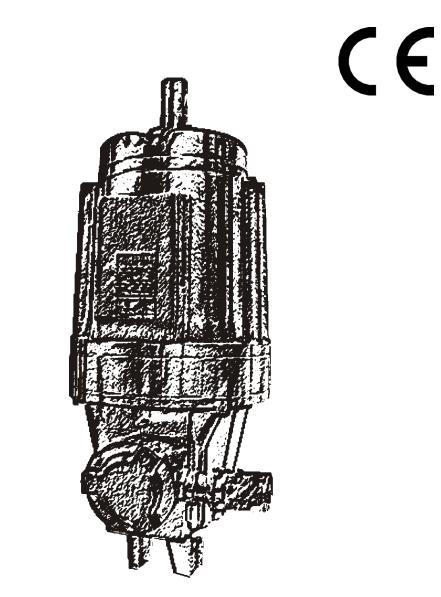
ELDRO[®] electrohydraulic thrusters

EdEx series

Electrical devices with an explosion-proof design, ignition protection provided by a "pressure-proof housing"

Operating manual





EMG Automation GmbH Factory Oschersleben





Technical Data

Туре	Nom inal actuating	Nominal stroke	C spring	Brake/reset force ¹⁾	Power consumption ²⁾	Power at 400 V AC 3-ph ²⁾	Power consumption ²⁾	Power at 400 V AC 3-ph ²⁾	Filling quantity	Weight	
	power			minmax	Hydroth	erm 46 M	Siliko	1 10cst			
	[N]	[mm]		[N]	[W]	[A]	[W]	[A]	[1]	[kg]	
Short-stroke											
devices											
EdEx 32/50	320	50	C 18	170 215	150	0,30	140	0,35	2,4	32,0	
			C 32	370 440							
EdEx 50/50	500	50	C 18	170 215	180	0,38	180	0,38	2,4	32,0	
			C 32	370 440							
			C 50	540 655							
EdEx 80/60	800	60	C 45	460 570	220	0,48	210	0,55	3,9	45,0	
			C 80	7401080							
EdEx 80/75	800	75			220	0,48			3,9	45,0	
EdEx 125/60	1250	60	C 45	460 570	250	0,52			3,9	45,0	
			C 80	7401080							
	1050		C 125	12001650							
EdEx 125/75	1250	75	0.15	400 570	250	0,52			3,9	45,0	
EdEx 150/60	1500	60	C 45	460 570	360	0,63			3,9	20,6	
			C 80	7401080							
	1700		C 125	12001650							
EdEx 150/75	1500	75	0.45	400 570	360	0,63	050	0.70	3,9	20,6	
EdExB 200/60	2000	60	C 45	460 570	320	0,64	350	0,70	7,4	65,0	
			C 70	650 910							
			C 130	12501600							
E.I.E. 050/00	0500		C 200	19002510	000	0.00			7.4	05.0	
EdEx 250/60	2500	60	C 45	460 570	360	0,69			7,4	65,0	
			C 70 C 130	650 910							
				12501600							
EdEx 320/100	3200	100	C 200 C 70	19002510 530940	550	0,90	450	0,80	10,8	80,0	
Edex 320/100	3200	100	C 70	20803700	550	0,90	450	0,80	10,8	80,0	
			C 320	26104640							
Long-stroke											
devices											
EdEx 80/160	800	160	C 45	260 520	210	0,48			6,0	54,0	
Lully our roo	000	100	C 80	3501000	210	0,10			0,0	01,0	
EdEx 125/160	1250	160	C 45	260 520	250	0,52			6,0	54,0	
	1200	100	C 80	3501000	200	0,02			0,0	01,0	
			C 125	6101520							
EdEx 150/160	1500	160	C 45	260 520	300	0,57			6,0	54,0	
			C 80	3501000		-,			-,-	,-	
			C 125	6101520							
EdEx 200/160	2000	160	C 45	260 520	310	0,64			11,1	80,0	
			C 70	270 900		.,			,.	,-	
	1		C 130	6201600							
			C 200	8902500							
EdEx 250/160	2500	160	C 45	260 520	350	0,66			11,1	80,0	
			C 70	270 900					,	- , -	
			C 130	6201600							
			C 200	8902500							
EdEx 320/120	3200	120	C 70	530940	550	0,90			10,8	80,0	
			C 250	on request							
			C 320	on request							

The technical data is based on average values related to a temperature of devices of +20 °C.

1) Values for devices with integral brake/reset spring

2) Values measured at operational temperature; if the temperature during activation of the device is below 0 °C, the power consumption is about twice as much as for a device with a temperature of > +20 °C.

Setting times

ELDRO[®] thrusters are mainly used in brake systems. Therefore, the most important factor is the lowering time. The table on the right lists times for lowering and resetting, calculated for thrusters without an integral lowering valve, at constant nominal weight loads, at a device temperature of +20 °C.

loads, at a device temperature of +20 °C. Detailed data for adjustable delays in the case of integral lowering valves should be determined by the manufacturer based on case-by-case tests. This requires exact information concerning the conditions of use.

Туре	Lowering time	Adjustable lowering time						
	(without low ering	(with integral l	ow ering valve)					
	valve)							
		min.	max.					
	S	S	S					
EdEx 32/50	0.45	ling	corresponding ufacturer.					
EdEx 50/50	0.36	un ri	i. jo					
EdEx 80/60	0.48	r the corresponding manufacturer.	r the correspo manufacturer.					
EdEx 80/75	0.62	fac	con					
EdEx 125/60	0.36	ne c	he anu					
EdEx 125/75	0.49	a t	er t					
EdEx 150/60	0.34	the the	cuments fo consult the					
EdEx 150/75	0.44	consult	nen sult					
EdEx 200/60	0.4	uns	una					
EdEx 250/60	0.35	do do do do	do Se o					
EdEx 320/100	0.6	delivery documents for the ary, please consult the manu	delivery documents for the man					
EdEx 80/160	0.9	y, p	Z deli-					
EdEx 125/160	0.7	le c	Je (
EdEx 150/160	0.65	see the deli necessary,	see the del necessary,					
EdEx 200/160	0.85	e se	e se					
EdEx 250/160	0.8	Please : data. If	Please : data. If i					
EdEx 320/120	0.62	dati	Ple					

Operating fluid and maintenance

Explosion-proof ELDRO[®] devices are limited to the following ambient temperatures, depending on the hydraulic fluid used: ... Temperature range: -10 °C to +40 °C Hydraulic fluid: Hydrotherm 46 M Suitable ELDRO[®] devices: E I M2..., E II 2G... and E II 2D... ... Temperature range: -45 °C to +40 °C Hydraulic fluid: Xiameter PMX-200 Silicone Fluid 10,000 cst Suitable ELDRO[®] devices: E II 2G... and E II 2D Temperature range: -30 °C to +40 °C Hydraulic fluid: Pentosin CHF 11S Suitable ELDRO[®] devices: E II 2G... and E II 2D ... Exception: EdEx 32/50 series, version T4 -45 °C to +55 °C, and version T5 -45 °C to +40 °C.

 $\mathsf{ELDRO}^{\$}$ devices can only be operated with the hydraulic fluid indicated on the name plate.

Required renewal of hydraulic fluid:

mainly continuous operation S1: after 18 months of operating time mainly indexing operation S3: after 1.5 million cycles of operation

Renewal of hydraulic fluid (see safety information on the right side):

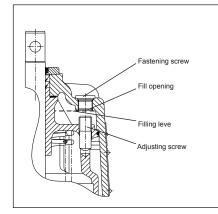
Position the ELDRO[®] thruster in a vertical position above a suitable collection tank. Then remove the filling and drain screws. After the device has been completely drained, firmly close the drain screws, and fill with new hydraulic fluid. Dispose of the used fluid in accordance with the legal provisions.

Important:

The explosion-proof ELDRO[®] thruster is sufficiently filled when the fluid level in the fill opening reaches the lower edge, while the thruster is in a vertical position and has its lifting rod retracted. In order to avoid any air being included, carry out several lifting movements. Then check the filling again and top up as needed. Finally firmly close the filling screw connections. If the thruster is not filled sufficiently, this may lead to inadmissible operating conditions.

If the fill level is too high, the liquid may cause overpressure due to the thermal expansion of the liquid.

Type key



<u>Attention:</u>

You must only change the hydraulic fluid outside of potentially explosive areas and atmospheres. Always cool the device down to room temperature. Only use the hydraulic fluid indicated on the name plate. Other fluids must not be used. Any repairs on electric operating equipment used in areas exposed to explosion should generally be carried out by the manufacturer. This applies in particular if components and subassemblies relevant for explosion protection, including the resulting gap dimensions, are affected by maintenance work.

Dust explosion protection

The ignition temperature of the dust must at least correspond to 1.5 times the maximum device surface temperature. The glow temperature of the dust must be at least 75 K above the maximum surface temperature of the device. The dust layer thickness must not exceed 5 mm. If the dust layer thickness exceeds 5mm, the safety distance between the minimum ignition temperature of deposited dust and the maximum surface temperature of the device must be increased (DIN EN 60079-14).

Device identification	EdEx 50/	′50 C	R	Н		Т	L	X.									
				S	Í				Ex	plos	sion	pro	tecti	ion			
ELDRO type				D	Τ				Æ	\mathbf{x}	2	2G	k E	Ex d II	вП	4	Gb
Brake/reset spring																	
Regulating spring																	
Lifting, lowering and throttle valve																	
Identification of installation position	Identification of installation position																
Corrosion protection																	
Sensors, limit switches																	
Adaptions, special series																	
Ex EC directives 94/9 ATEX																	
Group of devices																	
Category of devices																	
Type of protection for non-electrica	al equipme	ent "Prote	ection	by l	iquic	d imr	mers	ion"									
Type of protection for electrical eq	uipment: "r	pressure	e-proo	f ho	usin	gs" a	accor	rdin	g to) _							
Explosion protection																	
Temperature class																	
Equipment Protection Level identif	ication																

Explosion proofness Applied Standards

EN 13463-8:2004: Non-electric devices for use in potentially explosive areas – part 8 - Protection by liquid encapsulation "k"

EN 60079-0:2009: Explosive atmosphere - part 0 – Devices – General requirements

EN 60079-1:2007: Explosive atmosphere - part 1 – Device protection by pressure-proof housing "d"

EN 60079-7:2007: Explosive atmosphere- part 7 – Device protection by increased safety "e" EN 60079-31:2009: Explosive atmospheres – Part 31. Equipment dust ignition protection by enclosure "t"

Please note:

The maximum gap length and width for the purpose of additional explosion protection are dimensioned to deviate from the provisions as per EN 60079-1, tab. 1 and 2. Higher gap lengths and lower gap widths must not be changed as these form the basis for practical tests and type examination test certificates.

Identification

For use in pits exposed to firedamp a) (methane gas) È I M2 k Ex d I Mb or E I M2 k Ex de I Mb For use in other explosive areas b) E II 2G k Ex d IIB T4 Gb or E II 2G k Ex de IIB T4 Gb, E II 2G k Ex d IIC T4 Gb or E II 2G k Ex de IIC T4 Gb E II 2G k Ex d IIC T5 Gb (upon request) È II 2G k Ex de IIC T5 Gb (upon request) For dust explosion protection C) E II 2D k Ex tb IIIC T130 °C Db Ip65

Zonal structure

Test certificate

BVS 05 ATEX E 074 X

The max. surface temperature does not exceed a value of 130 °C even in the event of failure. The ignition temperature of gases must therefore not fall below a value of 130 °C as per the latest version of DIN EN 14522.

Mechanical design

Installation position

In a vertical position and intermediate positions up to 60° off the vertical position (identification "II"), the lifting rod should allow unlimited upward movement but should on no account be moved in a downward direction.

For a horizontal position and intermediate positions up to 30° off the horizontal position (identification "I"), please consult the manufacturer.

Coatings

For ELDRO devices for gas of group IIA/IIB, external coatings and/or non conductive coatings must not exceed 2 mm, for gas of group IIC they must not exceed 0.2 mm.

Paint

Colour RAL 5008, grey-blue (other RAL shades optional)

Paint structure, corrosion protection

Two-component epoxy primer filler, two component polyacrylic primer, two-component single layer topcoat based on polyacrylate, scratch and shock resistant, total dry layer thickness 80 µm (optional multilayer structure up to 180 µm)

Electric design

Motor

3 phase squirrel-cage motor, design to VDE 0530, performance data to "technical values" section or to the details on the name plate, insulation and insulation material class F to VDE 0530, for performance data see section "technical data" or name plate, insulation according to material class F.

Operating modes

Continuous duty S1 and switching operation S3 at max 240 c/h, up to 60 % duty cycle.

Ambient temperature, voltage, frequency See name plate

Type of protection

Connection

Junction plate, 4 pole (L1, L2, L3, N), conductor cross-section up to 4 x 2.5 mm² grounding outside M5

Cable entry for Ex d and Ex de designs Thread M20x1.5

up to max. cable outside diameter of 16 mm thread M25x1.5 up to max outside cable diameter of 26 mm type HAWKE 653 (E I M2) or type HAWKE ICG 653 (E II 2G and 2D) thread 3/4" NPT up to max. outside cable diameter of 19 mm type GOTHE 2602.NPT 3/4 A (E II 2G and 2D)

Cable entry only for Ex d design

Thread M25x1.5 up to max. outside cable diameter of 18mm type GOTHE 54232.18 M28 (E I M2, II 2G and 2D)

Cable entry only for Ex de design Thread M28x1.5

up to max. outside cable diameter of 18 mm type GOTHE 54242.18 M28 (E I M2, II 2G and 2D)

Exchange or replacement only with metal cable entries certified for the application!

Additional equipment

Lifting, lowering and throttle valve The integral valve system enables the continuous extension of the adjusting and/or reset times. The adjustment is made using an adjusting screw which can be found inside the device and is accessible once the external locking screw (see illustration page 3) has been removed. The tool needed for this is an 8 mm Allen key. The adjusting range goes from 0 to 6 revolutions (0 = CLOSED = max. delay). If no time has been defined, 3 revolutions (starting from the zero position) is the factory setting. Adjusting diagrams can be obtained from the manufacturer upon request.

Brake/reset spring (C spring)

integral C spring to generate the braking/reset force

Control/dampening spring (R spring) to dampen acyclic settling of the brake to match the lifting rod

Position indicator, sensors, limit switches (L...)

See separate sensor/switch name plates

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•

Commissioning

For ELDRO[®] characteristics, see name plate (1)

The device comes ready to put into operation, filled with hydraulic liquid (for the type, see the name plate (1)). Filling screws must not be opened by unauthorized people, as a loss of liquid could affect the technical values or lead to malfunction.

For the installation position, please see the above information. Take care with regard to the working direction of the lifting rod (2).

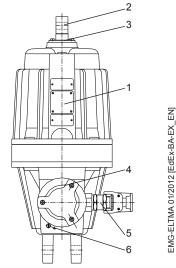
Movability of the device must be ensured, and the lifting rod (2) must not be subject to lateral forces.

Keep the terminal box (4) clean. Make sure the seal is correctly positioned and intact. Firmly close the terminal box (4). Check for tightness and ensure that the cable entry has been properly installed (5).

ELDRO[®] thrusters with integral brake springs are identified on the name plate (1) by "C...". Make sure that the brake has no spring and is not subject to load.

When painting the device after delivery, protect the lifting rod (2) and the gasket system (3). Risk of leakage!

Check the voltage supply against the data on the name plate (1), then make the electrical connection in line with the terminal diagram on the inside of the terminal box frame (4). The phases may be carried out in any sequence. Earthing must have a grounding resistance of < 106 Ohm. Connect to the grounding screw (6) using a suitable cable lug, with a minimum conductor cross-section of 4 mm².



Subject to modification

Operation

To avoid a layer of dust thicker than 5mm from accumulating on the device, clean it on a regular basis.

Make sure the device does not come into contact with substances that could affect the material it is made of.

Attention:

Never open the device while it is hot. Only open it away from explosive areas. Any hydraulic fluid which leaks could lead to serious injuries. Prior to servicing, allow the device to cool down at least to room temperature.

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