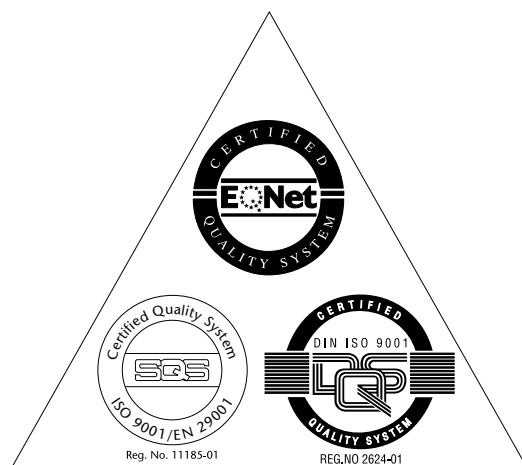


Operating Instructions

for Automatic Actuators for Machine Doors MxP 50/101/300



The enterprises Landert-Motoren AG and Landert GmbH are certified according to ISO 9001.

Contents

1	Notes Relating to the Operating Instructions	4
2	Safety	5
2.1	General Safety and Accident Prevention Regulations	5
2.2	Organisational Measures	6
2.3	Safety Facilities	6
3	Field of Application and Overview	8
4	Operation	9
5	Maintenance	11
5.1	Service by the Machine Manufacturer	11
5.2	Checks by the System Operator	12
6	Trouble Shooting	14
7	Additional Notes	15
7.1	Technical Data	15
7.2	Warranty	15
7.3	Disposal	15

1 Notes Relating to the Operating Instructions

Adressee

These instructions are addressed to the system operator and user of an automatic SERVAX actuator for machine doors system. It is presumed that the door system was installed and tested by qualified professionals and is thus ready for use.

Area of Application

This document is applicable for automatic actuator for machine doors at machine tools or industrial machines with the following actuators for machine doors:

MxP 50,

MxP 101,

MxP 300; subsequently named MxP

Symbol Explanation



In this document, we have marked all sections that concern your safety by this symbol. It warns of endangering situations of a general kind.

This symbol warns of lethal electric voltage and/or current.



This indication marks all sections whose attention is decisive for reliable operation of the system. Neglect can cause material damage or the destruction of the system.



Functions that are marked with this symbol correspond to the basic adjustments. However, the machine manufacturer can reprogram them with our SERsoft software.

This symbol marks optional components that are not part of all systems.

Useful notes relating to the course of action, to possibly necessary tentative investigations etc. are set in italic font like this text.

Languages

These operating instructions are available in different languages. Please contact us.

2 Safety

2.1 General Safety and Accident Prevention Regulations



Before commissioning the safety door system, the operating instructions must be read carefully and must be observed!

Particularly emphasised safety notes (symbol explanation see chapter 1) within this document must be observed in any case!

Correct Use

The SERVAX actuator for machine doors MxP is a device that automates motions of safety doors and ensures that no further danger results from this.

This activator is designed according to the current state of technology as well as the recognised safety-relevant rules and is intended exclusively for common deployment in industries.

For any other deployment, the manufacturer must be consulted in any case. Otherwise, no liability will be assumed for injuries to persons or system damage. Any other use, or any use going beyond this use, is considered to be an incorrect use that may lead to personal injury of the user or a third party as well as to system damage.

Fundamental Safety Measures—Proficient Behaviour

Use system only in a technically sound state. Ensure that faults, which may impair safety, are eliminated immediately by qualified professionals.

Consequences of improper use of the actuator for machine doors or the safety door system:

- Hazards for life and health of the user or a third party,
- Impairment of the system and other material assets.

Applicable Regulations

The operation, service and maintenance conditions prescribed by the manufacturer are to be observed. The actuator for machine doors may be serviced and repaired only by qualified people who are acquainted with the matter and are informed about any possible danger.

In addition to the operating instructions, the generally applicable legal regulations as well as safety-relevant regulations and regulations of industrial medicine for accident prevention and environmental protection of the respective country, where the door system is operated, are also applicable.

The buyer, technical designer and/or fitter of the MxP actuator for machine doors is responsible for the correct and safety-related flawless use of the activator. He must ensure that all national and/or local laws and regulations concerning the safety of force-activated doors and the relevant national worker's protection rules are observed.

Liability

Landert-Motoren AG is not responsible for accidents and/or consequential damages that could result from the application or use of the MxP actuator for machine doors. Our maximum obligation and guarantee is limited to the reimbursement of the cost of the sold product. Landert-Motoren AG does not make stipulations or suitability recommendations for specific safety door concepts. The buyer, technical designer and/or fitter of the MxP actuator for machine doors must decide himself whether the activator is suitable for a given application. Besides, Landert-Motoren AG declines any responsibility for damage or injuries, which result from the modification of the activator, including the change of software parameters. Employees of Landert-Motoren AG are not authorised to amend these conditions without written agreement and legal signature of the responsible authorities.

Fundamental

Actuator for machine doors are to be operated and maintained in such a way that the safety of the user, maintenance personnel and third persons is ensured at any time.

If faults occur on safety facilities (e.g. photocells ♦, strip sensor ♦), these may not be made ineffective for the door to be further used.

Working at the Safety Door System

The person operating, checking and maintaining actuator for machine doors must be in possession of the necessary instructions (operating instructions).

Personnel assigned to any activities at the system must have read and understood the operating instructions beforehand.

Mechanical and electrical work on the door system and the control system may be carried out only by our qualified personnel or by specialists after consultation with our qualified personnel.

It is prohibited for any other person to perform repairs or modifications on the system.

2.3 Safety Facilities

Internal Obstacle Recognition

A highly sensitive sensory system monitors the door motion during an opening or closing action and recognises automatically an obstacle, which may be within the travelling range of the safety door. If that obstacle blocks the door, the activator is immediately stopped and the direction of rotation reverses which protects people effectively against being jammed.

Function

If the door hits an obstacle during closing, it reopens immediately. On the next impulse, the door closes with half the speed. The door moves with normal speed again only after the obstacle is removed and an interrupt-free closing motion has been accomplished.

If the door hits an obstacle during opening, it runs immediately over a distance of 50 mm in closing direction whereby the object within the travelling range is relieved. On a renewed door opening command, the door moves with half the speed. The door moves with normal speed again only after the obstacle is removed and an interrupt-free opening and closing cycle has been accomplished.

Photocell ♦, Strip Sensor ♦

If an external safety device (strip sensor ♦, photocell ♦ etc.) responds during closing of the door, this signal initiates a reversing motion (opening motion after obstacle recognition).

Emergency Off Function ♦ (Installation is dependent on national regulations)

Function



The activation of the emergency-off pressure switch leads to an immediate standstill of the door. Afterwards, the door leaf is freely mobile. As long as the emergency-off function is active, the activator does not execute any run commands. Only after the function is reset, the door is in normal operating mode again.

The emergency-off function can be reset in different ways - dependent on the type of machine. Please inform yourself about this in the operating instructions of the machine tool or industrial machine.

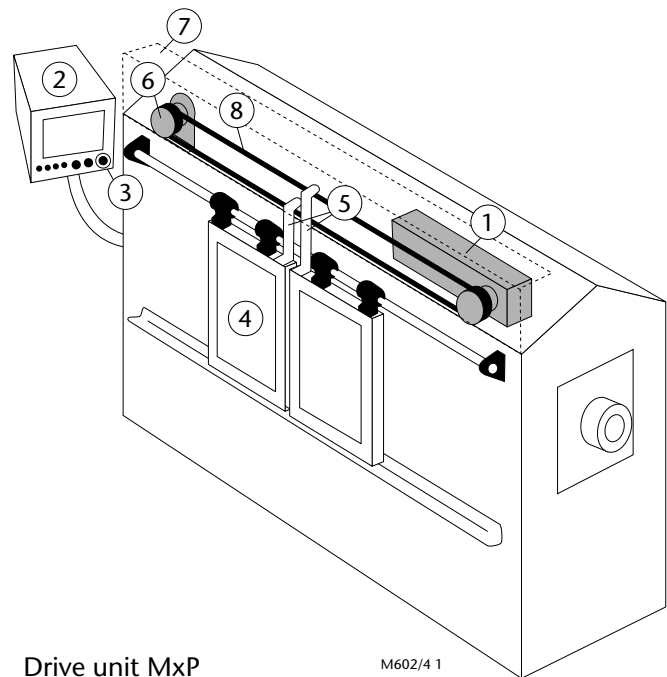
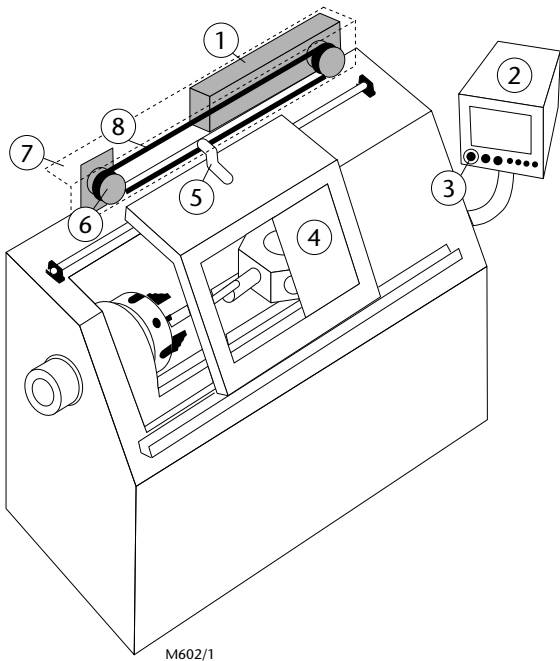
3 Field of Application and Overview

Field of Application MxP

The actuator for machine doors MxP automates the opening and closing of safety doors at machine tools or other industrial machines, which are operated by people or robots.

The Individual Components

The drive unit MxP (1) consists of a dust and waterproof housing of protective class IP 65, into which the motor and control system are built. The safety door (4) is interconnected by a driver (5) with the toothed belt (8), which runs over the deflection unit (6) and drive pulley. A casing (7) covers the drive system.



- (1) Drive unit MxP
- (2) PLC of the machine tool
- (3) Emergency-off switch
- (4) Safety door
- (5) Driver
- (6) Deflection unit
- (7) Casing
- (8) Toothed belt

The MxP actuator for machine doors was customer-specific configured during commissioning and adapted optimally to your machine tool or industrial machine.

If the operating conditions change, the configuration can be adapted to the new conditions by the machine manufacturer through our special programming software SERsoft.

4 Operation

Switching On the System

- Switch on mains voltage (main system switch).

Calibration run

⚙️ *The first opening and closing motion, after the system is switched on, is the calibration run. Depending upon the type of machine, the calibration run can be initiated automatically by the machine control system, or the system operator is requested to start the calibration run with an opening command.*

- Issue the opening command, wait for the door to reach the OPEN position →
 - the door moves slowly up to the OPEN end stop.
- Issue the closing command, wait for the door to reach the CLOSED position →
 - the door moves up to the CLOSED end stop.



During these reference motions, it is possible that the motor develops its full torque. The internal obstacle recognition is completely turned off or only partially active during the calibration run depending upon state. Because of this, the user must proceed on the assumption that all safety facilities are inactive: Do not stay within the travelling range of the door.

If the run commands OPEN or CLOSE are interrupted during the calibration run by an obstacle within the travelling path, the calibration run cannot be completed. The procedure is to be repeated in this case.

Querying Fault Indication ◆

- Query the fault indication at the display and/or observe warning lights or LED indication →
 - after completion of the calibration run, there must be no warnings or fault messages present.

The safety door system is thus ready for use.

Recommissioning

If a safety door system is out of operation over a longer time period, it is to be checked in accordance with section 5.2 before returning it to service. If necessary, it must be repaired so that the safety of people is ensured at any time.

Operation in Normal Operating Mode

The actuator for machine doors MxP ensures the reliable, automatic opening and closing of the door. Initiation of the safety door takes place automatically or manually:

- Automatically by means of the machine control system (PLC)
- Manually via push buttons ◆, touch screen ◆, keyboard ◆ etc.

OPEN

In contrast to the calibration run, the door does not hit the OPEN end stop but stops approx. 15 mm (3/8") ahead of it. The door leaves are not braked in the OPEN position, and thus they can be moved by hand.

CLOSE

With this run command, the door drives into the CLOSED position, whereby the mechanical CLOSED end stop is always hit. The securing brake fixes the door in this position.

Reduced OPEN ◆

The command reduced OPEN causes only a partial opening of the door. In the reduced OPEN position, the door is not braked.

The reduced opening width was programmed during commissioning the system. However, it can be adapted at a later time to changed needs by qualified personnel of the machine or activator manufacturer.

Free Wheeling (manual operation) ◆



With the command FREE WHEELING, the activator is disengaged; the door can be opened or closed by hand.

As long as free wheeling is active, the activator will not execute any run command. If FREE WHEELING is to be reset when the door is closed, a closing command must be issued subsequently. This ensures that the door is pressed into the CLOSED end stop again and that the securing brake is applied.

Operation on Mains Failure



On mains failure, the door is brought to a standstill by braking; afterwards, the door leaves are freely mobile.

On power recovery a calibration run must be performed (see section "Switching On the System" in this chapter).

5 Maintenance



- The competencies of the personnel for the maintenance work must be defined clearly.
- Keep hands or other extremities away from moving parts.



Spare parts must correspond to the technical requirements defined by the manufacturer. Original spare parts must be used.

5.1 Service by the Machine Manufacturer

Service Interval



The maintenance interval is defined in the context of the service contract for the machine tool or industrial machine; however, maintenance must take place at least once a year by a qualified professional.

Requirements for Maintenance Staff

Qualified professionals are persons, who exhibit adequate knowledge in the area of the force-activated doors due to their technical vocational training and experience and who are familiar with the relevant accident prevention regulations, directives and generally recognised rules of the technology to such an extent that they can judge the safe-for-working state of force-activated doors. Among these persons are for example qualified employees of the manufacturer or contractor as well as accordingly experienced, trained employees of the system operator.

Qualified professionals have to state their opinion objectively from the point of view of accident prevention and uninfluenced by other factors such as economic requirements.



Maintenance at electrical parts must be carried out by an electrical specialist, who must operate in accordance with the appropriate rules for this purpose. For all work, a visible separation between mains supply and actuator for machine doors is to be created; either by pulling the power plug or by a main system switch with lockable OFF position.

Extent of the Maintenance Work

The maintenance work to be carried out is listed in *System Manual MxP M-603*.

5.2 Checks by the System Operator

Checking Interval



Checks must take place periodically, however at least every 3 months.

Extent of Checks

The operator of an automatic safety door system has to check the functionality of the door and the safety devices in periodic time intervals. Thus, early identification of functional deficiencies and/or endangering changes to the system is ensured.



If defects should be determined during such a periodic control, it must be arranged that these be repaired immediately by the manufacturer of the machine tool or the industrial machine.



During these checks, the possibility of a malfunction of the system must also always be considered! No parts of the body may be used for operational tests if there is insufficient free space; as a substitute, a suitable object made from wood, rubber or similar material can be used.

Maintenance work that can be performed by the system operator takes only a short time; however, it is essential for a safe and reliable operation of the system.

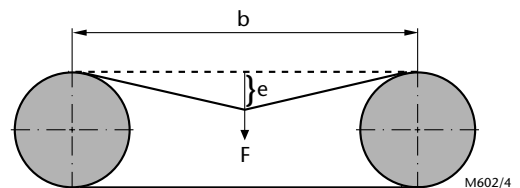
Maintenance work by the system operator includes the following:

Checking the Tension of the Toothed Belt

An optimal toothed belt tension ensures trouble-free engaging of the toothed belt teeth into the toothed pulley, which results in optimal power transmission, and it preserves the toothed belt as well as the bearings.

- Remove casing (7) (refer to illustrations in chapter 3).

- Determine dimension (b):
Measure the distance between the centre of the deflection unit (6) and the centre of the drive pulley at the drive unit (1).



- Calculate (e) with the following formula:
 $e \text{ [mm]} = 0,015 \times b \text{ [mm]}$

- Attach a spring balance to the centre of the toothed belt and pull with such strength that the toothed belt is deflected by the calculated value (e). Read the spring balance to find the force (F).

Permissible range for	MxP 50:	F = 7–7.5 N
	MxP 101:	F = 11.5–12.5 N
	MxP 300:	F = 35–37 N



Ask the machine manufacturer for immediate service if this should not be the case.

- Install casing (7).

Checking the Guide Rail

- Remove any residue or deposit from guide rail with a suitable cleaning agent.
- Make sure that the safety door runs easily and does not touch any other parts.

Checking the system for traces of excessive wear and tear.



- Check the outside of the door system for any recognisable damage or defect.

If there are excessive deposits of rubber (toothed belt), steel or aluminium (door leaves, drive support) on the floor around the system: call the service department of the machine manufacturer immediately so that the system can be submitted to a detailed inspection.

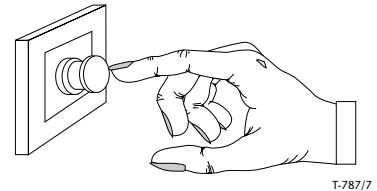
Checking the Functionality of the System

Control signals, push-buttons

- Check the basic functions in accordance with specifications provided by the machine manufacturer.

Emergency-off function ♦

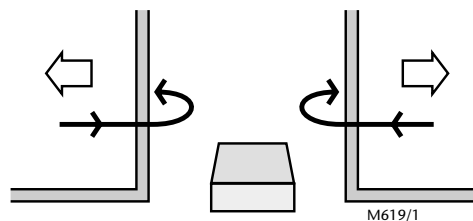
- Press the “Emergency off” push-button:
→ The door is released for manual operation; the door leaves are now freely mobile.
- Reset the emergency-off function in accordance with specifications provided by the machine manufacturer → the door is ready again for the normal operation.



T-787/7

Internal obstacle recognition

- Put an obstacle (block of foamed material or similar) within the closing range (thereby make sure that the light beams ♦ are not interrupted) and issue a closing command:
→ the door reopens after colliding with the obstacle. When the next closing command is issued, the door closes - however, with reduced speed.



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External obstacle recognition (photocells, strip sensor etc.) ♦

- With an object, interrupt the light beam or touch the strip sensor during a closing motion:
→ the door reopens immediately. When the next closing command is issued, the door closes—however, with reduced speed.

6 Trouble Shooting

The MxP microprocessor based control system continuously diagnosis itself. Warnings as well as any occurring faults are indicated—depending upon the type of machine tool or industrial machine—by way of a combination of periodically flashing LEDs or by the machine control system (indicator lights, messages in form of text on the display). Please refer to the operating instructions of the machine manufacturer.

Fault	Possible cause	Action plan
The warning "Door is in calibration run mode" is displayed.	<ul style="list-style-type: none"> After a mains failure, the calibration run was initiated automatically by the machine control system. 	<ul style="list-style-type: none"> Wait until the door is closed.
The fault "Emergency off" is displayed.	<ul style="list-style-type: none"> Emergency-off pressure switch was activated. 	<ul style="list-style-type: none"> Reset the emergency-off function.
The fault "Motor overheated" is displayed.		<ul style="list-style-type: none"> Call the service department.
The fault "No motion" is displayed.	<ul style="list-style-type: none"> Door is possibly blocked. Activator or toothed belt defective. 	<ul style="list-style-type: none"> Check travelling range of door. Check whether safety door runs easily and touches nowhere. Call the service department.
The warning "Reversing mode" is displayed.	<ul style="list-style-type: none"> The door has hit an obstacle. 	<ul style="list-style-type: none"> Remove obstacle. Wait until the door is closed.
The warning "External reversing motion" is displayed.	<ul style="list-style-type: none"> Light beam was interrupted or strip sensor has responded. 	<ul style="list-style-type: none"> Remove obstacle. Wait until the door is closed.
Activator crashes into the end stops.	<ul style="list-style-type: none"> Toothed belt is insufficiently tensioned. 	<ul style="list-style-type: none"> Check tension of toothed belt. Call the service department.
Jerky door motion during the calibration run.	<ul style="list-style-type: none"> Defective motor control system. 	<ul style="list-style-type: none"> Call the service department.
Irregular door motion.	<ul style="list-style-type: none"> Motion control is not optimised. 	<ul style="list-style-type: none"> Call the service department.
No reaction.	<ul style="list-style-type: none"> Main system switch in position OFF. Mains failure. Fuse blown. 	<ul style="list-style-type: none"> Get power supply and fuse checked by a professional.

7 Additional Notes

7.1 Technical Data

Activator type		MxP 50	MxP 101	MxP 300
Mains voltage	[V AC]	230 ± 10 %/115 ± 10 % (switchable)		
Mains frequency	[Hz]	50–60	50–60	50–60
Power consumption	[W]	6–110	8–265	6–170
Operating temperature	[°C]	–20 to +40		
Protective class		IP65		
Equivalent continuous sound pressure level	[dB(A)]	< 70		

7.2 Warranty

Deliberate or malicious damage to the system or soiling of any system parts, as well as any modification of the activator or the control system by a third party, will void all warranty!

7.3 Disposal

At the end of its life span, this system is to be disposed of according to the applicable national regulations. We recommend getting in touch with a company specialising in the field of waste disposal.



All information is subject to technical change!



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