

BA PA-L-180/xxx EN 1.0

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ATTENTION

Actuators of the PA-L series are not compatible with actuators of the EA-L series!

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These operating instructions are only valid with the supplied supplementary sheet „Safety instructions and Warranty conditions“!

Figures

1. Figures

Figure 1: Heavy-duty linear actuator



Figure 2: Dimensions Actuator

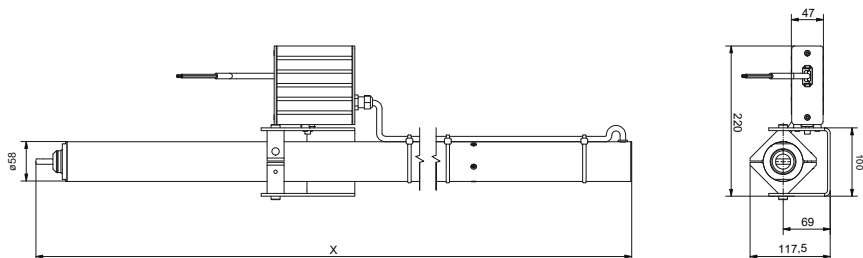


Table 1: Total lengths

Stroke	Total length X
500 mm	917 mm
600 mm	1017 mm
750 mm	1167 mm
1000 mm	1417 mm

Figure 3: Dimensions external cut-off AM-985

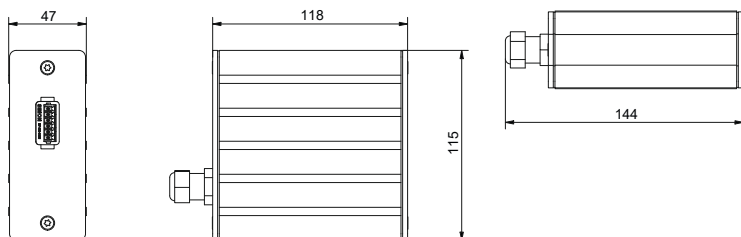


Figure 4: Bracket OK-1500 (K2 1501 B)

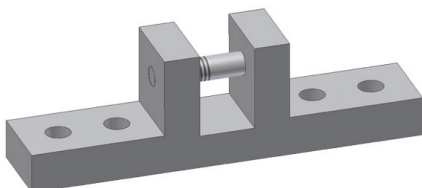
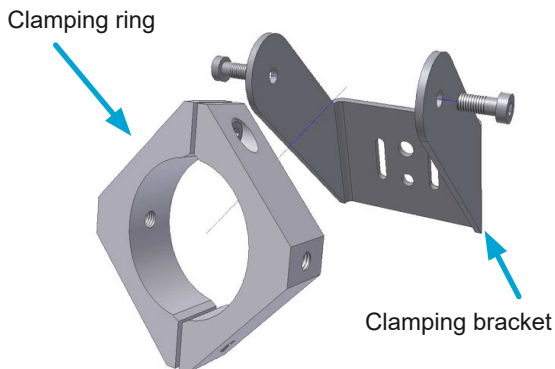


Figure 6: External cut-off AM-985 (M2 3401 X)



Figure 5: Lower Bracket K-L-UK-180 (K2 1585)



2. General

2.1. Use for the intended purpose

See supplementary sheet "Safety instructions and Warranty conditions"!

3. Mounting

3.1. Safety instructions

See supplementary sheet "Safety instructions and Warranty conditions"!

3.2. Mechanical connection

The exact position of the linear actuator at the rear/lower bracket can be re-adjusted at any time by unscrewing the stud bolts.



ATTENTION

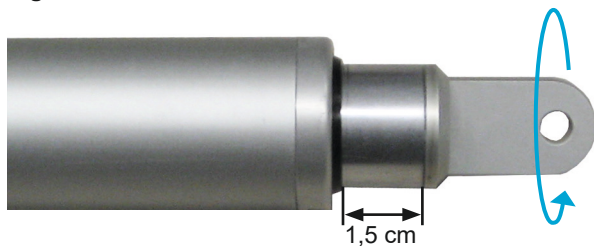
When mounting the actuator, observe the static properties of the frame.

Use suitable fasteners depending on the material of the window onto which the actuator is to be mounted.

Fastenings are not included in the scope of delivery!

- To achieve a good tight fit of the building cover, turn the eyebolt on the linear actuator counterclockwise until the push tube is extended approx. 1.5 cm before mounting the actuator.

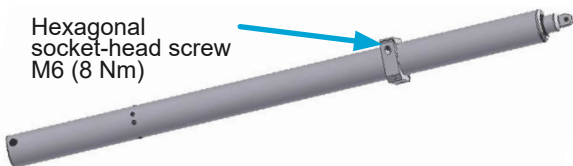
Figure 7



- Tighten the M6 hexagonal socket-head screw of the clamping ring to a torque of **8 Nm**.

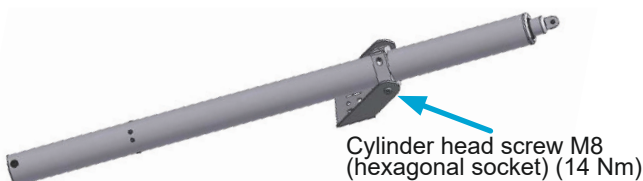
Figure 8

Hexagonal socket-head screw M6 (8 Nm)



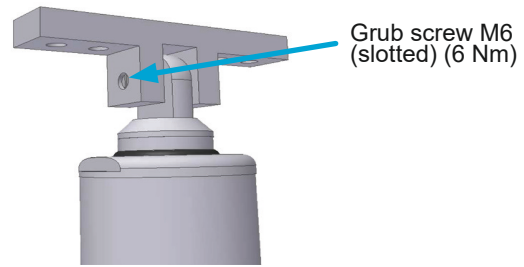
- Tighten the M8 cylinder head screws of the clamping bracket to a torque of **14 Nm**.

Figure 9



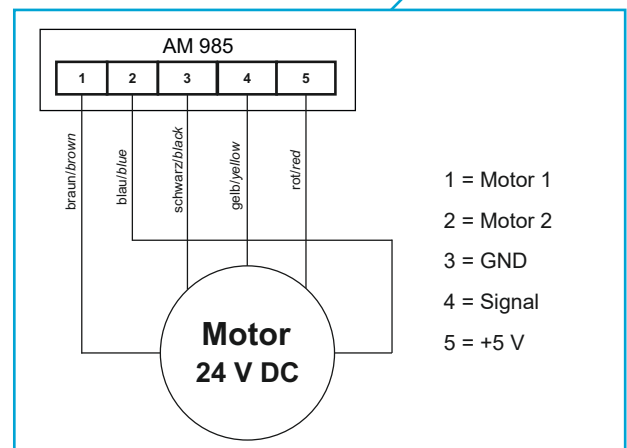
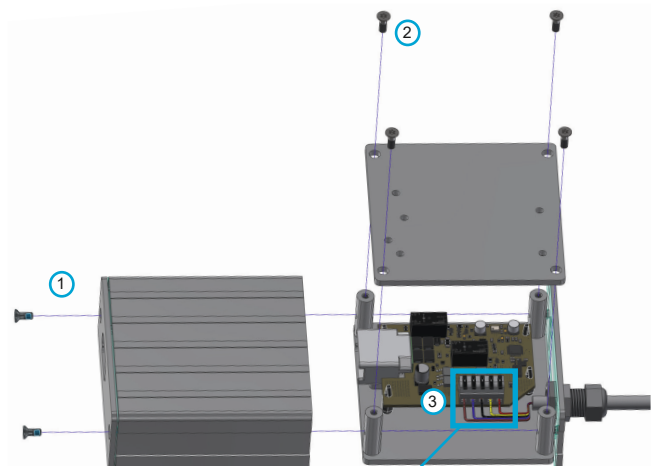
- Tighten the self-locking M6 grub screw at the connection of the actuator to the wing guide block with a torque of **6 Nm**.

Figure 10



3.2.1. Shortening the motor cable

Figure 11



- Remove screws from the revision cover (1) of the external cut-off AM-985 and open it.
- Unscrew the housing cover of the external cut-off AM-985 (2).

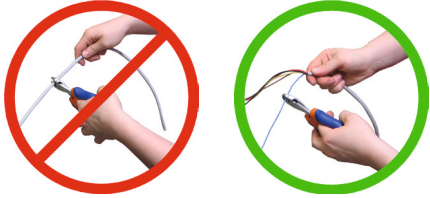
Disconnect the wires from the motor terminals (3), shorten them wire by wire to the desired length (see note on next page!) and reconnect according to wiring diagram.

Mounting



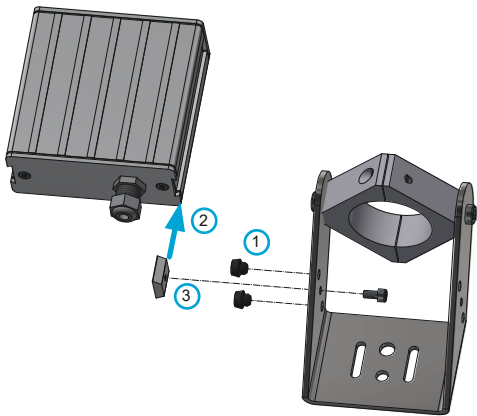
ATTENTION

Only shorten the motor cable wire by wire! There must be no electrical connection between the wires!



3.2.2. Mounting of the cut-off

Figure 12



- Attach the rubber stoppers to the clamping bracket (1).
- Slide the fastening element into the rail on the cut-off AM-985.
- Place the clamping bracket on the fastening element. Fix the fastening element with the rubber stoppers and tighten it with an M5 x 10 cylinder head screw on the clamping console (3)

3.2.3. Mounting examples

Figure 13

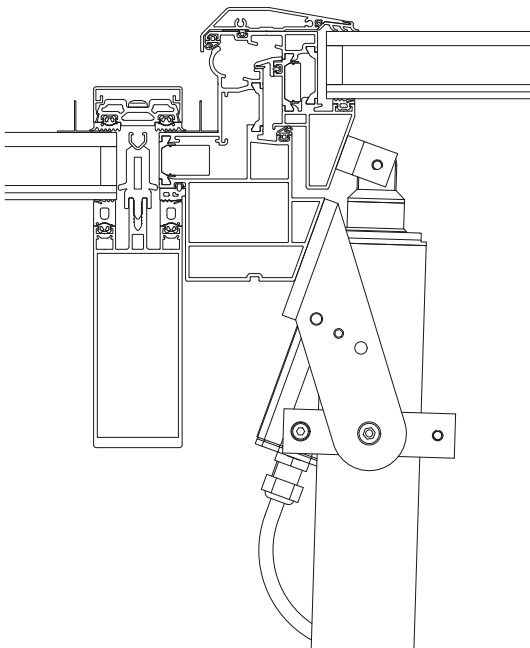
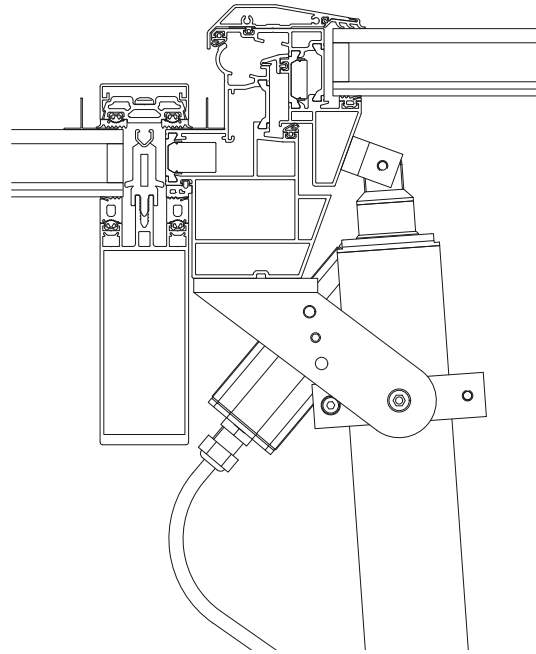


Figure 14



ATTENTION

If the clamp bracket is mounted close to the window frame, there is a risk of the AM-985 external switch colliding with the frame.

In this case there is also a risk that the motor cable will get pinched. Observe the bending radius of the motor connection cable!

Mounting

3.3. Electrical connection

See the attached sheet “**safety instructions and warranty conditions**”!



ATTENTION

Unused wires must be electrically insulated.

The wires **C1** and **C2** must not be connected to each other during normal operation.

3.3.1. Power supply

The supply voltage must be dimensioned sufficiently for the actuator. Voltage and current must fit the specifications on the type label.

3.3.2. Feedback – volt-free contact

The normally open contact (NO1, NO2) is activated in direction “CLOSE” when the actuator is cut off in end position “CLOSE”. The message is stroke-dependent and can be evaluated as a “CLOSED” messages. The relay can be freely parameterized via software.



ATTENTION

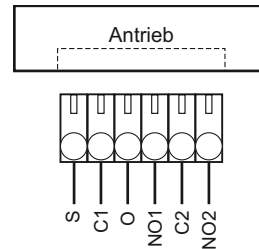
The maximum load capacity of the contact must not be exceeded.

3.3.3. Preparation for installation

Before starting the installation, the required connection cable must be assembled. For this purpose use the plug included in the scope of delivery (see instructions in the accessory bag with SICO PLUG). For NSHEV according to EN 12101-2, the silicone connecting cable approved by the manufacturer must be used.

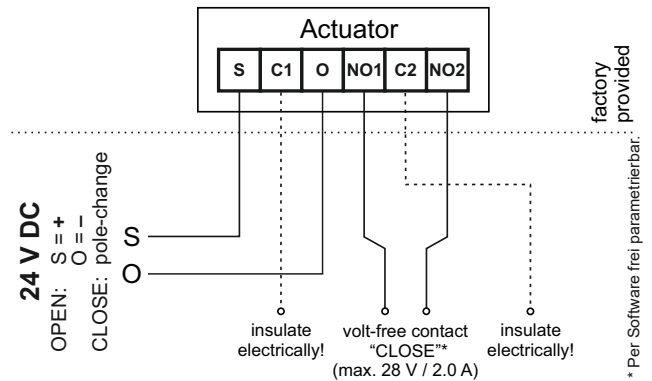


3.3.4. SICO PLUG assignment



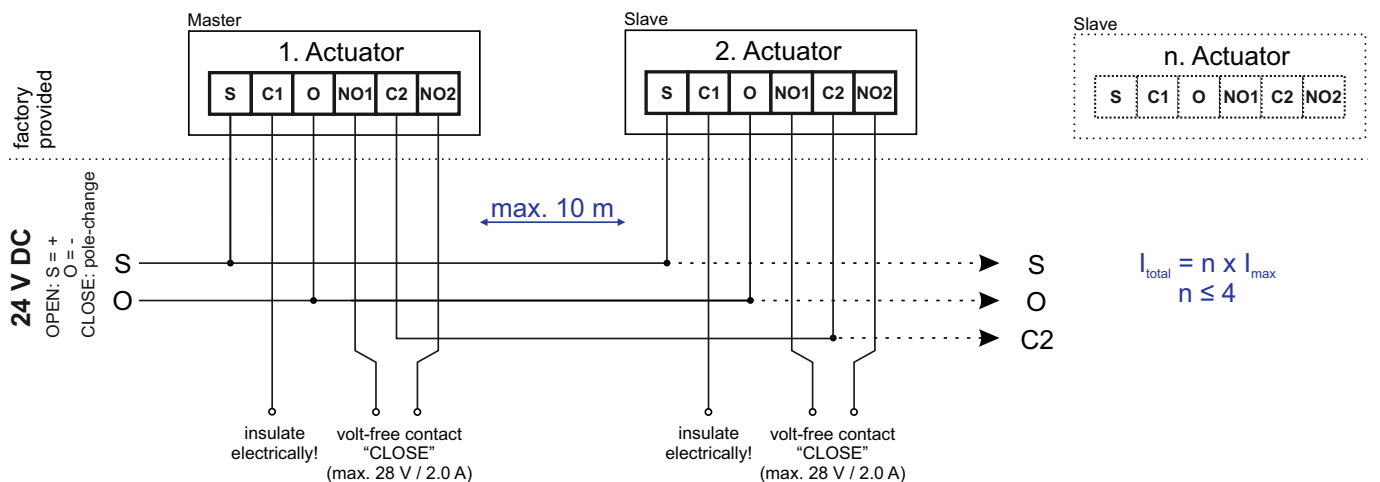
3.3.5. Single operation

➤ Connect wires according to the the wiring diagram.



3.3.6. Synchronous operation

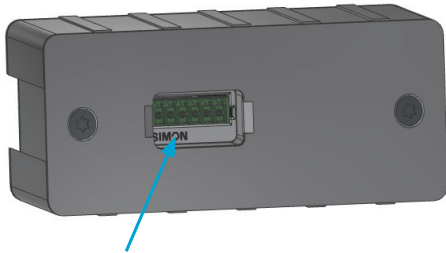
➤ Connect wires according to the wiring diagram.



3.4. Setting options

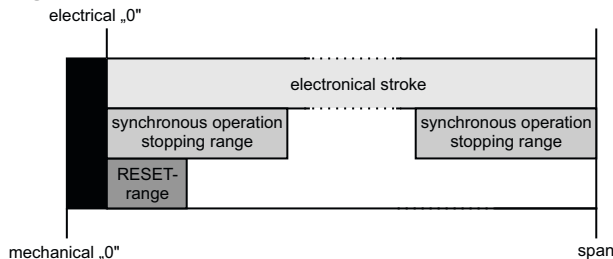
You can set **single operation** or **synchronous operation mode MASTER / SLAVE** via SICO LINK or manually.

Figure 15: Interface for SICO LINK



Connection for SICO-USB-110

Figure 16: Stroke behaviour



RESET-range: When the actuator is cut off on overload within the RESET-range, the electronic zero point will be set new.

Synchronous operation stopping range: If an actuator cuts off in synchronous operation in direction "OPEN" or "CLOSE" within the **stopping range**, the remaining actuators continue to run until cutoff in the respective end position.

3.4.1. Synchronous actuators

The synchronous actuators of the PA-L series are identified by the suffix "S" in the part number (e.g. PA-L-50/750-S).



INFORMATION

Solo actuators can be converted to synchronous actuators on site via SICO LINK using SICO tokens.

3.4.2. Zero point/RESET-range

It's necessary to reset the zero point, if the closed position of the actuator is out of the RESET-range after installation. (SICO LINK / RESET-run).

3.4.3. Operating modes synchronous actuator

If a synchronous actuator is to be used as a single actuator, the operating mode must be set to "Single operation" (SICO LINK or RESET-run) – factory setting.

If several actuators are to be used in synchronous operation, one actuator must be set to "Synchro Master" and the remaining actuators to "Slave" (SICO LINK or manual MASTER/SLAVE setting).



ATTENTION

In order to recalibrate the synchronous function, the actuator must be fully closed in the reset range after max. 50 cycles.

3.5. Manual setting

3.5.1. MASTER/SLAVE setting



ATTENTION

Manual setting: One MASTER and one SLAVE possible.
SICO LINK: ONE MASTER and up to four SLAVES possible.

- Drive the actuator in direction "CLOSE" (**S**="–" **O**="+") and let it cut off in the end position. If the actuator does not reach the „mechanical ZERO“ position due to its mounting position, a RESET-run must be performed.
- Leave the actuator energized!
- Connect the wires **C1** and **C2** directly. A relay click can be heard.
 - ◆ After 5 seconds you can hear a relay click, the actuator is set to MASTER with one connected SLAVE. Separate wires.
 - ◆ After 10 seconds a further relay click can be heard, the actuator is now set to SLAVE. Separate wires.
- Disconnect the actuator from power supply!
- Connect the two actuators in according to chapter 3.3.6: „Synchronous operation“ on page 5.

3.5.2. RESET-run

A RESET-run should be carried out,

- if the opening width of the closed actuator at the window is outside the RESET-range.
- if the MASTER/SLAVE setting needs to be reset.
- Disconnect the actuator(s) from power supply!
- Connect the wires **C1** and **C2** of each actuator directly with each other.
- Drive each actuator in direction "CLOSE" (**S**="–" **O**="+") and let it be cut-off in the end position!
- Again disconnect the actuator(s) from power supply and disconnect the wires **C1** and **C2**!
 - The zero point is set.
 - In case of "synchro capable" actuators, the operating mode is reset to "single operation" by the RESET-run. In this mode, the actuators can be operated standalone

Technical Data

4. Technical Data

Table 2: Electrical characteristics

Actuator type	PA-L-180/xxx	PA-L-180/xxx-S
Rated voltage	24 V DC	
Permissible rated voltage range	24 V DC \pm 15%	
Ripple of rated voltage Vpp	max. 500 mV	
Undervoltage detection	Yes	
Rated current ⁽¹⁾	4.0 A	
Soft close current	0.7 A	
Current consumption after cut-off (closed current)	65 mA	
Cut-off via	external electronic overload cut-off	
Maximum permissible number of actuators connected in parallel (synchro mode)	—	4
Cable length between two actuators in synchro mode	—	max. 10 m
Protection class	III	

(1) Maximum current consumption with nominal load.

Table 3: Feedback contact

Actuator type	PA-L-180/xxx	PA-L-180/xxx-S
Rated voltage	24 V DC	
Relay contact load	2 A	

Table 4: Connection and operation

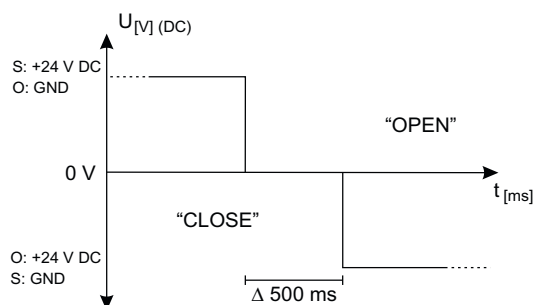
Actuator type	PA-L-180/xxx	PA-L-180/xxx-S
Pause time during change of direction ⁽²⁾	min. 500 ms	
Switch-on duration	ED 30	
Stability of opening and closing cycles	> 11,000	
Sound level ⁽³⁾	< 70 dB (A)	
Deadlock according to prEN 12101-9 / ISO 21927-9	allowed	
Multiple triggering after stop	allowed	
Maintenance	See supplementary sheet "Safety instructions and Warranty conditions"!	

(2) For the change of direction (pole reversal) it is necessary that the power supply ensures a pause time (zero-volt range) of at least 500 ms (see Figure 17).

(3) Measured at a distance of one metre under normal conditions.

Technical Data

Figure 17: Zero voltage range at changing of direction



ATTENTION

Voltage stability/quality: only defined cut-off processes are permitted (cut-off time from rated voltage 24 V to 0 V in $t < 10$ ms).

This applies in particular for switching operations from primary (mains operation) to secondary energy source (emergency power batteries).

Table 5: Installation and environmental conditions

Actuator type	PA-L-180/xxx	PA-L-180/xxx-S
Rated operating temperature	20 °C	
Permissible ambient temperature range	-5 °C – 75 °C	
Temperature - stability (SHEV)	300 °C	
Ingress protection	IP 54	
Usage range	Central European environmental conditions $\leq 2,000$ metres above sea level	

Table 6: Approvals and certificates

Actuator type	PA-L-180/xxx	PA-L-180/xxx-S
CE conformity	In accordance with EMC directive 2014/30/EU and the low voltage directive 2014/35/EU	
Further approvals	On request	

Table 7: Mechanical characteristics

Actuator type	PA-L-180/xxx	PA-L-180/xxx-S
Maximum pushing force ⁽¹⁾	1800 N	
Maximum pull force ⁽¹⁾⁽²⁾	1800 N	
Condition of loading	Opening against nominal load Closing with nominal load support	
Nominal locking force	≤ 2000 N in "OPEN" and "CLOSE"	
Nominal stroke ⁽³⁾	500 mm / 600 mm / 750 mm / 1000 mm	
Stroke speed at nominal load	12.5 mm/s	
Material / Surface	Alu E6/EV1 Coatings in all RAL and DB colours possible	
Dimensions (L × W × H)	See figure 2 „Dimensions“ on page 2	
Weight approx.	5.7 kg / 6.3 kg / 7.2 kg / 8.8 kg	

(1) Force can be reduced by reducing the rated current.

(2) Other values are optionally possible.

(3) The nominal stroke can deviate by $\pm 3\%$, but not more than 20 mm, due to mechanical damping and tolerances.