Soft-start and exhaust valves MS-SV, MS series, NPT

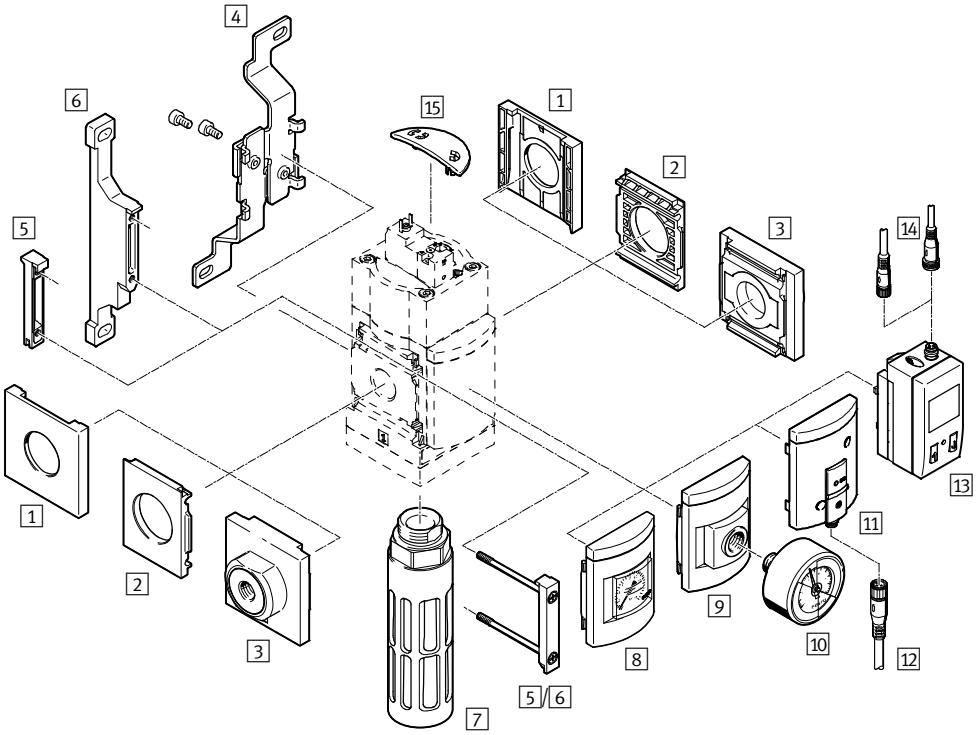
New

MS…-10V24C/10V24D/10V24F

Soft-start and quick exhaust valves MS6N-SV-C, MS series, NPT

Peripherals overview

Soft-start and quick exhaust valve MS6N-SV-C

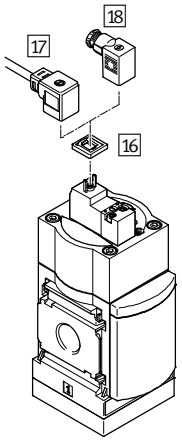


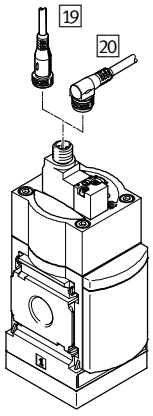
Note

Additional accessories:

- Module connector for combination with size MS4/MS6 or size MS9 ➔ Internet: amv, rmv, armv
- Adapter plate for mounting on profiles ➔ Internet: ipm-80, ipm-40-80, ipm-80-80

Supply voltage 10V24/10V24C	Supply voltage 10V24D/10V24F/10V24P





Soft-start and quick exhaust valves MS6N-SV-C, MS series, NPT

Peripherals overview

Mounting attachments and accessories		Individual device		Combination		→ Page/Internet
		Without connecting plate	With connecting plate	Without connecting plate	With connecting plate	
1	Cover cap MS6-END	–	–	■	–	ms6-end
2	Mounting plate MS6-AEND	■1)	–	■1)	–	ms6-aend
3	Connecting plate-SET MS6-AQ…	–	■1)	–	■1)	ms6-aq
4	Mounting bracket MS6-WB	■	■	–	–	ms6-wb
5	Module connector MS6-MV	–	■	■	■	ms6-mv
6	Mounting bracket MS6-WP	■	■	■	■	ms6-wp
	Mounting bracket (not shown) MS6-WPB/WPE/WPM	■	■	■	■	ms6-wp
7	Silencer U-¾-B-NPT	■	■	■	■	40
8	MS pressure gauge AG/RG	■	■	■	■	10
9	Adapter plate for EN pressure gauge ¼ A4	■	■	■	■	10
10	Pressure gauge MA	■	■	■	■	41
11	Pressure sensor with operational status indicator AD7 … AD10	■	■	■	■	10
12	Connecting cable NEBU-M8…-LE3	■	■	■	■	41
13	Pressure sensor with LCD display AD1 … AD4	■	■	■	■	10
14	Connecting cable NEBU-M8…-LE3/NEBU-M12…-LE4	■	■	■	■	41
15	Cover MS6-SV-C-MK	■	■	■	■	39
16	Illuminating seal MEB-LD	■	■	■	■	40
17	Plug socket with cable KMEB	■	■	■	■	40
18	Plug socket MSSD-EB	■	■	■	■	40
19	Connecting cable NEBU-M12G5	■	■	■	■	41
20	Connecting cable NEBU-M12W5	■	■	■	■	41

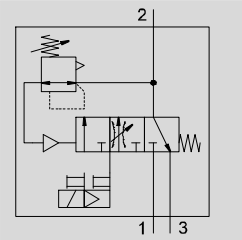
1) Module connector MS6-MV 5 or mounting bracket MS6-WP/WPB/WPE/WPM 6 is required for mounting.

New
MS…-10V24C/10V24D/10V24F

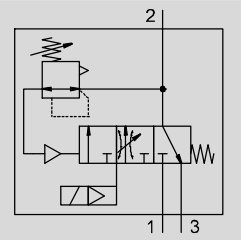
Soft-start and quick exhaust valves MS6N-SV-C, MS series, NPT

Technical data

MS6N-SV-…-10V24/10V24F/10V24P



MS6N-SV-…-10V24C/10V24D



- Flow rate
  5,700 l/min
- Temperature range
  0 … +60 °C
- Operating pressure
  3 … 10 bar
- www.festo.com

Electro-pneumatic soft-start and quick exhaust valve for gradual pressurisation and quick exhausting of system components (single channel).
The main flow control valve in the cover permits a gradual build-up of output pressure p2. Once the output pressure p2 has reached the set pressure switchover point (switching pressure), the valve opens and the full operating pressure p1 is present at the output.

- Suitable for applications with high flow rates and restricted space with medium safety requirements up to controller category 1, performance level "c"
- High volumetric flow rate for pressurisation and venting
- The filling flow rate can be set via a flow control valve for gradual pressure build-up
- Adjustable pressure switchover point
- Optional pressure sensor
- Optional cover for the control sections as tamper protection

Safety characteristics	
Conforms to standard	EN ISO 13849-1
Safety function	Exhausting
	Avoidance of unexpected start-up (pressurisation)
Performance level (PL)	Exhausting: up to category 1, PL c
	Avoidance of unexpected start-up (pressurisation): up to category 1, PL c
Note on forced dynamisation	Switching frequency min. 1/month
CE marking (see declaration of conformity)[1)]	To EC Machinery Directive
Shock resistance	Shock test with severity level 2 according to FN 942017-5 and EN 60068-2-27
Vibration resistance	Transport application test with severity level 2 according to FN 942017-4 and EN 60068-2-6

1) Additional information www.festo.com/sp ➔ Certificates.

Note on forced dynamisation: switching frequency min. 1/month

The mechanical system is not tested in the controlled (i.e. pressurised) state. If the process-related switching frequency (safe exhausting) is less than once a month, the machine's operator has to carry out a forced switch off.

Soft-start and quick exhaust valves MS6N-SV-C, MS series, NPT

Technical data

General technical data		
Pneumatic connection 1, 2		
	Female thread	NPT½
	Connecting plate AQ…	NPT¼, NPT⅜, NPT½ or NPT¾
Pneumatic connection 3		NPT¾
Actuation type		Electric
Design		Piston spool valve
Type of mounting		Via accessories
		In-line installation
Mounting position		Any
Pressure indicator		Via pressure sensor for displaying output pressure via LCD display and electrical output
		Via pressure sensor for displaying output pressure via operational status indicator and electrical output
		Via pressure gauge for displaying output pressure
		Via pressure gauge with red/green scale for displaying output pressure
		G¼ prepared
Valve function		3/2-way valve, closed, single solenoid
		Soft-start function, adjustable
Non-overlapping		Yes
Exhaust function		No flow control
Manual override	10V24/10V24F	At the pilot solenoid valve: non-detenting At the soft-start and quick exhaust valve: detenting, self-resetting
	10V24P	At the pilot solenoid valve: non-detenting/detenting At the soft-start and quick exhaust valve: detenting, self-resetting
	10V24C/10V24D	None
Reset method		Mechanical spring
Type of control		Piloted
Pilot air supply		Internal
Sealing principle		Soft

Flow rate characteristics	
Pneumatic connection	Female thread NPT½
Standard nominal flow rate qnN[1] [l/min]	
In main flow direction 1 → 2	5,700
Standard flow rate qN [l/min], p2 = 6 bar	
In venting direction 2 → 3	7,600[2]
C value [l/s*min]	
In main flow direction 1 → 2	23.2
b value	
In main flow direction 1 → 2	0.4

1) Measured at p1 = 6 bar and p2 = 5 bar, Δp = 1 bar
2) Measured with respect to atmosphere with silencer S

Electrical data		
Coil characteristics	10V24/10V24P	24 V DC: 1.8 W; permissible voltage fluctuations –10%/+10%
	10V24C/10V24D/ 10V24F	24 V DC: 1.8 W; permissible voltage fluctuations –15%/+10%
Electrical connection	10V24/10V24C	Plug, 2-pin, to EN 175301-803, type C
	10V24D/10V24F/ 10V24P	M12x1 to ISO 20401 suitable to EN 61076-2-101
Protection class		IP65 with plug socket
Duty cycle	[%]	100
Switching time off	[ms]	65
Switching time on	[ms]	370

Soft-start and quick exhaust valves MS6N-SV-C, MS series, NPT

Technical data

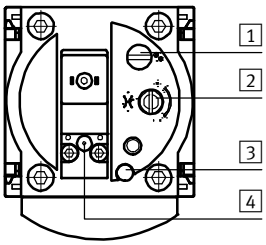
Operating and environmental conditions	
Operating pressure [bar]	3 … 10
Operating medium	Compressed air according to ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium	Lubricated operation possible (in which case lubricated operation will always be required)
Ambient temperature [°C]	0 … +60 (0 … +50)[1]
Temperature of medium [°C]	0 … +60 (0 … +50)[1]
Storage temperature [°C]	–10 … +60 (0 … +50)[1]
Corrosion resistance class CRC[2]	2
CE marking (see declaration of conformity)[3]	To EU Machinery Directive
Food-safe[3]	See supplementary material information (except solenoid valve)

1) With pressure sensor AD…
2) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
3) Additional information www.festo.com/sp ➔ Certificates.

Weight [g]	
Soft-start and quick exhaust valve	886
Soft-start and quick exhaust valve with silencer S	1,006

Materials	
Housing	Die-cast aluminium
Piston rod	High-alloy stainless steel
Seals	NBR
Note on materials	RoHS-compliant

Adjusting elements



1 Screw for adjusting the pressure switchover point
2 Flow control screw for adjusting the filling time
3 Manual override at the soft-start and quick exhaust valve:
– Detenting, self-resetting as soon as the solenoid coil or manual override at the pilot solenoid valve is actuated (with 10V24/10V24F/ 10V24P)
– None (with 10V24C/10V24D)
4 Manual override at the pilot solenoid valve:
– Non-detenting, actuation from above (with 10V24/10V24F)
– Non-detenting/detenting, actuation from above (with 10V24P)
– None (with 10V24C/10V24D)

Soft-start and quick exhaust valves MS6N-SV-C, MS series, NPT

Technical data

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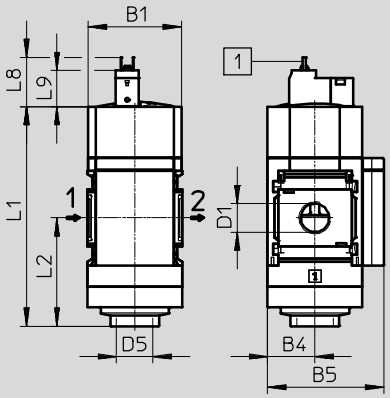
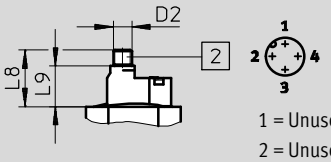
Dimensions – Basic design Download CAD data ➔ **www.festo.com**

With female thread NPT½, with cover plate

Supply voltage
10V24/10V24C

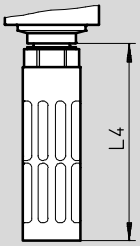


Supply voltage
10V24D/10V24F/10V24P



1 = Unused
2 = Unused
3 = com (–)
4 = Signal (+) solenoid 14

With silencer S



1 Plug connection to EN 175301-803
2 Electrical connection M12x1 to ISO 20401 suitable to EN 61076-2-101, version 4 pin for connecting cable NEBU-M12

➔ Flow direction

Type	B1	B4	B5	D1	D2	D5	L1	L2	L4
MS6N-SV-C	62	31	76	NPT½	M12x1	NPT¾	144	71	135

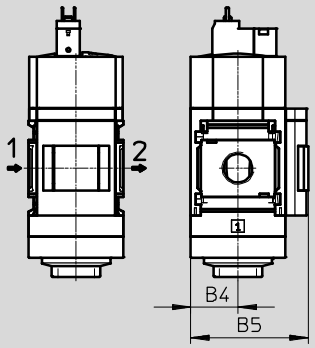
Type	L8		L9	
	10V24/10V24C	10V24D/10V24F/10V24P	10V24/10V24C	10V24D/10V24F/10V24P
MS6N-SV-C	33	37	24	26

Soft-start and quick exhaust valves MS6N-SV-C, MS series, NPT

Technical data

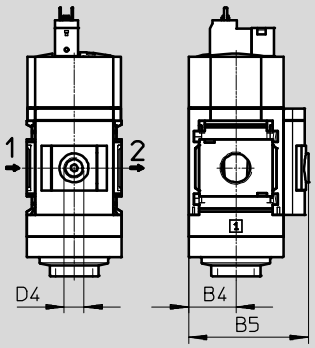
Dimensions – Pressure gauge/pressure gauge alternatives Download CAD data ➔ **www.festo.com**

Integrated MS pressure gauge with standard scale AG or red/green scale RG



➔ Flow direction

Adapter plate A4 for EN pressure gauge ¼, without pressure gauge



➔ Flow direction

Type	B4	B5	D4
MS6N-SV-…-AG	31	77	–
MS6N-SV-…-RG	31	78.5	–
MS6N-SV-…-A4	31	78.5	G¼

Soft-start and quick exhaust valves MS6N-SV-C, MS series, NPT

Technical data

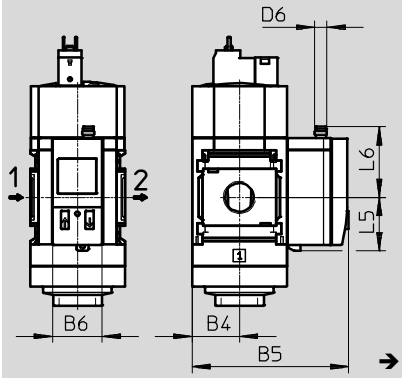
FESTO

Dimensions – Pressure gauge/pressure gauge alternatives

Download CAD data ➔ **www.festo.com**

Pressure sensor with LCD display AD1 … AD4

Technical data ➔ Internet: sde1



➔ Flow direction

Variant AD1:
SDE1-D10-G2-MS-L-P1-M8 with 3-pin plug M8x1, 1 switching output PNP

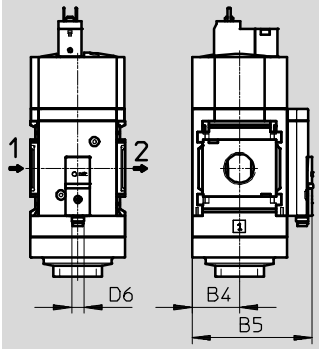
Variant AD2:
SDE1-D10-G2-MS-L-N1-M8 with 3-pin plug M8x1, 1 switching output NPN

Variant AD3:
SDE1-D10-G2-MS-L-PI-M12 with 4-pin plug M12x1, 1 switching output PNP and 4 … 20 mA analogue

Variant AD4:
SDE1-D10-G2-MS-L-NI-M12 with 4-pin plug M12x1, 1 switching output NPN and 4 … 20 mA analogue

Pressure sensor with operational status indicator AD7 … AD10

Technical data ➔ Internet: sde5



➔ Flow direction

Variant AD7:
SDE5-D10-O-…-P-M8 with 3-pin plug M8x1, threshold value comparator, 1 switching output PNP, N/O contact

Variant AD8:
SDE5-D10-C-…-P-M8 with 3-pin plug M8x1, threshold value comparator, 1 switching output PNP, N/C contact

Variant AD9:
SDE5-D10-O3-…-P-M8 with 3-pin plug M8x1, window comparator, 1 switching output PNP, N/O contact

Variant AD10:
SDE5-D10-C3-…-P-M8 with 3-pin plug M8x1, window comparator, 1 switching output PNP, N/C contact

Type	B4	B5	B6	D6	L5	L6
MS6N-SV-…-AD1/AD2	31	102	32.3	M8x1	35.1	46.7
MS6N-SV-…-AD3/AD4				M12x1		55.8
MS6N-SV-…-AD7/AD8/AD9/AD10	31	79	–	M8x1	–	–

Soft-start and quick exhaust valves MS6N-SV-C, MS series, NPT

Ordering data – Modular products

FESTO

M Mandatory data →

Module No.	Series	Size	Thread		Function		Pneumatic connection		Performance level		Supply voltage	
548714	MS	6	N		SV		½, AQ…		C		10V24,10V24C, 10V24D, 10V24F, 10V24P	
Ordering example												
548714	**MS**	**6**	**N**	–	**SV**	–	**AQP**	–	**C**	–	**10V24**	–

Ordering table

Grid dimension [mm]		62	Condi-tions	Code		Enter code
M	Module No.	**548714**				
	Series	Standard		**MS**		MS
	Size	6		**6**		6
	Thread	NPT thread		**N**		N
	Function	Soft-start and quick exhaust valve		**-SV**		-SV
	Pneumatic connection	Female thread NPT½		**-½**		
		Connecting plate NPT¼		**-AQN**		
		Connecting plate NPT⅜		**-AQP**		
		Connecting plate NPT½		**-AQR**		
		Connecting plate NPT¾		**-AQS**		
	Performance level	Category 1, 1-channel, to EN ISO 13849-1		**-C**		-C
	Supply voltage	24 V DC (pin allocation to EN 175301), 3 … 10 bar, manual override – at the soft-start and quick exhaust valve: detenting, self-resetting – at the pilot solenoid valve: non-detenting		**-10V24**		
		24 V DC (pin allocation to EN 175301), 3 … 10 bar, none manual override		**-10V24C**		
		24 V DC, M12x1 to ISO 20401 suitable to EN 61076-2-101, 3 … 10 bar, none manual override		**-10V24D**		
		24 V DC, M12x1 to ISO 20401 suitable to EN 61076-2-101, 3 … 10 bar, manual override – at the soft-start and quick exhaust valve: detenting, self-resetting – at the pilot solenoid valve: non-detenting		**-10V24F**		
↓		24 V DC, M12x1 to ISO 20401 suitable to EN 61076-2-101, 3 … 10 bar, manual override – at the soft-start and quick exhaust valve: detenting, self-resetting – at the pilot solenoid valve: non-detenting/detenting		**-10V24P**		

Transfer order code

548714	**MS**	**6**	**N**	–	**SV**	–		–	**C**	–		

Soft-start and quick exhaust valves MS6N-SV-C, MS series, NPT

FESTO

Ordering data – Modular products

➔ 0 **Options**

	Silencer		Pressure gauge/ pressure gauge alternatives		Alternative pressure gauge scale		Type of mounting		Tamper protection		Flow direction
	S		AG, A4, RG, AD1 … AD4, AD7 … AD10		BAR, MPA		WP, WPM, WPB, WB		MK		Z
–	**S**	–	**AG**	–		–	**WP**	–		–	

Ordering table

Grid dimension [mm]		62	Condi-tions	Code	Enter code
0	Silencer	Silencer		**-S**	
	Pressure gauge/pressure gauge alternatives	MS pressure gauge	1	**-AG**	
		Adapter plate for EN pressure gauge ¼, without pressure gauge		**-A4**	
		Integrated pressure gauge, red/green scale	1	**-RG**	
		Pressure sensor with LCD display, plug M8, 1 switching output PNP, 3-pin	2	**-AD1**	
		Pressure sensor with LCD display, plug M8, 1 switching output NPN, 3-pin	2	**-AD2**	
		Pressure sensor with LCD display, plug M12, 1 switching output PNP, 4-pin, analogue output 4 … 20 mA	2	**-AD3**	
		Pressure sensor with LCD display, plug M12, 1 switching output NPN, 4-pin, analogue output 4 … 20 mA	2	**-AD4**	
		Pressure sensor with operational status indicator, plug M8, threshold value comparator, PNP, N/O contact	2	**-AD7**	
		Pressure sensor with operational status indicator, plug M8, threshold value comparator, PNP, N/C contact	2	**-AD8**	
		Pressure sensor with operational status indicator, plug M8, window comparator, PNP, N/O contact	2	**-AD9**	
		Pressure sensor with operational status indicator, plug M8, window comparator, PNP, N/C contact	2	**-AD10**	
	Alternative pressure gauge scale	bar	3	**-BAR**	
		MPa	3	**-MPA**	
	Type of mounting	Mounting bracket standard design		**-WP**	
		Mounting bracket for attaching the service units	4	**-WPM**	
		Mounting bracket for large wall gap		**-WPB**	
		Mounting bracket centrally at rear (wall mounting top and bottom), connecting plates not required		**-WB**	
	Tamper protection	Complete (manual override at soft-start/quick exhaust valve locked, adjusting screw locked, manual override at pilot solenoid valve locked (only with supply voltage 10V24, 10V24P))		**-MK**	
	Flow direction	Flow direction from right to left		**-Z**	

1 **AG, RG** Pressure gauge scale in psi.
With pressure gauge RG: PSI scale serves only as an auxiliary scale (inner scale), outer scale in bar

2 **AD1 … AD4, AD7 … AD10**
Measuring range max. 10 bar

3 **BAR, MPA** Only in combination with pressure gauge AG or RG

4 **WPM** Only with connecting plate AQN, AQP, AQR or AQS

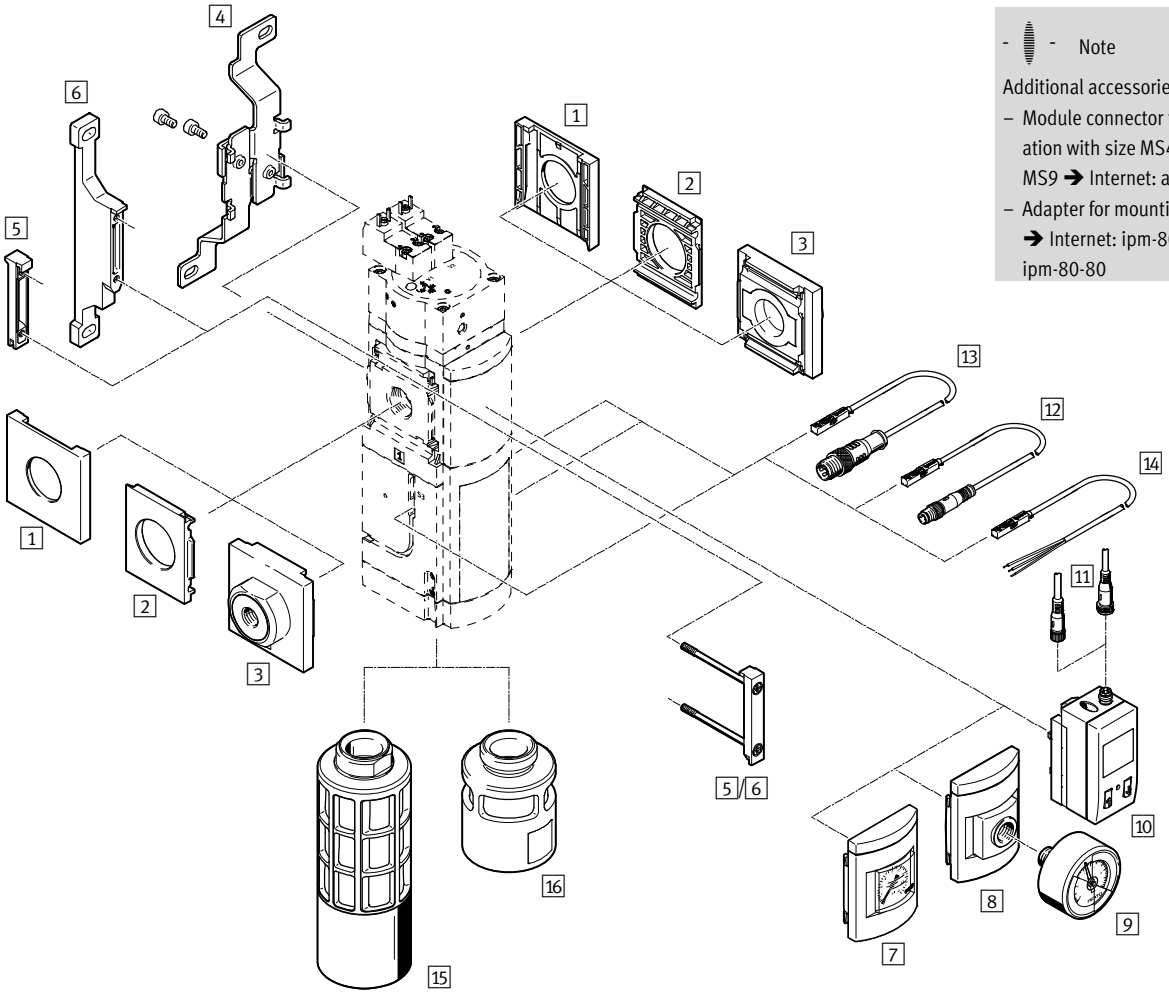
Transfer order code

– | | – | | – | | – | | – | |

Soft-start and quick exhaust valves MS6N-SV-D, MS series, NPT

Peripherals overview

Soft-start and quick exhaust valve MS6N-SV-D

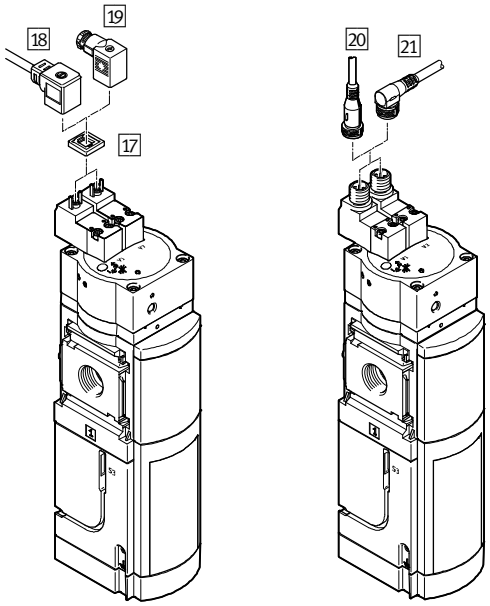


- Note

Additional accessories:

- Module connector for combination with size MS4/MS6 or size MS9 ➔ Internet: amv, rmv, armv
- Adapter for mounting on profiles ➔ Internet: ipm-80, ipm-40-80, ipm-80-80

Supply voltage 10V24	Supply voltage 10V24P



Soft-start and quick exhaust valves MS6N-SV-D, MS series, NPT

Peripherals overview

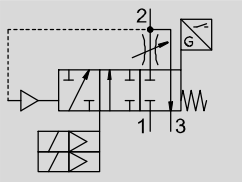
Mounting components and accessories						
		Individual device		Combination		→ Page/Internet
		Without connecting plate	With connecting plate	Without connecting plate	With connecting plate	
1	Cover cap MS6-END	–	–	■	–	ms6-end
2	Mounting plate MS6-AEND	■[1)]	–	■[1)]	–	ms6-aend
3	Connecting plate kit MS6-AQ...	–	■[1)]	–	■[1)]	ms6-aq
4	Mounting bracket MS6-WB	■	■	–	–	ms6-wb
5	Module connector MS6-MV	–	■	■	■	ms6-mv
6	Mounting bracket MS6-WP	■	■	■	■	ms6-wp
	Mounting bracket (not shown) MS6-WPB/WPE/WPM	■	■	■	■	ms6-wp
7	MS pressure gauge AG/RG	■	■	■	■	22
8	Adapter for EN pressure gauge ¼ A4	■	■	■	■	22
9	Pressure gauge MA	■	■	■	■	41
10	Pressure sensor with LCD display AD1 ... AD4	■	■	■	■	22
11	Connecting cable NEBU-M8...-LE3/NEBU-M12...-LE4	■	■	■	■	41
12	Proximity sensor 2M8/S3, SMT-8M-A-...-M8D	■	■	■	■	22, 40
13	Proximity sensor 2M12/S3, SMT-8M-A-...-M12	■	■	■	■	22, 40
14	Proximity sensor 2OE/S3, SMT-8M-A-...-OE	■	■	■	■	22, 40
15	Pneumatic Silencer SO, UOS-1	■	■	■	■	22, 38
16	Pneumatic Silencer UOS-1-LF	■	■	■	■	38
17	Illuminating seal MEB-LD	■	■	■	■	40
18	Plug socket with cable KMEB	■	■	■	■	40
19	Plug socket MSSD-EB	■	■	■	■	40
20	Connecting cable NEBU-M12G5	■	■	■	■	41
21	Connecting cable NEBU-M12W5	■	■	■	■	41

1) Module connector MS6-MV 5 or mounting bracket MS6-WP/WPB/WPE/WPM 6 is required for mounting.

Soft-start and quick exhaust valves MS6N-SV-D, MS series, NPT

Technical data

Function



Flow rate
4300 l/min

Temperature range
–10 … +50 °C

Operating pressure
3.5 … 10 bar

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The electropneumatic soft-start and quick exhaust valve is used to reduce pressure quickly and safely and to build up pressure gradually in industrial pneumatic piping systems and terminal equipment.
The MS6N-SV-D has two safety functions:
– pressure release
– protection from unexpected start-up (non-switching)
The MS6N-SV-D has a 2-channel structure, i.e. it has two internal 2-way valves which can be controlled separately by pilot valves (V1 and V2) situated on the cover. These valves are actuated when both coils are energised simultaneously; this changes the MS6N-SV-D from the normal position to the switching position. The outlet pressure p2 rises slowly in accordance with the throttle setting. The main seat opens when the switch-through pressure is reached. The normal position is achieved by switching off both coils.

Two proximity sensors (S1 and S2) secured on the housing monitor the directional control valves. A further proximity sensor (S3) can optionally be added to monitor the soft-start valve.
The MS6N-SV-D can achieve various categories and safety levels to EN ISO 13849-1 depending on how the directional control valves are monitored.
Where there is appropriate integration into the control chain as well as appropriate linking of the signals for initial position sensing with the signals for activation (plausibility checking):
– Performance Level d/category 3 to EN ISO 13849-1 and EN ISO 13849-2 can be achieved when using sensors S1 and S2 and
– Performance Level e/category 4 to EN ISO 13849-1 and EN ISO 13849-2 can be achieved when using sensors S1, S2 and S3.

Note

To avoid back pressures, it is recommended that the device be operated together with the silencer UOS-1. The silencer can be ordered via the modular product system (SO ➔ 30) or as an accessory (UOS-1 ➔ 58).

Note

Only devices that do not impair pressure release may be positioned downstream of the MS6N-SV-...-D. The MS6N-SV-...-D is not permitted for use as a press safety valve.

- Conforms to standard IEC 61508
- Switching time delay adjustable via a flow control valve for gradual pressure build-up; main seat opens at approx. 50% of operating pressure
- Optional pressure sensor

Safety characteristics		
Conforms to standard		EN ISO 13849-1 and EN ISO 13849-2
Safety function		Exhausting
		Avoidance of unexpected start-up (pressurisation)
Performance Level (PL)	With sensing by S1 and S2	Exhausting: category 3, PL d or category 3, PL e[1)]
		Avoidance of unexpected start-up (pressurisation): category 3, PL d or category 3, PL e[1)]
	With sensing by S1, S2 and S3	Exhausting: category 4, PL e
		Avoidance of unexpected start-up (pressurisation): category 4, PL e
Safety integrity level (SIL)		Exhausting: SIL 3
		Avoidance of unexpected start-up (pressurisation): SIL 3
Note on forced dynamisation		Switching frequency min. 1/month
CE marking (see declaration of conformity)[2)]		To EC Machinery Directive
Shock resistance		Shock test with severity level 2 according to FN 942017-5 and EN 60068-2-27
Vibration resistance		Transport application test with severity level 2 according to FN 942017-4 and EN 60068-2-6

1) Dependent on the average number of annual actuations (n_{op}).
2) Additional information www.festo.com/sp ➔ Certificates.

Note on forced dynamisation: switching frequency min. 1/month

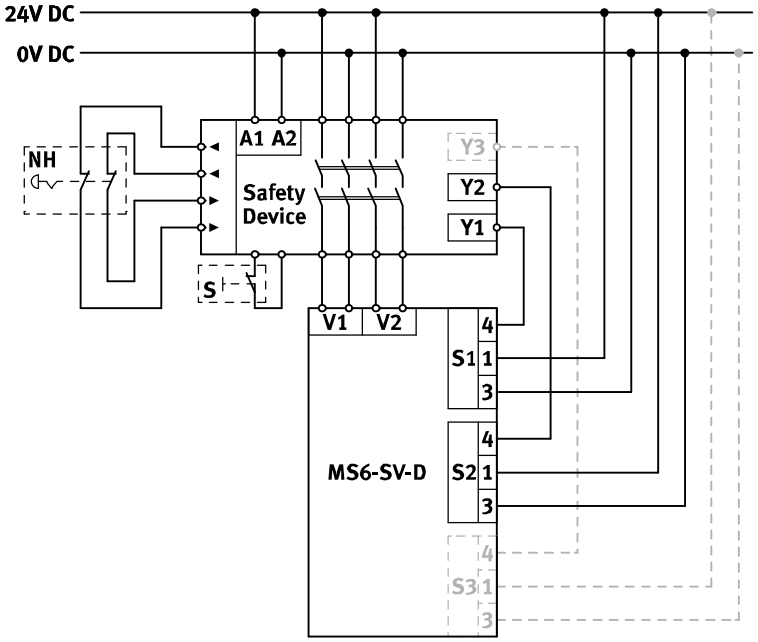
The mechanical system is not tested in the controlled (i.e. pressurised) state. If the process-related switching frequency (safe exhausting) is less than once a month, the machine's operator has to carry out a forced switch off.

Switching logic						
	Voltage at the pilot valve		Switching position Proximity sensor			Status
	V1	V2	S1	S2	S3	
In the normal position (completely exhausted MS6N-SV-D), the pilot valves V1 and V2 are not actuated. If both pilot valves are actuated, the MS6N-SV-D switches first into switching position 1 and then, when the switch-through pressure is reached, automatically into switching position 2.	0 V	0 V	1	1	1	**Normal position** Pneumatic port 1 closed, passage from pneumatic port 2 to 3 open
	24 V	0 V	0	1	1	**Normal position** Pneumatic port 1 closed, passage from pneumatic port 2 to 3 open
	0 V	24 V	1	0	1	**Normal position** Reduced flow through flow control valve from pneumatic port 1 to 2, passage from pneumatic port 2 to 3 open
	24 V	24 V	0	0	1	**Switching element position 1** Reduced flow through flow control valve from pneumatic port 1 to 2, passage from pneumatic port 2 to 3 closed
	24 V	24 V	0	0	0	**Switching position 2** Full flow from pneumatic port 1 to 2, passage from pneumatic port 2 to 3 closed

Proximity sensor response times[1)]		
Proximity sensor	Switching on	Switching off
S1	Edge change max. 4 s after voltage signal at V1.	Edge change max. 4 s after voltage drop at V1.
S2	Edge change max. 4 s after voltage signal at V2.	Edge change max. 4 s after voltage drop at V2.
S3	Edge change after voltage signal at V1 and V2. Dependent on operating pressure p1, throttle position and system volume p2	Edge change max. 5 s after voltage drop at V1 and V2. Dependent on system volume at p2.

1) When the proximity sensors undergo an edge change, bounce can occur. This bounce can be ignored by taking the response times into account. The maximum specified response times must be considered in the diagnostics. The response times are normally shorter.

Example circuit



A1, A2: Supply voltage
S1: Proximity sensor S1
S2: Proximity sensor S2
S3: Proximity sensor S3
NH: Emergency stop (input circuit)
Safety device: Safety switching device or safety PLC
V1: Coil connection, pilot valve V1
V2: Coil connection, pilot valve V2
Y1: Diagnostic input 1
Y2: Diagnostic input 2
Y3: Diagnostic input 3
S: Monitored start (start circuit)

Soft-start and quick exhaust valves MS6N-SV-D, MS series, NPT

Technical data

General technical data	
Pneumatic port 1, 2	
Female thread	NPT½
Connecting plate AQ...	NPT¼, NPT⅜, NPT½ or NPT¾
Pneumatic port 3	NPT1
Actuation type	Electric
Design	Piston seat
Type of mounting	Via accessories
	In-line installation
Mounting position	Any
Pressure indicator	Via pressure sensor for displaying output pressure via LCD display and electrical output
	Via pressure gauge for displaying output pressure
	Via pressure gauge with red/green scale for displaying output pressure
	G¼ prepared
Position sensing principle	Magnetic piston principle
Valve function	3/2-way valve, closed, single solenoid
	Soft-start function, adjustable
Non-overlapping	No
Exhaust function	No flow control
Manual override	None
Reset method	Mechanical spring
Type of control	Piloted
Pilot air supply	Internal
Sealing principle	Soft

Flow rate characteristics	
Pneumatic connection	Female thread NPT½
Standard nominal flow rate qnN[1] [l/min]	
In main flow direction 1 → 2	4300
Standard flow rate qN [l/min], p2 = 6 bar	
In venting direction 2 → 3	9000[2]
C value [l/s*min]	
In main flow direction 1 → 2	19.3
b value	
In main flow direction 1 → 2	0.21

1) Measured at p1 = 6 bar and p2 = 5 bar, Δp = 1 bar
2) Measured with respect to atmosphere with silencer UOS-1

Soft-start and quick exhaust valves MS6N-SV-D, MS series, NPT

Technical data

Electrical data		
Pilot valve		
Coil characteristics		24 V DC: 1.8 W; permissible voltage fluctuations –15%/+10%
Electrical connection	10V24	2 x plug connectors, 2-pin, to EN 175301-803, type C
	10V24P	2 x M12x1 to ISO 20401 suitable to EN 61076-2-101
Degree of protection		IP65 with plug socket
Duty cycle	[%]	100
Max. switching frequency	[Hz]	1
Switching time off	[ms]	40
Switching time on	[ms]	130
Proximity sensor		
Nominal operating voltage	[V DC]	24
Electrical connection, proximity sensor	2M8	2 x cables with plug connector M8x1, 3-pin, rotatable thread, cable length 0.3 m
	2M12	2 x cables with plug connector M12x1, 3-pin, rotatable thread, cable length 0.3 m
	2OE	2 x cable with open end, 3-wire, cable length 5 m
	2M8 + S3	3 x cables with plug connector M8x1, 3-pin, rotatable thread, cable length 0.3 m
	2M12 + S3	3 x cables with plug connector M12x1, 3-pin, rotatable thread, cable length 0.3 m
	2OE + S3	3 x cable with open end, 3-wire, cable length 5 m
Switching element function		N/O contact
Measuring principle		Magneto-resistive
Signal status display		LED and switching outputs
Switching output		PNP

Operating and environmental conditions		
Operating pressure	[bar]	3.5 ... 10
Operating medium		Compressed air according to ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Ambient temperature	[°C]	–10 ... +50 (0 ... +50)[1]
Temperature of medium	[°C]	–10 ... +50 (0 ... +50)[1]
Storage temperature	[°C]	–10 ... +50 (0 ... +50)[1]
Corrosion resistance class CRC[2]		2
Noise level	[dB(A)]	75 (with silencer UOS-1)
CE marking (see declaration of conformity)[3]		To EU Machinery Directive
UL certification[3]		c UL us - Recognized (OL)
Certification		RCM Mark
KC marking		KC EMC

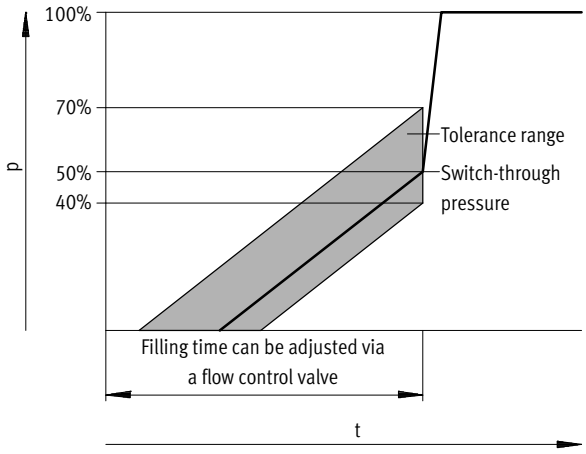
1) With pressure sensor AD...
2) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
3) Additional information www.festo.com/sp ➔ Certificates.

Weight [g]	
Soft-start/quick exhaust valve	1900
Soft-start/quick exhaust valve with silencer UOS-1	2110

Materials	
Housing	Die-cast aluminium
Piston rod	High-alloy stainless steel
Seals	NBR
Note on materials	RoHS-compliant

Switch-through pressure

Pressure p as a function of time t



Note

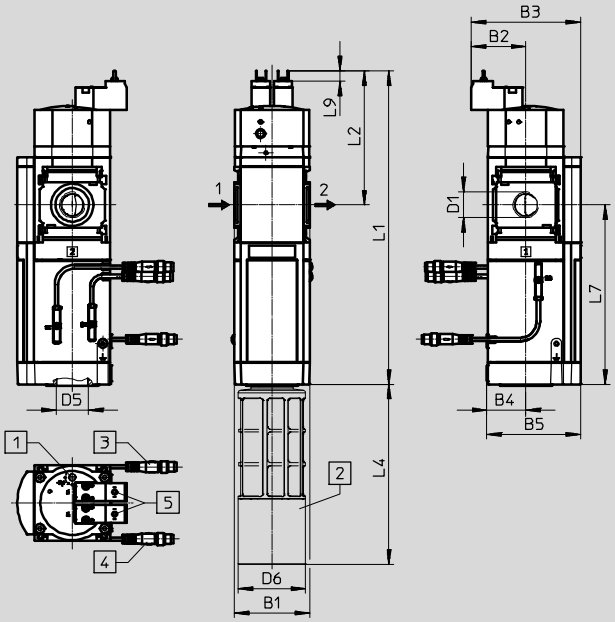
The +20%/–10% switch-through pressure tolerance refers to the operating pressure p1.
Example: A switch-through pressure from 1.6 bar to 2.8 bar is permissible at an operating pressure of 4 bar.

Soft-start and quick exhaust valves MS6N-SV-D, MS series, NPT

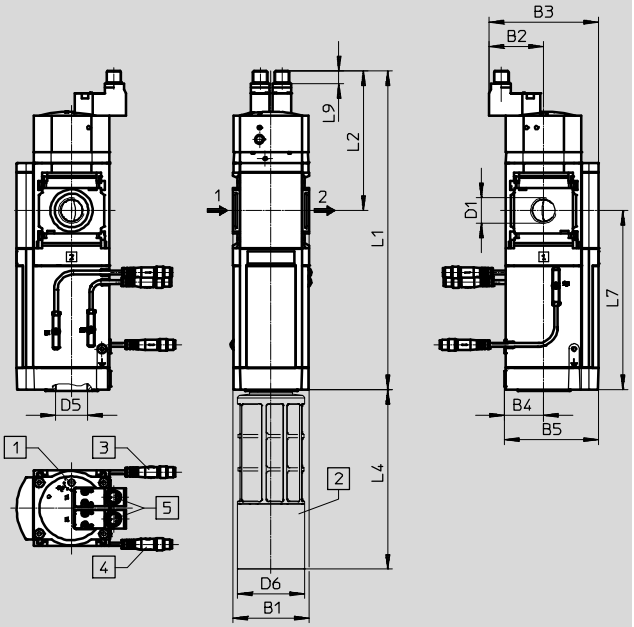
Technical data

Dimensions – Basic design Download CAD data ➔ **www.festo.com**

With supply voltage 10V24, with female thread NPT½, with cover plate



With supply voltage 10V24P, with female thread NPT½, with cover plate



1 = Unused
2 = Unused
3 = com (–)
4 = Signal (+) solenoid 14

1 Regulating screw for flow control valve
2 Silencer UOS-1
3 Extended sensing, variant S3: additional third proximity sensor SMT, port depends on connection technology chosen 4

4 Connection technology,
- variant 2M8: 2 proximity sensors SMT with cable (plug connector M8x1, 3-pin, rotatable thread, cable length 0.3 m)
- variant 2M12: 2 proximity sensors SMT with cable (plug connector M12x1, 3-pin, rotatable thread, cable length 0.3 m)
- variant 2OE: 2 proximity sensors SMT with cable (open end, 3-wire, cable length 5 m)

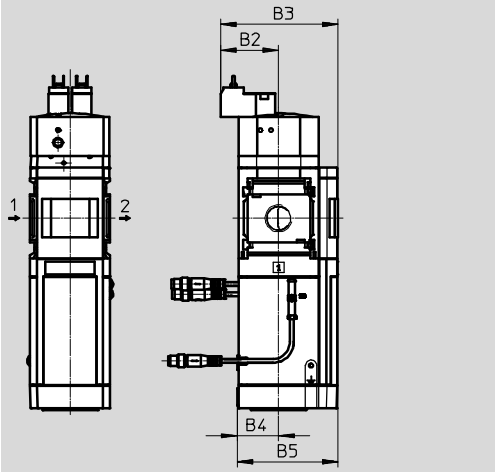
5 Supply voltage,
- variant 10V24: Electrical connection to EN 175301-803, 2 x plug connectors, 2-pin, type C
- variant 10V24P: Electrical connection 2 x M12x1 to ISO 20401 suitable to EN 61076-2-101, version 4 pin for connecting cable NEBU-M12

➔ Flow direction

Type	B1	B2	B3	B4	B5	D1	D5	D6 ∅	L1	L2	L4	L7	L9
MS6N-SV-½-D-10V24	62	45	90	31	76	NPT½	NPT1	55	257	110	147	147	9
MS6N-SV-½-D-10V24P									262	115			11

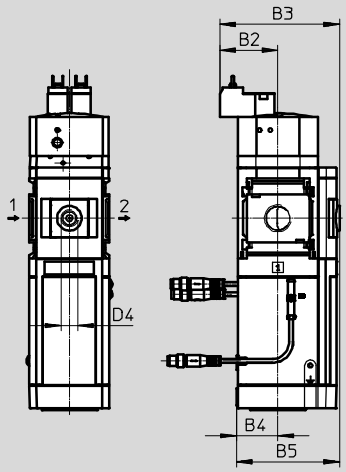
Dimensions – Pressure gauge/pressure gauge alternatives Download CAD data ➔ **www.festo.com**

Integrated MS pressure gauge with standard scale AG or red/green scale RG



➔ Flow direction

Adapter A4 for EN pressure gauge ¼, without pressure gauge

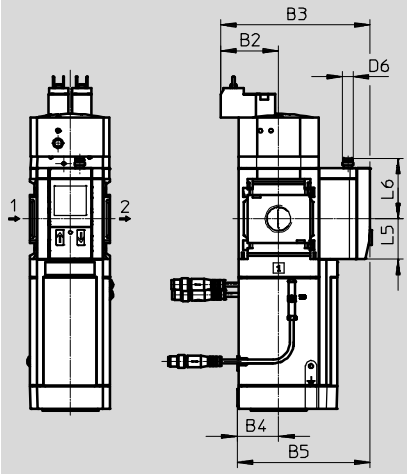


➔ Flow direction

Type	B2	B3	B4	B5	D4
MS6N-SV-...-D-...-AG	44	90	31	77	–
MS6N-SV-...-D-...-RG	44	91.5	31	78.5	–
MS6N-SV-...-D-...-A4	44	91.5	31	78.5	G¼

Dimensions – Pressure gauge/pressure gauge alternatives Download CAD data ➔ **www.festo.com**

Pressure sensor with LCD display AD1 ... AD4 Technical data ➔ Internet: sde1



➔ Flow direction

Variant AD1:
SDE1-D10-G2-MS-L-P1-M8 with
3-pin plug connector M8x1,
1 switching output PNP

Variant AD2:
SDE1-D10-G2-MS-L-N1-M8 with
3-pin plug connector M8x1,
1 switching output NPN

Variant AD3:
SDE1-D10-G2-MS-L-PI-M12 with
4-pin plug connector M12x1,
1 switching output PNP and
4 ... 20 mA analogue

Variant AD4:
SDE1-D10-G2-MS-L-NI-M12 with
4-pin plug connector M12x1,
1 switching output NPN and
4 ... 20 mA analogue

Type	B2	B3	B4	B5	D6	L5	L6
MS6N-SV-...-D-...-AD1/AD2	44	116	31	103	M8x1	31.2	46.8
MS6N-SV-...-D-...-AD3/AD4					M12x1		55.8

Soft-start and quick exhaust valves MS6N-SV-D, MS series, NPT

Ordering data – Modular products

FESTO

M **Mandatory data** ➔

Module no.	Series	Size	Thread		Function		Pneumatic connection		Performance Level		Supply voltage		Connection technology	
548714	MS	6	N		SV		½, AQ...		D		10V24, 10V24P		2M8, 2M12, 2OE	
Ordering example														
548714	**MS**	**6**	**N**	–	**SV**	–	**AQR**	–	**D**	–	**10V24**	–	**2OE**	–

Ordering table

Grid dimension [mm]		62	Conditions	Code		Entry code
M	Module no.	**548714**				
	Series	Standard		**MS**		MS
	Size	6		**6**		6
	Thread	NPT thread		**N**		N
	Function	Soft-start and quick exhaust valve		**-SV**		-SV
	Pneumatic connection	Female thread NPT½		**-½**		
		Connecting plate NPT¼		**-AQN**		
		Connecting plate NPT⅜		**-AQP**		
		Connecting plate NPT½		**-AQR**		
		Connecting plate NPT¾		**-AQS**		
	Performance Level	Category 3, 2-channel, to EN ISO 13849-1		**-D**		-D
	Supply voltage	24 V DC (pin allocation to EN 175301)		**-10V24**		
		24 V DC, M12x1 to ISO 20401 suitable to EN 61076-2-101		**-10V24P**		
	Connection technology	2 proximity sensors SMT with cable plug connector M8x1, 3-pin, rotatable thread, cable length 0.3 m)		**-2M8**		
		2 proximity sensors SMT with cable (plug connector M12x1, 3-pin, rotatable thread, cable length 0.3 m)		**-2M12**		
↓		2 proximity sensors SMT with cable (open end, 3-wire, cable length 5 m)		**-2OE**		

Transfer order code

548714	**MS**	**6**	**N**	–	**SV**	–		–	**D**	–		–

Soft-start and quick exhaust valves MS6N-SV-D, MS series, NPT

Ordering data – Modular products

➔ 0 **Options**

	Extended sensing		Silencer		Pressure gauge/ pressure gauge alternatives		Alternative pressure gauge scale		Type of mounting		UL certification		Flow direction
	S3		SO		AG, A4, RG, AD1 … AD4		BAR, MPA		WP, WPM, WPB, WB		UL1		Z
–	**S3**	–	**SO**	–	**AG**	–		–	**WPB**	–		–	

Ordering table

Grid dimension [mm]		62	Conditions	Code		Entry code
0	Extended sensing	Additional proximity sensor SMT; required to achieve Performance Level e; port depends on connection technology chosen		**-S3**		
	Silencer	Silencer open		**-SO**		
	Pressure gauge/pressure gauge alternatives	MS pressure gauge	1	**-AG**		
		Adapter for EN pressure gauge ¼, without pressure gauge		**-A4**		
		Integrated pressure gauge, red/green scale	1	**-RG**		
		Pressure sensor with LCD display, plug connector M8, 1 switching output PNP, 3-pin		**-AD1**		
		Pressure sensor with LCD display, plug connector M8, 1 switching output NPN, 3-pin		**-AD2**		
		Pressure sensor with LCD display, plug connector M12, 1 switching output PNP, 4-pin, analogue output 4 … 20 mA		**-AD3**		
		Pressure sensor with LCD display, plug connector M12, 1 switching output NPN, 4-pin, analogue output 4 … 20 mA		**-AD4**		
	Alternative pressure gauge scale	bar	2	**-BAR**		
		MPa	2	**-MPA**		
	Type of mounting	Mounting bracket standard design		**-WP**		
		Mounting bracket for attaching the service units	3	**-WPM**		
		Mounting bracket for large wall gap		**-WPB**		
		Mounting bracket centrally at rear (wall mounting top and bottom), connecting plates not required		**-WB**		
	UL certification	cULus, ordinary location for Canada and USA		**-UL1**		
	Flow direction	Flow direction from right to left		**-Z**		

1 **AG, RG** Pressure gauge scale in psi.
With pressure gauge RG: PSI scale serves only as an auxiliary scale (inner scale), outer scale in bar

2 **BAR, MPA** Only in combination with pressure gauge AG or RG.

3 **WPM** Only with connecting plates AQN, AQP, AQR or AQS

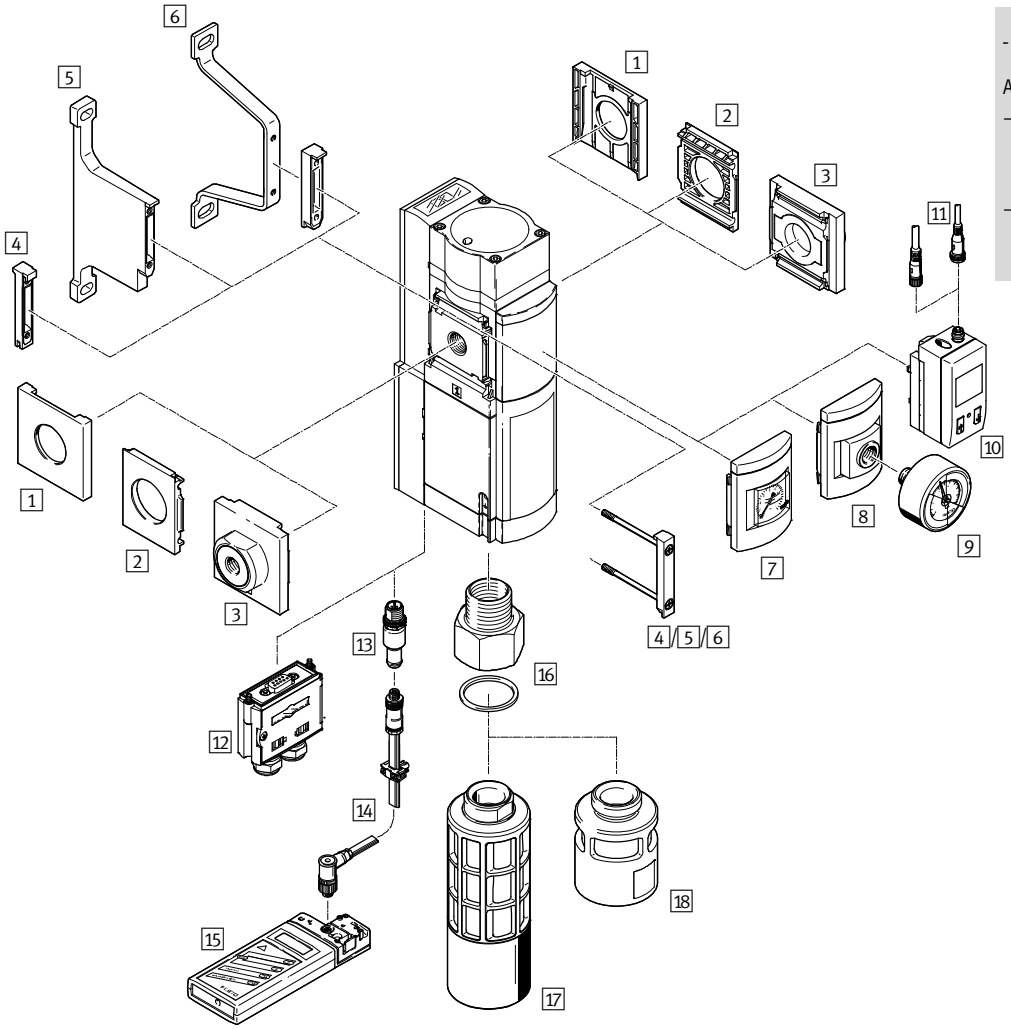
Transfer order code

–		–		–		–		–		–		–	

Soft-start and quick exhaust valves MS6N-SV-E, MS series, NPT

Peripherals overview

Soft-start and quick exhaust valve MS6N-SV-E



- Note

Additional accessories:

- Module connector for combination with size MS4/MS6 or size MS9 ➔ Internet: amv, rmv, armv
- Adapter plate for mounting on profiles ➔ Internet: ipm-80, ipm-40-80, ipm-80-80

Soft-start and quick exhaust valves MS6N-SV-E, MS series, NPT

Peripherals overview

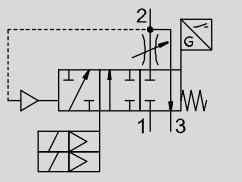
Mounting attachments and accessories						
		Individual device		Combination		➔ Page/Internet
		Without connecting plate	With connecting plate	Without connecting plate	With connecting plate	
1	Cover cap MS6-END	–	–	■	–	ms6-end
2	Mounting plate MS6-AEND	■1)	–	■1)	–	ms6-aend
3	Connecting plate-SET MS6-AQ...	–	■1)	–	■1)	ms6-aq
4	Module connector MS6-MV	–	–	■	■	ms6-mv
5	Mounting bracket MS6-WPB	■	■	■	■	ms6-wpb
6	Mounting bracket MS6-WPE	■	■	■	■	ms6-wpe
7	MS pressure gauge AG/RG	■	■	■	■	34
8	Adapter plate for EN pressure gauge ¼ A4	■	■	■	■	34
9	Pressure gauge MA	■	■	■	■	41
10	Pressure sensor with LCD display AD1 ... AD4	■	■	■	■	34
11	Connecting cable NEBU-M8...-LE3/NEBU-M12...-LE4	■	■	■	■	41
12	Multi-pin plug socket NECA	■	■	■	■	36
13	AS-i configuration plug CACC	■	■	■	■	39
14	Addressing cable KASI-ADR	■	■	■	■	kasi-asi
15	Addressing device ASI-PRG-ADR	■	■	■	■	asi-prg-adr
16	Adapter AD	■	■	■	■	40
17	Silencer UOS-1	■	■	■	■	38
18	Silencer UOS-1-LF	■	■	■	■	38

1) Module connector MS6-MV or mounting bracket MS6-WPB/WPE is required for mounting.

Soft-start and quick exhaust valves MS6N-SV-E, MS series, NPT

Technical data

Function



- Flow rate
  4,300 l/min
- Temperature range
  –10 … +50 °C
- Operating pressure
  3.5 … 10 bar
- www.festo.com

The electro-pneumatic soft-start and quick exhaust valve is used to reduce pressure quickly and reliably and to build up pressure gradually in industrial pneumatic systems and terminals.
The device is a self-testing, redundant mechatronic system conforming to the requirements of EN ISO 13849-1. The safety-related pneumatic protection objective of safe venting is also guaranteed in the event of faults inside the valve (e.g. due to wear, contamination, electronic faults). Thanks to the 2-channel design and its monitoring, the device fulfils controller category 3 and 4 requirements. This enables a performance level of max. "e" to be attained.
The device receives the secure enable signals (EN1/EN2) via the electrical connection (multi-pin plug socket NECA Sub-D, 9-pin or AS-i connecting cable). The signals in question come from commercially available electronic or electromechanical safety switching devices which monitor the protective equipment of the machine (e.g. emergency stop, light curtain, electrical door switch of a protective enclosure, etc.).

Note

The MS6N-SV-...-E-10V24 must be used in combination with the multi-pin plug socket NECA approved for it. The multi-pin plug socket can be ordered via the modular product system (MP... ➔ 44) or as an accessory (NECA ➔ 56).

Note

To avoid back pressures, it is recommended that the device be operated together with the silencer UOS-1. The silencer can be ordered via the modular product system (SO ➔ 44) or as an accessory (UOS-1 ➔ 58).

Note

Only devices that do not impair the pneumatic protective measure – safe venting – may be placed downstream of the MS6N-SV-...-E.
The MS6N-SV-...-E is not permitted for use as a press safety valve.

- Performance level "e"/category 4 according to EN ISO 13849-1
- Conforms to standard IEC 61508
- Switching time delay adjustable via a flow control valve for gradual pressure build-up
- Optional pressure sensor

Safety characteristics		
Type	MS6N-SV-...-E-10V24	MS6N-SV-...-E-ASIS
Conforms to standard	EN ISO 13849-1	
Safety function	Exhausting	
	Avoidance of unexpected start-up (pressurisation)	
Performance level (PL)	Exhausting: up to category 4, PL e	
	Avoidance of unexpected start-up (pressurisation): up to category 4, PL e	
Safety integrity level (SIL)	Exhausting: SIL 3	
	Avoidance of unexpected start-up (pressurisation): SIL 3	
Note on forced dynamisation	Switching frequency min. 1/month	
Certificate issuing authority[1)]	IFA 1001180	TÜV Nord, Registration no. 44 799 12 556236 000
CE marking (see declaration of conformity)[1)]	To EU Machinery Directive	
	To EU EMC Directive	
Shock resistance	Shock test with severity level 2 according to FN 942017-5 and EN 60068-2-27	
Vibration resistance	Transport application test with severity level 2 according to FN 942017-4 and EN 60068-2-6	

1) Additional information www.festo.com/sp ➔ Certificates.

Note on forced dynamisation: switching frequency min. 1/month

The mechanical system is not tested in the controlled (i.e. pressurised) state. If the process-related switching frequency (safe exhausting) is less than once a month, the machine's operator has to carry out a forced switch off.

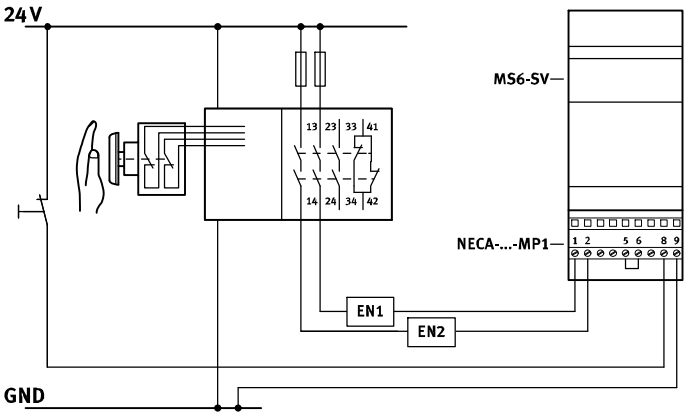
Additional functions of MS6N-SV-...-E-ASIS:

- Integrated pressure sensors via AS-i protocol
- Pressure monitoring (under/overshooting)

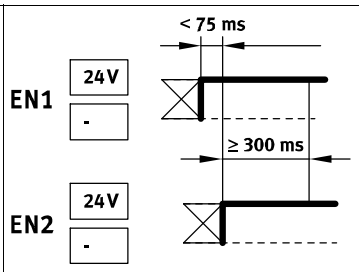
Operational principle of the multi-pin plug socket NECA				
Status of enable signal		Status of MS6N-SV-...-E-10V24 with multi-pin plug		
EN1	EN2	NECA-...- MP1	NECA-...- MP3	NECA-...- MP5
0 V	0 V	Unpressurized	MS6N-SV-...-E-10V24 goes into the fault mode.	MS6N-SV-...-E-10V24 does not go into the fault mode, but remains in the safe, unpressurized status. **Note:** Cross-circuit detection and error detection/evaluation via external controller necessary.
0 V	24 V	MS6N-SV-...-E-10V24 goes into the fault mode.	Pressurized	Pressurized
24 V	24 V	Pressurized	MS6N-SV-...-E-10V24 goes into the fault mode.	MS6N-SV-...-E-10V24 does not go into the fault mode, but remains in the safe, unpressurized status. **Note:** Cross-circuit detection and error detection/evaluation via external controller necessary.
24 V	0 V	MS6N-SV-...-E-10V24 goes into the fault mode.	Unpressurized	Unpressurized

MS6N-SV-...-E-10V24 with multi-pin plug socket NECA

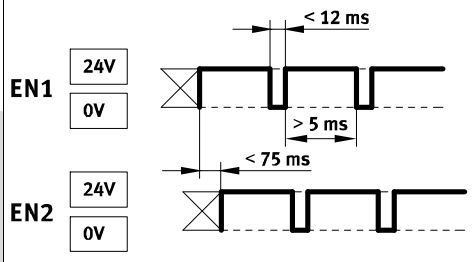
NECA-...- MP1



– Static enable signals (EN1 = 24 V, EN2 = 24 V).



– Clocked enable signals (EN1 = 0 ... 24 V, EN2 = 0 ... 24 V) for cross-circuit detection.
Cross-circuit detection with clock signals is in principle carried out by the safety switching device/safety PLC used.

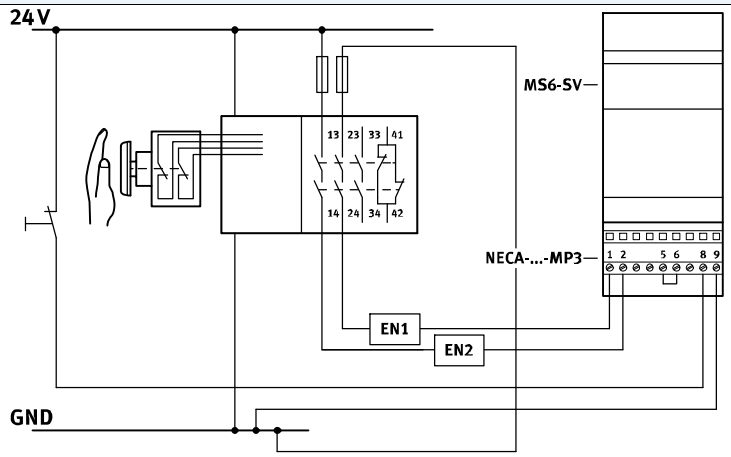


- Note

Given the fact that clock outputs from different controller manufacturers are not standardised, their usability must be checked in each case. If the clock pulse is outside of the described limits, this is recognised by the MS6N-SV-...-E-10V24 as an error and a safe switch-off is performed.

MS6N-SV-...-E-10V24 with multi-pin plug socket NECA

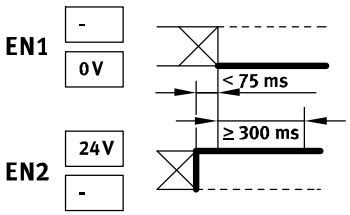
NECA-...- MP3



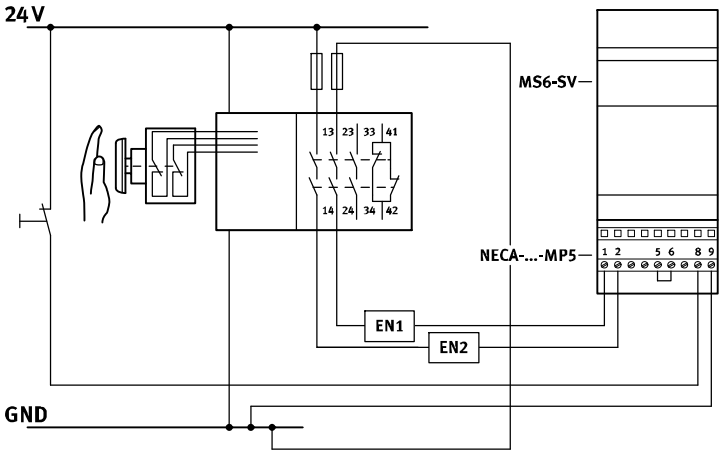
Note

The multi-pin plug socket NECA-S1G9-P9-MP3 is intended for conventional circuitry with electromechanical safety relays. If problems arise in use with bipolar semiconductor outputs, use the multi-pin plug socket NECA-S1G9-P9-MP5.

- Static enable signals with opposite potentials.
- The time delay of the level change of the enable signals is monitored.
- Behaviour on detection of a cross circuit:
  - MS6N-SV-...-E-10V24 in the exhausted status: remains in the safe status and goes into the fault mode.
  - MS6N-SV-...-E-10V24 in the pressurized status: goes into the safe status and goes into the fault mode.



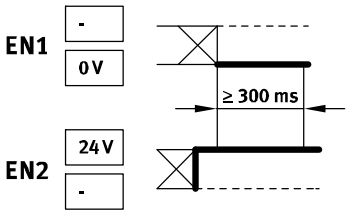
NECA-...- MP5



Note

A cross circuit between the enable signals (EN1/EN2) is not detected and does not cause an error response. The system can is pressurized only when the enable signals are applied correctly.

- Static enable signals with opposite potentials.
- The time delay of the level change of the enable signals is not monitored.
- Behaviour on detection of a cross circuit (through upstream safety switching device/safety PLC):
  - MS6N-SV-...-E-10V24 in the exhausted status: remains in the safe status and does not go into the fault mode.
  - MS6N-SV-...-E-10V24 in the pressurized status: goes into the safe status and does not go into the fault mode.
- Enable signal are galvanically separated from the supply voltage.

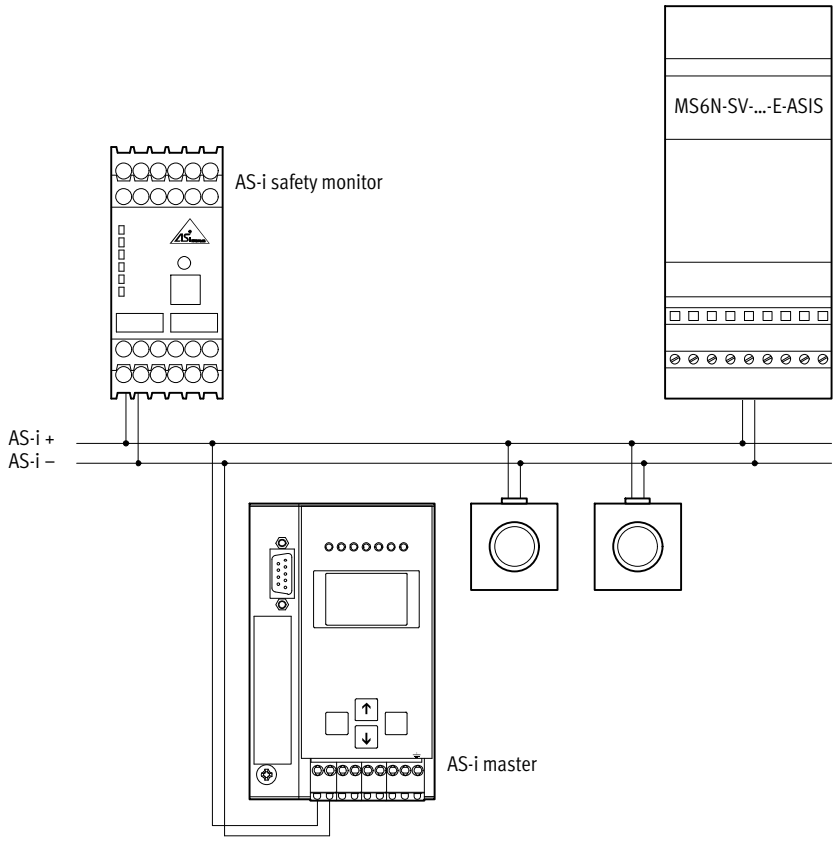


Note

The time delay between EN1 and EN2 must be automatically determined. The duration of the delay is not evaluated.

MS6N-SV-...-E-ASIS in the actuator-sensor interface (AS-i)

The actuator-sensor interface (AS-i) is a system for networking sensors and actuators on the lowest level of the automation hierarchy. It is a non-proprietary, open bus system and enables transfer of data and energy on just one line. This simple method permits an efficient configuration with simultaneously reliable performance. The network topology of the AS-i system can be expanded as desired without any difficulty.
An AS-i network consists of a control unit, a so-called master and the associated sensor and actuator components, namely the slaves. The master cyclically polls all configured slaves and exchanges input and output data with them. A telegram consists of 4 bits of user data. The master communicates with the slaves via a serial transmission protocol.
AS-i Safety at Work is a certified standard that enables safety-related components to be used in the AS-i system. The safe AS-i system is designed for safety applications up to category 4 according to EN ISO 13849-1 PL "e". Mixed operation of standard components and safety-oriented components is possible. The AS-interface master considers the safety-oriented slaves just like all other slaves and incorporates them into the network. The transmission protocol and the cables in the AS-i system are laid out so that they are also capable of transmitting safety-oriented telegrams.
The AS-i safety monitor is the central safe component and monitors the safety-oriented slaves assigned to it within an AS-i system. The safety function is ensured via additional signal transmission between the safety-oriented slaves and the AS-i safety monitor. This transmission takes place with a special safety protocol.
In the case of a stop request or defect, the AS-i safety monitor in protection mode reliably switches the system off with a maximum reaction time of 40 ms.



Soft-start and quick exhaust valves MS6N-SV-E, MS series, NPT

Technical data

General technical data	
Pneumatic connection 1, 2	
Female thread	NPT½
Connecting plate AQ...	NPT¼, NPT⅜, NPT½ or NPT¾
Pneumatic connection 3	NPT1
Actuation type	Electric
Design	Piston seat
Type of mounting	Via accessories
	In-line installation
Mounting position	Any
Pressure indicator	Via pressure sensor for displaying output pressure via LCD display and electrical output
	Via pressure gauge for displaying output pressure
	Via pressure gauge with red/green scale for displaying output pressure
	G¼ prepared
Position sensing principle	Solenoid piston principle
Valve function	3/2-way valve, closed, single solenoid
	Soft-start function, adjustable
Non-overlapping	No
Exhaust function	No flow control
Manual override	None
Reset method	Mechanical spring
Type of control	Piloted
Pilot air supply	Internal
Sealing principle	Soft

Flow rate characteristics	
Pneumatic connection	Female thread NPT½
Standard nominal flow rate qnN[1] [l/min]	
In main flow direction 1 ⇢ 2	4,300
Standard flow rate qN [l/min], p2 = 6 bar	
In venting direction 2 ⇢ 3	9,000[2]
C value [l/s*min]	
In main flow direction 1 ⇢ 2	19.3
b value	
In main flow direction 1 ⇢ 2	0.21

1) Measured at p1 = 6 bar and p2 = 5 bar, Δp = 1 bar
2) Measured with respect to atmosphere with silencer UOS-1

Electrical data			
Type		MS6N-SV-...-E-10V24	MS6N-SV-...-E-ASIS
Electrical connection		Sub-D, 9-pin	2x M12
Nominal operating voltage	[V DC]	24	–
Permissible voltage fluctuations	[%]	±10	–
Operating voltage range for AS-interface	[V DC]	–	22 ... 31.6
Duty cycle	[%]	100	
Max. switching frequency	[Hz]	1	
Switching time off	[ms]	40	
Switching time on	[ms]	130	
Signal status display		LED and floating contact	LED and via AS-i
Protection class		IP65 with plug socket	

Soft-start and quick exhaust valves MS6N-SV-E, MS series, NPT

Technical data

AS-i Safety-specific data	
Type	MS6N-SV-...-E-ASIS
Fieldbus interface	Socket M12 (AS-i Out) and plug M12 (AS-i In)
LED displays	AS-i and status
Device-specific diagnostics	Inputs for cyclical digital data (exhausted, pressurised, fault) Cyclical analogue values (supply pressure p1, output pressure p2) Acyclical values (counter, pressure monitoring, fault, switching frequency exceeded, status)
Product identification	IO code: 0x7 Profile: 7.5.5 ID code: 0x5 ID1: 0xF ID2: 0x5
Vendor ID AS-interface	0x014D
Device ID AS-interface	0x03A6
Addressing range	Standard slave: 1 ... 31

Operating and environmental conditions			
Type		MS6N-SV-...-E-10V24	MS6N-SV-...-E-ASIS
Operating pressure	[bar]	3.5 ... 10	3.5 ... 10
Operating medium		Compressed air according to ISO 8573-1:2010 [7:4:4]	
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)	
Ambient temperature	[°C]	–10 ... +50 (0 ... +50)[1]	0 ... +50
Temperature of medium	[°C]	–10 ... +50 (0 ... +50)[1]	0 ... +50
Storage temperature	[°C]	–10 ... +50 (0 ... +50)[1]	0 ... +50
Corrosion resistance class CRC[2]		2	
Noise level	[dB(A)]	75 (with silencer UOS-1)	
CE marking (see declaration of conformity)[4]		To EU EMC Directive[3]	
		To EU Machinery Directive	
UL certification[4]		cULus recognized (OL)	
Certification		RCM Mark	
KC marking		KC EMC	

1) With pressure sensor AD...
2) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
3) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.
4) Additional information www.festo.com/sp ➔ Certificates.

Weight [g]	
Soft-start and quick exhaust valve	2,000
Soft-start and quick exhaust valve with silencer UOS-1	2,200

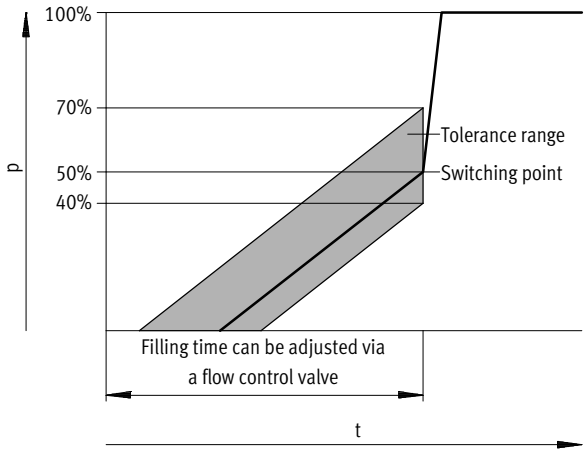
Materials	
Housing	Die-cast aluminium
Piston rod	High-alloy stainless steel
Seals	NBR
Note on materials	RoHS-compliant

Soft-start and quick exhaust valves MS6N-SV-E, MS series, NPT

Technical data

Switching point

Pressure p as a function of time t



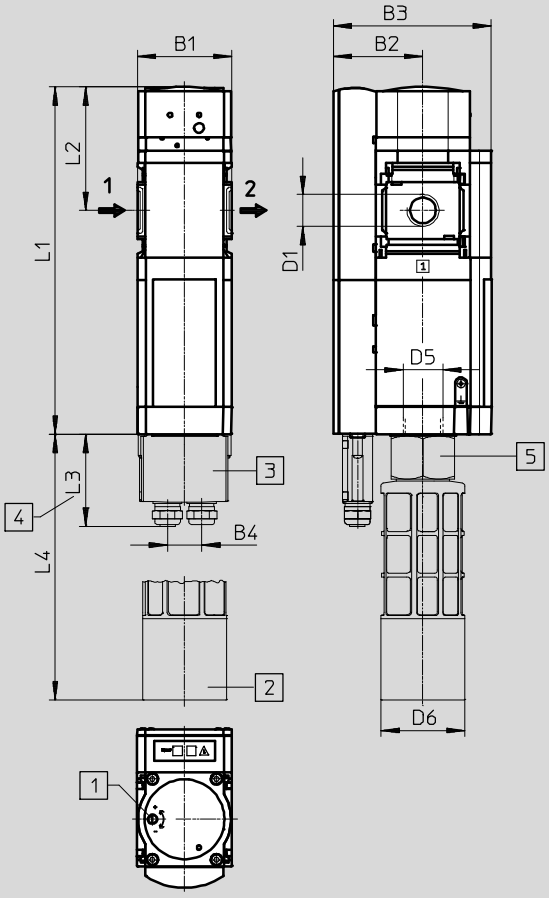
Note

The +20%/–10% switching point tolerance refers to the operating pressure p1.
Example: A switching point from 1.6 bar to 2.8 bar is permissible at an operating pressure of 4 bar.

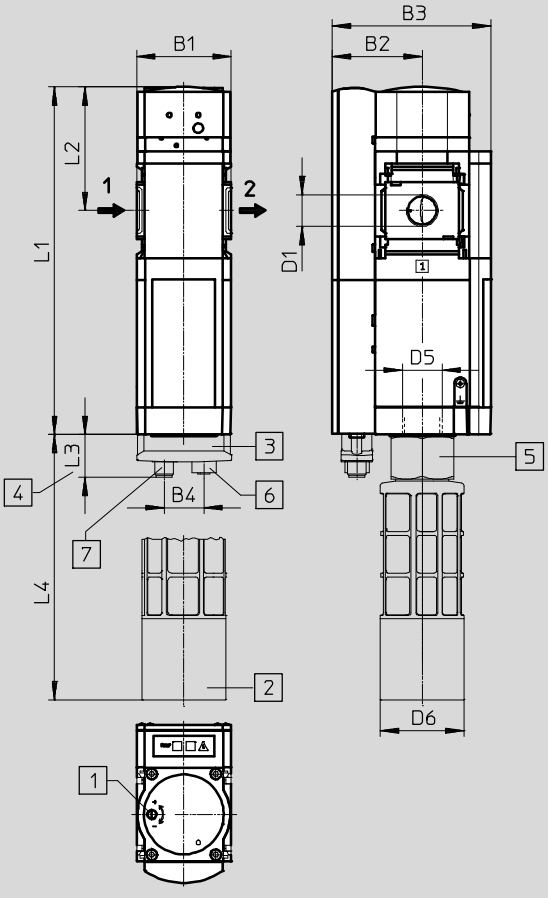
Dimensions – Basic design

Download CAD data ➔ **www.festo.com**

With supply voltage 10V24,
with female thread NPT½, with cover plate



With supply voltage ASIS,
with female thread NPT½, with cover plate

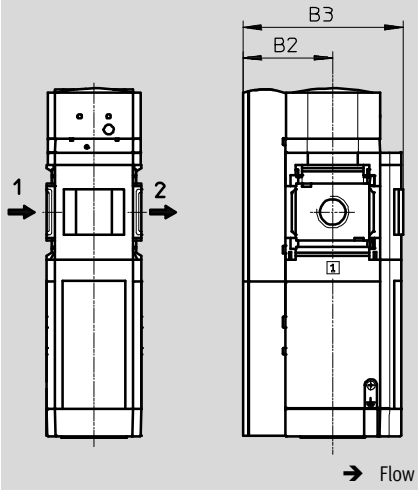


1 Regulating screw for flow control valve
2 Silencer UOS-1
3 Multi-pin plug socket NECA or AS-i configuration plug CACC
4 Dimension without cable
5 Adapter AD
6 M12 socket, 5-pin
7 M12 pin, 5-pin
➔ Flow direction

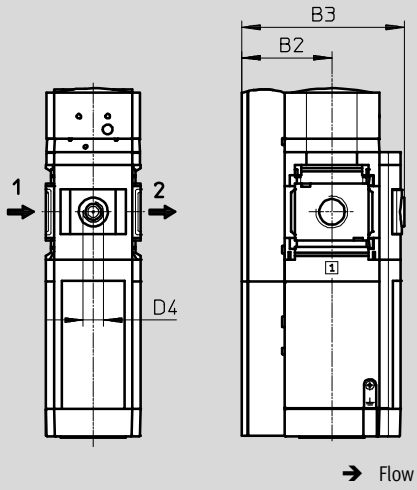
Type	B1	B2	B3	B4	D1	D5	D6	L1	L2	L3	L4
MS6N-SV-½-E-10V24	62	59	104	23	NPT½	NPT1	55	228	81	61	174
MS6N-SV-½-E-ASIS				26						28	

Dimensions – Pressure gauge/pressure gauge alternatives Download CAD data ➔ **www.festo.com**

Integrated MS pressure gauge with standard scale AG or red/green scale RG



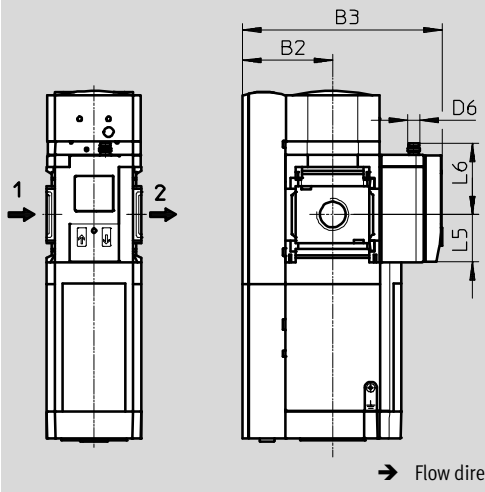
Adapter plate A4 for EN pressure gauge ¼, without pressure gauge



Type	B2	B3	D4
MS6N-SV-...-E-...-AG	59	105	–
MS6N-SV-...-E-...-RG	59	106.5	–
MS6N-SV-...-E-...-A4	59	106.5	G¼

Dimensions – Pressure gauge/pressure gauge alternatives Download CAD data ➔ **www.festo.com**

Pressure sensor with LCD display AD1 ... AD4 Technical data ➔ Internet: sde1



Variant AD1:
SDE1-D10-G2-MS-L-P1-M8 with 3-pin plug M8x1, 1 switching output PNP

Variant AD2:
SDE1-D10-G2-MS-L-N1-M8 with 3-pin plug M8x1, 1 switching output NPN

Variant AD3:
SDE1-D10-G2-MS-L-PI-M12 with 4-pin plug M12x1, 1 switching output PNP and 4 ... 20 mA analogue

Variant AD4:
SDE1-D10-G2-MS-L-NI-M12 with 4-pin plug M12x1, 1 switching output NPN and 4 ... 20 mA analogue

Type	B2	B3	D6	L5	L6
MS6N-SV-...-E-...-AD1/AD2	59	131	M8x1	31.2	46.7
MS6N-SV-...-E-...-AD3/AD4			M12x1		55.8

FESTO

[M] Mandatory data ➔

Module No.	Series	Size	Thread		Function		Pneumatic connection		Performance level		Supply voltage	
548714	MS	6	N		SV		½, AQ…		E		10V24, ASIS	
Ordering example												
548714	**MS**	**6**	**N**	–	**SV**	–	**AQP**	–	**E**	–	**10V24**	–

Ordering table

Grid dimension [mm]		62	Condi-tions	Code	Enter code
[M]	Module No.	**548714**			
	Series	Standard		**MS**	MS
	Size	6		**6**	6
	Thread	NPT thread		**N**	N
	Function	Soft-start and quick exhaust valve		**-SV**	-SV
	Pneumatic connection	Female thread NPT½		**-½**	
		Connecting plate NPT¼		**-AQN**	
		Connecting plate NPT⅜		**-AQP**	
		Connecting plate NPT½		**-AQR**	
		Connecting plate NPT¾		**-AQS**	
	Performance level	Category 4, 2-channel with self-monitoring, to EN ISO 13849-1		**-E**	-E
	Supply voltage	24 V DC		**-10V24**	
↓		22 … 31.6 V DC, AS-i Safety at Work, SPEC3.0 Profile 7.5.5		**-ASIS**	

Transfer order code

548714	**MS**	**6**	**N**	–	**SV**	–		–	**E**	–		

Soft-start and quick exhaust valves MS6N-SV-E, MS series, NPT

Ordering data – Modular products

FESTO

➔ 0 **Options**

	Silencer		Pressure gauge/ pressure gauge alternatives		Alternative pressure gauge scale		Multi-pin plug socket		Type of mounting		UL certification		Flow direction
	SO		AG, A4, RG, AD1 ... AD4		BAR, MPA		MP1, MP3, MP5		WPB		UL1		Z
–	**SO**	–	**AG**	–		–	**MP1**	–	**WPB**	–		–	

Ordering table

Grid dimension [mm]		62	Conditions	Code		Enter code
0	Silencer	Open silencer		**-SO**		
	Pressure gauge/pressure gauge alternatives	MS pressure gauge	1	**-AG**		
		Adapter plate for EN pressure gauge ¼, without pressure gauge	2	**-A4**		
		Integrated pressure gauge, red/green scale	1	**-RG**		
		Pressure sensor with LCD display, plug M8, 1 switching output PNP, 3-pin	2	**-AD1**		
		Pressure sensor with LCD display, plug M8, 1 switching output NPN, 3-pin	2	**-AD2**		
		Pressure sensor with LCD display, plug M12, 1 switching output PNP, 4-pin, analogue output 4 ... 20 mA	2	**-AD3**		
		Pressure sensor with LCD display, plug M12, 1 switching output NPN, 4-pin, analogue output 4 ... 20 mA	2	**-AD4**		
	Alternative pressure gauge scale	bar	3	**-BAR**		
		MPa	3	**-MPA**		
	Multi-pin plug socket	Sub-D, 9-pin, screw terminal, without cable, static enable signals (EN1 = 24 V, EN2 = 24 V)	2	**-MP1**		
		Sub-D, 9-pin, screw terminal, without cable, static enable signals (EN1 = 0 V, EN2 = 24 V), short-circuit detection possible	2	**-MP3**		
		Sub-D, 9-pin, screw terminal, without cable, static enable signals (EN1 = 0 V, EN2 = 24 V), galvanic isolation of the enable signals from the supply voltage	2	**-MP5**		
	Type of mounting	Mounting bracket for large wall gap		**-WPB**		
	UL certification	cULus, ordinary location for Canada and USA	2	**-UL1**		
	Flow direction	Flow direction from right to left		**-Z**		

1 **AG, RG** Pressure gauge scale in psi.
With pressure gauge RG: PSI scale serves only as an auxiliary scale (inner scale), outer scale in bar

2 **A4, AD1, AD2, AD3, AD4, MP1, MP3, MP5, UL1** Not with supply voltage ASIS

3 **BAR, MPA** Only in combination with pressure gauge AG or RG

Transfer order code

–		–		–		–		–		–		–	

Multi-pin plug socket NECA
(order code in the modular product system: MP1/MP3/MP5)
- For soft-start and quick exhaust valve MS6N-SV-E-10V24

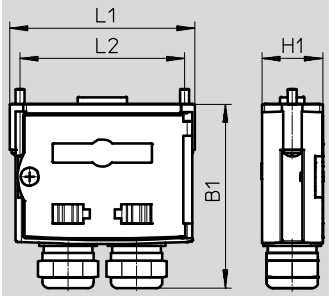
Technical data		
Type of mounting		Via through-hole
Electrical connection 1		Sub-D 9-pin
Electrical connection 2		Screw terminal 9-pin
Operating voltage range	[V DC]	21.6 ... 26.4
Nominal operating voltage	[V DC]	24
Acceptable current load	[A]	1.0
Connection cross section	[mm^2]	0.34 ... 1.0 without wire end sleeves
	[mm^2]	0.34 ... 0.5 with wire end sleeves
Permissible cable diameter	[mm]	5.0 ... 10.0
Protection class to IEC 60529		IP65

Operating and environmental conditions		
Relative air humidity		95%, non-condensing
Ambient temperature	[°C]	0 ... +50
Storage temperature	[°C]	–20 ... +70
Corrosion resistance class CRC[1)]		2

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Materials	
Housing	PA reinforced
Screws	Steel
Union nut	Brass
Seals	NBR

Dimensions Download CAD data ➔ **www.festo.com**



B1	H1	L1	L2
61	20	61	54.1

Ordering data

Description	Connection	Weight [g]	Part No.	Type
For MS6N-SV-E-10V24	Without cable, static enable signals (EN1 = 24 V, EN2 = 24 V)	60	**548719**	**NECA-S1G9-P9-MP1**
	Without cable, static enable signals (EN1 = 0 V, EN2 = 24 V), cross-circuit detection possible	60	**552703**	**NECA-S1G9-P9-MP3**
	Without cable, static enable signals (EN1 = 0 V, EN2 = 24 V), galvanic isolation of the enable signals from the supply voltage	60	**573695**	**NECA-S1G9-P9-MP5**

Soft-start and quick exhaust valves MS-SV, MS series, NPT

Accessories

Silencer UOS-1
(order code in the modular product system: SO)
- For soft-start and quick exhaust valve MS6N-SV-D/E

Silencer UOS-1-LF
- For soft-start and quick exhaust valve MS6N-SV-D/E

Note

The space-saving silencer UOS-1-LF may only be used for applications with low exhaust rates. Pneumatic port 2 at the soft-start and quick exhaust valve MS6N-SV-D/E must be reduced to NPT¼ using a connecting plate MS6-AQN.

UOS-1

UOS-1-LF

Technical data	
Pneumatic connection	G1
Design	Open silencer
Type of mounting	Via male thread
Mounting position	Any
Type of seal on threaded collar	No seal

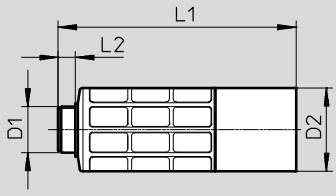
Operating and environmental conditions		
Operating pressure	[bar]	0 … 10
Operating medium		Compressed air to ISO 8573-1:2010 [–:–:–]
Ambient temperature	[°C]	–10 … +50
Corrosion resistance class CRC[1)]		2

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

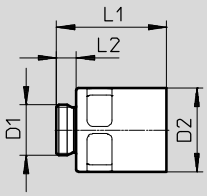
Materials		
Type	UOS-1	UOS-1-LF
Housing	POM	Wrought aluminium alloy
Sleeve	Wrought aluminium alloy	–
Silencer insert	PE	
Note on materials	RoHS-compliant	
	Free of copper and PTFE	

Dimensions Download CAD data ➔ **www.festo.com**

UOS-1



UOS-1-LF



Type	D1	D2 ∅	L1	L2
UOS-1	G1	55	156.5	11.5
UOS-1-LF			72.2	13

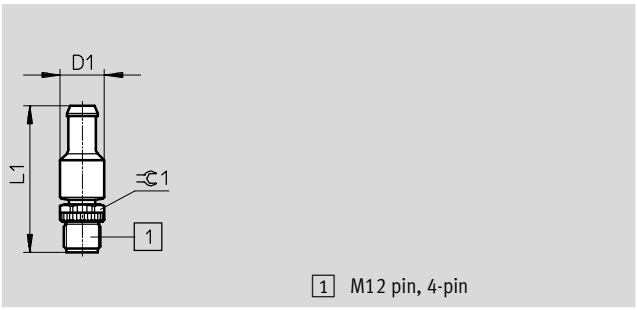
Ordering data

Description		Weight [g]	Part No.	Type
For MS6N-SV-D/E	For high exhaust rate	200	**552252**	**UOS-1**
	For low exhaust rate	157.9	**1901207**	**UOS-1-LF**

AS-i configuration plug CACC

- For soft-start and quick exhaust valve MS6N-SV-E-ASIS

Note on materials: RoHS-compliant



1 M12 pin, 4-pin

Dimensions and ordering data

Description	D1	L1	⊂1	Part No.	Type
For MS6N-SV-E-ASIS	14.5	48.3	13	**573923**	**CACC-CP-AS**

Cover MS-SV-MK

(order code in the modular product system: MK)

- For soft-start and quick exhaust valve MS6N-SV-C

Note on materials: RoHS-compliant

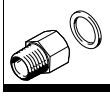
MS6-SV-C-MK

Ordering data

Description		CRC[1)]	Part No.	Type
For MS6N-SV-C	Tamper protection for manual override at the soft-start and quick exhaust valve, flow control screw, adjusting screw for pressure switchover point and manual override at the pilot solenoid valve	2	**8001479**	**MS6-SV-C-MK**

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

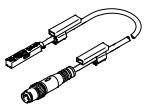
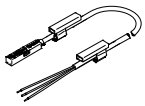
Ordering data – Adapter AD

	Description	Pneumatic connection		Part No.	Type
		1	2		
	For MS6N-SV-E	NPT1	G1	**546547**	**AD-1NPT-G1-I**

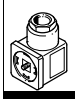
Ordering data – Silencer U-...-B — Technical data ➔ Internet: u

	Description	Pneumatic connection	Order code in the modular product system	Part No.	Type
	For MS6N-SV-C	NPT¾	S	**566823**	**U-¾-B-NPT**

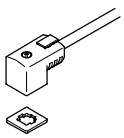
Ordering data – Proximity sensor SMT — Technical data ➔ Internet: smt

	Description	Switching output	Switching element function	Electrical connection	Cable length [m]	Order code in the modular product system	Part No.	Type
	For MS6N-SV-D	PNP	N/O contact	Cable with plug M8x1, 3-pin	0.3	2M8/S3	★ **574334**	**SMT-8M-A-PS-24V-E-0,3-M8D**
				Cable with plug M12x1, 3-pin	0.3	2M12/S3	★ **574337**	**SMT-8M-A-PS-24V-E-0,3-M12**
	For MS6N-SV-D	PNP	N/O contact	Cable, 3-wire	5	2OE/S3	★ **574336**	**SMT-8M-A-PS-24V-E-5,0-OE**

Ordering data – Plug socket MSSD — Technical data ➔ Internet: mssd

	Description	Electrical connection	Type of mounting for cable connection	Part No.	Type
	For MS6N-SV-C/D	3-pin	Clamping screws	★ **151687**	**MSSD-EB**
		4-pin	Insulation displacement connectors	**192745**	**MSSD-EB-S-M14**
		3-pin	Clamping screws	**539712**	**MSSD-EB-M12**

Ordering data – Plug socket with cable KMEB — Technical data ➔ Internet: kmeb

	Description	Operating voltage	Electrical connection	Switching status display	Cable length [m]	Part No.	Type
	For MS6N-SV-C/D	24 V DC	2-pin	LED	2.5	**547268**	**KMEB-3-24-2,5-LED**
					5	**547269**	**KMEB-3-24-5-LED**
				–	2.5	**547270**	**KMEB-3-24-2,5**
					5	**547271**	**KMEB-3-24-5**
			3-pin	LED	2.5	★ **151688**	**KMEB-1-24-2,5-LED**
					5	**151689**	**KMEB-1-24-5-LED**
					10	**193457**	**KMEB-1-24-10-LED**
		230 V AC	3-pin	–	2.5	**151690**	**KMEB-1-230AC-2,5**
					5	**151691**	**KMEB-1-230AC-5**

Ordering data – Illuminating seal MEB-LD — Technical data ➔ Internet: meb

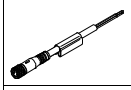
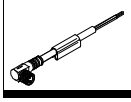
	Description	Operating voltage range	Part No.	Type
	For plug socket with cable KMEB and plug socket MSSD-EB	12 ... 24 V DC	**151717**	**MEB-LD-12-24DC**
		230 V DC/AC ±10%	**151718**	**MEB-LD-230AC**

Festo core product range

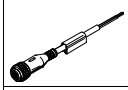
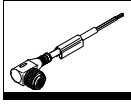
★ Generally ready for shipping ex works in 24 hours

☆ Generally ready for shipping ex works in 5 days

Ordering data – Connecting cable NEBU-M8 — Technical data ➔ Internet: nebu

	Electrical connection	Number of wires	Cable length [m]	Part No.	Type
	M8x1, straight socket	3	2.5	★ **541333**	**NEBU-M8G3-K-2.5-LE3**
			5	★ **541334**	**NEBU-M8G3-K-5-LE3**
	M8x1, angled socket	3	2.5	★ **541338**	**NEBU-M8W3-K-2.5-LE3**
			5	★ **541341**	**NEBU-M8W3-K-5-LE3**

Ordering data – Connecting cable NEBU-M12 — Technical data ➔ Internet: nebu

	Electrical connection	Number of wires	Cable length [m]	Part No.	Type
	M12x1, straight socket	4	2.5	★ **550326**	**NEBU-M12G5-K-2.5-LE4**
			5	★ **541328**	**NEBU-M12G5-K-5-LE4**
	M12x1, angled socket	4	2.5	**550325**	**NEBU-M12W5-K-2.5-LE4**
			5	**541329**	**NEBU-M12W5-K-5-LE4**

Ordering data – Pressure gauge MA

	Nominal size	Pneumatic connection	Display range [bar]	Display range [psi]	Part No.	Type
	Pressure gauge MA, EN 837-1					Technical data ➔ Internet: ma
	40	R¼	0 … 16	0 … 232	**187080**	**MA-40-16-R¼-EN**
		G¼	0 … 16	0 … 232	**183901**	**MA-40-16-G¼-EN**
	Pressure gauge MA, EN 837-1, with red/green range					Technical data ➔ Internet: ma
	50	R¼	0 … 16	–	**525729**	**MA-50-16-R¼-E-RG**

Festo core product range

★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days