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English

COLUMBUS McKINNON

Translation

Operating instruction/ Assembling instruction Electromechanical Linear Actuator ELA

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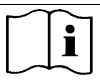
ALLTEC antriebstechnik

1 General information 3
2 Technical specifications 4
3 Initial operation 8
4 Assembly 8
5 Accessories 10
6 Electrical installation 15
7 Operation 17
8 Inspection and maintenance instructions 19
9 Operational malfunctions and their causes 21

Explanation of the symbols

	Practical information
	Warning against a general hazard. Risk of injury due to neglect.
	Warning against electrical voltage. Severe risk of injury due to neglect.
	Information on the safety screw jacks
	Danger of explosion
	Important information for use in spaces with explosion hazards
	Important information
	Assembly and setting information
	Disposal

1 General information

Always observe and follow these operating instructions when using the equipment.

Read these operating instructions carefully before initial operation and keep them available to all responsible persons.

Carefully observe the safety information.

Store the operating instructions and documents carefully.

1.1 Transport, storage, preservation

Inspect the linear drives promptly upon delivery for possible transport damage. Notify the transport company about this immediately. The initial operation of the drives may be prohibited for safety reasons.

1.2 Intended use

The electromechanical linear drive "ELA" serves as an adjustment drive within a machine for lifting, lowering or for horizontal moving of loads or for the transfer of forces. The linear drive is intended for fastening between bolt bearings.

Not suitable for use in spaces with explosion hazards.

Not suitable for use in aggressive environments.

If used outdoors, the device and the electrical controls need to be protected by a rain roof.

Changes to the operating conditions or modifications to our drives are permissible only with our express written approval.

1.3 Safety information

Assembly, operation and maintenance only by authorised and knowledgeable personnel.

(Definition for qualified personnel acc. to IEC 364) Qualified personnel are persons who - because of their education, experience, instructions and knowledge about corresponding standards and regulations, rules for the prevention of accidents, and operating conditions - are authorised by the person responsible for the safety of the plant to perform the required actions and who are able to recognise potential hazards.

⇨ It is prohibited to stay in the danger area or to use the equipment to transport persons.

⇨ No lateral forces may act on the ELAs.

⇨ Defects are to be rectified immediately in a competent manner.

⇨ Permitted loads and power-on time may not be exceeded.

⇨ Even singular overheating may cause premature wear.

⇨ Ball thread spindles are not self-locking or self-braking. ELAs with ball screw spindle are available **only with** brake motor.

⇨ To reduce the overtravel distance of ELA with trapezoidal thread spindles, we recommend using a brake motor. The brake control should be executed for direct and alternating current-side interruption (quick actuation of the brake, see chapter 7.4).

⇨ To limit the stroke, stroke limit switches and, depending on the application or the guideline (regulation) to be met, additional safety limit switches are required. The stroke limits can be executed by customer-provided limit switches or an optionally available, installed stroke limit.

⇨ Unintended overrunning of the end positions needs to be prevented by on-site mechanical end stops or the like (limit switches, safety limit switches, and so forth).

⇨ Secure the load or the ELA against turning on-site or by the optionally available torsional lock.

1.4 Accident prevention regulations

Observe applicable regulations in the country of use[1)]

in Germany at present:

EC Guideline 2006/42/EC

EC Low voltage guideline 2006/95/EC

EC Guideline EMC 2004/108/EC

DIN EN 12100-1 Safety of machines

DIN EN 12100-2

DIN EN 1494 Drivable mobile lift unit and similar devices

EN 60204 T1, "Electrical Machine Components"

EN 60204 T32, Electrical Machine Components - Hoists (VDE 0100 T726)

[1)] in the respective valid version

1.5 Electric parts

Electrical installations and repairs of electrical components may be done only by trained electricians.

The safety guidelines and standards for electrical work are to be observed.

Maintenance of the electrical system may be done only when the current supply is interrupted.

1.6 Daily inspections

- ⇨ Function switch UP - DOWN
- ⇨ Limit stop switches
- ⇨ Emergency stop equipment
- ⇨ Main switch
- ⇨ El. overload protection (mandatory as of 1000 kg)
- ⇨ Controls
- ⇨ Brake function (motor brake)
- ⇨ Supporting structure
- ⇨ Mechanical fastening
- ⇨ Check that the screws are tight

2 Technical specifications

2.1 Type key

ELA - Tr - 10.1 - H - 1

Spindle type
Tr = Trapezoidal thread spindle
Ku = Recirculating ball screw

Size
10.1; 20.1; 30.1; 40.1

Ratio
H; V; N; L

Motor
0 = without Motor
1 = 3-phase AC-Motor
2 = 3-phase AC-Motor with brake
3 = 1-phase AC-Motor
4 = 1-phase AC-Motor with brake
5 = DC Motor
6 = DC Motor with brake
7 = Free shaft end

Observe the technical data according to our order confirmation.

2.2 ELA with 3-phase AC motor

230/400V-50Hz			Trapezoidal thread spindle				Ball thread spindle			
Size			**10.1**	**20.1**	**30.1**	**40.1**	**10.1**	**20.1**	**30.1**	**40.1**
Worm gear			Tr 13.5x3	Tr 16x4	Tr 22x5	Tr 22x5	Ku 12x5	Ku 16x5	Ku 20x5	Ku 25x6
Axial force static	F_{stat}	[daN]	250	450	800	1300	250	450	800	1300
Motor power	**P**	[kW]	0,09	0,12	0,25	0,55	0,09	0,12	0,25	0,55
Operating mode			S3-20 %							
Ratio H			10.1 Tr H	20.1 Tr H	30.1 Tr H	40.1 Tr H	10.1 Ku H	20.1 Ku H	30.1 Ku H	40.1 Ku H
Tensile force / pressure	F_{dyn}	[daN]	55	125	150	500	60	135	300	655
Ratio		i	4 : 1	4 : 1	2,78 : 1	6,75 : 1	4 : 1	4:1	2,78 : 1	6,75 : 1
Lift speed	**V**	[mm/s]	35	46,6	84	34,5	59	58	84	41,5
				w brake		w brake	w brake	w brake	w brake	w brake
			Switching off the drive may result an overtravel. The overtravel is to consider during the adjustment of the limit switches.							
Required holding torque, torque support (w/o torsional lock)		[Nm]	1,2	3,5	3,6	19,5	1,4	3	7,8	20
Ratio V			10.1 Tr V	20.1 Tr V	30.1 Tr V	40.1 Tr V	10.1 Ku V	20.1 Ku V	30.1 Ku V	40.1 Ku V
Tensile force / pressure	F_{dyn}	[daN]	90	165	350	650	95	215	580	850
Ratio		i	6,5 : 1	6,5 : 1	5 : 1	10 : 1	6,5 : 1	6,5 : 1	5 : 1	10 : 1
Lift speed	**V**	[mm/s]	22	31	46,6	23,3	36	37	47	28
							w brake	w brake	w brake	w brake
			Switching off the drive may result an overtravel. The overtravel is to consider during the adjustment of the limit switches.							
Required holding torque, torque support (w/o torsional lock)		[Nm]	2	4,5	13,2	25	2	5	15	26
Ratio N			10.1 Tr N	20.1 Tr N	30.1 Tr N	40.1 Tr N	10.1 Ku N	20.1 Ku N	30.1 Ku N	40.1 Ku N
Tensile force / pressure	F_{dyn}	[daN]	160	275	600	1000	190	350	600	1300
Ratio		i	15 : 1	15 : 1	10 : 1	20 : 1	15 : 1	15 : 1	10 : 1	20 : 1
Lift speed	**V**	[mm/s]	9	13	23,3	11,5	16	15,6	23,3	14
							w brake	w brake	w brake	w brake
			Switching off the drive may result an overtravel. The overtravel is to consider during the adjustment of the limit switches.							
Required holding torque, torque support (w/o torsional lock)		[Nm]	3,5	6,8	22	39	4,3	8,5	15,4	40
RatioL			10.1 Tr L	20.1 Tr L	30.1 Tr L	40.1 Tr L	10.1 Ku L	20.1 Ku L	30.1 Ku L	40.1 Ku L
Tensile force / pressure	F_{dyn}	[daN]	200	350	600	1000	250	350	600	1300
Ratio		i	25 : 1	25 : 1	20 : 1	25 : 1	25 : 1	25 : 1	20 : 1	25 : 1
Lift speed	**V**	[mm/s]	5,5	7,5	11,7	9	9	9	11,7	11
							w brake	w brake	w brake	w brake
			Switching off the drive may result an overtravel. The overtravel is to consider during the adjustment of the limit switches.							
Required holding torque, torque support (w/o torsional lock)			4,5	10	22	39	5,4	8,5	15,4	40
Suitable for an ambient temperature			0 °C to +40 °C							

w brake= only with brake motor (DC and AC side braking (quick braking) see chapter 7.4)

If there is a relatively accurate stop position required, ELA with brake motor is necessary (see chapter 3).
DC and AC side braking (quick braking) is necessary (see chapter 7.4)

2.3 ELA with 1-phase AC motor

230 V, 50 Hz			Trapezoidal thread spindle				Ball thread spindle			
Size			**10.1**	**20.1**	**30.1**	**40.1**	**10.1**	**20.1**	**30.1**	**40.1**
Worm gear			Tr 12x3	Tr 16x4	Tr 22x5	Tr 22x5	Ku 12x5	Ku 16x5	Ku 20x5	Ku 25x6
Axial force static	F_{stat}	[N]	2500	4500	8000	13000	2500	4500	8000	13000
Motor power	**P**	[kW]	0,09	0,12	0,25	0,55	0,09	0,12	0,25	0,55
Operating mode			S3-20 %							
Ratio H			10.1 Tr H	20.1 Tr H	30.1 Tr H	40.1 Tr H	10.1 Ku H	20.1 Ku H	30.1 Ku H	40.1 Ku H
Tensile force / pressure	F_{dyn}	[N]	550	1200	1100	3500	700	1250	2200	5500
Ratio		i	4 : 1	4 : 1	2,78 : 1	6,75 : 1	4 : 1	4:1	2,78 : 1	6,75 : 1
Lift speed	**V**	[mm/s]	35	46,6	84	34,5	59	58	84	42
					w brake		w brake	w brake	w brake	w brake
			Switching off the drive may result an overtravel. The overtravel is to consider during the adjustment of the limit switches.							
Required holding torque, torque support (w/o torsional lock)		[Nm]	1,3	3,6	4	10	1,6	3	7,8	17
Ratio V			10.1 Tr V	20.1 Tr V	30.1 Tr V	40.1 Tr V	10.1 Ku V	20.1 Ku V	30.1 Ku V	40.1 Ku V
Tensile force / pressure	F_{dyn}	[N]	900	1600	2500	5300	1000	2000	4200	7500
Ratio		i	6,5 : 1	6,5 : 1	5 : 1	10 : 1	6,5 : 1	6,5 : 1	5 : 1	10 : 1
Lift speed	**V**	[mm/s]	22	31	46,6	23,3	36	37	47	28
							w brake	w brake	w brake	w brake
			Switching off the drive may result an overtravel. The overtravel is to consider during the adjustment of the limit switches.							
Required holding torque, torque support (w/o torsional lock)		[Nm]	2	4,8	9,4	20	2,3	3,9	15	23
Ratio N			10.1 Tr N	20.1 Tr N	30.1 Tr N	40.1 Tr N	10.1 Ku N	20.1 Ku N	30.1 Ku N	40.1 Ku N
Tensile force / pressure	F_{dyn}	[N]	1600	2300	4500	8500	2000	3500	4500	13000
Ratio		i	15 : 1	15 : 1	10 : 1	20 : 1	15 : 1	15 : 1	10 : 1	20 : 1
Lift speed	**V**	[mm/s]	9	13	23,3	11,5	16	15,6	23,3	14
							w brake	w brake	w brake	w brake
			Switching off the drive may result an overtravel. The overtravel is to consider during the adjustment of the limit switches.							
Required holding torque, torque support (w/o torsional lock)		[Nm]	3,7	6,8	17	33	4,5	3,6	15,5	40
Ratio L			10.1 Tr L	20.1 Tr L	30.1 Tr L	40.1 Tr L	10.1 Ku L	20.1 Ku L	30.1 Ku L	40.1 Ku L
Tensile force / pressure	F_{dyn}	[N]	2000	3500	6000	10000	2500	3500	6000	13000
Ratio		i	25 : 1	25 : 1	20 : 1	25 : 1	25 : 1	25 : 1	20 : 1	25 : 1
Lift speed	**V**	[mm/s]	5,5	7,5	11,7	9	9	9	11,7	11
							w brake	w brake	w brake	w brake
			Switching off the drive may result an overtravel. The overtravel is to consider during the adjustment of the limit switches.							
Required holding torque, torque support (w/o torsional lock)		[Nm]	4,5	10	22,5	39	5,7	8,5	15,5	40
Suitable for an ambient temperature 0 °C to +40 °C										

w brake= only with brake motor (DC and AC side braking (quick braking) see chapter 7.4)

If there is a relatively accurate stop position required, ELA with brake motor is necessary (see chapter 3).
DC and AC side braking (quick braking) is necessary (see chapter 7.4)

2.4 ELA with direct current motor

24 V DC			Trapezoidal thread spindle				Ball thread spindle			
Size			**10.1**	**20.1**	**30.1**	**40.1**	**10.1**	**20.1**	**30.1**	**40.1**
Worm gear			Tr 13.5x3	Tr 16x4	Tr 22x5	Tr 22x5	Ku 12x5	Ku 16x5	Ku 20x5	Ku 25x6
Axial force static	F_{stat}	[daN]	250	450	800	1300	250	450	800	1300
Motor power	**P**	[kW]	0,09	0,12	0,25	0,55	0,09	0,12	0,25	0,55
Operating mode			S3-20 %							
Ratio H			Tr 10.1 H	Tr 20.1 H	Tr 30.1 H	Tr 40.1 H	Ku 10.1 H	Ku 20.1 H	Ku 30.1 H	Ku 40.1 H
Tensile force / pressure	F_{dyn}	[daN]	55	125	150	500	60	135	300	655
Ratio		i	4 : 1	4 : 1	2,78 : 1	6,75 : 1	4 : 1	4:1	2,78 : 1	6,75 : 1
Lift speed	**V**	[mm/s]	35	46,6	84	34,5	59	58	84	41,5
				w brake	w brake	w brake	w brake	w brake	w brake	w brake
			Switching off the drive may result an overtravel. The overtravel is to consider during the adjustment of the limit switches.							
Required holding torque, torque support (w/o torsional lock)		[Nm]	1,5	3,5	4	13	1,7	3	5,5	17
Ratio V			Tr 10.1 V	Tr 20.1 V	Tr 30.1 V	Tr 40.1 V	Ku 10.1 V	Ku 20.1 V	Ku 30.1 V	Ku 40.1 V
Tensile force / pressure	F_{dyn}	[daN]	90	165	350	650	95	215	580	850
Ratio		i	6,5 : 1	6,5 : 1	5 : 1	10 : 1	6,5 : 1	6,5 : 1	5 : 1	10 : 1
Lift speed	**V**	[mm/s]	22	31	46,6	23,3	36	37	47	28
				w brake	w brake		w brake	w brake	w brake	w brake
			Switching off the drive may result an overtravel. The overtravel is to consider during the adjustment of the limit switches.							
Required holding torque, torque support (w/o torsional lock)		[Nm]	2,5	4,5	9,5	20	2,5	3	11	23
Ratio N			Tr 10.1 N	Tr 20.1 N	Tr 30.1N	Tr 40.1 N	Ku 10.1 N	Ku 20.1 N	Ku 30.1 N	Ku 40.1 N
Tensile force / pressure	F_{dyn}	[daN]	160	275	600	1000	190	350	600	1300
Ratio		i	15 : 1	15 : 1	10 : 1	20 : 1	15 : 1	15 : 1	10 : 1	20 : 1
Lift speed	**V**	[mm/s]	10	13	23,3	11,5	15	15,6	23,3	14
							w brake	w brake	w brake	w brake
			Switching off the drive may result an overtravel. The overtravel is to consider during the adjustment of the limit switches.							
Required holding torque, torque support (w/o torsional lock)		[Nm]	3	7	17	33	3,5	8,5	11	40
RatioL			Tr 10.1 L	Tr 20.1 L	Tr 30.1 L	Tr 40.1 L	Ku 10.1 L	Ku 20.1 L	Ku 30.1 L	Ku 40.1 L
Tensile force / pressure	F_{dyn}	[daN]	200	350	600	1000	250	350	600	1300
Ratio		i	25 : 1	25 : 1	20 : 1	25 : 1	25 : 1	25 : 1	20 : 1	25 : 1
Lift speed	**V**	[mm/s]	5,5	7,5	11,7	9	9	9	11,7	11
							w brake	w brake	w brake	w brake
			Switching off the drive may result an overtravel. The overtravel is to consider during the adjustment of the limit switches.							
Required holding torque, torque support (w/o torsional lock)		[Nm]	4,5	10	22	40	5,5	8,5	15	40
Suitable for an ambient temperature			0 °C to +40 °C							

w brake= only with brake motor (DC and AC side braking (quick braking) see chapter 7.4)

If there is a relatively accurate stop position required, ELA with brake motor is necessary (see chapter 3).
DC and AC side braking (quick braking) is necessary (see chapter 7.4)

2.5 Functional description

The electromechanical linear drive "ELA" consists of a worm gear with axial bearing and with worm gear drive.

By means of a worm gear drive (trapezoidal thread or ball-type linear drive), the rotational movement is converted into a longitudinal movement.

The drive is provided by a three-phase rotary current, single-phase alternating current or direct current motor.

The load protection is provided, depending on the version, by self-locking and electromagnetic disc brake.

To reduce the overtravel distance, an electromagnetic disc brake can be supplied for self-locking worm gear drives.

3 Initial operation

⇨ Before the first start up and after significant modifications, the device including the support structure needs to be inspected by an expert (authorised person).

⇨ Drives with ball thread spindle are not self-locking capable and may be used only with brake motor.

⇨ Depending on requirements, we recommend a brake motor to reduce the overtravel.

⇨ To limit the stroke, stroke limit switches and, depending on the application or the guideline (regulation) to be met, additional safety limit switches are required. The stroke limits can be executed by customer-provided limit switches or an optionally available, installed stroke limit. These have to be provided and tested according to the respective standards.

⇨ **The limit switches have to be integrated with the correct function into the regulatory circuit. The responsibility lies here with the manufacturer of the entire plant.**
With built-in limit switches, be sure to check the function in connection with the entire plant.
If the polarization or connection is faulty, the end switches are ineffective.

Attention:Do not activate the ELA before setting and connecting the limit switches.

Please note:

◆ **There is a overtravel distance when switching on or braking the drive. For the reference value of the overtravel distance see the technical specifications.**

◆ **During the commissioning, especially in the load direction "lower", set the switch point before the end position is reached.**

⇨ **Regular inspection of the set switch-off paths are required.**

⇨ **The thrust pipe needs to be secured against turning. The securing against the turning of the thrust pipe against the housing can be provided by the on-site construction. In case the torsional lock is not possible by on-site restraints, the ELA with integrated torsional lock can be used.**

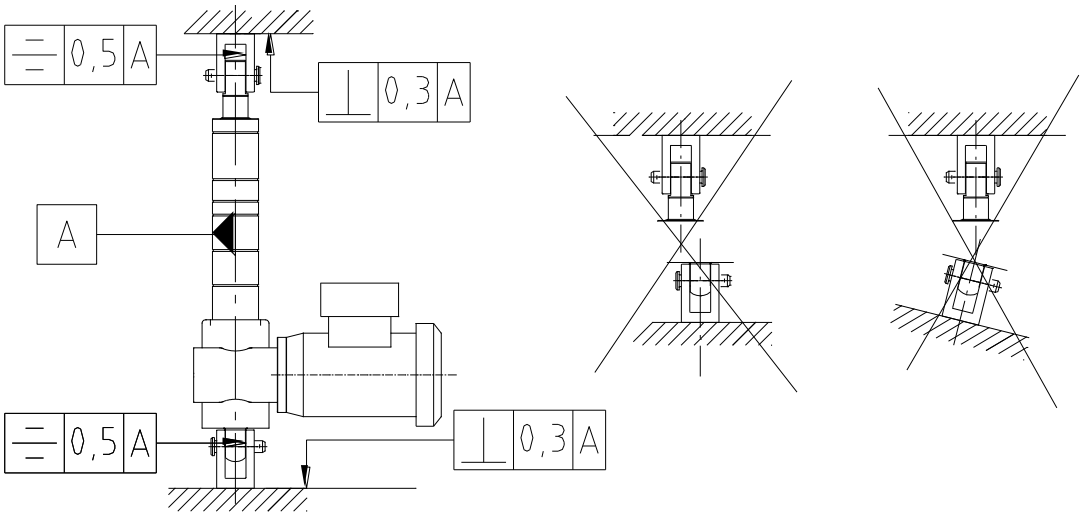
⇨ **To limit the stroke, stroke limit switches should basically be installed. The protection needs to be ensured on site.**

⇨ **Unintended overrunning of the end positions needs to be prevented by on-site mechanical end stops or the like (limit switches, safety limit switches, and so forth).**

4 Assembly

The supporting structure needs to be constructed in relation to the occurring forces (see also technical data) **and the torques. (Impact factors need to be taken into account depending on the application (guidelines), e.g. 1.25)**

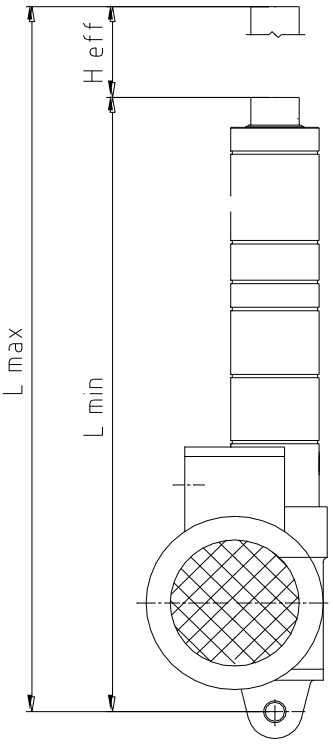
The ELA needs to be aligned as illustrated. Greater deviations and misalignment cause lateral forces. Misalignments or lateral forces reduce the service life or lead to premature malfunction of the device.



4.1 Mechanical fastening of the console (only for sizes 20.1 and 30.1)

Size ELA	20.1	30.1
Screws	M 8	M 8
Quality class	min. 8.8	min. 8.8
Number of screws	2	2
Tightening torque	***max. 4 Nm***	***max. 4 Nm***

4.2 Installation dimensions for versions without stroke limits



		Nominal stroke	L_{min}	L_{max}	H_{eff} (effective stroke)
ELA 10.1	[mm]	100	269	369	100
	[mm]	200	369	569	200
	[mm]	300	469	769	300
	[mm]	400	569	969	400
ELA 10.1 Ku	[mm]	100	284	369	85
	[mm]	200	384	569	185
	[mm]	300	484	769	285
	[mm]	400	584	969	385
ELA 20.1	[mm]	200	390	590	200
	[mm]	400	590	990	400
	[mm]	600	790	1390	600
ELA 20.1 Ku	[mm]	200	411	596	185
	[mm]	400	611	996	385
	[mm]	600	811	1396	585
ELA 30.1	[mm]	200	420	620	200
	[mm]	400	620	1020	400
	[mm]	600	820	1420	600
	[mm]	800	1020	1820	800
ELA 30.1 Ku	[mm]	200	430	620	190
	[mm]	400	630	1020	390
	[mm]	600	830	1420	590
	[mm]	800	1030	1820	790
ELA 40.1	[mm]	200	475	675	200
	[mm]	400	675	1075	400
	[mm]	600	875	1475	600
	[mm]	800	1075	1875	800
ELA 40.1 Ku	[mm]	200	485	675	190
	[mm]	400	685	1075	390
	[mm]	600	885	1475	590
	[mm]	800	1085	1875	790

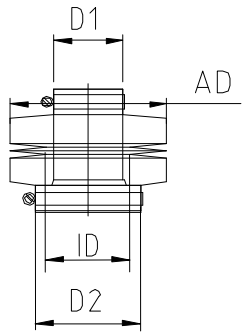
5 Accessories

5.1 Bellows (option)

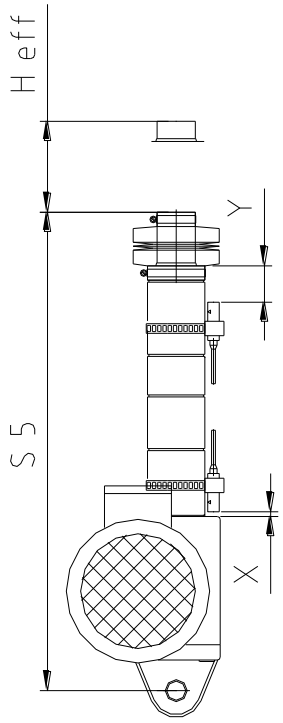
(not in connection with mechanical stroke limit):

⇨ VA clamps and air screens
⇨ Material PN-XT
⇨ Temperature range from 0 °C to +40 °C

Size	ID [mm]	AD [mm]	D1 [mm]	D2 [mm]
ELA 10.1	ø30	ø72	ø25x12	ø36x12
ELA 20.1	ø36	ø78	ø30x15	ø55x15
ELA 30.1	ø36	ø78	ø30x15	ø55x15
ELA 40.1	ø48	ø90	ø40x15	ø60x15



5.1.1 Installation dimensions

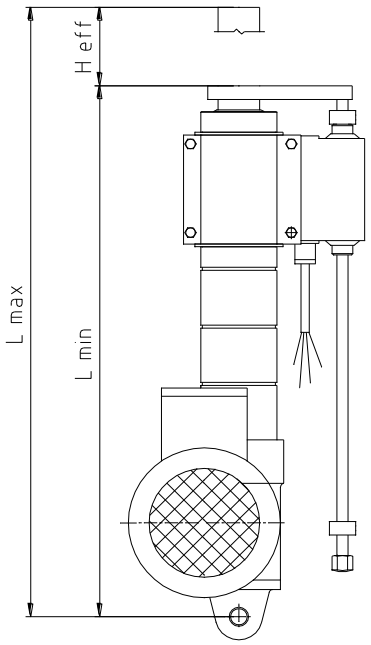


		Nominal stroke	S5	H_{eff} (effective stroke)	≥X	≥Y
ELA 10.1	[mm]	100	288	78	32	0
	[mm]	200	398	168	32	10
	[mm]	300	508	258	32	20
	[mm]	400	618	348	32	30
ELA 10.1 Ku	[mm]	100	306	60	50	0
	[mm]	200	406	160	50	0
	[mm]	300	506	260	50	0
	[mm]	400	616	350	50	10
ELA 20.1	[mm]	200	424	170	25	20
	[mm]	400	644	350	25	40
	[mm]	600	869	525	25	65
ELA 20.1 Ku	[mm]	200	426	165	28	22
	[mm]	400	646	345	28	42
	[mm]	600	871	520	28	67
ELA 30.1	[mm]	200	446	170	25	20
	[mm]	400	666	350	25	40
	[mm]	600	891	525	25	65
	[mm]	800	1111	705	25	85
ELA 30.1 Ku	[mm]	200	450	160	31	24
	[mm]	400	670	340	31	44
	[mm]	600	895	515	31	69
	[mm]	800	1115	695	31	89
ELA 40.1	[mm]	200	500	175	43	15
	[mm]	400	720	355	43	35
	[mm]	600	945	530	43	60
	[mm]	800	1165	710	43	80
ELA 40.1 Ku	[mm]	200	500	175	38	20
	[mm]	400	720	355	38	40
	[mm]	600	945	530	38	65
	[mm]	800	1165	710	38	85

5.2 Electromechanical stroke limit (option)

For versions with electromechanical stroke limit, there are different stroke and installation dimensions.
Observe the respectively valid offer drawings or chapter 5.2.1

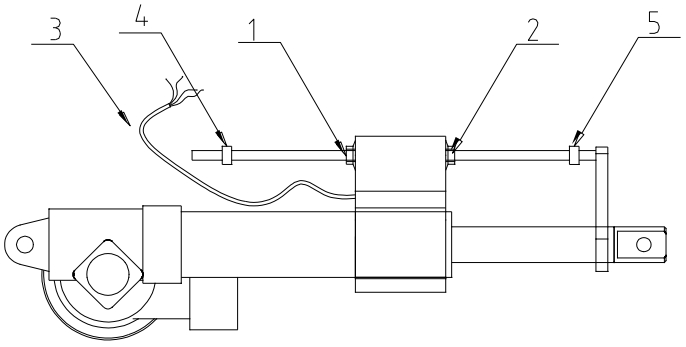
5.2.1 Installation dimensions



		Nominal stroke	L_{min}	L_{max}	H_{eff} (effective stroke)
ELA 10.1	[mm]	100	269	369	100
	[mm]	200	369	569	200
	[mm]	300	469	769	300
	[mm]	400	569	969	400
ELA 10.1 Ku	[mm]	100	284	369	85
	[mm]	200	384	569	185
	[mm]	300	484	769	285
	[mm]	400	584	969	385
ELA 20.1	[mm]	200	390	590	200
	[mm]	400	590	990	400
	[mm]	600	790	1390	600
ELA 20.1 Ku	[mm]	200	411	596	185
	[mm]	400	611	996	385
	[mm]	600	811	1396	585
ELA 30.1	[mm]	200	420	620	200
	[mm]	400	620	1020	400
	[mm]	600	820	1420	600
	[mm]	800	1020	1820	800
ELA 30.1 Ku	[mm]	200	430	620	190
	[mm]	400	630	1020	390
	[mm]	600	830	1420	590
	[mm]	800	1030	1820	790
ELA 40.1	[mm]	200	475	675	200
	[mm]	400	675	1075	400
	[mm]	600	875	1475	600
	[mm]	800	1075	1875	800
ELA 40.1 Ku	[mm]	200	485	675	190
	[mm]	400	685	1075	390
	[mm]	600	885	1475	590
	[mm]	800	1085	1875	790

5.2.2 Technical specifications (limit switch with quick action contact)

Protection class	IP 54
Nominal voltage	max. 250 V (AC) / 30 V (DC)
Switching current (Ohm resistive load)	0.1 A (AC) / 0.1A (DC)
Connection cable	1 m; 5x0.5mm^2



1 Limit switch 1
2 Limit switch 2
3 Connection cable, cable configuration, see Chap. 5.2.3
4 Setting ring 1 for position: "Extended"
5 Setting ring 2 for position: "Retracted"

5.2.3 Set electromechanical stroke limit

The setting rings of the electromechanical stroke limit are factory set to 2/3 of the nominal stroke (see Chap. 5.2.1).

Limit switch 1
for position "Extended"
Cable no. 1
2
Contact: Opener (NC)

Limit switch 2
for position "Retracted"
Cable no. 3
4
Contact: Opener (NC)

Protective earth conductor (earthing): green/yellow

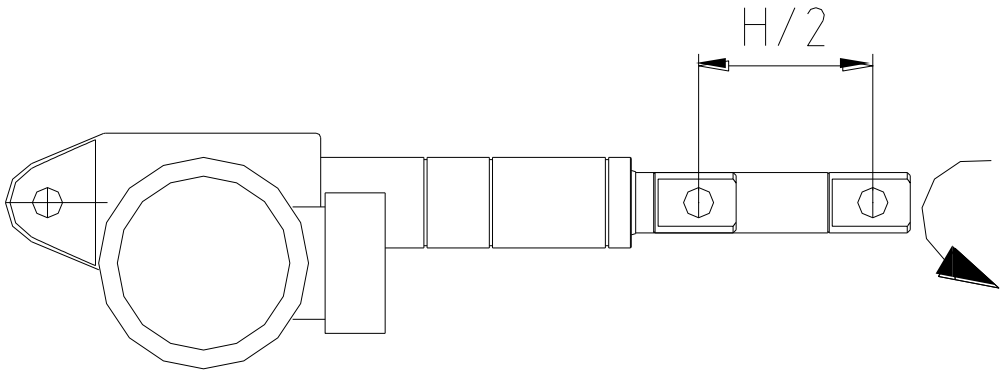
1. **Before installation,** move ELA into middle stroke position (see Chap. 5.3)
2. Check the function of the limit switch for the respective sense of rotation by manually activating the switch during the drive in the respective direction.
   Limit switch 1 for direction "Extended"
   Limit switch 2 for direction "Retracted"
3. Adjust the settings rings for the limit switches so that a stroke switch-off occurs still before the mechanical end position.
   (L_{min} and L_{max} see Chapter 5.2.3)
4. The position of the setting rings is secured by a headless screw. Screw in the headless screw and tighten.

Deviations from the installation dimensions (see Chapter 5.2.1) **causes damages to the drives.** Unintended overrunning of the extended stroke position needs to be prevented by on-site mechanical end stops or the like.

Depending on the existing overtravel path a brake motor is necessary.

5.3 Setting the middle stroke position

H/2 = Stroke/2



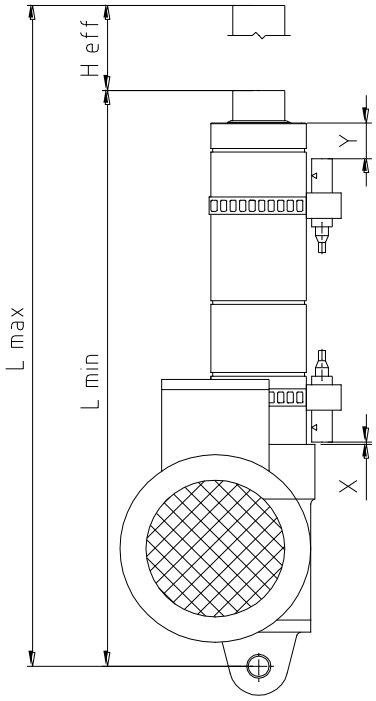
On versions **without** torsional lock and **without** mechanical stroke limit by turning on the thrust pipe.

On versions **with** torsional lock or **with** mechanical stroke limit, determine the sense of rotation by briefly starting up the motor and then setting the middle stroke position by motor.

5.4 Reed contact switch, stroke limit (option)

For versions with reed contact switch, stroke limit, there are different stroke and installation dimensions.
Observe the respectively valid offer drawings or chapter 5.4.1

5.4.1 Installation dimensions



		Nominal stroke	L_{min}	L_{max}	H_{eff} (effective stroke)
ELA 10.1 X ≥ 0 Y ≥ 32	[mm]	100	288	366	78
	[mm]	200	388	566	178
	[mm]	300	488	766	278
	[mm]	400	588	966	378
ELA 10.1 Ku X ≥ 0 Y ≥ 50	[mm]	100	306	366	60
	[mm]	200	406	566	160
	[mm]	300	506	766	260
	[mm]	400	606	966	360
ELA 20.1 X ≥ 0 Y ≥ 25	[mm]	200	404	594	190
	[mm]	400	604	994	390
	[mm]	600	804	1394	590
ELA 20.1 Ku X ≥ 7 Y ≥ 28	[mm]	200	411	591	180
	[mm]	400	611	991	380
	[mm]	600	811	1391	580
ELA 30.1 X ≥ 0 Y ≥ 25	[mm]	200	426	616	190
	[mm]	400	626	1016	390
	[mm]	600	826	1416	590
	[mm]	800	1026	1816	790
ELA 30.1 Ku X ≥ 14 Y ≥ 31	[mm]	200	440	610	170
	[mm]	400	640	1010	370
	[mm]	600	840	1410	570
	[mm]	800	1040	1810	770
ELA 40.1 X ≥ 0 Y ≥ 43	[mm]	200	485	675	190
	[mm]	400	685	1075	390
	[mm]	600	885	1475	590
	[mm]	800	1085	1875	790
ELA 40.1 Ku X ≥ 5 Y ≥ 38	[mm]	200	485	675	190
	[mm]	400	685	1075	390
	[mm]	600	885	1475	590
	[mm]	800	1085	1875	790

5.4.2 Technical specifications

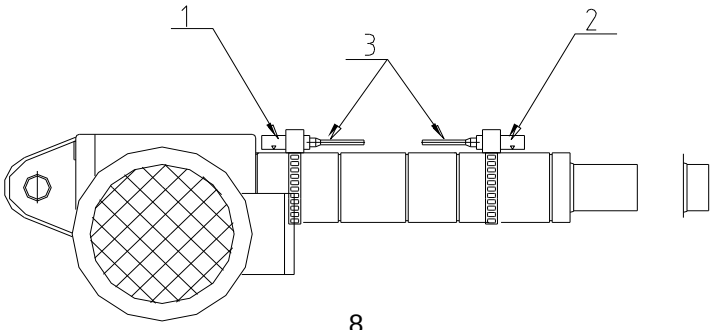
Protection class	IP 67
Nominal voltage	10..150 V (AC/DC)
Switching capacity	max. 20 W / VA
Switching current (Ohm resistive load)	max. 500 mA
Connection cable	2 m, 2x 0.25 mm^2

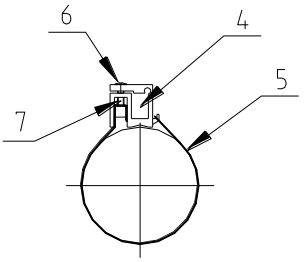
5.4.3 Setting the reed contact switch, stroke limit

The limit switches of the stroke limit are factory set to the middle stroke position of the device.

1. Limit switch 1
2. Limit switch 2
3. Connection cable
   (cable configuration, see Chap. 5.2
4. Reed contact
5. Gripper clamp
6. Screw
7. Nut
8. Arrow in shaft direction

Connecting the limit switch:
Limit switch 1 and 2
Cable colour: brown
white
Contact: Opener (NC)





⇨ **Before installation,** move ELA into a middle stroke position (see Chapter 5,3).

⇨ By loosening the gripper clamp, the reed contact can be turned as well as shifted in any position. After adjusting the switches, check that the clamp sits tight.
(L_{min}, $L_{max;}$ X and Y see Chapter 5.4.1)

Deviations from the installation dimensions (see Chapter 5.4.1) **causes damages to the drives.**

Unintended overrunning of the extended stroke position needs to be prevented by on-site mechanical end stops or the like.

Depending on the existing overtravel path (refer to Techn. specifications) a brake motor needs to be used.

When mounting the anti-turn device with magnetic limit switches (reed contacts) please attend that the positioning of the reed contact is not made in the hatched area as shown on the photograph since there could be a failure of the reed contact switching off.

5.5 Torsional lock (optional)

On versions with torsional lock, the connecting rod is secured against turning by an integrated torsional lock. No extra construction against turning needs to be provided on site.

5.6 Ball thread spindle (option)

On ELA with ball thread spindle, there are changed stroke and instalment dimensions. Refer to the respectively valid offer drawings and section 4.2.

Ball thread spindles are not self-locking; a brake motor is therefore necessary. Available only with brake motor.

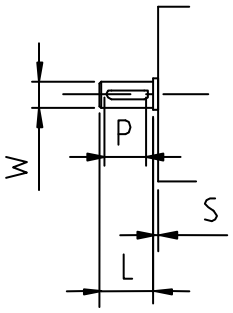
The brake needs to be switched on the direct current side (quick braking), see Chapter 7.4.

5.7 Second shaft end (option)

For mounting a transmitter or for synchronisation of several drives, the ELA can be retrofitted with a second shaft end or the motor can be delivered with a second shaft end.

The feather key in the shaft end is secured by a shaft protective sleeve only for transport and storage.
It is strictly prohibited to start up or trial run with the feather key secured by only the shaft protective sleeve, because the danger of the feather key being flung out.

	ELA 10.1	ELA 20.1	ELA 30.1	ELA 40.1
	Not available with 2nd shaft end	2nd shaft end	2nd shaft end	2nd shaft end
L	—	18,5	23	30
P	—	14	15	20
S	—	4	0	2,5
W	—	ø9	ø12	ø14



5.8 Free shaft end (option)

The ELA can be fitted with a free shaft end for attaching an external motor, four coupling 2 ELAs to one drive scheme or for manual operation.

Observe the permitted drive torque according to the following table.

5.9 Shaft encoder (optional)

The ELA can be optionally equipped with a shaft encoder. For this, observe the operating instructions of the manufacturer and the circuit diagrams for the plug assignment.

6 Electrical installation

With delivery of the electromechanical linear drive without electrical controls or with on-site provision of the controls, the specifications on the electrical controls, operating elements and operation need to be observed as projection information.

The manufacturer of the total plant carries out a risk analysis acc. EN 1050 and provides by his own responsibility user instructions and technical documentation for the total plant.

Work on the electrical system may only be performed:

⇨ When the current supply is interrupted

⇨ By trained specialist electricians

The safety guidelines and standards for electrical work are to be observed.
In Germany, the VDE guidelines apply.

6.1 EMC note

The electromechanical linear drive with controller is designed for industrial operations.

The norm for electromagnetic interference (EN DIN 50081-2) is fulfilled with up to 5 switches/min.

For applications in connection with electronic circuits or the like or at more than 5 switches/min., additional EMC measures (line filter) need to be taken (on site or deliverable as an option).

6.2 Electrical controls

Control with reversing contactors, thermal motor protection relay, main switch and **built-in operating elements**	H1TM
Control with reversing contactors, thermal motor protection relay, main switch, main contactor and **external operating elements**	H1TM
Control with reversing contactors, thermal motor protection relay, main switch, main contactor and **electronic overload protection***	H1TM

*** Lift drives / lifting equipment with a lift capacity of more than 1000 kg have to be equipped with overload protection.**

Contactor controls are designed for:

Rotary current	**Single-phase alternating current**	**Direct current**
⇨ f=50 Hz: 380-420 V; ⇨ f=60 Hz: 440-460 V; ⇨ Protection class IP 54; ⇨ Control voltage 24 V; 50/60 Hz	⇨ f=50 Hz: 220-240 V ⇨ Protection class IP 54 ⇨ Control voltage 24 V; 50 Hz	⇨ 24 V ⇨ Protection class IP 54 ⇨ Control voltage 24 V DC

6.3 Emergency stop switch

An easily and quickly accessible emergency stop device needs to be available at each control-section. Where required, additional devices for an emergency stop need to be installed.

6.4 Main switch

On versions with direct control, a main switch needs to be provided on site.
A main switch is installed by standard in contactor controls.

Main current fuses / feed lines / circuit diagrams

The connection of the linear drive always has to be done according to the supplied or on-site provided circuit diagrams and terminal plans.

Main current fuses have to be provided on site.

Assignment recom. overload protection devices and cable cross-sections for rotary current 400V-50Hz (440V-60Hz)				
Motor power (50Hz) P [kW]	**Nominal current I_N** *Median values*	**I_A / I_N**	**Short-circuit protection (fuses - delay-action) [A]**	**Recom. Feed line** (halogen-free sheath) **min. diameter NYM-J [mm²] Cu**
0,09	0,4	3,8	4	4 x 1.5
0,12	0,6	4,5	4	4 x 1.5
0,25	0,8	4,8	4	4 x 1.5
0,55	1,9	4,6	4	4 x 1.5

Assignment recom. overload protection devices and cable cross-sections for single-phase alternating current 220-240 V			
Motor power [kW]	**Nominal current I_N**	**Short-circuit protection (fuses - delay-action) [A]**	**Recom. Feed line min. diameter NYM-J [mm²] Cu**
0,09	1,3	6	3 x 1.5
0,12	1,7	6	3 x 1.5
0,25	2,8	6	3 x 1.5
0,55	5,2	6	3 x 1.5

Assignment recom. overload protection devices and cable cross-sections for direct 24 V				
Motor power [kW]	**Nominal current**		**Short-circuit protection (fuses - delay-action) [A]**	**Recom. Feed line min. diameter NYM-J [mm²] Cu**
	I_N	**$I_{max.}$**		
0,07	3,7	18	25	2 x 20
0,15	8,5	41	50	2 x 20
0,30	15,6	78	100	2 x 20
0,50	25	125	125	2 x 25

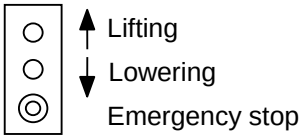
Attention!

For longer cable lengths, the voltage drop needs to be taken into account as well.
Fastening by an electrician
The connection lines are to be laid out in suitable cable ducts or protecting tubes.
Sharp edges, ridges, rough surfaces or threads with which the conductor (conductors) may come into contact, have to be removed from the line channels.

6.5 Operating elements:

The operating elements (control sites) need to be installed so that the entire load path can be overlooked from the operator's location.

Pushbuttons need to be arranged sensibly.



Protective measures:

Connections, protective measures and safeties have to be implemented according to the local, national and international regulations.

Check before initial operation:

⇨ Proper polarization, direction of rotation, assignment of command devices	⇨ Protective earth system ⇨ Insulation resistance	⇨ Overload protection device (if available) ⇨ Function

7 Operation

Turn on main switch before initial operation. By pressing the respective pushbutton, the desired direction of movement can be initiated Up ↑ - Down ↓

Safety information, see page 3.

During operation, the operator must constantly overlook the load as well as the space below or over the load and the hoist.

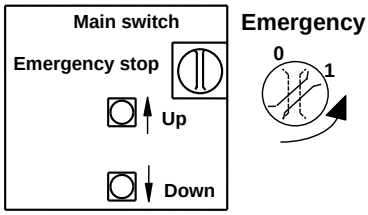
In case of malfunction, operation must cease immediately and the fault be rectified.

Always make sure the direction of movement corresponds to the operating elements.

In case the overload protection triggers, the load needs to be reduced.

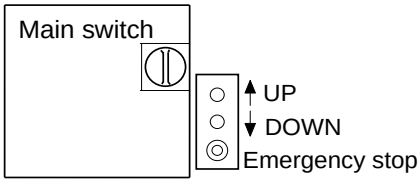
In case of danger, the emergency stop switch needs to be pressed.

7.1 Control with integrated operating elements



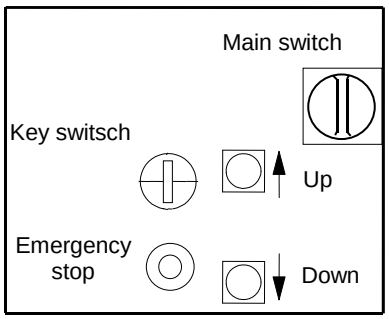
An easily and quickly accessible emergency stop device needs to be available at each control-section. Where required, additional devices for an emergency stop need to be installed, for example in the vicinity of unprotected cable winches.

7.2 Control with external operating elements



In any case, a quickly accessible emergency off button (switch) needs to be implemented (integrated in Pfaff-silberblau controls).

7.3 Control with electronic overload protection (more than 1000 kg)



The electronic overload protection is set and becomes effective at between 100% and 110% of the nominal load.

In case the overload protection triggers, the load needs to be reduced.

If the overload protection triggers, it needs to be unlocked by a key switch after the load has been reduced. After the unlocking, a pause of at least 20 seconds needs to be made so that the electronic overload protection can function again properly.

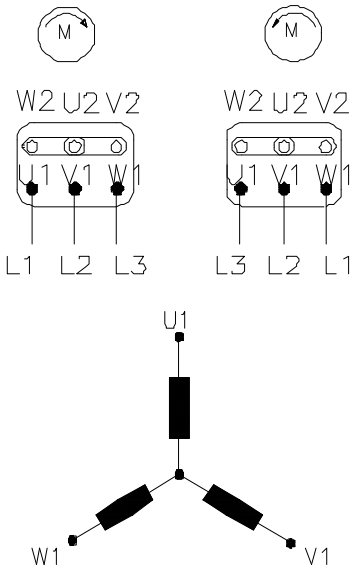
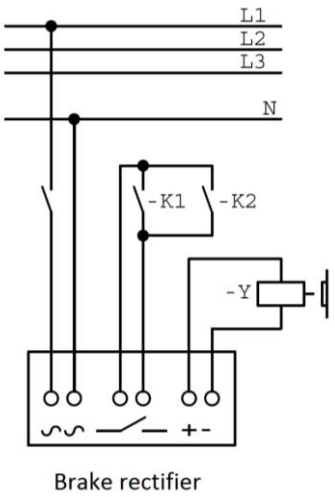
The key needs to be securely stored by the user (do not leave inserted).

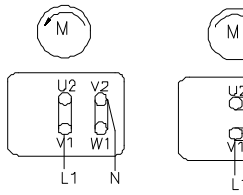
The key switch may not be held permanently in unlocking position.

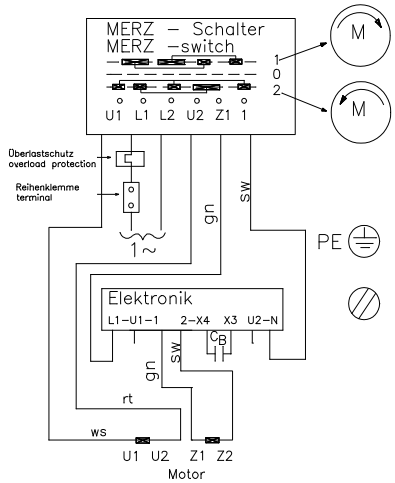
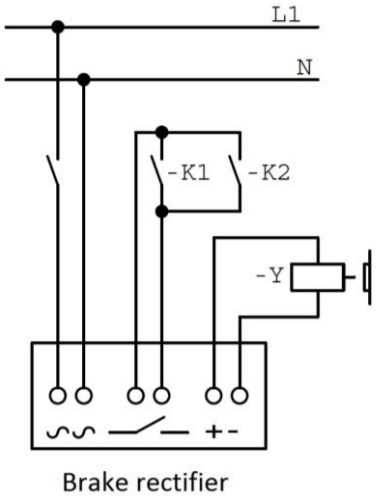
When leaving the control site, the danger area below the load needs to be secured.

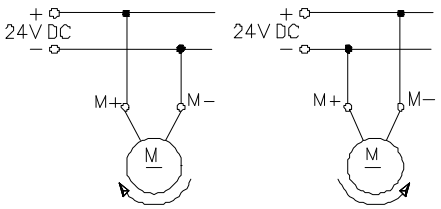
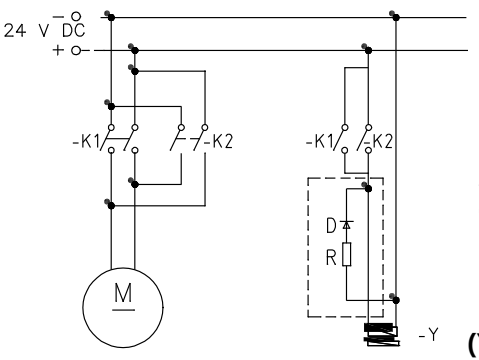
After completing the operation, the main switch has to be turned off and (if necessary) secured by a lock.

7.4 Motor connection

<table>
<tr><th></th><th>Motor</th><th>brake</th></tr>
<tr><td rowspan="2">Three-phase rotary current</td><td> 
</td><td>Direct and alternating current-side braking (quick braking)
 

Switch open bridge by switch contacts K1 (lift) and K2 (lower)
Y=brake</td></tr>
<tr><td>Single-phase alternating current</td><td>ELA 10.1
 

ELA 20.1; ELA 30.1; ELA 40.1
 
</td><td>Direct and alternating current-side braking (quick braking)
 

Switch open bridge by switch contacts K1 (lift) and K2 (lower)
(Y = brake)</td></tr>
<tr><td>24 V direct current</td><td> 
</td><td>DC motor with brake
 

Brake connection by separated switch contacts
(Y = brake)</td></tr>
</table>

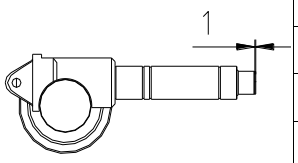
8 Inspection and maintenance instructions

Safety information

Before carrying out inspection and maintenance tasks, the load needs to be taken from the linear drive.

Work on the electrical system is permitted for qualified electricians when the power supply is interrupted.

The ELA electromechanical linear drives have a permanent lubrication. An oil change is usually unnecessary.

Inspection intervals	Inspection tasks
Daily / per shift	Safety functions emergency stop, limit stop, main switch
	Visual inspection of supporting structure, shaft pipe, thrust pipe
	Visual inspection for corrosion
	Control for proper function, function switch Up-Down
	Brake function (self-locking)
	Leak oil characteristics (is a leak detectable?)
Quarterly	Check limit switch mount [1] / Gripper clamp [2] for firm seating.
	Check mounts, screw and bolt connections for tight fit.
Annually 	Check the wear of the nut (on versions with trapezoidal thread spindle).
	If the axial play of the thrust pipe in unloaded state is greater than 1.0 mm, then the travelling nut needs to be exchanged.[3]
	Function and condition of the limit switch (also on site)
	Check motor
	Check brake wear (on brake motor)
	Check overload protection device (if available)
	Electrical controls - check switch contacts, condition and wear; replace contactors if necessary. **Switch contacts have a limited service life.**
	Check lubricants
	Check type plate for legibility, replace if necessary.
	Have an expert inspection conducted [3] Record results in a log.

[1] Only with versions with **mech.** stroke limit

[2] Only with versions with **reed contact** stroke limit

[3] Only by manufacturer or authorised technicians e.g. by Pfaff-silberblau customer services.

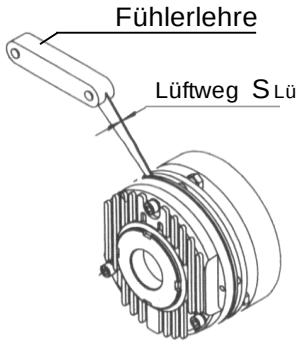
The service life of the device is limited; worn parts need to be replaced in time.

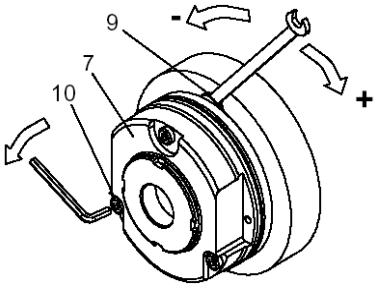
8.1 Brake wear control

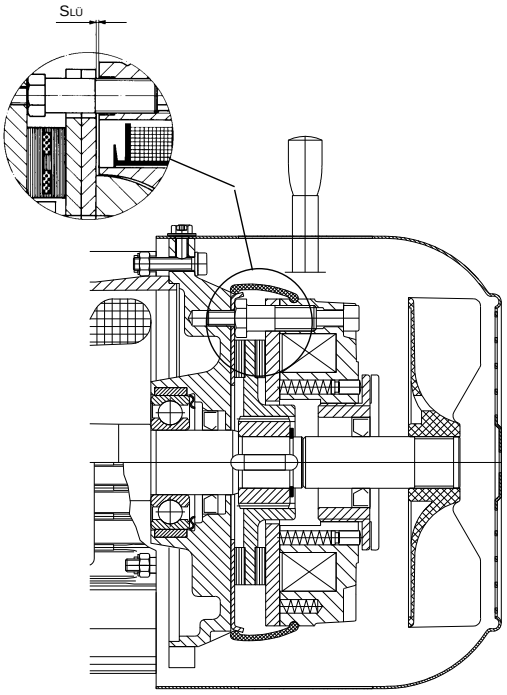
To check the brake's wear, the air gap needs to be measured regularly and be readjusted if necessary.

If the gap can no longer be adjusted, then the brake disks need to be replaced.

Work on the brake may be done only by technicians authorised for this.







Request the operation manual if necessary!

Setting of the lift path

Check the lift path S_{LPnom} in vicinity of the screws (10) with a feeler gauge.

If the deviation from the lift path is too great, set S_{LPnom} as follows:

- ⇨ Loosen screws (10).
- ⇨ Turn the sleeve bolts (9) slightly with a fork spanner.
- ⇨ If the lift path is too great, in the magnet part (7).
- ⇨ If the lift path is too small, out of the magnet part (7).
- ⇨ 1/6 rotation changes the lift path by about 0.15 mm.
- ⇨ Tighten screws (10).
- ⇨ Repeat the check of the lift path and if necessary, readjust the lift path.

Attention!

A lift gap that is too great can cause the brake to stop lifting. If operation continues without readjustment of the brake, the brake becomes overloaded or is destroyed, with a possible crash of the load.

Three-phase rotary current motor	Brake type	Lift path S_{LP} [mm]		Max. readjustment permit. wear path	Brake torque set for
	MK [Nm]	Nominal ±0.05 mm	Max.		
ELA 10.1	Combistop 00.08	Lift gap cannot be checked. Brake no longer lifts ⇒ worn		Not readjustable	1 Nm
ELA 20.1	Combistop 00.08			Not readjustable	1 Nm
ELA 30.1	Combistop 02.38	0,2	0,4	2	5 Nm
ELA 40.1	Combistop 02.38	0,2	0,4	2	5 Nm

Single-phase AC current motor	Brake type	Lift path S_{LP} [mm]		Max. readjustment permit. wear path	Brake torque set for
	MK [Nm]	Nominal ±0.05 m	Max.		
ELA 10.1	Combistop 00.08	-	-	Not readjustable	1 Nm
ELA 20.1	BFK 06	0,2	0,4		2 Nm
ELA 30.1	BFK 06	0,2	0,4		2 Nm
ELA 40.1	BFK 06	0,2	0,4		4 Nm

Direct current motor	Brake type	Lift path S_{LP} [mm]		Max. readjustment permit. wear path	Brake torque set for
	MK [Nm]	Nominal ±0.05 mm	Max.		
ELA 10.1	PENTA 1				0.5 Nm
ELA 20.1	PENTA 5				1.7 Nm
ELA 30.1	PENTA 5				4 Nm
ELA 40.1	PENTA 5				4 Nm

8.2 Operating materials / lubricants recommendation

Lubricant Marking acc. to DIN 51502	Gear grease Kübersynth GE 14-151				Screw grease Klüberplex GE 11-690	Shaft pipe lubricant Fin grease MP 2/3+Teflon
ELA	10.1	20.1	30.1	40.1	10.1; 20.1; 30.1; 40.1	10.1; 20.1; 30.1; 40.1
Grease approx.	40 ml	60 ml	90 ml	120 ml	Apply grease	

The lubricants listed in the table above are recommended for a perfect function of the linear drive.

The lubricants are made for ambient temperatures ranging from -20 to +40 °C.

At extreme temperature conditions, please contact us or the "Technical Services" of the mentioned mineral oil companies.

A different brand lubricant can also be used (in consultation with our Techn. Dept. or with the lubricant manufacturer)

Dispose of used lubricants in accordance with legal requirements.

9 Operational malfunctions and their causes

Malfunction	Possible cause	Elimination
Motor does not start	No voltage available	Check connections, cables, plugs, fuses
	Motor connection faulty	Connect the motor according to circuit/terminal diagram.
	Fuse defective	Insert new fuse or press cut-off
	Capacitor defective [1)]	Renew
	Brake does not open	Check power supply, check brake gap, set if necessary
		Brake rectifier defective, exchange brake rectifier
	The travelling nut is mechanically blocked (L_{min} or L_{max} exceeded or not reached)	Send in to manufacturer for repair.
	Drop below permitted ambient temperature [2)]	Consult manufacturer
Motor does not run at nominal speed	Capacitor defective [3)]	Renew
	Load too high	Reduce load
	Motor connection wrong	Check terminal connection
Motor is running, but there is no lifting movement.	Load is not secured against turning.	The thrust pipe / load needs to be secured against turning.
	Worm wheel is worn.	Repair gears [3)]
	Travelling nut is worn.	Repair gears [3)]
	Load too high	Reduce load
Motor and gears are overheated (surface temperature >80 °C)	Switch-on duration exceeded	Reduce switch-on duration
	Alignment fault during installation	Align (refer to Chap. 44.2Assembly)
	Gear or screw lubrication no longer sufficient	Carry out lubrication check [3)]
Load is no longer held, overtravel path too great	Brake is worn.	Conduct a wear control. Adjust lift gap (see page 20
	Self-locking by improving the efficiency of the ambient conditions, no longer sufficient	Have worm gear checked by manufacturer and replaced if necessary

[1)] Only with alternating current motor

[2)] Ambient temperature, see order confirmation

[3)] Only by manufacturer or authorised technicians e.g. by Pfaff-silberblau customer services.

9.1 Disposal

After decommissioning, the parts of the ELA are to be sent to recycling or disposed of in accordance with the legal regulations!

Einbauerklärung für unvollständige Maschinen im Sinne der EG-Maschinen-richtlinie 2006/42/EG, Anhang II, Nr. 1B	***Declaration of incorporation for incomplete machines according to EC machine directive 2006/42/EC, Annex II, No. 1B***	***Déclaration d'incorporation pour machines incomplètes conformément à la directive européenne relative aux machines 2006/42/CE, annexe II, n° 1B***
Elektromechanischer Linearantrieb ELA	***Electromechanical linear actuator ELA***	***Vérin électromécanique ELA***
Größe/ Size / Model ***Tr 10.1 / Tr 20.1 / Tr 30.1 / Tr 40.1***		
Größe/ Size / Model / ***Ku 10.1 / Ku 20.1 / Ku 30.1 / Ku 40.1***		
Antriebselement zum Einbau in eine Maschine	***Actuator element for assembly in a machine***	***pour lever, baisser ou déplacement des charges***
ist eine unvollständige Maschine nach Artikel 2g und ausschließlich zum Einbau in eine Maschine oder zum Zusammenbau mit anderen Maschinen oder Ausrüstung vorgesehen.	is an incomplete machine according to Article 2 g and has been designed exclusively for installation in a machine or for assembly with other machines or equipment.	est une machine incomplète selon l'article 2g et a été conçue uniquement pour être montée dans une machine ou à être assemblée avec d'autres machines ou équipement.
Folgende grundlegenden Sicherheits- und Gesundheitsschutzanforderungen gemäß Anhang I dieser Richtlinie kommen zur Anwendung und wurden eingehalten 1.1.2; 1.1.3; 1.1.5; 1.3.2; 1.3.3; 1.3.4; 1.3.7; 1.3.9; 1.5.2; 1.7.3; 1.7.4; 4.1.2.6	The following basic health and safety requirements in Annex I to this Directive are applicable and have been observed 1.1.2; 1.1.3; 1.1.5; 1.3.2; 1.3.3; 1.3.4; 1.3.7; 1.3.9; 1.5.2; 1.7.3; 1.7.4; 4.1.2.6	Les exigences suivantes de sécurité et relatives à la santé, conformes à l'annexe I de cette directive, ont été appliquées et respectées 1.1.2; 1.1.3; 1.1.5; 1.3.2; 1.3.3; 1.3.4; 1.3.7; 1.3.9; 1.5.2; 1.7.3; 1.7.4; 4.1.2.6
Die speziellen technischen Unterlagen gemäß Anhang VII B wurden erstellt und sie werden der zuständigen nationalen Behörde auf Verlangen in elektronischer Form übermittelt	The special technical documentation referred to in Annex VII B has been prepared and will be forwarded to the competent national authority, upon request in electronic form	La documentation technique spéciale conforme à l'annexe VII B a été préparée et sera transmise aux autorités nationales compétentes, également sous forme électronique, si nécessaire.
Diese unvollständige Maschine ist in Übereinstimmung mit den Bestimmungen der folgenden EG Richtlinien	This incomplete machine is in compliance with the provisions of the following EC directives	Cette machine incomplète est conforme aux dispositions des directives européennes suivantes
Angewendete harmonisierte Normen, insbesondere:	Applied harmonised standards, in particular:	Normes harmonisées utilisées, en particulier :
DIN EN 1494:2000; DIN EN ISO 12100-1; DIN EN ISO 12100		
Angewendete nationale Normen und technische Spezifikationen, insbesondere:	Applied national technical standards and specifications, in particular:	Normes et spécifications techniques nationales qui ont été utilisées, notamment
Diese unvollständige Maschine darf erst dann in Betrieb genommen werden, wenn festgestellt wurde, dass die Maschine, in die diese unvollständige Maschine eingebaut werden soll, den Bestimmungen der EG-Maschinenrichtlinie entspricht	This incomplete machine may only be put into operation if it has been determined that the machine into which this incomplete machine will be installed complies with the provisions of the EC machine directive	Cette machine incomplète ne doit être mise en service que lorsqu'il a été déterminé, que la machine dans laquelle cette machine incomplète doit être montée, est conforme aux dispositions de la directive européenne relative aux machines

Kissing, 08.08.2013

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ppa. U. Hintermeier

Der Unterzeichnende ist bevollmächtigt die technischen Unterlagen gemäß Anhang VII A zusammenzustellen und der zuständigen Behörde auf Verlangen zu übermitteln.	The undersigned is authorised to prepare the technical documentation referred to in Annex VII A and submit it to the responsible authorities on request.	Le signataire est habilité à réunir la documentation technique spéciale conforme à l'annexe VII A et à la transmettre aux autorités compétentes si nécessaire.

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