

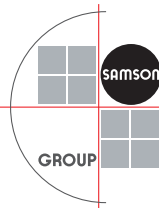
10.8.1. Principle of operation of Type 3755 Volume Booster

The volume booster **Type 3755** is used together with positioners to increase the positioning speed of pneumatic actuators.

C_{V100} for Supply and Exhaust	2.9
Signal-to-output ratio	1:1

The pneumatic volume booster supplies an air flow output at the actuator port whose pressure corresponds exactly with the signal pressure, except that it has a much higher volume output.

If the positioner signal increases to supply air to the actuator, 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.



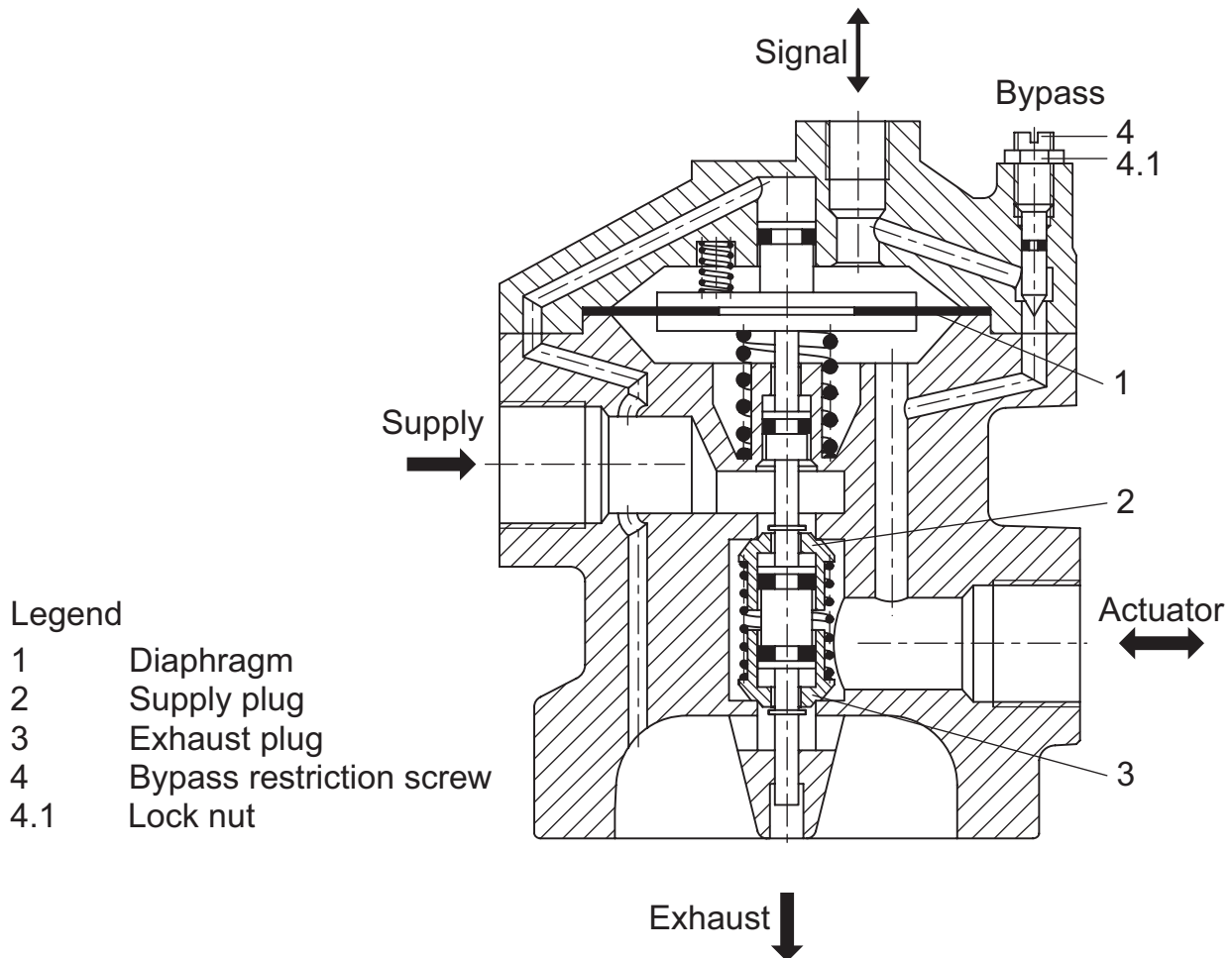


Figure 10.8.1.-1: Type 3755, cross-sectional drawing with pneumatic connections

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 fail-safe action upon signal pressure failure always causes venting!

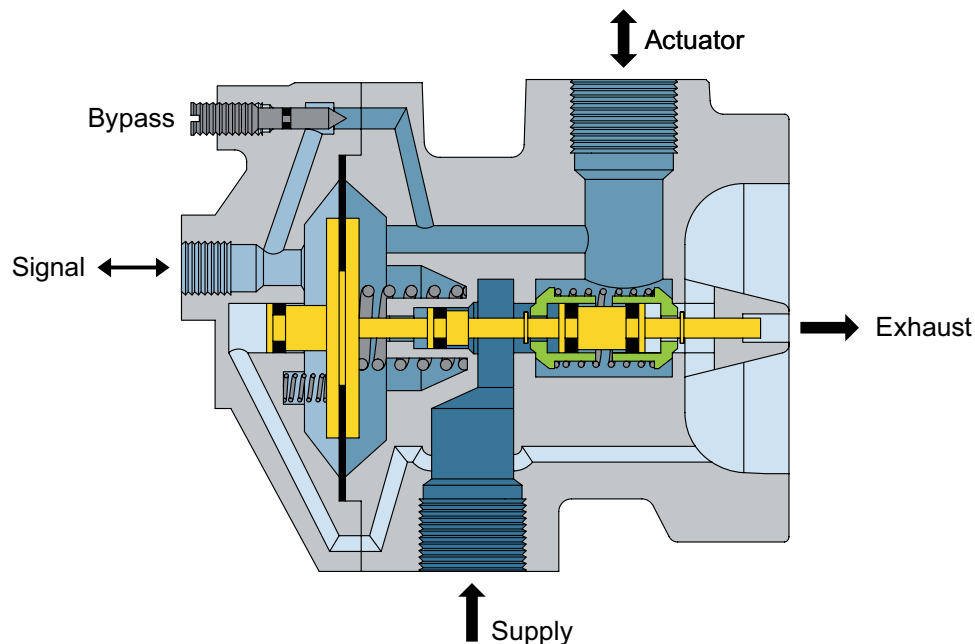
The bypass restriction screw (4) is used to adjust the response of the pneumatic volume booster to match the system conditions. The setting of the bypass restriction screw can be locked in position by a lock nut to prevent it from being turned and additionally lead-sealed.

The bypass restriction screw must never be completely closed. This prevents the system from hunting and allows for a stable control performance by the positioner.

Note: The bypass restriction screw (4) with lock nut (4.1) must only be hand-tightened. The maximum permissible tightening torque is 3 Nm.

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 additionally lead-sealed.

Type 3755 Volume Booster



The volume booster is used together with positioners to increase the positioning speed of pneumatic actuators. It supplies an air flow output at the actuator port whose pressure corresponds exactly with the signal pressure, except that it has a much higher volume output.

Flow capacity	Supply	K_{vs} 2.5 m ³ /h
	Exhaust	K_{vs} 2.5 m ³ /h
	Bypass	K_{vs} 0.8 m ³ /h
Pressure ratio	Signal to output = 1:1	
Reversing pressure	80 mbar	
Pressure	Supply	max. 10 bar max. 150 psi
	Actuator	max. 7 bar · max. 105 psi
	Signal	max. 7 bar · max. 105 psi
Permissible ambient temperature	-40 to 80 °C (-40 to 176 °F)	
Connecting threads	Supply (SUP)	G ¾ (optionally ¾ NPT)
	Actuator (OUT)	G ¾ (optionally ¾ NPT)
	Signal (SIG)	G ¼ (optionally ¼ NPT)
	Flanged-on exhaust port (EXH)	G 1 or G ¾ (optionally 1 NPT or ¾ NPT)
Service life	≥ 1 x 10 ⁷ full cycles	
Degree of protection	IP 42 (with the exhaust port facing downwards)	
Safety instrumented systems	Use in SIS acc. to IEC 61508/SIL 2 (in preparation)	
Data Sheet	T 8393 EN	

Figure 10.8.1.-2: Technical data of Type 3755 Volume Booster