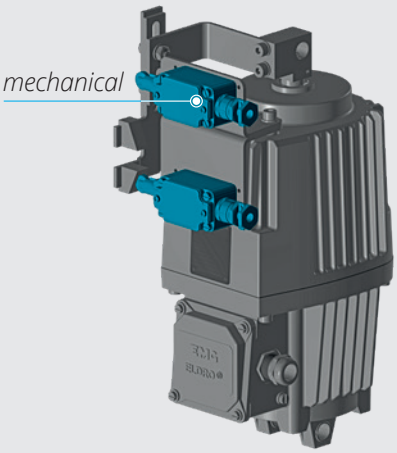
Versions with brake spring

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

Possible position monitoring

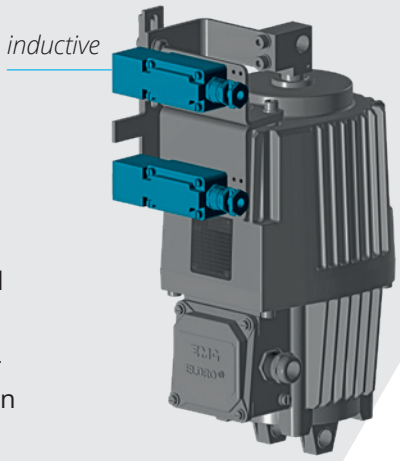
- Brake open
- Brake open - Brake closed
- Brake open - Rest stroke reached (indication of critical wear of brake pads)





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.

EMG ELDRO® Series ED

Electrical & mechanical auxiliary equipment

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

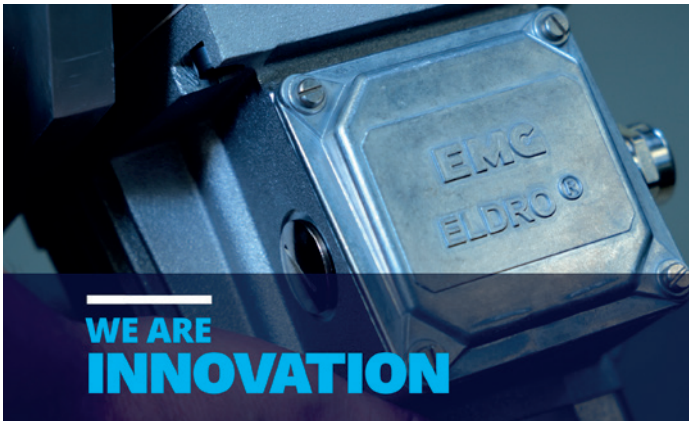
» With a built-in stroke and/or lowering valve, the stroke and/or lowering times can be extended continuously. The adjustable minimum values reach 10 to 20 times the normal values.
» Built-in valves in "open position" result in an extension of the stroke and lowering times for short-stroke thrusters 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.
» Automatic switch-off of the heating by bimetal switch

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.



EMG ELDRO® Series ED

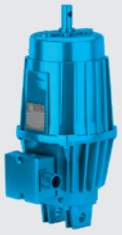
Replacement made easy

For the series EMG ELDRO®classic, EMG ELHY® DIN and EMG ELHY® TGL, our new series "EMG ELDRO® – THE Thruster" is now available. Due to unchanged installation dimensions and functionalities, these can be replaced without restriction, according to the following list.

Typecode **ED300-50-370**

ELDRO® [ED]
Lifting force [N]
Lifting stroke [mm]
Installation dimension [mm]

Size	EMG ELDRO®	Replaces EMG ELDRO®classic DIN 15430	Replaces EMG ELHY® DIN 15430	Replaces EMG ELHY® TGL 35868	Lifting force [N]	Stroke [mm]	Mounting dimension [mm]
BG 0.5	ED120-40-286	Ed 12/4	EB 120-40/3		120	40	286
	ED120-50-286			EB 12/50/2	120	50	286
	ED220-50-286	Ed 23/5	EB 220-50/2		220	50	286
BG 1	ED300-50-380			EB 20/50	300	50	380
	ED300-50-286	Ed 25/5			300	50	286
	D300-50-370	Ed 30/5	EB 300-50		300	50	370
NEW	D300-60-370				300	60	370
	ED500-20-400			EB 50/20	500	20	400
	ED500-50-400			EB 50/50	500	50	400
NEW	ED500-50-370				500	50	370
NEW	ED500-60-370				500	60	370

Size	New	Replaced	
BG 0.5			
BG 1			

EMG ELDRO®

100 % SAFETY
100 % QUALITY
100 % DIVERSITY
100 % RELIABILITY

WE ARE ELDRO®

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