



Translation

Operating instruction/
Assembly instruction

High performance Linear Actuator
HLA

www.cmco.eu/pfaff-silberblau



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1 General information and safety

1.1 Introduction

These operating instructions describe the Pfaff-silberblau worm gear screw jacks of the HLA model series. Please refer to our order confirmation or worm gear screw jack compendium for details on the layout, design and permissible operating conditions for the drives. Always observe and follow these operating instructions when using the equipment.



- Read these operating instructions carefully before assembly or initial operation and have them available to all responsible persons.
- Observe the safety information.
- Store the operating instructions and documents carefully.

1.2 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

1.3 Glossary

HLA	High-performance Linear Actuator
Type 1 (Ba1)	Method of operation for type with lifting screw
Type 2 (Ba2)	Method of operation for type with rotating screw
Specifications	A = screw on housing cover side; B= screw on mounting surface side
Tr	Trapezoidal thread spindle
Ku	Ball screw spindle
S	Buttress thread screw
P	Screw pitch
DIN	German industry standards
EN	European norm
ISO	International standards
ID	Intermittent duty in % / h

1.4 Intended use



HLA are partly completed machines and intended for installation in complete machines or to be used for assembly with a totality of machinery to create systems.
They are drive elements that are employed for converting rotational movement into longitudinal movement and speed reduction or torque conversion.
The drive system may only be used for its designated purpose.
They may be used only under the application conditions specified in the operating instructions, in the technical documentation or in the order confirmation.
Operation outside the respective performance limitations / ambient conditions is not permitted.

Not suitable for use in spaces with explosion hazards.
Not suitable for use in aggressive environments. If not constructed especially for these applications.
Modifications to the screw jacks as well as the attachment of additional devices are only permitted with our express and written authorisation.
Pay attention to the technical data and functional description!

	<p>If stated in the order confirmation, the worm gear screw jacks with corresponding additional supplementary equipment comply with the requirements of various standards and guidelines:</p>
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1.4.1 HLA with safety devices for lifting platforms according to EN 1570, EN 280; EN 1756; EN 1493



HLA with safety devices such as limited pitch angle – safety nut , speed monitoring and/or wear monitoring are designed or constructed according to the requirements of the respective norm,
EN 1570 – Lifting tables
EN 280 – Lift work platforms
EN 1493 – Car hoists
DIN 56950 (BCV C1) – Technical installations – event technology and are intended for installation in machines according to the stated norms.
The manufacturer of the complete system acc. to EN 1570 –EN 280 – EN 1493 – DIN 56950 tests the conformity in combination with the total machine and conducts the risk evaluation for the total system in his own responsibility.
The information of our operating instructions need to be integrated into the instructions for the entire machine.
Required samples (experts' examinations) need to be carried out under the responsibility of the manufacturer of the total machine.

1.4.2 HLA in accordance with ATEX guideline – 94/9/EC



are suited as components (94/9/EC item 1 (3) for building into machines for use explosive areas as indicated by the ATEX label.
For the analysis on the source of ignition, the ATEX checklist must be filled out completely (www.cmco.eu/pfaff-silberblau).

The manufacturer of the complete system tests the ATEX conformity in combination with the total machine and conducts the analysis on the source of ignition for the total system in his own responsibility.
The information of our operating instructions need to be integrated into the instructions for the entire machine.
The suitability of the ATEX components for use in existing Ex zones (areas) has to be checked of examined taking into account the ATEX label, according to order confirmation, conformity declaration and type plate.



1.4.2.1 Markings according to RL 94/9/EC

		II	2	G/D	c*	T4	135°C	U
Ex (explosion-proof) symbol								
Device group								
Category								
Ex Atmosphere								
Ignition protection type								
Temperature class								
Max. surface temperature (in dusty atmospheres) where 5 mm dust can collect								
Ex component with parts description, cannot be used by itself								

*= at HLA Ignition protection type "ck"

If not otherwise indicated, the explosion group is at Gas IIB

1.5 Accident prevention regulations - Guidebooks

Observe the relevant instructions, regulations, and standards in the country of use. In Germany, these are currently:

		Rules and regulations	
EC machinery directive		2006/42/EC	
Machine safety		DIN EN ISO 12100-1 DIN EN ISO 12100-2	
Lift devices		DIN EN 1494	
	Lifting tables	EN 1570	
	Lift work platforms	EN 280	
	Loading platforms	EN 1756	
	Car hoists	EN 1493	
	Stages and studios	BGV C1	
	Stage mechanics, safety equipment	DIN 56950	
	Non-electric devices for use in spaces with explosion hazards	Guideline 94/9/EC (ATEX) EN 1127-1 EN 13463-1 EN 13463-5	EN 13463-6 EN 13463-8 EN 60079-0 EN 60079-14

1.6 General safety information



Assembly, service, commissioning and maintenance only by authorised personnel familiar with the relevant regulations.



It is **forbidden** to transport people **or to loiter in the danger area** for devices not suitable for that. Exception: Screw jacks with safety features with appropriate intended use according to Chapter 1.4.1 in the framework of the corresponding product norm.



Not suitable for use in **spaces with explosion hazards!**

Exception: HLA are designed and marked as components for use in spaces with explosion hazards, according to chapter 1.4.2.



- Never grasp, cover, or block moving parts.
- Do not remove or disable the safety devices.
- The operational and safety limit switches have to ensure that the lifting process stops safely at the end positions.
- To prevent contact with rotating/moving parts, fasten protective covers (such as bellows, shaft caps) or make those areas of the machine inaccessible.
- Screw/Travelling nut must be fastened on-site or be turn-secured or equipped with the optional torsional lock (max. screw torque according to technical documents). The construction must be able to bear the screw torque securely.
- Ball thread spindles and multi-gear trapezoidal thread spindles are not self-locking. An appropriate brake device needs to be integrated into the system.
- In the standard version, the screw does not have any protection against unintended skimming out of the gear box (Ba1) or against the travelling nut driving out the screw. A protection against skimming needs to be realised either on site or by worm gear screw jacks with mechanical end stops.
- No lateral forces on the screw.
- Risk assessment by the manufacturer of the overall system.

1.7 Safety information ATEX



- The owner of a system must ensure that the explosion-risk conditions are adhered to.
- On-site layer thickness from surface coatings (e.g. lacquering) max. 2 mm (explosion group IIA and IIB) and 0.2 mm at explosion group IIC
- Requirement for the reliable operation is a properly lubricated screw and a lift gear box provided with lubrication.
- The affects from knocks and bumps on the screw jack is not permitted.
- Dust deposits are to be removed regularly.
- Connect the screw jacks with potential equalisation (earth) and check the bleeder resistance ($<10^6 \text{ Ohm}$).
- Establish and check potential equalisation of all electrically conducting components.
- Observe the speeds and permitted drive power output specified in the technical data when operating with rotation speed control in the potentially explosive atmospheres.
- On motorized drives, monitor the motor output with output gauge or otherwise temperature monitor (e.g. thermistors (PTC) with evaluation device). Minimum requirements according to EN 13463-6 category 2-IPL2; category 3 –IPL1.
- Materials used need to be resistant to the media.
- The operator has to count or measure the alternations of load or operating hours and document them.

1.8 Type plate

Type	HLA 10 N-	Yr of manufacture	201x	kN
		Pressure / tension	-	
Item no.	040040400	ID	-	%/h
Ser. no.	20242020-0001	Stroke / NL	150	mm
Grease / Oil	PGLP 220	Lift speed	-	m/min

Example HLA 10 N H/vi

Type:

Model series

Size

Ratio

Specifications

Design variant



1.9 Technical specifications

1.9.1 HLA standards and with safety features

Model series unit size		10			25		
Max Load (tension and pressure)	[kN]	10			25		
Spindle		Tr 24x5	Ku 25x5	Ku 25x10	Tr 30x6	Ku 32x10	Ku 32x20
Ratio N		5:1			6:1		
Lift per rotation at ratio N	[mm/U]	1	1	2	1	1,67	3,33
Ratio L		20:1			24:1		
Lift per rotation at ratio L	[mm/U]	0,25	0,25	0,5	0,25	0,42	0,83
Max. drive power at 20°C ambient temperature and 20% ID/hr	[kW]	0,9			1,5		
Max. drive power at 20°C ambient temperature and 10% ID/hr	[kW]	1,5			2,6		
Spindle efficiency	[%]	41	91,2	95,3	40	94,2	96,9
dyn. Load capacity	[kN]	16,9 *		16,9 *	36 **		27,5 *
stat. Load capacity	[kN]	33,8 *		33,8 *	93 **		50 *
Spindle torque at max. Load	[Nm]	19,4	8,7	16,7	59,8	42,3	82,1
Max. permitted torque at the drive shaft.	[Nm]	29,4			48,7		
Max. permitted load with pressure load	[mm]	see buckling diagram HLA-Flyer					
Max. permitted spindle length 1)	[mm]	2200	2300	2300	2700	2900	2900
Gear housing Material		ALSi 12			GGG 50		
Base weight	[kg]	9,5			24,5		
Add. weight per 100 mm Lift	[kg]	1,3			2,2		

Model series unit size		50			100		
Max Load (tension and pressure)	[kN]	50			100		
Spindle		Tr 50x8	Ku 40x10	Ku 40x20	Tr 80x14	Ku 63x10	Ku 63x20
Ratio N		7:1			8:1		
Lift per rotation at ratio N	[mm/U]	1,14	1,43	2,86	1,75	1,25	2,5
Ratio L		28:1			32:1		
Lift per rotation at ratio L	[mm/U]	0,29	0,36	0,71	0,44	0,31	0,63
Max. drive power at 20°C ambient temperature and 20% ID/hr	[kW]	2,3			3,6		
Max. drive power at 20°C ambient temperature and 10% ID/hr	[kW]	4,0			6,3		
Spindle efficiency	[%]	34,3	92,8	96,2	36,5	89,2	94,3
dyn. Load capacity	[kN]	67 **			118 **		
stat. Load capacity	[kN]	170 *			290 **		
Spindle torque at max. Load	[Nm]	185,6	85,7	165,4	615,6	178,5	337,8
Max. permitted torque at the drive shaft.	[Nm]	168			398		
Max. permitted load with pressure load	[mm]	see buckling diagram HLA-Flyer					
Max. permitted spindle length 1)	[mm]	3800	3600	3600	5100	5000	5000
Gear housing Material		GGG50					
Base weight	[kg]	45			102		
Add. weight per 100 mm Lift	[kg]	4,5			10		

1) Limitation of the length due to the critical whirling speed at $n = 3000$ 1/min and ratio N (= max. length L according Compendium screw jacks)

1.9.2 Technical specifications ATEX



HLA for use in **spaces with explosion hazards** are designed based on the environmental influences (ATEX checklist) that have been given to us. The technical specifications and ATEX terms and conditions specified in the order confirmation must be adhered to. The manufacturer of the total system needs to evaluate the suitability according to the identification.

The declaration of conformity expires according to guideline 94/9/EC if the technical data and ATEX terms and conditions are not followed.

Model series unit size		10			25		
Max Load (tension and pressure)	[kN]	10			25		
Spindle		Tr 24x5	Ku 25x5	Ku 25x10	Tr 30x6	Ku 32x10	Ku 32x20
Ratio N		5:1			6:1		
Lift per rotation at ratio N	[mm/U]	1	1	2	1	1,67	3,33
Ratio L		20:1			24:1		
Lift per rotation at ratio L	[mm/U]	0,25	0,25	0,5	0,25	0,42	0,83
Max. drive power at 20°C ambient temperature and 20% ID/hr	[kW]	0,45			0,75		
Max. drive power at 20°C ambient temperature and 10% ID/hr	[kW]	0,9			1,5		
Spindle efficiency	[%]	41	91,2	95,3	40	94,2	96,9
dyn. Load capacity	[kN]	16,9 *		16,9 *	36 **		27,5 *
stat. Load capacity	[kN]	33,8 *		33,8 *	93 **		50 *
Spindle torque at max. Load	[Nm]	19,4	8,7	16,7	59,8	42,3	82,1
Max. permitted torque at the drive shaft.	[Nm]	29,4			48,7		
Max. permitted load with pressure load	[mm]	see buckling diagram HLA-Flyer					
Max. permitted spindle length 1)	[mm]	2200	2300	2300	2700	2900	2900
Gear housing Material		ALSi 12			GGG 50		
Base weight	[kg]	9,5			24,5		
Add. weight per 100 mm Lift	[kg]	1,3			2,2		

Model series unit size		50			100		
Max Load (tension and pressure)	[kN]	50			100		
Spindle		Tr 50x8	Ku 40x10	Ku 40x20	Tr 80x14	Ku 63x10	Ku 63x20
Ratio N		7:1			8:1		
Lift per rotation at ratio N	[mm/U]	1,14	1,43	2,86	1,75	1,25	2,5
Ratio L		28:1			32:1		
Lift per rotation at ratio L	[mm/U]	0,29	0,36	0,71	0,44	0,31	0,63
Max. drive power at 20°C ambient temperature and 20% ID/hr	[kW]	1,2			1,8		
Max. drive power at 20°C ambient temperature and 10% ID/hr	[kW]	2,3			3,6		
Spindle efficiency	[%]	34,3	92,8	96,2	36,5	89,2	94,3
dyn. Load capacity	[kN]	67 **			118 **		
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Max. permitted torque at the drive shaft.	[Nm]	168			398		
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Max. permitted spindle length 1)	[mm]	3800	3600	3600	5100	5000	5000
Gear housing Material		GGG50					
Base weight	[kg]	45			102		
Add. weight per 100 mm Lift	[kg]	4,5			10		

1) Limitation of the length due to the critical whirling speed at $n = 3000$ 1/min and ratio N (= max. length L according Compendium screw jacks)

2 Receipt of goods, storage, transport

2.1 Receipt of goods



Startup with defective screw jacks is forbidden.



Immediately check if the contents of delivery correspond with the shipping documents upon receipt. No other warranties can be approved for subsequent defect claims.

Claims on defects and incompleteness are to be made immediately at Pfaff-silberblau.

Claims on perceivable damages due to transport are to be reported to the transport company immediately.



Small parts such as limit switches are usually delivered unattached and packed individually.

2.2 Transport



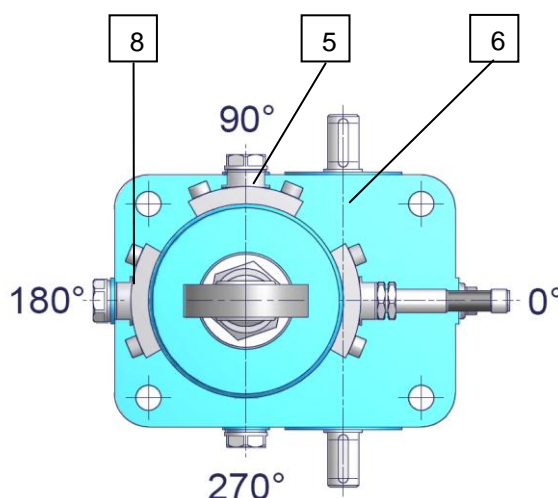
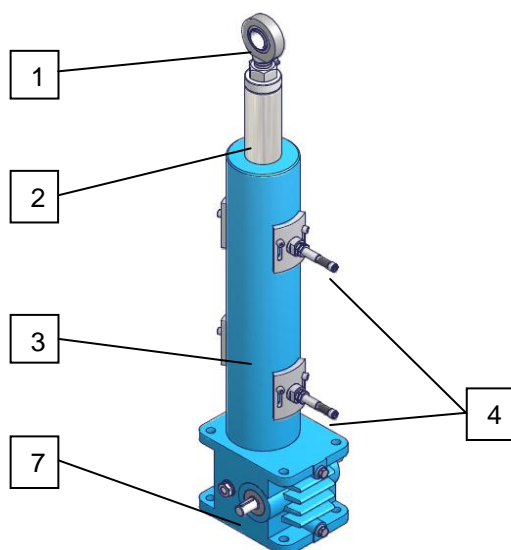
- Lift / transport the screw jack by the appropriate hoisting points.
- Pay attention to the attachment parts. No person is to stand under suspended loads.
- Use hoisting gear in good condition.

2.3 Storage

Storage period < 3 years	Check corrosion protection; renew or repair, if necessary. Check lubrication of moveable machinery, re-lubricate if necessary. Check oil level of gears; refill, if necessary.
Storage period > 3 years	Check corrosion protection; renew or repair, if necessary. Check lubrication of moveable machinery, re-lubricate if necessary. Clean spindle and grease with fresh lubricant along the whole length. Drain gear oil, and fill gear unit with the prescribed oil quantity and quality. Re-grease for grease lubrication.

General information

3 Functional description



Subject to technical changes

Images non-binding

Feature		Description
1	Head type	Head types see Compendium screw jacks
2	Pushing tube	The Pushing tube has an anti turn device and corrosion-resistant
3	Shaft tube	The shaft tube is a complete closed and corrosion-resistant construction
4	Option: Limit switches	Inductive or mechanical
5	Option: Wear control (Safety nut)	The wear control (Vk) is only with the safety nut deliverable.
6	Option: 2nd shaft end	Through the 2nd shaft end can be connected several HLA with joint shafts, or for mounting of an encoder.
7	Worm gear	Worm gear with oil lubrication
8	Re-Lubrication	Access to spindle lubrication through the shaft tube
Spindle		Trapezoidal spindle(Standard) or ball bearing spindle (Option) with grease lubrication
Operating temperature range - 15°C bis +40°C		If temperatures deviate, a design by our technical office is necessary.
Safety nut (Option)		Exceeding the permissible may lead to nut failure. The safety nut avoids the load from falling down in case of a nut breakage. The safety nut is designed for tension and pressure load.
		After nut failure is the operation of the installation forbidden!
Arrangement of the options		The arrangement of the options is coosable in 90° steps. (Standard: 0° = Limit switchr; 90° = Vk; 180° = Lubrication)

4 Safety worm gear screw jacks



The HLA are equipped with a long safety nut, and an electric nut breakage monitoring system for lifting tables acc. to EN 1570, lift work platforms acc. to EN 280, car hoists acc. to EN 1493 and stages and studios acc. to BGV C1/DIN56950.



The manufacturer is responsible for the risk assessment of the entire system.



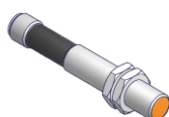
Self-locking of braking needs to be inspected individually, taking the total system into account. Depending on lift speed and positioning precision, additional brake(s) is/are necessary.

5 Options for the HLA

5.1 Inductive lift limitation



In explosive area this type is not allowed. Please contact our technical department for the data of the ATEX Pulse generator



Optional are inductive and electromechanical lift limitations available. The limit switch fixation is pre-set to the nominal lift and has the possibility to adjust ± 10 mm each.

IF 5598; connection thread M12x1

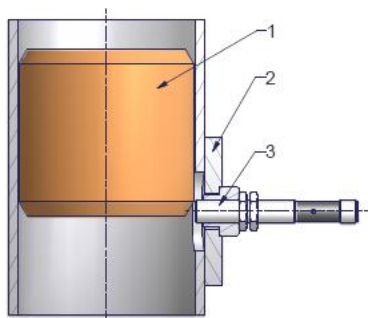
5.2 Technical Data limit switch

type		IF 5598
Output		progr. DC quadronorm
Operating voltage	[V]	10...55 DC
Current rating	[mA]	300
Voltage drop/max. load	[V]	4,6
Leakage current/current cons. at 24V DC	[mA]	0,5
Housing material		Nickel-plated brass
Ambient temperature	[°C]	-25....80
Protection		IP 67

Connecting plug

type		E 10216
Connection		progr.
Cable lenght	[m]	2
Cablematerial		PPU
Protection		IP 67

5.2.1 Assembly



- 1 Travelling nut
- 2 Fixation
- 3 Inductive limit switch

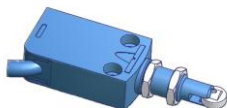
1. Bring travelling nut in position (OuterØ of the travelling nut is in the bore visible).
2. Screw inductive limit switch in until the traveling nut (to avoid that the sensor can not be damaged).
3. Secure the pulse generator by tightening the hexagon nut. Pay attention that the generator is not distorted!



If the generator projects over the wall thickness, the generator be damaged and sheared-off parts of the generator must be removed from the tube.

Max. tightening torque is 7Nm!

5.3 Electromechanical lift limitation (Option)



XCM D 21F2L1; connecting thread M12 x 1

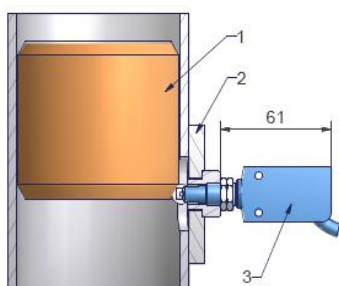


In explosive area this type is not allowed. Please contact our technical department for the data of the ATEX Pulse generator

5.3.1 Technical Data

Typ		XCM D 21F2L1
Nominal operating data	[V]	240 AC
	[A]	1.5 AC
	[V]	250 DC gemäß IEC 60947-5-1 Anhang A, EN 60947-5-1
	[A]	0.1 DC gemäß IEC 60947-5-1 Anhang A, EN 60947-5-1
Switch with connecting cable	[A]	6
Switch with connecting plug M12 4 poles	[V]	250
	[A]	3
Electrical lifetime		According IEC 60947-5-1 Annex C
		Utilisation category AC-15 und DC-13
		Max. operating cycles: 3600 cycles / h
		duty factor: 0,5
Connection		PVR-cable 5 x 0,75mm ² length 1m

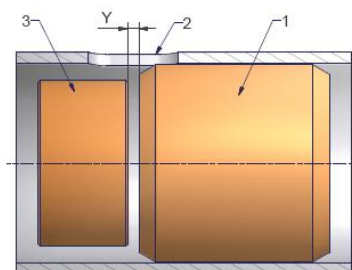
5.3.2 Assembly



1. Travelling nut
2. Fixation
3. Inductive limit switch

1. Bring travelling nut in position (OuterØ of the travelling nut is in the bore visible).
2. screw inductive limit switch in until the cam roller is in contact with the traveling nut afterwards turn back 1-2 revolutions (to avoid that the sensor can not be damaged). control dimension 61mm
3. be aware before fixing that the cam is in direction of the pushing tube.
4. Secure the pulse generator by tightening the hexagon nut. Pay attention that the generator is not distorted!

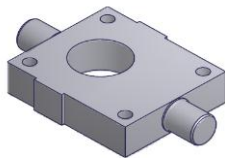
5.4 Safety nut



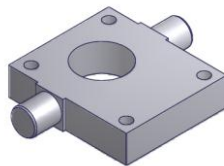
- 1 Travelling nut
- 2 Visual wear monitor
- 3 Safety nut

The safety nut is connected to the travelling nut. Wear on the travelling nut leads to axial shifting of the safety nut, this means, the distance between safety and carrying nut is reduced proportionally to the state of wear. If the carrying nut is worn out by 50% (distance Y between carrying and safety nut has reduced by P/4), the carrying nut and the safety nut have to be replaced. (see chapter 6)

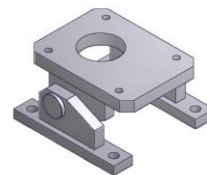
5.5 Swivel bearing and Swivel plate



Swivel plate



Swivel plate quer

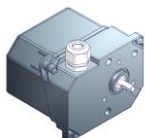


Swivel bearing



Swivel bearing and swivel plate must be assembled free- moving pivoting!

5.6 Limit switch



For lift limitation the HLA can be equipped optional with a geared cam limit switch. Attend the external operating instruction and the circuit diagram for the plug connection.

5.6.1 Adjustment of the gear limit switch

For contact adjustment, remove the cap of the limit switch.

Before adjusting the switching point assure that the live contact connection are covered by a protection against accidental touch or with flat plugs by a receptacle for tabs, and that touching of the connections is excluded.

The limit switch is provided with individual or block adjustment.

5.6.2 Block adjustment

With the black adjusting screw (2) the base of all cam discs (1) can be commonly adjusted. The relatives adjustments of the individual contacts to each other are not modified. When turning the black screw clockwise by one revolution, the cam discs as well are turned clockwise by 0,575°.

5.6.3 Individual adjustment

An infinitely adjustable cam disc is provided for each contact. Independently from each other, the cam discs (1) can be set with the white adjusting screw (2). It is not necessary to loosen any parts for the adjustment. The screw is self-locked. The screw can be turned by means of a screw driver of 10mm or 4mm or by means of a hexagon socket screw key of 4mm.

When turning the screw by one clockwise revolution 360°, the cam disc as well is turned clockwise by 2,464° (view to the rear part, the B-side of the switch).

The standard cam discs are designed to dispose of a max. useful travel and a max. overtravel. When exceeding the overtravel, the switch is not damaged. The contact, however, is opened or closed again.



5.7 Incremental- and Absolute encoder



For lift limitation the HLA can be equipped optional with incremental- or an absolute encoder. Attend the external operating instruction and the circuit diagram for the plug connection.

5.7.1 Incremental Encoder: Type ID

	Variant 1	Variant 2	Variant 3	Variant 4
Impulse per rotation:	10	10	20	20
Interface:	Incremental	Incremental	Incremental	Incremental
Number of Channels:	(A/B)+Negation	(A/B)+Negation	(A/B)+Negation	(A/B)+Negation
Zero impulse:	0+Negation	0+Negation	0+Negation	0+Negation
Supply voltage:	11-27VDC	11-27VDC	11-27VDC	11-27VDC
Output level:	5VDC	11-27VDC	5VDC	11-27VDC
Input power (without charge):	<4Watt	<4Watt	<4Watt	<4Watt
Protection system:	IP 65	IP 65	IP 65	IP 65
Limiting temperature:	0°C -60°C	0°C -60°C	0°C -60°C	0°C -60°C
Connection type:	Radial connector 12-pol. Contact	Radial connector 12-pol. Contact	Radial connector 12-pol. Contact	Radial connector 12-pol. Contact
Mating connector:	Yes	Yes	Yes	Yes

Weitere Drehgeber auf Anfrage

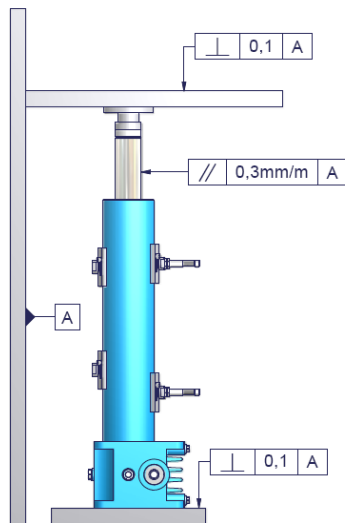
5.7.2 Absolute Multiturn Encoder: Type AMD (preassigned)

	Variant 5	Variant 6
Positions per revolution:	256	256
Number of rotations:	4096	4096
Interface:	SSI	Profibus-DP
Output Code:	programmable (preset Gray)	programmable via Profibus-DP at PNO-Class 2
Supply voltage:	11-27VDC	11-27VDC
Output level:	RS422	RS485
Input power (without charge)	<3Watt	<3Watt
Protective system:	IP 65	IP 65
Limiting temperature:	0°C -60°C	0°C -60°C
Connection type:	12-pol. Contact	2xM16x1,5/ 1xM12x1,5
Mating connector:	Yes	No
Number of Addresses	---	3 up to adjustable via DIP-switch
Option ENC	Preset 1+2, programmable	9,6kbaud up to 12Mbaud
Option ENC	---	PNO-Profile Class 2

Subject to technical changes

Images non-binding

6 Montage



1. Align screw and screw jack with a spirit level and then screw tight, dowel down if necessary.
2. Replace lock screw with oil sight glass (oil level indicator), pull tapered pin at the venting or insert pressure venting screw. Check lubricant level and refill if necessary.
3. Make sure the screw is parallel and at a right angle to the on-site guides.

Avoid distortions. The worm shaft should turn easily and evenly throughout the entire lift height.

For multi-screw units



1. Check turning directions of all screw jacks.
2. Even out uneven support surfaces (pieces of sheet metal).
3. Move the screws/travelling nuts to the same height before depositing, aligning and fasten the load.



To even out alignment errors between the individual elements, use rotationally elastic couplings, rotationally elastic propeller shafts or cardan shafts.



- Inspecting the used screw jacks for compliance with the technical requirements.
- Add-on construction, supporting structure and groundwork is designed for the maximum forces
- Tightening torques for screws see **Fehler! Verweisquelle konnte nicht gefunden werden.**
- Protect screws from soiling during transport, assembly, construction and storage.
- Screws need to be protected against soiling, e.g. by bellows, coils or on-site covers.
- Replace lock screw with oil sight glass (oil level indicator), pull tapered pin at the venting or insert pressure venting screw. Check lubricant level and refill if necessary.
- Check operational and safety limit switches if necessary
- Distortions increase power consumption and reduce the service life!
- Avoid misalignment and angular offset.
- Provide movable load support points if necessary.
- Unit risk analysis by the manufacturer of the overall system.



Carry out assembly and run-in phase without explosion-risk atmosphere.

Unit risk analysis by the manufacturer of the overall system.

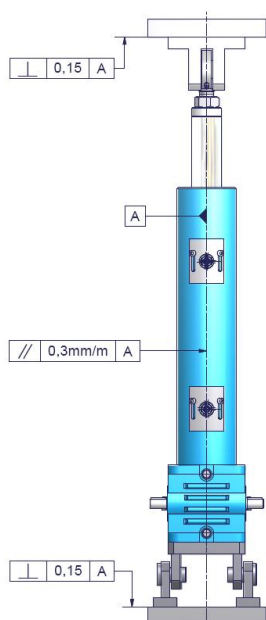
6.1 Mechanical fixing



Hubelementgehäuse

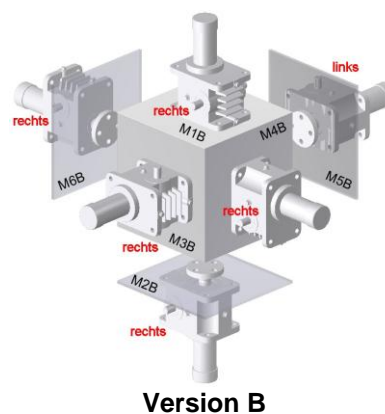
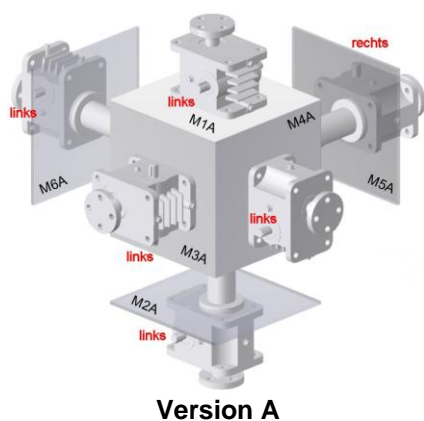
HLA unit size	10	25	50	100
Screws (Güteklasse min. 8.8)	M 8	M 12	M 16	M 20
Number of screws	4	4	4	4

6.2 Assembly (Schwenkantrieb)

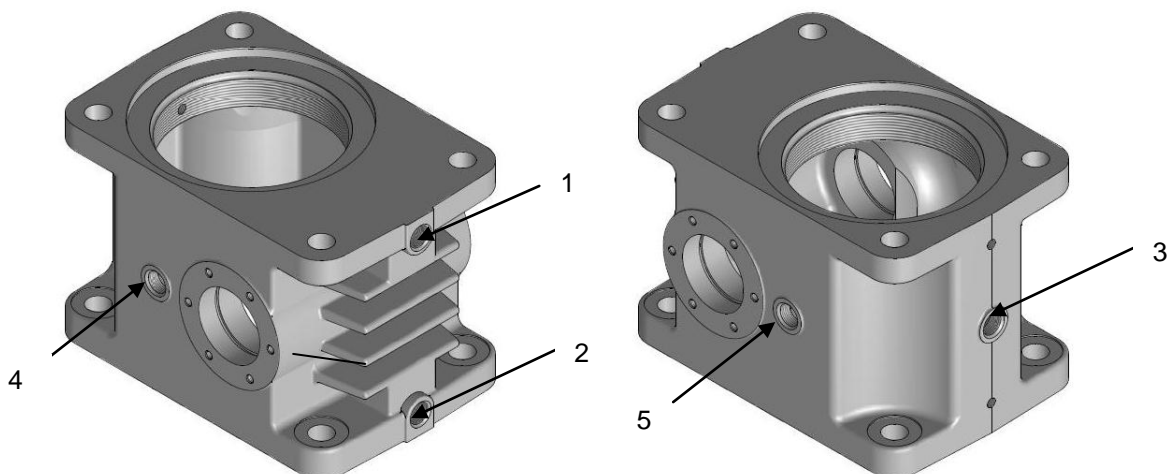


- No side forces due to alignment errors.
- If necessary, install movable load support points or pivoting bearings.
- Fasten screw jacks using only quality bolts and screws.
- Secure bolts and screws.
- Design added constructions for maximum force

6.3 Fitting positions HSE



6.3.1 Oil fixtures HSE



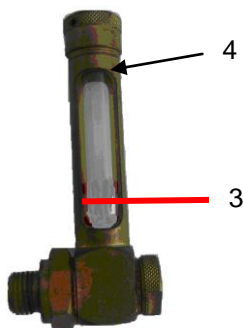
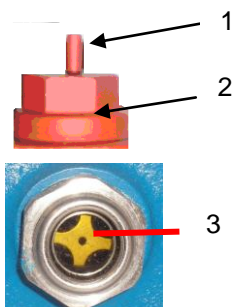
Fitting position	M1A M1B	M2A M2B	M3A M3B	M4A M4B	M6A M6B	
Pos 1						Oil sight glass or lock screw
Pos 2						Fill screw/venting
Pos 3						Drain screw
Pos 4						
Pos 5						



For HSE for the ATEX area, insert the pressure bleed plug at the highest point for venting.



Tighten the venting screws always to the highest position.



1 Venting pin (**pull at initial operation**)

2 Bleed plug

3 Oil level

4 Oil level display



Tighten the venting screws always to the highest position.

7 Initial operation

	<ul style="list-style-type: none"> • Always observe and follow these operating instructions when using the equipment. • Any use other than the intended use is prohibited. • Commissioning may only be performed by authorised personnel. • Check lubrication level. • Check limit switches. • Pay attention to the proper polarization of the electrical installation the the motor's sense of direction. • Put lift unit into operation without a load. (1x lifting 1x lower) • Operate intermittently, gradually increasing the load. • During initial operation, constantly control the operating temperature, the motor's current consumption and the spindle contact pattern. • After 5 hours of operation, check that the screws are tight. Retighten where necessary. • Monitor the lubrication film and the screw temperature during the run-in phase. Rapid lubrication consumption and excessive temperature indicate undue lateral forces even if the power-on time and the maximum power specifications are complied with.
	<p>Carry out commission and run-in phase in secure explosive-free atmosphere. Check the earthing of the mounted parts. (Discharge resistance less than $10^6 \Omega$) Units for spaces with explosion hazards should be checked by a specially authorised person before commissioning. (TRBS 1203-1). Observe the ATEX safety instructions in Chapter 1.7. Check the match of the ATEX designation with the existing atmosphere.</p>

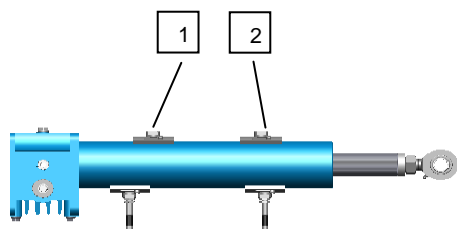
8 Maintenance and inspection

	<p>The regular (recommendation 1 time per year) inspection/ maintenance is to be conducted by and authorised person (pursuant TRBS 1203)¹ on orders of the operator. All tests and modifications must be documented (e.g. machine file, inspection log).</p>
	<p>The operator has to count or measure the alternations of load or operating hours and document them. Risk analysis by the manufacturer of the overall system. Carry out maintenance/inspection in secure explosive-free atmosphere. Conduct a technical ATEX safety inspection by an especially qualified person (acc. to TRBS 1203-1) every 3 years.</p>
	<p>Power must be turned off before maintenance and inspection of the unit.</p>
	<p>Observe to the pertinent safety regulations during maintenance and inspection. Support loads.</p>

 Prior to every operation	<p>Check screw jack externally for leaks.</p>
 Quarterly	<p>Check the gear lubrication level and refill if necessary.</p>

8.1 Schmierung

¹ We recommend that Pfaff-silberblau Hebezeugfabrik performs this inspection.
Subject to technical changes Images non-binding



Spindel schmieren

1. Drive HLA into upper or lower lift position.
2. Loosen upper (1) or lower cover (2)
3. Re-grease the travelling nut via the lubricating nipple (upper or lower)

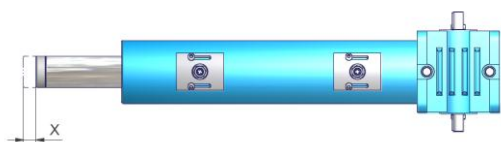
Every 3 years or after 5000 hours of operation



Drain the oil, clean the gear with petroleum ether or coning oil and re-fill oil.

8.2 Wear monitoring

8.2.1 Verschleißkontrolle ohne Sicherheitsmutter



Check the wear on the travelling nut and protokolll it at least once per year.

If the axial backlash X on the pushing tube in unloaded state is more than $P/4$ the nut has to be replaced

8.2.2 Safety-HLA

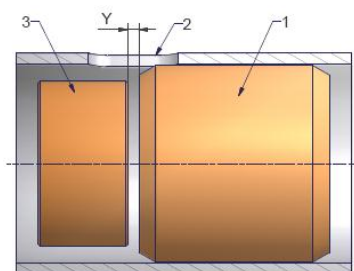


For use in installations according to EN 280, EN1570, EN1593; DIN 56950

In accordance with BetrSichV, lifting equipment must undergo an examination by an authorised person in intervals specified by the owner.

The inspection term should not exceed a year.²

8.2.2.1 Wear check with safety nut (Option)



- 4 Travelling nut
- 5 Hole for wear control
- 6 Safety nut (Option)

- Check the wear on the travelling nut and protokolll it at least once per year.
- Option Safety nut:
Remove cover (5 Chapter 2.1)
The wear has to be measured between travelling- and safety nut.
Max wear $= P/4$
- Pressure load: $Y_{min.} = 5mm - P/4$
- Tension load: $Y_{max.} = 5mm + P/4$
P = Pitch
Y = 5 mm Nominal distance

² We recommend that the service of CMEP GmbH performs this inspection.
Subject to technical changes

Images non-binding



Permitted wear on the travelling nut

HLA	Tr x P	Max. permitted wear (P/4)	Ymin (Pressure)	Ymax (Tension)
10	24x5	1mm	4mm	6mm
25	30 x 6	1.5mm	3,5mm	6,5mm
50	50 x 8	2.0mm	3mm	7mm
100	80 x 14	3.5mm	1,5mm	8,5mm

8.2.3 Record for measuring the wear

We recommend recording the new condition and the results from measuring the wear (dimension X).

	HLA 1	HLA 2	HLA 3	HLA 4	Signature
New condition Dimension X					
Measuring the wear on _____					
Measuring the wear on _____					
Measuring the wear on _____					
Measuring the wear on _____					

8.2.4 Screw tightening torques







Coarse-pitch thread	Tightening torque M _A [Nm]		
	Quality 8.8	Quality 10.9	Quality 12.9
M 4	2,8	4,1	4,8
M 6	9,5	14	16,5
M 8	23	34	40
M 10	46	68	79
M 12	79	117	135
M 16	195	280	330
M 20	390	560	650
M 24	670	960	1120

9 Decommissioning



When decommissioning the system, recycle or dispose of the various system components and/or screw jacks according to the legal requirements.

10 Lubricants

	Ambient temperature range [°C]	Speed range n [min ⁻¹]	Lubricant ¹⁾	ISO-NLGI ¹⁾		 			
HLA trapezoidal screws	-30 up to 0		Grease KP2E-40	NLGI 2	SKF LGLT 2 4)	Molub-Alloy 243 Arktik	UNIREX S 2	gleitmo 585K	ISOFLEX LDS 18 Special A
	-15 to +40		Grease KP2K-20	NLGI 2	EP 2 special grease for lifting gears		Beacon EP 2	gleitmo 585K	Klüberplex BE 11-462
	+20 to +80		Grease KP2K-20	NLGI 2	EP 2 special grease for lifting gears		Beacon EP 2	gleitmo 585K	Klüberplex BE 11-462
	+40 to +180		Grease KP2S-20	NLGI 2				URETHYN E/M 2	Klübersynth BH 72-422
HSE gear	-30 up to 0		Synth. oil CLP-PG	VG 68					Klübersynth GH 6-80
	-15 to +40	<= 1500	Synth. oil CLP-PG	VG220		Tribol 800/220	Glycolube 220	Gearmaster PGP 220	Klübersynth GH 6-220
	-15 to +40	> 1500	Synth. oil CLP-PG	VG150		Tribol 800/150	Glycolube 150	Gearmaster PGP 150	Klübersynth GH 6-150
	+20 to +80	<= 1500	Synth. oil CLP-PG	VG680		Tribol 800/680	Glycolube 680	Gearmaster PGP 680	Klübersynth GH 6-680
	+20 to +80	> 1500	Synth. oil CLP-PG	VG220		Tribol 800/220	Glycolube 220	Gearmaster PGP 220	Klübersynth GH 6-220
	+40 to +120		Synth. oil CLP-PG	VG680				Gearmaster PGP 680	Klübersynth GH 6-680
Ball screws	-30 up to 0		Grease KP2E-30	NLGI 2	SKF LGLT 2 4)			gleitmo 585 K	ISOFLEX LDS 18 SPEZIAL A
	-15 to +80		Grease KP1K-20	NLGI 1 ¹⁾				URETHYN E/M 2	Stabutherm GH 461
	+40 to +120		Grease KP1K-20	NLGI 1 ¹⁾				URETHYN E/M 2	Stabutherm GH 461

Printed bold = Standard lubricants: Factory-filled gear lubrication or otherwise lubrication recommendation for screws

Caution: The alternatives to our standard lubricants are specifications of the lubricant manufacturers.

Pfaff-silberblau does not have any references whether the lubricants meet the manufacturer specifications.

Lubricant selection: The temperature ranges refer to the ambient temperature. Higher lubricant temperatures that may result during the operation of the drive elements have already been taken into account.

Standard temperature range: -15 °C to +40 °C

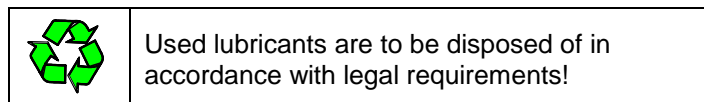
Only if the limits of the standard temperature range is exceeded should lubricants of other temperature ranges be used.

To operate the drive elements in temperature ranges that deviate from the standard, design modifications are necessary along with possible construction measures. Observe the technical data according to the order confirmation and the operating instructions.

Observe the lubricant specifications in the type plate.

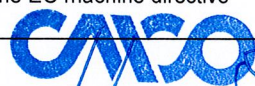
Mineral and synthetic lubricants should not be mixed together. It is recommended to generally not mix lubricants or to check the composition.

- 1) Specifications refer to the factory lubricant
- 2) Critical start-up characteristics at low temperatures should be observed.
- 4) SKF GmbH
- 5) Zeller+Gmelin GmbH & Co. KG



Einbauerklärungen für unvollständige Maschinen im Sinne der EG-Maschinenrichtlinie 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
Hochleistungs-Linearantrieb HLA 10; 25; 50; 100 Antriebselement zum Einbau in eine Maschine	High Performance Linear Actuator HLA 10; 25; 50; 100 Actuator element for assembly in a machine	Vérins hautes performances linéaires HLA 10; 25; 50; 100 Propulsif élément pour assemblée dans une machine
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: DIN EN 1494:2000; DIN EN ISO 12100-1; DIN EN ISO 12100	Applied harmonised standards, in particular: DIN EN 1494:2000; DIN EN ISO 12100-1; DIN EN ISO 12100	Normes harmonisées utilisées, en particulier :
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

Ort/Datum Kissing 01.06.2013



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Name:

pfa. 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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Einbauerklärung für unvollständige Maschinen im Sinne der EG-Maschinenrichtlinie 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
Hochleistungs-Linearantrieb HLA 10; 25; 50; 100 mit Sicherheitseinrichtungen Antriebsselement zum Einbau in Hubtische, Hebebühnen, Hubarbeitsbühnen oder Fahrzeughebebühnen	High Performance Linear Actuator HLA 10; 25; 50; 100 with safety devices Actuator element for assembly in lifting tables, lifting platforms, working platforms or vehicle lifting platforms	Vérins hautes performances linéaires HLA 10; 25; 50; 100 avec équipement de sûreté Propulseur élément pour installation dans table de levage, plateforme élévatrice, plateforme de travail, plateforme de levage pour véhicule
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: DIN EN ISO 12100-1; DIN EN ISO 12100-2; DIN EN 1494:2000; EN1570; EN280; EN1756; EN1493	Applied harmonised standards, in particular:	Normes harmonisées utilisées, en particulier :
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

Ort/Datum Kissing 01.06.2013



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Name:

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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Konformitätserklärung
im Sinne der EG-Richtlinie
94/9/EG vom 23.03.1994

Declaration of
conformity
as defined by EC Directive
94/9/EC, from 23.03.1994

Declaration de
conformité
conformément à la directive
"CE" 94/9/CE 23 03.1994

Hiermit erklären wir, dass	Herewith we declare that the supplied model of	Nous déclarons que le modèle
Hochleistungs-Linearantrieb HLA 10; 25; 50; 100 eine Komponente im Sinne der RL 94/9/EG Artikel 1 (3) ist und die Anforderungen gemäß Anhang II der RL 94/9/EG erfüllt.	High Performance Linear Actuator HLA 10; 25; 50; 100 a component as defined by EC Directive 94/9/EC article 1(3) is and fulfills the requirement according to annex II of the Directive 94/9/EC	Vérins hautes performances linéaires HLA 10; 25; 50; 100 un composant dans le sens de la directive 94/9/EC article 1 (3) est et les exigences conformément à l'annexe II de la directive 94/9/EC ré
Das Spindelhubelement ist geeignet für den Einsatz in explosionsgefährdeten Bereichen entsprechend der Kennzeichnung  II 2 G/D-ck-T4/135°C U	The worm gear screw jack is suitable for the operation in hazardous environment according to the marking  II 2 G/D-ck-T4/135°C U	vérins à vis sans fin est approprié pour l'application dans les secteurs explosifs conformément au marquage  II 2 G/D-ck-T4/135°C U

Angewendete insbesondere:	harmonisierte Normen,	Applied harmonized standards, in particular:	Normes harmonisées utilisées,
EN 1127-1 (Explosionsschutz Grundlagen und Methodik/ Explosion prevention Basic concepts and methodology/ Prévention de l'explosion Notations fondamentales et méthodologie) EN 13463-1 (Grundlagen und Anforderungen/ Basic method and requirement/ Prescriptions et méthode de bases) EN 13463-5 (Schutz durch konstruktive Sicherheit/ Protection by constructional safety/ Protection par sécurité de construction) 94/9/EG Anhang VIII / 94/9/EC Annex VIII / 94/9/EC annexe VIII			
Auftragsbestätigung bzw. technisches Datenblatt sind Bestandteil dieser Konformitätserklärung. Die Anlage darf erst in Betrieb genommen werden, wenn festgestellt wurde, dass die Gesamtanlage in die diese Komponenten eingebaut werden, den Bestimmungen der ATEX Richtlinie 94/9/EG entspricht Die technische Dokumentation für Hubelemente der Kategorie 2 ist bei der benannten Stelle 0035 unter der Registrierungsnummer 296/Ex-Ab 1498/10 hinterlegt.			

Ort/Datum Kissing 01.06.2013

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