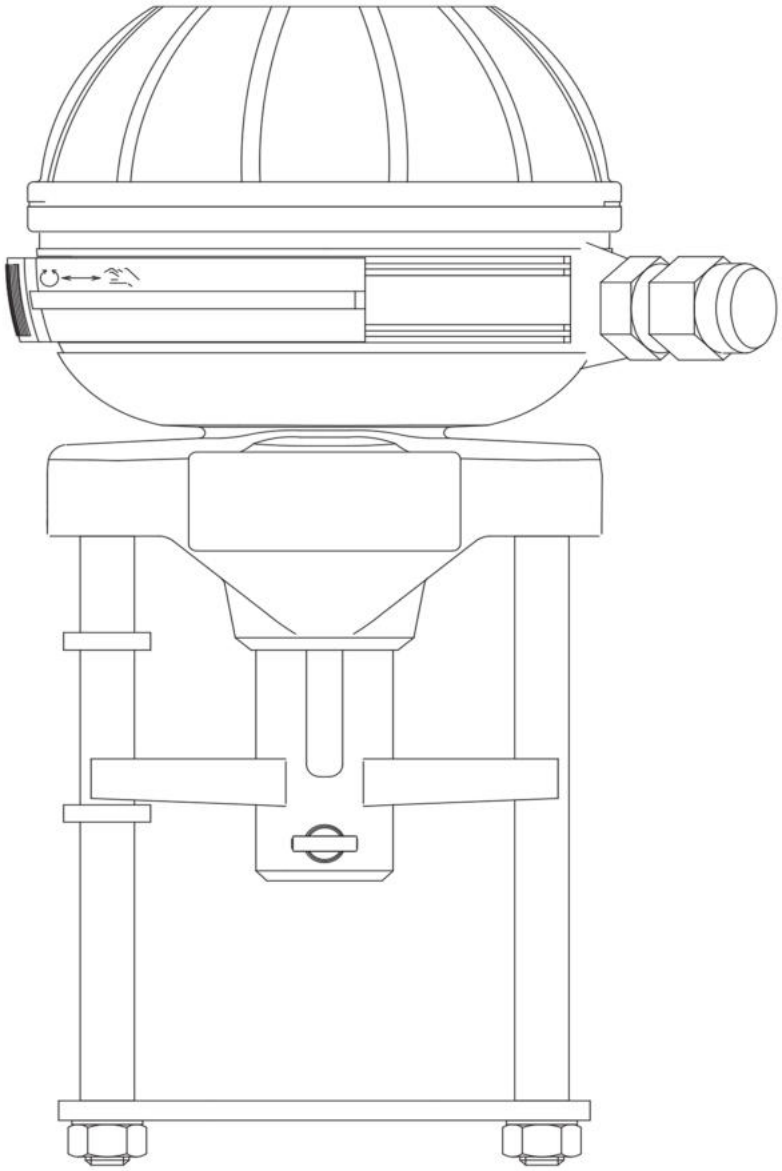

Operating Manual

Linear actuators

MLH55TPC • MLH55TPA • MLH55YC

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General information

Amendment

Version	Date	Modifications
1.0	June 2006	Initial preparation
2.0	June 2007	Revision
3.0	May 2008	Complete revision and amendment

Copyright

Subject to alteration

The regulations, directives, standards etc. are compliant with the current state of information at the time of development and are not subject to modification service. They must be applied by the operator at his own responsibility in their latest valid version.

Concerning all data, information, and illustrations in this manual we reserve the right of technical modifications and improvements. No claims can be considered for alteration or rework of already delivered lift drives.

Table of contents

1 Safety

Read these Operating Instructions carefully particularly the following safety instructions prior to installation and operation.

DANGER
Directly threatening hazard leading to death or serious physical injuries.

WARNING
Potentially hazardous situation which may lead to death or serious physical injuries.

CAUTION
Potentially hazardous situation which could lead to minor physical injuries. Indicates a hazard which may cause material damage.

ATTENTION
Potentially hazardous situation where the product or an object in its environment may get damaged.

Hint: Utilisation instructions and other useful information.

1.1 Proper use

Linear actuators MLH55TPC - MLH55TPA - MLH55YC are controlled by three-point control or constant control. Linear actuators in the series described in these Operating Instructions are used for valve stroke adjustment.

Concurrence of the above type designation with the linear actuator rating plate must be checked prior to starting any operations in order to guarantee utilisation in accordance with specification. The data on the rating plate is decisive for linear actuator technical data and mains power supply requirements.

Any utilisation for tasks other than the aforementioned usage in accordance with specification and operating with mains power supply ratios other than those permitted is not deemed to be utilisation in accordance with specification. The operator bears sole liability for the risk to persons and machine and other assets in the event of utilisation not in accordance with specification.

The intended use also includes the compliance with accident preventions, DIN VDE regulations and safe working practices for all measures described in these operating instructions in due consideration of prevailing rules.

1.2 Information for the operator

Always keep the Operating Instructions available at the linear actuator deployment site.

Observe the current health and safety, accident prevention and DIN VDE standards for installation, operation and maintenance.

Take into consideration any additional regional, local or in-house safety regulations.

Ensure that every person entrusted with one of the tasks specified in these Operating Instructions has read and understood these instructions.

1.3 Personnel

Only qualified personnel may work on these linear actuators or in their vicinity. Qualified persons are those persons entrusted with installation, assembly, commissioning and operation or maintenance of the linear actuators and possessing the appropriate qualifications for their activity. The necessary and prescribed qualifications include:

- Training / instruction or authorization to turn on /off circuits and appliances / systems according to EN 60204 (DIN VDE 0100 / 0113) and the standards of safety technology.
- Training or instruction according to the standards of the safety technology concerning care and use of adequate safety and work protection equipment.
- First Aid training.

Work in a safe manner and refrain from any working practice which endangers the safety of persons or damages the linear actuator or other assets in any way whatsoever.

1.4 Prior to starting work

Prior to starting any work, check that the type designations specified here concur with the data on the linear actuator rating plate.
Linear actuators MLH55TPC, MLH55TPA, MLH55YC.

1.5 During operation

Safe operation is only possible if transportation, storage, installation, operation and maintenance are carried out safely and materially and professionally correctly.

Transportation, installation and assembly

Observe the general set-up and safety regulations for heating, ventilation, air-conditioning and pipework design. Use tools correctly. Wear the necessary personal and other safety equipment.

Repairs and maintenance

Ensure that qualified personnel switch off the linear actuator prior to maintenance or repair work in accordance with DIN VDE.

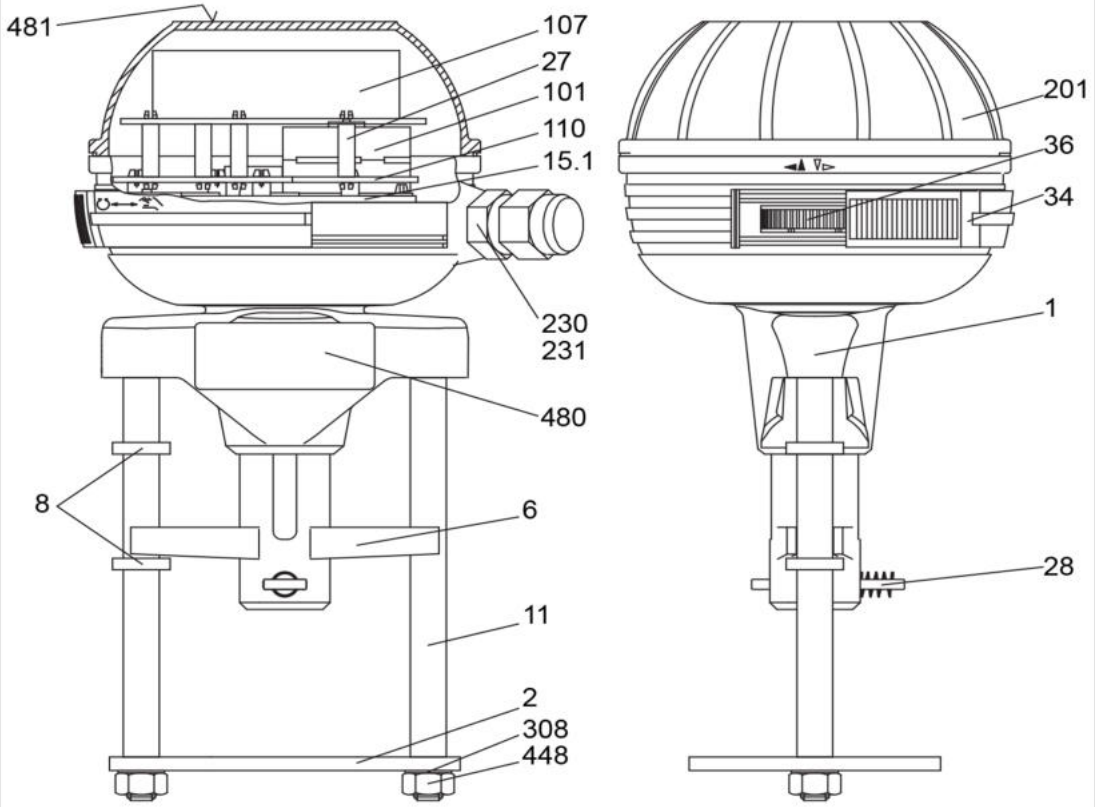
1.6 Working environment

Read the data concerning the working environment in the Technical Data.

2 Product Specification

The linear actuators control a stepper motor by means of a micro controller. The rotational movement of the stepper motor is converted into a linear movement by spur gears and a threaded spindle with spindle nut.

2.1 Component parts



1	Actuator housing	**101**	Engine/ motor
2	Cross head	**107**	Push-fit PCB for 24 V or 230 V
6	Clutch	**110**	Main board
8	Position display unit	**201**	Cover*
11	Distance sleeve	**230**	Cable lead-in M16 × 1,5*
15.1	Gear plate	**231**	Cable lead-in M12 × 1.5*
27	Spacer for 230 V*	**308**	Safety disk*
28	C-frame	**448**	Hexagon nut M8*
34	Slide Valve	**480**	Type plate
36	Hand wheel	**481**	Wiring diagram on cover

diagram 1 Component part denominations

* This component part is available as a spare part.

2.2 Operating modes

The linear actuator can be operated manually or automatically.

- In manual mode stroke is adjusted via the hand wheel.
- In automatic mode stroke is controlled electrically.

2.2.1 Continuous mode MLH55YC

In continuous mode the system control presets the position of the linear actuator whilst inside the linear actuator the input signal (Y) of the system control is continuously compared with the output signal (X) of the linear actuator. In doing so the output signal depends on the position of the linear actuator (travel).

The linear actuator keeps moving until the input signal and the output signal match.

Input signal (Y)

The input signal (Y) of the system control specifies the desired position for the linear actuator. It is applied in the form of an analogue signal to terminal Y.

Possible input signals:

- 0 … 10 V DC / 2 … 10 V DC
- 0 … 20 mA / 4 … 20 mA

Output signal (X)

The output signal (X) determines the actual position of the linear actuator. It is applied to terminal X in the form of an analogue signal.

0% to 100% valve lift is put out as:

- 0 … 10 V DC

2.2.2 Three-point mode MLH55TPC, MLH55TPA

The direction of rotation is set via the control voltage at terminal 2 and terminal 3 on the main PCB:

- When the control voltage is applied to terminal 2, the spindle nut will be extended.
- When the control voltage is applied to terminal 3, the spindle nut will be retracted.

Output signal (X)

The output signal (X) determines the actual position of the linear actuator. It is applied to terminal X in the form of an analogue signal.

0% to 100% valve lift is put out as:

- 0 … 10 V DC

2.3 Functions

2.3.1 Binary signal / frost protection function MLH55YC

The terminals B1 and B2 on the main PCB are bridged during normal operation. If the electric circuit between B1 and B2 is interrupted, the linear actuator will store the current position and afterwards move automatically to its limit position.

All other control signals will be ignored during this process.

The linear actuator will remain in limit position until the electric circuit between B1 and B2 has closed.

As soon as the electric circuit between B1 and B2 is closed, the desired value of the input signal will be started.

⇨ *5.5 Setting the limit position for MLH55YC* on page 21

2.3.2 Blockage detection

When the linear actuator is mechanically blocked the blockage detector will turn off the motor as soon as one of the two limit positions have been reached or a blockage occurs due to overload.

2.3.3 Wire break detection MLH55YC

Wire break detection is only available for continuous mode with an input signal 2 … 10 V DC and 4 … 20 mA.

The linear actuator moves to the limit position set by jumper JP2 if the input signal drops below 1 V or 2 mA.

⇨ *5.5 Setting the limit position for MLH55YC* on page 21

2.3.4 Actuating time

The time required for the spindle nut to travel a defined distance is called actuating time. Actuating time is specified in s/mm. Jumper JP3 on the plug-in jumper wire is used to set the actuating time.

⇨ *5.3 Setting the actuating time* on page 19

2.3.5 Manual operation

In manual mode it is possible to change the stroke without supply voltage.

- Motor and control electronics are turned off in manual mode to make hoisting movements of the control impossible.

⇨ *6.1 Changing between manual and automatic mode* on page 22

2.4 Technical data

Type	MLH55TPC, MLH55YC	MLH55TPA
Supply voltage:	24 V AC ± 10% 24 V DC ± 10%	230 V AC + 6% -10% 115 V AC ± 10%
Power consumption	3,5 VA	7 VA
Weight	1.5 kg	1.5 kg
Dimensions	See technical data sheets	
Stroke MC55 **Stroke MC65**	max. 14 mm max. 20 mm	max. 14 mm max. 20 mm
Frequency	50/60 Hz ± 5%	50/60 Hz ± 5%
Ambient temperature	0 to +60°C	0 to +60°C
Enclosure protection	IP 54 IP 30 in manual mode	IP 54 IP 30 in manual mode
Operating mode	S3-50% ED	S3-50% ED
Actuating time	9 or 5 s/mm	9 or 5 s/mm
Actuating force	0.6 kN During 24 V DC the specified actuating force can only be reached with the help of an aligned AC voltage.	0.6 kN

table 1 Technical data

Type	MLH55TPC, MLH55TPA	MLH55YC
Input signal Y/ Resistance of load	• Three-point	• 0 … 10 V DC / 77 kΩ • 2 … 10 V DC / 77 kΩ • 0 … 20 mA / 510 Ω • 4 … 20 mA / 510 Ω
Output signal X/ Load rating	• 0 … 10 V DC / resistance of load ≥ 1200 Ω, $I_{max.}$ 8 mA	
Cable impedance between B1 and B2		• max. 10 Ω

table 2 Technical data signals

2.5 Type plate

The type plate is attached to the housing of the linear actuator.

It bears the type denomination, serial number (s/no) and date of manufacture (last four digits).

⇨ *2.1 Component parts* on page 6

MLH55YC	**08203017/01/0408**
AC 50/60 Hz	24V
max 3.5 VA	IP 54/30

diagram 2 Example of type plate

3 Transportation & Storage

CAUTION

Non-compliance with safety regulations may result in injury!

- Wear the required personal and other safety equipment.

- Avoid impacts, blows, vibrations etc. to the linear actuator.
- Store the linear actuator (and, where appropriate, the entire controlling device) in a dry place.
- Keep to the specified transport and storage temperatures between -20 to +65°C.

4 Assembly

Prior to assembling the linear actuator:

⇨ *4.1 Checking the scope of delivery* on page 11
⇨ *4.2 Preparing assembly* on page 11

The following sequence of operations is part of the linear actuator assembly:

⇨ *4.3 Mounting the linear actuator on the valve* on page 12
⇨ *4.4 Assembling/disassembling the cover* on page 13
⇨ *4.5 Electrical connection* on page 14

4.1 Checking the scope of delivery

1. Check the packaging for damage.
2. Dispose of packaging in an environmentally friendly manner.
3. Check the delivered items against the delivery note in order to see whether the delivery is complete.
4. Report any missing or damaged products to the manufacturer.

4.2 Preparing assembly

ATTENTION

A non-attached valve causes damage!

If you operate the linear actuator without valve, the spindle nut may fall off due to the missing stroke.

- Always operate the linear actuator with a valve attached.

1. Allow for about 140 mm space above the cover at the site of installation.
2. Check the working environment before assembling and commissioning the linear actuator:
3. Ensure that the valve is correctly fitted. For details please see assembly instructions for valve.
4. Determine the assembly position of the linear actuator. Do not arrange linear actuators in a hanging position.

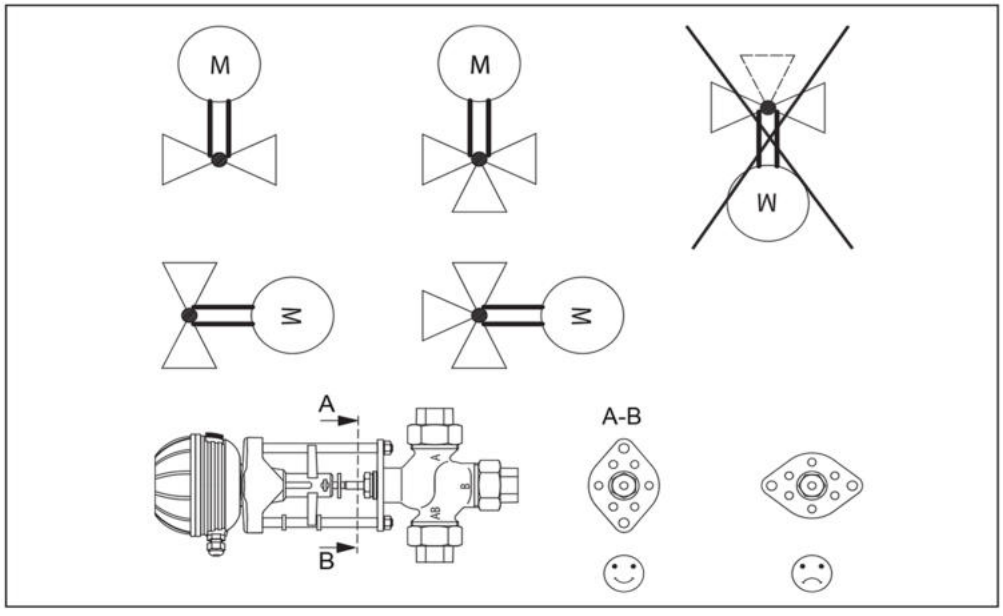
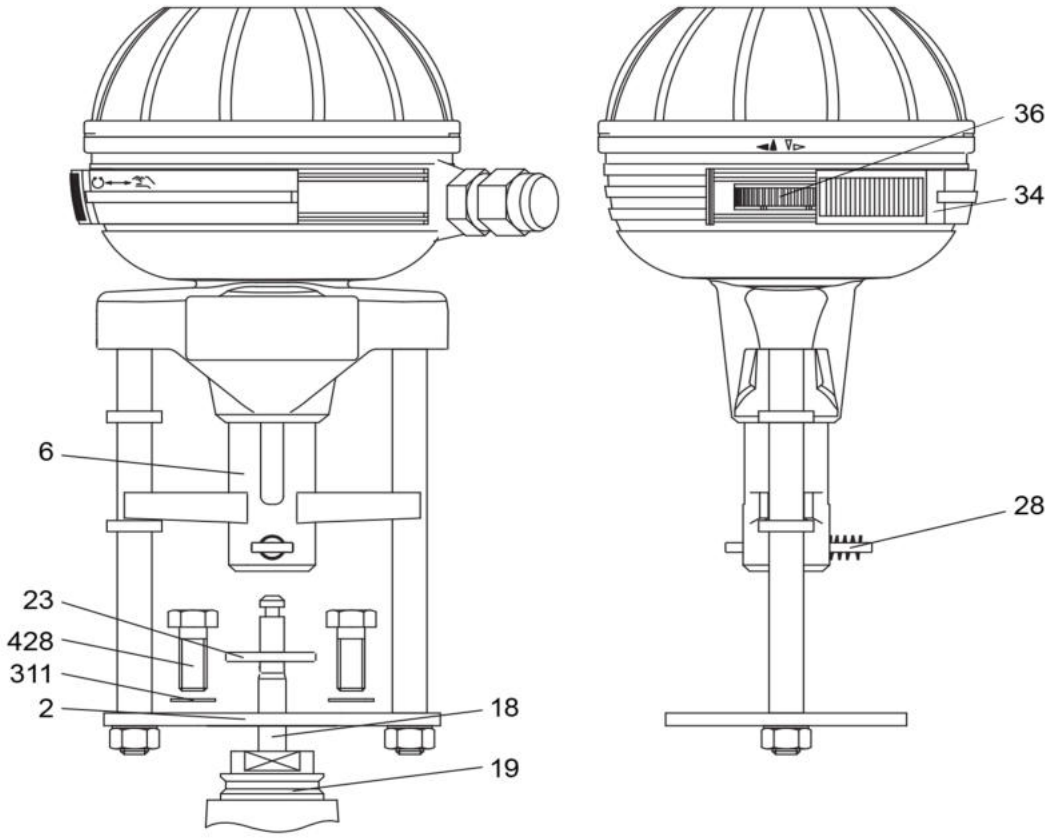


diagram 3 Assembly positions for linear actuator and valve

4.3 Mounting the linear actuator on the valve

If the linear actuator and the valve are supplied separately you will have to mount the linear actuator on the valve.



2	Cross head	**28**	C-frame
6	Clutch	**34**	Slide Valve
18	Valve stem	**36**	Hand wheel
19	Valve neck	**311**	Lock washers
23	Assembly aid	**428**	Screws

diagram 4 Mounting the linear actuator on the valve

■ **How to assemble linear actuator:**

1 Place actuator with crossbeam **(2)** on valve neck **(19)**.

⇨ *diagram 4* on page 12

2 Insert the C-frame **(28)** and, using a mounting aid, pull the valve stem upwards **(18)** **(23)** until the valve stem **(18)** locks inside the clutch **(6)**.

3 Fix the crossbeam **(2)** of the actuator with the help of screws**(428)** spanner width 13 and lock washers **(311)** on the valve neck **(19)**.

■ **How to disassemble the linear actuator**

1 Follow the sequence of operation in reverse order.

4.4 Assembling/disassembling the cover

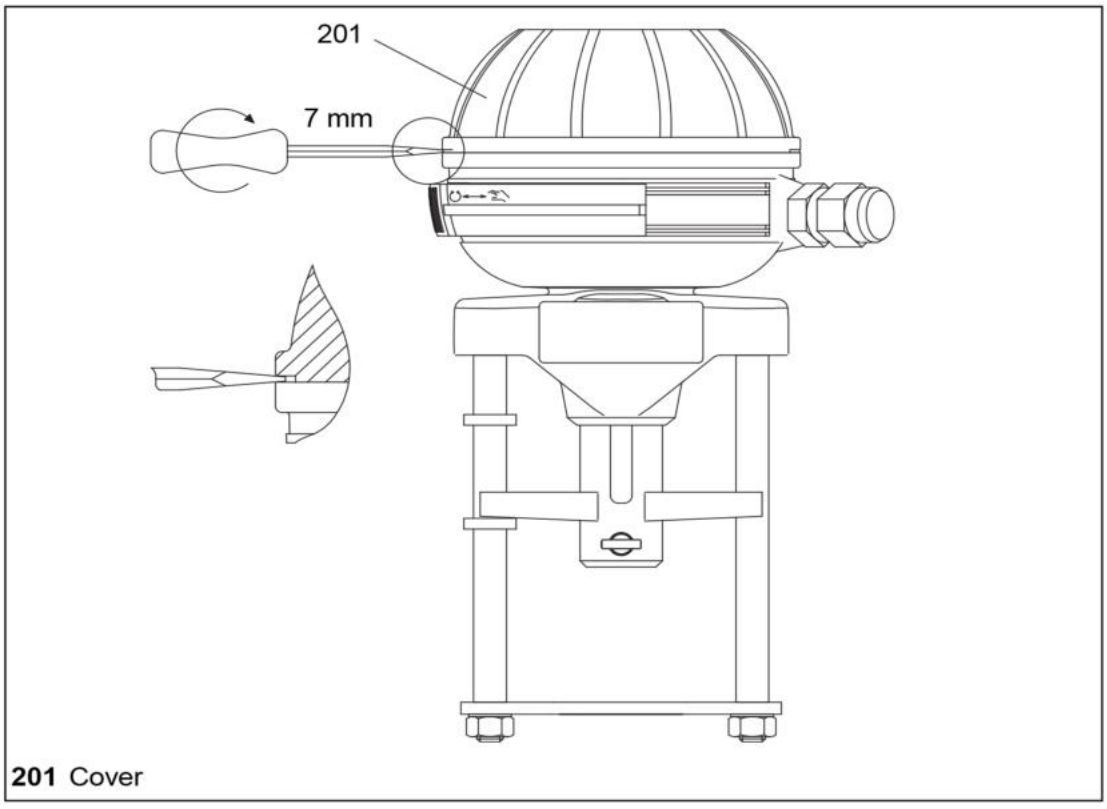
WARNING

Risk of injury from electric shock by live parts!
When the power supply is on there is a danger of electric shock due to live parts.

- Prior to commencing any work, ensure that the actuator is safely disconnected from the power supply system.
- Secure against unauthorised restarting.
- Remove the cover only momentarily.

■ **How to remove the cover**

1 Insert a screwdriver in the notch of the cover and lift the cover **(201)**.



201 Cover

diagram 5 Removing the cover

2 Remove the cover **(201)** carefully.

■ **How to attach the cover**

Hint: The cover may be mounted in any position.

1 Place the cover **(201)** on top and push it down to make it fit by applying moderate force.

2 Check the cover for correct fit to ensure air-tightness for the actuator housing.

4.5 Electrical connection

WARNING

Danger of life caused by incompetent staff!
Electrical connections carried out by unqualified staff may result in death, severe bodily injury or considerable material damage.
- Make sure that such all work is carried out by qualified staff.

⇨ *1.3 Personnel* on page 5

WARNING

Risk of injury from electric shock by live parts!
When the supply voltage is turned on there is a risk of electric shock from live parts.
- Prior to commencing any work, ensure that the actuator is safely disconnected from the power supply system.
- Secure against unauthorised restarting.

■ **How to prepare the electric connection**

1 Ensure that the supply voltage matches the specifications on the type place of the linear actuator.

2 To avoid breakdown, construct the line diameter according to actuating performance and required line length.

3 Lay the mains for a supply voltage of > 48 V separate from the signal and control wires.

When laying cables in a joint cable duct, use shielded control wires.

4 Check the supply voltage.

If the required tolerance is not achieved by a power transformer you will have to use an AC voltage stabilizer.

⇨ *2.4 Technical data* on page 9

■ **How to establish electrical connection**

1 Remove the cover **(201)**.

⇨ *How to remove the cover* on page 13

2 Run the cable through the screw joint to the terminal strip.

3 Connect the power supply according to the wiring diagram.

⇨ *diagram 6* on page 15

Hint: The wiring diagram **(481)** is on the cover **(201)**.

ATTENTION

Malfunctions caused by incorrect zero potential!
If the electric power supply for the linear actuator is fed by transducing sensors with varying zero potentials this may result in incorrect automatic controller action.
- Ensure that the zero potential is properly applied.

⇨ *table 3* on page 15

4 Tighten the screw joints.

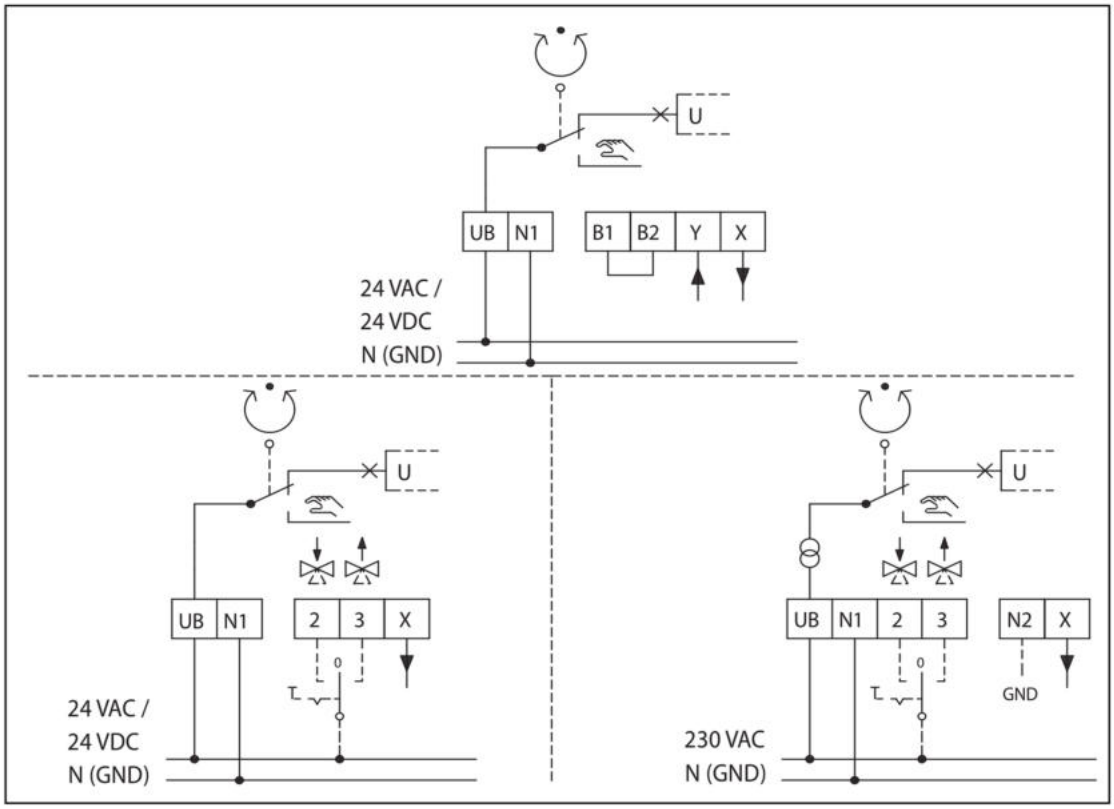


diagram 6 Circuit diagram

Terminal	Description
UB, N1	Supply voltage:
2	Control voltage for downward movement during three-point mode
3	Control voltage for upward movement during three-point mode
B1, B2	Binary input / frost protection function
N2	Zero potential of signal X at 230 V AC • If you run the actuator in three-point mode at 230 V you will have to connect N2 before you can use X.
Y	Input signal continuous mode
X	Output signal

table 3 Key to wiring diagram

4.5.1 Controller independent circuit MLH55YC

When working with 24 V supply voltage and 0 … 10 V DC / 2 … 10 V DC input signal you can switch the actuator controller-independently via a three-step toggle switch in the control cabinet.

■ **How to switch the actuator controller-independently**

1 Run the supply voltage 24 V AC via a diode and a three-step toggle switch to terminal Y.

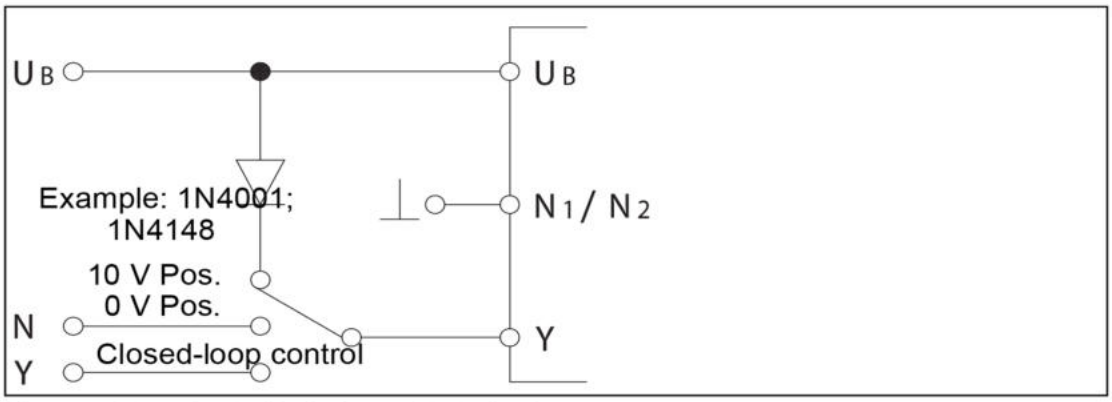


diagram 7 Controller independent circuit

2 Using the toggle you can move the linear actuator to the following positions:

- Closed-loop control by input signal Y (normal operation)
- 10 V-position
- 0 V-Position, the linear actuator can be moved to the position on the plug-in jumper selected by jumper JP2 at 2 … 10 V DC .

⇨ *5.1 Operating parameters and jumper settings* on page 19
⇨ *5.5 Setting the limit position for MLH55YC* on page 21

4.5.2 Remove push-fit PCB and transformer MLH55TPA

To change settings you have to remove the push-fit PCB **(107)** on the 230 V model.

WARNING

Risk of injury from electric shock by live parts!
When the power supply is on there is a danger of electric shock due to live parts.

- Prior to commencing any work, ensure that the actuator is safely disconnected from the power supply system.
- Secure against unauthorised restarting.

1 Detach the two screws **(367)**

2 Pull off the push-fit PCB **(107)** in a straight movement from the spacers **(27)** and hold the gear plate by pressing it against the motor.

3 Access to plug-in jumpers **(113)** JP2 to JP5 is now established.

4 After making changes to the setting carefully put the PCB back on.

Hint: When doing so, make sure that the socket strip fits correctly on the pin strip **(124)**.

5 Tighten both screws **(367)**.

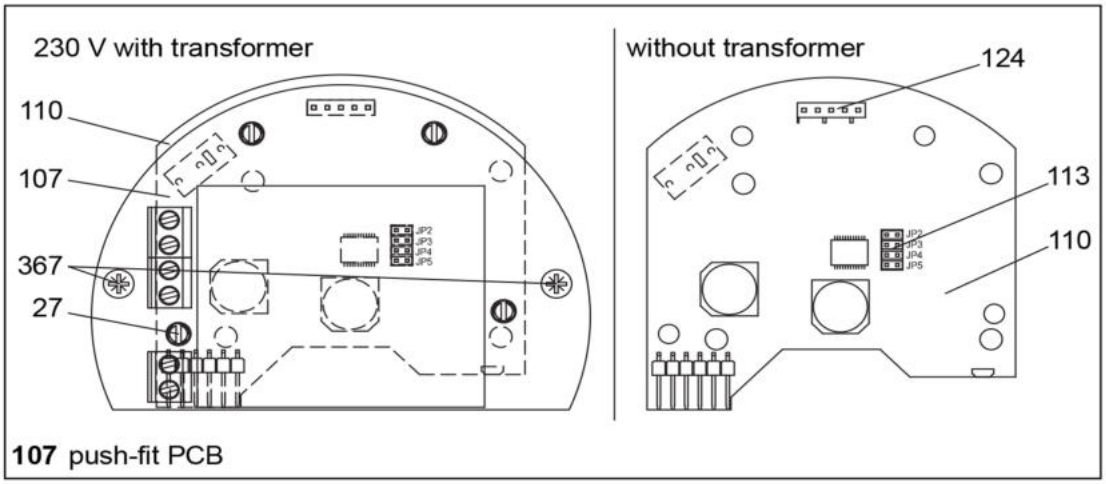


diagram 8 Remove push-fit CB and transformer

5 Commissioning

WARNING

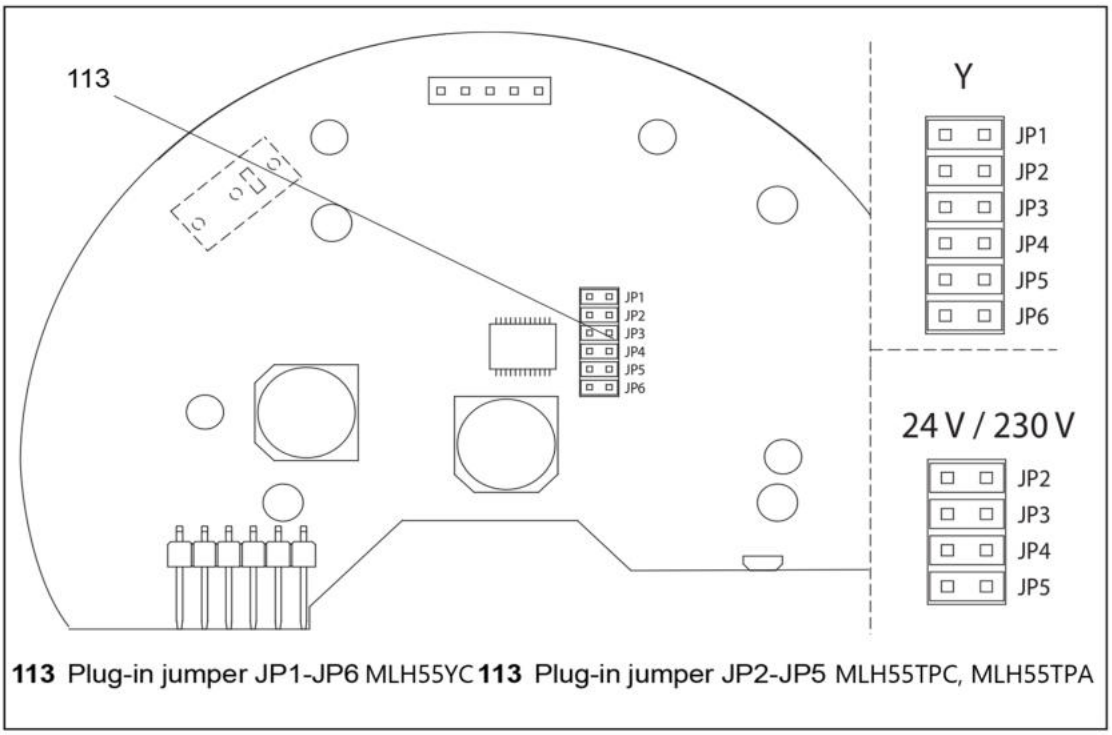
Risk of injury from electric shock by live parts!

When the power supply is on there is a danger of electric shock due to live parts.

- Prior to commencing any work, ensure that the actuator is safely disconnected from the power supply system.
- Secure against unauthorised restarting.

The jumpers on the plug-in jumper are used to set the operating parameters **(113)**. The plug-in jumper and the jumpers are underneath the push-fit PCB **(107)** in the actuator housing **(1)**.

⇨ *4.4 Assembling/disassembling the cover* on page 13
⇨ *4.5.2 Remove push-fit PCB and transformer MLH55TPA* on page 17



113 Plug-in jumper JP1-JP6 MLH55YC **113** Plug-in jumper JP2-JP5 MLH55TPC, MLH55TPA

diagram 9 Plug-in jumper position on the main PCB

5.1 Operating parameters and jumper settings

Before starting to operate the linear actuator you will have to set the operating parameters with the help of the jumpers.

ATTENTION

Malfunctions caused by incorrect jumper setting JP5

The jumper JP5 must be set to “on“ at all times.

- Ensure that jumper JP5 is set to “on“.

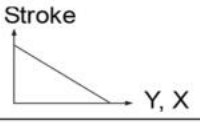
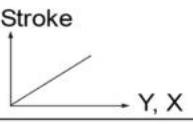
Jumper	on	off
JP1	Input signal (Y) 0 ... 10 VDC or 0 ... 20 mA	Input signal (Y) 2 ... 10 VDC or 4 ... 20 mA
JP2	Limit position actuator spindle moved out	Limit position actuator spindle moved in
JP3	Actuating time 9 s/mm	Actuating time 5 s/mm
JP4	Y, X characteristic curve 	Y, X characteristic curve 
JP5	Ready for operation	-
JP6	Input signal (Y) in mA	Input signal (Y) in V

table 4 Jumper settings MLH55YC

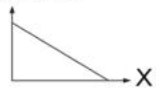
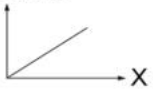
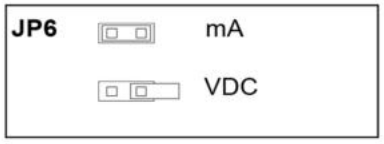
Jumper	on	off
JP2	No function	No function
JP3	Setting time 9 s/mm	Setting time 5 s/mm
JP4	X-characteristic curve 	X-characteristic curve 
JP5	Ready for operation	-

table 5 Jumper settings MLH55TPC, MLH55TPA

5.2 Setting the input signal for MLH55YC



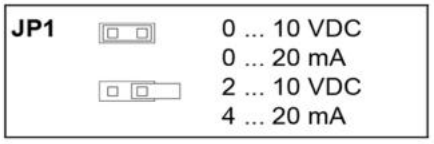


diagram 10 Setting the input signal

⇨ Additional information: *Input signal (Y)* on page 7

5.3 Setting the actuating time

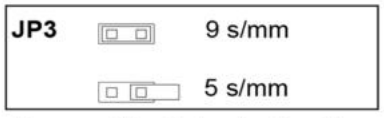


diagram 11 Set actuating time

⇨ *2.3.4 Actuating time* on page 8

5.4 Setting the actuating direction

You can reverse the actuating direction for the linear actuators on the plug-in jumper **(113)** using jumper JP4 (reverse operation).

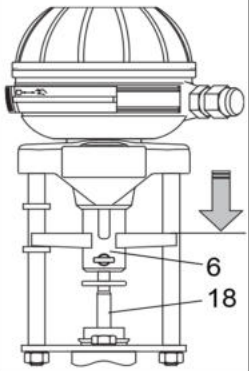
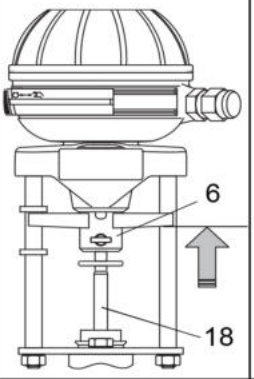
Actuator setting	Normal operation	Reverse operation
	Y = 10 V DC JP6 Y = 20 mA JP6 X = 10 V DC	Y = 0 V DC JP1 JP6 Y = 2 V DC JP1 JP6 Y = 0 mA JP1 JP6 Y = 4 mA JP1 JP6 X = 0 V DC
	Y = 0 V DC JP1 JP6 Y = 2 V DC JP1 JP6 Y = 0 mA JP1 JP6 Y = 4 mA JP1 JP6 X = 0 V DC	Y = 10 V DC JP6 Y = 20 mA JP6 X = 10 V DC
JP4		
MLH55YC	Stroke Y, X	Stroke Y, X
MLH55TPC **MLH55TPA**	Stroke X	Stroke X

table 6 Setting the actuating direction

5.5 Setting the limit position for MLH55YC

Use Jumper JP2 to select a limit position for the linear actuator.

- JP2 ON: Limit position with extended spindle nut
- JP2 OFF: Limit position with retracted spindle nut

The limit position is approached in the following situations:

- Due to wire break detection by the Y signal (2 … 10 V DC or 4 … 20 mA only),
- Due to a binary signal (When electric circuit between terminal B1 and B2 is interrupted),

5.6 Commissioning

1. Check whether all fitting and assembly work has been competently finished.
   ⇨ *4 Assembly* on page 11
2. Ensure that the electrical actuation of the linear actuator can take place safely without putting people or devices at risk.
3. Ensure that the linear actuator is attached correctly and that the cover of the linear actuator is closed.
   ⇨ *4.4 Assembling/disassembling the cover* on page 13
4. Ensure that the linear actuator is set to automatic mode.
   ⇨ *6.1 Changing between manual and automatic mode* on page 22
5. Ensure that the operating parameters are set correctly.
   ⇨ *5.1 Operating parameters and jumper settings* on page 19
6. Apply supply voltage. The linear actuator will now move to the reference point.
   The linear actuator is ready for operation.

6 Operation

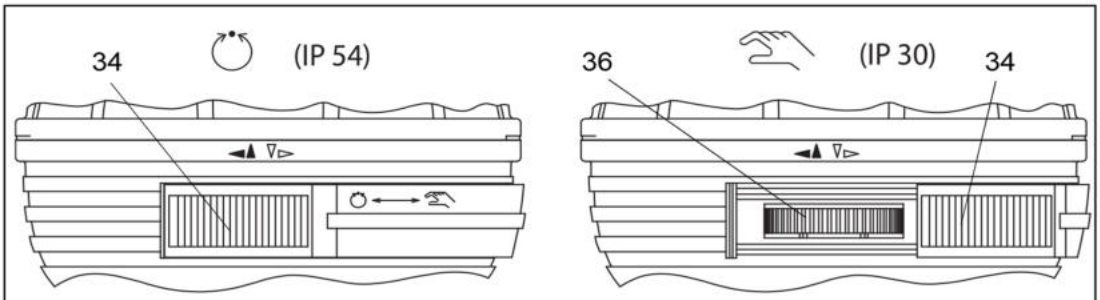
Prior to commissioning the linear actuator you will have to select the operating mode.

⇨ *5 Commissioning* on page 18

6.1 Changing between manual and automatic mode

It is possible to run the linear actuator in automatic mode or manual mode (manual adjustment).

- In automatic mode the spindle nut moves to the position set by the controller.
- In manual mode it is possible to set the spindle manually, e. g. for control purposes. Output signal (X) is not available in manual mode.



Automatic operation
34 Slide Valve

Manual operation
36 Hand wheel

diagram 12 Selecting automatic mode

■ How to change-over in manual mode

1 Push the slide bar **(34)** into manual position until you hear an audible locking sound.

ATTENTION

Risk of damage to valve and actuator during manual mode!
The valve may get damaged if it is pushed too hard into its receptacle during manual mode.

- Do not try and keep turning the hand wheel when you realise that the required effort increases noticeably!
- Never use force !

2 Use the hand wheel to turn the spindle nut to the desired position. Turn the hand wheel until the preset potentiometer increases. Do not use force!

■ How to change-over in automatic mode

1 Push the slide bar to **(34)** position automatic mode.

2 The linear actuator first moves to both limit positions and afterwards to the position specified by the controller.

7 Maintenance, care and repairs

The linear actuator requires little maintenance. You do not have to carry our continuous or periodical maintenance.

8 Spare parts

When ordering accessories and spare parts please quote the specifications engraved on the type plate of your linear actuator. The specifications on the type plate are standard for the technical date of linear actuators as well as the requirements for the public power supply.


ATTENTION

Damage to device caused by faulty spare parts!
Spare parts must match the technical data specified by the manufacturer.
- Use genuine spare parts at all times.

⇨ *2.1 Component parts* on page 6

9 Decommissioning and disposal

Dispose of the linear actuator according to national regulations and laws.

10 Removal of faults

10.1 How to remedy faults

If the linear actuator does not work properly follow the sequence of operations described below in order to remedy the fault:

1. Check whether the linear actuator was correctly assembled.
2. Check the settings for the linear actuator against the specifications on the type plate.
3. Remedy the fault by following the check list.
   ⇨ *10.2 Check list for breakdown* on page 24
4. If you are unable to remedy the fault contact the manufacturer.
5. For all queries at the manufacturer's and when sending back the device please quote the following :
   - SN (serial number = order number)
   - Type denomination
   - Supply voltage and frequency
   - Accessory equipment
   - Error report
6. If you are unable to remedy the fault despite inquiry you can send the device to the manufacturer.

10.2 Check list for breakdown

Fault	Cause/reason	Remedy
1. Linear actuator is not working.	Slide bar (34) in position manual mode	☐ Switch the slide bar to position automatic mode.
	Power cut	☐ Determine cause and remedy.
	Fuse defective (in control cabinet)	☐ Determine cause and remedy, replace fuse.
	Linear actuator incorrectly connected	☐ Set the connection correctly according to the wiring diagram (on the cover).
	Short circuit due to humidity	☐ Determine cause, dry the linear actuator; replace cover seal or screw joints and/or attach protective cover, as required.
	Short circuit due to incorrect connection	☐ Correct setting for connection
	Motor has winding damage (burnt-out) • e.g. voltage too high • Electronic system defective	☐ Determine cause, measure current data, Compare to type plate and table, Disassemble linear actuator and send it in for repairs.
2. Linear actuator running unsteadily, i. e. veering between clockwise and anti-clockwise rotation.	Drop of voltage due to excessively long connecting cables and / or insufficient diameter.	☐ Measure the current data; if required, re-calculate and replace connecting cables!
	Public power supply fluctuations greater than admissible tolerance ⇨ *2.4 Technical data* on page 9	☐ Improve public power supply conditions
3. Linear actuator pauses intermittently or initialises frequently	Slack contact in feeder line	☐ Check connections (terminal strips / connecting cables) and tighten, as required.
4. Linear actuator does not move to limit position. Valve does not open/close.	Valve is stuck	☐ Provide smooth-running valve
	Excessive system pressure	☐ Adjust system pressure
5. Linear actuator does not move at all or not correctly to the position preset by input signal Y	Input signal Y is faulty: • Interfering signals • Signal variations	☐ Check input signal Y on linear actuator, remove cause of fault
	Main PCB defective	☐ Disassemble the linear actuator and send it in for repair.

table 7 Check list breakdown