XSz 10 & XSz 10V
Pneumatic actuated fail-safe safety valve

- 3/2 or 5/2-way Port size: G1/2
- Inherently fail-safe without residual pressure
- Dynamic self monitoring
- Fast exhaust capability
- Improves safety and reduces downtime
- No additional electrical monitoring required
- With the appropriate application, performancelevel „e" (cat. 4) of DIN EN ISO 13849-1 is achieved for the safety function "Pressure building up from '1' to '2' and pressure dropping from '2' to '3'". DGUV and other approvals
- Suitable for safety applications with single acting (3/2-way valve) and double acting (5/2-way valve) cylinders

Technical features

Medium:
Compressed air, filtered ≤ 50 µm, lubricated or non-lubricated

Suitable oils:
Shell Tellus S2 MA 32, ExxonMobil Febis K 32 or comparable oil with DVI values < 8 (DIN ISO 1817) and ISO viscosity class 32-46 (DIN 51519)

Type of control:
Double valve, pneumatically actuated with spool

Flow:
See page 2

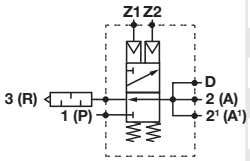
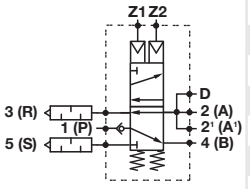
Operating Pressure:
XSz10:
2 ... 10 bar (29 ... 145 psi)
XSz10V:
3 ... 10 bar (43.5 ... 145 psi)

Mounting position:
Spool vertically

Ambient/Media temperature:
-10 ... +55°C (+14 ... +131°F)
For temperatures higher than +35°C (+95°F) we recommend to use lubricated air.
Air supply must be dry enough to avoid ice formation at temperatures below +2°C (+35°F)

Monitoring:
Internal
It is advisable to install a failure indication module to display malfunction messages. For further information please refer to data sheet 5.14.420

Technical data

Symbol	Series	Pressure range (bar)	Pressure range (psi)	Pilot pressure (bar)	Pilot pressure (psi)	Port sizes 1 (P)	2 (A)	21 (A1)	3 (R)	4(B)	5 (S)	12/14		Weight (kg)	Weight (lbs)	Drawing No.	Model *1)
	XSz 10	2 ... 10	29 ... 145	3 ... 10	43 ... 145	G1/2	G1/2	G1/2	—	—	—	—	Ø 4 mm	2,1	4.6	1	4420403
	XSz 10V	3 ... 10	43 ... 145	3 ... 10	43 ... 145	G1/2	G1/2	G1/2	G1/2	G1/2			Ø 4 mm	3,0	6.6	2	4420453

*1) *All valves are delivered with silencers

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Flow rate as per ISO 6358 (CETOP RP 84 P)

XSz 10

	Ports 1 (P) » 2 (A) (m3/h) *3)	2 (A) » 3 (R) (m3/h)
Normal cycle	190	390
Malfunction I *1)	—	260
Malfunction II *2)	—	260

*1) Malfunction I: only Z 1 switched off
*2) Malfunction II: only Z 2 switched off
*3) Nominal flow volume Q nom. at p1 = 6 bar and Δp = 1 bar

XSz 10V

	Port 1 (P) » 2 (A) (m3/h) *3)	2 (A) » 3 (R) (m3/h) *3)	1 (P) » 4 (B) (m3/h) *3)	4 (B) » 5 (S) (m3/h) *3)
Normal cycle	150	390	160	98
Malfunction I *1)	—	260	120	—
Malfunction II *2)	—	260	150	—

Switching times

XSz 10 measured without consume
Control cable: Ø 2,6 mm, 1 m long

	Ports	Pressure characteristic	Operating time (ms) *3) 3 bar	6 bar	10 bar
ON position	1 (P) » 2 (A)	rising	46	36	26
OFF position	2 (A) » 3 (R)	falling	41	49	65
OFF *1) Malfunction I	2 (A) » 3 (R)	falling	45	52	65
OFF *2) Malfunction II	2 (A) » 3 (R)	falling	44	52	68

*1) Malfunction I: only Z 1 switched off
*2) Malfunction II: only Z 2 switched off
*3) Operating time: From electric ON signal to 90% nominal pressure build-up
From electric OFF signal until pressure drops to 10% of nominal pressure.

XSz 10V measured without consumer
Control cable: Ø 2,6 mm, 1 m long

	Ports	Pressure characteristic	Operating time (ms) *3) 3 bar	6 bar	10 bar
ON position	1 (P) » 2 (A)	rising	47	38	32
	4 (B) » 5 (S)	falling	43	36	32
OFF position	2 (A) » 3 (R)	falling	43	51	62
	1 (P) » 4 (B)	rising	46	53	65
OFF *1) Malfunction I	2 (A) »3 (R)	falling	46	54	65
	1 (P) »4 (B)	rising	50	56	69
OFF *2) Malfunction II	2 (A) » 3 (R)	falling	47	54	68
	1 (P) » 4 (B)	rising	48	58	70

Accessories

Valve Series	Model	Silencer	Integrated silencer
			
XSz 10	4420403	–	0016422
XSz 10V	4420453	MB004B (G 1/2)	0016422

Note: The security is dependent on the quality of the silencer, use only original Norgren Herion silencer!

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Application

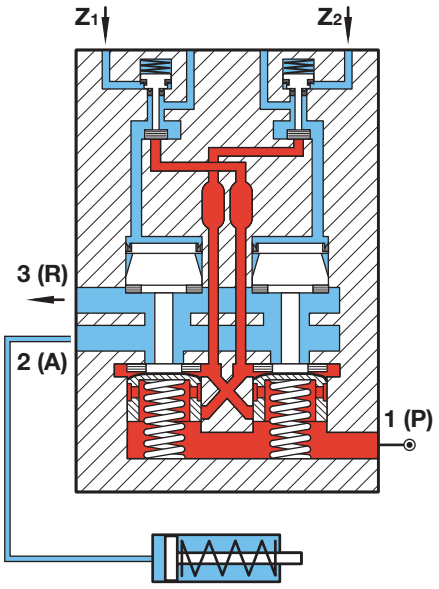
The double-acting valve is a system which meets the requirements of Safety Category 4 (self-monitoring control devices), provided that the actuating solenoids are controlled in conformity with Safety Category 4. If the double-acting valve is used in conjunction with an electric two-hand
control, the actuating solenoids must be controlled by an output signal from a Type III C electric two-hand control as per DIN EN ISO 13849-1 if Category 4 has been selected as a result of a risk assessment. If the double-acting valve is used to control dangerous movements in an electropneumatic system then the pneumatic control commands used to control the actuating solenoids, the connection lines and any downstream control units must comply with the safety category selected on the basis of a risk assessment.
Owing to its type of construction, the double-acting valve cannot prevent
an elevated load from descending slowly in the event of a power failure or the power being disconnected. If a power failure or a disconnection of power can cause a dangerous movement, then additional devices may be required (e.g. spring-loaded clamping devices, pilot-controlled nonreturn valves) depending on the risk assessment and the safety category selected on the basis of that risk assessment.

Pneumatic actuated valves are not suitable for the control of clutch and brake on mechanical presses.

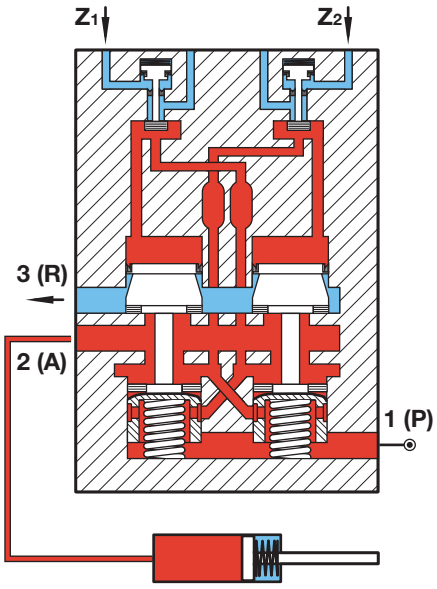
Description of the 3/2- way safety valve XSz 10

The device consists of two mechanically separated pilot systems and two main valve systems, normally closed position. The valves are pneumatically actuated. The design of the valve is such that the working port 2 (A) only takes a pressure output when a) both command signals arrive at the same time within a time delay < 0,1 s (synchronous actuation)
b) both spindles were previously in rest position
c) both spindles move into response position within the given time delay.

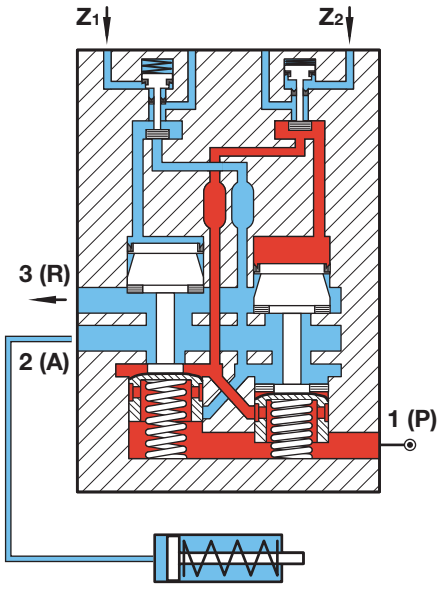
Failure:
In the event of a fault on one of the two systems (e.g. mechanical blockage), the pressure will fail to build up on connection 2 (A).



Rest position
Process connection 2(A) is vented via connection 3(R).
Pressure connection 1 (P) is blocked.
There isn't pressure at the working port 2 (A) as it is vented freely over the exhaust port 3 (R).



Switching position
The safety valve is simultaneously pressurized via the Z ports, Process port 2 (A) is connected to pressure port 1 (P). Each valve system is selfmonitoring and checks for correct
functioning upon each switching operation (dynamic monitoring)



Malfunction
The Z ports are pressurized with a time difference.
The dynamic monitoring system detects the time delay in actuation and prevents pressure from building up on process port 2 (A).

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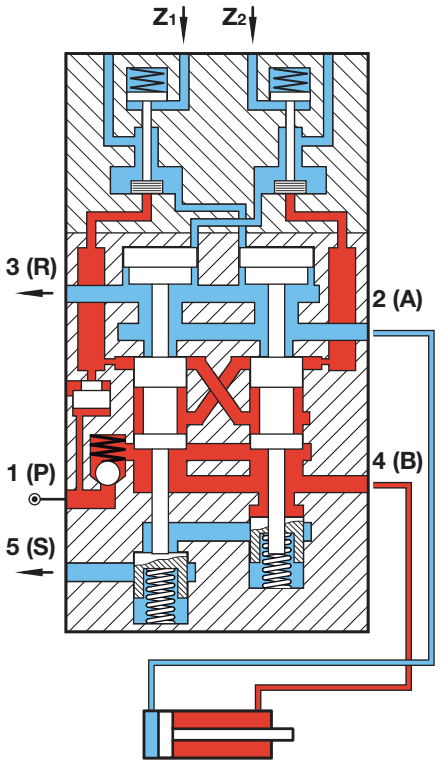
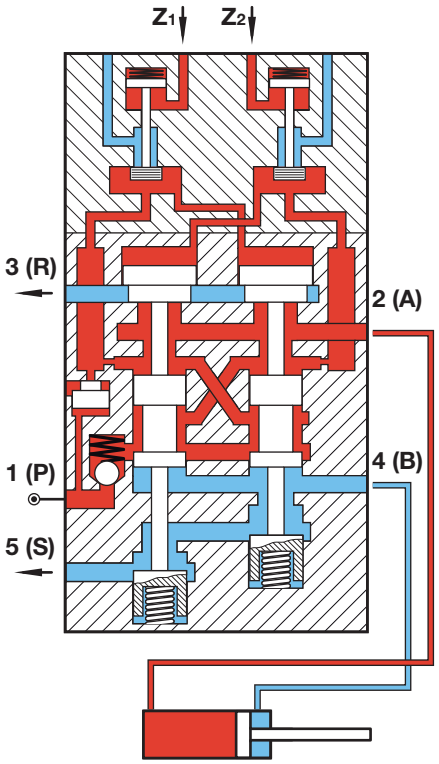
Description of the 5/2 way valve XSz 10V

Like the 3/2-way safety valve, the 5/2-way safety valve consists of two mechanically separated pilot control systems and main valve systems. The valves are pneumatically operated. The design of the main valve system is such that, in rest position, connection 2(A) is vented and connection 4(B) is pressurised.
The valves are solenoid operated. The design of the valve is such that process connection 2(A) will only be depressurised and connection 4(B) will only be vented if:
a) both command signals arrive at the same time within a time delay < 0,1 s (synchronous actuation)
b) both spindles were previously in rest position
c) both spindles move into response position within the given time delay.

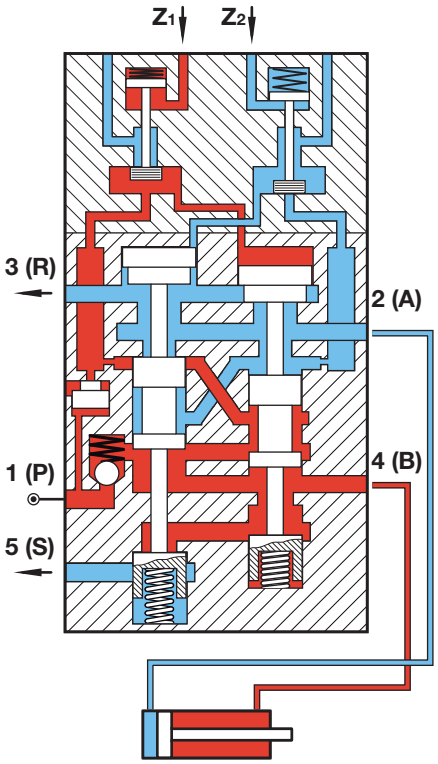
Failure:
In the event of a fault on one of the two systems (e.g. mechanical blockage), the pressure will fail to build up on connection 2 (A) and connection 4 (B) will remain pressurised upon restart (provided that the operating pressure is present on connection 1 (P)).



Rest position
Process connection 2(A) is vented via connection 3(R). Connection 4(B) is connected to pressure port 1 (P).



Switching position
The safety valve is simultaneously pressurized via the Z ports. Process port 2 (A) is connected to pressure port 1 (P). Connection 4 (B) is vented via exhaust port 5(S). Each valve system is self-monitoring and checks for correct functioning upon each switching operation (dynamic monitoring).



Malfunction
The Z ports are put under pressure with a time delay. The dynamic monitoring system detects the time delay in actuation and prevents pressure from building up on process port 2 (A). Port 4 (B) remains connected to 1 (P) port so as to prevent, for example, the upper tool of the press from descending.

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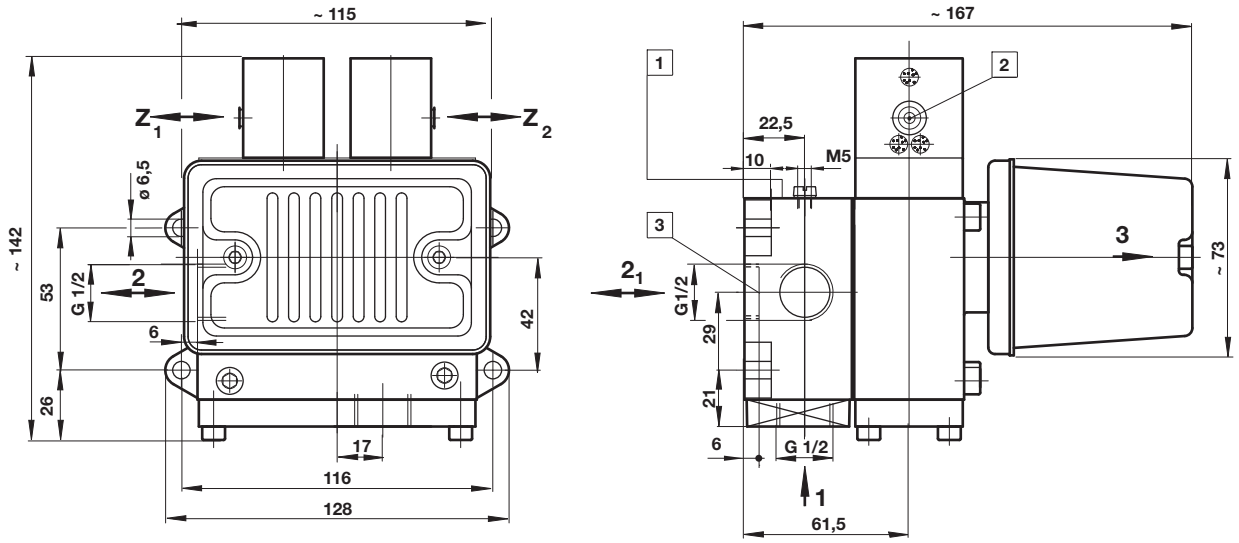
1

XSz 10 – with silencer

Dimensions in mm
Projection/First angle



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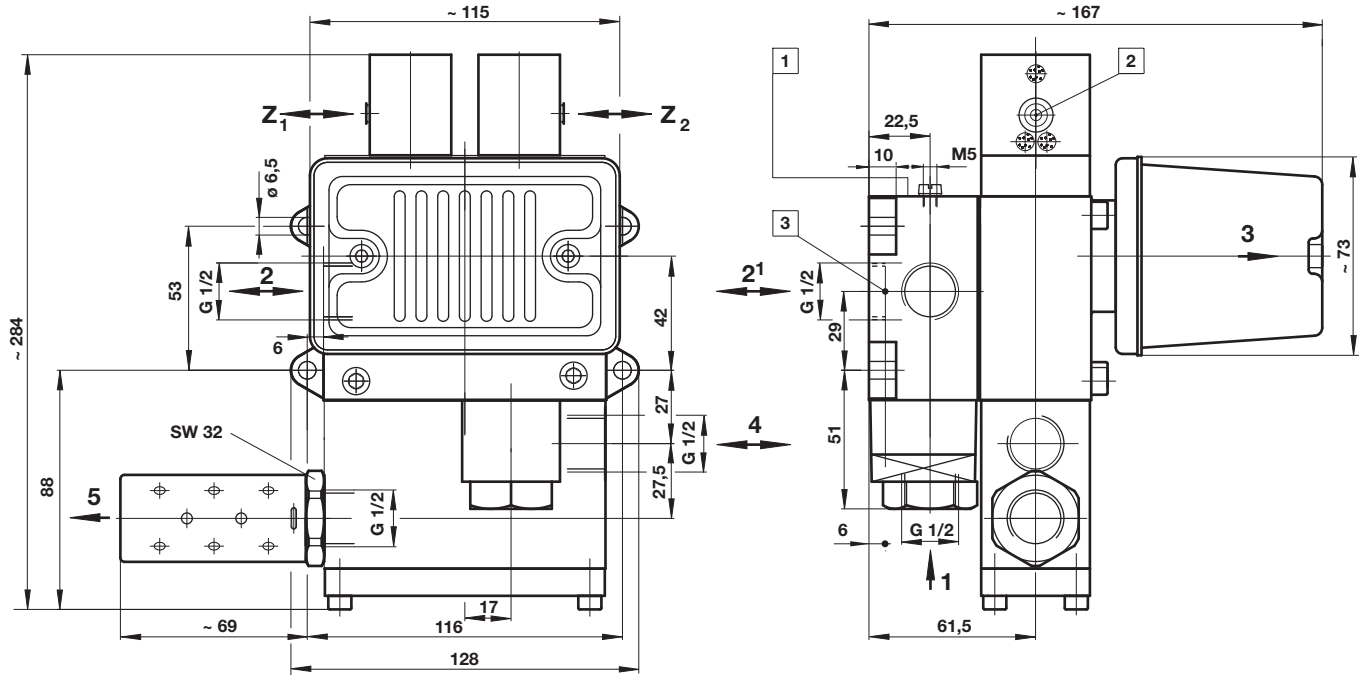
XSz 10V – with silencer



1 Mounting interface for pressure switch and failure indication module.
2 Hose size DA = 4 +0,05/ -0,10
3 Optional Port 2 sealed with plug

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For external indication (e.g. visual, electrical or acoustic signal) of a malfunction, the installation of a failure indication element is recommended. Such an element is not necessary to fulfil the safety function of the valve.
(For further information please see the corresponding data sheet no. 5.14.420).
A suitable air treatment unit (dehydration, filtration, lubrication) must be connected upstream of pressure port 1(P). Lubrication can only be omitted if the connected consuming device and all additional equipment is suited for oil-free operation.
Degree of filtration: 50 µm. The lubrication should be adjusted to supply only enough oil to form a film on the inner parts of the valve. Excessive lubrication may cause a build-up of oil in the pilot lines and cause sluggish operation of the valves.
The size of pressure regulator, lubricator and filter must be consistent with the inlet port size. An accumulator tank is recommended between the pressure regulator and safety valve. The operating pressure must not drop below the minimum operating pressure indicated on the name plate and the use of a pressure switch is suggested.

Attention: Uncontrollable elements, such as quick exhaust valves, nozzles and nonreturn valves may not be installed between the press safety valve and rotary fitting.
In case of malfunctions the unit has to be tested and/or replaced immediately. The valves should be mainted an checked dependent on the loads to which they are subjected, at least, however, once a year.
Repair, maintenance and testing has to be performed in accordance with the operation and maintenance manual and the requirements of the relevant safety associations of the country where the unit is operated.
Repairs and maintenance must only be carried out by the after-sales service of the valve manufacturer or by a qualified engineer trained by the valve manufacturer.
For the use at pneumatical presses:
The regulations contained in DIN EN ISO 13849-1 must be met.
All liability is denied for unautorized modifications of the units, installation
or usage not in accordance with the manual, the local safety requirements as well as the principles of DIN EN ISO 13849-1.

Warning

These products are intended for use in industrial compressed air systems only. Do not use these products where pressures and temperatures can exceed those listed under **»Technical features/data«**.
Before using these products with fluids other than those specified, for non-industrial applications, life-support systems or other applications not within published specifications, consult Norgren.
Through misuse, age, or malfunction, components used in fluid power systems can fail in various modes.

The system designer is warned to consider the failure modes of all component parts used in fluid power systems and to provide adequate safeguards to prevent personal injury or damage to equipment in the event of such failure.
System designers must provide a warning to end users in the system instructional manual if protection against a failure mode cannot be adequately provided.
System designers and end users are cautioned to review specific warnings found in instruction sheets packed and shipped with these products.

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