DATA SHEET

T 8393 EN

Type 3755 Pneumatic Volume Booster

Application

The Type 3755 Pneumatic Volume Booster is used together with positioners to increase the positioning speed of pneumatic actuators with an effective area ≥ 1000 cm² or a travel volume ≥ 6 l.

K_{VS} for exhaust and supply **2.5 m³/h**
Pressure ratio: signal to output **1:1**

The pneumatic volume booster is mounted between the positioner and actuator. It supplies the actuator with an air flow output whose pressure corresponds exactly to the signal pressure, except that it has a much higher volume output.

Special features

- Excellent control accuracy
- Fast dynamic response due to low hysteresis
- Balanced plug ensures constant reversing pressure
- Bypass restriction with linear characteristic
- Bypass restriction setting can be lead-sealed
- Aluminum or stainless steel body material
- Sintered polyethylene filter disk ensures low noise emissions
- Low-noise venting or exhaust port connected to a pipe
- Standard or low-temperature version
- Version with G or NPT thread

Versions

– **Type 3755-1** (Fig. 1) · Pneumatic volume booster (cast aluminum body) with low-noise sintered polyethylene filter disk

– **Type 3755-2** (Fig. 2) · Pneumatic volume booster (aluminum body) with flanged-on threaded exhaust port

– **Type 3755-2** (Fig. 3) · Pneumatic volume booster (stainless steel body), threaded exhaust port

Fig. 1: *Type 3755-1 (cast aluminum body)*

Fig. 2: *Type 3755-2 (cast aluminum body)*

Fig. 3: *Type 3755-2 (stainless steel body)*

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Principle of operation (Fig. 4)

If the positioner signal to supply air to the actuator increases, the pressure above the diaphragm (1) increases. The differential pressure at the diaphragm causes the supply plug (2) to open, providing supply air up to a maximum of 10 bar to the actuator.

In contrast, a positioner signal to vent the actuator causes the exhaust plug (3) to open. The pressure in the actuator is relieved over the exhaust port.

The bypass restriction screw (4) is used to adjust the response of the pneumatic volume booster to match the closed control loop requirements. The setting of the bypass restriction screw can be locked in position to prevent it from being turned and can additionally be lead-sealed.

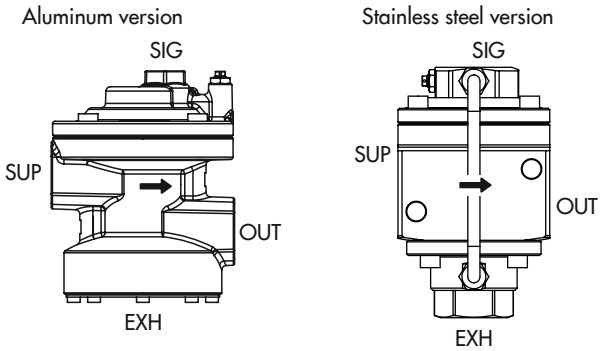
Mounting on control valves

Mount the volume booster with the air flowing from the supply port to the actuator port in the direction indicated by the arrow (see Fig. 4). The volume booster is mounted between the positioner and actuator.

Pneumatic connections

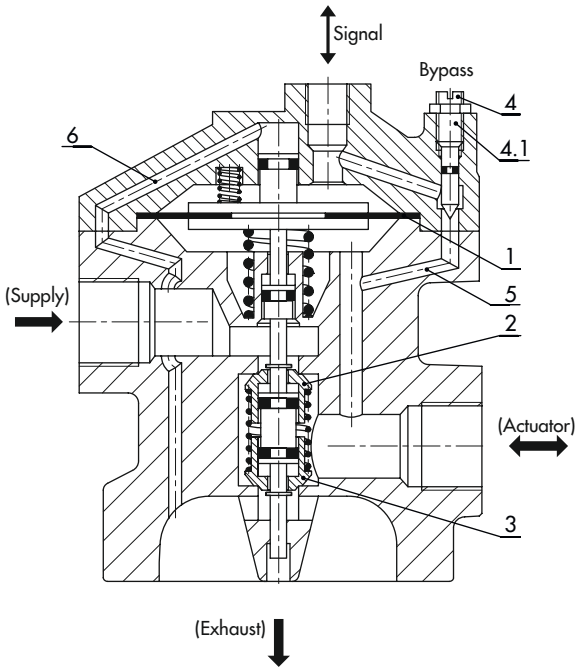
The air connections for signal, supply, actuator and for the version with (flanged-on) exhaust port are designed with G or NPT threads depending on the pipe female thread selected.

Connections:



SIG Signal
SUP Supply air
OUT Output (to actuator)
EXH Exhaust air

Sectional drawing of version with aluminum body:
(the same principle applies to the version with stainless steel body)



1 Diaphragm
2 Supply plug
3 Exhaust plug
4 Bypass restriction screw
4.1 Lock nut
5 Bypass duct [1)]
6 Duct for pressure balancing [1)]

Through hook-up in version with stainless steel body

Fig. 4: *Pneumatic connections and sectional drawing*

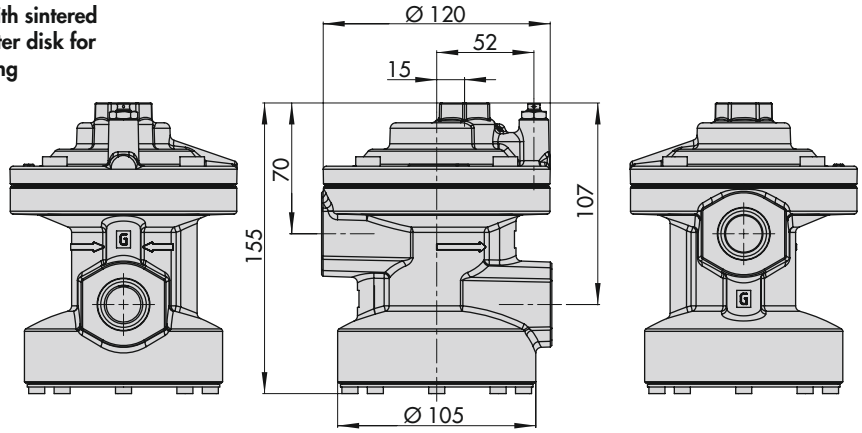
Technical data

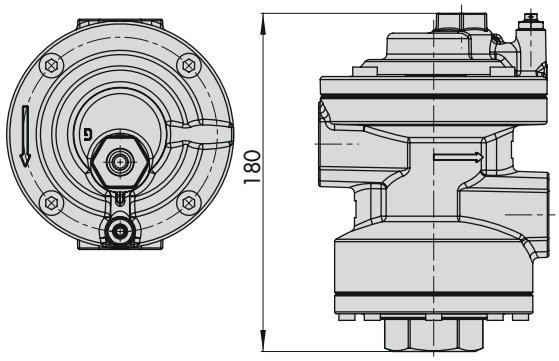
Type	3755-1 (aluminum)	3755-2 (aluminum)	3755-2 (stainless steel)
Flow coefficient			
K_{VS} Supply	2.5 m³/h		
K_{VS} Exhaust	2.5 m³/h		
K_{VS} Bypass	0.3 m³/h		
Closed loop control			
Pressure ratio	Signal:output = 1:1		
Response pressure	Standard temperature range: 80 mbar · Low-temperature range: 100 mbar		
Pressure			
Supply	Max. 10 bar · max 145 psi		
Actuator	Max. 7 bar · max 101.5 psi		
Signal	Max. 7 bar · max 101.5 psi		
Air quality acc. 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		
Connecting thread			
Supply (SUP)	G ¾ (optionally ¾ NPT)		
Actuator/output (OUT)	G ¾ (optionally ¾ NPT)		
Signal (SIG)	G ¼ (optionally ¼ NPT)		
Exhaust port (EXH)	–	G 1 (optionally 1 NPT)	
Safety integrity level			
Use in safety-instrumented systems acc. to IEC 61508/ IEC 61511 [1]	**Suitable for use in safety-instrumented systems up to SIL 2:** applies to a single device **Suitable for use in safety-instrumented systems up to SIL 3:** applies to redundant configuration of valves according to IEC 61508 See Safety Manual ▶ SH 8393		
Degree of protection according to EN 60529			
Degree of protection provided by enclosure	IP44 [2]	IP66 [3]	
Other operating parameters			
Permissible ambient temperature	Standard temperature range: –40 to +80 °C · Low-temperature range: –55 to +60 °C		
Service life	≥1 x 10^7 full strokes		
Weight	2.1 kg	2.4 kg	5.2 kg
Materials			
Body	Cast aluminum, powder paint coated (RAL 1019)		1.4404 and 1.4571
	EN AC-43000KF according to DIN EN 1706	EN AC-43000KF according to DIN 1706 and EN AW-5083-H112 according to DIN EN 755-3	
Exhaust side	Muffler with sintered polyethylene filter disk and stainless steel retaining plate	Flanged-on threaded port made of aluminum, powder coated (RAL 1019)	Threaded port made of stainless steel
Diaphragm	Standard temperature range: VMQ · Low-temperature range: PVMQ		
Seat-plug seal	VMQ		
Other seals	NBR		
Other external parts	Stainless steel		

1) Only suitable for the standard temperature range and with the aluminum body
2) Exhaust side facing downward or to the side
3) The following applies for Type 3755-2: body IP 66; the IP rating depends on how the venting is implemented (pipe, muffler etc.).

Dimensions in mm · Version with cast aluminum body

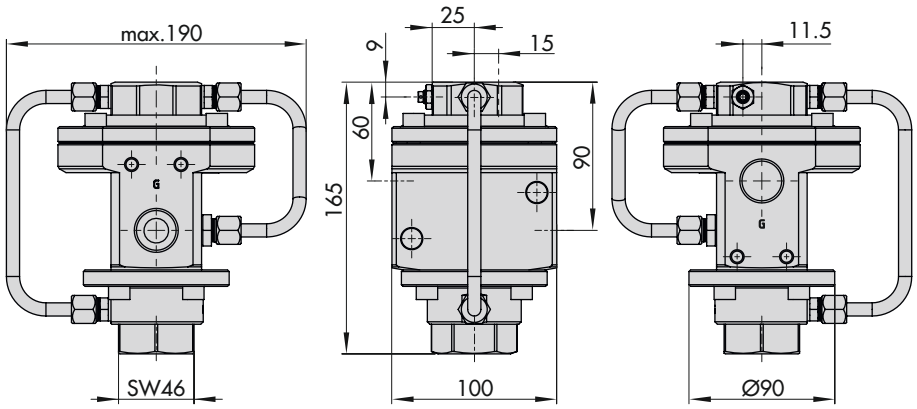
Type 3755-1 with sintered polyethylene filter disk for low-noise venting

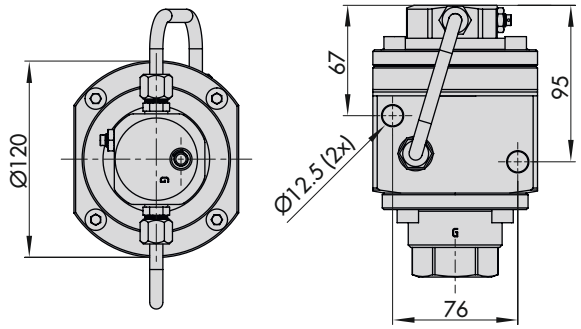




Type 3755-2
Flanged-on threaded exhaust port connected to a pipe

Dimensions in mm · Version with stainless steel body





Article code

Pneumatic Volume Booster Type 3755-	x	x	x	0	0	x	x	0	0	x	0	0	0	0
Design														
Low-noise venting over a sintered polyethylene filter disk	1		0			0								
(Flanged-on) threaded exhaust port	2		3/5			0/1								
Pneumatic connections														
Supply air and actuator ISO 228 - G ¾, signal ISO 228 - G ¼		1												
Supply air and actuator ¾-14 NPT, signal ¼-18 NPT		2												
Exhaust version														
Sintered polyethylene filter disk			0											
(Flanged-on) threaded exhaust port ISO 228 - G 1			3											
(Flanged-on) threaded exhaust port 1-11½ NPT			5											
Flow coefficient														
Supply K_{VS} = 2.5 m³/h, exhaust K_{VS} = 2.5 m³/h				0										
Dynamic response														
Standard (normal control)					0									
Body material														
Aluminum						0								
Stainless steel						1								
Device color														
Gray-beige, structured finish, RAL 1019 (aluminum body)							0							
Without (stainless steel body)							1							
Temperature range														
Standard temperature, –40 to +80 °C										0				
Low temperature version, –55 to +60 °C										1				

Ordering text

Pneumatic volume booster	Type 3755
Design	Low-noise venting or exhaust port connected to a pipe
Pneumatic connections	G or NPT
Exhaust version	Sintered polyethylene filter disk or (flanged-on) threaded exhaust port
Body material	Aluminum/stainless steel
Temperature range	Standard or low temperature