



ELDRO[®] classic

ELECTRO HYDRAULIC THRUSTERS

SERIES ED



THE ORIGINAL. BE SAFE.

ELECTRO HYDRAULIC THRUSTERS

For 70 years, EMG Automation GmbH has been developing and producing drive systems for industrial brakes in a wide range of industrial applications, from low ambient temperatures to extremely harsh environments.

The customer benefit arises due to the combination of long-term experience with industrial strength, efficient solutions, outstanding logistics and top quality standards.

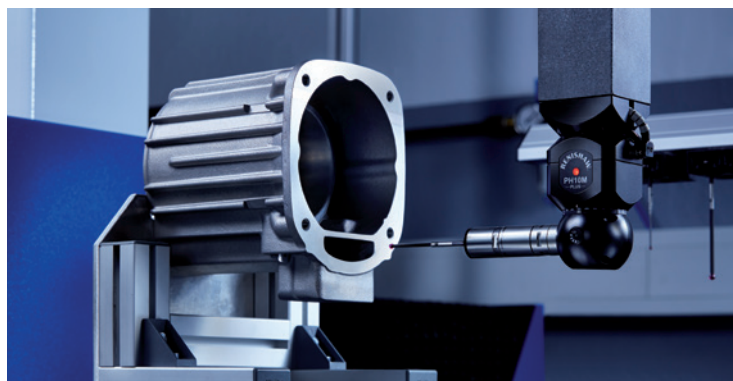
EMG offers its customers uncompromising reliability coupled with intelligent innovation. In production, EMG greatly values the highest possible manufacturing quality in order to ensure its high quality standards.

The electrohydraulic thrusters ELDRO® and ELHY®, produced by EMG, ensure safe and “soft” braking in combination with modern drum and disc brakes. Additionally they ensure safety for man and machine.

As an independent manufacturer of linear industrial drive systems, the most important application fields for EMG products comprise ports, steel and metallurgy, as well as mining and raw material extraction.

To date, more than 2 million electro hydraulic thrusters have been supplied in many thousands of design variants worldwide.

THE ORIGINAL. BE SAFE.



FUNCTION AND ADVANTAGES

MODE OF OPERATION

All elements of a hydraulic actuation system are combined in the ELDRO^{classic}® to produce a compact assembly. When switched off, the hydraulic piston with the piston rod is located in its bottom limit position.

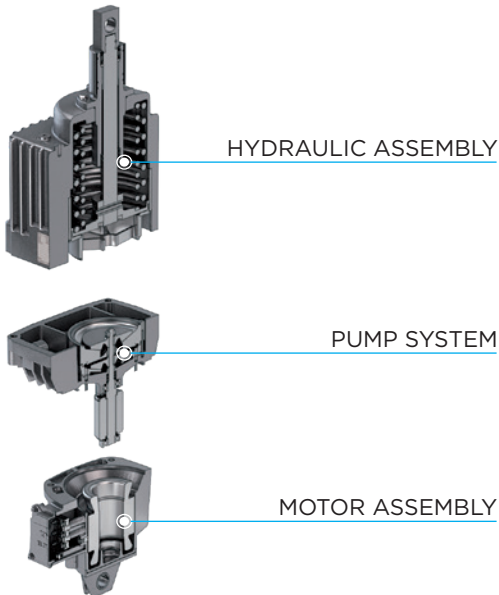
When switched on, the hydraulic pump pumps the operating fluid beneath the piston and in doing so generates the hydraulic pressure here. This moves the piston up to the maximum stroke path. When doing so, the counterforce – which is generated through an integrated brake or return spring, or an external load (e.g. a brake) – must be safely overcome.

Due to its hydraulic operating principle, an ELDRO^{classic}® thruster with a maximum travel distance of, for example, 60 mm can be used in any brake that requires a stroke travel between 20 mm and 60 mm.

In the respective piston limit position, the power consumption of the motor reduces in comparison to the power consumed during the lifting process due to the laws of hydraulics. The pressure in the device reaches its maximum value here. The drive motor is therefore relieved in the resting position of the piston. Mechanical overloading of the ELDRO^{classic}® thruster is not possible.

ADVANTAGES

- Use of robust asynchronous motors
- Use of high quality materials
- Use of the proven hydrodynamic principle
- Broad standard temperature range from – 25 °C to + 50 °C, expandable to – 45 °C to + 80 °C with additional equipment, e.g. heating and use of special operating media
- Mains voltage fluctuations only have a limited influence on the function of the devices, because the motor speed is predominantly dependent on frequency and less on voltage
- No thermal protective circuit required
- Automatic driving back of the piston to the default position when switched off
- Linear lifting and lowering speeds (exception: motor start-up and run-down range)
- No sensitive electronic and sensory installation parts needed for the operating principle
- Long service intervals



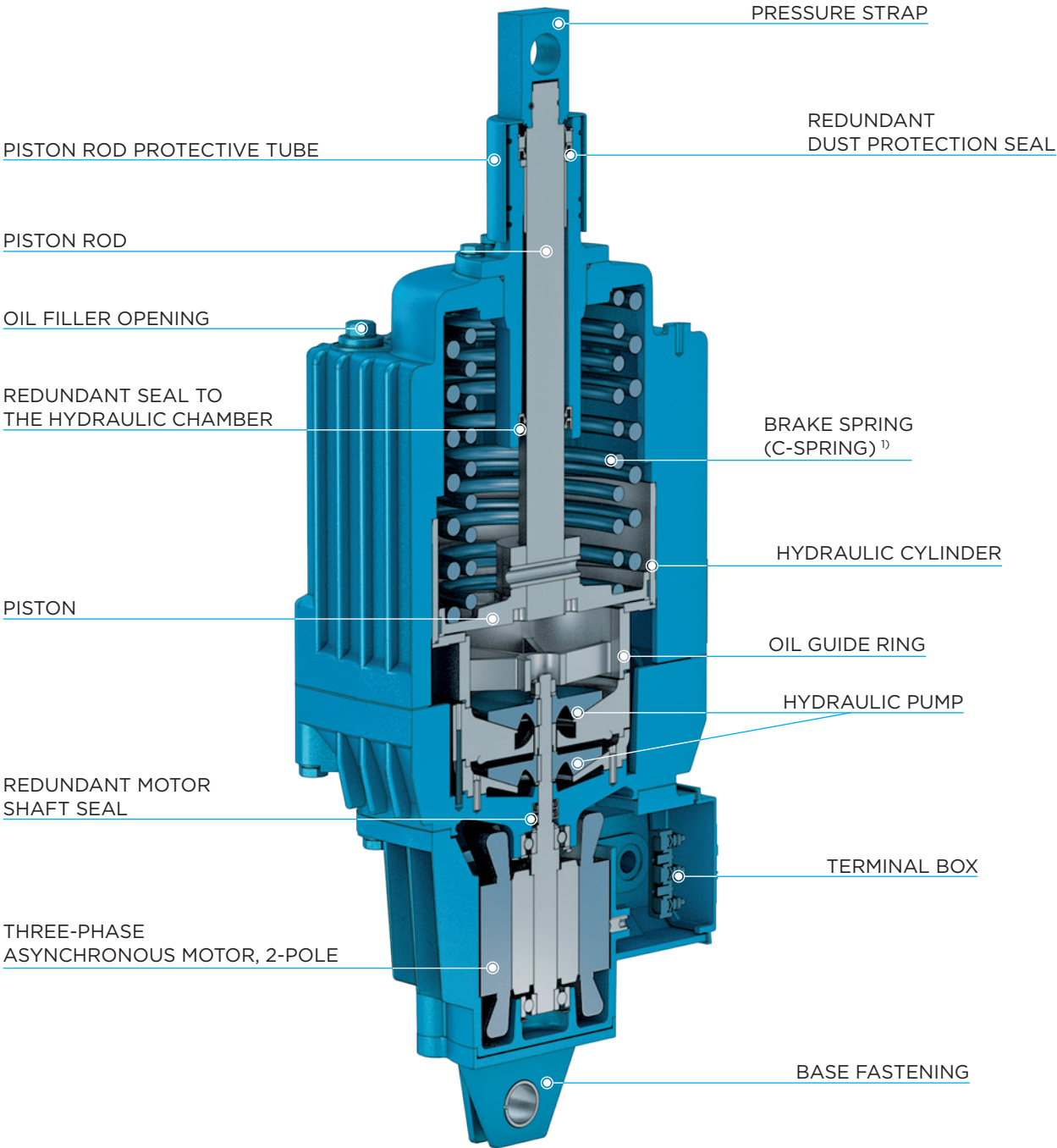
CHARACTERISTIC FEATURES

The electro hydraulic system of the ELDRO^{classic}[®] thrusters, in conjunction with the straightforward integration in brake systems and the simple electrical start-up, result in the following features under the diverse application conditions:

- High operational safety
- Long service life due to wear-free work under constant self-lubrication
- Soft and impact-free mode of operation, as a systemic result of the hydraulic working principle
- Short actuating times
- Approved continuous operation S1
- High switching frequency of up to 2,000 cycles per hour in switching operation S3
- Reversing operation without limitations
- Easy to install and de-install
- Arbitrary direction of motor rotation, meaning no changeover contactors required
- Overloading not possible during operation
- Arbitrary external limiting of the stroke path
- Stepless extension of the lifting and/or lowering times through the installation of valves
- The fill level of the operating medium is optimised according to the application conditions and requires no further checking



DESIGN AND FUNCTION



¹⁾ Auxiliary equipment

Ed THRUSTER OVERVIEW

CHARACTERISTIC FEATURES

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- High operational safety
- Long service life due to wear-free work under constant self-lubrication
- Soft and impact-free mode of operation, as a systemic result of the hydraulic working principle
- Short actuating times
- Approved continuous operation S1 in standard temperature range of -25 °C up to +50 °C
- High switching frequency of up to 2,000 cycles per hour in switching operation S3
- Reversing operation without limitations
- Easy to install and de-install
- Arbitrary direction of motor rotation, meaning no changeover contactors required
- Overloading not possible during operation
- Arbitrary external limiting of the stroke path
- Stepless extension of the lifting and/or lowering times through the installation of valves
- The fill level of the operating medium is optimised according to the application conditions

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]
<i>Three-phase current version</i>						
Ed 12/...	120	40	120	0.36	2,000	8
Ed 23/...	220	50	165	0.50	2,000	10
Ed 25/...	300	50	165	0.50	2,000	10
Ed 30/...	300	50	200	0.50	2,000	14
Ed 50/...	500	60 - 120	210	0.50	1,200 - 2,000*	23 - 26*
Ed 80/...	800	60 - 120	330	1.20	1,200 - 2,000*	24 - 27*
Ed 121/...	1,250	60 - 200	330	1.20	400 - 2,000*	39
Ed 125/...	1,250	70	330	1.20	2,000	24
Ed 185/...	1,850	60 - 155	450	1.30	400 - 2,000*	40
Ed 201/...	2,000	60 - 120	450	1.30	1,200 - 2,000*	39
Ed 301/...	3,000	60 - 150	500	1.40	400 - 1,500*	40 - 50*
Ed 350/...	3,500	200	550	1.40	400	50
Ed 400/...	4,000	80 - 200	550	1.40	400 - 600*	50
Ed 450/...	4,500	80 - 200	600	1.40	400 - 600*	40 - 50*
Ed 500/...	5,000	80	700	1.80	400	50
Ed 630/...	6,300	80 - 120	700	1.80	400	70

* depending on stroke path

** further on request

Stroke work (N cm) = Lifting force x stroke path

Ed THRUSTER OVERVIEW



Ed 12/4



Ed 23/5



Ed 30/5



Ed 80/6

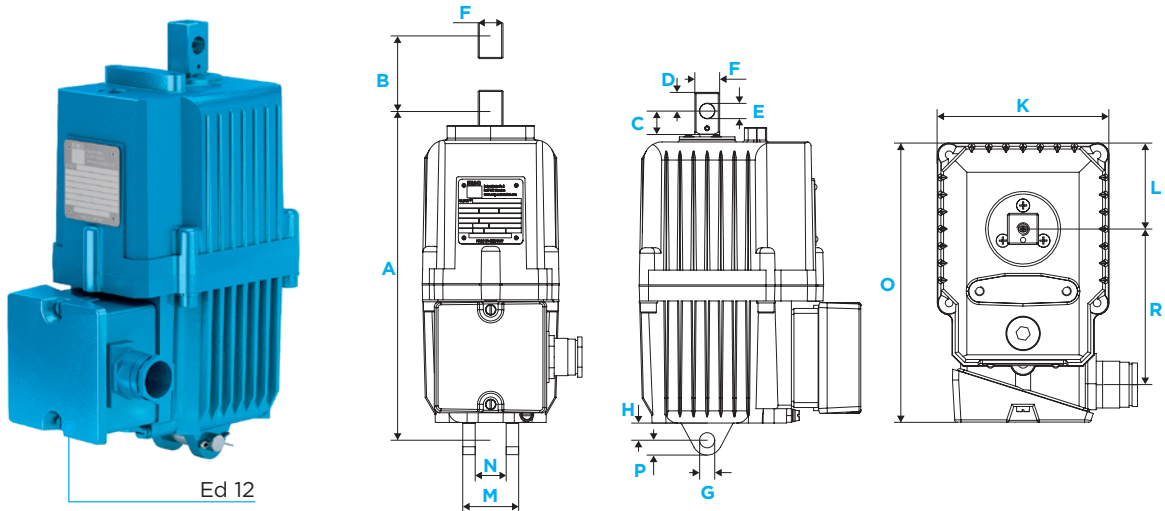


Ed 301/6

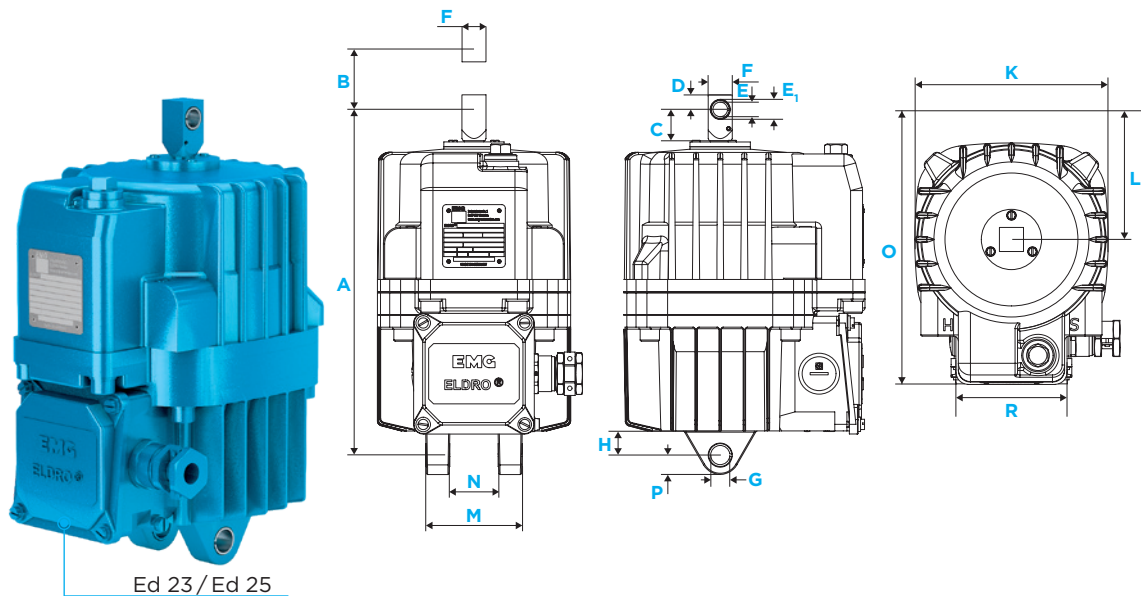


Ed 630/9

Ed 12



Ed 23 TO Ed 25

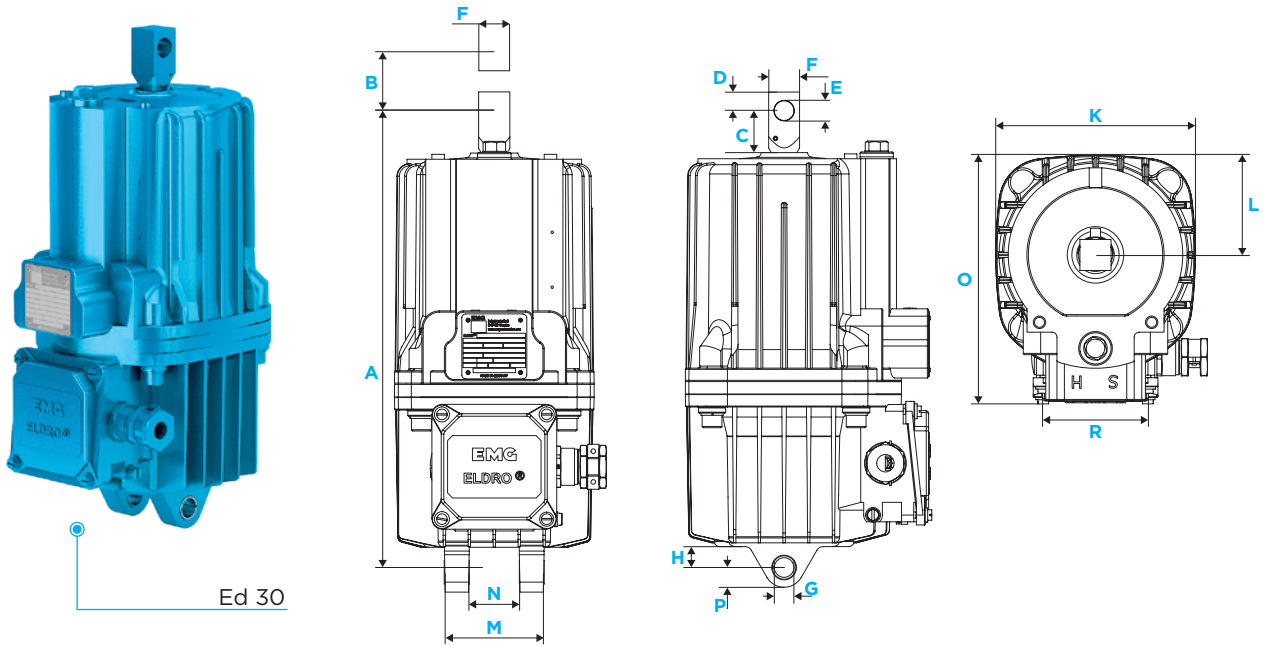


Type	A	C	D	E	E ₁	F	G	H	K	L	M	N	O	P	R
Ed 12/...	265	20	10	12	-	20	12	12	110	55	45	25	178	14	100
Ed 23/...	286	26	12	12	16	20	16	20	160	80	80	40	200	16	92
Ed 25/...	286	26	12	12	16	20	16	20	160	80	80	40	200	16	92

All dimensions in mm

B = stroke path (variable) | E convertible to E₁ by removing the clamping bush

Ed 30 TO Ed 80 AND Ed 125

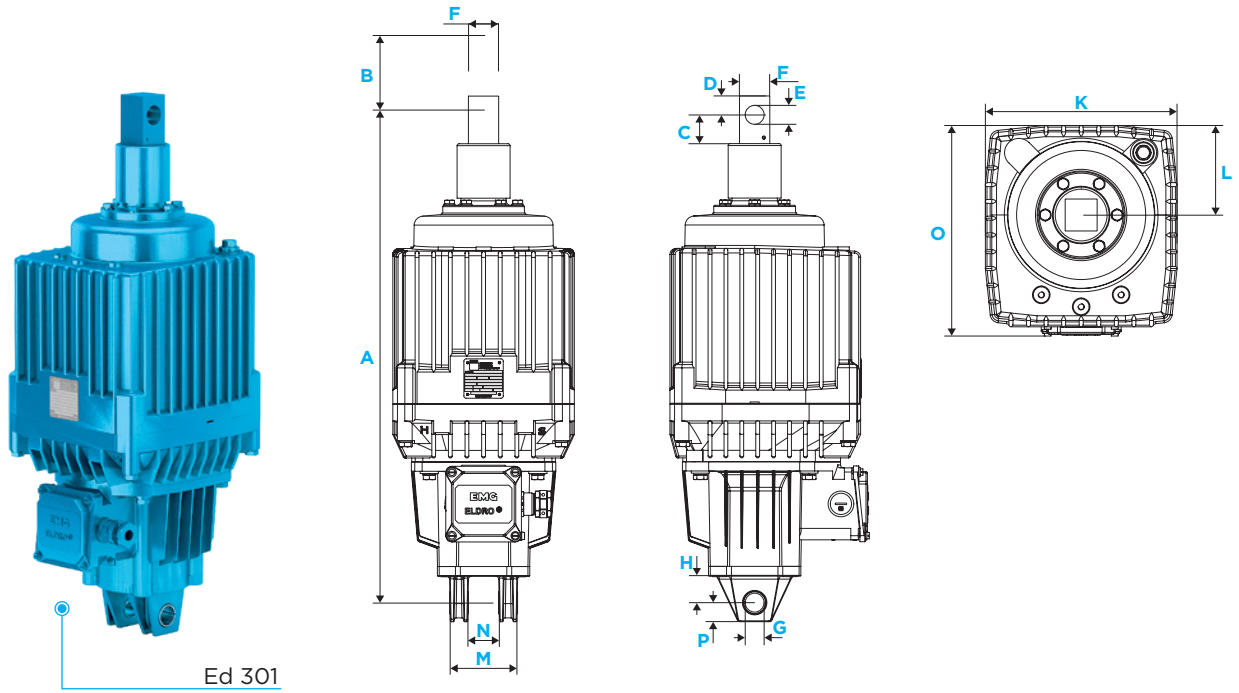


Type	A	C	D	E	E ₁	F	G	H	K	L	M	N	O	P	R
<i>Short stroke thrusters</i>															
Ed 30/...	370	34	15	16	-	25	16	18	160	80	80	40	197	16	80
Ed 50/...	435	36	18	20	-	30	20	23	195	97	120	60	254	22	90
Ed 80/...	450	36	18	20	-	30	20	23	195	97	120	60	254	22	90
Ed 125/...	450	36	18	20	-	30	20	23	195	97	120	60	254	22	90
<i>Long stroke thrusters</i>															
Ed 50/...	515	36	18	20	-	30	20	23	195	97	120	60	254	22	90
Ed 80/...	530	36	18	20	-	30	20	23	195	97	120	60	254	22	90

All dimensions in mm

B = stroke path (variable) | E convertible to E₁ by removing the clamping bush

Ed 121 TO Ed 630



Type	A	C	D	E	F	G	H	K	L	M	N	O	P	R
<i>Short stroke thrusters</i>														
Ed 121/...	645	38	25	25	40	25	35	240	112	90	40	260	25	-
Ed 185/...	600	42	25	25	40	27	44	240	112	160	80	260	25	-
Ed 201/...	645	38	25	25	40	25	35	240	112	90	40	260	25	-
Ed 301/...	645	38	25	25	40	25	35	240	112	90	40	260	25	-
<i>Long stroke thrusters</i>														
Ed 121/...	705	38	25	25	40	25	35	240	112	90	40	260	25	-
Ed 185/...	700	42	25	25	40	27	44	240	112	160	80	260	25	-
Ed 201/...	705	38	25	25	40	25	35	240	112	90	40	260	25	-
Ed 301/...	705	38	25	25	40	25	35	240	112	90	40	260	25	-
Ed 301/...*	880	38	25	25	40	27	44	250	117	160	80	265	25	-
Ed 350/...	880	38	25	25	40	27	44	250	117	160	80	265	25	-
Ed 400/...	645	42	25	25	40	25	34	240	112	90	40	265	25	-
Ed 450/...	645	42	25	25	40	25	34	240	112	90	40	265	25	-
Ed 500/...	665	52.5	25	25	40	25	35	250	117	90	40	265	25	-
Ed 630/...	705	38	25	25	40	25	35	274	127	90	40	328	30	-

All dimensions in mm

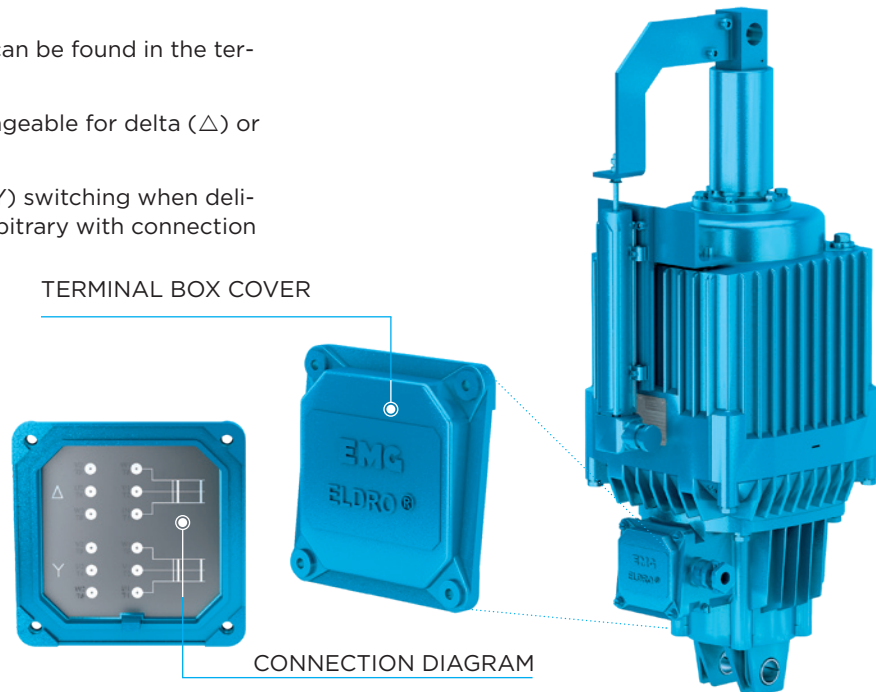
B = stroke path (variable) | * from 130 mm stroke path

GENERAL INFORMATION

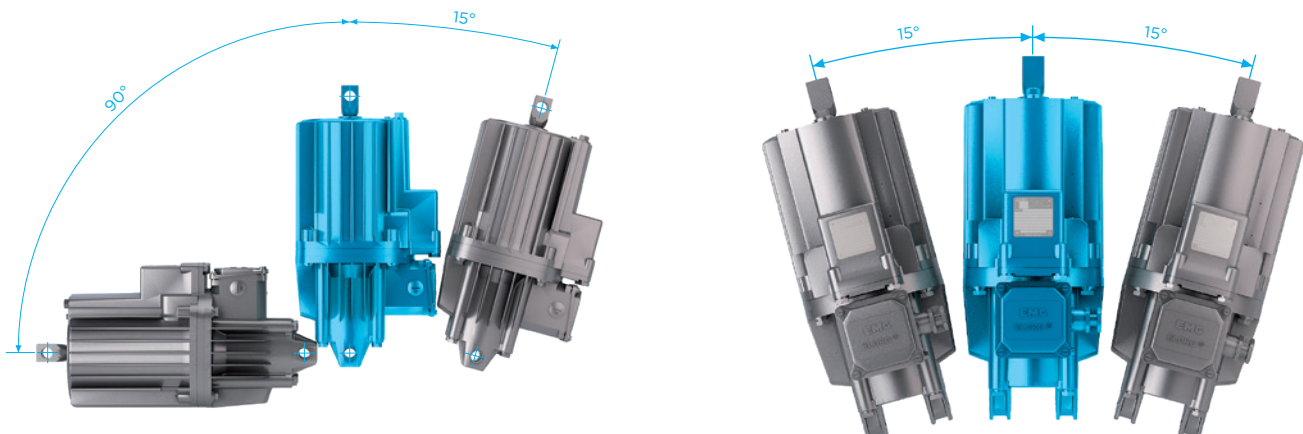
- For device key data see device type plate
- The devices are delivered ready for operation, filled with operating fluid

ELECTRICAL CONNECTION

- The connection diagram can be found in the terminal box cover
- Motor is voltage interchangeable for delta (Δ) or star (Y) switching
- The devices exhibit star (Y) switching when delivered. Phase sequence arbitrary with connection



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 VERSION

MOTOR

- Three-phase asynchronous motor, 2-pole
- For power data see “Technical values”
- Standard insulation per insulation class F
- Special version in insulation class H

VOLTAGES AND FREQUENCIES

- Standard:
 - 230/400 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 star (Y) connected on delivery
- Alternating current versions (with capacitor for Steinmetz circuit) on request
- DC current version see separate brochure

CABLE INLET

- Threaded cable gland M 25 x 1.5 for cable cross-sections to 4 x 2.5 mm² (Ø 12 - 18 mm)

OPERATING MODES

- Continuous operation S1 and intermittent duty S3 - 60 % duty cycle standard
- With ambient temperatures > 50 °C deviating technical values (available on request)



TERMINAL BOX

- Terminal board 6-pole, with thrusters with heating the terminal board is 9-pole
- Supply line connection M4
- Internal protective conductor connection: M4
- External protective conductor connection: M6

INSTALLATION VARIANTS

- In case of types from Ed 50, the base fastening can be mounted offset through 90°.
- With the types Ed 23/5 and Ed 30/5, the base fastening is cast on the motor.
 - Here, 90° offset installation is possible with a special motor housing.
- The pressure strap at the top rotates in all types.
- In case of versions with a limit switch, minor modifications are required in order to rotate the pressure strap or fasten the base as required.

OPERATING FLUID

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

ENCLOSURE

- Standard IP 65, in special version up to IP 68

PAINT APPLICATION PER DIN EN ISO 12944

- Standard for corrosion load C1, layer thickness 70 µm
- Special paint up to corrosion load C5-M, coating thickness to 280 µm
- Standard colour RAL 7022 (umbra grey)

PROTECTIVE MEASURES

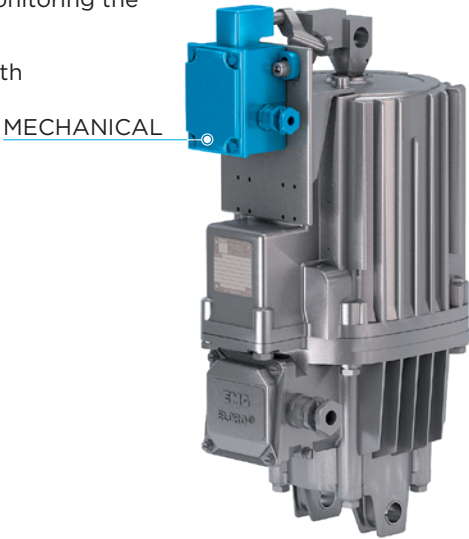
- Redundant dust protection seal
- Redundant seal with the hydraulic chamber
- Piston rod chromium plated to dimension
- With Ed 121, Ed 201, Ed 301, Ed 350, Ed 630 additional piston rod protective tube against external mechanical influences

ELECTRICAL & MECHANICAL AUXILIARY EQUIPMENT

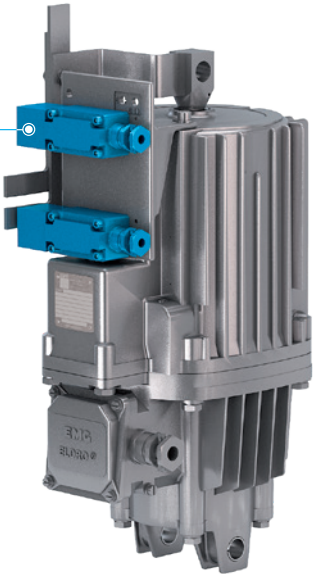


POSITIONING MEASURING SYSTEMS

- Analogue measuring systems for monitoring the entire stroke path
- Version dependent on the stroke path



INDUCTIVE



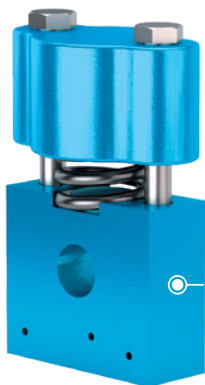
LIMIT SWITCHES

- All ELDROclassic® devices can be fitted with mechanical or inductive limit switches for the electrical display of the air and brake setting.
- Detailed information is available in the data sheet for the limit switches

ELECTRICAL & MECHANICAL AUXILIARY EQUIPMENT

DAMPING SPRING (D-SPRING)

- Damping of the load change when closing and opening the brake.
- The D-spring is only effective in conjunction with a C-spring.
- With the installation of the D-spring, it is not possible to fit a limit switch.
- The installation length “A” of the device does not change.
- When specifying the working point of the brake, dimension “z” must be taken into account (see device specific dimension drawing).
- Main application: ELDRO[®] classic control brake



d-spring

BRAKE SPRING (C-SPRING)

- Integrated C-spring for generating the brake force. The specified brake force of the C-spring is reached at 1/3 of the nominal stroke.

VERSIONS WITH BRAKE SPRING

Type	Brake spring force (C-spring) [N]
<i>Three-phase current version</i>	
Ed 23/5	180
Ed 30/5	270
Ed 50/6	460
Ed 80/6	750
Ed 121/6	1,200
Ed 185/6	1,900
Ed 201/6	1,900
Ed 301/6	2,700



LIFTING AND/OR LOWERING VALVE (H, S, HS)

- The lifting and lowering times can be steplessly extended with an integrated lifting and/or lowering valve. The adjustable minimum values attain 10 to 20-times the normal values.
- Integrated valves in “open position” result in an extension of the lifting and lowering times with short stroke thrusters of up to approx. 0.1 to 0.2 seconds, and with long stroke thrusters of up to approx. 0.2 to 0.4 seconds.
- The desired lifting or lowering time is set externally on the thruster.

QUICK LOWERING SWITCHING

- The lowering times are shortened through the use of three-phase motor capacitors, or by short-circuiting the stator winding via a contactor.
- The lowering times reduce by approx. 15 %.

HEATING

- With ambient temperatures below - 25 °C and use of the standard operating fluid, the ELDRO^{classic}® thruster must be equipped with low temperature heating.
- The task of the heating lies in keeping the operating fluid within the liquid range.
- In order to avoid condensation in the motor at high humidity, the ELDRO^{classic}® thruster can be equipped with parking heaters. The temperature of the ELDRO^{classic}® thruster is kept slightly above the ambient temperature and the formation of condensation is thereby avoided.

INCREASED CORROSION PROTECTION

- Increased corrosion protection is necessary with the use of ELDRO^{classic}® thrusters in environments of aggressive media and/or high relative humidity with the resultant formation of condensation.
- **Increased protection in the motor:**
Vacuum full potting of the stator or the use of a parking heater
- **Increased external protection:**
Through special paint application, see “Mechanical version”



EMG



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