











Translation

Operating Instruction
Electromechanical
linear drive
CMLA

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Explanation of the symbols

	Practical information
	Warning against a general hazard. Risk of injury if ignored
	Warning against electrical voltage. Severe risk of injury if ignored.
	Information on the safety screw jacks
	Danger of explosion
	Important information
	Assembly and installation information
	Disposal

1. General information








These operating instructions describe the linear drives of the CMLA (Columbus McKinnon Linear Actuator) series.

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

	CLMA electromechanical linear drives are incomplete machines and are intended for installation in complete machines or for assembly with several machines into a system. They are drive elements to convert rotary motion to linear motion, with an integrated motor. The drive systems may only be used for the 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.
	When used as lifting equipment, a risk analysis in accordance with Annex I of the Machinery Directive 2006/42/EC-4 General requirements for lifting operations must be conducted.
	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. Unless constructed especially for these applications.
	Modifications to the linear drives as well as the attachment of additional devices are only permitted with our express and written authorization.
	Pay attention to the technical data and functional description!

1.3. Safety information

	Operation, assembly, commissioning and maintenance only by: authorized and knowledgeable personnel (Definition for qualified personnel in accordance with 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 authorized by the person responsible for the safety of the plant to perform the required actions and who are able to recognize potential hazards.
	<p>⇒ It is forbidden to transport people or to loiter in the danger area.</p> <p>⇒ No lateral forces may act on the CMLAs.</p> <p>⇒ If a malfunction occurs, shut down the CMLA immediately and remove it from operation.</p> <p>⇒ Permitted loads and power-on time may not be exceeded.</p> <p>⇒ Even singular overheating may cause premature wear.</p> <p>⇒ Ball thread spindles are not self-locking or self-braking. CMLAs with ball screw spindle are only available with brake motor.</p> <p>⇒ The brake control should be designed for AC and DC-side interruption (quick actuation of the brake)</p> <p>⇒ Depending on the application, it may be necessary to use safety limit switches provided by the customer.</p> <p>⇒ Overrunning of the end positions must be prevented by on-site mechanical end stops or similar safety limit switches.</p> <p>⇒ Surface temperature during operation: Electric linear drives can become very hot during operation. If touched, they can cause burns. The linear drive must be integrated into the machine in such a way that touching the hot surface is avoided. Do not touch the motor or the brakes during operation or during the cool-down phase after switching off.</p>

1.4. Accident prevention guide

Observe applicable regulations in the country of use;¹⁾

in Germany currently:

EC Directive 2006/42/EC

EC Low Voltage Directive 2006/95/EC

EC Directive EMC 2004/108/EC

EN 60204 T1, electrical equipment of machines

EN 60204 T32, electrical equipment of machines - Hoists (VDE 0100 T726)

¹⁾ in the respective valid version

2. Functional description

The CMLA linear drive is a motor-driven spindle drive.

The driving force is created by a three-phase asynchronous motor or a shunt DC motor. The gear thread - trapezoidal thread or ball screw is connected to the driving motor by a spur gear intermediate drive.

For models with a trapezoidal thread screw, load protection is provided by a self-locking mechanism, while for ball screws it is provided via electromagnetic spring-operated disc brake.

To reduce overtravel or increase positional accuracy, the trapezoidal thread version can be fitted with a brake.

The electric linear drive is fitted with an integrated torsional lock, a torque support is not necessary.

The stop positions of the spindle drive can be limited by end stop switches with mechanical contacts.

For intermediate positions, or if required by the directives, additional stop position switches can be fitted to the system by the customer.

The linear drive can be fitted with additional adjustable reed contact stop position switches as an optional extra.

3. Technical specifications

Size	CMLA	P50	P70	P90	P125
Available hoisting lengths	[mm]	150	150	250	250
		300	300	500	500
		450	450	750	750
		600	600	1000	1000
Protection class		IP65			
Permitted ambient temperature		-5 to +40°C			

3.1. Trapezoidal spindle model

Size	CMLA		P50	P70	P90	P125
Max. axial force	F_{stat}	[N]	5000	7000	9000	12500
Three-phase motor			AC 3Ph 400V; 50 Hz			
Power	P	[W]	180	370	650	900
Nominal current	I_N	[A]	0,6	1,1	1,6	2,5
Cos φ	-	-	0,874	0,789	0,832	0,838
Operating mode***			S3-25%	S3-15%	S3-15%	S3-10%
Translation			06	06	12	12
Max. tensile/compressive force	F_{dyn}	[N]	5000	7000*	9000	12500**
Lifting speed	v	[mm/s]	13	13	20	20
Translation			04	04	10	10
Max. tensile/compressive force	F_{dyn}	[N]	3000	5000	6500	8500
Lifting speed	v	[mm/s]	28	28	41	41
Translation			02	02	08	08
Max. tensile/compressive force	F_{dyn}	[N]	800	1800	2800	3800
Lifting speed	v	[mm/s]	87	87	84	84

* For 600mm lift, max compressive force of 5000 N

* For 1000mm lift, max compressive force of 11500 N

*** At reduced loads, duty cycles in accordance with the circuit diagram on p. 5, chapter 3.1.1 are permitted

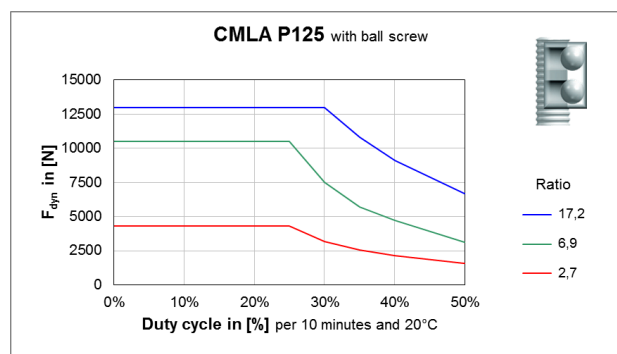
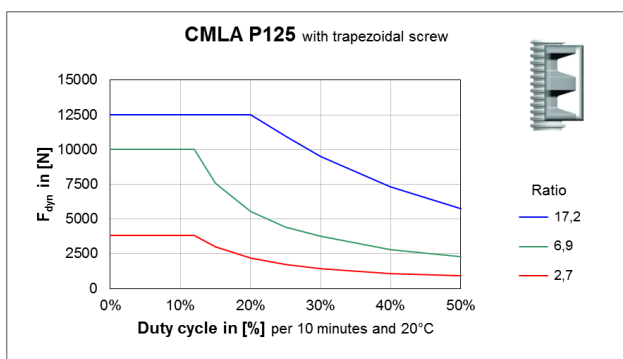
Size	CMLA		P50	P70
Max. axial force	F_{stat}	[N]	5000	7000
DC motor			DC 24VDC	
Nominal current	I_N	[A]	12	20
Operating mode***			S3-25%	S3-15%
Translation			06	06
Max. tensile/compressive force	F_{dyn}	[N]	5000	7000*
Lifting speed	v	[mm/s]	12	12
Translation			04	04
Max. tensile/compressive force	F_{dyn}	[N]	3000	5000
Lifting speed	v	[mm/s]	26	26
Translation			02	02
Max. tensile/compressive force	F_{dyn}	[N]	800	1800
Lifting speed	v	[mm/s]	81	81

3.2. Ball screw spindle model

Size	CMLA		P50	P70	P90	P125
Max. axial force	F_{stat}	[N]	5500	7500	9500	13000
Three-phase motor			AC 3Ph 400V; 50 Hz			
Power	P	[W]	180	370	650	900
Nominal current	I_N	[A]	0,6	1,1	1,6	2,5
cos φ	-	-	0,874	0,789	0,832	0,838
Operating mode***			S3-25%	S3-15%	S3-15%	S3-10%
Translation			06	06	12	12
Max. tensile/compressive force	F_{dyn}	[N]	5500	7500*	9500	13000
Lifting speed	v	[mm/s]	16	16	41	41
Translation			04	04	10	10
Max. tensile/compressive force	F_{dyn}	[N]	3500	5500	7000	9000
Lifting speed	v	[mm/s]	35	35	83	83
Translation			02	02	08	08
Max. tensile/compressive force	F_{dyn}	[N]	1300	2300	3300	4300
Lifting speed	v	[mm/s]	109	109	169	169

* For 600mm lift, max compressive force of 6500 N

Size	CMLA		P50	P70
Max. axial force	F_{stat}	[N]	5500	7500
Three-phase motor			DC 24 VDC	
Nominal current	I_N	[A]	12	20
Operating mode***			S3-25%	S3-15%
Translation			06	06
Max. tensile/compressive force	F_{dyn}	[N]	5500	7500
Lifting speed	v	[mm/s]	15	15
Translation			04	04
Max. tensile/compressive force	F_{dyn}	[N]	3500	5500
Lifting speed	v	[mm/s]	32	32
Translation			02	02
Max. tensile/compressive force	F_{dyn}	[N]	1300	2300
Lifting speed	v	[mm/s]	101	101

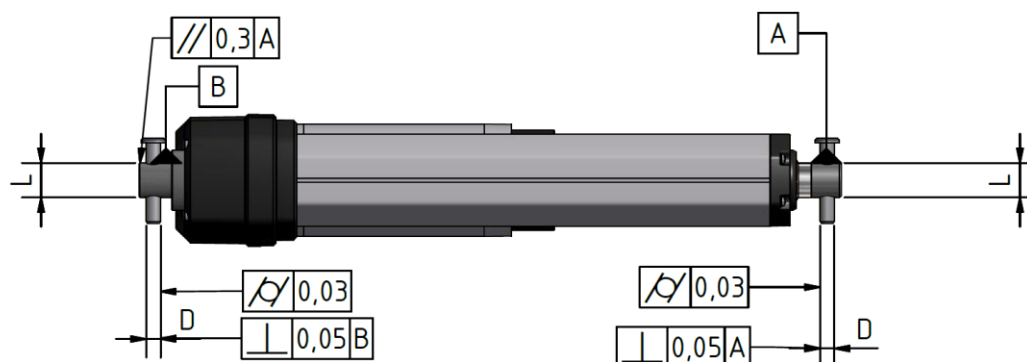


4. Installation

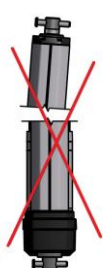
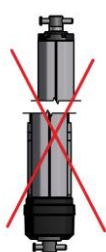
The supporting structure/add-on construction needs to be dimensioned taking into account the relevant forces (see also technical data).



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

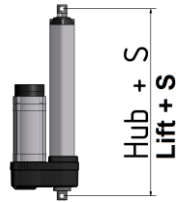


Size	CMLA	P50	P70	P90	P125
D [mm]		13	13	16	16
L [mm]		30	30	44,45	44,45



No crushing or shearing points should be created in areas accessible to people. Additional protection should be provided if necessary

4.1. Installation dimension

	CMLA	Dimension S
	P50	260
	P70	260
	P90	320
	P125	320

5. Electrical installation



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 (VDE standards and EN 60...ff)

⇒ Connect the CMLA electrically using a power supply cord (2m). The device must not be opened.



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



⇒ Do not operate the CMLA before correct electrical connection. Connect the limit switch beforehand. If the motor has the wrong polarity or the limit switch is incorrectly fitted, the stop position will be exceeded and the drive will be blocked, which may lead to damage to the CMLA. In case of incorrect polarity or an incorrect connection, the limit switches are not operational.

The limit switches must be integrated correctly into the control current circuit.

The manufacturer is responsible for the overall system.

With the limit switches, make sure to check the function in conjunction with the overall system.

5.1. Notes for controller assembly

With delivery of the CMLA linear drive without electrical controller or with on-site provision of the controls, the specifications on the electrical controls, operating elements and operation must be regarded as projection information.

The manufacturer of the total plant carries out a risk analysis in accordance with DIN EN ISO 12100:2013 and is responsible for providing user instructions and technical documentation for the overall system.

If the controls are fitted by the customer, the manufacturer's circuit diagram must be made available.

The applicable Directives must be observed.

The connection of the CMLA must always be in accordance with the circuit diagram and terminal plans created by the customer.

5.1.1. Electromechanical limit switch (integrated)

Nominal voltage	24 V DC
Switching current (Ohm resistive load)	100 mA

5.1.2. 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.

5.1.3. EMC note

The CLMA linear drive is designed for industrial operations.

The standard for electromagnetic interference (EN DIN 50081-2) is reached with up to 5 switching operations/min.

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

5.1.4. Main current fuses / feed lines / circuit diagrams

The linear drive must always be connected according to the circuit diagrams!

The three-phase infeed is via L1, L2 and L3. The motor is connected in the proper phases to U, V and W.

When connected to the right-hand rotating field (AC) or correct connection + - (DC), the movement of the spindle is in the direction "retract".

Main current fuses have to be provided on site.

Layout of recommended protection devices and cable cross-sections:

at a three-phase current of 400V-50Hz (optional brake 205V DC, 20W)			
Motor power (50Hz) P [kW]	Nominal current I _N	Short-circuit protection (fuses - delay-action) [A]	Recommended Feed line min. diameter NYM-J [mm ²] Cu
0,18	0,5	6	1,5
0,37	1,1	6	1,5
0,65	1,6	6	1,5
0,9	2,4	6	1,5

at a direct current of 24 V optional brake (24VDC 16W)			
Motor power [kW]	Nominal current I _N	Short-circuit protection (fuses - delay-action) [A]	Recom. Feed line min. cross-section NYM-J [mm ²] Cu
0,2	12	16	2,5
0,36	21	25	4



For longer cable lengths, the additional voltage drop must also be taken into account



Connections, protective measures and fuses must be implemented according to the local, national and international regulations. Specification by a qualified electrician.

The connection lines are to be laid out in suitable cable ducts or sheath 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.

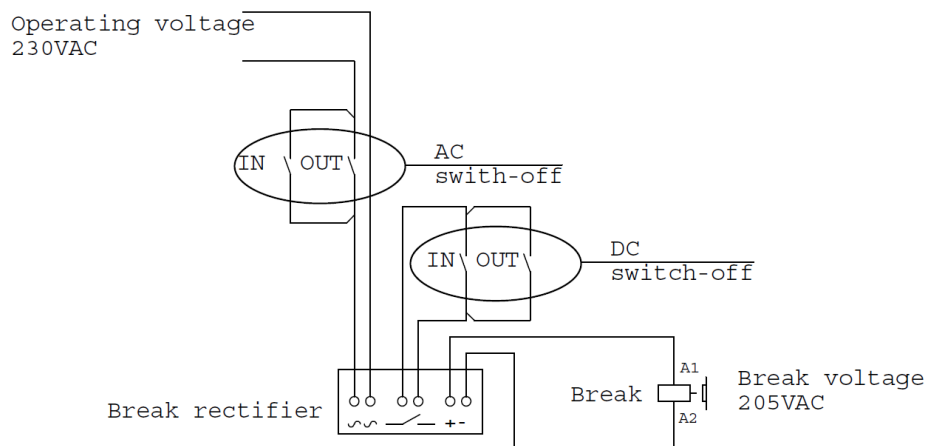
5.2. 3ph 400V alternating current model without electrical controller

If the model includes a brake, this must be supplied with a direct current of 205VDC $I=100\text{mA}$ (20W). The power supply for the brakes can be supplied externally or via a brake rectifier

The brake must be switched in synch with the motor.

To keep overtravel of the load to a minimum during the lowering operation, the connection of the electromagnetic disc brake **MUST** be interrupted on both the AC and DC side when the motor is switched off!

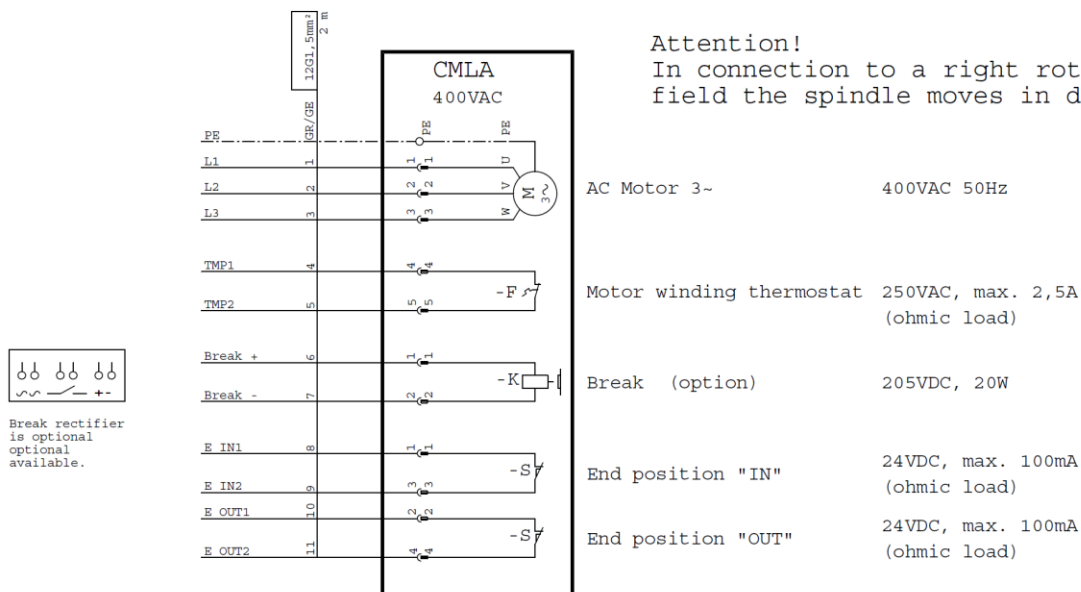
Example of AC and DC switching of the brake



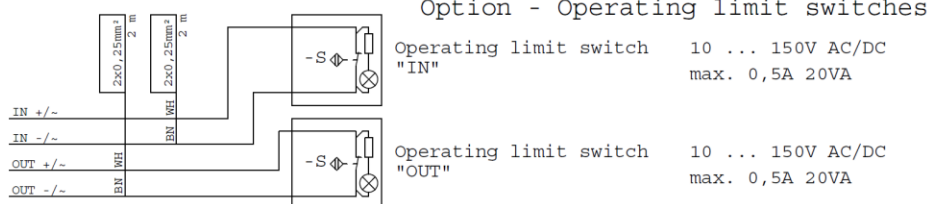
Brake must be switched in synch with the motor!

5.2.1. Allocation of the power supply cord

Linear drive with 400V three-phase motor without controller

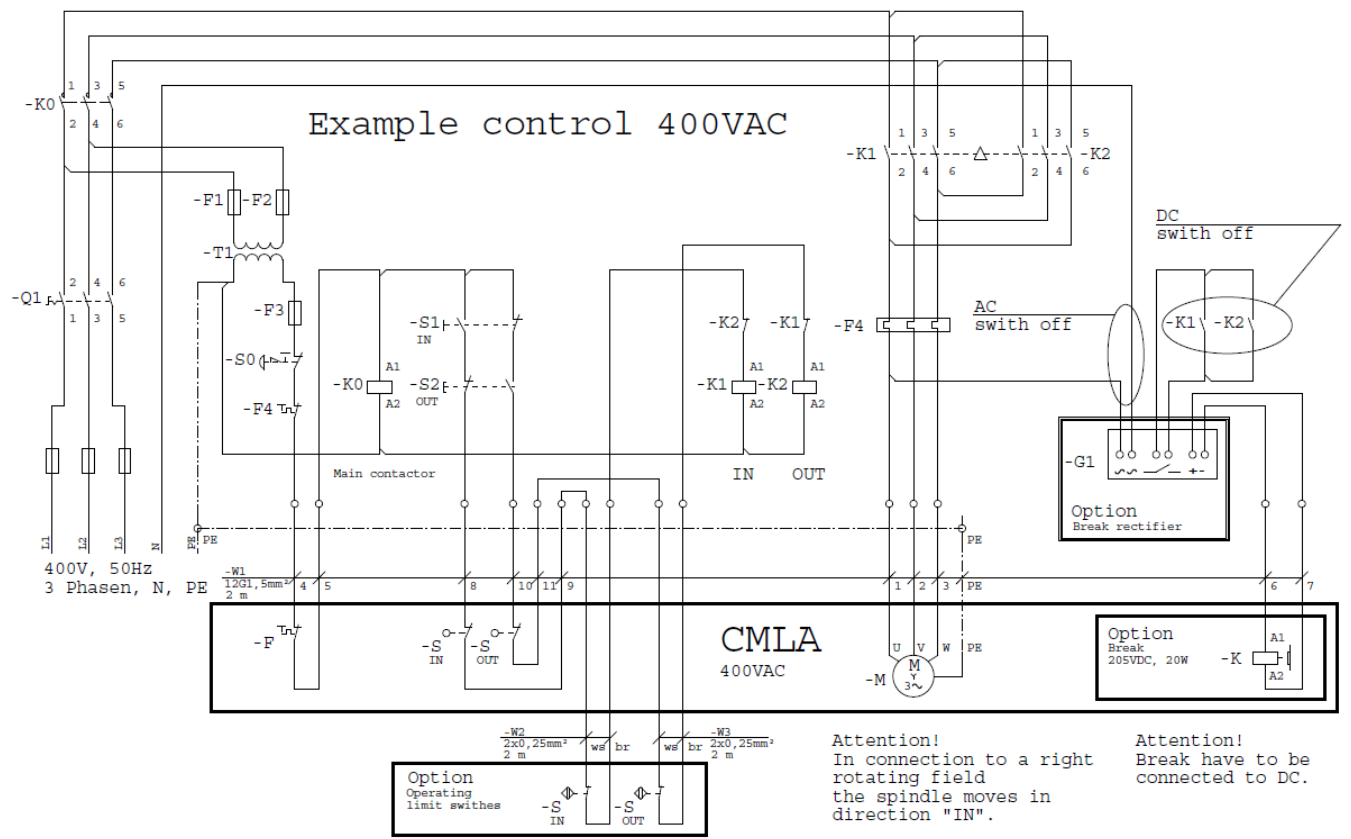


Attention!
In connection to a right rotating field the spindle moves in direction "IN"



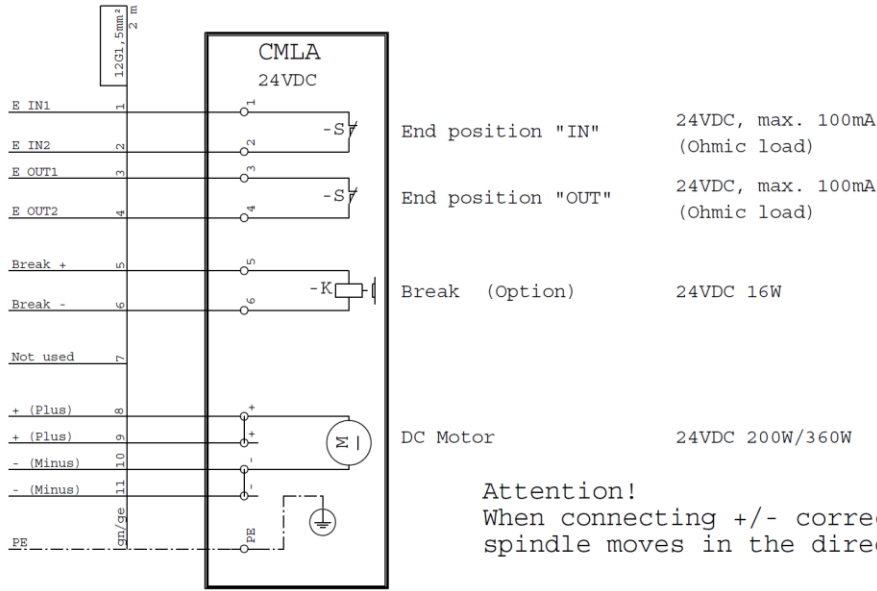
Brake must be switched in synch with the motor!

5.2.2. Example of controls for CMLA linear drive with 400V AC motor without controller

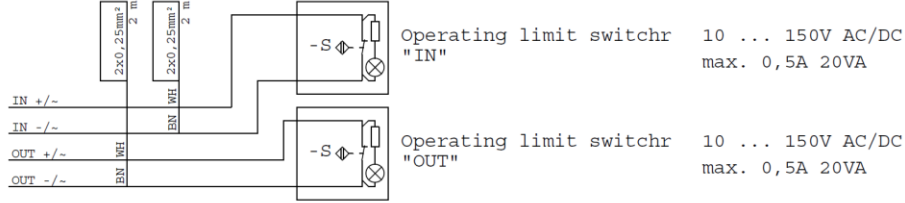


5.3. Allocation of the power supply cord

CMLA linear drive with 24VDC DC motor without electrical controller

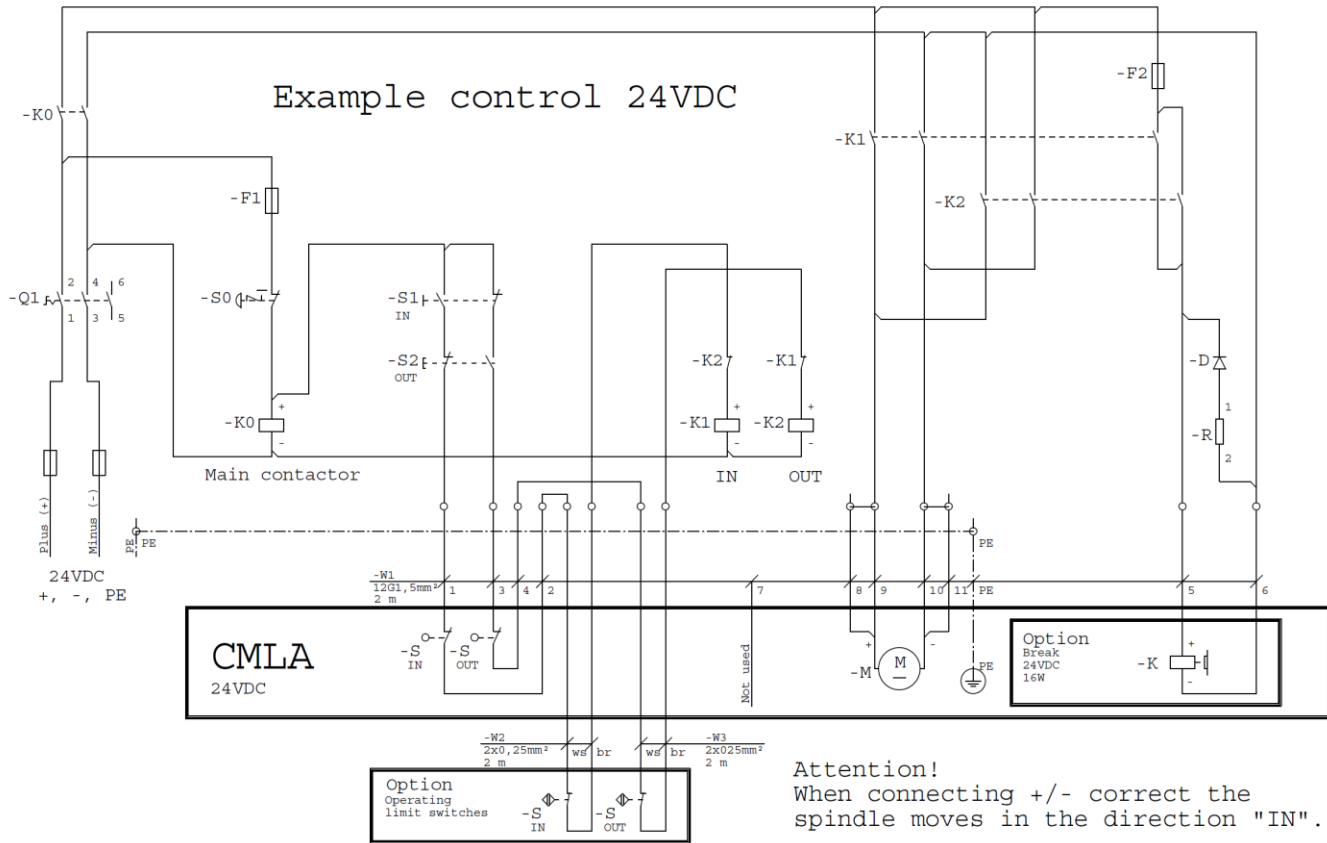


Option - Operating limit switches



Brake must be switched in synch with the motor!

5.3.1. Example of controls for a CMLA linear drive with 24VDC three-phase motor without controller

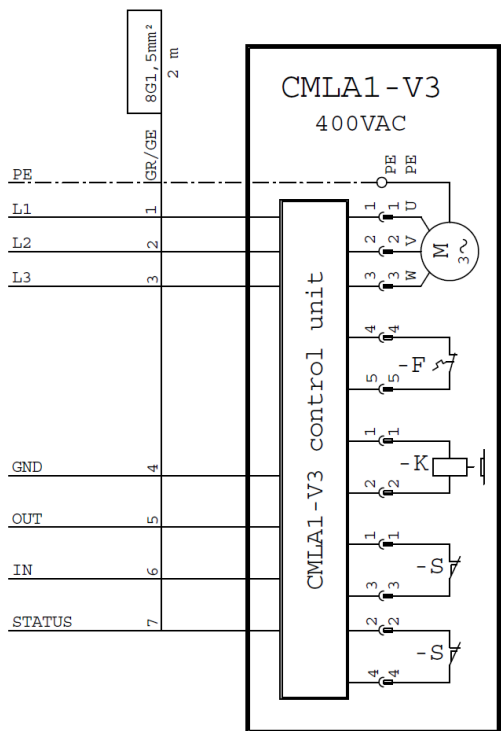


6. Additional equipment

6.1. CMLA1-V3 controller (option)

6.1.1. Allocation of the power supply cord

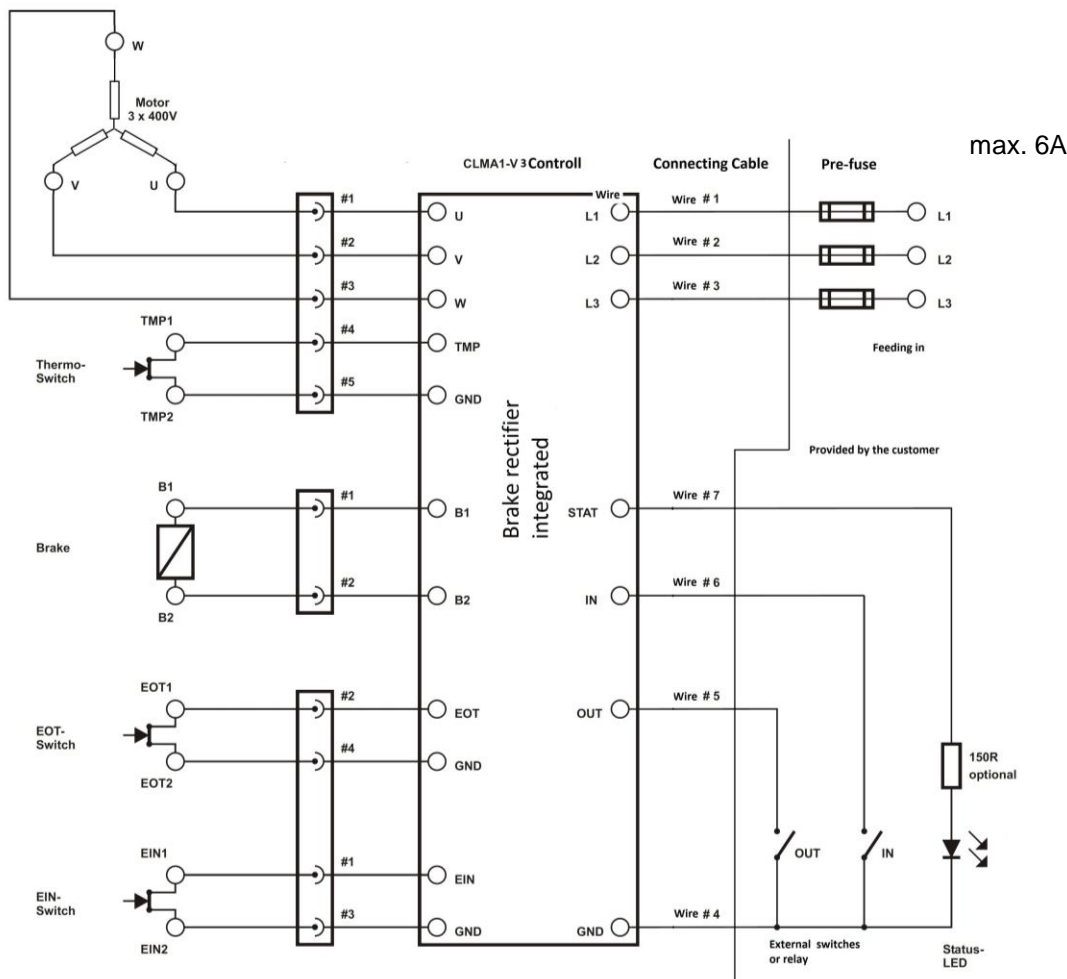
CMLA linear drive with 3ph 400V three-phase motor with CMLA1-V3 controller



Attention!
Connecting to a right
rotation field.

AC Motor 3~	400VAC 50Hz
Motor winding thermostat	250VAC, max. 2,5A (ohmic load)
Break (optional)	205VDC, 20W
End position "IN"	24VDC, max. 100mA (ohmic load)
End position "OUT"	24VDC, max. 100mA (ohmic load)

6.1.2. Example of controls for CMLA linear drive with 400V three-phase motor with CMLA1 V3 controller



6.1.3. Description of CMLA1-V3 controller

This controller is a logical element based on electronic semiconductor elements.

External switching can be performed either using the relay contacts of a controller or the control keys. **The notes on controller assembly (p7, chapter 5.1) must be observed.** The control inputs "OUT" and "IN" are connected to the CMLA1-V3 controller, which correspond to "extend" and "retract" of the drive respectively. Auxiliary voltage is not necessary.

6.1.4. "STAT" status output

A "STAT" status output is issued externally by the CMLA1-V3 controller. For safety, there is a protective resistor R12 in the line to limit the current in case of a short circuit of the output.



The status output is not suitable for direct connection to the relay.

Output voltage, maximum 5 V without load

Output current, maximum 10 mA to LED

Direct connection of LED or optocoupler

6.1.5. Error evaluation and "STAT" status output

Internally, a differentiation is made between 4 statuses:

- No error: Output has continuous voltage, LED lights up as operating indicator
- Thermal error: LED flashes slowly (1 second interval)
- Limit switch exceeded error: LED flashes rapidly (0.2 second interval)
- Overcurrent error: No output voltage, LED is off.

6.1.6. - Reset off error

In case of an error, the controller must be restarted by interrupting the power supply.



Errors are NOT saved.

After an interruption to the voltage, the operator could continue to move in the direction of the passed limit switch, which would destroy the drive.



After resetting the error "Limit switch exceeded", the operator must move in the opposite direction of the passed limit switch. Make sure to visually observe the direction of travel.

Overcurrent and thermal errors typically indicate that the drive was overloaded.

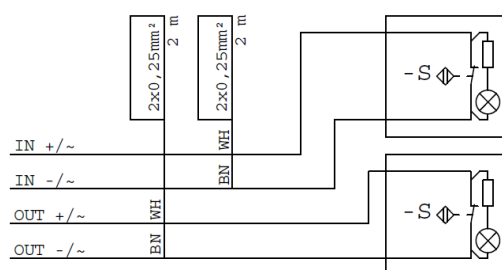
After correcting the problem, the drive will operate normally again.

6.2. Stroke limit, reed contact switch (option)

6.2.1. 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

6.2.2. Example of controls for reed contact switch

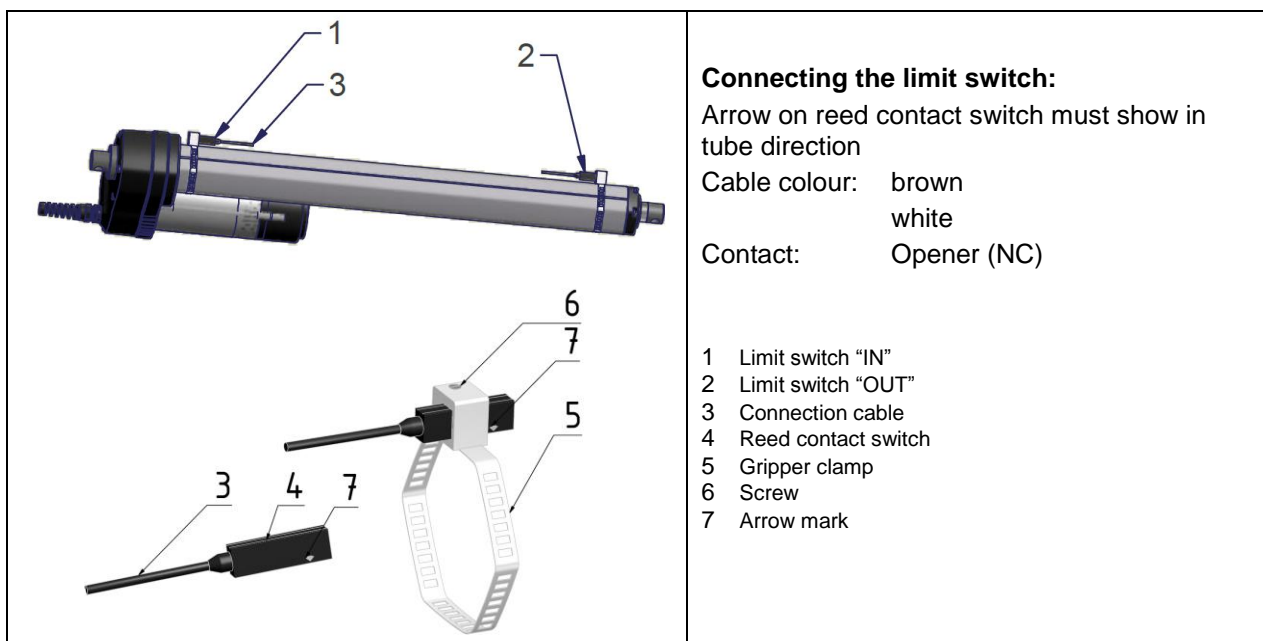


Option - Operating limit switches

Operating limit switch "IN" 10 ... 150V AC/DC
max. 0,5A 20VA

Operating limit switch "OUT" 10 ... 150V AC/DC
max. 0,5A 20VA

6.2.3. Setting the reed contact switch, stroke limit



⇒ **Before installation**, move CMLA into a middle stroke position

⇒ 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.

7. Initial operation

Check before initial operation:



⇒ Proper polarisation, direction of rotation, assignment of command devices

⇒ Protective earth system

⇒ Insulation resistance

⇒ Overload protection device (if available)

⇒ Function

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

Before commissioning the system, read the operating instructions and make them available to all persons responsible for commissioning.



Observe the safety information.

Store the operating instructions and documents carefully.



Ensure that the direction of rotation is correct before commissioning (correct connection). Subsequent connection of the rotating field and the limit switches. If the direction of rotation or connection of the limit switch is incorrect, this may cause a blockage (damage to the CMLA).



Where it is to be used as lifting equipment, the overall system must be examined by a competent person before commissioning.

8. Inspection and maintenance instructions

Safety information



Before carrying out inspection and maintenance tasks, the load needs to be taken from the linear drive. Crushing risk if started accidentally.

Operation, assembly, commissioning and maintenance only by: authorised and knowledgeable personnel





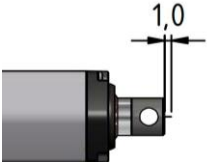
Work on the electrical system by qualified electricians is permitted once the power supply is interrupted.



During operation the linear drive can reach a high surface temperature.

Only touch the linear drive when it has cooled down.

	<p>The CMLA electric linear cylinder is filled with lubricant and maintenance-free during its service life under normal operating conditions. (Lubricant grease KP2K-20) Defective parts must be replaced in good time, where possible.</p>
	<p>The regular (recommended at least once a year) inspection/ maintenance is to be conducted by a qualified person (in accordance with TRBS 1203¹) on behalf of the operator. All tests and modifications must be documented (e.g. machine file, inspection log)</p>

Inspection intervals	Inspection tasks
Quarterly	<p>Check mounts, screw and bolt connections for tight fit.</p> <p>Check drive, limit switch, brake (optional) for proper function.</p>
<p>Annually At least every 500 hours of operation</p> 	<p>Check the wear of the nut (on versions with trapezoidal thread spindle)</p> <p>If the axial play of the thrust pipe in unloaded state is greater than 1.0 mm, then the drive must be replaced.</p> <p>Inspection by qualified person.</p> <p>We recommend recording the result in a log.</p>
The service life of the device is limited	

8.1. Operational malfunctions and their causes

Malfunction	Possible cause	Elimination
CMLA 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
	Brake does not open	Check on-site voltage supply.
		Check on-site brake rectifier.
	Travelling nut mechanically blocked (installation dimension exceeded or not reached)	Replace CMLA
CMLA does not run at nominal speed	Load too high	Reduce load
	Motor connection incorrect	Check terminal connection
CMLA is running, but there is no lifting movement	Gear worn	Replace CMLA
	Travelling nut worn	Replace CMLA
CMLA is overheated (surface temperature >80 °C) or temperature monitor has reported	Load too high	Reduce load
	Duty cycle exceeded	Reduce duty cycle
	Alignment fault during installation	Align (refer to the chapter on assembly)
	Gear or screw lubrication no longer sufficient	Replace CMLA
Load is no longer held, overtravel path too great	Brake is worn	Replace CMLA

8.2. Disposal



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

¹ We recommend that Pfaff-silberblau Hebezeugfabrik performs this inspection.

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
Elektromechanischer Linearantrieb CMLA	Electromechanical linear actuator CMLA	Vérin électromécanique CMLA
Größe/ Size / Model P50; P70; P 90; P125		
Antriebsselement 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;; 1.5.4; 1.5.8; 1.5.10; 4.1.2.2; 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;; 1.5.4; 1.5.8; 1.5.10; 4.1.2.2; 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;; 1.5.4; 1.5.8; 1.5.10; 4.1.2.2; 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 EG-Niederspannungsrichtlinie 2006/95/EG EG Richtlinie EMV 2004/108/EG	This incomplete machine is in compliance with the provisions of the following EC directives Low voltage directive 2006/95/EC EMC directive 2004/108/EC	Cette machine incomplète est conforme aux dispositions des directives européennes suivantes Directive "Basse tension" 2006/95/CE Directive "Compatibilité électromagnétique" 2004/108/CE
Angewendete harmonisierte Normen, insbesondere: DIN EN 1494:2000; DIN EN ISO 12100:2010; DIN EN 60204 T1+T32	Applied harmonised standards, in particular: DIN EN 1494:2000; DIN EN ISO 12100:2010; DIN EN 60204 T1+T32	Normes harmonisées utilisées, en particulier : DIN EN 1494:2000; DIN EN ISO 12100:2010; DIN EN 60204 T1+T32
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

When used as lifting equipment, a risk analysis in accordance with Annex I of the Machinery Directive 2006/42/EC-4 General requirements for lifting operations must be conducted.

Kissing, 28/05/2014


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 ppa. Ulrich Hintermeier i.V. Konrad Ertl

The undersigned is authorised to prepare the technical documentation referred to in Annex VII A and submit it to the responsible authorities on request.	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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