Type 3756 Booster Valve

Translation of original instructions

Mounting and Operating Instructions

EB 3756 EN

Edition August 2015

Note on these mounting and operating instructions

These mounting and operating instructions (EB) assist you in mounting and operating the device safely. The instructions are binding for handling SAMSOMATIC devices.

➔ For the safe and proper use of these instructions, read them carefully and keep them for later reference.

➔ If you have any questions about these instructions, contact SAMSOMATIC (samsomatic@samsomatic.de).

Referenced documentation

The documents for the devices used in combination with the booster valve apply in addition to these mounting and operating instructions.

The mounting and operating instructions for all supplied devices are included in the delivery. The latest versions of the documents are available on our website at www.samsomatic.de > Products.

Definition of signal words

DANGER!
Hazardous situations which, if not avoided, will result in death or serious injury

WARNING!
Hazardous situations which, if not avoided, could result in death or serious injury

NOTICE
Property damage message or malfunction

Note:
Additional information

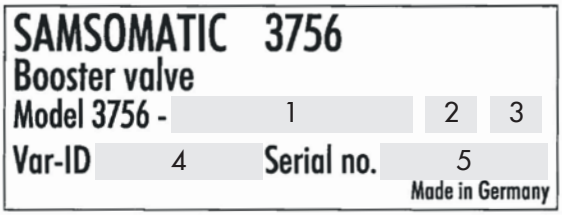
Tip:
Recommended action

1 General safety instructions

– The device is to be mounted, started up or operated only by trained and experienced personnel familiar with the product.
– According to these mounting and operating instructions, trained personnel refers to individuals who are able to judge the work they are assigned to and recognize possible dangers due to their specialized training, their knowledge and experience as well as their knowledge of the applicable standards.
– Explosion-protected versions of this device are to be operated only by personnel who has undergone special training or instructions or who is authorized to work on explosion-protected devices in hazardous areas.
– Any hazards that could be caused in the control valve by the process medium, the signal pressure or by moving parts are to be prevented by taking appropriate precautions.
– The supply air must not exceed the maximum permissible supply pressure and must be limited by pressure reducing valve, if necessary.
– If inadmissible motions or forces are produced in the pneumatic actuator as a result of the supply pressure level, it must be restricted using a suitable supply pressure reducing station.
– Proper shipping and storage are assumed.

2 Markings on the device

2.1 Nameplate



1 Article code
2 Device index
3 Safety approval
4 Configuration ID
5 Serial no.

2.2 Article code

Booster valve	Type 3756-	x	x	x	x	x	x	x	x	x	x	x
Control												
Pneumatic		**0**										
Over CNOMO interface		**1**										
With Type 3963 Solenoid Valve (as spare part)		**2**										
With Type 3967 Solenoid Valve		**3**										
Over NAMUR interface ¼" according to VDI/VDE 3845		**4**										
Switching function												
3/2-way function with spring-return mechanism			**0**									
5/2-way function with spring-return mechanism			**1**									
5/2-way function with two detent positions			**2**									
5/3-way function with spring-centered mid-position (ports 2 and 4 closed)			**3**									
5/3-way function with spring-centered mid-position (ports 2 and 4 supplied with air)			**4**									
5/3-way function with spring-centered mid-position (ports 2 and 4 vented)			**5**									
6/2-way function with spring-return mechanism			**6**									
3/2-way function with spring-return mechanism (open in neutral position)			**7**									
Attachment												
NAMUR interface according to VDI/VDE 3845				**0**								
Threaded connections				**1**								
K_{VS} [1]												
1.4					**0**							
4.3					**1**							
2.9					**2**							
2.0					**3**							
1.9					**5**							
8.7					**6**							
Connection												
G ¼						**0**						
¼ NPT						**1**						
G ½						**2**						
½ NPT						**3**						
G 1						**6**						

[1] The air flow rate when p_1 = 2.4 bar and p_2 = 1.0 bar is calculated using the following formula:
$Q = K_{VS} \times 36.22$ in m³/h.

Booster valve	Type 3756-	x	x	x	x	x	x	x	x	x	x	x
Ambient temperature [1]												
–20 to +80 °C							**0**					
–45 to +80 °C							**1**					
–40 to +80 °C							**2**					
Material												
Aluminum								**0**				
Stainless steel								**1**				
Safety approval												
Without									**0**			
SIL [2]									**1**			
TÜV [3]									**2**			
Special version												
Without										**0**	**0**	**0**
Emergency venting (1-out-of-2 redundancy)										**0**	**1**	**0**
Emergency air supply (1-out-of-2 redundancy)										**0**	**1**	**1**

1) The maximum permissible ambient temperature depends on the permissible ambient temperature of the components, type of protection, and temperature class.
2) SIL according to IEC 61508
3) Emergency release or locking of compressed air supply

3 Design and principle of operation

Function of the switching diaphragm

The booster valve consists of a body with a diaphragm element actuated on one side with return spring.

In the neutral position, the connection from port 4 to port 3 is closed by the spring force acting on the switching element. After applying the necessary control pressure on the switching diaphragm, the booster valve switches to the operating position and opens the connection from port 4 to port 3. This causes port 5 to close. The return spring causes the switching element to switch back to the neutral position after the control pressure is removed.

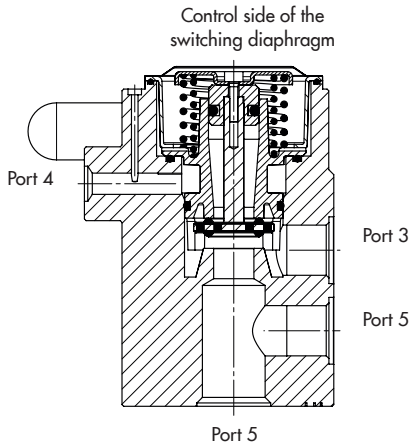


Fig. 1: *Type 3756 Booster Valve with switching diaphragm*

Function of the spool

The booster valve consists of a body with a spool actuated on one side with return spring.

In the neutral position, the connection from port 1 to port 2 and the connection from port 4 to port 5 is open. After applying the necessary control pressure to the control side of the spool, the spool moves to the operating position, opening the connection from port 1 to port 4 and the connection from port 2 to port 3. The return spring causes the spool to be pushed back to the neutral position after the control pressure is removed.

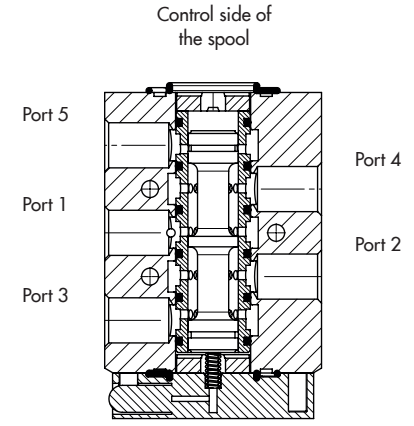


Fig. 2: *Type 3756 Booster Valve with spool*

3.1 Technical data

Booster valve with threaded connections or NAMUR interface, K_{VS} 1.4, actuated on one side				
Switching function		3/2-way function with exhaust air feedback		5/2-way function
K_{VS} [1]		1.4		
Safety approval		TÜV [2]		–
Design		Spool, metal-to-metal seat, zero overlap, with return spring		
Material	Enclosure	Aluminum, powder coated, gray beige RAL 1019, or stainless steel 1.4404		
	Seals	Silicone rubber		
	Filter	Polyethylene		
	Screws	Stainless steel 1.4571		
	Springs	Stainless steel 1.4310		
Operating medium		Instrument air (free from corrosive substances) or nitrogen, air containing oil or non-corrosive gases		
Compressed air quality according to ISO 8573-1		Max. particle size and density: Class 4 · Oil content: Class 3 · Pressure dew point: Class 3 or at least 10 K below the lowest ambient temperature to be expected		
Actuation, control pressure, switching points		Pneumatic connection G ⅛ or NPT ⅛	1.4 to 10 bar	≤ 0.2 bar (switchover to neutral position), ≥ 1.4 bar (switchover to operating position)
		CNOMO interface	1.4 to 10 bar [3]	
		Type 3963 Solenoid Valve (as spare part)	1.4 to 6 bar	
		Type 3967 Solenoid Valve	1.4 to 10 bar	
Max. operating pressure		10.0 bar		
Ambient temperature [4]		–45 to +80 °C		
Connection		G ¼ or ¼ NPT and NAMUR interface ¼" [5]		
Approx. weight		0.48 kg		

1) The air flow rate when p_1 = 2.4 bar and p_2 = 1.0 bar is calculated using the following formula: $Q = K_{VS} \times 36.22$ in m^3/h.
2) Emergency release or locking of compressed air supply
3) The permissible control pressure with the CNOMO interface depends on the pilot valve used.
4) The maximum permissible ambient temperature depends on the permissible ambient temperature of the components, type of protection, and temperature class.
5) NAMUR interface according to VDI/VDE 3845

Booster valve with threaded connections or NAMUR interface, K_{VS} 1.4, actuated on both sides					
Switching function		5/2-way function with two detent positions	5/3-way function with spring-centered mid-position (ports 2 and 4 closed)	5/3-way function with spring-centered mid-position (ports 2 and 4 vented)	5/3-way function with spring-centered mid-position (ports 2 and 4 supplied with air)
K_{VS} [1]		1.4			
Safety approval		TÜV [2]	–	TÜV [2]	–
Design		Spool, metal-to-metal seat, zero overlap			
Material	Enclosure	Aluminum, powder coated, gray beige RAL 1019, or stainless steel 1.4404			
	Seals	Silicone rubber			
	Filter	Polyethylene			
	Screws	Stainless steel 1.4571			
	Springs	Stainless steel 1.4310			
Operating medium		Instrument air (free from corrosive substances) or nitrogen, air containing oil or non-corrosive gases			
Compressed air quality according to ISO 8573-1		Max. particle size and density: Class 4 · Oil content: Class 3 · Pressure dew point: Class 3 or at least 10 K below the lowest ambient temperature to be expected			
Actuation, control pressure, switching points		Pneumatic connection G ⅛ or NPT ⅛	1.4 to 10 bar	≤ 0.2 bar (switchover to neutral position), ≥ 1.4 bar (switchover to operating position)	
		CNOMO interface	1.4 to 10 bar [3]		
		Type 3963 Solenoid Valve (as spare part)	1.4 to 6 bar		
		Type 3967 Solenoid Valve	1.4 to 10 bar		
Max. operating pressure		10.0 bar			
Ambient temperature [4]		–45 to +80 °C			
Connection		G ¼ or ¼ NPT and NAMUR interface ¼" [5]			
Approx. weight		0.48 kg			

1) The air flow rate when p_1 = 2.4 bar and p_2 = 1.0 bar is calculated using the following formula: $Q = K_{VS} \times 36.22$ in m³/h.
2) Emergency release or locking of compressed air supply
3) The permissible control pressure with the CNOMO interface depends on the pilot valve used.
4) The maximum permissible ambient temperature depends on the permissible ambient temperature of the components, type of protection, and temperature class.
5) NAMUR interface according to VDI/VDE 3845

Booster valve with threaded connections, K_{VS} 4.3, actuated on one side				
Switching function		3/2-way function (closed in neutral position)		
K_{VS} [1] (direction of flow)		1.9 (4»3), 1.5 (3»4), 4.3 (3»5), 4.7 (5»3)		
Safety approval		SIL [2], TÜV [3]		
Design		Poppet valve with diaphragm actuator, soft seated, with return spring		
Material	Enclosure	Aluminum, powder coated, gray beige RAL 1019, or stainless steel 1.4404		
	Diaphragms	Chloroprene rubber (–20 to +80 °C) or silicone rubber (–45 to +80 °C)		
	Seals	Chloroprene rubber (–20 to +80 °C) or silicone rubber (–45 to +80 °C)		
	Screws	Stainless steel 1.4571		
	Springs	Stainless steel 1.4310		
Operating medium		Instrument air (free from corrosive substances) or nitrogen, air containing oil or non-corrosive gases		
Compressed air quality according to ISO 8573-1		Max. particle size and density: Class 4 · Oil content: Class 3 · Pressure dew point: Class 3 or at least 10 K below the lowest ambient temperature to be expected		
Actuation, control pressure, switching points		Pneumatic connection G ¼ or ¼ NPT	1.4 to 3 bar	≤ 0.2 bar (switchover to neutral position), ≥ 1.4 bar (switchover to operating position)
		CNOMO interface	1.4 to 10 bar [4]	
		Type 3963 Solenoid Valve (as spare part)	1.4 to 6 bar	
Max. operating pressure		10.0 bar		
Ambient temperature [5]		–20 to +80 °C –45 to +80 °C		
Connection		G ½ or ½ NPT		
Approx. weight		0.58 kg		

1) The air flow rate when p_1 = 2.4 bar and p_2 = 1.0 bar is calculated using the following formula: $Q = K_{VS} \times 36.22$ in m³/h.
2) SIL according to IEC 61508
3) Emergency release or locking of compressed air supply
4) The permissible control pressure with the CNOMO interface depends on the pilot valve used.
5) The maximum permissible ambient temperature depends on the permissible ambient temperature of the components, type of protection, and temperature class.

Booster valve with threaded connections, K_{VS} 4.3, actuated on one side		
Switching function		3/2-way function (open in neutral position)
K_{VS} [1] (direction of flow)		1.9 (4»3), 1.5 (3»4), 4.3 (3»5), 4.7 (5»3)
Safety approval		–
Design		Poppet valve with diaphragm actuator, soft seated, with return spring
Material	Enclosure	Aluminum, powder coated, gray beige RAL 1019
	Diaphragms	Chloroprene rubber (–20 to +80 °C) or silicone rubber (–45 to +80 °C)
	Seals	Chloroprene rubber (–20 to +80 °C) or silicone rubber (–45 to +80 °C)
	Screws	Stainless steel 1.4571
	Springs	Stainless steel 1.4310
Operating medium		Instrument air (free from corrosive substances) or nitrogen, air containing oil or non-corrosive gases
Compressed air quality according to ISO 8573-1		Max. particle size and density: Class 4 · Oil content: Class 3 · Pressure dew point: Class 3 or at least 10 K below the lowest ambient temperature to be expected
Actuation, control pressure, switching points		Pneumatic connection G ¼ or ¼ NPT 1.4 to 3 bar ≤ 0.2 bar (switchover to neutral position), ≥ 1.4 bar (switchover to operating position)
Max. operating pressure		10.0 bar
Ambient temperature [2]		–20 to +80 °C –45 to +80 °C
Connection		G ½ or ½ NPT
Approx. weight		0.58 kg

1) The air flow rate when p_1 = 2.4 bar and p_2 = 1.0 bar is calculated using the following formula: $Q = K_{VS} \times 36.22$ in m³/h.

2) The maximum permissible ambient temperature depends on the permissible ambient temperature of the components, type of protection, and temperature class.

Booster valve with threaded connections, K_{VS} 4.3, actuated on one side			
Switching function		5/2-way function	6/2-way function
K_{VS} [1] (direction of flow)		1.9 (1.4»1.3 and 2.4»2.3), 1.5 (1.3»1.4 and 2.3»2.4), 4.3 (1.3»1.5 and 2.3»2.5), 4.7 (1.5»1.3 and 2.5»2.3)	
Safety approval		–	
Design		Poppet valve with diaphragm actuator, soft seated, with return spring	
Material	Enclosure	Aluminum, powder coated, gray beige RAL 1019	
	Diaphragms	Chloroprene rubber (–20 to +80 °C) or silicone rubber (–45 to +80 °C)	
	Seals	Chloroprene rubber (–20 to +80 °C) or silicone rubber (–45 to +80 °C)	
	Screws	Stainless steel 1.4571	
	Springs	Stainless steel 1.4310	
Operating medium		Instrument air (free from corrosive substances) or nitrogen, air containing oil or non-corrosive gases	
Compressed air quality according to ISO 8573-1		Max. particle size and density: Class 4 · Oil content: Class 3 · Pressure dew point: Class 3 or at least 10 K below the lowest ambient temperature to be expected	
Actuation, control pressure, switching points		Pneumatic connection G ¼ or ¼ NPT	1.4 to 3 bar ≤ 0.2 bar (switchover to neutral position), ≥ 1.4 bar (switchover to operating position)
		CNOMO interface	1.4 to 10 bar [2]
		Type 3963 Solenoid Valve (as spare part)	1.4 to 6 bar
Max. operating pressure		10.0 bar	
Ambient temperature [3]		–20 to +80 °C –45 to +80 °C	
Connection		G ½ or ½ NPT	
Approx. weight		1.1 kg	

1) The air flow rate when p_1 = 2.4 bar and p_2 = 1.0 bar is calculated using the following formula: $Q = K_{VS} \times 36.22$ in m^3/h.
2) The permissible control pressure with the CNOMO interface depends on the pilot valve used.
3) The maximum permissible ambient temperature depends on the permissible ambient temperature of the components, type of protection, and temperature class.

Booster valve with threaded connections, K_{VS} 8.7, actuated on one side		
Switching function		3/2-way function
K_{VS} [1]		8.7
Safety approval		–
Design		Poppet valve with diaphragm actuator, soft seated, with return spring
Material	Enclosure	Aluminum alloy, hard-coat anodizing
	Seals	Nitrile butadiene rubber
	Screws	Stainless steel 1.4571
	Springs	Stainless steel 1.4310
Operating medium		Instrument air (free from corrosive substances) or nitrogen, air containing oil or non-corrosive gases
Compressed air quality according to ISO 8573-1		Max. particle size and density: Class 4 · Oil content: Class 3 · Pressure dew point: Class 3 or at least 10 K below the lowest ambient temperature to be expected
Actuation, control pressure, switching points		NAMUR interface ¼ [2] 3 to 10 bar
		Type 3967 Solenoid Valve 3 to 10 bar
Max. operating pressure		10.0 bar
Ambient temperature [3]		–40 to +80 °C
Connection		G 1 or 1 NPT
Approx. weight		4.7 kg

1) The air flow rate when p_1 = 2.4 bar and p_2 = 1.0 bar is calculated using the following formula: $Q = K_{VS} \times 36.22$ in m^3/h.
2) NAMUR interface according to VDI/VDE 3845
3) The maximum permissible ambient temperature depends on the permissible ambient temperature of the components, type of protection, and temperature class.

Booster valve with NAMUR interface, K_{VS} 2.9 [1], actuated on one side			
Switching function		3/2-way function	5/2-way function
K_{VS} [2]		2.9	
Safety approval		–	
Design		Spool, metal-to-metal seat, zero overlap, with return spring	
Material	Enclosure	Aluminum, powder coated, gray beige RAL 1019	
	Seals	Silicone rubber	
	Filter	Polyethylene	
	Screws	Stainless steel 1.4571	
	Springs	Stainless steel 1.4310	
Operating medium		Instrument air (free from corrosive substances) or nitrogen, air containing oil or non-corrosive gases	
Compressed air quality according to ISO 8573-1		Max. particle size and density: Class 4 · Oil content: Class 3 · Pressure dew point: Class 3 or at least 10 K below the lowest ambient temperature to be expected	
Actuation, control pressure, switching points		CNOMO interface	1.4 to 10 bar [3]
		Type 3963 Solenoid Valve (as spare part)	1.4 to 6 bar
		Type 3967 Solenoid Valve	1.4 to 10 bar
Max. operating pressure		10.0 bar	
Ambient temperature [4]		–45 to +80 °C	
Connection		G ½ or ½ NPT and NAMUR interface ½" [5]	
Approx. weight		1.76 kg	

1) On request
2) The air flow rate when p_1 = 2.4 bar and p_2 = 1.0 bar is calculated using the following formula: $Q = K_{VS} \times 36.22$ in m³/h.
3) The permissible control pressure with the CNOMO interface depends on the pilot valve used.
4) The maximum permissible ambient temperature depends on the permissible ambient temperature of the components, type of protection, and temperature class.
5) NAMUR interface according to VDI/VDE 3845

Booster valve with NAMUR interface, K_{VS} 2.9 [1], actuated on both sides		
Switching function		5/2-way function with two detent positions
K_{VS} [2]		2.9
Safety approval		–
Design		Spool, metal-to-metal seat, zero overlap, with return spring
Material	Enclosure	Aluminum, powder coated, gray beige RAL 1019
	Seals	Silicone rubber
	Screws	Stainless steel 1.4571
	Springs	Stainless steel 1.4310
Operating medium		Instrument air (free from corrosive substances) or nitrogen, air containing oil or non-corrosive gases
Compressed air quality according to ISO 8573-1		Max. particle size and density: Class 4 · Oil content: Class 3 · Pressure dew point: Class 3 or at least 10 K below the lowest ambient temperature to be expected
Actuation, control pressure, switching points		CNOMO interface 1.4 to 10 bar [3]
		Type 3963 Solenoid Valve (as spare part) 1.4 to 6 bar
		Type 3967 Solenoid Valve 1.4 to 10 bar
Max. operating pressure		10.0 bar
Ambient temperature [4]		–45 to +80 °C
Connection		G ½ or ½ NPT and NAMUR interface ½" [5]
Approx. weight		1.76 kg

1) On request
2) The air flow rate when p_1 = 2.4 bar and p_2 = 1.0 bar is calculated using the following formula: $Q = K_{VS} \times 36.22$ in m^3/h.
3) The permissible control pressure with the CNOMO interface depends on the pilot valve used.
4) The maximum permissible ambient temperature depends on the permissible ambient temperature of the components, type of protection, and temperature class.
5) NAMUR interface according to VDI/VDE 3845

Booster valve with NAMUR interface, K_{VS} 2.0 or 4.3, actuated on one side			
Switching function		3/2-way function	
K_{VS} [1] (direction of flow)		1.1 (4»3) 2.0 (3»5)	1.9 (4»3) 4.3 (3»5)
Safety approval		SIL [2], TÜV [3]	
Design		Poppet valve with diaphragm actuator, soft seated, with return spring	
Material	Enclosure	Aluminum, powder coated, gray beige RAL 1019, or stainless steel 1.4404	
	Diaphragms	Chloroprene rubber (–20 to +80 °C) or silicone rubber (–45 to +80 °C)	
	Seals	Chloroprene rubber (–20 to +80 °C) or silicone rubber (–45 to +80 °C)	
	Screws	Stainless steel 1.4571	
	Springs	Stainless steel 1.4310	
Operating medium		Instrument air (free from corrosive substances) or nitrogen, air containing oil or non-corrosive gases	
Compressed air quality according to ISO 8573-1		Max. particle size and density: Class 4 · Oil content: Class 3 · Pressure dew point: Class 3 or at least 10 K below the lowest ambient temperature to be expected	
Actuation, control pressure, switching points		Pneumatic connection G ¼ or ¼ NPT — 1.4 to 3 bar	≤ 0.2 bar (switchover to neutral position), ≥ 1.4 bar (switchover to operating position)
		CNOMO interface — 1.4 to 10 bar [4]	
		Type 3963 Solenoid Valve (as spare part) — 1.4 to 6 bar	
		Type 3967 Solenoid Valve — 1.4 to 10 bar	
Max. operating pressure		10.0 bar	
Ambient temperature [5]		–20 to +80 °C –45 to +80 °C	
Connection	Supply air	G ¼ or ¼ NPT and NAMUR interface ¼" [6] with G ⅜ / ⅜ NPT	G ½ or ½ NPT and NAMUR interface ½" [6]
	Exhaust air	G ½ or ½ NPT and NAMUR interface ¼" [6] with G ⅜ / ⅜ NPT	G ½ or ½ NPT and NAMUR interface ½" [6]
Approx. weight		1.38 kg	1.5 kg

1) The air flow rate when p_1 = 2.4 bar and p_2 = 1.0 bar is calculated using the following formula: $Q = K_{VS} \times 36.22$ in m³/h.
2) SIL according to IEC 61508
3) Emergency release or locking of compressed air supply
4) The permissible control pressure with the CNOMO interface depends on the pilot valve used.
5) The maximum permissible ambient temperature depends on the permissible ambient temperature of the components, type of protection, and temperature class.
6) NAMUR interface according to VDI/VDE 3845

Booster valve with NAMUR interface, K_{VS} 1.9, actuated on both sides (1-out-of-2 redundancy)			
Switching function		3/2-way function (emergency venting)	3/2-way function (emergency air supply)
K_{VS} [1]		1.9	
Safety approval		SIL [2]	
Design		Poppet valve with diaphragm actuator, soft seated, with return spring	
Material	Enclosure	Aluminum, powder coated, gray beige RAL 1019, or stainless steel 1.4404	
	Diaphragms	Chloroprene rubber (–20 to +80 °C) or silicone rubber (–45 to +80 °C)	
	Seals	Chloroprene rubber (–20 to +80 °C) or silicone rubber (–45 to +80 °C)	
	Screws	Stainless steel 1.4571	
	Springs	Stainless steel 1.4310	
Operating medium		Instrument air (free from corrosive substances) or nitrogen, air containing oil or non-corrosive gases	
Compressed air quality according to ISO 8573-1		Max. particle size and density: Class 4 · Oil content: Class 3 · Pressure dew point: Class 3 or at least 10 K below the lowest ambient temperature to be expected	
Actuation, control pressure, switching points		Type 3963 Solenoid Valve (as spare part) 1.4 to 6 bar	
		Type 3967 Solenoid Valve 1.4 to 10 bar	
Max. operating pressure		10.0 bar	
Ambient temperature [3]		–20 to +80 °C –45 to +80 °C	
Connection		G ½ or ½ NPT and NAMUR interface ½" [4]	
Approx. weight		2.2 kg	

1) The air flow rate when p_1 = 2.4 bar and p_2 = 1.0 bar is calculated using the following formula: $Q = K_{VS} \times 36.22$ in m³/h.
2) SIL according to IEC 61508
3) The maximum permissible ambient temperature depends on the permissible ambient temperature of the components, type of protection, and temperature class.
4) NAMUR interface according to VDI/VDE 3845

3.2 Summary of explosion protection approvals

Type	Certification			Type of protection/comments
3756	SIL	No.	V 60.09/14 rev. 01	Certification for safety-instrumented systems according to IEC 61508
		Date	2015-02-10	
	TÜV	No.	S 284 2013 E2 rev. 01	Mounted on control valves according to DIN 3394-1, DIN EN 161, DIN 32725, DIN EN 264, and DIN 32730
		Date	2014-01-16	

4 Accessories

Order no.	Designation
8504-0066	Filter made of polyethylene, G ¼ connection, degree of protection IP 54
8504-0068	Filter made of polyethylene, G ½ connection, degree of protection IP 54
1136-0208	Silencer G 1, male thread
1400-9598	Adapter plate, painted aluminum, for NAMUR interface ¼" on NAMUR rib/threaded connection (G ¼)
1400-9599	Adapter plate, painted aluminum, for NAMUR interface ¼" on NAMUR rib/threaded connection (¼ NPT)
1400-9600	Adapter plate, stainless steel 1.4404, for NAMUR interface ¼" on NAMUR rib/threaded connection (G ¼)
1400-9601	Adapter plate, stainless steel 1.4404, for NAMUR interface ¼" on NAMUR rib/threaded connection (¼ NPT)
1402-0827	Adapter plate, painted aluminum, for NAMUR interface ½" on NAMUR rib/threaded connection (G ½)
1402-0829	Adapter plate, painted aluminum, for NAMUR interface ½" on NAMUR rib/threaded connection (½ NPT)
1402-0828	Adapter plate, stainless steel 1.4404, for NAMUR interface ½" on NAMUR rib/threaded connection (G ½)
1402-0830	Adapter plate, stainless steel 1.4404, for NAMUR interface ½" on NAMUR rib/threaded connection (½ NPT)
1380-1652	Adapter plate, painted aluminum, for NAMUR interface ¼" on rotary actuator ½"
1380-1797	Adapter plate, stainless steel 1.4404, for NAMUR interface ¼" on rotary actuator ½"
1380-1795	Adapter plate, painted aluminum, for NAMUR interface ½" on rotary actuator ¼"
1380-1796	Adapter plate, stainless steel 1.4404, for NAMUR interface ½" on rotary actuator ¼"

5 Mounting and start-up

Note:
The mounting accessories (fastening screws, washers, and O-rings) are included in the scope of delivery.

5.1 Mounting position

Any mounting position may be used. The following applies concerning the installation of the valve:

➔ Install the booster valve in such a way that the vent ports face downward (in cases where this is not possible, mount them in the horizontal position).

5.2 Ambient temperature

The minimum permissible ambient temperature is
–20 °C (Types 3756-xxxx x0),
–45 °C (Types 3756-xxxx x1).

In the pilot-actuated devices, the maximum permissible ambient temperature depends on the permissible ambient temperature of the components, type of protection, and temperature class.

5.3 Attachment to linear actuators using a mounting bracket

Type 3756-xx1

To mount these devices to a linear actuator, insert screws through the holes to fasten the device on a mounting bracket (0300-1444).

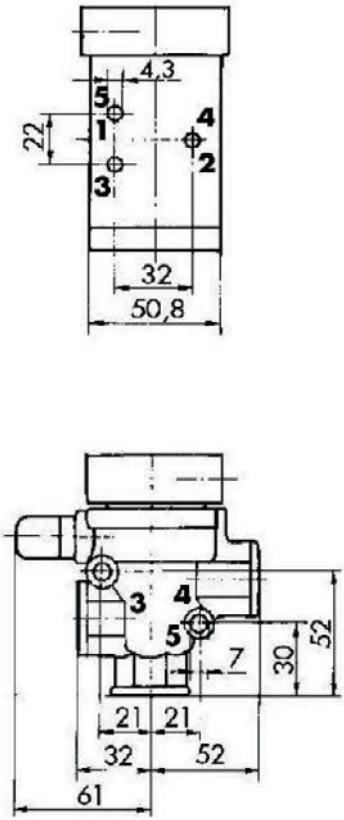


Fig. 3: *Booster valve with holes (dimensions in mm)*

5.4 Attachment to linear actuators using an adapter plate

Type 3756-xx0

These devices are suitable for attachment according to IEC 60534-6 (NAMUR rib).
Mount the device over an adapter plate with NAMUR interface to the NAMUR rib in ¼ or ½ (see section 4). When positioners or limit switches are also to be mounted to the linear actuator (DN 15 to 80), a support (1400-5905) is required.

5.5 Mounting on rotary actuators

Type 3756-xx0

These devices can be mounted to rotary actuators with NAMUR interface (VDI/ VDE 3845).

➔ Before mounting, check that the O-rings are seated properly.

Use a coded grub screw to determine the direction of action of the rotary actuator at the connecting flange. Use two screws to mount the device.

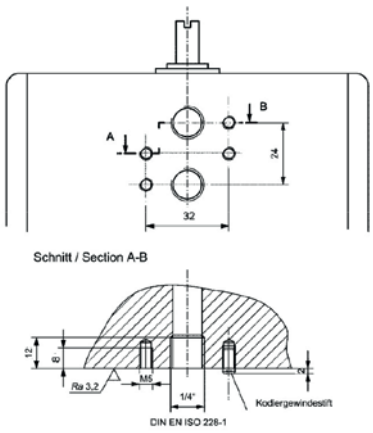


Fig. 4: *NAMUR interface ¼" (dimensions in mm)*

6 Pneumatic connection

WARNING!
Risk of injury due to high pressure inside device.
Prior to performing repair and maintenance work on the device, depressurize the connecting lines.

The air connections are designed as threaded holes with G ⅛/⅛ NPT, G ¼/¼ NPT, G ½/½ NPT or G 1 / 1 NPT threads depending on the device version.

➔ Run and attach the connecting lines and screw joints according to good professional practice.

➔ Check the connecting lines and screw joints for leaks and damage at regular intervals and repair them.

➔ The K_{VS} coefficient of an upstream pressure reducing valve must be at least 1.6 times larger than the K_{VS} coefficient of the device.

Port labeling

K_{VS} 2.0 and 4.3

Inscription	Function
4	Supply air
8	Control pressure connection (with pneumatic actuation only)
9	External air supply (only when a pilot valve is used)
3/5	Output

Port labeling

Kvs 1.4 and 2.9

Inscription	Function
1	Supply air
14/12	Control pressure connection (with pneumatic actuation only)
9	External air supply (only when a pilot valve is used)
2/4 and 3/5	Output

Port labeling

Kvs 8.7

Inscription	Function
1	Supply air
9	External air supply (only when a pilot valve is used)
2/3	Output

6.1 Sizing of the connecting line

Refer to the table below for the minimum required nominal size of the connecting line at the port ***4/1*** of the body.

For pilot-actuated booster valves, these specifications apply to a connecting line shorter than 2 m. Use a larger nominal size for lines longer than 2 m.

Connection	8/9/12/14	4/1
Pipe [1]	6 x 1 mm	12 x 1 mm
Hose [2]	4 x 1 mm	9 x 3 mm

[1] Outside diameter x Wall thickness
[2] Inside diameter x Wall thickness

6.2 Compressed air quality

Compressed air quality according to ISO 8573-1		
Particle size and quantity	Oil content	Pressure dew point
Class 4	Class 3	Class 3
≤5 µm and 1000/m³	≤1 mg/m³	–20 °C/10 K below the lowest ambient temperature to be expected

6.3 Supply air

Air must be supplied to the pilot-actuated booster valve.

In the delivered state, the supply air is fed internally over port ***4/1***, if not specified otherwise.

➔ On mounting the pilot-actuated booster valve to rotary or linear actuators fitted with positioners, the supply air must be changed to an external supply air over port ***9***.

To change to an external supply through port ***9***, proceed as follows:

6.3.1 K_{VS} 1.4, 2.0, 2.9, and 4.3

➔ Loosen the cap screw on the connection plate and remove plate (1) and turnable gasket (2).

➔ Turn the turnable gasket (2) by 90°. The tip of gasket (2) rests in the plate cut-out marked '9'.

➔ Fasten plate (1) and turnable gasket (2) to the connection plate.

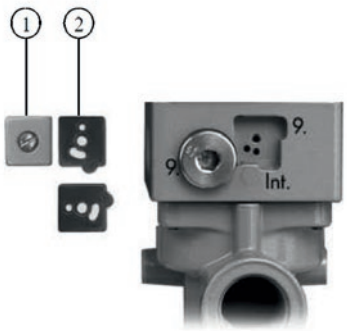


Fig. 5: *Turnable gasket of the booster valve*

6.3.2 K_{VS} 8.7

When the control pressure at port 9 is higher than the operating pressure at port 1, a check valve in these devices automatically switches the supply air from internal to external.

6.3.3 K_{VS} 1.4

Type 3756-1

➔ Undo the two hexagonal socket head screws (Fig. 6) and carefully remove the CNOMO interface.

Fig. 6: *CNOMO interface with booster*

Make sure that the gaskets on the booster valve and CNOMO interface do not get damaged.

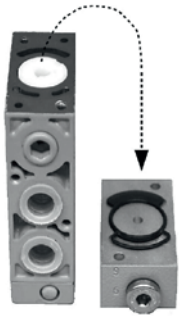


Fig. 7: *CNOMO interface and booster*

Internal air supply:

Do not seal the marked hole with the black turnable gasket (Fig. 8, left).

External air supply:

Seal the marked hole with the black turnable gasket (Fig. 8, right).

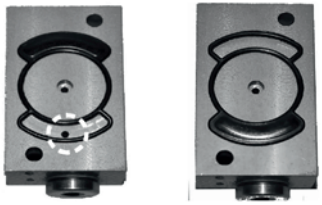


Fig. 8: *CNOMO interface: location of the turnable gasket for internal air supply (left) and for external air supply (right)*

➔ Carefully place the CNOMO interface onto the booster valve. Make sure that all gaskets are seated properly on the booster valve.

Observe direction on installation:

The port 9 (external air supply) of the CNOMO interface must be located on the same side as port 1 (supply air) or port 3 (vent) of the booster valve.

➔ Use the two hexagonal socket head screws to fasten the CNOMO interface (Fig. 6).

7 Electrical connections

The device does not have any electrical connection. To use the booster valves with a pilot valve, the specifications written in the mounting and operating instructions of the pilot valve apply for the electrical connection.

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