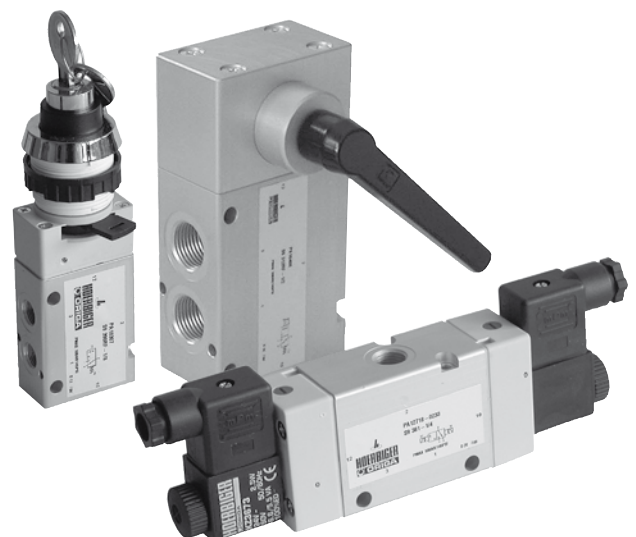


Contents

Version	Actuation System	Page		
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Directional Control Valves

*Series
S9-G1/8 to G1/2*



3/2, 5/2 and 5/3 Directional Control Valves

Series
S9-G1/8 to G1/2

* Valve Manifold Assemblies
with electrically actuated
valves -10 to +50°C

(¹ Note:
For use below freezing point
please contact us

(² Actuation force for valves
without spring return,
actuation with rotary lever:
5N

(³ Actuation force for valves
with spring return,
Actuation with rotary lever:
15N

(⁴ Only for version with biased
position 2 – 10 bar,
pneumatically actuated
2 – 10 bar, electrically
actuated 2.5 – 10 bar

(⁵ Version with biased position
2.5 – 10 bar

(⁶ Low wattage version:
Plug to
DIN EN 175301-803
form A

(⁷ Version “middle position
vented“ 1000 l/min

(⁸ Version “middle position
vented“ 3300 l/min
Version “middle position
pressured“ 3600 l/min

(⁹ 5/3 Way Valve 2.5 – 10 bar
(¹⁰ Valves with panel mounting
actuators 2 – 10 bar

Series S9 – G1/8 to G1/2

Characteristics		Symbol	Unit	Series S9 G1/8		
Actuation			Manual control	pneumatic	electrical	
General Features						
Type			Spool valve			
Mounting			2 Screws M5			
Tube connection			Thread			
Thread			G1/8 – 7.4 deep			
Weight		kg	See page 48, 56, 64			
Installation			In any position			
Ambient temperature range (1)		T _{min. / max.}	°C	-10 to +60 *		
Medium temperature range (1)		T _{min. / max.}	°C	-10 to +60 *		
Medium			Filtered compressed air			
Lubrication			With or without oil mist lubrication (We recommend the use of mineral oil type VG 32 to ISO 3448)			
Pneumatische Characteristics						
Nominal pressure		p _{min. / max.}	bar	6		
Operating pressure range		p _{min. / max.}	bar	0–10 (10) – –		
– permanent signal version		p _{min. / max.}	bar	–	0–10	2–10
– impulse version		p _{min. / max.}	bar	–	0–10	2–10
– with external pilot air		p _{min. / max.}	bar	–	–	0–10
Nominal flow		QN	l/min	500 (450 bei 3/2 Way Valve)		
Actuation						
Manual control			Direct			
Stroke			mm	4.5		
Actuation force		Fb	N	7 (2) 10 (3)		
Actuation force for panel mounting actuators			See page 48			
Pneumatic			Direct			
Actuation pressure range						
– permanent signal version		p _{min. / max.}	bar	–	2–10	2–10
– impulse version		p _{min. / max.}	bar	–	1.5–10	1.5–10
Electrical						
Voltage type			Electrical pilot operated Alternating current (50/60Hz)			
Nominal voltage						
– Standard version		U _n	V	230 ±10%		
– Low wattage version		U _n	V	230 ±10%		
Initial power consumption			G1/8	G1/4	G1/2	
– Standard version			VA (W)	8.5	8.5	11.0
– Low wattage version			VA (W)	6.6	6.6	7.8
Continuous consumption			G1/8	G1/4	G1/2	
– Standard version			VA (W)	6.0	6.0	8.5
– Low wattage version			VA (W)	3.9	4.9	4.9
Duty cycle		ED	%	100		
Electrical protection			IP	IP65 to DIN 40050 (applise only to solenoid with plug)		
Connection			Plug to DIN EN 175301-803 form B – industrial standard (6)			

Series S9 G1/4				Series S9 G1/2		
Manual control	pneumatic	electrical		Manual control	pneumatic	electrical
Spool valve				Spool valve		
2 Screws M6				2 Screws M6		
Thread				Thread		
G1/4 – 11 deep				G1/2 – 16 deep		
See page 52, 60, 66				See page 54, 62, 68		
In any position				In any position		
-10 to +60 *				-10 to +60 *		
-10 to +60 *				-10 to +60 *		
6				6		
0–10				0–10		
–				–		
–				–		
–				–		
1300 ⁽⁷⁾				3500 ⁽⁸⁾		
Direct				Direct		
6.5				9.4		
10 ⁽²⁾				15 ⁽²⁾		
15 ⁽³⁾				40 ⁽³⁾		
–				–		
Direct				Direct		
2–10				2.2–10 ⁽⁹⁾		
1.5–10				1.5–10 ⁽⁵⁾		
Direct current						
24 ±10%				Other voltages on request		
24 ±10%						
G1/8				G1/2		
2.5				4.8		
2.1				2.7		
G1/8				G1/2		
2.5				4.8		
2.1				2.7		

3/2, 5/2 and 5/3 Way Valves for use in EX areas

Series
S9-G1/8 to G1/2

* Valve Manifold Assemblies
with electrically actuated
valves -10 to +50°C

- (¹ Note:
For use below freezing
point please contact us
(² Actuation force for valves
without spring return,
Actuation with rotary lever:
5N
(³ Actuation force for valves
with spring return,
actuation with rotary lever:
15N
(⁴ Only for version with biased
position pneumatically
actuated 2 – 8 bar,
electrically actuated
2.5 – 8 bar
(⁵ Version with biased position
2.5 – 8 bar
(⁶ Maximum power if warmed
up to termal load limit
(⁷ Version “middle position
vented“ 1000 l/min
(⁸ Version “middle position
vented“ 3300 l/min
Version “middle position
pressured“ 3600 l/min
(⁹ 5/3 Way Valve 2.5 – 8 bar
(¹⁰ Valves with panel mounting
actuators 2 – 8 bar

Series S9 – G1/8 to G1/2

Characteristics		Symbol	Unit	Series S9 G1/8		
Actuation				Manual Control	pneumatic	electrical
General Features						
Type				Spool valve		
Mounting				2 screws M5		
Tube connection				Thread		
Thread				G1/8 – 7.4 deep		
Weight			kg	See page 48, 56, 64		
Installation				In any position		
Ambient temperature range ⁽¹⁾ T _{min. / max.}			°C	-10 to +60 *		
Medium temperature range ⁽¹⁾ T _{min. / max.}			°C	-10 to +60 *		
Medium				Filtered, unlubricated compressed air – free from water and dirt to ISO8573-1		
Pneumatic Characteristics						
Nominal pressure		p _{min. / max.}	bar	6		
Operating pressure range		p _{min. / max.}	bar	0–8 ⁽¹⁰⁾	–	–
– permanent signal version		p _{min. / max.}	bar	–	0–8	2–8
– impulse version		p _{min. / max.}	bar	–	0–8	1.5–8 ⁽⁴⁾
– with external pilot air		p _{min. / max.}	bar	–	–	0–8
Nominal flow		QN	l/min	500 (450 bei 3/2 Way Valve)		
Actuation						
Manual control				Direct		
Stroke			mm	4.5		
Actuation force		Fb	N	7 ⁽²⁾ 10 ⁽³⁾		
Actuation force for panel mounting actuators				See page 48		
Pneumatic				Direct		
Actuation pressure range						
– permanent signal version		p _{min. / max.}	bar	–	2–8	2–8
– impulse version		p _{min. / max.}	bar	–	1.5–8	1.5–8 ⁽⁴⁾
Electrical						
Certification				Electrical pilot operated EC Type Test Certificate for single valve: not required for mechanical units in II 2G		
Category, type of ignition protection				Single valve II 2G c T4T135°C-10°C≤Ta≤+60°C		
Voltage type				Alternating current (50/60Hz)		
Nominal voltage		U _N	V	230 ±10%		
		U _N	V	110 ±10%		
		U _N	V	24 ±10%		
Power rating at U _N				G1/8, G1/4, G1/2		
			VA (W)	3.1 (230V)		
			VA (W)	3.0 (110V)		
			VA (W)	2.5 (24V)		
Max. power at U _N ⁽⁶⁾				G1/8, G1/4, G1/2		
			VA (W)	2.9 (230V)		
			VA (W)	2.8 (110V)		
			VA (W)	2.4 (24V)		
Electrical protection			IP	IP65 (applise only to solenoid with cable)		
Connection				Cable – cable lengths see Order Instructions		

Series S9 G1/4			Series S9 G1/2		
Manual Control	pneumatic	electrical	Manual Control	pneumatic	electrical
Spool valve			Spool valve		
2 Screws M6			2 Screws M6		
Thread			Thread		
G1/4 – 11 deep			G1/2 – 16 deep		
See page 52, 60, 66			See page 54, 62, 68		
In any position			In any position		
-10 to +60 *			-10 to +60 *		
-10 to +60 *			-10 to +60 *		
Solids: Class 7 particle size <40 µm for gas			Water content: pressure dew point + 3°C,		
Class 4, but at least 5°C below minimum operating temperature					
6			6		
0–8	–	–	0–8	–	–
–	0–8	2–8	–	0–8	2.2–8
–	0–8	1.5–8 ⁽⁴⁾	–	0–8	1.5–8 ⁽⁴⁾
–	–	0–8	–	–	0–8
1300 ⁽⁷⁾			3500 ⁽⁸⁾		
Direct			Direct		
6.5			9.4		
10 ⁽²⁾			15 ⁽²⁾		
15 ⁽³⁾			40 ⁽³⁾		
–			–		
Direct			Direct		
2–8	2–8	2–8	–	2.2–8 ⁽⁹⁾	2.2–8
1.5–8	1.5–8 ⁽⁴⁾	1.5–8 ⁽⁴⁾	–	1.5–8 ⁽⁵⁾	1.5–8 ⁽⁴⁾
EC Type Test Certificate for solenoid: PTB-No. 03 Ex IEC 2019X and PTB 03 ATEX 2018X toT5					
Solenoid/individual use: II 2G EEx m II T5 -20°C≤Ta≤+50°C Solenoid/manifold mounting: II 2G EEx m II T5 -20°C≤Ta≤+40°C					
Direct current					
24 ±10%			Other voltages on request		
G1/8, G1/4, G1/2					
3.3 (24V)					
G1/8, G1/4, G1/2					
3.0 (24V)					

3/2 Way Valves Series S9

G1/8

Actuation:

- Hand lever
- Pneumatic
- Electrical pilot operated
- Electrical pilot operated with external pilot air
- Panel mounting actuators for mounting diameter to DIN 43696

Versions:

- Normally closed
- Normally open
- With external pilot air
- Version to ATEX Standard

Note:

The “normally open” valve S9 381S-RF-1/8 cannot be used on a P-supply manifold.

Weight (mass) kg

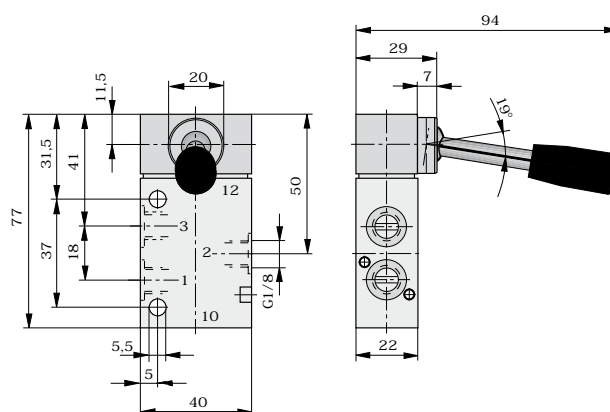
Description	Type	Weight (mass) kg
Hand lever indexed	S9 311-1/8	0.162
– with spring return	S9 311RF-1/8	0.162
Pneumatic, by permanent signal	S9 361RF-1/8	0.137
Pneumatic, by impulse	S9 361-1/8	0.147
Electrical, by permanent signal	S9 381(S)RF-1/8	0.247
Electrical, by impulse	S9 381(S)-1/8	0.382

Weight (mass) kg and action forces for valves with panel mounting actuators

Description	Type	Actuation force (N, Nm)	Weight (mass) kg
Rotary lever	S9 312T-1/8	0.3	0.137
	S9 312T-RF-1/8	0.3	0.137
Pushbutton	S9 313T-RF-1/8	8.0	0.137
Mushroom pushbutton	S9 315T-RF-1/8	8.0	0.137
Locking switch	S9 316T-1/8	9.0	0.202
Rotary switch	S9 317T-1/8	0.3	0.127
Mushroom pushbutton emergency-Off	S9 318T-1/8	10.0	0.137

Hand lever actuated

Type: S9 311-1/8, S9 311RF-1/8



For order instructions see page 70-72, characteristics see page 44-47 and for RPS manifolds see page 93-100, Valve Islands see page 87-92

Dimensions in mm

Technical drawing of the S9 381S-1/8 and S9 381S-1/8S valves, showing side and front views with dimensions.

Side View Dimensions:

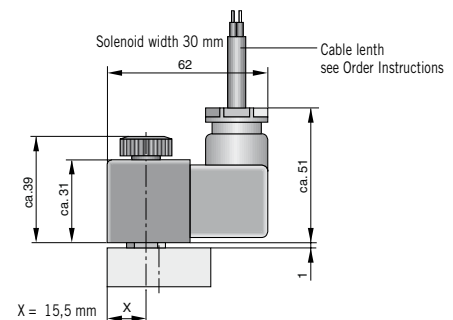
- Total height: 122 mm
- Handle height: 22 mm
- Valve body height: 56 mm
- Base height: 56 mm
- Port diameter: 1/8"
- Internal components: handle, stem, ball

Front View Dimensions:

- Total width: 190 mm
- Handle width: 40 mm
- Valve body width: 63 mm
- Base width: 63 mm
- Port diameter: 1/8"
- Internal components: handle, stem, ball

Notes:

- only for type S9 381S-1/8 S9 381S-1/8S



For more information on valves to ATEX standards
see page 46, 47, 72

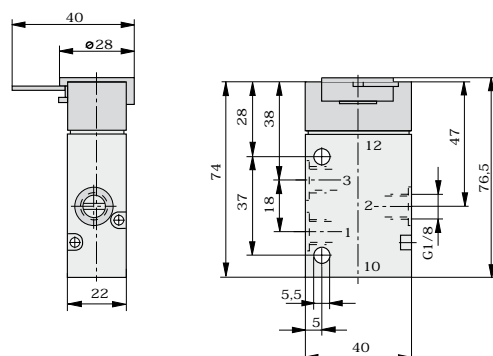
- * Manual override
 ** Operating pressure supply p_{st} only for type S9 381S
 *** Solenoid width = 30 mm on low wattage coil version

For order instructions see page 70-72, characteristics see page 44-47
P-Manifolds and for RPS manifolds see page 93-100, Valve Islands see page 87-92

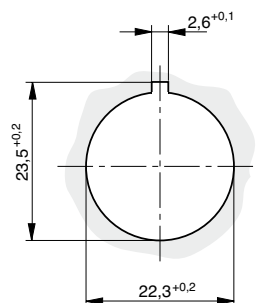
Dimensions in mm

Basic valve for panel mounting actuators – Type: S9 390RF-1/8

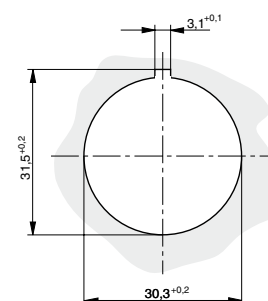
Mounting diameter



Mounting diameter Ø22 mm



Mounting diameter Ø30 mm



The actuators for these valves are interchangeable and can be mounted with 180° displacement on the basic valve. The actuators are not mounted upon delivery.

Rotary lever, indexed – Type: 12T-22, 12T-30,

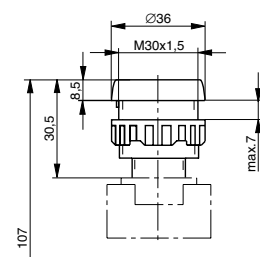
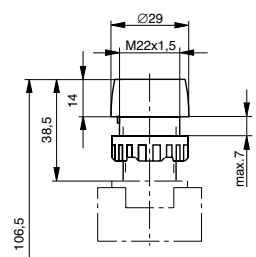
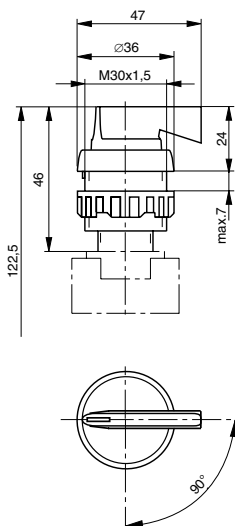
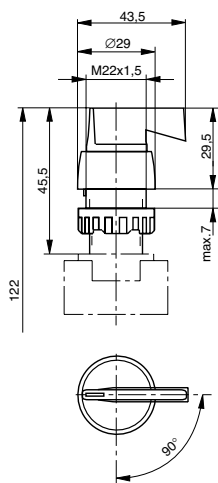
Pushbutton – Type: 13T-RF-22, 13T-RF-30

Mounting diameter Ø22 mm

Mounting diameter Ø30 mm

Mounting diameter Ø22 mm

Mounting diameter Ø30 mm

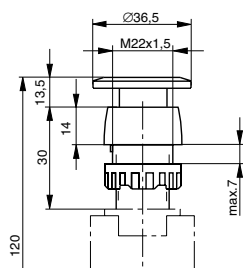


For order instructions see page 70-72, characteristics see page 44-47

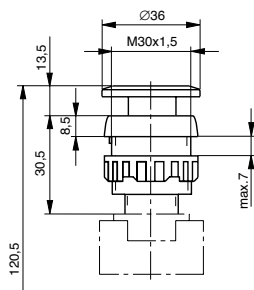
Dimensions in mm

Mushroom pushbutton – Type: 15T-RF-22, 15T-RF-30

Mounting diameter Ø22 mm

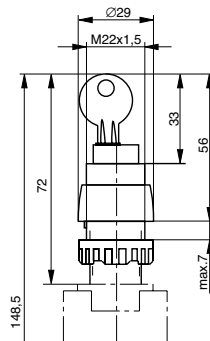


Mounting diameter Ø30 mm

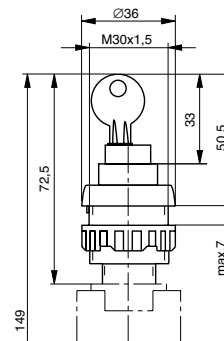


Locking switch – Type: 16T-22, 16T-30

Mounting diameter Ø22 mm

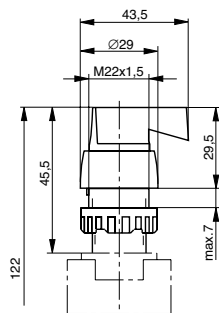


Mounting diameter Ø30 mm

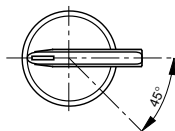
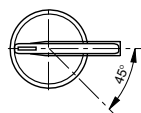
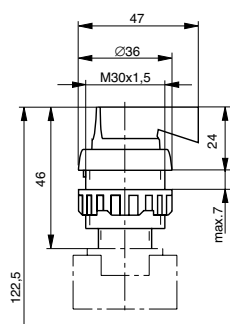


Rotary lever with spring return – Type: 12T-RF-22, 12T-RF-30

Mounting diameter Ø22 mm

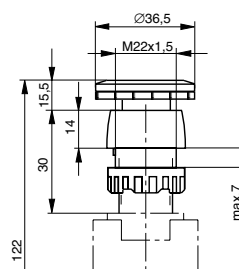


Mounting diameter Ø30 mm

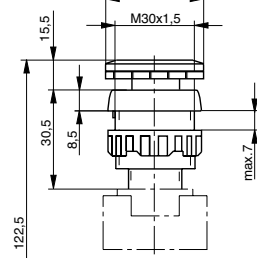


Mushroom pushbutton emergency-Off – Type: 18T-22, 18T-30

Mounting diameter Ø22 mm

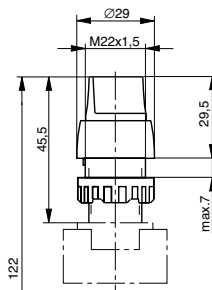


Mounting diameter Ø30 mm

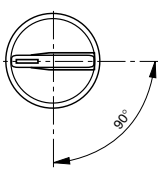
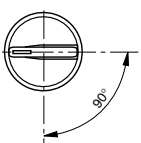
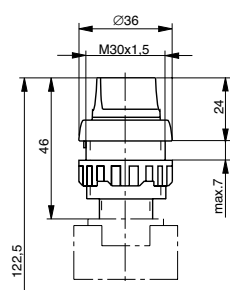


Rotary switch – Type: 17T-22, 17T-30

Mounting diameter Ø22 mm



Mounting diameter Ø30 mm



3/2 Way Valves Series S9

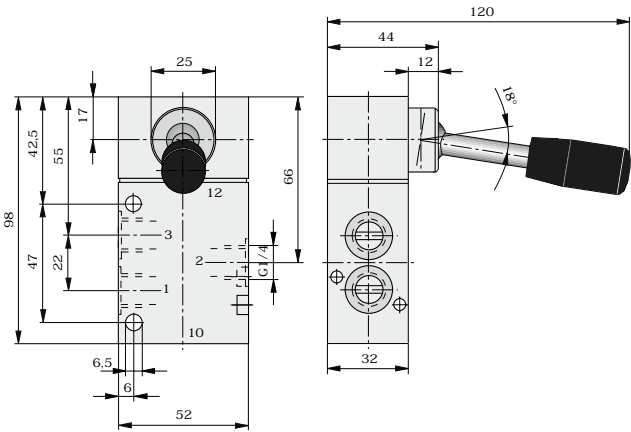
G1/4

- Actuation systems:
- Hand lever
 - Pneumatic
 - Electrical pilot operated
 - Electrical pilot operated with external pilot air

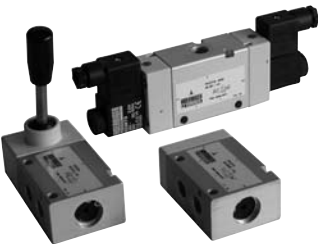
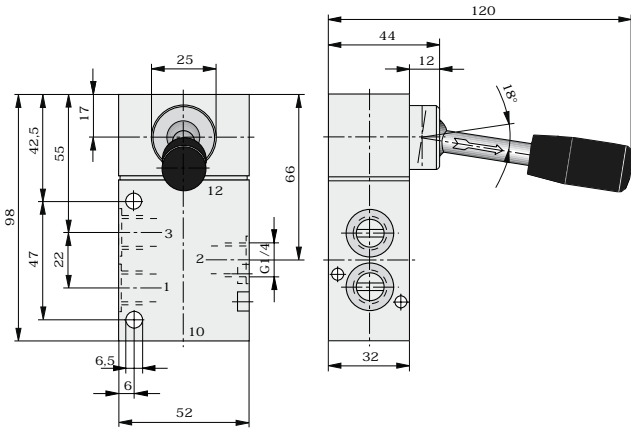
- Versions:
- Normally closed
 - Normally open
 - With external pilot air
 - With biased position
 - Version to ATEX Standard

Weight (mass) kg		
Description	Type	Weight (mass)
Hand lever, indexed	S9 311-1/4	0.370
– with spring return	S9 311RF-1/4	0.370
Safety hand lever	S9 311S-1/4	0.370
Rotary lever, indexed	S9 312-1/4	0.370
– with spring return	S9 312RF-1/4	0.370
Pneumatic, by permanent signal	S9 361RF-1/4	0.370
Pneumatic, by impulse	S9 361-1/4	0.430
– with biased position	S9 362-1/4	0.430
Electrical, by permanent signal	S9 381(S) RF-1/4	0.500
Electrical, by impulse	S9 381(S)-1/4	0.600
– with biased position	S9 382(S)-1/4	0.600

Hand lever actuated – Type: S9 311-1/4, S9 311RF-1/4

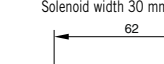


Safety hand lever actuated – Type: S9 311S-1/4



Technical drawing of a 1/4 inch NPT female fitting. The drawing includes the following dimensions and features:

- Overall Length:** 76.5
- Thread Length:** 47
- Thread Diameter:** 12
- Thread Pitch:** 1.25
- Thread Angle:** 60°
- Thread Type:** NPT
- End View Dimensions:**
 - Outer Diameter: 32
 - Inner Diameter: 25
 - Thread Diameter: 12
 - Thread Pitch: 1.25
 - Thread Angle: 60°
 - Thread Type: NPT
- Note:** only for type S9 361-1/4, S9 362-1/4

- 
- Technical drawing of the Solenoid Valve 24VDC 10A 1/2. The drawing shows the valve assembly with dimensions in millimeters. Key dimensions include: Solenoid width 30 mm, Cable length (see Order Instructions), 62 mm (total width), ca. 39 mm (height), ca. 31 mm (height), ca. 51 mm (height), 1 mm (thickness), and X = 15.5 mm (offset).

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3/2 Way Valves Series S9

G1/2

Actuation systems:

- Hand lever
- Pneumatic
- Electrical pilot operated
- Electrical pilot operated with external pilot air

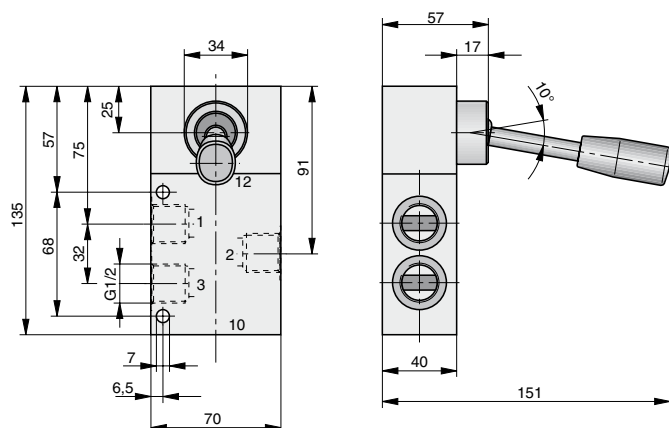
Versions:

- Normally closed
- Normally open
- With external pilot air
- With biased position
- Version to ATEX Standard

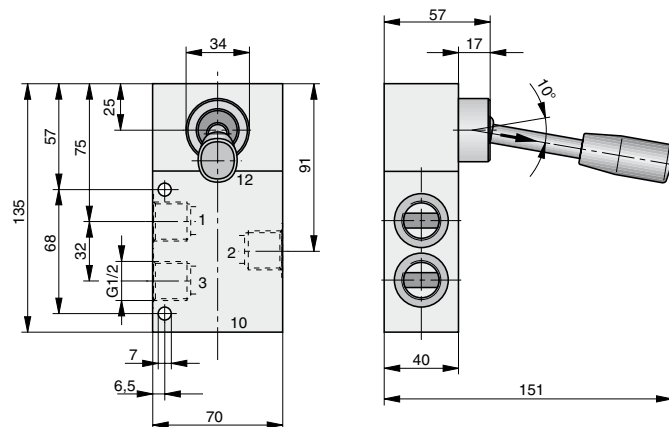
Weight (mass) kg

Description	Type	Weight (mass)
Hand lever, indexed	S9 311-1/2	0.900
– with spring return	S9 311RF-1/2	0.900
Safety hand lever	S9 311S-1/2	0.900
Rotary lever, indexed	S9 312-1/2	0.950
–with spring return	S9 312RF-1/2	0.950
Pneumatic, by permanent signal	S9 361RF-1/2	0.700
Pneumatic, by impulse	S9 361-1/2	0.650
– with biased position	S9 362-1/2	0.650
Electrical, by permanent signal	S9 381(S) RF-1/2	0.770
Electrical, by impulse	S9 381(S)-1/2	1.008
– with biased position	S9 382(S)-1/2	1.008

Hand lever actuated – Type: S9 311-1/2, S9 311RF-1/2



Safety hand lever actuated – Type: S9 311S-1/2



The technical drawing shows two views of a mechanical component:

- Front View (Left):** Shows a rectangular base with a total width of 70 mm and a total height of 135 mm. The top section has a height of 57 mm. A central feature includes a circular hole with a diameter of 34 mm and a depth of 12 mm. Below this, there are two smaller holes with diameters of 6.5 mm and 7 mm, spaced 68 mm apart. The bottom section has a height of 91 mm. A dimension of 32 mm indicates the distance from the top edge to the center of the lower holes.
- Side View (Right):** Shows the profile of the component with a total width of 103.2 mm. The top section has a height of 57 mm. A central feature includes a circular hole with a diameter of 34 mm and a depth of 12 mm. Below this, there are two smaller holes with diameters of 6.5 mm and 7 mm, spaced 68 mm apart. The bottom section has a height of 91 mm. A dimension of 32 mm indicates the distance from the top edge to the center of the lower holes.

Technical drawing of the S9 581(S)-1/2 and S9 582(S)-1/2 valves. The drawing shows a side view and a top view. The side view includes dimensions for overall height (246), mounting bracket height (167, 158, 117), and valve body height (73). The top view shows dimensions for overall width (70), mounting bracket width (68), and valve body width (40). The drawing also shows the valve handle, actuator, and various connection points (G1/8, G1/2, G3/4).

- The “normally open” valve S9 381S-RF-1/2 cannot be used on a P-supply manifold.

Solenoid width 30 mm

Cable length see Order Instructions

62

ca. 39

ca. 31

ca. 51

1

X = 21 mm

For order instructions see page 70-72, characteristics see page 44-47

55

5/2 Way Valves Series S9

G1/8

Actuation systems:

- Hand lever
- Safety hand lever
- Pneumatic
- Electrical pilot operated
- Electrical pilot operated with external pilot air
- Panel mounting actuators to DIN 43696

Versions:

- With external pilot air
- With biased position
- Version to ATEX Standard

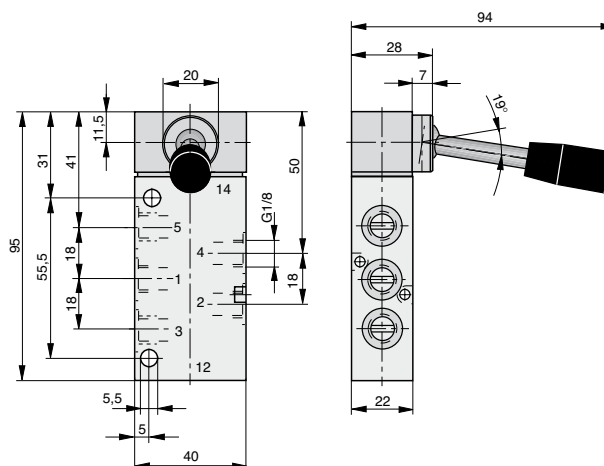
Weight (mass) kg

Description	Type	Weight (mass)
Hand lever, indexed	S9 511-1/8	0.195
– with spring return	S9 511RF-1/8	0.195
Safety hand lever	S9 511S-1/8	0.195
Pneumatic, by permanent signal	S9 561RF-1/8	0.160
Pneumatic, by impulse	S9 561-1/8	0.170
Electrical, by permanent signal	S9 581(S)RF-1/8	0.280
Electrical, by impulse	S9 581(S)-1/8	0.415
– with biased position	S9 582-1/8	0.415

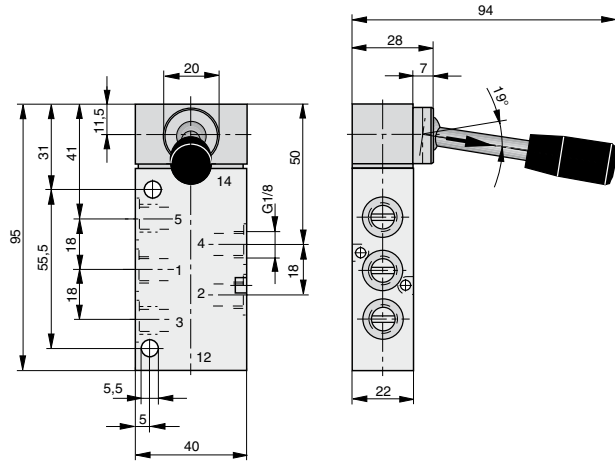
Weight (mass) and actuating forces for valves with panel mounting

Description	Type	Actuating force (N, Nm)	Weight (mass) (kg)
Rotary lever	S9 512T-1/8	0.3	0.160
	S9 512T-RF-1/8	0.3	0.160
Pushbutton	S9 513T-RF-1/8	8.0	0.150
Mushroom pushbutton	S9 515T-RF-1/8	8.0	0.160
Locking switch	S9 516T-1/8	9.0	0.225
Rotary switch	S9 517T-1/8	0.3	0.150
Mushroom pushbutton emergency-Off	S9 518T-1/8	10.0	0.160

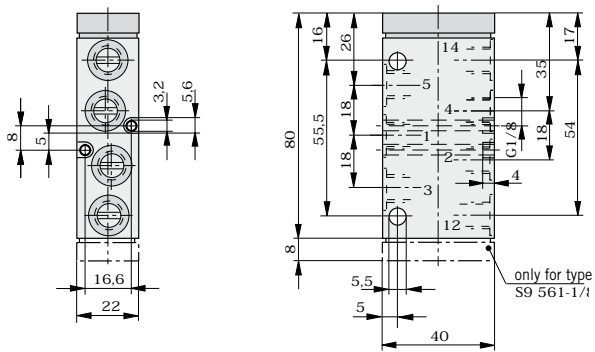
Hand lever actuated – Type: S9 511-1/8, S9 511RF-1/8



Safety hand lever actuated – Type: S9 511S-1/8

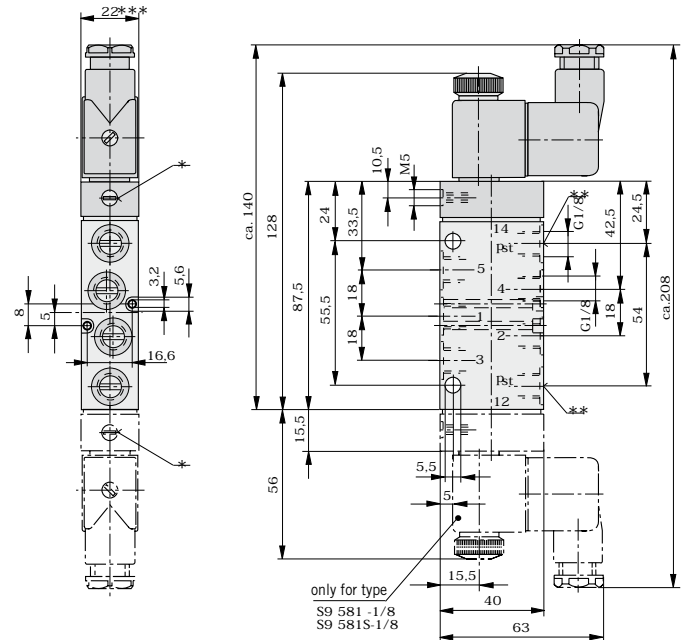


Pneumatically actuated – Type: S9 561-1/8, S9 561RF-1/8



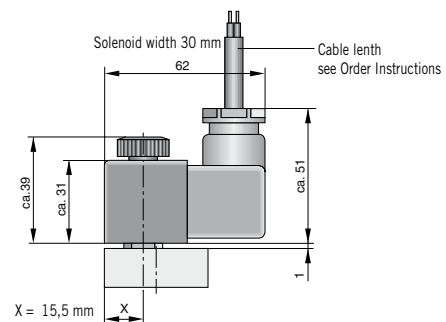
Electrically actuated

Type: S9 581(S)-1/8, S9 581(S)RF-1/8, S9 582-1/8



- * Manual override
- ** Operating pressure supply p_{st} only for type S9 581S
- *** Solenoid width = 30 mm on low wattage coil version

**Solenoid for use in EX areas
Dimensions**

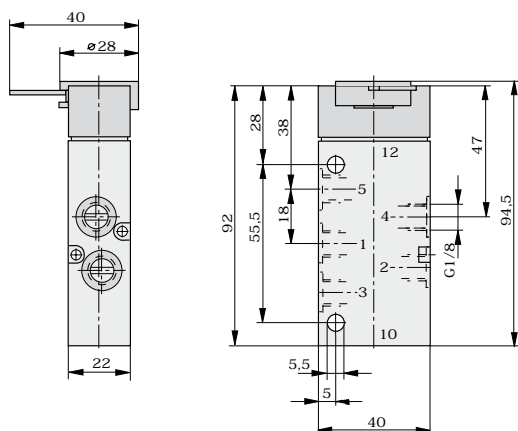


For more information on valves to ATEX standards
see page 46, 47, 74

For order instructions see page 73, 74, characteristics see page 44-47

Dimensions in mm

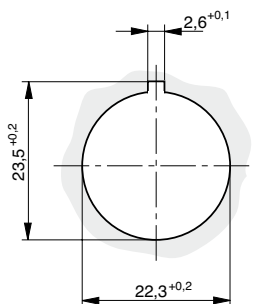
Basic valve for panel mounting actuators – Type: S9 590RF-1/8



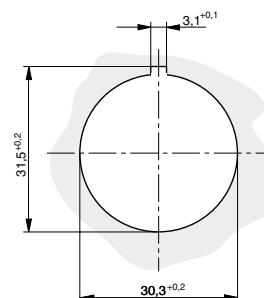
The actuators for these valves are interchangeable and can be mounted with 180° displacement on the basic valve. The actuators are not mounted upon delivery.

Mounting diameter

Mounting diameter Ø22 mm

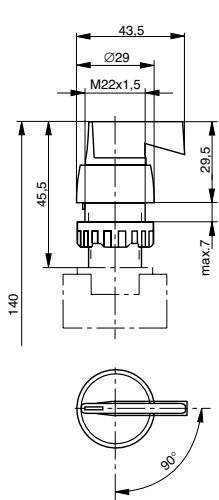


Mounting diameter Ø30 mm

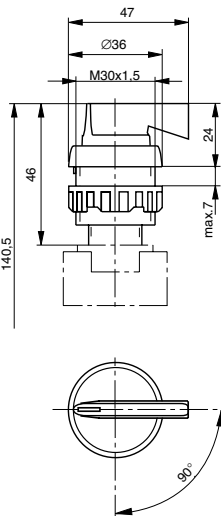


Rotary lever, indexed – Type: 12T-22, 12T-30

Mounting diameter Ø22 mm

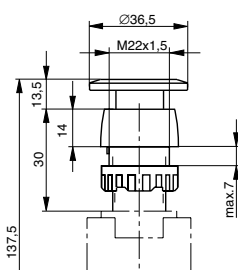


Mounting diameter Ø30 mm

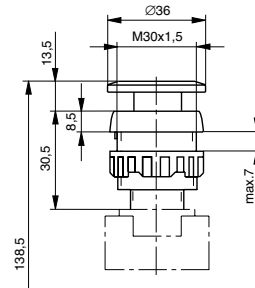


Mushroom pushbutton – Type: 15T-RF-22, 15T-RF-30

Mounting diameter Ø22 mm

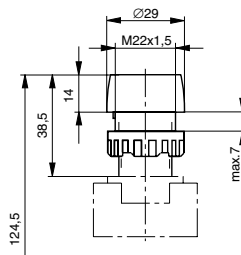


Mounting diameter Ø30 mm

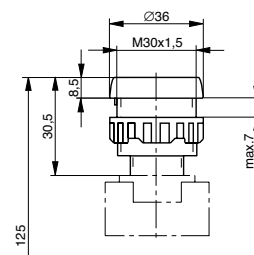


Pushbutton – Type: 13T-RF-22, 13T-RF-30

Mounting diameter Ø22 mm

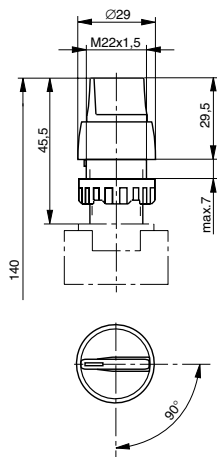


Mounting diameter Ø30 mm

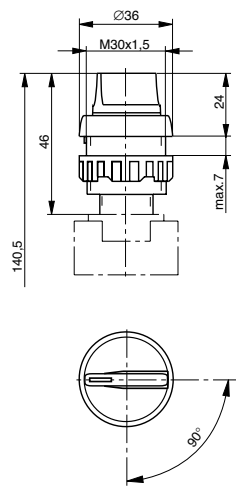


Rotary switch – Type: 17T-22, 17T-30

Mounting diameter Ø22 mm

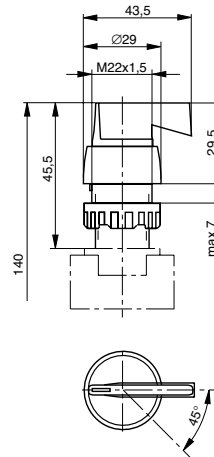


Mounting diameter Ø30 mm

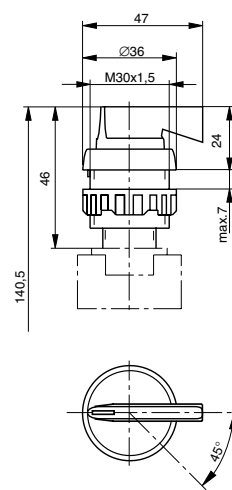


Rotary lever with spring return – Type: 12T-RF-22, 12T-RF-30

Mounting diameter Ø22 mm

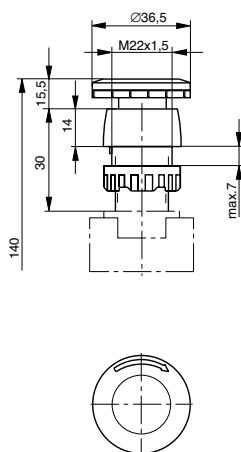


Mounting diameter Ø30 mm

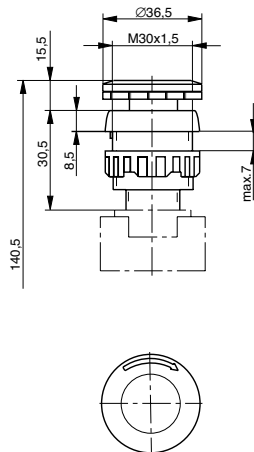


Mushroom pushbutton emergency-Off – Type: 18T-22, 18T-30

Mounting diameter Ø22 mm

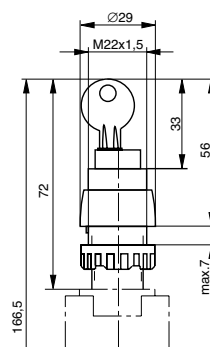


Mounting diameter Ø30 mm

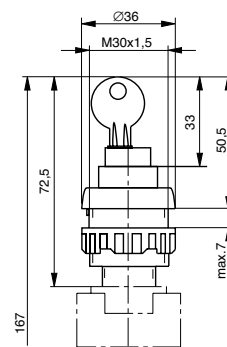


Locking switch – Type: 16T-22, 16T-30

Mounting diameter Ø22 mm



Mounting diameter Ø30 mm



For order instructions see page 73, 74, characteristics see page 44-47

Dimensions in mm

G1/4

- Hand lever
- Safety hand lever
- Pneumatic
- Electrical pilot operated
- Electrical pilot operated with external pilot air

- With external pilot air
- With biased position
- Version to ATEX Standard

Description	Type	Weight (mass)
Hand lever, indexed	S9 511-1/4	0.520
– with spring return	S9 511RF-1/4	0.520
Safety hand lever	S9 511S-1/4	0.520
Rotary lever, indexed	S9 512-1/4	0.520
– with spring return	S9 512RF-1/4	0.520
Pneumatic, by permanent signal	S9 561RF-1/4	0.490
Pneumatic, by impulse	S9 561-1/4	0.510
– with biased position	S9 562-1/4	0.510
Electrical, by permanent signal	S9 581(S) RF-1/4	0.600
Electrical, by impulse	S9 581(S)-1/4	0.700
– with biased position	S9 582(S)-1/4	0.700

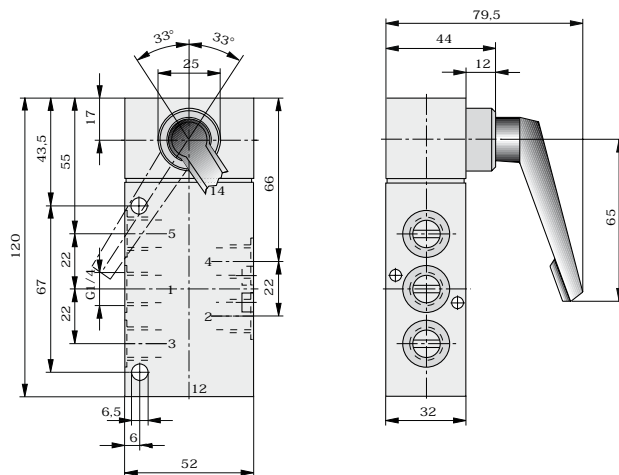
The technical drawing consists of two views of a mechanical component:

- Front View (Left):** Shows a rectangular base with a total width of 120 mm and a total height of 67 mm. The base has three circular features arranged vertically, each with a diameter of 14 mm. The top feature is centered horizontally. The middle and bottom features are offset from the centerline by 22 mm. The distance between the centers of the middle and bottom features is 22 mm. The top feature is located 43.5 mm from the top edge of the base. The base has a thickness of 6 mm. A dimension of 55 mm indicates the height of the upper section. A dimension of 17 mm indicates the height of the lower section. A dimension of 25 mm indicates the width of the upper section. A dimension of 66 mm indicates the total height of the upper section. A dimension of 12 mm indicates the width of the lower section. A dimension of 6.5 mm indicates the width of the middle section. A dimension of 6 mm indicates the width of the bottom section. A dimension of 52 mm indicates the total width of the base.
- Side View (Right):** Shows the profile of the component with a total width of 120 mm. The top feature has a radius of R12. The middle and bottom features have a radius of R8. The top feature is located 44 mm from the left edge of the base. The middle and bottom features are located 12 mm from the left edge of the base. The top feature is located 44 mm from the top edge of the base. The middle and bottom features are located 12 mm from the top edge of the base. The top feature is located 44 mm from the right edge of the base. The middle and bottom features are located 12 mm from the right edge of the base. The top feature is located 44 mm from the bottom edge of the base. The middle and bottom features are located 12 mm from the bottom edge of the base. The top feature is located 44 mm from the front edge of the base. The middle and bottom features are located 12 mm from the front edge of the base. The top feature is located 44 mm from the back edge of the base. The middle and bottom features are located 12 mm from the back edge of the base. The top feature is located 44 mm from the left edge of the base. The middle and bottom features are located 12 mm from the left edge of the base. The top feature is located 44 mm from the right edge of the base. The middle and bottom features are located 12 mm from the right edge of the base. The top feature is located 44 mm from the top edge of the base. The middle and bottom features are located 12 mm from the top edge of the base. The top feature is located 44 mm from the bottom edge of the base. The middle and bottom features are located 12 mm from the bottom edge of the base. The top feature is located 44 mm from the front edge of the base. The middle and bottom features are located 12 mm from the front edge of the base. The top feature is located 44 mm from the back edge of the base. The middle and bottom features are located 12 mm from the back edge of the base.



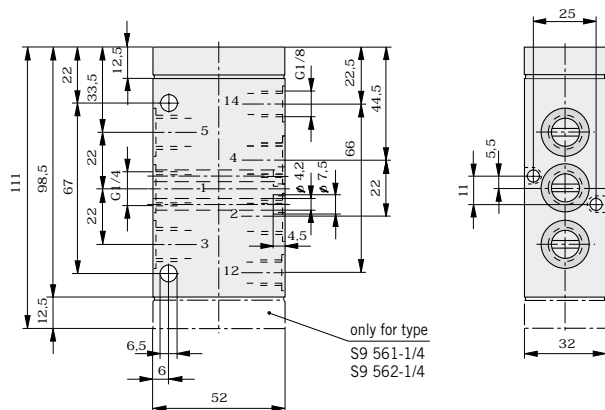
Rotary lever actuated

Type: S9 512-1/4, S9 512RF-1/4



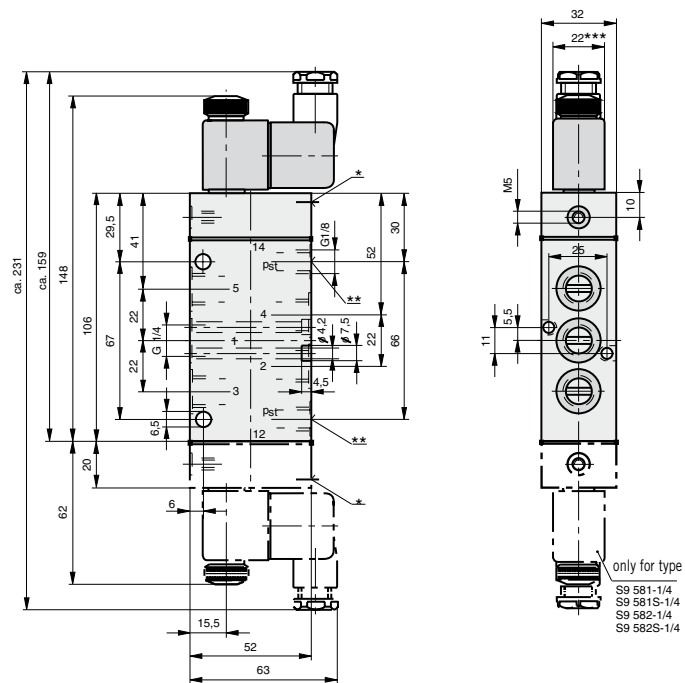
Pneumatically actuated

Type: S9 561-1/4, S9 562-1/4, S9 561RF-1/4



Electrically actuated

Type: S9 581(S)-1/4, S9 582(S)-1/4, S9 581(S)RF-1/4

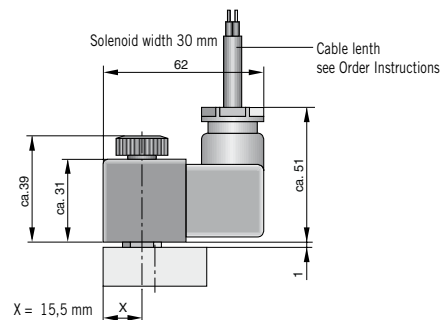


* Manual override

** Operating pressure supply p_{st} only for type S9 581S

*** Solenoid width = 30 mm on low wattage coil version

Solenoid for use in EX areas Dimensions



For more information on valves to ATEX standards
see page 46, 47, 74

For order instructions see page 73, 74, characteristics see page 44-47

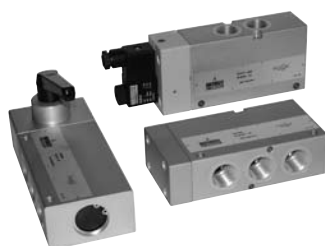
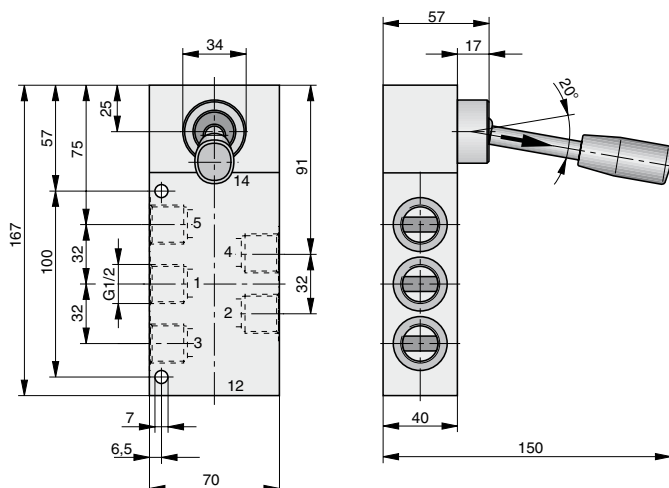
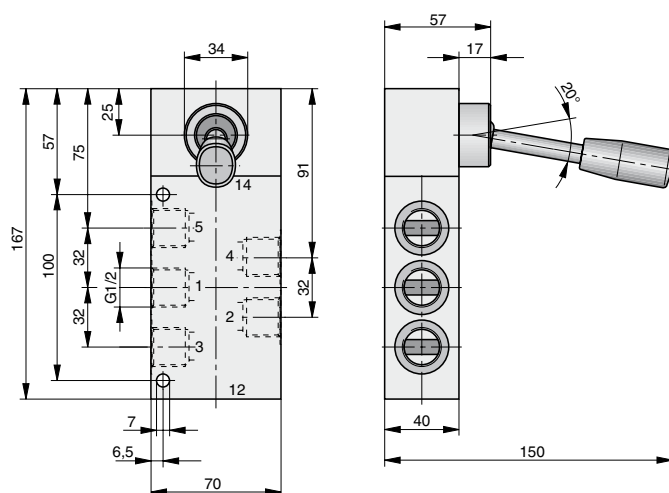
Dimensions in mm

$G1/2$

- Hand lever
- Safety hand lever
- Pneumatic
- Electrical pilot operated

- With external pilot air
- With biased position
- Version to ATEX Standard

Description	Type	Weight (mass)
Hand lever, indexed	S9 511-1/2	0.120
– with spring return	S9 511RF-1/2	0.120
Safety hand lever	S9 511S-1/2	0.120
Rotary lever, indexed	S9 512-1/2	0.120
– with spring return	S9 512RF-1/2	0.120
Pneumatic, by permanent signal	S9 561RF-1/2	0.800
Pneumatic, by impulse	S9 561-1/2	0.900
– with biased position	S9 562-1/2	0.900
Electrical, by permanent signal	S9 581(S) RF-1/2	1.000
Electrical, by impulse	S9 581(S)-1/2	1.045
– with biased position	S9 582-1/2	1.045



only for type
S9 561-1/2
S9 562-1/2

only for type
S9 581-1/2
S9 582-1/2
S9 581S-1/2

- * Manual override
- ** Operating pressure supply p_{st} only for type S9 581S
- *** Solenoid width is 30 mm on low wattage coil version

Technical drawing of the Solenoid Valve Assembly (Type 5232) showing dimensions and labels:

- Solenoid width 30 mm
- 62
- Cable length see Order Instructions
- ca. 39
- ca. 31
- ca. 51
- 1
- X = 21 mm
- X

For more information on valves to ATEX standards
see page 46, 47, 74

Dimensions in mm

5/3 Way Valves Series S9

G1/8

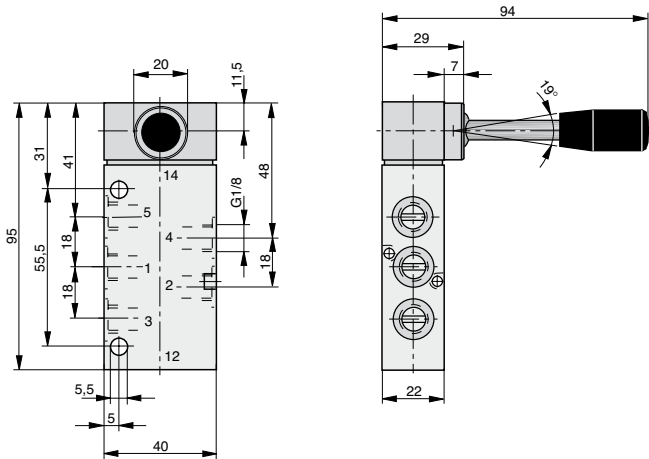
- Actuation systems:
- Hand lever
 - Safety hand lever
 - Pneumatic
 - Electrical pilot operated

- Versions:
- With external pilot air
 - Version to ATEX Standard

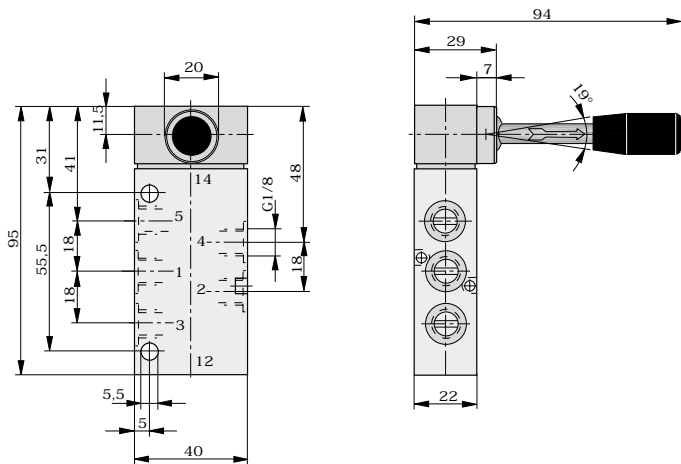
Weight (mass) kg		
Description	Type *	Weight (mass)
Hand lever	S9 511.-1/8	0,195
– with spring return	S9 511RF.-1/8	0,195
Safety hand lever	S9 511S.-1/8	0,195
Pneumatic, by permanent signal	S9 561RF.-1/8	0,180
Electrical, by permanent signal	S9 581RF.-1/8	0,425
Electrical, by permanent signal	S9 581S-RF.-1/8	0,425

* Type code for middle position functions
 G = middle position closed
 E = middle position exhausted
 B = middle position pressurized

Hand lever actuated – Type: S9 511.-1/8, S9 511RF.-1/8



Safety hand lever actuated – Type: S9 511S.-1/8



The technical drawing shows two views of the HPS 6000 pressure washer:

- Front View (Left):** Shows the main body with a width of 22 mm at the top handle area. The distance between the trigger gun mounting points is 16.6 mm. The distance from the bottom handle to the trigger gun is 8 mm. The distance from the trigger gun to the spray lance connection is 5 mm. The distance from the spray lance connection to the motor unit is 3.2 mm. The distance from the motor unit to the bottom handle is 5.6 mm. There are asterisks (*) indicating specific features or tolerances.
- Side View (Right):** Shows the profile of the device with various dimensions:
 - Total height: ca. 140 mm
 - Height from base to trigger gun: 128 mm
 - Height from base to motor unit: 87.5 mm
 - Height from base to spray lance connection: 55.5 mm
 - Height from base to trigger gun: 24 mm
 - Height from base to motor unit: 35.5 mm
 - Height from base to spray lance connection: 18 mm
 - Height from base to trigger gun: 18 mm
 - Height from base to motor unit: 10.5 mm
 - Height from base to spray lance connection: M5
 - Height from base to trigger gun: G1/8
 - Height from base to motor unit: 14 mm
 - Height from base to spray lance connection: 4 mm
 - Height from base to trigger gun: 2 mm
 - Height from base to motor unit: 1 mm
 - Height from base to spray lance connection: 12 mm
 - Height from base to trigger gun: 5.5 mm
 - Height from base to motor unit: 5 mm
 - Height from base to spray lance connection: 15.5 mm
 - Height from base to trigger gun: 40 mm
 - Height from base to motor unit: 63 mm
 - Height from base to spray lance connection: 42.5 mm
 - Height from base to trigger gun: 18 mm
 - Height from base to motor unit: 1 mm

* Manual override
 ** Solenoid width = 30 mm on low wattage coil version
 *** Operating pressure supply p_{st} only for type S9 581S

Solenoid width 30 mm

Cable length see Order Instructions

62

ca. 51

1

ca. 39

ca. 31

X = 15,5 mm

For more information on valves to ATEX standards
see page 46, 47, 77

Dimensions in mm

5/3 Way Valves Series S9

G1/4

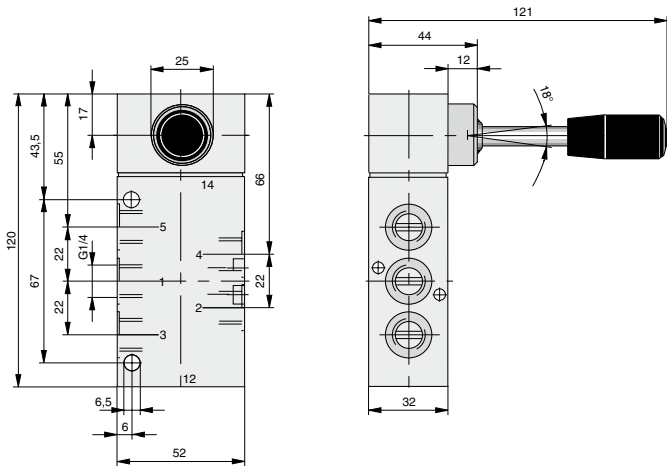
- Actuation systems:
- Hand lever
 - Safety hand lever
 - Pneumatic
 - Electrical pilot operated

- Versions:
- Version to ATEX Standard

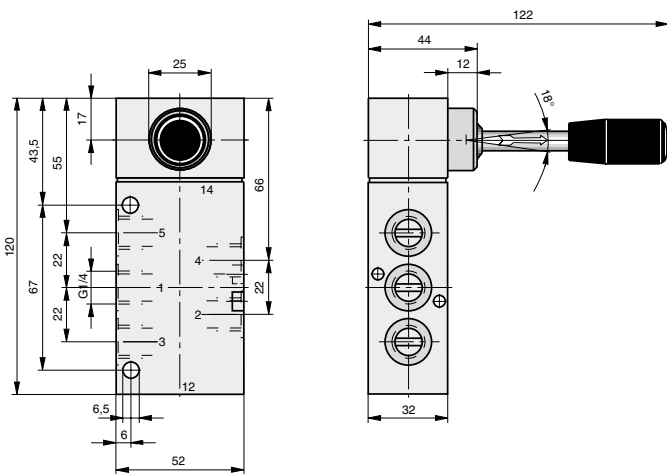
Weight (mass) kg		
Description	Type *	Weight (mass)
Hand lever, indexed	S9 511.-1/4	0.520
– with spring return	S9 511RF.-1/4	0.530
Safety hand lever	S9 511S.-1/4	0.520
Rotary lever, indexed	S9 512.-1/4	0.520
–with spring return	S9 512RF.-1/4	0.530
Pneumatic, by permanent signal	S9 561RF.-1/4	0.530
Electrical, by permanent signal	S9 581RF.-1/4	0.700

* Type code for middle position functions
 G = middle position closed
 E = middle position exhausted
 B = middle position pressurized

Hand lever actuated – Type: S9 511.-1/4, S9 511RF.-1/4



Safety hand lever actuated – Type: S9 511S.-1/4



5/3 Way Valves Series S9

G1/2

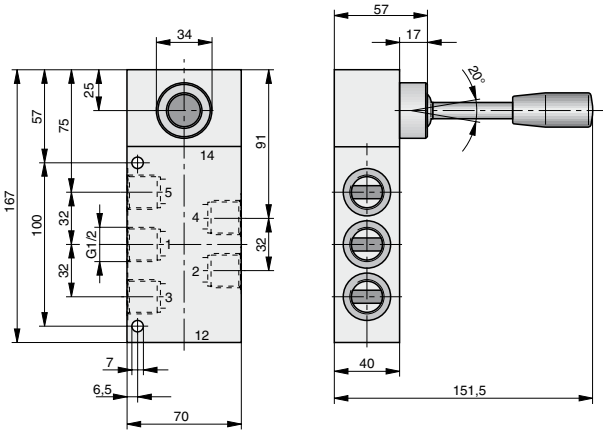
- Actuation systems:**
- Hand lever
 - Safety hand lever
 - Pneumatic
 - Electrical pilot operated

- Versions:**
- Version to ATEX Standard

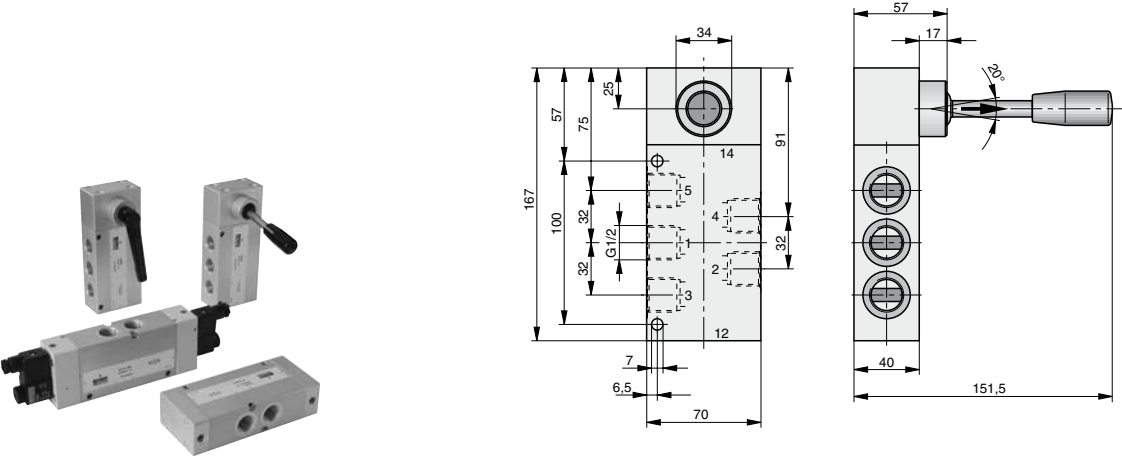
Weight (mass) kg		
Description	Type *	Weight (mass)
Hand lever, indexed	S9 511.-1/2	1.200
– with spring return	S9 511RF.-1/2	1.200
Safety hand lever	S9 511S.-1/2	1.200
Rotary lever, indexed	S9 512.-1/2	1.200
– with spring return	S9 512RF.-1/2	1.200
Pneumatic, by permanent signal	S9 561RF.-1/2	0.900
Electrical, by permanent signal	S9 581RF.-1/2	1.045

* Type code for middle position functions
 G = middle position closed
 E = middle position exhausted
 B = middle position pressurized

Hand lever actuated – Type: S9 511.-1/2, S9 511RF.-1/2



Safety hand lever actuated – Type: S9 511S.-1/2



The technical drawing shows two views of a mechanical component:

- Front View (Left):** A rectangular part with overall dimensions of 70 mm width and 158 mm height. It features three horizontal slots. The top slot has a depth of 6.5 mm and a width of 7 mm. The middle slot has a depth of 7 mm and a width of 19 mm. The bottom slot has a depth of 14 mm and a width of 19 mm. The distance between the centers of the slots is 32 mm. The total height from the base to the top of the first slot is 100 mm.
- Side View (Right):** A rectangular part with overall dimensions of 40 mm width and 140 mm height. It features three circular holes arranged vertically. The center-to-center distance between the holes is 32 mm. The distance from the base to the center of the bottom hole is 63 mm. The diameter of each hole is 16 mm. The thickness of the part is 9.5 mm deep.

Technical drawing of the 1000 Series Hydraulic Cylinder, showing front and side views with dimensions in millimeters.

Front View Dimensions:

- Total height: 283
- Top section height: 201.5
- Section height: 190
- Section height: 149
- Section height: 100
- Section height: 39
- Section height: 57
- Section height: 32
- Section height: 32
- Section height: 6.5
- Section height: 7
- Section height: 29
- Section height: 70
- Section height: 12
- Section height: 14
- Section height: 29
- Section height: 73
- Section height: 32
- Section height: 21
- Section height: 68
- Section height: 70

Side View Dimensions:

- Total width: 40
- Section width: 32.5
- Section width: 22
- Section width: 16
- Section width: 5.3
- Section width: 9.56 deep

** Solenoid width is 30 mm on low wattage coil version

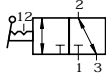
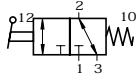
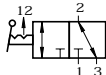
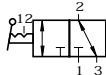
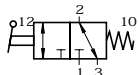
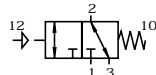
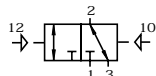
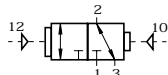
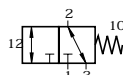
Technical drawing of the Solenoid Valve Assembly (Type 5232) showing dimensions and labels:

- Solenoid width 30 mm
- 62
- Cable length see Order Instructions
- ca. 39
- ca. 31
- ca. 51
- 1
- X = 21 mm
- X

For more information on valves to ATEX standards
see page 46, 47, 77

Dimensions in mm

3/2 Way Valves – Standard versions

Actuation System	Symbol	Mounting Ø (mm)	Order Instructions		Page
			Type	Order No.	
Hand lever, indexed			S9 311-1/8	PA 10293	48
			S9 311-1/4	PA 12708	52
			S9 311-1/2	PA 16404	54
Hand lever, spring return			S9 311RF-1/8	PA 10294	48
			S9 311RF-1/4	PA 12709	52
			S9 311RF-1/2	PA 16405	54
Hand lever secured in 2 switching positions			S9 311S-1/4	PA 12710	52
			S9 311S-1/2	PA 16406	54
Rotary lever, indexed			S9 312-1/4	PA 12711	53
			S9 312-1/2	PA 16407	45
Rotary lever, spring return			S9 312RF-1/4	PA 12712	53
			S9 312RF-1/2	PA 16408	55
Pneumatic, by permanent signal			S9 361RF-1/8	PA 10295	49
			S9 361RF-1/4	PA 12713	53
			S9 361RF-1/2	PA 16409	55
Pneumatic, by impulse			S9 361-1/8	PA 10296	49
			S9 361-1/4	PA 12714	53
			S9 361-1/2	PA 16410	55
Pneumatic, by impulse, with biased position			S9 362-1/4	PA 12715	53
			S9 362-1/2	PA 16411	55
Basic valve for panel mounting			S9 390RF-1/8	PA 10307	50
Rotary lever, indexed		22	12T-22	KX 9355	50
		30	12T-30	KX 9314	
Rotary lever, spring return		22	12T-RF-22	KX 9356	51
		30	12T-RF-30	KX 9315	
Pushbutton		22	13T-RF-22	KX 9357	50
		30	13T-RF-30	KX 9316	
Mushroom pushbutton		22	15T-RF-22	KX 9358	51
		30	15T-RF-30	KX 9317	
Locking switch		22	16T-22	KX 9359	51
		30	16T-30	KX 9318	

Actuation System	Symbol	Mounting Ø (mm)	Order Instructions Type	Order No.	Page
Rotary switch		22	17T-22	KX 9360	51
		30	17T-30	KX 9319	
Mushroom pushbutton emergency-Off		22	18T-22	KX 9361	51
		30	18T-30	KX 9320	
Electrical by permanent signal			S9 381RF-1/8-NC-..	PA 10297-..33	49
			S9 381RF-1/4-NC-..	PA 12716-..33	53
			S9 381RF-1/2-NC-..	PA 16412-..33	55
			S9 381RF-1/8-NO-..	PA 10298-..33	49
			S9 381RF-1/4-NO-..	PA 12717-..33	53
			S9 381RF-1/2-NO-..	PA 16413-..33	55
			S9 381S-RF-1/8-..	PA 10300-..33	49
			S9 381S-RF-1/4-..	PA 12719-..33	53
			S9 381S-RF-1/2-..	PA 16415-..33	55
			S9 381-1/8-..	PA 10299-..33	49
			S9 381-1/4-..	PA 12718-..33	53
			S9 381-1/2-..	PA 16414-..33	55
Electrical, by impulse, with external pilot air			S9 381S-1/8-..	PA 10301-..33	49
			S9 381S-1/4-..	PA 12720-..33	53
			S9 381S-1/2-..	PA 16417-..33	55
Electrical by impulse, with biased position			S9 382-1/4-..	PA 12721-..33	53
			S9 382-1/2-..	PA 16418-..33	55
			S9 382S-1/4-..	PA 12722-..33	53
			S9 382S-1/2-..	PA 16419-..33	55

Solenoid version	Nominal voltage	Applicable for	Key code	ATEX Type additon
Standard version	230V 50/60Hz	110 V =	61	–
	24V =	60V 50/60Hz	02	–
Low wattage version	24V =		13	–
	230V 50/60Hz		69	–
EX Area versions to ATEX standard see page 72				

EX Area versions to ATEX Standard**Category, type of ignition protection**

Single valve: Ⓢ II 2G c T4 T135°C -10°C≤Ta≤+60°C

Solenoid/individual use: Ⓢ II 2G EEx m II T5 -20°C≤Ta≤+50°C

Solenoid/manifold mounting: Ⓢ II 2G EEx m II T5 -20°C≤Ta≤+40°C

Solenoid version	Nominal voltage	Applicable for	Key code	ATEX Type additon
Solenoid	24V =		48	ATEX
– with cable 1.2 m				
– with cable 3 m	24V =		45	ATEX
– with cable 5 m	24V =		46	ATEX
– with cable 10 m	24V =		47	ATEX
– with cable 1.2 m	24V 50/60Hz		99	ATEX
– with cable 1.2 m	110V 50/60Hz		97	ATEX
– with cable 1.2 m	230V 50/60Hz		98	ATEX

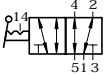
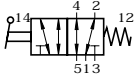
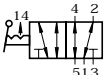
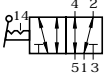
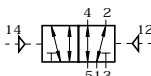
Example for valves in ATEX-Version:

– for valves Series S9-G1/8, S9-G1/4, S9-G1/2

Please add behind the Standard Order No. “ATEX”

Type: S9 381RF-1/8-NC-4633**Order No. PA10297-4633ATEX**

Order Instructions – 5/2 Way Valves – Standard versions

Actuation System	Symbol	Mounting Ø (mm)	Order Instructions		Page
			Type	Order No.	
Hand lever, indexed			S9 511-1/8	PA 10308	56
			S9 511-1/4	PA 12671	60
			S9 511-1/2	PA 16367	62
Hand lever, spring return			S9 511RF-1/8	PA 10309	56
			S9 511RF-1/4	PA 12672	60
			S9 511RF-1/2	PA 16366	62
Hand lever secured in 2 switching positions			S9 511S-1/8	PA 10368	57
			S9 511S-1/4	PA 12673	60
			S9 511S-1/2	PA 16368	62
Rotary lever, indexed			S9 512-1/4	PA 12674	61
			S9 512-1/2	PA 16378	63
Rotary lever, spring return			S9 512RF-1/4	PA 12675	61
			S9 512RF-1/2	PA 16379	63
Pneumatic, by permanent signal			S9 561RF-1/8	PA 10310	57
			S9 561RF-1/4	PA 12676	61
			S9 561RF-1/2	PA 16165	63
Pneumatic, by impulse			S9 561-1/8	PA 10311	57
			S9 561-1/4	PA 12677	61
			S9 561-1/2	PA 16166	63
Pneumatic, by impulse, with biased position			S9 562-1/4	PA 12678	61
			S9 562-1/2	PA 16167	63
Basic valve for panel mounting			S9 590RF-1/8	PA 10320	58
Rotary lever, indexed		22	12T-22	KX 9355	58
		30	12T-30	KX 9314	
Rotary lever, spring return		22	12T-RF-22	KX 9356	59
		30	12T-RF-30	KX 9315	
Pushbutton		22	13T-RF-22	KX 9357	58
		30	13T-RF-30	KX 9316	
Mushroom pushbutton		22	15T-RF-22	KX 9358	58
		30	15T-RF-30	KX 9317	
Locking switch		22	16T-22	KX 9359	59
		30	16T-30	KX 9318	

Order Instructions – 5/2 Way Valves – Standard versions

Actuation System	Symbol	Mounting Ø (mm)	Order Instructions		Page
			Type	Order No.	
Rotary switch		22	17T-22	KX 9360	58
		30	17T-30	KX 9319	
Mushroom pushbutton Emergency-Off		22	18T-22	KX 9361	59
		30	18T-30	KX 9320	
Electrical, by permanent signal			S9 581RF-1/8-..	PA 10312-..33	57
			S9 581RF-1/4-..	PA 12679-..33	61
			S9 581RF-1/2-..	PA 16171-..33	63
			S9 581S-RF-1/8-..	PA 10314-..33	57
			S9 581S-RF-1/4-..	PA 12681-..33	61
			S9 581S-RF-1/2-..	PA 16174-..33	63
Electrical, by impulse			S9 581-1/8-..	PA 10313-..33	57
			S9 581-1/4-..	PA 12680-..33	61
			S9 581-1/2-..	PA 16172-..33	63
			S9 581S-1/8-..	PA 10315-..33	57
			S9 581S-1/4-..	PA 12682-..33	61
			S9 581S-1/2-..	PA 16175-..33	63

Solenoid version	Nominal voltage	Applicable for	Key code	ATEX Type additon
Standard version	230V 50/60Hz	110 V =	61	–
	24V =	60V 50/60Hz	02	–
Low wattage version	24V =		13	–
	230V 50/60Hz		69	–

EX Area versions to ATEX Standard

Category, type of ignition protection

Single valve: Ⓢ II 2G c T4 T135°C -10°C≤Ta≤+60°C

Solenoid/individual use: Ⓢ II 2G EEx m II T5 -20°C≤Ta≤+50°C

Solenoid/manifold mounting: Ⓢ II 2G EEx m II T5 -20°C≤Ta≤+40°C

Solenoid version	Nominal voltage	Applicable for	Key code	ATEX Type additon
Solenoid	24V =		48	ATEX
– with cable 1.2 m	24V =		45	ATEX
– with cable 3 m	24V =		46	ATEX
– with cable 5 m	24V =		47	ATEX
– with cable 10 m	24V =		99	ATEX
– with cable 1.2 m	24V 50/60Hz		97	ATEX
– with cable 1.2 m	110V 50/60Hz		98	ATEX
– with cable 1.2 m	230V 50/60Hz			ATEX

Example for valves in ATEX-Version:

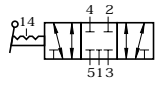
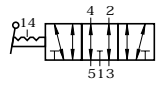
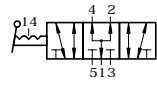
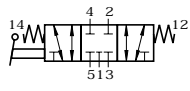
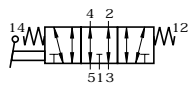
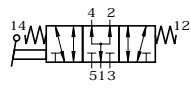
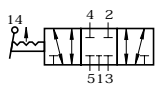
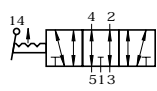
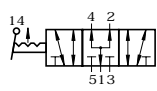
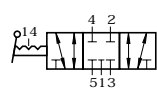
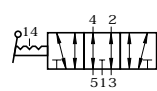
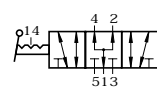
– for valves Series S9-G1/8, S9-G1/4, S9-G1/2

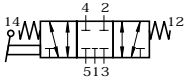
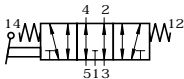
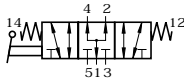
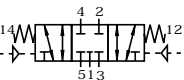
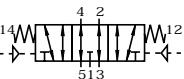
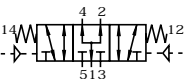
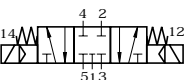
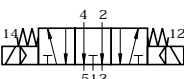
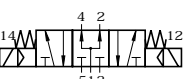
Please add behind the Standard Order No. “ATEX“

Type: S9 581RF-1/8-4633

Order No. PA10312-4633ATEX

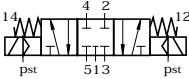
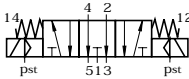
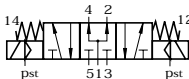
Order Instructions – 5/3 Way Valves – Standard versions

Actuation System	Symbol	Order Instructions		Page
		Type	Order No.	
Hand lever, secured in 3 operating positions		S9 511G-1/8	PA 10321	64
		S9 511G-1/4	PA 12687	66
		S9 511G-1/2	PA 16369	68
		S9 511E-1/8	PA 10322	64
		S9 511E-1/4	PA 12688	66
		S9 511E-1/2	PA 16370	68
		S9 511B-1/8	PA 10323	64
		S9 511B-1/4	PA 12689	66
		S9 511B-1/2	PA 16371	68
Hand lever, spring return to middle position		S9 511RFG-1/8	PA 10324	64
		S9 511RFG-1/4	PA 12690	66
		S9 511RFG-1/2	PA 16372	68
		S9 511RFE-1/8	PA 10325	64
		S9 511RFE-1/4	PA 12691	66
		S9 511RFE-1/2	PA 16373	68
		S9 511RFB-1/8	PA 10326	64
		S9 511RFB-1/4	PA 12692	66
		S9 511RFB-1/2	PA 16374	68
Hand lever, secured in 3 operating positions		S9 511SG-1/8	PA 10327	64
		S9 511SG-1/4	PA 12693	66
		S9 511SG-1/2	PA 16375	68
		S9 511SE-1/8	PA 10328	64
		S9 511SE-1/4	PA 12694	66
		S9 511SE-1/2	PA 16376	68
		S9 511SB-1/8	PA 10329	64
		S9 511SB-1/4	PA 12695	66
		S9 511SB-1/2	PA 16377	68
Rotary lever, indexed in 3 operating positions		S9 512G-1/4	PA 12696	67
		S9 512G-1/2	PA 16380	69
		S9 512E-1/4	PA 12697	67
		S9 512E-1/2	PA 16381	69
		S9 512B-1/4	PA 12698	67
		S9 512B-1/2	PA 16382	69

Actuation System	Symbol	Order Instructions		Page
		Type	Order No.	
Rotary lever, spring return to middle position		S9 512RFG-1/4	PA 12699	67
		S9 512RFG-1/2	PA 16383	69
		S9 512RFE-1/4	PA 12700	67
		S9 512RFE-1/2	PA 16384	69
		S9 512RFB-1/4	PA 12701	67
		S9 512RFB-1/2	PA 16385	69
Pneumatic, by permanent signal		S9 561RFG-1/8	PA 10330	65
		S9 561RFG-1/4	PA 12702	67
		S9 561RFG-1/2	PA 16168	69
		S9 561RFE-1/8	PA 10331	65
		S9 561RFE-1/4	PA 12703	67
		S9 561RFE-1/2	PA 16169	69
		S9 561RFB-1/8	PA 10332	65
		S9 561RFB-1/4	PA 12704	67
		S9 561RFB-1/2	PA 16170	69
Electrical by permanent signal		S9 581RFG-1/8-..	PA 10333-..33	65
		S9 581RFG-1/4-..	PA 12705-..33	67
		S9 581RFG-1/2-..	PA 16176-..33	69
		S9 581RFE-1/8-..	PA 10334-..33	65
		S9 581RFE-1/4-..	PA 12706-..33	67
		S9 581RFE-1/2-..	PA 16177-..33	69
		S9 581RFB-1/8-..	PA 10335-..33	65
		S9 581RFB-1/4-..	PA 12707-..33	67
		S9 581RFB-1/2-..	PA 16178-..33	69



For complete Type- and Order No. - see page 77

Actuation System	Symbol	Order Instructions		Page
		Type	Order No.	
Electrical by permanent signal		S9 581S-RFG-1/8-..	PA 10377-..33	65
		S9 581S-RFG-1/4-..	PA 12925-..33	67
spring return to middle position		S9 581S-RFE-1/8-..	PA 10379-..33	65
		S9 581S-RFE-1/4-..	PA 12923-..33	67
with external pilot air		S9 581S-RFB-1/8-..	PA 10378-..33	65
		S9 581S-RFB-1/4-..	PA 12924-..33	67

Solenoid version	Nominal voltage	Applicable for	Key code	ATEX Type additon
Standard version	230V 50/60Hz	110 V =	61	–
	24V =	60V 50/60Hz	02	–
Low wattage version	24V =		13	–
	230V 50/60Hz		69	–

EX Area versions to ATEX Standard

Category, type of ignition protection

Single valve: Ⓢ II 2G c T4 T135°C -10°C≤Ta≤+60°C

Solenoid/individual use: Ⓢ II 2G EEx m II T5 -20°C≤Ta≤+50°C

Solenoid/manifold mounting: Ⓢ II 2G EEx m II T5 -20°C≤Ta≤+40°C

Solenoid version	Nominal voltage	Applicable for	Key code	ATEX Type additon
Solenoid	24V =		48	ATEX
– with cable 1.2 m	24V =		45	ATEX
– with cable 3 m	24V =		46	ATEX
– with cable 5 m	24V =		47	ATEX
– with cable 10 m	24V =		99	ATEX
– with cable 1.2 m	24V 50/60Hz		97	ATEX
– with cable 1.2 m	110V 50/60Hz		98	ATEX
– with cable 1.2 m	230V 50/60Hz			ATEX

Example for valves in ATEX-Version:

– for valves Series S9-G1/8, S9-G1/4, S9-G1/2

Please add behind the Standard Order No. “ATEX“

Type: S9 581RFG-1/8-4633

Order No. PA10333-4633ATEX

3/2, 5/2 and 5/3 Way Valves Series S9

G1/8, G1/4

Actuation systems:

Pneumatic

- AND
- OR
- TIMER

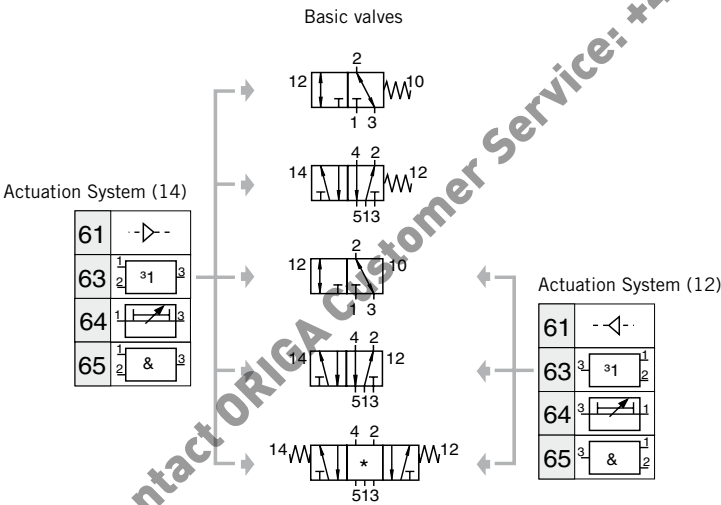
Versions:

- Freely selectable types
- See Order information
- All Timer-Versions on request

Weight (mass) kg

Description	Weight (mass) – Connection size	
	G1/8	G1/4
3/2 Way Valve, by permanent signal	0.137	0.370
3/2 Way Valve, by impulse	0.147	0.430
5/2 Way Valve, by permanent signal	0.160	0.490
5/2 Way Valve, by impulse	0.170	0.510
5/3 Way Valve, by permanent signal	0.180	0.530

Possible combinations:



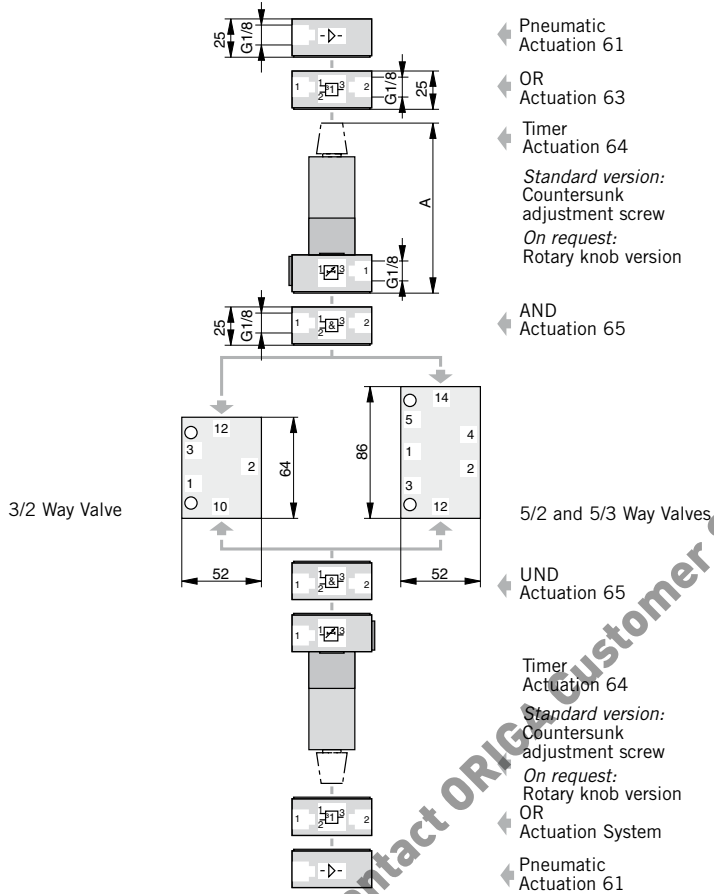
For more information on standard valves see Instructions sheets on page 44-69

- * RFG = middle position closed
- RFE = middle position exhausted
- RFB = middle position pressurized



Dimensions in mm

Valve Combinations with Logic Elements – 3/2, 5/2 and 5/3 Way Valves



Dimension Table and adjustment ranges

Adjustment range	Dimension A [mm]
0.1 to 15	103 (133*)
0.1 to 30	117 (147*)
0.1 to 60	150 (180*)

* Version with rotary knob (optional)

Dimension Table and adjustment ranges

Adjustment range	Dimension A [mm]
0.1 to 15	103 (133*)
0.1 to 30	117 (147*)
0.1 to 60	150 (180*)

* Version with rotary knob (optional)

Order Instructions

S9	5	63	/	65	-	RFG	-	1/4
----	---	----	---	----	---	-----	---	-----

Version

3	3 Way Valve
5	5 Way Valve

Actuation System (14)

61	Pneumatic
63	OR
64	Timer* – all Timer-Versions on request
65	AND

* only with connection size G1/4

Connection size

1/8	G1/8
1/4	G1/4

Mid position function (only with 5/3 Way Valves)

RFG	closed
RFE	vented
RFB	pressurized

Actuation System (14)

RF	spring return
61	pneumatic
63	OR
64	Timer* – all Timer-Versions on request
65	AND

* only with Connection size G1/4

Dimensions in mm

Way Valves with NAMUR Connections

Characteristics for Standard Valves

(¹ Note :
Please consult us for opera-
ting temperatures below 0° C

(² Low wattage version
connector DIN EN
175301-803 form A

(³ Version "middle position
vented" 1000 l/min



Series S9 – G1/8, G1/4 NAMUR

Characteristics	Symbol	Unit	Series S9	
			G1/8	G1/4
Actuation			Electrically actuated	Electrically actuated
General Features				
Type			Spoolvalve	Spoolvalve
Mounting			2 Screws M5	2 Screws M6
Tube connection			Thread/NAMUR connections	Thread/NAMUR connections
Thread			G1/8 – 7,4 deep	G1/4 – 11 deep
Weight		kg	0.245 permanent signal version	0.600 permanent signal version
		kg	0.340 impulse version	0.700 impulse version
Installation			In any position	In any position
Ambient temperature range (¹)	T _{min. / max.}	°C	-10 to +60	-10 to +60
Medium temperature range (¹)	T _{min. / max.}	°C	-10 to +60	-10 to +60
Medium			Filtered compressed air	
Lubrication			With or without oil mist lubrication (We recommend the use of mineral oil type VG 32 to ISO 3448)	
Pneumatic Characteristics				
Nominal pressure	p _{min. / max.}	bar	6	
Operating pressure range				
– permanent signal version	p _{min. / max.}	bar	2–10	
– impulse version	p _{min. / max.}	bar	1.5–10	
Nominal flow	Q _N	l/min	500	1300 (³)
Actuation				
Electrical			Pilot operated	
Voltage type			Alternating current (50/60Hz)	Direct current
Nominal voltage				
– Standard version	Un	V	230 ±10%	24 ±10% other voltages on request
– Low wattage version	Un	V	230 ±10%	24 ±10% other voltages on request
Initial power consumption				
– Standard version		VA (W)	8.5	2.5
– Low wattage version		VA (W)	6.6	2.1
Continuous consumption				
– Standard version		VA (W)	6.0	2.5
– Low wattage version		VA (W)	3.9	2.1
Duty cycle	ED	%	100	
Electrical protection		IP	IP 65 to DIN 40050 (applies only to solenoid with connector)	
Connection			Plug to DIN EN 175301-803 form B – industrial standard (²)	

Series S9 – G1/8, G1/4 NAMUR

Characteristics	Symbol	Unit	Series S9 G1/8	G1/4
Actuation			Electrically actuated	Electrically actuated
General Features				
Type			Spool valve	Spool valve
Mounting			2 Screws M5	2 Screws M6
Tube connection			Thread/NAMUR connections	Thread/NAMUR connections
Weight		kg	0.245 permanent signal version	0.600 permanent signal version
			0.340 impulse version	0.700 impulse version
Installation			In any position	In any position
Ambient temperature range ⁽¹⁾	T _{min. / max.}	°C	-10 to +60	-10 to +60
Medium temperature range ⁽¹⁾	T _{min. / max.}	°C	-10 to +60	-10 to +60
Medium			Filtered, unlubricated compressed air – free from water and dirt to ISO 8573-1 Solids: Class 7 particle < 40µm for gas Water content: pressure dew point +3°C, Class 4, but at least 5 °C below minimum operating temperature	
Pneumatic Characteristics				
Nominal pressure	p _{min. / max.}	bar	6	
Operating pressure range				
– permanent signal version	p _{min. / max.}	bar	2–8	
– impulse version	p _{min. / max.}	bar	1.5–8	
Nominal flow	Q _N	l/min	500	1300 ⁽³⁾
Actuation				
Electrical			Pilot operated	
Certification			EC Type Test Certificate for single valve: not required for mechanical units EC Type Test Certificate for solenoid coil: PTB-No. 03 Ex IEC 2019X and PTB 03 ATEX 2018X to T5	
Category, type of ignition protection			Single valve: Ⓢ II 2G c T4 T135°C -10°C≤Ta≤+60°C Solenoid/individual use: Ⓢ II 2G EEx m II T5 -20°C≤Ta≤+50°C Solenoid/manifold mounting: Ⓢ II 2G EEx m II T5 -20°C≤Ta≤+40°C	
Voltage type			Alternating current (50/60Hz)	Direct current
Nominal voltage	UN	V	230 ±10% 110 ±10% 24 ±10%	24 ±10% other voltages on request
Max. switching frequency		Hz	1	
Connection			G1/8, G1/4	G1/8, G1/4
Power rating at U _N		VA (W)	3.1 (230V) 3.0 (110V) 2.5 (24V)	3.3 (24V)
Max. power at U _N ⁽²⁾		VA (W)	2.9 (230V) 2.8 (110V) 2.4 (24V)	3.0 (24V)
Electrical protection		IP	IP65 (applies only to solenoid with cable)	
Connection			Cable – cable lengths see Order Instructions	

Way Valves with NAMUR Connections

Characteristics for Valves in EX Areas

⁽¹⁾ Note : Please consult us for operating temperatures below 0° C

⁽²⁾ Maximum power if warmed up to thermal load limit

⁽³⁾ Version “middle position vented” 1000 l/min



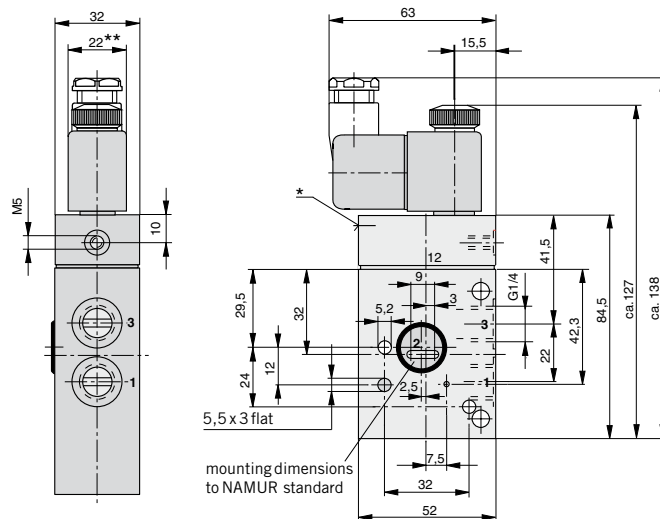
3/2 Way Valves Series S9

Electrically actuated – Type: S9 381RF-1/4-NC S0

G1/4

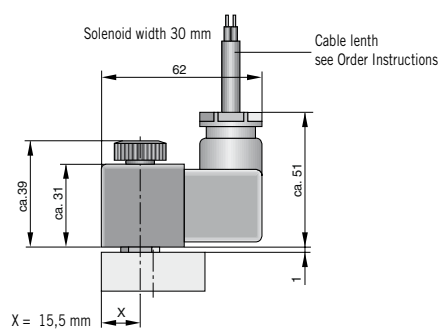
Actuation systems:
– Electrical pilot operated

Versions:
– With NAMUR connections
– Version to ATEX Standard



- * Manual override
- ** Solenoid width = 30 mm on low wattage coil version

Solenoid for use in EX areas Dimensions



The delivery includes:

- 1 Valve
- 2 Mounting Screws
- 1 Coding pin
- 2 O-Rings

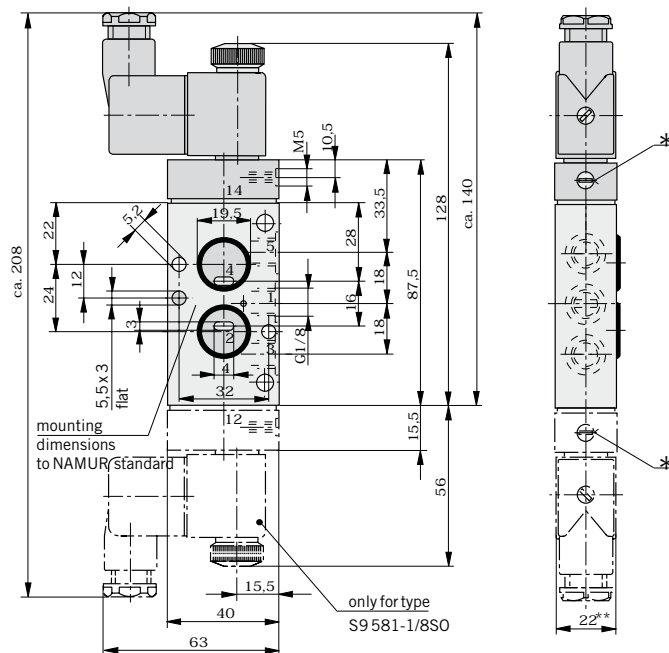
For more information on valves to ATEX standards
see page 46, 47, 107



Overview see page 107

Dimensions in mm

Electrically actuated – Type: S9 581...-1/8 SO



5/2 Way Valves Series S9

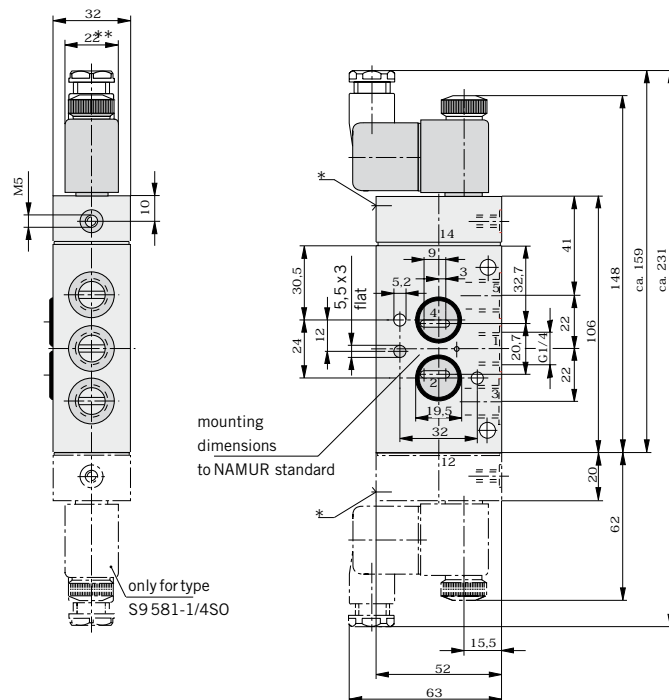
G1/8, G1/4

Actuation systems:
– Electrical pilot operated

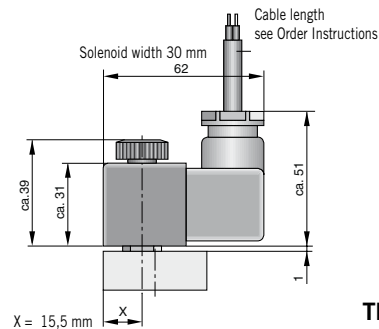
Versions:
– With NAMUR connections
– Version to ATEX standard

- * Manual override
- ** Solenoid width = 30 mm on low wattage coil version

Electrically actuated – Type: S9 581...-1/4 SO



Solenoid for use in EX areas
Dimensions



For more information on valves to ATEX standards see page 46, 47, 107

- * Manual override
- ** Solenoid width = 30 mm on low wattage coil version

The delivery includes:
1 Valve
2 Mounting Screws
1 Coding pin
2 O-Rings

Overview see page 107

Dimensions in mm



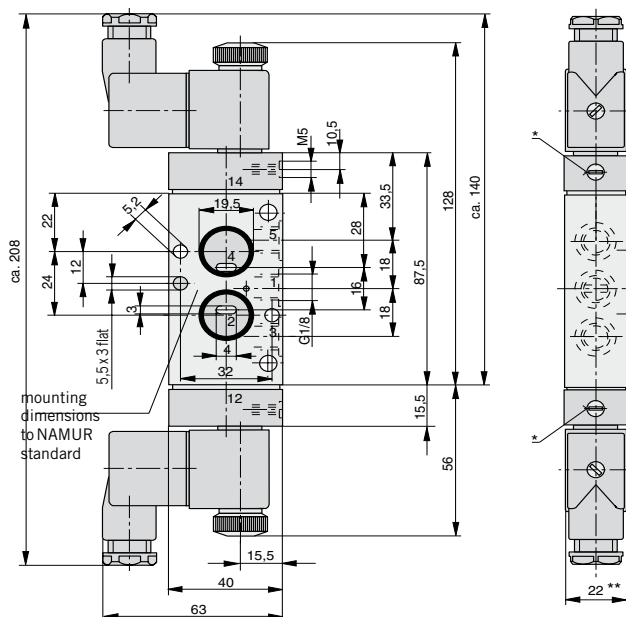
5/3 Way Valves Series S9

G1/8, G1/4

Actuation systems:
– Electrical pilot operated

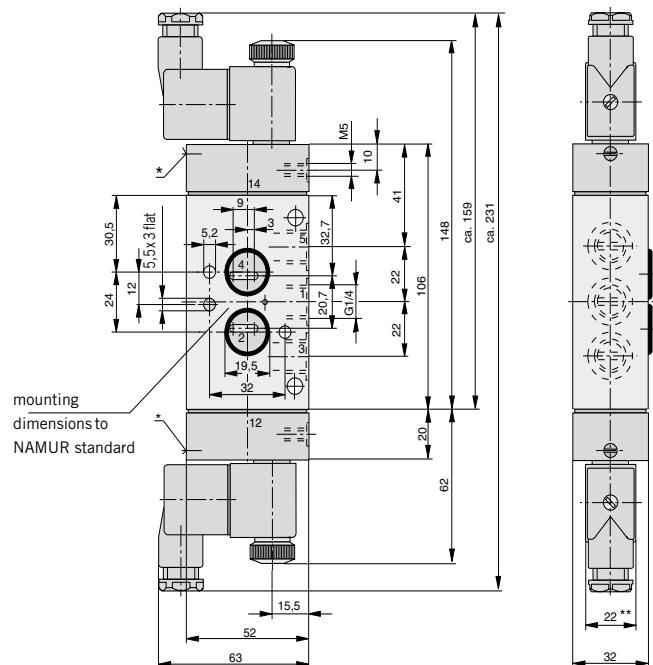
Versions:
– With NAMUR connections
– Version to ATEX Standard

Electrically actuated – Type: S9 581RF.-1/8-NC SO

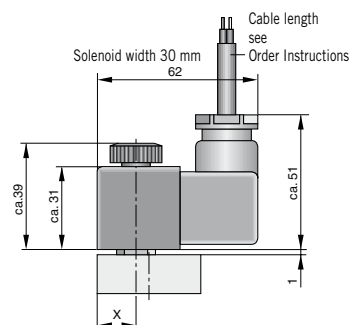


* Manual override
** Solenoid width = 30 mm
on low wattage coil
version

Electrically actuated – Type: S9 581RF.-1/4-NC SO



**Solenoid for use in EX areas
Dimensions**



For more information on
valves to ATEX standards
see page 46, 47, 107

* Manual override
** Solenoid width = 30 mm
on low wattage coil
version

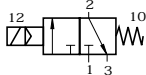
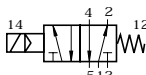
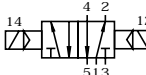
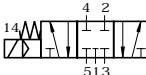
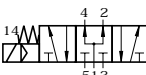
The delivery includes:
1 Ventil
2 Mounting Screws
1 Coding pin
2 O-Rings



Overview see page 107

Dimensions in mm

Order Instructions – 3/2, 5/2 and 5/3 Way Valves – with NAMUR connections

Actuation System	Symbol	Order Instructions		Page
		Type	Order No.	
Electrical, permanent signal		S9 381RF-1/4NG SO-..	PD 33854-..33	104
Electrical, permanent signal		S9 581RF-1/8 SO-..	PD 34143-..33	105
		S9 581RF-1/4 SO-..	PD 34985-..33	105
Electrical, impulse		S9 581-1/8 SO-..	PD 34984-..33	105
		S9 581-1/4 SO-..	PD 34986-..33	105
Electrical, permanent signal spring return to middle position		S9 581RFG-1/8 SO-..	PD 40813-..33	106
		S9 581RFG-1/4 SO-..	PD 40808-..33	106
		S9 581RFE-1/8 SO-..	PD 40814-..33	106
		S9 581RFE-1/4 SO-..	PD 40618-..33	106
		S9 581RFB-1/8 SO-..	PD 40815-..33	106
		S9 581RFB-1/4 SO-..	PD 40809-..33	106

Solenoid version	Nominal voltage	Applicable for	Key code	ATEX Type additon
Standard version	230V 50/60Hz	110 V =	61	–
	24V =	60V 50/60Hz	02	–
Low wattage version	24V =		13	–
	230V 50/60Hz		69	–

EX Area versions to ATEX Standard

Category, type of ignition protection

Single valve: Ⓢ II 2G c T4 T135°C -10°C≤Ta≤+60°C

Solenoid/individual use: Ⓢ II 2G EEx m II T5 -20°C≤Ta≤+50°C

Solenoid/manifold mounting: Ⓢ II 2G EEx m II T5 -20°C≤Ta≤+40°C

Solenoid version	Nominal voltage	Applicable for	Key code	ATEX Type additon
Solenoid	24V =		48	ATEX
– with cable 1.2 m				
– with cable 3 m	24V =		45	ATEX
– with cable 5 m	24V =		46	ATEX
– with cable 10 m	24V =		47	ATEX
– with cable 1.2 m	24V 50/60Hz		99	ATEX
– with cable 1.2 m	110V 50/60Hz		97	ATEX
– with cable 1.2 m	230V 50/60Hz		98	ATEX

Example for valves in ATEX-Version:

– for valves Series S9-G1/8, S9-G1/4, S9-G1/2

Please add behind the standard order No. “ATEX“

Type: S9 581RFG-1/8SO-4633

Order No. PA34143-4633ATEX

5/2 Way Valve Series S9

G1/8, G1/4

Actuation System: – Pneumatic for two hand operation

2 hand operated valve for pneumatically controlled machines and equipment.

The 2-handed trip valves PD37173 and PD37673 are classed as category 1 in accordance with DIN EN 954-1 (only in connection with suitable push button valves) and type IIIA in accordance with DIN EN 574.

ISO 13851:

Safety of machines; two-handed controls.

ISO 13849-1:

Safety of machines; safety-related parts of control systems.

Area of application:

The 2-handed safety valves are intended to be used where persons carry out manual control functions in areas that are subject to accident risks. These comprise primarily equipment with pneumatic cylinders, the operation of which requires that both hands are kept away from the danger zone. The valves can also be used to prevent unintended starts of pneumatic processes.



Characteristics – Pneumatically actuated with 2 hand operation and Time Delay Valve

Characteristics	Symbol	Unit	Description
Version			Two Hand Operation Time Delay Valve
Type			S9 563/65RF-1/8-SO S9 563/65RF-1/4-SO S9 361RF-1/8-SO
General Features			
Type			Spool valve Spool valve Spool valve
Mounting			2 Screws M5 2 Screws M6 2 Screws M5
Tube connection			Thread Thread Thread
Port size			G1/8 G1/4 (12.1 and 12.2: G1/8) G1/8
Weight (mass)	kg		0.27 0.64 0.18
Installation			In any position
Ambient temperature range	T _{min/max}	°C	-10 to +60 **
Medium temperature range	T _{min/max}	°C	-10 to +60 **
Medium			Filtered compressed air - free from water and dirt to ISO 8573-1 Solids: Class 6 particle <5µm for Gas gaswater content: pressure dew point +3°C, Class 4, but at least 5°C less than min. operating temperature
Lubrication *			none or oil mist lubrication
Pneumatic Characteristics			
Nominal pressure	p _n	bar	6
Operating pressure range	p _{min/max}	bar	0 – 10 2-10
Nominal flow	Q _N	l/min	500 1300 450
Actuation			
Pneumatic			Direct
Actuation pressure range	p _{st min/max}		2 – 10 3 – 10 2-10

* We recommend the use of mineral oil type VG 32 to ISO 3448

** Note: Please consult us for operating temperatures below 0° C

Function:

The valve only switches from outlet port 4 to outlet port 2 if both signal inlets are simultaneously actuated or are actuated within 0.5 s. When the operator releases one or both control buttons, the valve switches back immediately.

In order to resume the switch function, both trip signals have to be cancelled first.

Note:

Not applicable for operating eccentric presses and presses of similar design.

Fitting Instructions:

If due to mechanical stopping and re-opening of the compressed air supply both control buttons are operated or possibly blocked at the same time, the 2-handed trip valve will continue the control function. The 2-handed trip valve is not suited to prevent the switching from port 4 to port 2 upon the compressed air being switched back on after it was shut off and/or permanently operated control buttons.

In order to prevent this process from happening, we advise users that it is necessary to install a time-delay valve in the supply line of one of the control buttons (line 12.1 or 12.2).

We recommend the following time-delay valve from our range: type PD49078.

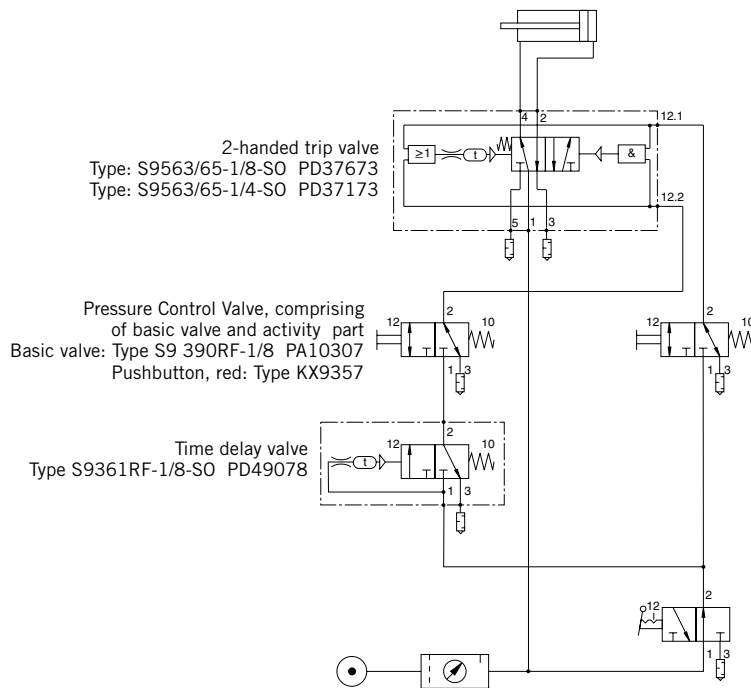
As push button valve we recommend the basic valve PA10307 for control panel configuration, in combination with push button KX9357.

Characteristics of time-delay valve see table above.

Dimensions in mm

Safety switch diagram (example)

Usage of 2-hand-operation valve with necessary time delay valve

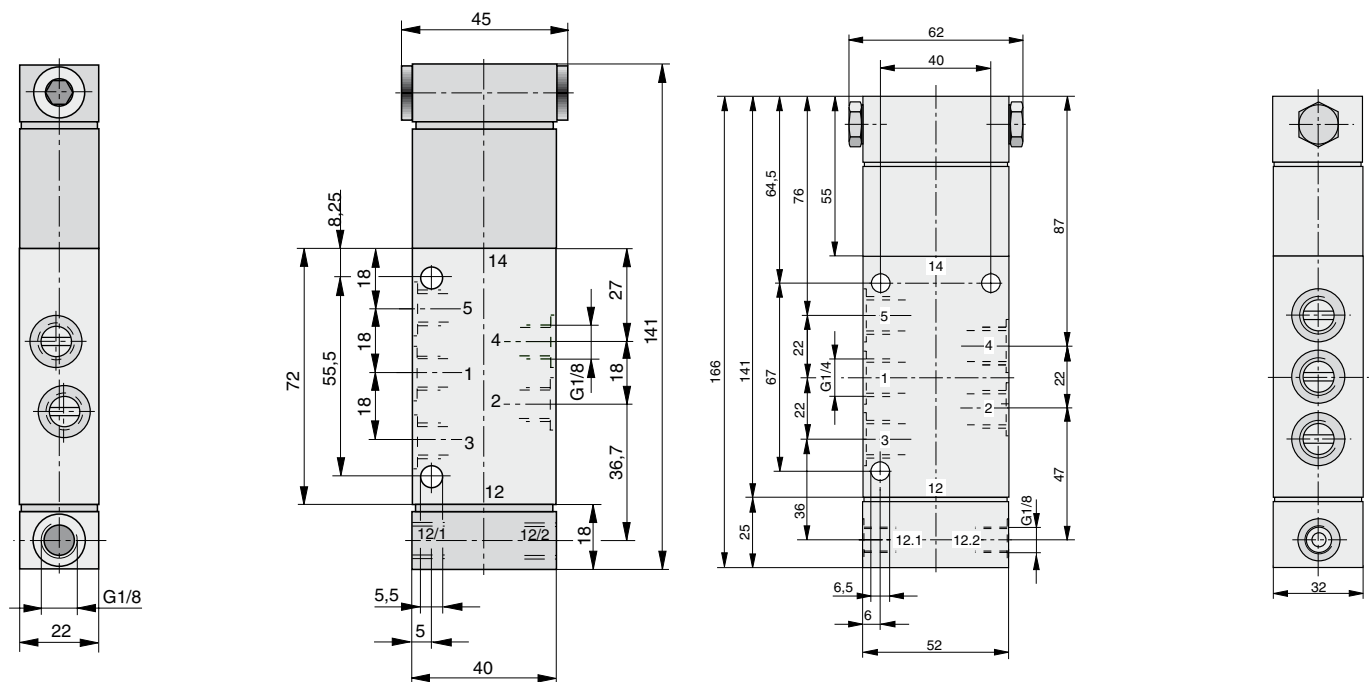


In order to comply with safety requirements, plant and equipment with certain operating mechanisms require the installation of a time-delay valve in the pneumatic control system, as shown in the example.

Pneumatically actuated by 2-handed trip valve

Type: S9 563/65RF-1/8-SO

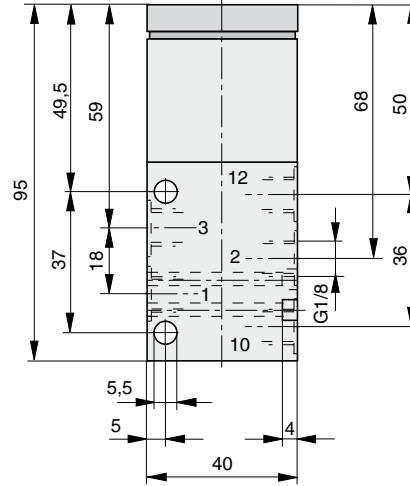
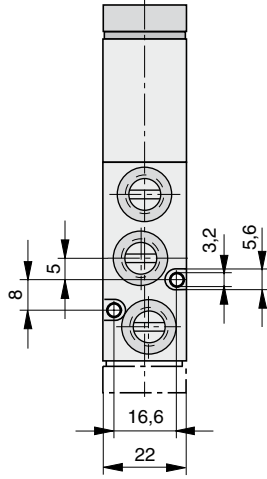
Type: S9 563/65RF-1/4-SO



Dimensions in mm

Time-delay valve to 2-handed trip valve
Type: S9 361RF-1/8-S0

Note:
Suitable measures must be taken to protect the valves against ingress of dust and water.



Order Instructions

Actuation System	Symbol	Order Instructions	
		Type	Order No.
pneumatic, by 2-hand tripping		S9 563/65RF-1/8-SO	PD37673
		S9 563/65RF-1/4-SO	PD37173
Time Delay Valve for 2-Hand-safety related control		S9 361RF-1/8-SO	PD49078

Characteristics

Characteristics	Symbol	Unit	Description
General Features			
Type			Spool valve
Mounting			2 Screws M6 (M4)
Tube connection			Thread
Connection size			G1/4, 11 deep
Weight (mass)		kg	0.65
Installation			In any position
Ambient temperature range **	$T_{min/max}$	°C	-10 to +60
Medium temperature range **	$T_{min/max}$	°C	-10 to +60
Medium			Filtered and oiled or filtered, unoled compressed air
Lubrication *			None or oil mist lubrication
Pneumatic Characteristics			
Nominal pressure	p_n	bar	6
Operating pressure range	$p_{min/max}$	bar	3–8
Nominal flow	Q_N	l/min	1300
Actuation			
Pneumatic			Direct
Actuation pressure range	$p_{st min/max}$		3–8

* We recommend the use of mineral oil type VG 32 to ISO 3448

** Note: Please consult us for operating temperatures below 0°C

5/2-Way Oscillating Valves Series S9

G1/4

Actuation System:
– Pneumatic

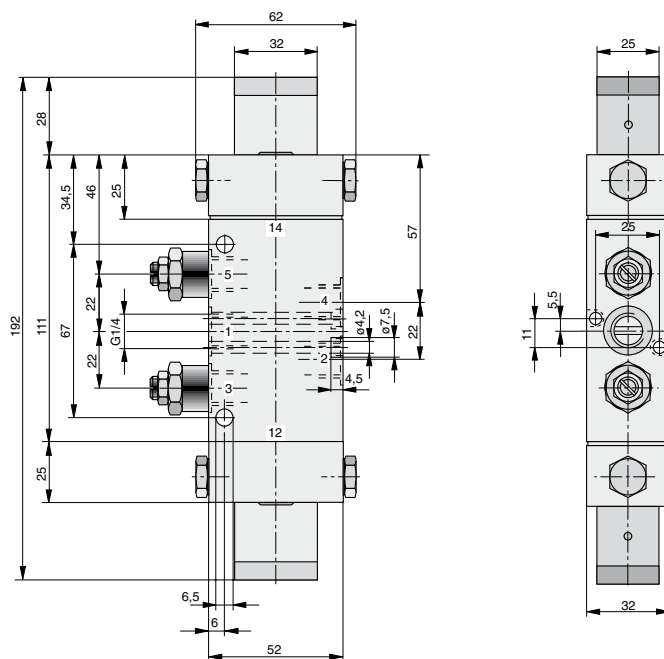
The oscillating valve generates oscillating movements such as e.g. shaking, hammering, plunging, feed motions etc.

Function:

If compressed air is introduced into inlet port 1, the outlet ports 4 and 2 are alternately supplied with compressed air.

The speed of the operated cylinder and also the stroke frequency are adjusted with two exhaust air throttles.

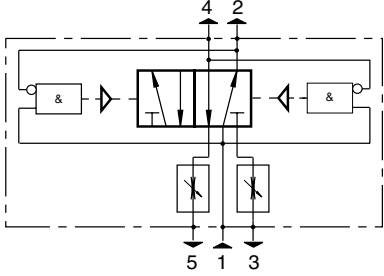
Pneumatic oscillating – Type: S9 568/68-1/4-S0



Dimensions in mm



Order Instructions

Actuation System	Symbol	Order Instructions	
		Type	Order No.
Pneumatic	 The diagram shows a 5/2-way directional control valve. It has five ports: two at the top (4 and 2) and three at the bottom (5, 1, and 3). The valve is controlled by two solenoid actuators, one on each side, each represented by a coil with an ampere symbol (&). The valve has two spring returns, one on each side, represented by a triangle with a diagonal line. The symbol is enclosed in a dashed rectangular box.	S9 568/68-1/4-S0	PD 34796

Dimensions in mm