

MS6-LRE
Electrical pressure regulator

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[8118307]

Instructions | Operating

Translation of the original instructions

1 Applicable documents

Table with 3 columns: Document, Product, Contents. Rows include Instructions for Module connector MS6-MV and Mounting bracket MS6-WPB.

Tab. 1 Documentation on the product

2 Safety

2.1 Safety Instructions

- Only use the product in original status without unauthorised modifications.
- Only use the product if it is in perfect technical condition.
- Observe labelling on the product.
- Take into consideration the ambient conditions at the location of use.
- Prior to mounting, installation and maintenance work: Switch off power supply and secure it from being switched back on.
- The manipulation of signal statuses can cause serious injury to people or material damage.
- Observe tightening torques. Unless otherwise specified, the tolerance is ± 20 %.

2.2 Intended Use

The product regulates the compressed air in the subsequent string to the set outlet pressure.

The product is intended for installation in a machine or automated system and must be used exclusively as follows:

- In an industrial environment
- In its original condition, without unauthorised modifications
- In perfect technical condition

2.3 Foreseeable Misuse

- Use with other media, e.g. liquids or gases
- Construction of electrical control loops

2.4 Training of qualified personnel

Installation, commissioning, service and disassembly should only be conducted by skilled personnel. The skilled personnel must be familiar with the installation of electrical and pneumatic control systems.

3 Additional information

- Accessories -> www.festo.com/catalogue.
- Spare parts -> www.festo.com/spareparts.

4 Service

Contact your regional Festo contact person if you have technical questions -> www.festo.com.

5 Product Overview

5.1 Structure

5.1.1 Product Design

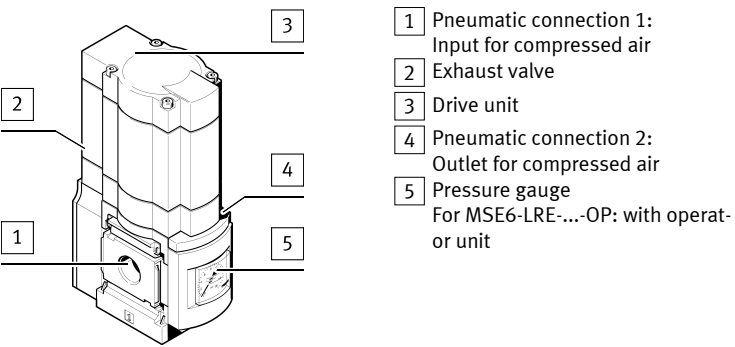


Fig. 1 Product Design

5.2 Function

The product smoothes out pressure fluctuations in pneumatic systems. The electric drive unit enables the output pressure to be adjusted in the pneumatic closed-loop controller. The product is controlled via digital input signals. This determines the direction of rotation of the drive unit and enables the output pressure to be adjusted in an increasing (UP) or decreasing (DOWN) direction. The pressure control works mechanically.

6 Assembly

- Observe the flow direction from 1 to 2 -> 5.1.1 Product Design.
- Mount the product using the mounting accessories provided. The opening of the exhaust valve [2] must not be blocked.

Assembly of module connectors and mounting brackets -> Tab. 1 Documentation on the product.

7 Installation

7.1 Pneumatic Installation

If using fittings with width across flats greater than 24:

- Push the cover cap upwards and remove it.

If using fittings with width across flats up to 24:

- Note the screw-in depth of the connector thread.

Table with 2 columns: Product, Screw-in depth. Rows include Thread ISO 228 (MS6-LRE-1/4, MS6-LRE-3/8, MS6-LRE-1/2) and Thread NPT (MS6N-LRE-1/4, MS6N-LRE-3/8, MS6N-LRE-1/2).

Tab. 2 Maximum Screw-in Depth of the Connector Thread

- Screw the connectors into the pneumatic connections using a suitable sealing material.

7.2 Electrical Installation

WARNING!

Risk of injury due to electric shock.

- For the electrical power supply, use only PELV circuits in accordance with IEC 60204-1/EN 60204-1 (Protective Extra-Low Voltage, PELV).
- Observe the general requirements of IEC 60204-1/EN60204-1 for PELV circuits.
- Only use voltage sources that ensure a reliable electric separation from the mains network in accordance with IEC 60204-1/EN 60204-1.

Protection against electric shock (protection against direct and indirect contact) is guaranteed in accordance with IEC/DIN EN 602041 by using PELV circuits (electrical equipment of machines, general requirements).

Table with 4 columns: Plug, Pin, Cable colours, Function. Rows include Plug M12 supply voltage/input signals with pin details for 1 to 5.

1) Tightening torque: ≤ 0.5 Nm

Tab. 3 Pin Allocation of Plug M12

Plug	Pin	Cable colours	Function
Plug sensor M8 - only MS6-LRE-...-PI/PU ¹⁾			
	1	Brown	Not assigned
	3	Blue	GND/0 V
	4	Black	Analogue output

1) Tightening torque: ≤ 0.3 Nm

Tab. 4 Pin Allocation of Plug Sensor M8

8 Commissioning

The output pressure can be set via the digital inputs on plug M12 or via the operator unit (MSE6-LRE-...-OP) → 9 Operation.



With simultaneous control, the operator unit has higher priority than the signal lines at plug M12.

- Switch on the operating voltage.
- Close product. Control the drive unit in the direction DOWN.
- Pressurise the system slowly.
- Control the product in the direction UP up to the desired output pressure. The pressure regulation range must not be exceeded
→ 13.2 Technical Data, Pneumatic.
Correctly pressurised, the input pressure is 0.5 bar higher than the output pressure.

9 Operation



A new output pressure must always be set in a pressure rising direction. During control, observe the ratio between the control duration and pause.

The desired output pressure is lower than the current output pressure:

- Control the product in the direction DOWN until a value of at least 0.3 bar lower than the desired output pressure is reached.
During the control in the direction DOWN, take into account that the product has a lower exhausting capacity
 - The product adjusts faster than the output pressure is reduced.
This may result in the output pressure not corresponding to the desired control pressure when electrically querying and evaluating the output pressure. This must be taken into account when exhausting larger initial volumes.
- Control the product in the direction UP up to the desired output pressure. In the event of a power failure, the last setting of the output pressure remains stored → Fail-safe mode.

The pneumatic pressure control is guaranteed.

9.1 With Operator Unit for MSE6-LRE-...-OP

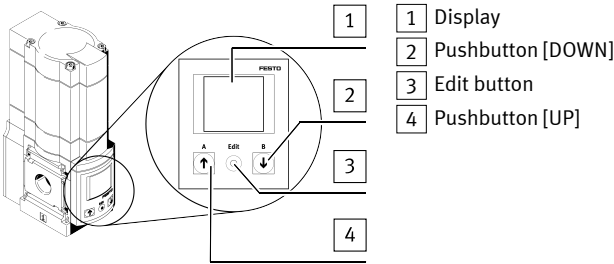


Fig. 2 Operator unit MS6-LRE-...-OP

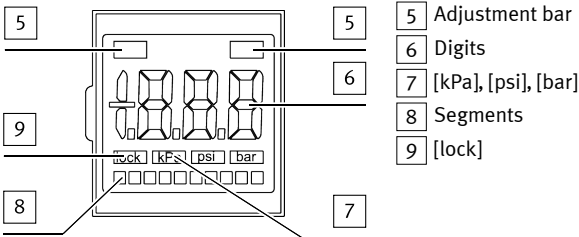


Fig. 3 Display MS6-LRE-...-OP

Elements display	Function	Description
Adjustment bar [5]	Not illuminated	Electric drive unit cannot be controlled with pushbutton [DOWN] [2] or pushbutton [UP] [4].
	Flashing	Electric drive unit can be controlled with pushbutton [DOWN] [2] or pushbutton [UP] [4].

Elements display	Function	Description
Digits [6]	Illuminated	Current output pressure is displayed.
	Flashing	Current output pressure has exceeded the pressure regulation range.
	Not illuminated	Pressure unit is inactive.
[kPa] [psi] [bar] [7]	Flashing	Pressure unit can be set.
	Not illuminated	Pressure unit is inactive.
Segments [8]	Illuminated	Graphical display of the current output pressure, related to the current value of the pressure regulation range.
[lock] [9]	Illuminated	Active safety lock. For blocking against unauthorised changes to the output pressure.
	Not illuminated	Security lock is inactive. Value 0 is set.
	Flashing	The security code can be set.

Tab. 5 Elements Display MS6-LRE-...-OP

Overview of Menu Structure

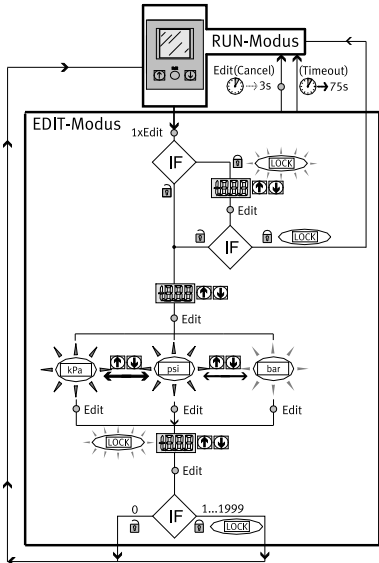


Fig. 4 Overview of Menu Structure

RUN Mode

The default state of the product is called RUN mode. It indicates the current output pressure.

Change from EDIT mode to RUN mode:

- Press EDIT button for 3 s or
- Expiration of monitoring time/timeout of 75 s

EDIT Mode

Adjust output pressure and pressure unit:

- Press the EDIT button [3].
Only when the safety lock is activated:
 - The display element [lock] [9] flashes
 - Press the [DOWN] [2] pushbutton or the [UP] [4] pushbutton until the selected security code is set.
 - To confirm, press the Edit button [3]. If the correct entry is made, the safety lock is released. If an incorrect entry is made, the safety lock remains in effect. The unit returns to RUN mode. The procedure must be repeated.
- The adjustment bars [5] flash. Press the [DOWN] pushbutton or the [UP] pushbutton until the desired output pressure is set. Exceeding the pressure regulation range is possible and is indicated by a flashing value in the display.
- Confirm with Edit button
- The display elements [kPa], [psi] or [bar] [7] flash. Set the desired pressure unit with the [DOWN] and [UP] pushbuttons.
- Confirm with Edit button
- The display element [lock] [9] flashes. Use the [DOWN] pushbutton or the [UP] pushbutton to set the desired security code (0 ... 1999). The value 0 deactivates the safety lock.
- Confirm with Edit button. The product is back in RUN mode.

9.2 Resetting MS6-LRE-...-OP to Factory Settings

This procedure can also be performed if the security code does not exist.



By resetting to the factory settings, the current settings are lost.

- Switch off operating voltage.
- Press the [DOWN] pushbutton, [UP] pushbutton and Edit button simultaneously. Switch on the operating voltage again.

- 10Maintenance

10.1Cleaning

1.

Switch off energy sources:

–Operating voltage

–Compressed air

2.

Clean the outside of the product as required. Approved cleaning agents are soap solutions (max. +50 °C), petroleum ether and all non-abrasive cleaning agents.

- 11Disassembly

1.

Switch off energy sources

–Operating voltage

–Compressed air

2.

Separate the applicable connections from the product.

12Disposal

 ENVIRONMENT!

Send the packaging and product for environmentally sound recycling in accordance with the current regulations → www.festo.com/sp.

13Technical Data

13.1Technical Data, Mechanical

MS6-LRE-...		-D5-...	-D6-...	-D7-...	-D8-...
Mounting position		Any			
Control time at 25 °C	[s]	≤ 90			
Temperature					
Environment	[°C]	0 ... +50			
Medium	[°C]	0 ... +50			
Immission/Emission					
Degree of protection		IP65			
Immunity to interference		EN 61000-6-2:2005			
Interference emission		EN 61000-6-4:2006 + A1:2010			
Vibration/shock resistance					
Vibration resistance		Severity level 2 as per EN 60068			
Shock resistance		Severity level 2 as per EN 60068			

Tab. 6 Technical Data, Mechanical

Type of Severity Level (SL)					
Vibration load					
Frequency range [Hz]		Acceleration [m/s²]		Deflection [mm]	
SG1	SG2	SG1	SG2	SG1	SG2
2 ... 8	2 ... 8	–	–	±3.5	±3.5
8 ... 27	8 ... 27	10	10	–	–
27 ... 58	27 ... 60	–	–	±0.15	±0.35
58 ... 160	60 ... 160	20	50	–	–
160 ... 200	160 ... 200	10	10	–	–
Shock load					
Acceleration [m/s²]		Duration [ms]		Shocks per direction	
SG1	SG2	SG1	SG2	SG1	SG2
±150	±300	11	11	5	5
Continuous shock load					
Acceleration [m/s²]		Duration [ms]		Shocks per direction	
± 150		6		1000	

Tab. 7 Type of Severity Level (SL)

13.2Technical Data, Pneumatic

MS6-LRE-...		-D5-...	-D6-...	-D7-...	-D8-...
Ratio control duration:pause		1:3			
Operating pressure					
Input pressure	[MPa]	0.08 ... 2			
	[bar]	0.8 ... 20			
Pressure regulation range ¹⁾	[MPa]	0.03 ... 0.4	0.03 ... 0.7	0.05 ... 1.2	0.05 ... 1.6
	[bar]	0.3 ... 4	0.3 ... 7	0.5 ... 12	0.5 ... 16
Medium					
Operating medium		Compressed air according to ISO 8573-1:2010 [7:4:4]			
		Inert gases			

1) If the pressure regulation range is exceeded, the output value may increase proportionally.

Tab. 8 Technical Data, Pneumatic

13.3Technical Data, Electrical

MS6-LRE-...	-D5-...	-D6-...	-D7-...	-D8-...
Nominal operating voltage	[V DC]	24		

MS6-LRE-...		-D5-...	-D6-...	-D7-...	-D8-...
Permissible voltage fluctuations	[%]	± 10			
Current consumption	[A]	≤ 3.5 at 24 V DC			
Outputs					
Analogue with MS6-LRE-...-PU	[V]	0 ... 10			
Analogue for MS6-LRE-...-PI	[mA]	4 ... 20			
Inputs					
Version Inputs		According to IEC 61131-2, no galvanic isolation			

Tab. 9 Technical Data, Electrical