



Pneumatic

piezo



HOERBIGER
ORIGA

HOERBIGER-ORIGA is a manufacturer and supplier of pneumatically driven components and systems designed to solve movement tasks for a variety of branches of machine construction and automation engineering. Special products and solutions for hazardous areas compliment the extensive programme.

Area's of competence



in welding technology



in the automobile industry



in the paper industry



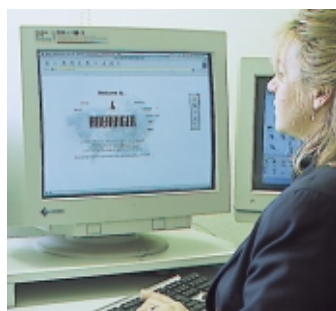
in clean room technology

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in the chemical industry



in hazardous systems



in medical technology

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Directional valves in-line and base plate design

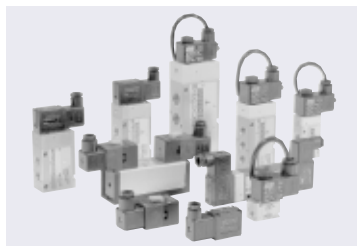
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Compatibility with market leaders for control systems

EEx ia IIC T4 / T5 / T6



E

Certified according to European Standard CENELEC

HOERBIGER-ORIGA Valves are certified additionally by the new ATEX 100a-Standard, Directive 94/9/EC, required July 1, 2003

Ex

Explosion Proofed

i (a)

Type of Protection

Technically different principles of protection

ia: no ignition if: normal use + 1 fault or combination of 2 faults (zone 0, 1, 2)

ib: no ignition if: normal use + 1 fault (zone 1, 2)

- i** – Intrinsic Safety (→ Zone 0,1,2)
- m** – Encapsulation (→ Zone 1,2)
- o** – Oil Immersion
- p** – Excess Pressured
- q** – Powder Filled
- e** – Increased Safety
- d** – Flameproof

IIC

Apparatus Grouping

Degree of ignition ability for different gases

Typical Gas	Minimum Ignition Energy
IIC Acetylene	20 μJ
IIC Hydrogen	20 μJ
IIB Ethylene	60 μJ
IIA propane	180μJ

T4/T5/T6

Temperature Class

Highest permissible surface temperature of an equipment part

IEC 79-8 T-Class	Maximum Surface Temperature	Minimum Ignition Temperature of a gas
T1	450 °C	> 450 °C
T2	300 °C	> 300 – ≤ 450 °C
T3	200 °C	> 200 – ≤ 300 °C
T4	135 °C	> 135 – ≤ 200 °C
T5	100 °C	> 100 – ≤ 135 °C
T6	85 °C	> 85 – ≤ 100 °C

Area Classification

Zone 0 (gases) danger present continuously (> 1000 hours per year)

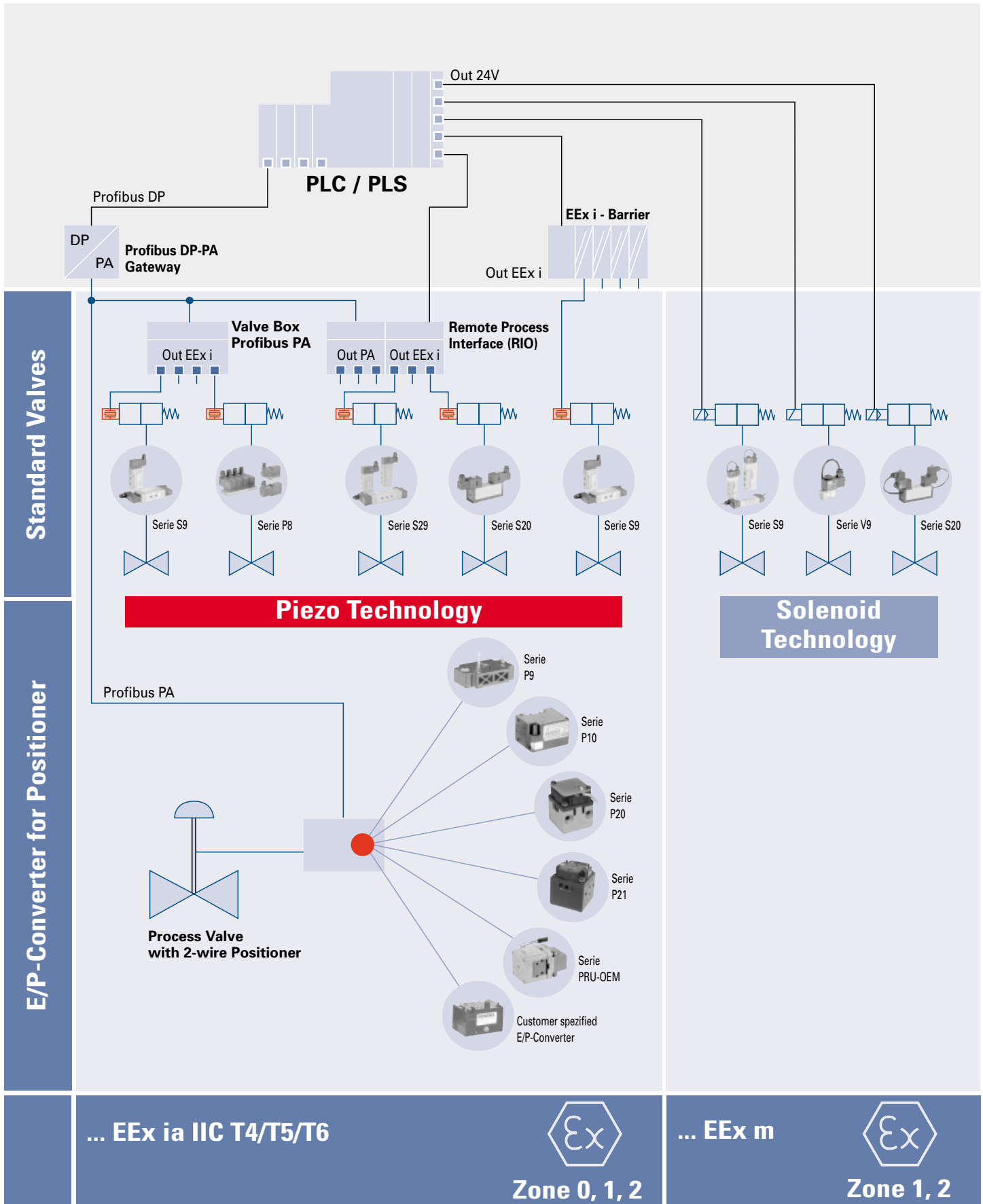
Zone 1 (gases) danger present intermittently (10 – 1000 hours per year)

Zone 2 (gases) danger present abnormally (0 – 10 hours per year)

Amount of probability of existing danger, fixes the protection type.

(Compatible HOERBIGER-ORIGA Valves specifications are marks red)

in Explosion Areas



How do piezo valves work?

Design and function

The central element is a Piezo-ceramic bending element which is built up of several layers, rather like a bimetallic strip. When an electrical voltage is applied, this element bends a few hundredths of a millimetre. This bending allows air to enter the piezo valve through port 1 to port 2 (Fig. 2). In the unactuated mode, the air can flow from port 2 to port 3 (Fig. 1). Depending on the voltage applied, the lesser or greater bending of the element generates an analogue pressure signal at port 2.

The piezo valve can therefore be used either as a switching valve or as a proportional valve. Optimized versions for either switching or proportional use are available.

When the P8-valve (Fig.3) is electrically actuated (ON-condition), the signal that is filtered and prepared by the control electronics opens the supply air seat in the piezo valve. The activated control circuit actuates the integrated valve – air flows from 1 to 2. A pressure regulator and a micro-filter are connected in series before the piezo valve.

Fig. 1

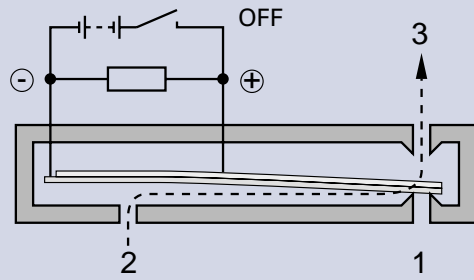


Fig. 2

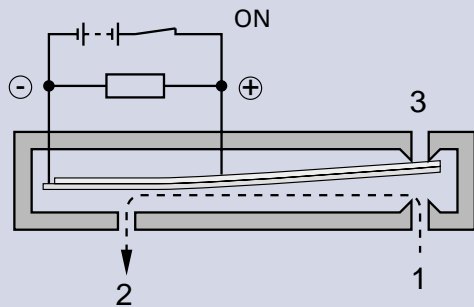


Fig. 3

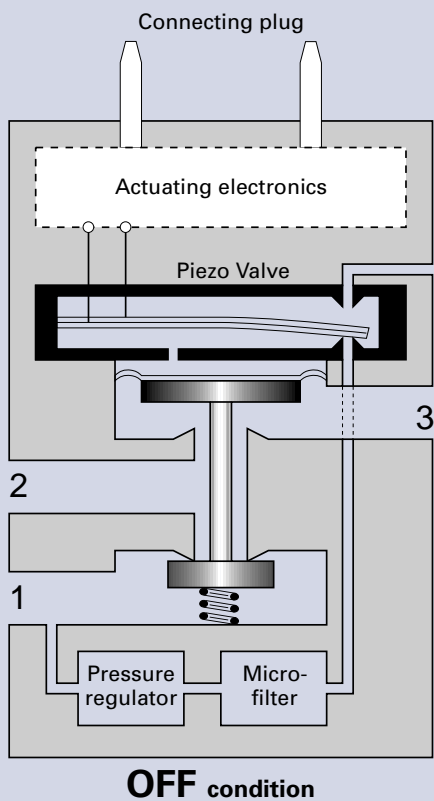
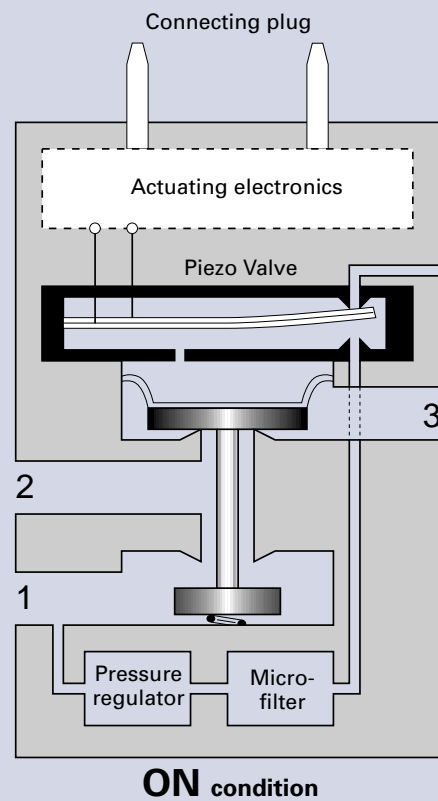
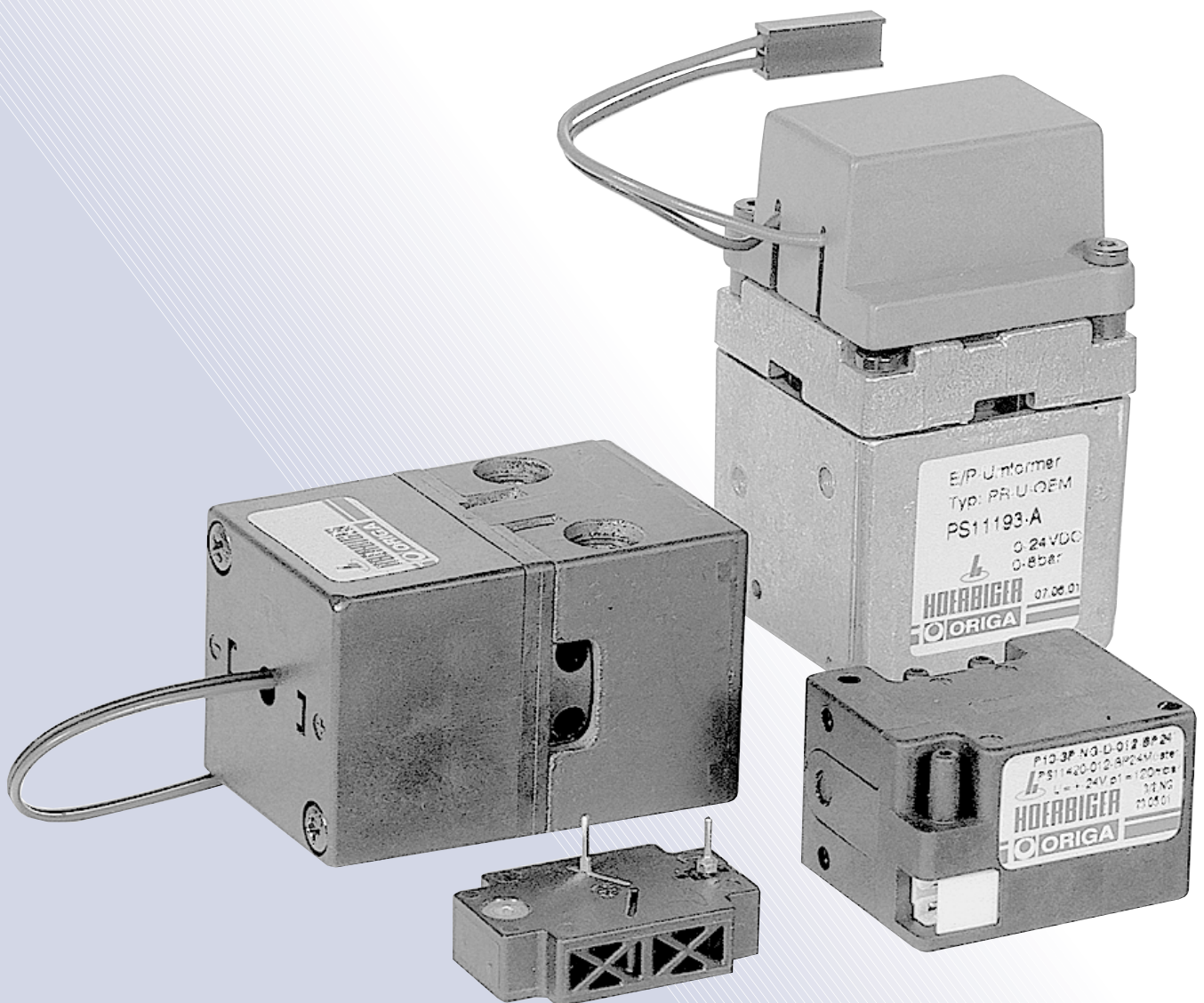


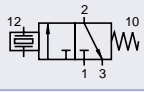
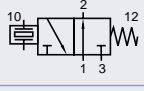
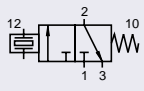
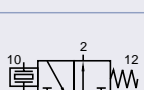
Fig. 4



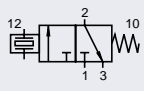
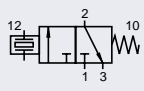
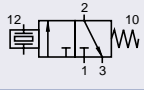
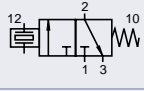
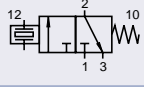
General purpose valves



3/2 Way Piezo Miniature Valves and Pilot Valves – Series P9

Description	Symbol	Order Instructions Type	Order No.	Page
Switching valve, normally closed (+pole on the left side)		P9-NG-S-L	PS 11010-11L	11
Switching valve, normally closed (+pole on the left side)		P9-NO-S-L	PS 11010-21L	11
Proportional valve, normally closed (+pole on the right and left side)		P9-NG-P-LR	PS 11010-31LR	11
Proportional valve, normally open (+pole on the right and left side)		P9-NO-P-LR	PS 11010-41LR	11

3/2 Way Chip Valves (Piezo Miniature Switching Valve) – Series P10 *

Version	Symbol	Order Instructions Type	Order No.	Page
3/2 way switching valve normally closed 0.1 bar version		P10-3S-NG-D-010	PS11400-010-A	12
3/2 way switching valve normally closed 0.3 bar version		P10-3S-NG-D-030	PS11400-030-A	12
3/2 way switching valve normally closed 0.6 bar version		P10-3S-NG-D-060	PS11400-060-A	12
3/2 way switching valve normally closed 1.2 bar version		P10-3S-NG-D-120	PS11400-120-A	12
3/2 way switching valve normally closed 2.0 bar version		P10-3S-NG-D-200	PS11400-200-A	12

* on request:

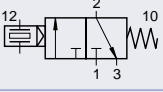
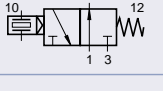
3/2 way switching valve, normally open

2/2 way switching valve, normally closed and normally open

3/2 way proportional control valves, normally closed and normally open

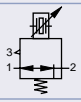
2/2 way proportional control valves, normally closed and normally open

3/2 Way Piezo Valves NW 2 – Series P20-OEM

Version	Symbol	Order Instructions Type	Order No.	Page
Pilot valve, normally closed		P20 381RF-NG-COEM	PS10021-001A	13
Pilot valve, normally open		P20 381RF-NO-COEM	PS10022-001A	13
Base plate			PS10531-A-01	31

Base Plates see page 31

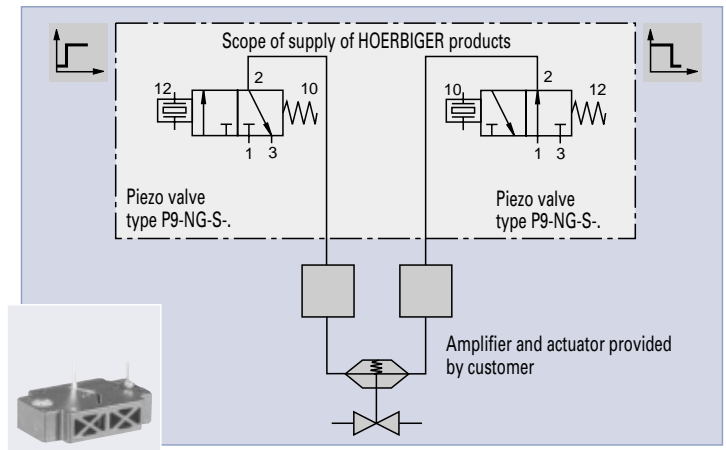
Proportional Pressure Regulating Valve NW 2 – Series PR-U-OEM

Description	Symbol	Order Instructions Type	Order No.	Page
Proportional pressure regulating valve		PR-U-OEM	PS11193-A	14
Base plate G1/8			PS11112-A-01	14

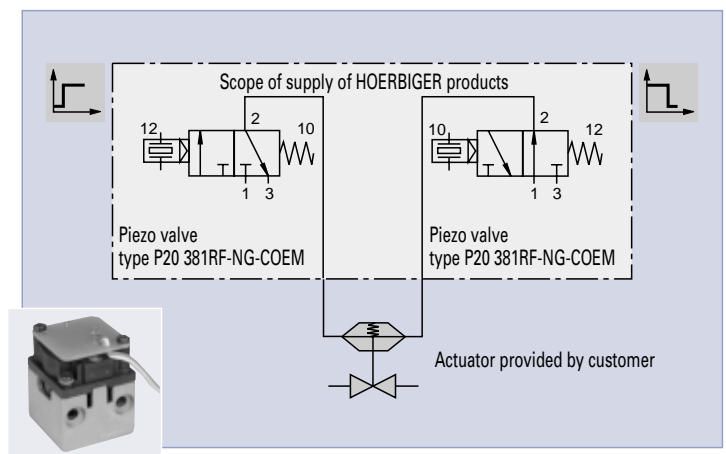
In the following configurations piezo valves can be supplied for use in modern actuators.

Supply of P9 or P10 piezo chips as switching or proportional pilot valves

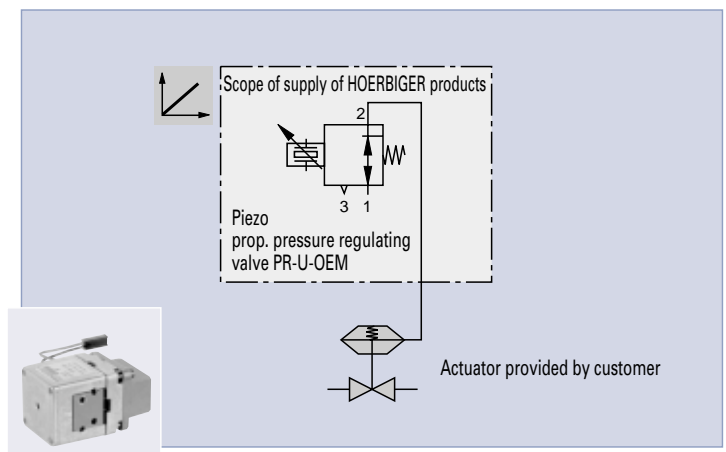
These provide the user with the highest degree of flexibility in the design of dedicated digital or analog actuator systems (IP converter with amplifier) as stand-alone devices or as part of large-scale positioning systems.



Supply of P20-OEM digital piezo valves consisting of piezo chip (pilot valve) and volume amplifier

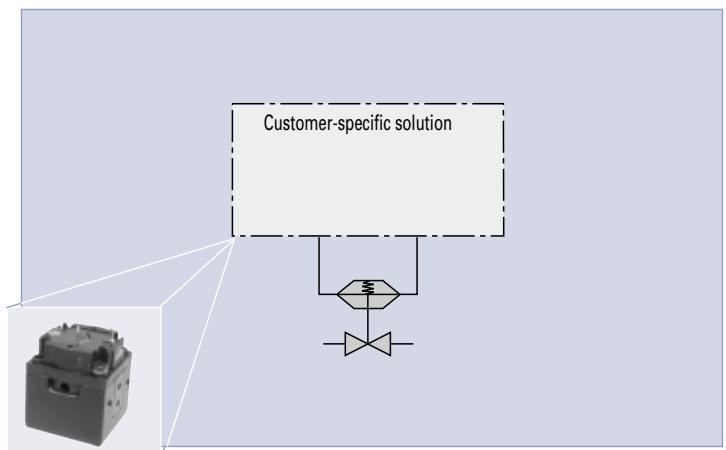


Supply of analog PR-U-OEM piezo valve consisting of piezo chip (pilot valve) and proportional main valve



Customer-specific solutions

Complete development and delivery of customer-specific actuator control systems as part of a joint development project.



HOERBIGER Interface provides a comprehensive support package for the installation and application of all variants.

General purpose valves

3/2 Way Piezo Valve Series P9

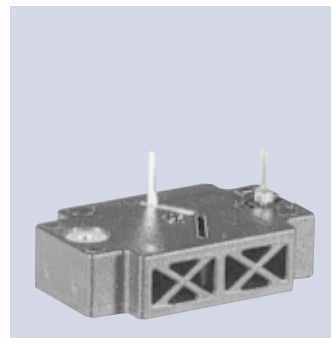
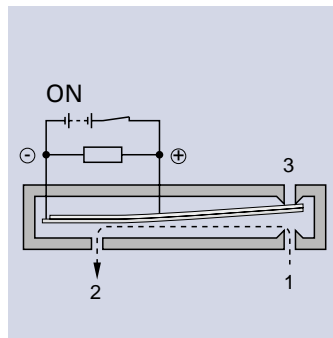
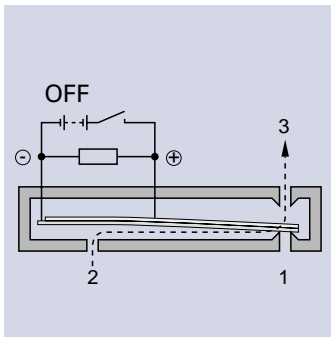
3/2 Way Piezo Miniature Valve and Pilot Valve Series P9

Versions

- Proportional valve
- Switching valve
- NC or NO

Special Versions

- Special pressure ranges
- 2/2 way valve



Characteristics	Symbol	Unit	Description
General Features			
System			Directly actuated 3/2 way proportional poppet valve
Housing			Plastic
Mounting			Flange (see dimensional drawing) **
Port size			= NW 0.33
Weight		g	6
Flow direction			ON: from 1 to 2 OFF: from 2 to 3
Installation position			Optional
Ambient temperature range	ϑ_{\min} ϑ_{\max}	°C °C	-30 +80 Note: When using below freezing point please contact our technical department
Pneumatic Characteristics			
Operating pressure	p_N	bar	1.2 (other pressures between 0 and 2 bar on request)
Nominal flow	Q_N	l/min	1.5
Medium			Filtered air (5 μ) *
Leakage	Q_L	l/min	On: 0.15 max Off: 0.10 max
Electrical Characteristics			
Operating voltage	U_N	V	24 DC *** (other voltages on request)
Capacity	C	nF	< 100
Switching energy	E	mWs	0.014
Holding energy	P	W	0
Switching time	t	ms	< 2
Connection			Contact pins – \varnothing 0.8 mm

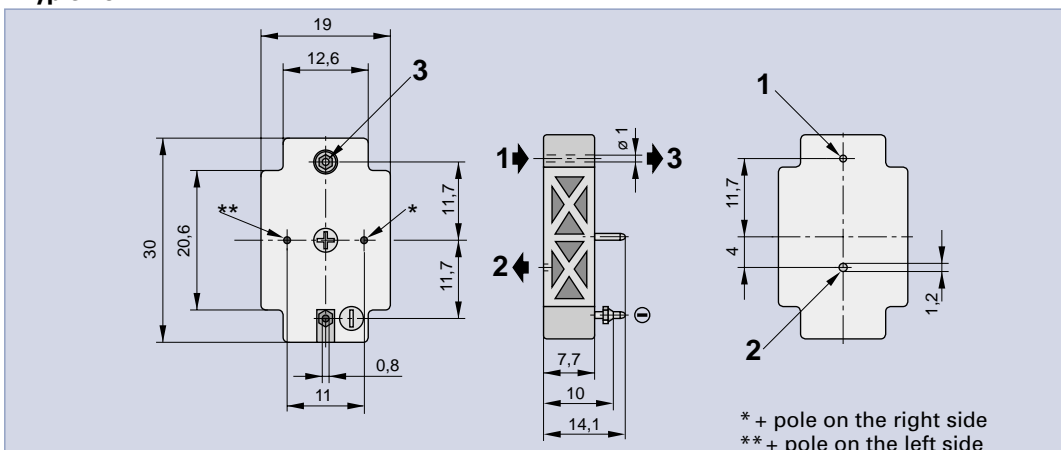
* other fluids on request

** observe installation recommendations

*** observe control recommendations

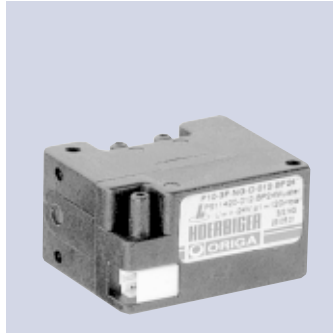
Piezo Chip

Typ:e P9-...-..



Dimensions in mm

"Chip Valve" Piezo Miniature Valve Series P10



Versions

- 3/2 way switching valves normally closed (NG)

Special Versions ⁽⁴⁾ (on request)

- 3/2 way switching valves normally open (NO)
- 2/2 way switching valves
- 3/2 way proportional control valves
- 2/2 way proportional control valves ⁽⁴⁾ normally closed and normally open versions

Scope of supply

- 1 valve
- Mounting kit consisting of 3 rollers and O-rings
- 2 M2.5 x 25 mm screws
- 2 EJOT 2.5 x 6 screws
- 1 connecting cable 2 x 0.14, 300 mm, with connector

⁽¹⁾ Normally open (NO) version on request

⁽²⁾ Nominal pressure p_N against atmosphere

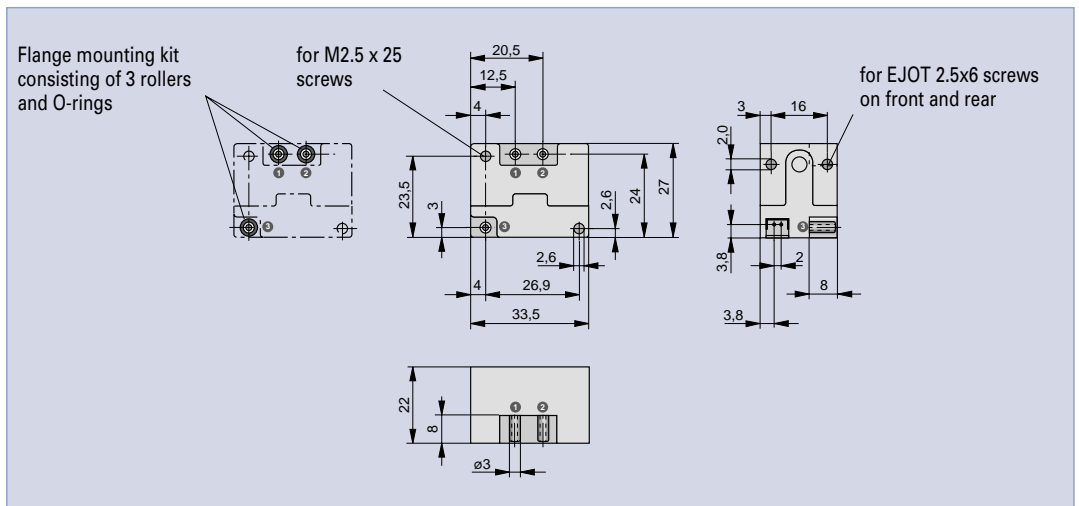
⁽³⁾ Voltages < 24 V on request (not for prop. control valves)

⁽⁴⁾ Characteristics on request

⁽⁵⁾ Not suitable as safety valve with 100% ED

Characteristics	Symbol	Unit	Description				
General Features							
System			Directly controlled (from system) proportional control or switching poppet valve				
Mounting			Metal screws (part of scope of supply)				
Connection			Flange or nose nozzle (3 mm)				
Port size		NW	ca. 0.33				
Installation position			Optional				
Weight		g	20				
Flow direction (normally closed NG) ⁽¹⁾			ON: from 1 to 2 OFF: from 2 to 3 (3/2-Way valve)				
Medium and ambient temperature range	ϑ_{\min} ϑ_{\max}	°C	0	other temperatures on request			
Medium			Filtered air (30 μ), other gases or fluids possible on request				
Pneumatic Characteristics							
Valve nominal pressure	p_N	bar	0.1 bar	0.3 bar	0.6 bar	1.2 bar	2.0 bar
Input pressure range	p_1 min/max	bar	0.05-0.15	0.2-0.3	0.5-0.7	1.1-1.3	1.8-2.2
Output pressure range (proportional version)	p_2 min/max	bar	0-0.1	0-0.3	0-0.6	0-1.2	0-2.0
Flowrate ⁽²⁾							
3/2 way models	Q	l/min	0.5	0.9	1.5	1.5	1.4
Leakage			inlet air side 4% of Q outlet air side: 8% of Q				
Electrical Characteristics							
Operating volatage	U_N	V	24 DC (proportional control valve 0 - 24 V DC) ⁽³⁾				
Holding energy	P	W	0.006				
Connection			2-pin connector				
Relative switching time	ED	%	100 ⁽⁵⁾				
Electrical protection		IP	20				

Chip Valve Type: P10-...-...-...



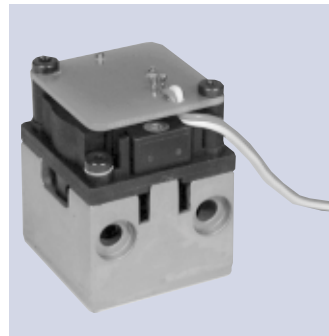
3/2 Way Piezo Valve Series P20-OEM

Series P20-OEM – NW 2.0

Characteristics	Symbol	Unit	Description
General Features			
System			Poppet valve system, pneumatic pilot control with piezo valve, some overlap
Mounting			Flange (see dim. drawing)
Pipe connection			Flange
Port size			NW2
Weight (mass)		kg	0.100
Flow direction			ON: from 1 to 2 OFF: from 2 to 3 ⁽¹⁾
Installation position			Optional
Medium and ambient temperature range	$\varnothing_{min. / max.}$	°C	-10 to +60 Note: Contact technical department advice if used in temperatures between -30 and +80°C
Medium			Dry or filtered air (30 μ), no or minimal oil mist lubrication (max. 30mg/m ³)
Pneumatic Characteristics			
Nominal pressure	$p_{min. / max.}$	bar	6
Operating pressure	$p_{min. / max.}$	bar	1.5 – 8
Nominal flow	Q_N	l/min	130 (from 6 to 5 bar)
Nominal size		mm	2.0
Electrical Characteristics			
Nominal voltage	U_N	V DC	24
Capacity	C	nF	< 100
Switching energy	E	mWS	0.014
Holding energy	P	W	0
Duty cycle	ED	%	100
Connection			Cable 300 mm long
Switching time	t_{ON}	ms	< 20 (10% of discharge pressure)
	t_{OFF}	ms	< 20 (90% of discharge pressure)
Electrical protection		IP	20 ⁽²⁾

⁽¹⁾ outlet air not included

⁽²⁾ not suitable as safety valve with 100% ED



3/2 Way Piezo Valve Serie P20-OEM NW 2

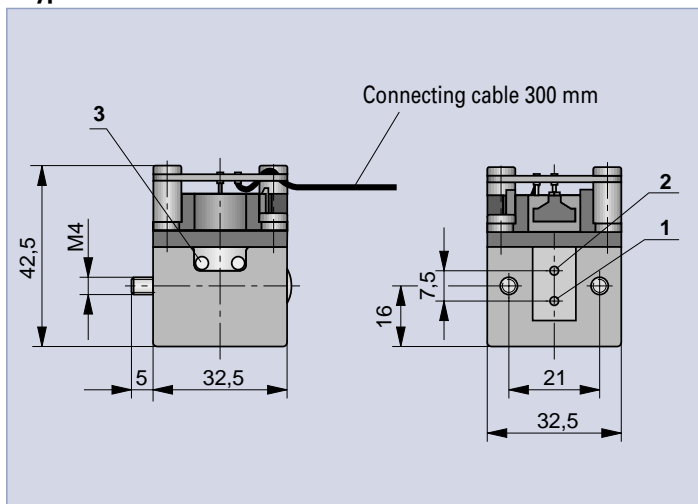
Versions

- normally closed (NG)
- normally open (NO)

Note:

The valve for the P20-OEM series fulfils the requirements for approval as an intrinsically safe device when used with an appropriate controller.

Type: P20 381RF-.-COEM



Base plate see page 31

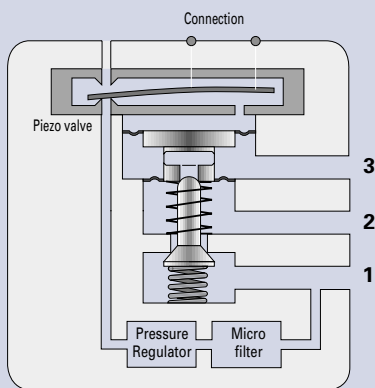
Pressure Regulating Valve Series PR-U-OEM NW 2 and G1/8

Proportional valve with Piezo pilot

Note:
The valve for the PR-U-OEM series fulfils the requirements for approval as an intrinsically safe device when used with an appropriate controller.

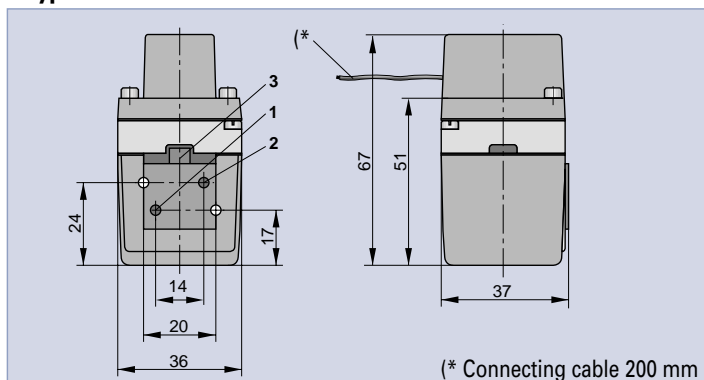


A piezo valve is used as the pilot control element. The piezo valve generates a pilot pressure in the pilot chamber of the main valve proportional to the control voltage.
The supply for the piezo valve is tapped off from the control air connection 1 and passed through a pressure regulator and filter.



1 = Pressure supply (P)
2 = Outlet (A)
3 = Exhaust (R)

Pressure Regulating Valve Type: PR-U-OEM



Series PR-U-OEM – NW 2.5

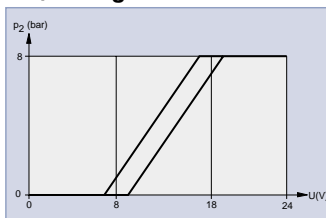
Characteristics	Symbol	Unit	Description
General Features			
Type			Membrane pressure regulating valve, pneumatic pilot control with piezo valve, some overlap
Mounting			Flange (see dim. drawing)
Connection			Flange
Port size			NW2.5
Weight (mass)		kg	0.100
Flow direction			ON: from 1 to 2 OFF: from 2 to 3 ⁽¹⁾
Installation			In any position
Medium and ambient temperature range	$\vartheta_{\text{min. / max.}}$	°C	-30 to +80 Note: When using below freezing point it is necessary to consult us.
Medium			Dry or filtered air (30 μ), no or minimal oil mist lubrication (max.30mg/m ³)
Pneumatic Characteristics			
Nominal pressure	$p_{\text{min. / max.}}$	bar	6
Operating pressure	$p_{\text{min. / max.}}$	bar	1.5 – 10
Nominal flow	Q_N	l/min	200 (from 6 to 5 bar)
Nominal size		mm	2.6
Electrical Characteristics			
Input voltage	U	V DC	0 – 24 ⁽³⁾
Capacity	C	nF	< 100
Switching energy	E	mWS	0.014 (from 0 to 24 V)
Holding energy	P	W	0
Connection			Connecting cable 200 mm 2-pin AMP connector Grid size 2.54
Electrical protection		IP	20

⁽¹⁾ outlet air not included

⁽²⁾ The device should only be used in a closed control loop.

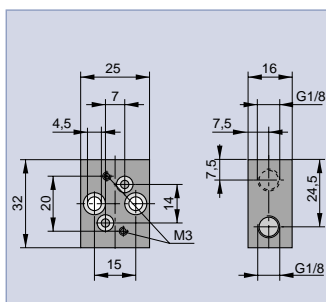
A 0-24 V DC controller should be provided (see U/P diagram).

U/P-Diagram

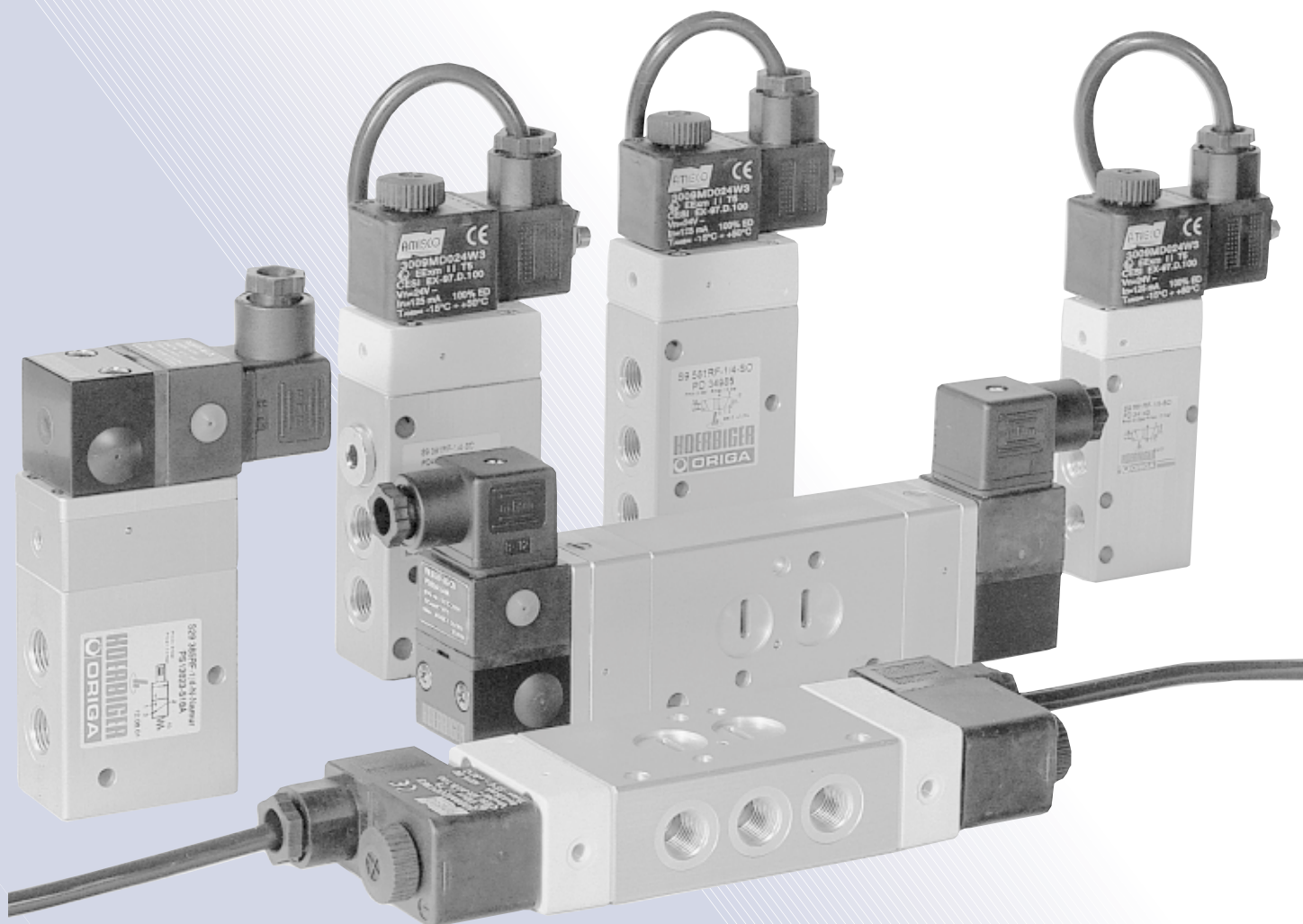


The operating voltage range of the valve may fluctuate due to temperature or long-term effects.
A control range of 0 to 24 V must therefore be designed into the controller.

Base Plate G1/8



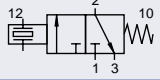
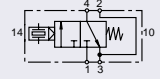

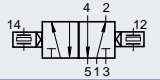
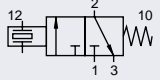
Directional Valves with NAMUR Connections



Directional Valves with NAMUR Connections

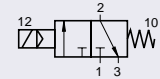
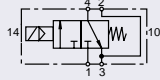
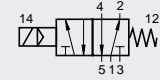
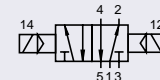
Overview

Intrinsically safe 3/2, 4/2 and 5/2 Way Valves with NAMUR Connection – Series S29

Actuation	Symbol	Order Instructions Type	Order No.	Page
Electrical, by permanent signal		S29 385RF-1/4-.-NAMUR	PS 13623-..6A	18
Electrical, by permanent signal		S29 485RF-1/4-.-NAMUR	PS 13621-..6A	18
Electrical, by permanent signal		S29 585RF-1/4-.-NAMUR	PS 13619-..6A	18
Electrical, by impulse		S29 585-1/4-.-NAMUR	PS 13620-..6A	21
Pilot valve as spare part (electrical, by permanent signal)		P29 381 RF-NG-C.	PS 10041-..1A	–

Version	Nominal voltage	Type key	Key code
Intrinsically safe II 2G EEx ia IIC T4/T5/T6	6 – 9 V DC	M	54
	7 – 16 V DC	N	51
	12 – 24 V DC	L	55
	24 – 30 V DC	E	21

3/2, 4/2 and 5/2 Way Valves with EEx m-Solenoids and NAMUR Connection – Series S9

Actuation	Symbol	Order Instructions Type	Order No.	Page
Electrical, by permanent signal		S9 381RF-1/4-NG-SO-..	PD 33854-..33	20
Electrical, by permanent signal		S9 481RF-1/4-SO-..	PD 40996-..33	20
Electrical, by permanent signal		S9 581RF-1/8-SO-.. S9 581RF-1/4-SO-..	PD 34143-..33 PD 34985-..33	19 20
Electrical, by impulse		S9 581-1/8-SO-.. S9 581-1/4-SO-..	PD 34984-..33 PD 34986-..33	19 20

Solenoid version	Nominal voltage	Key code
Casting cover EEx m II T5	24V =	48
	220V/50(60) Hz	98
	other voltages on request	

Characteristics

Series S29 – G1/4 and S9 – G1/8 -1/4

Characteristics	Symbol	Unit	Series S29, S9 G1/8	G1/4
Actuation			Electrical piloted	Electrical piloted
General Features				
Type			Spool valve	Spool valve
Mounting			2 screws M5	2 screws M6
Tube connection			Thread and NAMUR connection	Thread and NAMUR connection
Thread			G1/8 – 7.4 deep	G1/4 – 11 deep
Weight		kg	See page 18	see page 19, 20
Installation			In any position	in any position
Ambient temperature range	$\vartheta_{\min. / \max.}$	°C	-10 to +60	Note: When using below freezing point please contact our technical department
Medium temperature range	$\vartheta_{\min. / \max.}$	°C	-10 to +60	
Medium			Filtered compressed air (30 μ)	
Lubrication			With or without oil mist lubrication ⁽¹⁾ (we recommend the use of mineral oil type VG 32 to ISO 3448)	
Pneumatic Characteristics				
Nominal pressure	$p_{\min. / \max.}$	bar	6	6
Operating pressure range				
– Permanent signal range	$p_{\min. / \max.}$	bar	2–8 (Series S29), 2–10 (Series S9)	2–8 (Series S29), 2–10 (Series S9)
– Impulse range	$p_{\min. / \max.}$	bar	1.5–8 (Series S29), 1.5–10 (Series S9)	1.5–8 (Series S29), 1.5–10 (Series S9) ⁽²⁾
Nominal flow	Q_N	l/min	500 (450 at 3/2-way valve)	1300 ⁽³⁾
Actuation				
Actuation pressure range				
– Permanent signal range	$p_{\min. / \max.}$	bar	2–8 (Series S29), 2–10 (Series S9)	2–8 (Series S29), 2–10 (Series S9)
– Impulse range	$p_{\min. / \max.}$	bar	1.5–8 (Series S29), 1.5–10 (Series S9)	1.5–8 (Series S29), 1.5–10 (Series S9) ⁽²⁾
Electrical piloted			●	●

Piezo Electrical Actuation ⁽⁴⁾				
Conformity			EU type test certificate DMT 01 ATEX E 025 X, DMT 01 ATEX E 026 X	
Category			II 2G EEx ia IIC T4/T5/T6	
HOERBIGER-Code			M	N L E
Voltage			DC	
Switching voltage	U	V/DC	6 – 9	7 – 16 12 – 24 24-30
Initial current	I	mA	–	– 1,6
Permanent current	I	mA	1 – 2	2 – 5.5 1.5 – 3.5 0.24 – 0.3
Electrical protection				
Connection			Plug to DIN 43650A	
Safety data according to EU type test certificate				
Voltage	U_i	V	9	16 24 30
Current	I_i	mA	–	– 150
Outer capacity	C_i	nF	12	12 12 12
Outer inductivity	L_i	nH	120	120 120 120

Electrical, EEx m-solenoids				
Class of protection			EEx m	
Voltage			AC	DC
Nominal voltage	U_n	V	220	24 other voltages on request
Initial power consumption		VA (W)	5.0	5.1
Continuous consumption		VA (W)	5.0	5.1
Electrical protection				
Insulating material			E to VDE 0580	
Connection			Cable 1200 mm long	

⁽¹⁾ at piezo electrical actuated valve: dried or filtered air (30 μ), nor or minimal oil mist lubrication (max.30mg/m³)

⁽²⁾ at differential piston version 2.5 – 8 bar (Series S29), 2.5–10 (Series S9)

⁽³⁾ at version middle position exhausted 1000 l/min

⁽⁴⁾ not suited as safety valve with 100% ED

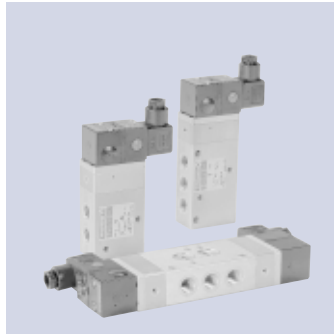
Directional Valves with NAMUR Connections

Series S29 – intrinsically safe, piezo electrical actuated

3/2, 4/2 and 5/2 Way Valve Series S29 G1/4

with NAMUR connections

Actuation:
– Piezo electric actuated



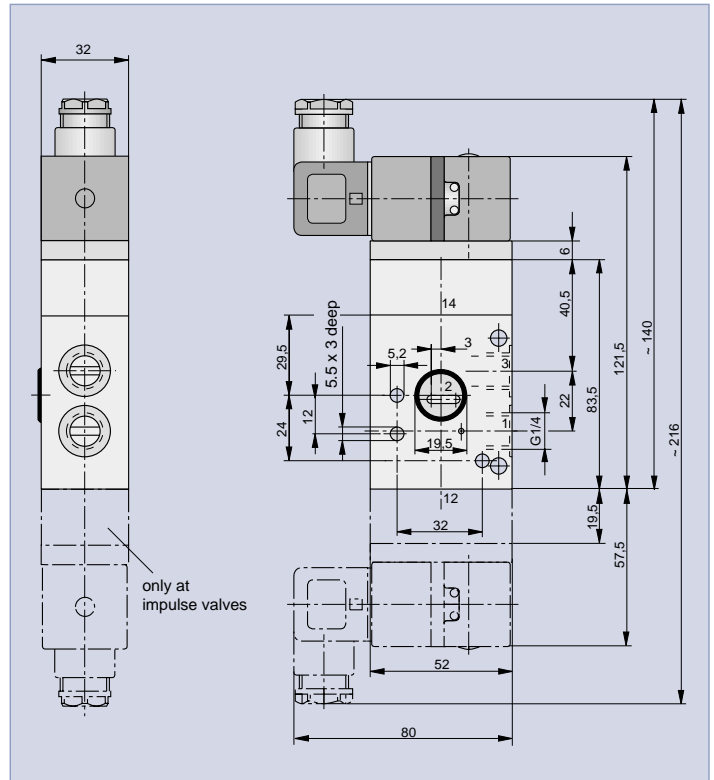
The delivery includes:

- 1 Valve
- 2 Mounting screws
- 1 Coding pin
- 2 O-rings

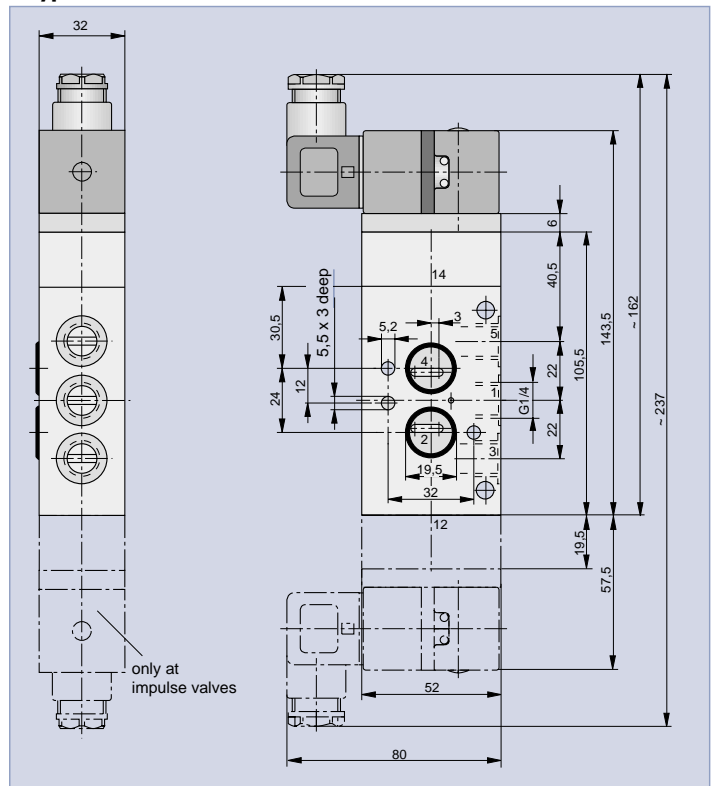
Weight (mass) kg

Description	Type	Weight (mass)
Electrical, by perm. signal	S29 385RF-1/4-.NAMUR	0.460
Electrical, by perm. signal	S29 485RF-1/4-.NAMUR	0.550
Electrical, by perm. signal	S29 585RF-1/4-.NAMUR	0.550
Electrical, by impulse	S29 585-1/4-.NAMUR	0.650

3/2 Way valve Type: S29 385RF-1/4-. Namur



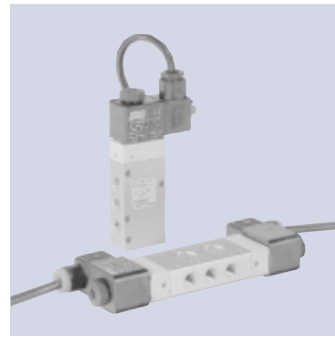
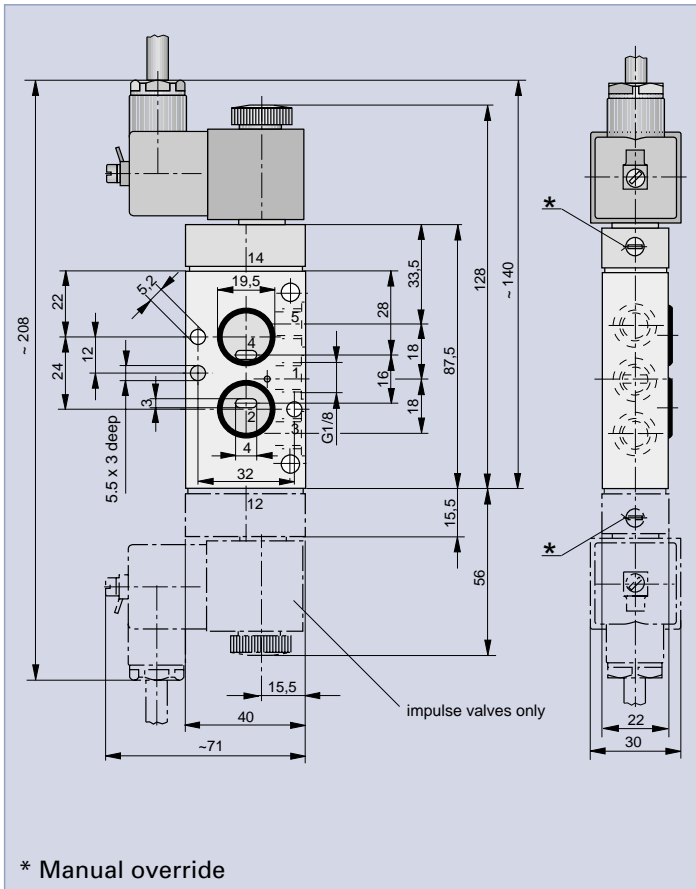
4/2 and 5/2 Way Valve Type: S29 4(5)85RF-1/4-. Namur, S29 585-1/4-. Namur



Order Instructions see page 16, Characteristics see page 17

Series S9 – with EEx m-Solenoids

5/2 Way valve
Type: S9 581RF-1/8-SO-.., S9 581-1/8-SO-..



5/2 Way Valve Series S9 G1/8

with NAMUR connections

Actuation:
 EEx m-solenoids
 –Electrical pilot operation

The delivery includes:

- 1 Valve
- 2 Mounting screws
- 1 Coding pin
- 2 O-rings

Weight (mass) kg

Description	Type	Weight (mass)
Electrical, by perm. signal	S9 581RF-1/8-..	0.280
Electrical, by impulse	S9 581-1/8-..	0.415

Order Instructions see page 16, Characteristics see page 17
 P-supply and RPS manifolds see page 41, 42, 46

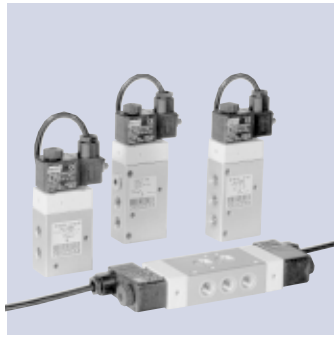
Directional Valves with NAMUR Connections

Series S9 – with EEx m-Solenoids

3/2, 4/2 and 5/2 Way Valve Series S9 G1/4

with NAMUR connections

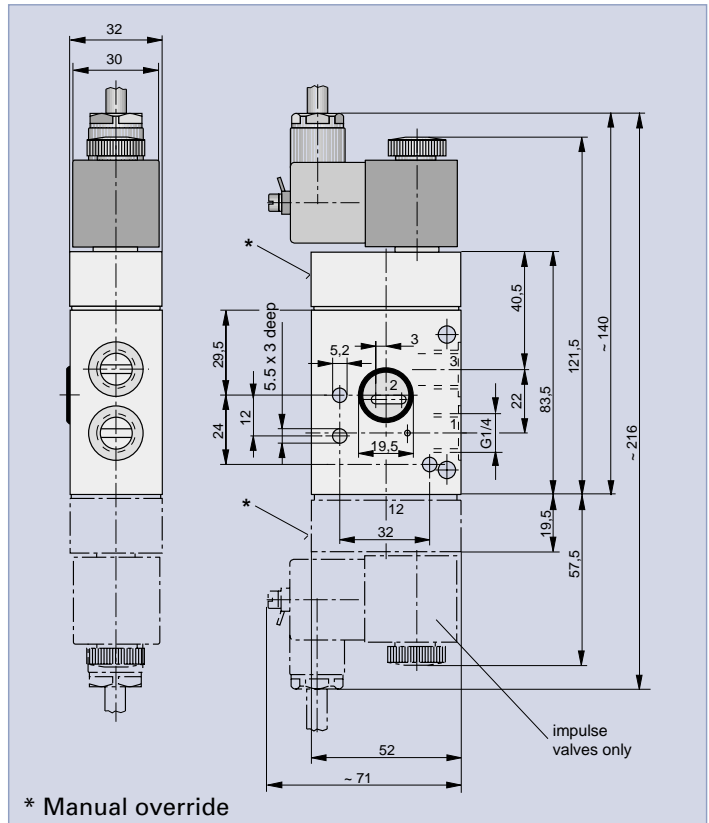
Actuation:
EEx m-Solenoids
– Electrical pilot operation



The delivery includes:

- 1 Valve
- 2 Mounting screws
- 1 Coding pin
- 2 O-rings

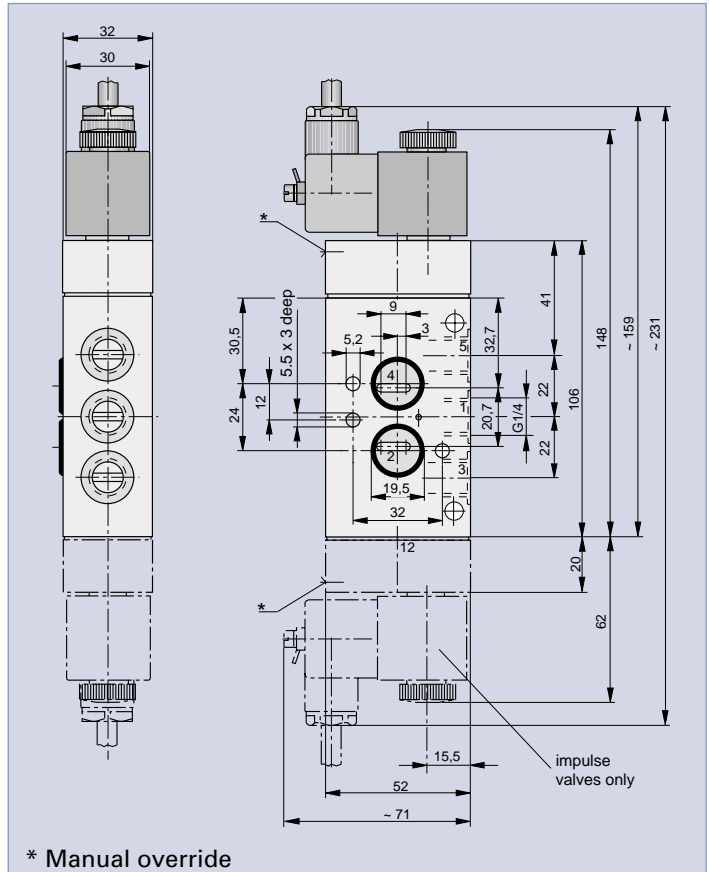
3/2 Way valve Type: S9 381RF-1/4-SO-..



Weight (mass) kg

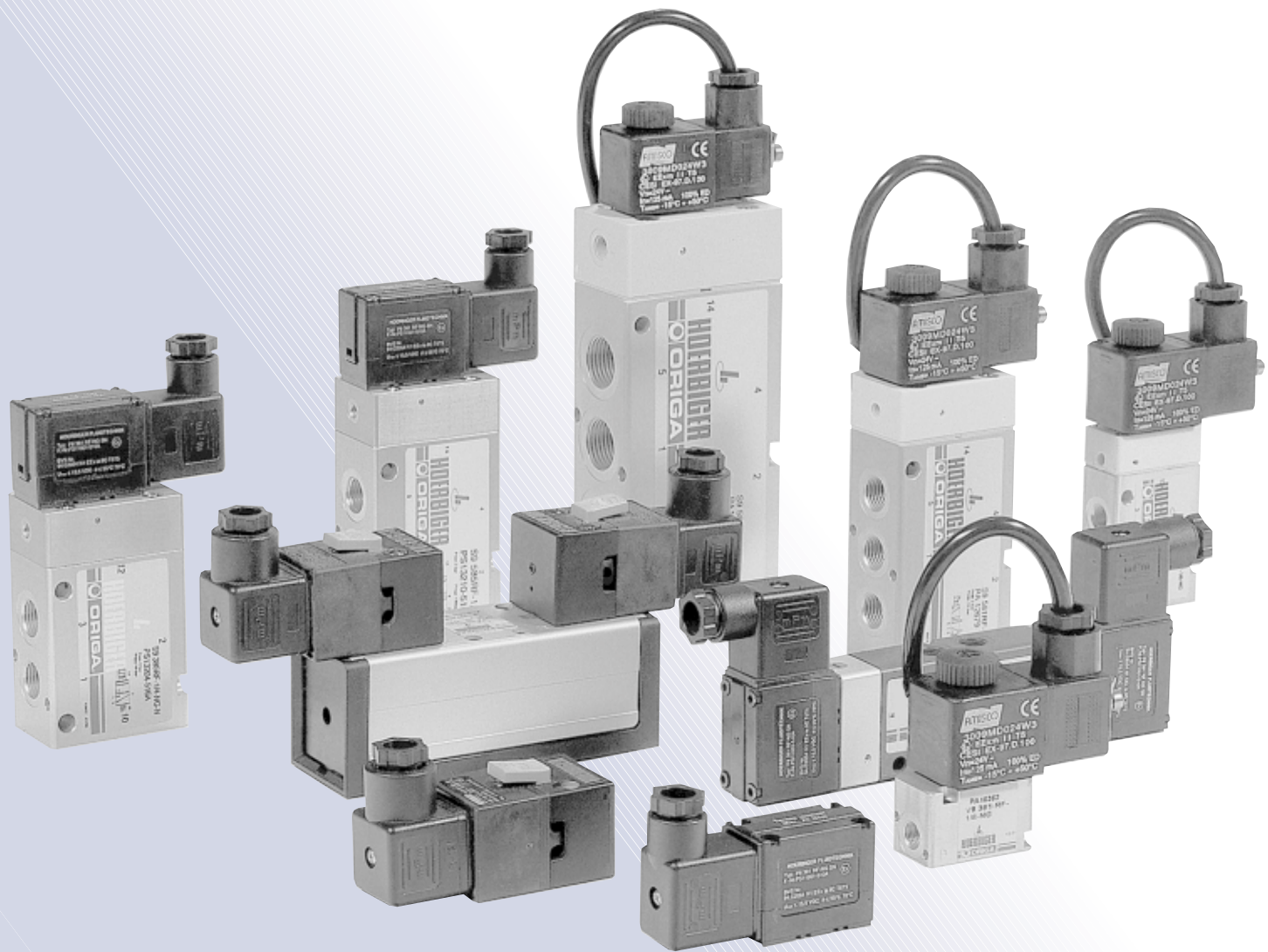
Description	Type	Weight (mass)
Electrical, by perm. signal	S9 381RF-1/4-..	0.500
Electrical, by perm. signal	S9 481RF-1/4-..	0.600
Electrical, by perm. signal	S9 581RF-1/4-..	0.600
Electrical, by impulse	S9 581-1/4-..	0.700

4/2 and 5/2 Way valve Type: S9 4(5)81RF-1/4-SO-.., S9 581-1/4-SO-..



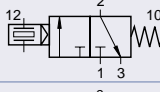
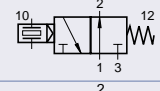
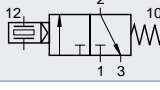
Order Instructions see page 16, Characteristics see page 17
P-supply and RPS manifolds see page 43,44,47

Directional Valves, intrinsically safe and with EEx m-Solenoids



Overview and Order Instructions

3/2 Way Poppet Valves (Pilot and Single Valves) – Series P8

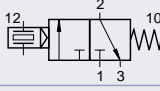
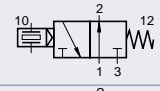
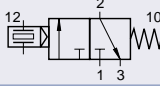
Actuation	Symbol	Port size	Order Instructions		Page
			Type	Order No.	
Pilot valve ⁽¹⁾ normally closed		NW 1.6	P8 381RF-NG-S.	PS 11001-..0A	30
			P8 381RF-NO-S.	PS 10002-..0A	
normally open		NW 1.6	P8 381RF-NO-S.	PS 10002-..0A	30
Single valve M5 ⁽²⁾ normally closed		M5	P8 381RF-M5 NG-S.	PS 11003-..0A-01	30

⁽¹⁾ without base plate and without plug

⁽²⁾ with plug and with base plate

Version	Nominal voltage	Type key	Key code
Intrinsically safe II 2G EEx ia IIC T4/T5/T6	6 – 9 V DC	M	54
	7 – 16 V DC	N	51
	12 – 24 V DC	L	55
	24 – 30 V DC	E	21

3/2 Way Poppet Valves (Pilot and Single Valve) – Series P20

Actuation	Symbol	Port size	Order Instructions		Page
			Type	Order No.	
Pilot valve ⁽¹⁾ normally closed		NW 2	P20 381RF-NG-C.	PS 10021-..1A	31
			P20 381RF-NO-S.	PS 10022-..1A-01	
normally open		NW 2	P20 381RF-NO-S.	PS 10022-..1A-01	31
Single valve G1/8 ⁽²⁾ normally closed		G1/8	P20 381RF-1/8NG-C.	PS 10023-..1A-01	31

⁽¹⁾ without base plate and without plug

⁽²⁾ with plug and with base plate

Version	Nominal voltage	Type key	Key code
Intrinsically safe II 2G EEx ia IIC T4/T5/T6	6 – 9 V DC	M	54
	7 – 16 V DC	N	51
	12 – 24 V DC	L	55
	24 – 30 V DC	E	21

Base Plates and Accessories for Series P8 and P20

Series P8

Description	Type	Order No.
Base plate for 1 valve		PS11614-A-01
Base plate for 2 valves		PS11614-A-02
Base plate for 4 valves		PS11614-A-04
Base plate for 6 valves		PS11614-A-06
Base plate for 8 valves		PS11614-A-08
Base plate for 10 valves		PS11614-A-10
Blanking plate, complete		PS11530-A
Plug	GSD-22	KY9393

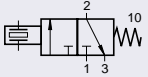
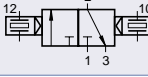
Series P20

Description	Type	Order No.
Base plate for 1 valve		PS10531-A-01
Base plate for 2 valves		PS10531-A-02
Base plate for 4 valves		PS10531-A-04
Base plate for 6 valves		PS10531-A-06
Base plate for 8 valves		PS10531-A-08
Base plate for 10 valves		PS10531-A-10
Blanking plate, complete		PS10559-A
Plug	GSD-30	KY5637

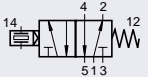
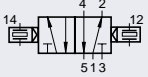
Directional Valves – intrinsically safe, piezo electrically actuated, Series S9-G1/8, G1/4, S20- ISO 1, 2, 3

Overview and Order Instructions

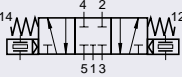

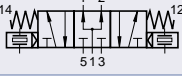
3/2 Way Valves – Series S9

Actuation	Symbol	Order Instructions		Page
		Type	Order No.	
Electrical, by permanent signal		S9 385RF-1/4-	PS 13204-..6A	32
Electrical, by impulse		S9 385-1/4-	PS 13200-..6A	32

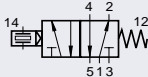
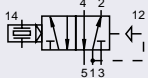
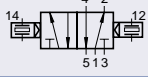
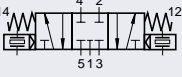
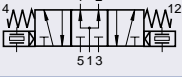
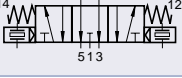
5/2 Way Valves – Series S9

Actuation	Symbol	Order Instructions		Page
		Type	Order No.	
Electrical, by permanent signal		S9 585RRF-1/8-	PS 13118-..6A	33
		S9 585RF-1/4-	PS 13210-..6A	34
Electrical, by impulse		S9 585-1/8-	PS 13104-..6A	33
		S9 585-1/4-	PS 13222-..6A	34

5/3 Way Valves – Series S9

Actuation	Symbol	Order Instructions		Page
		Type	Order No.	
Electrical, by permanent signal with spring return to middle position		S9 585RFG-1/8-	PS 13108-..6A	33
		S9 585RFG-1/4-	PS 13212-..6A	34
Electrical, by permanent signal with spring return to middle position		S9 585RFE-1/8-	PS 13109-..6A	33
		S9 585RFE-1/4-	PS 13213-..6A	34
Electrical, by permanent signal with spring return to middle position		S9 585RFB-1/8-	PS 13110-..6A	33
		S9 585RFB-1/4-	PS 13214-..6A	34

5/2 and 5/3 Way Valves to ISO 5599 – Sizes 1, 2, 3 – Series S20

Actuation	Symbol	Order Instructions		Page
		Type	Order No.	
Electrical, by permanent signal, spring return		S20 585RF-1-..	PS 13704-..1A	35
		S20 585RF-2-..	PS 13724-..1A	
		S20 585RF-3-..	PS 13744-..1A	
Electrical, by permanent signal, air spring return		S20 585R-1-..	PS 13702-..1A	35
		S20 585R-2-..	PS 13722-..1A	
		S20 585R-3-..	PS 13742-..1A	
Electrical, by impulse		S20 585-1-..	PS 13700-..1A	35
		S20 585-2-..	PS 13720-..1A	
		S20 585-3-..	PS 13740-..1A	
Electrical, by permanent signal, with spring return to middle position		S20 585RFG-1-..	PS 13706-..1A	35
		S20 585RFG-2-..	PS 13726-..1A	
		S20 585RFG-3-..	PS 13746-..1A	
Electrical, by permanent signal, with spring return to middle position		S20 585RFB-1-..	PS 13710-..1A	35
		S20 585RFB-2-..	PS 13730-..1A	
Electrical, by permanent signal, with spring return to middle position		S20 585RFE-1-..	PS 13708-..1A	35
		S20 585RFE-2-..	PS 13728-..1A	
		S20 585RFE-3-..	PS 13748-..1A	

Version	Nominal voltage	Type key	Key code
Intrinsically safe II 2G EEx ia IIC T4/T5/T6	6 – 9 V DC	M	54
	7 – 16 V DC	N	51
	12 – 24 V DC	L	55
	24 – 30 V DC	E	21

3/2 Way Valves – Standard Versions with EX-Proof-Solenoids

Actuation	Symbol	Order Instructions Type	Order No.	Page
Electrical, by permanent signal		S9 381RF-1/8-NG-.. S9 381RF-1/4-NG-.. S9 381RF-1/2-NG-..	PA 10297-..33 PA 12716-..33 PA 16412-..33	37
with external pilot air		S9 381RF-1/8-NO-.. S9 381RF-1/4-NO-.. S9 381RF-1/2-NO-..	PA 10298-..33 PA 12717-..33 PA 16413-..33	37
		S9 381S-RF-1/8-.. S9 381S-RF-1/4-.. S9 381S-RF-1/2-..	PA 10300-..33 PA 12719-..33 PA 16415-..33	37
Electrical, by impulse		S9 381-1/8-.. S9 381-1/4-.. S9 381-1/2-..	PA 10299-..33 PA 12718-..33 PA 16414-..33	37
Electrical, by impulse with external pilot air		S9 381S-1/8-.. S9 381S-1/4-.. S9 381S-1/2-..	PA 10301-..33 PA 12720-..33 PA 16417-..33	37
Electrical, by impulse, differential piston with external pilot air		S9 382-1/4-.. S9 382-1/2-..	PA 12721-..33 PA 16418-..33	37
		S9 382S-1/4-.. S9 382S-1/2-..	PA 12722-..33 PA 16419-..33	37
Electrical, by permanent signal	NW 1.3	V9 381RF-1/8-NG-..	PA 10362-..33	36
	NW 1.3	V9 381H-RF-1/8-NG-..	PA 10363-..33	36
	NW 1.3	V9 381H-RF-1/8-NO-..	PA 10367-..33	36

5/2 Way Valves – Standard Versions with EX-Proof-Solenoids

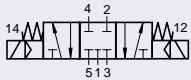

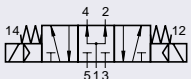
Actuation	Symbol	Order Instructions Type	Order No.	Page
Electrical, by permanent signal		S9 581RF-1/8-.. S9 581RF-1/4-.. S9 581RF-1/2-..	PA 10312-..33 PA 12679-..33 PA 16171-..33	38
with external pilot air		S9 581S-RF-1/8-.. S9 581S-RF-1/4-.. S9 581S-RF-1/2-..	PA 10314-..33 PA 12681-..33 PA 16174-..33	38
Electrical, by impulse		S9 581-1/8-.. S9 581-1/4-.. S9 581-1/2-..	PA 10313-..33 PA 12680-..33 PA 16172-..33	38
	with external pilot air	S9 581S-1/8-.. S9 581S-1/4-.. S9 581S-1/2-..	PA 10315-..33 PA 12682-..33 PA 16175-..33	38
Electrical, by impulse, differential piston with external pilot air		S9 582-1/4-.. S9 582-1/2-..	PA 12683-..33 PA 16173-..33	38
		S9 582S-1/4-..	PA 12684-..33	38

Solenoid version	Nominal voltage	Key code
EX-proof version	24V =	48
	220V/50(60) Hz	98
Further voltages available on request		

Directional Valves – with EEx m-Solenoids, Series S9 – G1/8 to G1/2

Overview and Order Instructions

5/3 Way Valves – Standard Versions with EX-Proof-Solenoids

Actuation	Symbol	Order Instructions		Page
		Type	Order No.	
Electrical, by permanent signal with spring return to middle position		S9 581RFG-1/8-.. S9 581RFG-1/4-.. S9 581RFG-1/2-..	PA 10333-..33 PA 12705-..33 PA 16176-..33	39
		S9 581RFE-1/8-.. S9 581RFE-1/4-.. S9 581RFE-1/2-..	PA 10334-..33 PA 12706-..33 PA 16177-..33	39
		S9 581RFB-1/8-.. S9 581RFB-1/4-.. S9 581RFB-1/2-..	PA 10335-..33 PA 12707-..33 PA 16178-..33	39

Solenoid version	Nominal voltage	Key code
EX-proof version	24V =	48
	220V/50(60) Hz	98
Further voltages available on request		

5/2 Way Valves – Standard Version with EX-Proof-Solenoids to ISO 5599 – Sizes 1, 2, 3

Actuation	Symbol	Order Instructions Type	Order No.	Page
Electrical, by permanent signal with spring return with external pilot air		S20 581RF-1.. S20 581RF-2.. S20 581RF-3..	PA 12875-..33 PA 16441-..33 PA 16442-..33	40
		S20 581S-RF-1.. S20 581S-RF-2.. S20 581S-RF-3..	PA 12882-..33 PA 16456-..33 PA 16462-..33	40
Electrical, by permanent signal with air spring return		S20 581R-1.. S20 581R-2.. S20 581R-3..	PA 12876-..33 PA 16444-..33 PA 16445-..33	40
Electrical, by impulse with external pilot air		S20 581-1.. S20 581-2.. S20 581-3..	PA 12874-..33 PA 16438-..33 PA 16439-..33	40
		S20 581S-1.. S20 581S-2.. S20 581S-3..	PA 12880-..33 PA 16454-..33 PA 16460-..33	40

5/3 Way Valves – Standard Version with EX-Proof-Solenoids to ISO 5599 – Sizes 1, 2, 3

Actuation	Symbol	Order Instructions Type	Order No.	Page
Electrical, by permanent signal with spring return to middle position		S20 581RFG-1.. S20 581RFG-2.. S20 581RFG-3..	PA 12877-..33 PA 16447-..33 PA 16448-..33	40
		S20 581RFB-1.. S20 581RFB-2..	PA 12879-..33 PA 16453-..33	40
with external pilot air		S20 581RFE-1.. S20 581RFE-2.. S20 581RFE-3..	PA 12878-..33 PA 16450-..33 PA 16451-..33	40
		S20 581S-RFG-1.. S20 581S-RFG-2.. S20 581S-RFG-3..	PA 12883-..33 PA 16457-..33 PA 16463-..33	40
		S20 581S-RFB-1.. S20 581S-RFB-2..	PA 12885-..33 PA 16459-..33	40
		S20 581S-RFE-1.. S20 581S-RFE-2.. S20 581S-RFE-3..	PA 12884-..33 PA 16458-..33 PA 16464-..33	40

Solenoid version	Nominal voltage	Key code
EX-proof version	24V =	48
	220V/50(60) Hz	98
Further voltages available on request		

Directional Valves – intrinsically safe, piezo electrically actuated, Series P8, P20

Characteristics

Series P8 – NW1.6 and M5, P20 – NW 2.0 and G1/8

Characteristics	Symbol	Unit	Series P8 NW 1.6 and M5	Series P20 NW 2.0 and G1/8
Actuation			piezo electrical piloted	piezo electrical piloted
General Features				
Type			Piezo poppet valve, some overlap	Piezo poppet valve, some overlap
Mounting			Flange (see dimensional drawing)	Flange to CNOMO (see dimensional drawing)
Tube connection			Flange / Thread	Flange / Thread
Thread			M5 – with base plate	G1/8 – with base plate
Weight		kg	0.050 (pilot valve)	0.080 (pilot valve)
Flow direction			ON: from 1 to 2 OFF: from 2 to 3	ON: from 1 to 2 OFF: from 2 to 3
Installation			In any position	In any position
Ambient temperature range ⁽¹⁾	$\vartheta_{\min. / \max.}$	°C	-10 to +60	-10 to +60
Medium temperature range ⁽¹⁾	$\vartheta_{\min. / \max.}$	°C	-10 to +60	-10 to +60
Medium			Filtered air (30 μ), nor or minimal oil mist lubrication (max.30mg/m ³) ⁽²⁾ (we recommend the use of mineral oil type VG 32 to ISO 3448)	
Pneumatic Characteristics				
Nominal pressure	$p_{\min. / \max.}$	bar	6	6
Operating pressure range	$p_{\min. / \max.}$	bar	1.2 – 8	1.2 – 8
Nominal flow	Q _N	l/min	50 b = 0,34; C = 12,5 l/min bar)	110 b = 0.33; C = 26.5 l/min bar)
Nominal size		mm	1.6	2.0

Piezo Electrical Actuation ⁽²⁾

Approval			EU type test certificate DMT 01 ATEX E 026 X / DMT 01 ATEX E 025 X			
Category, type of protection			II 2G EEx ia IIC T4/T5/T6			
HOERBIGER Code			M	N	L	E
Voltage			DC			
Switching voltage *	U	V/DC	6 – 9	7 – 16	12 – 24	24 – 30
Initial current	I	mA	–	–	–	1.6
Holding current	I	mA	1 – 2	2 – 5.5	1.5 – 3.5	0.24 – 0.3
Electrical protection			IP54			
Connection			Plug to DIN 43650A			
Safety data according to EU type test certificate						
Voltage	U _i	V	9	16	24	30
Current	I _i	mA	–	–	–	150
External capacitance	C _i	nF	12	12	12	12
External inductance	L _i	nH	120	120	120	120

⁽¹⁾ Note: When using below freezing point please contact our technical department.

⁽²⁾ Not suitable as safety valve with 100% ED

Characteristics

Series S9 – G1/8 to G1/2, Series V9-G1/8

Characteristics	Symbol	Unit	Series S9			
			Series V9 G1/8	G1/8	G1/4	G1/2
Actuation			Electrical direct	electrical piloted or piezo electrical piloted	electrical piloted or piezo electrical piloted	electrical piloted
General Features						
Type			Poppet valve	Spool valve	Spool valve	Spool valve
Mounting			2 screws M3	2 screws M5	2 screws M6	2 screws M6
Tube connection			Thread	Thread	Thread	Thread
Thread			G1/8–8 deep	G1/8 – 7.4 deep	G1/4 – 11 deep	G1/2 – 16 deep
Weight		kg	0.140	see page 33, 37-39	see page 32, 34, 37-39	see page 37-39
Installation			in any position	in any position	in any position	in any position
Ambient temperature range ⁽¹⁾	$\vartheta_{\min. / \max.}$	°C	-10 to +60	-10 to +60	-10 to +60	-10 to +60
Medium temperature range ⁽¹⁾	$\vartheta_{\min. / \max.}$	°C	-10 to +60	-10 to +60	-10 to +60	-10 to +60
Medium			Filtered compressed air (30 μ)			
Lubrication			With or without oil mist lubrication ⁽²⁾ (we recommend the use of mineral oil type VG 32 to ISO 3448)			
Pneumatic Characteristics						
Nominal pressure	$p_{\min. / \max.}$	bar	6	6	6	6
Operating pressure range	$p_{\min. / \max.}$	bar				
– Permanent signal range	$p_{\min. / \max.}$	bar	0–10	2–10	2–10	2.2–10
Impulse range	$p_{\min. / \max.}$	bar	–	1.5–10	1.5–10 ⁽³⁾	1.5–10 ⁽³⁾
– with external pilot air	$p_{\min. / \max.}$	bar	–	0–10	0–10	0–10
Nominal flow	Q_N	l/min	37 (150 NW2.5)	500 (450 at 3/2 way valve)	1300 ⁽⁴⁾	3500 ⁽⁵⁾
Actuation						
Actuation pressure range						
– Permanent signal range	$p_{\min. / \max.}$	bar	–	2–10	2–10	2.2–10
Impulse range	$p_{\min. / \max.}$	bar	–	1.5–10	1.5–10 ⁽³⁾	1.5–10 ⁽³⁾
– with external pilot air	$p_{\min. / \max.}$	bar	–	0–10	0–10	0–10
– electrical			direct			
piloted			–	●	●	●
piloted, with external pilot air			–	●	●	●

Piezo Electrical Actuation ⁽⁶⁾

Approval			EU type test certificate DMT 01 ATEX E 026 X			
Category, type of protection			II 2G EEX ia IIC T4/T5/T6			
HOERBIGER Code			M	N	L	E
Voltage			DC			
Switching voltage	U	V/DC	6 – 9	7 – 16	12 – 24	24 – 30
Initial current	I	mA	–	–	–	1.6
Holding current	I	mA	1 – 2	2 – 5.5	1.5 – 3.5	0.24 – 0.3
Electrical protection			IP54			
Connection			Plug to DIN 43650A			
Safety data according to EU type test certificate						
Voltage	U_i	V	9	16	24	30
Current	I_i	mA	–	–	–	150
External capacitance	C_i	nF	12	12	12	12
External inductance	L_i	nH	120	120	120	120

Electrical, by EX solenoids

		AC		DC	
Voltage					
Nominal voltage	U_n	V	220	24	other voltages on request
Switching energy		VA (W)	5.0	5.1	
Holding energy		VA (W)	5.0	5.1	
Electrical protection					
Insulation material			E to VDE 0580		
Connection			Cable 1200 mm long		

⁽¹⁾ Note: when using below freezing point please contact our technical department.

⁽²⁾ at piezo electrical piloted valve: filtered air (30 μ), nor or minimal oil mist lubrication (max. 30mg/m³)

⁽³⁾ at differential piston version 2.5 – 10 bar

⁽⁴⁾ at version middle position exhausted 1000 l/min

⁽⁵⁾ at version middle position exhausted 3300 l/min
at version middle position pressurized 3600 l/min

⁽⁶⁾ Not suitable as safety valve with 100% ED

Series S20 according to ISO 5599 Sizes 1, 2, 3

Characteristics	Symbol	Unit	Series S9 ISO 1	ISO 2	ISO 3
Actuation			electrical piloted	electrical piloted	electrical piloted
General Features					
Type			Ceramic spool valve		
Mounting			On base plate – to VDMA 24561 Gr. 01 and ISO 5599 Gr. 1, 2, 3		
Tube connection			Base plate		
Base plate-Thread			G1/4	G3/8	G1/2
Weight					
– Permanent signal range		kg	0.460	0.700	1.230
– Impulse range		kg	0.590	0.830	1.370
Installation			In any position		
Ambient temperature range ⁽¹⁾	$\vartheta_{\min. / \max.}$	°C	-10 to +60	-10 to +60	-10 to +60
Medium temperature range ⁽¹⁾	$\vartheta_{\min. / \max.}$	°C	-10 to +60	-10 to +60	-10 to +60
Medium			Filtered compressed air (30 μ)		
Lubrication			With or without oil mist lubrication ⁽²⁾ (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	$p_{\min. / \max.}$	bar		16 bar versions on request	
– Permanent signal range	$p_{\min. / \max.}$	bar	2–12		
– Impulse range	$p_{\min. / \max.}$	bar	2–12		
– with external pilot air	$p_{\min. / \max.}$	bar	-1–12		
Nominal flow	Q_N	l/min	1380	3720	6660
Actuation					
Actuation pressure range				16 bar versions on request	
– Permanent signal range	$p_{\min. / \max.}$	bar	2–10		
– Impulse range	$p_{\min. / \max.}$	bar	2–10		
– with external pilot air	$p_{\min. / \max.}$	bar	2–10		
electrical piloted				●	● ●
– with external pilot air				●	● ●

Piezo Electrical Actuation ⁽³⁾						
Approval			EU type test certificate DMT 01 ATEX E 025 X			
Category, type of protection			II 2G EEX ia IIC T4/T5/T6			
HOERBIGER Code			M	N	L	E
Voltage			DC			
Switching voltage	U	V/DC	6 – 9	7 – 16	12 – 24	24 – 30
Initial current	I	mA	–	–	–	1.6
Holding current	I	mA	1 – 2	2 – 5.5	1.5 – 3.5	0.24 – 0.3
Electrical protection			IP54			
Connection			Plug to DIN 43650A			
Safety data according to EU type test certificate						
Voltage	U_i	V	9	16	24	30
Current	I_i	mA	–	–	–	150
External capacitance	C_i	nF	12	12	12	12
External inductance	L_i	nH	120	120	120	120

Electrical, by EX solenoids						
Voltage			AC	DC		
Nominal voltage	U_n	V	220	24	other voltages on request	
Switching energy		VA (W)	5.0	5.1		
Holding energy		VA (W)	5.0	5.1		
Electrical protection						
Insulation material			E to VDE 0580			
Connection			Cable 1200 mm long			

⁽¹⁾ Note: when using below freezing point please contact our technical department.

⁽²⁾ at piezo electrical piloted valve: filtered air (30 μ), nor or minimal oil mist lubrication (max. 30mg/m³)

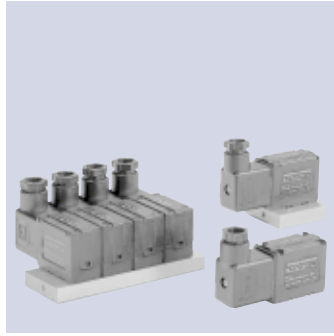
⁽³⁾ Not suitable as safety valve with 100% ED

3/2 Way Valves (Pilot Valves with Base Plate)

Series P8 – intrinsically safe, piezo electrical actuated

3/2 Way Poppet Valve Series P8 NW 1.6 and M5

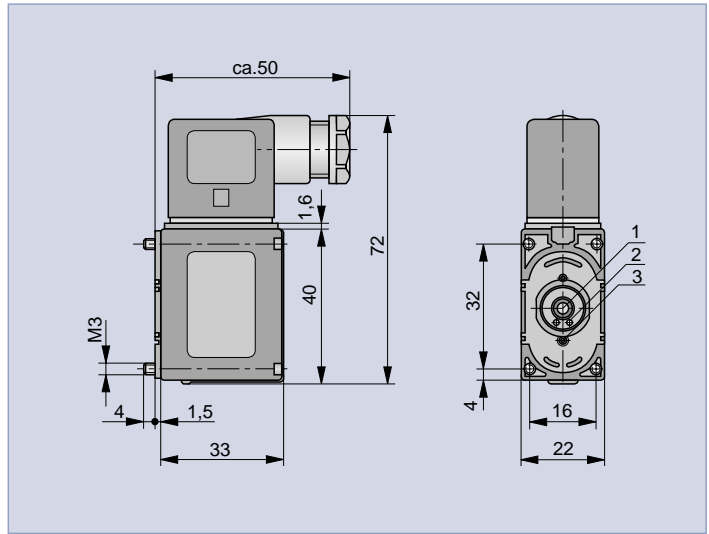
Actuation:
– Piezo electric piloted



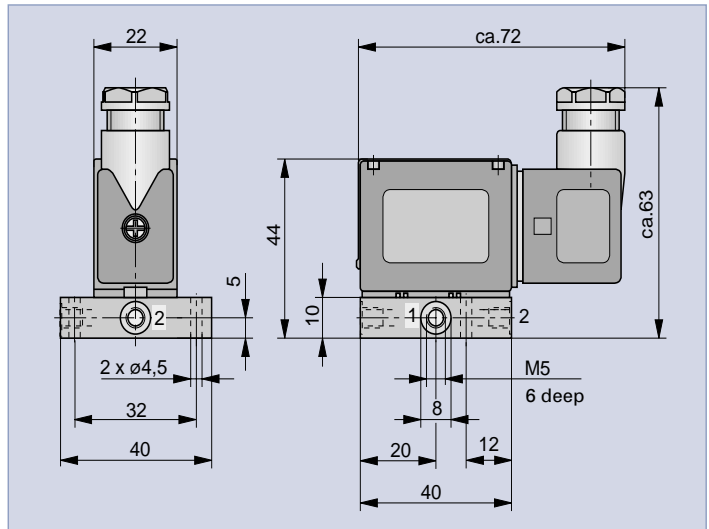
Versions

- Pilot valve NW1.6
- Single valve M5
- Manifold version M5
- Normally closed
- Normally open

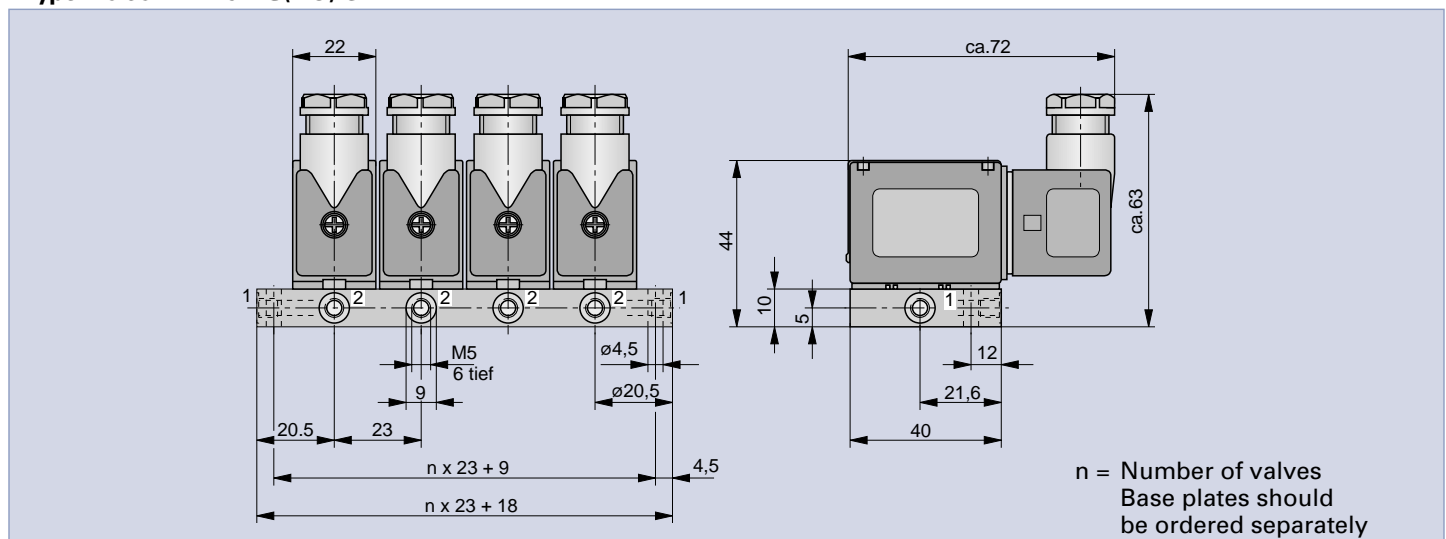
Pilot Valve
Type: P8 381RF-NG(NO)-.



Single Valve
Type: P8 381RF-M5 NG(NO)-.



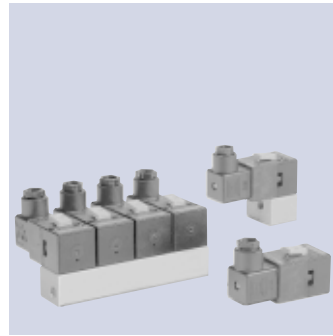
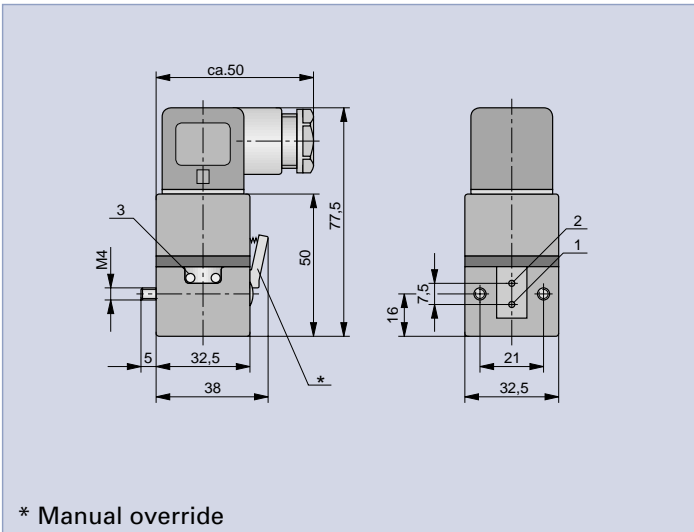
Manifold Version
Type: P8 381RF-M5 NG(NO)-S.



Order Instructions see page 22, Characteristics see page 27

Series P20 – intrinsically safe, piezo electrical actuated

Pilot Valve
Type: P20 381RF-NG(NO)-.

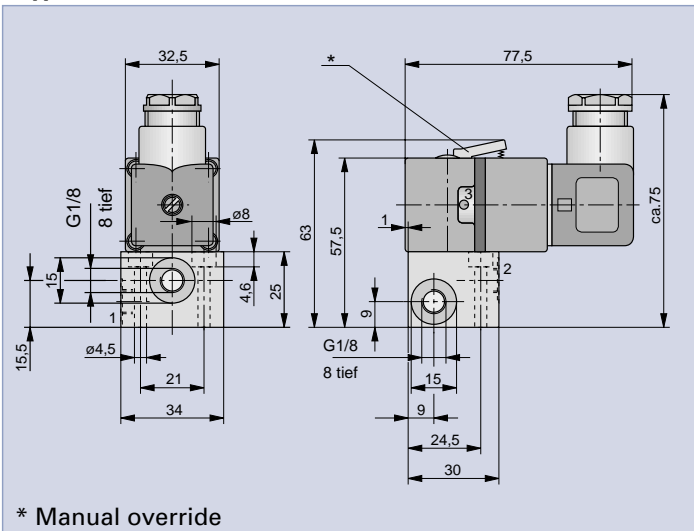


3/2 Way Poppet Valve Series P20 NW 2 and G1/8

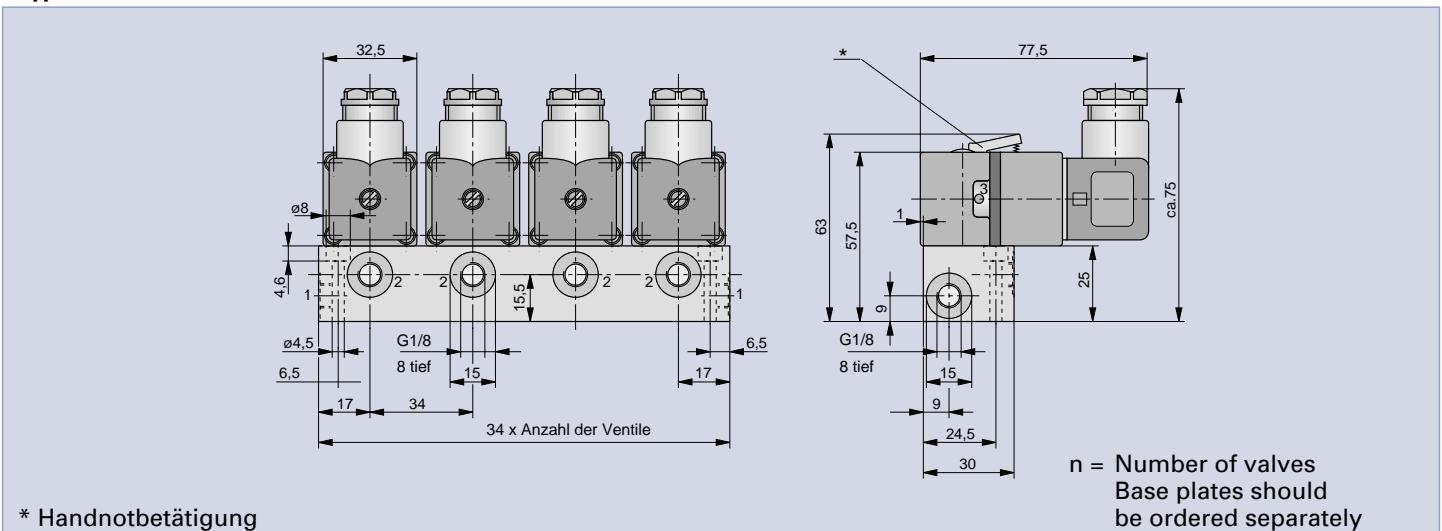
Actuation:
 – Piezo electric piloted

Versions
 – Pilot valve NW2
 – Single valve G1/8
 – Manifold version G1/8
 – Normally closed
 – Normally open

Single Valve
Type: P20 381RF-1/8 NG(NO)-.



Manifold Version
Type: P20 381RF-1/8 NG(NO)-.



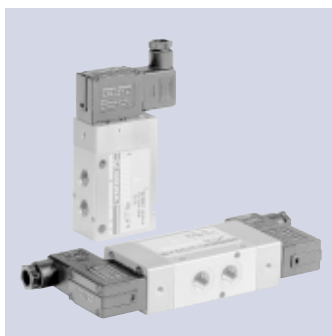
Order Instructions see page 22, Characteristics see page 27

3/2 Way Valve

Series S9 – intrinsically safe, piezo electrical actuated

3/2 Way Valve Series S9 G1/4

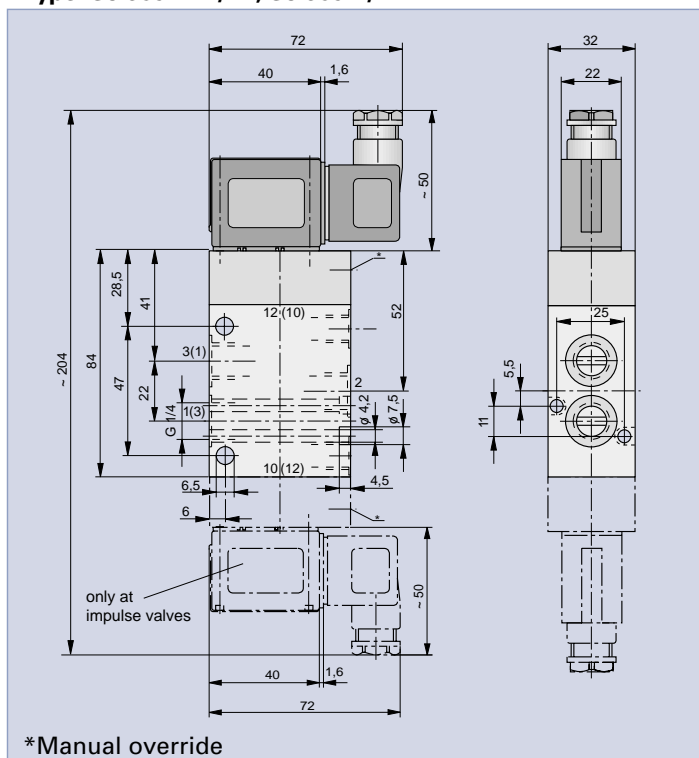
Actuation:
– Piezo electric piloted



Weight (mass) kg

Description	Type	Weight (mass)
Electrical, by perm. signal	S9 585RF-1/4-..	0.500
Electrical, by impulse	S9 585-1/4-..	0.600

3/2 Way Valve Type: S9 385RF-1/4-., S9 385-1/4-.

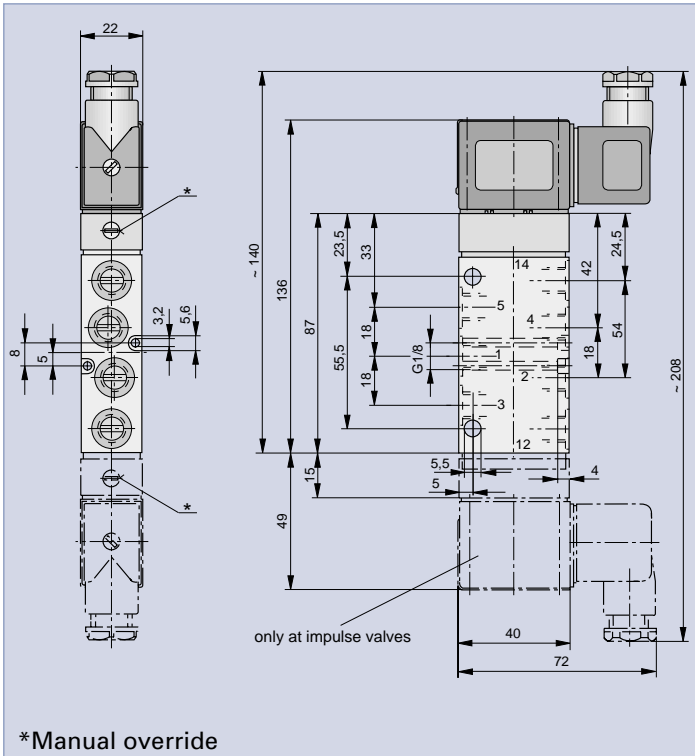


5/2 and 5/3 Way Valve

Series S9 – intrinsically safe, piezo electrical actuated

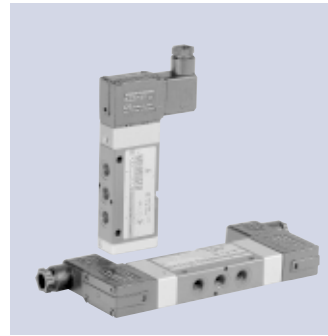
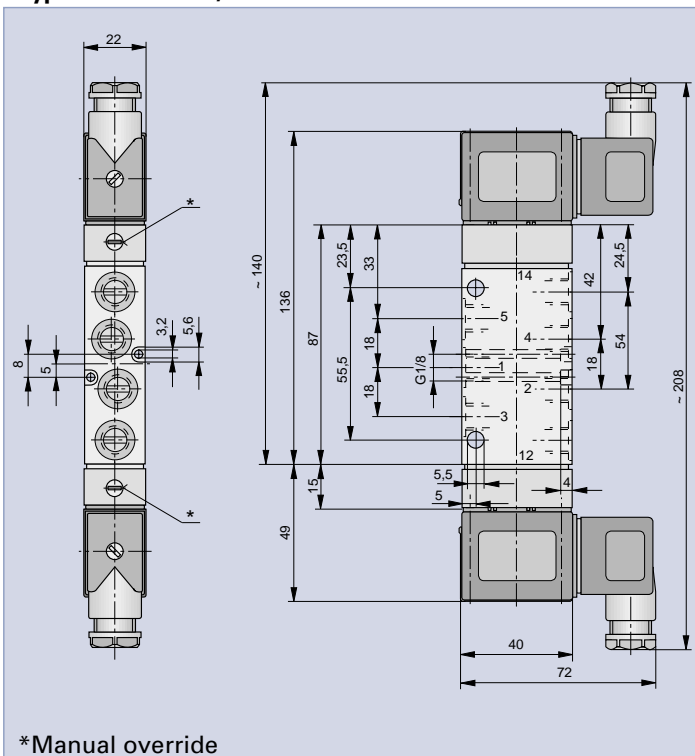
5/2 Way Valve

Type: S9 585RF-1/8-., S9 585-1/8-.



5/3 Way Valve

Type: S9 585RF-1/8-.



5/2 and 5/3 Way Valve Series S9 G1/8

Actuation:
– Piezo electric piloted

Weight (mass) kg

Description	Type	Weight (mass)
Electrical, by perm. signal	S9 585RF-1/8-..	0.245
Electrical, by impulse	S9 585-1/8-..	0.340
Electrical, by perm. signal *	S9 585RF-1/8-..	0.340

* Middle position variants RFG, RFE, RFB

Order Instructions see page 23, Characteristics see page 28
P-Supply and RPS Manifolds see pages 41, 42, 46

5/2 and 5/3 Way Valve

Series S9 – intrinsically safe, piezo electrical actuated

5/2 and 5/3 Way Valve Series S9 G1/4

Actuation:
– Piezo electric piloted

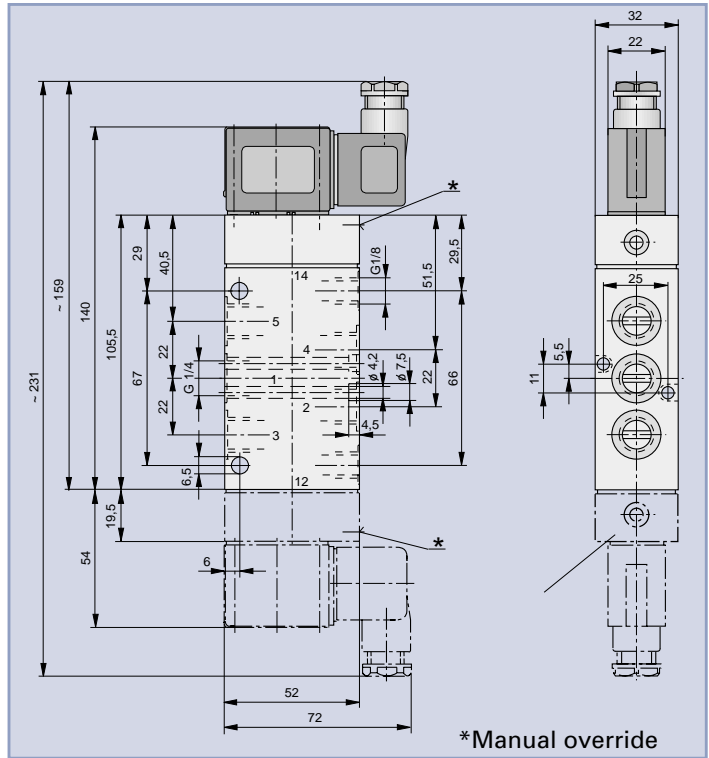


Weight (mass) kg

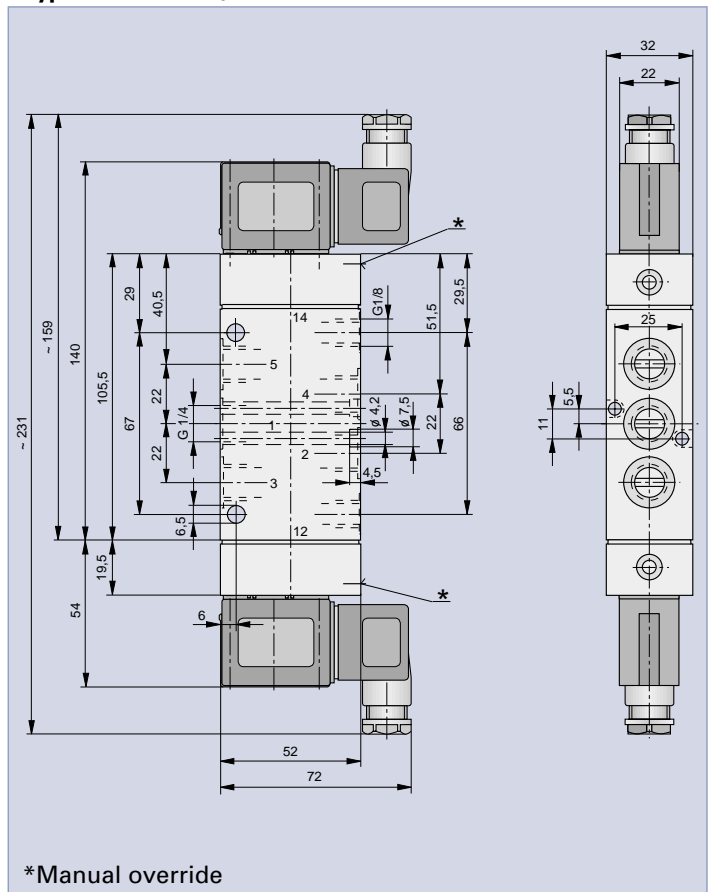
Description	Type	Weight (mass)
Electrical, by perm. signal	S9 585RF-1/4-..	0.550
Electrical, by impulse	S9 585-1/4-..	0.650
Electrical, by perm. signal *	S9 585RF.-1/4-..	0.620

* Middle position variants RFG, RFE, RFB

5/2 Way Valve Type: S9 585RF-1/4-., S9 585-1/4-.



5/3 Way Valve Type: S9 585RF.-1/4-.

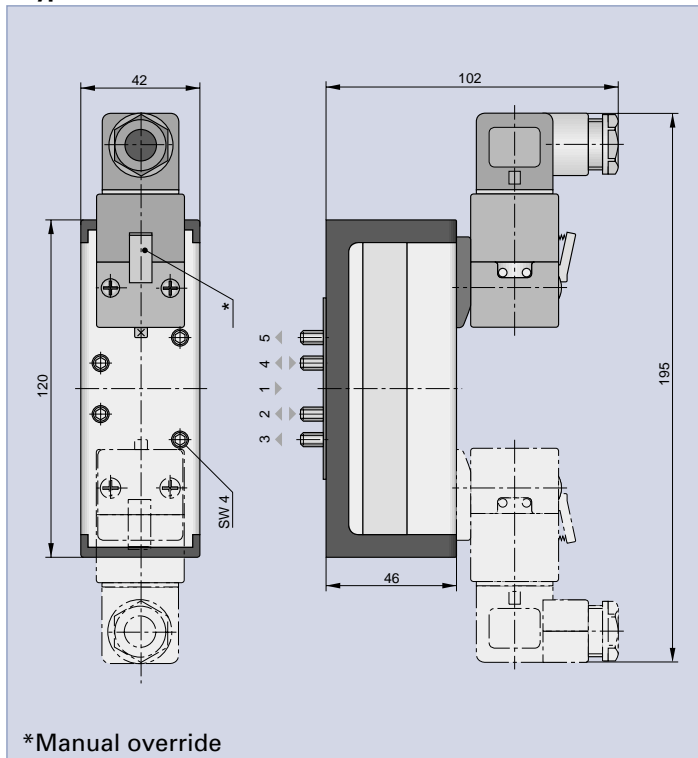


Order Instructions see page 23, Characteristics see page 28
P-Supply and RPS Manifolds see pages 43, 44, 47

Way Valve to ISO 5599

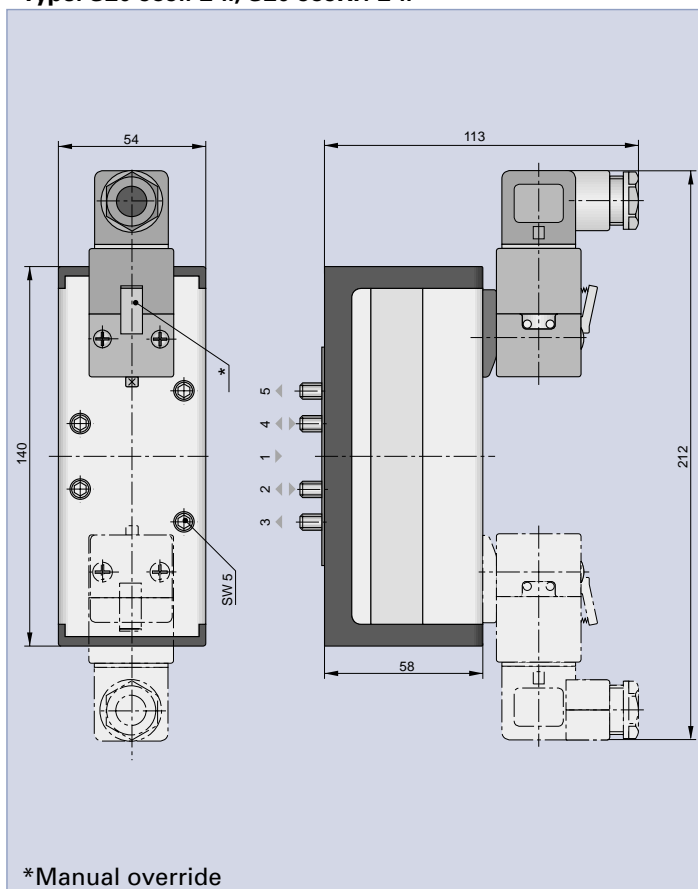
Series S20 – intrinsically safe, piezo electrical actuated

5/2 and 5/3 Way Valve to ISO 5599 Size 1
 Type: S20 585..-1-.., S20 585RF-1-..

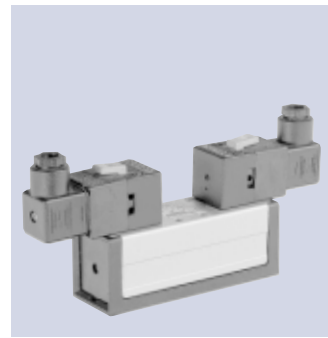


*Manual override

5/2 and 5/3 Way Valve to ISO 5599 Size 2
 Type: S20 585..-2-.., S20 585RF-2-..



*Manual override



5/2 and 5/3 Way Valve Series S20 to ISO 5599 Sizes 1, 2, 3

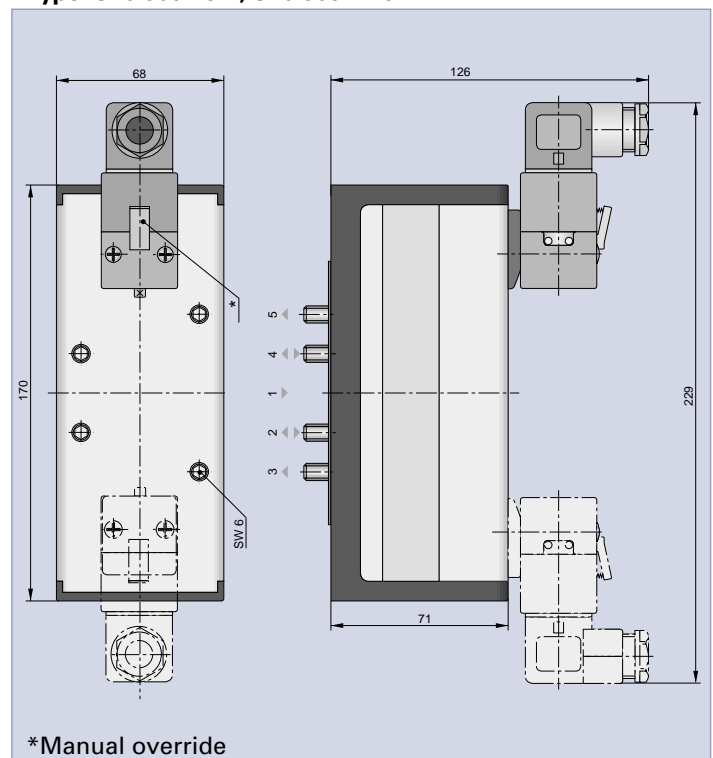
Actuation:
 – Piezo electric piloted

Weight (mass) kg

Description	Type	Weight (mass)
Electrical, by perm. signal	S20 585RF(R)-1-..	0.460
Electrical, by impulse	S20 585-1-..	0.590
Electrical, by perm. signal *	S20 585RF-1-..	0.590
Electrical, by perm. signal	S20 585RF(R)-2-..	0.700
Electrical, by impulse	S20 585-2-..	0.830
Electrical, by perm. signal *	S20 585RF-2-..	0.830
Electrical, by perm. signal	S20 585RF(R)-3-..	1.230
Electrical, by impulse	S20 585-3-..	1.370
Electrical, by perm. signal *	S20 585RF-3-..	1.370

* Middle position variants RFG, RFE, RFB

5/2 and 5/3 Way Valve to ISO 5599 Size 3
 Type: S20 585..-3-.., S20 585RF-3-..



*Manual override

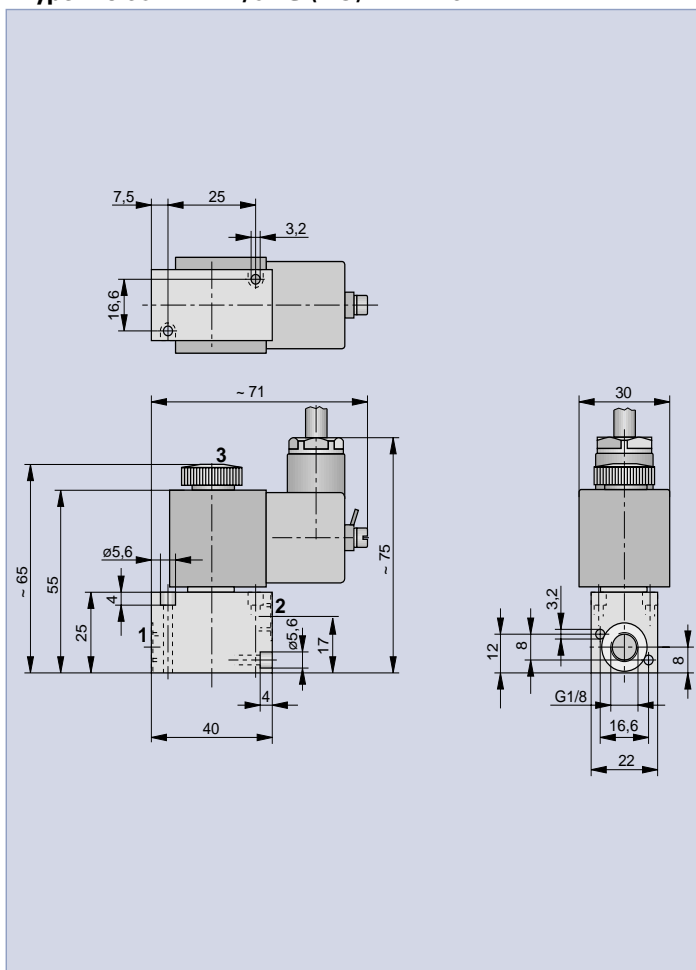
Order Instructions see page 23, Characteristics see page 29
 Base Plates see pages 48-51

3/2 Way Valve Series V9 NW 1.3

EEx m Solenoids
–Electrical, direct piloted



Type: V9 381RF-1/8NG (NO)– NW 1.3
Type: V9 381H-RF-1/8NG (NO)– NW 1.3



Accessories for P-Supply Manifolds

Description	for NW	Order No.
O-ring 10x2	1.3	88-37H643-75
Screw M3x40	1.3	ZP3986
P-supply manifolds PL-1/8-..	1.3	PD32763-....*
P-supply manifolds PLK-1/8-..	1.3	PD37174-....*

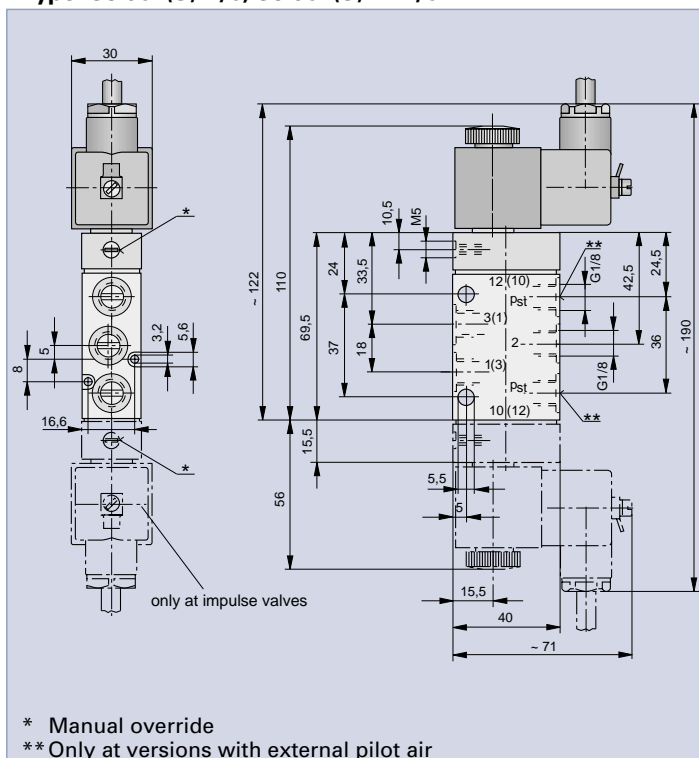
* Add number of valve positions to order no.

3/2 Way Valve

Series S9 – with EEx m-Solenoids

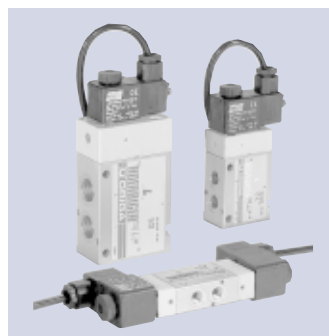
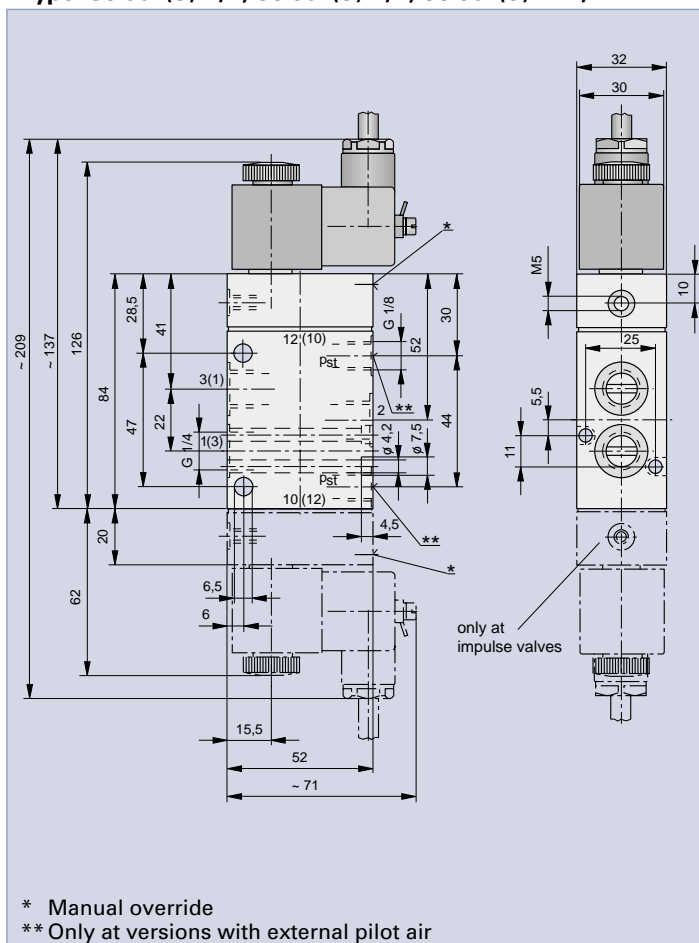
Electrical pilot operation

Type: S9 381(S)-1/8, S9 381(S)RF-1/8



Electrical pilot operation

Type: S9 381(S)-1/4, S9 382(S)-1/4, S9 381(S)RF-1/4



3/2 Way Valve Series S9 G1/8, G1/4, G1/2

Actuation:
EEx m Solenoids
– Electrical pilot operation
– Electrical pilot operation with external pilot air

Note:
If mounted to a P-supply manifold, the option of specifying valve S9 381S-RF-1/8 as “normally open” is not available

Versions

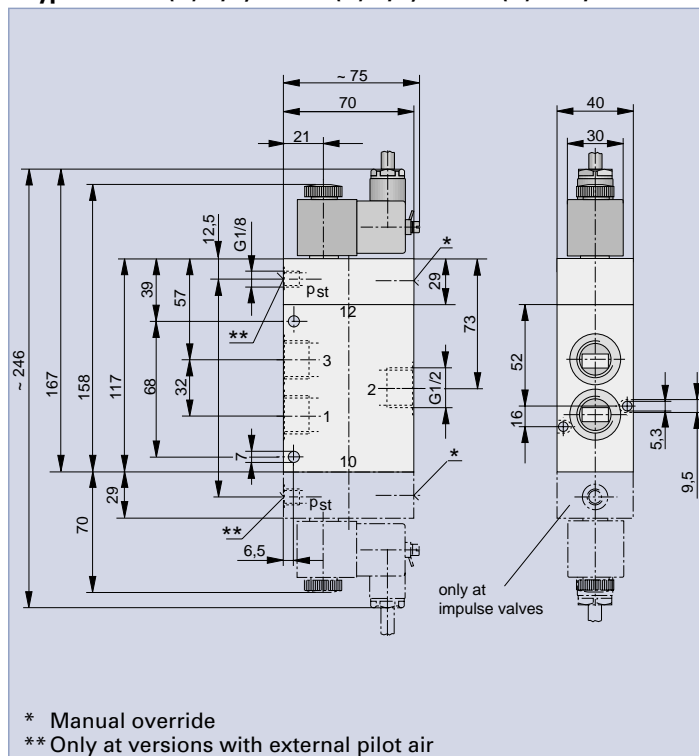
- Normally closed
- Normally open
- With external pilot air

Weight (mass) kg

Description	Type	Weight (mass)
Electrical, by permanent signal	S9 381(S)RF-1/8	0.247
Electrical, by impulse	S9 381(S)-1/8	0.382
Electrical, by permanent signal	S9 381(S)RF-1/4	0.500
Electrical, by impulse	S9 381(S)-1/4	0.600
– with differential piston	S9 382(S)-1/4	0.600
Electrical, by permanent signal	S9 381(S)RF-1/2	0.815
Electrical, by impulse	S9 381(S)-1/2	1.100
– with differential piston	S9 382(S)-1/2	1.100

Electrical pilot operation

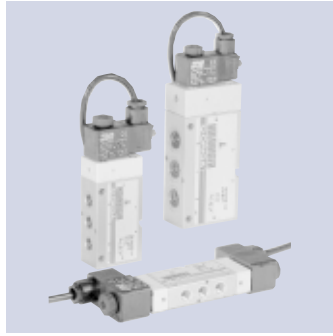
Type: S9 381(S)-1/2, S9 382(S)-1/2, S9 381(S)RF-1/2



Order Instructions see page 24, Characteristics see page 28
P-Supply and RPS Manifolds see pages 41-47

5/2 Way Valve Series S9 G1/8, G1/4, G1/2

Actuation:
EEx m Solenoids
– Electrical pilot operation
– Electrical pilot operation
with external pilot air

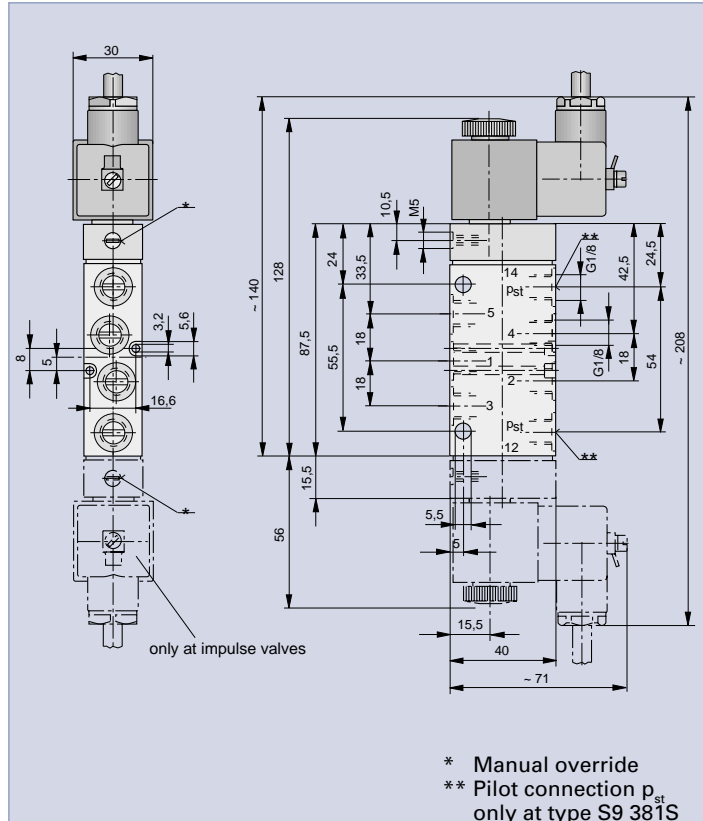


Versions
– With external pilot air

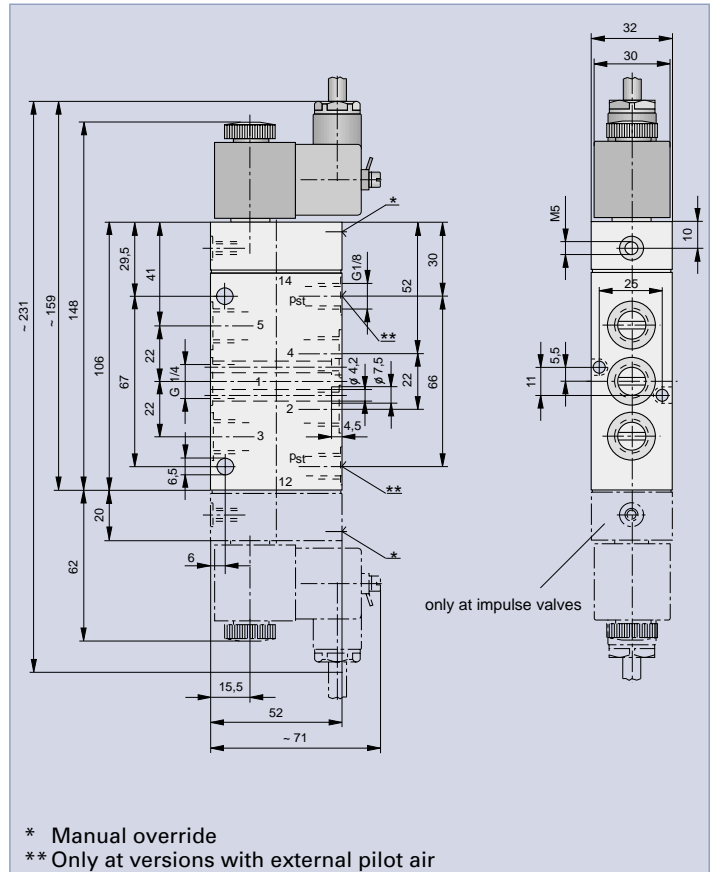
Weight (mass) kg

Description	Type	Weight (mass)
Electrical, by permanent signal	S9 581(S)RF-1/8	0.280
Electrical, by impulse	S9 581(S)-1/8	0.415
Electrical, by permanent signal	S9 581(S)RF-1/4	0.600
Electrical, by impulse	S9 581(S)-1/4	0.700
– with differential piston	S9 582(S)-1/4	0.700
Electrical, by permanent signal	S9 581(S)RF-1/2	1.000
Electrical, by impulse	S9 581(S)-1/2	1.270
– with differential piston	S9 582(S)-1/2	1.270

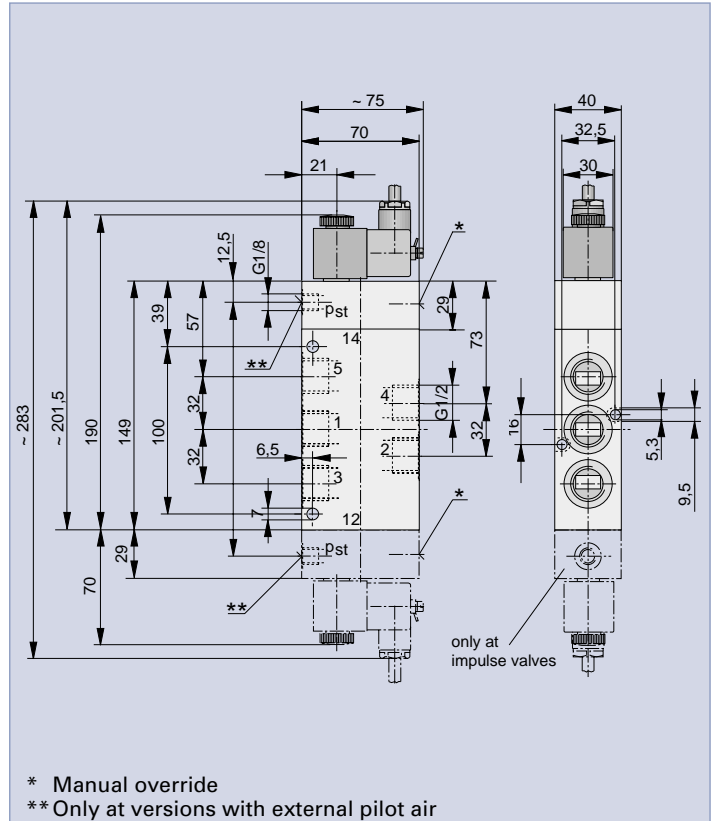
Electrical pilot operation Type: S9 581(S)-1/8, S9 581(S)RF-1/8



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



Electrical pilot operation Type: S9 581(S)-1/2, S9 582(S)-1/2, S9 581(S)RF-1/2

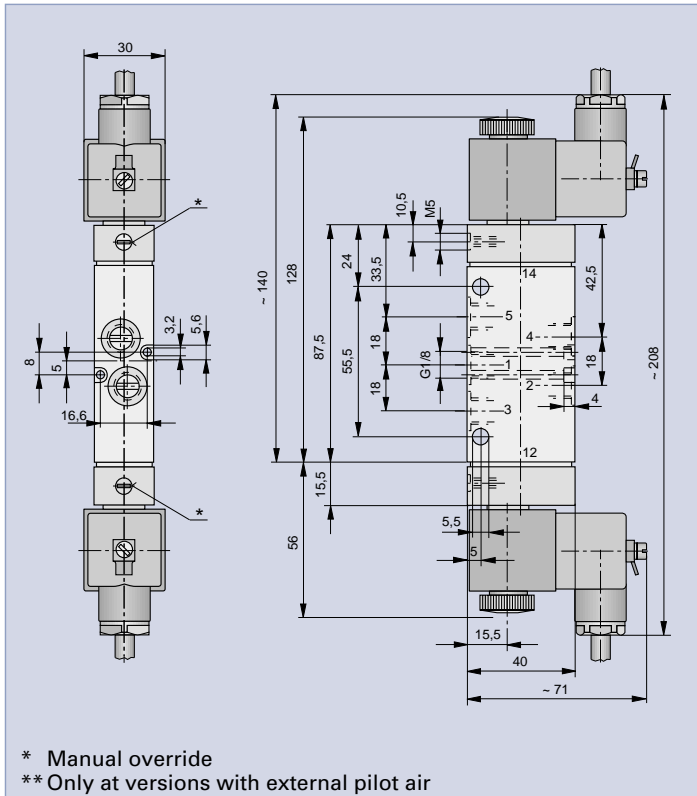


Order Instructions see page 24, Characteristics see page 28
P-Supply and RPS Manifolds see pages 41-47

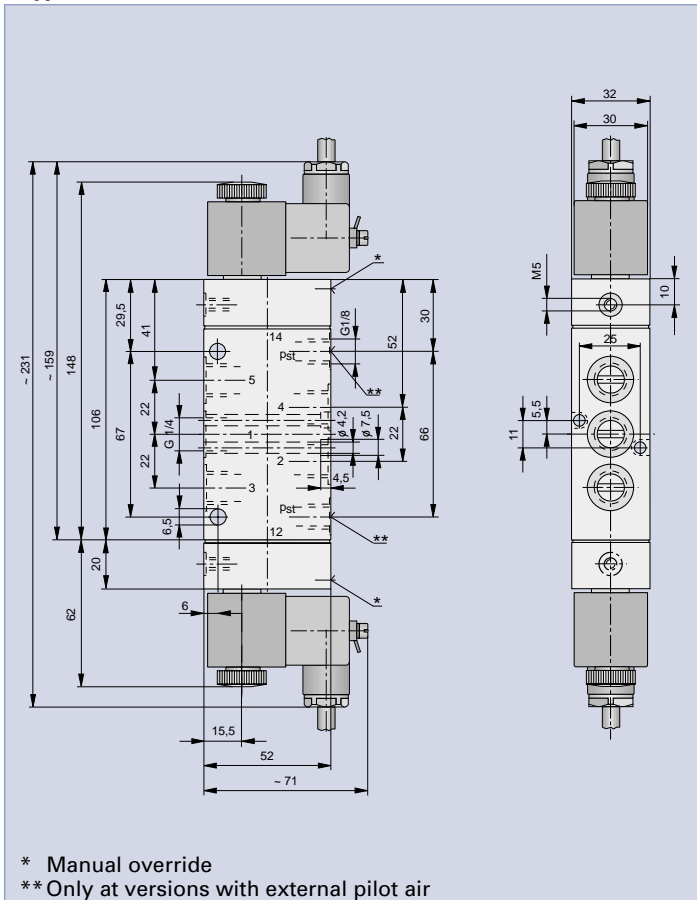
5/3 Way Valve

Series S9 – with EEx m-Solenoids

Electrical pilot operation
Type: S9 581RF-1/8



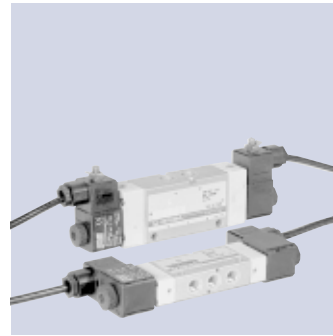
Electrical pilot operation
Type: S9 581RF-1/4



Order Instructions see page 24, Characteristics see page 28
P-Supply and RPS Manifolds see pages 41-47

5/3 Way Valve Series S9 G1/8, G1/4, G1/2

Actuation:
EEx m Solenoids
– Electrical pilot operation
– Electrical pilot operation
with external pilot air

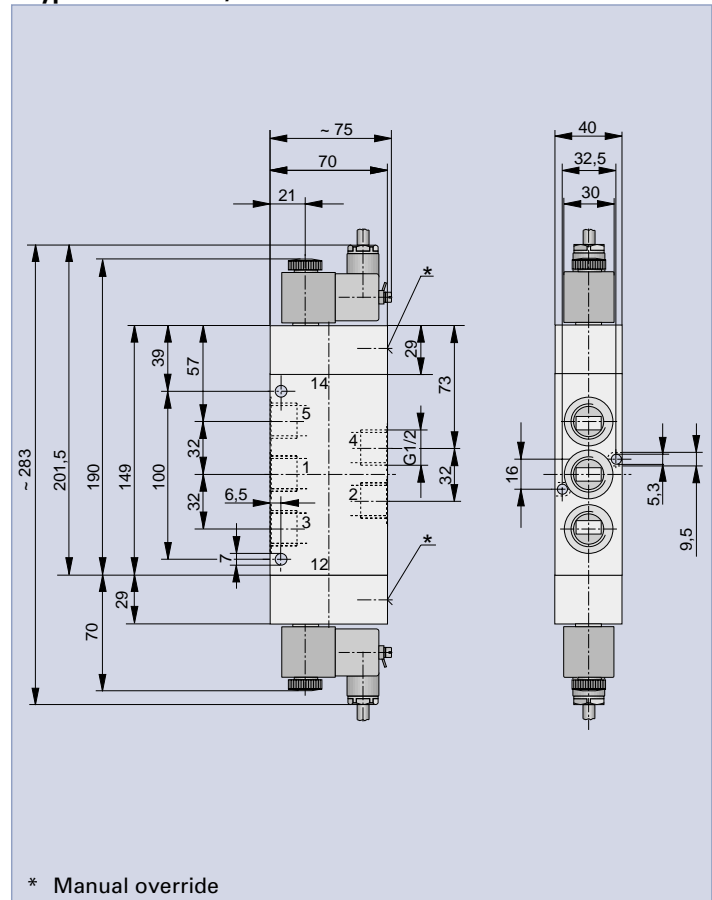


Weight (mass) kg

Description	Type	Weight (mass)
Electrical, by permanent signal *	S9 581RF-1/8	0.247
Electrical, by permanent signal *	S9 581RF-1/4	0.500
Electrical, by permanent signal *	S9 581RF-1/2	0.770

* Middle position variants RFG, RFE, RFB

Electrical pilot operation
Type: S9 581RF-1/2

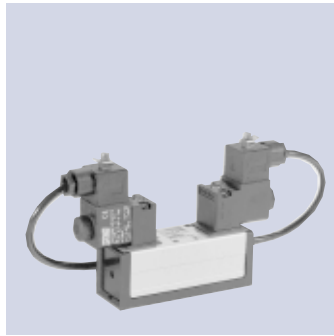


5/2 and 5/3 Way Valve to ISO 5599

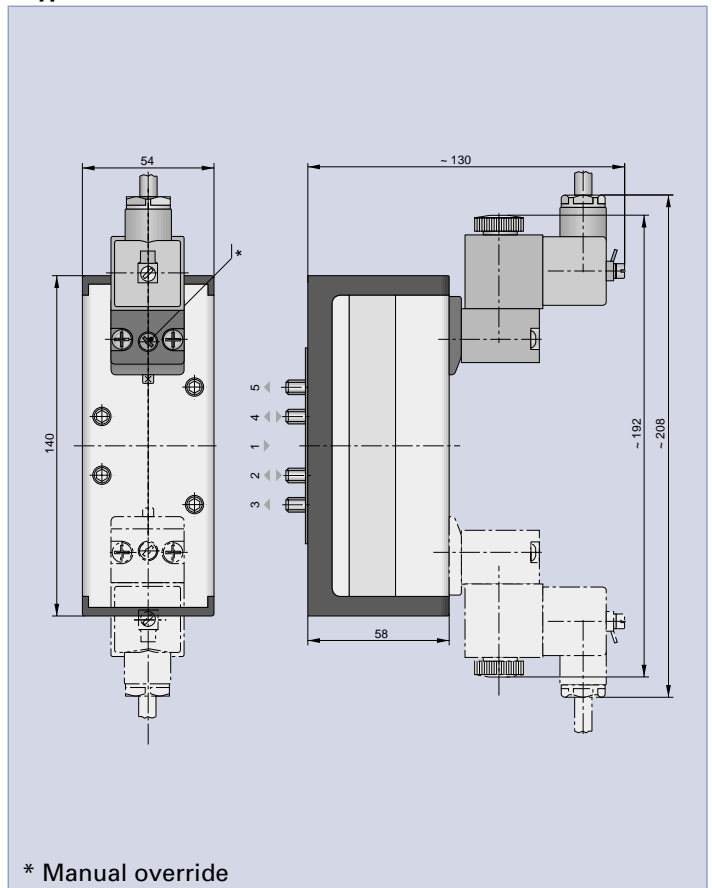
Series S20 – with EEx m-Solenoids

5/2 and 5/3 Way Valve Series S20 to ISO 5599 Sizes 1, 2, 3

Actuation:
EEx m Solenoids
–Electrical pilot operation



5/2 and 5/3 Way Valve to ISO 5599 Size 2 Type: S20 581..-2-.., S20 581RF-2-..



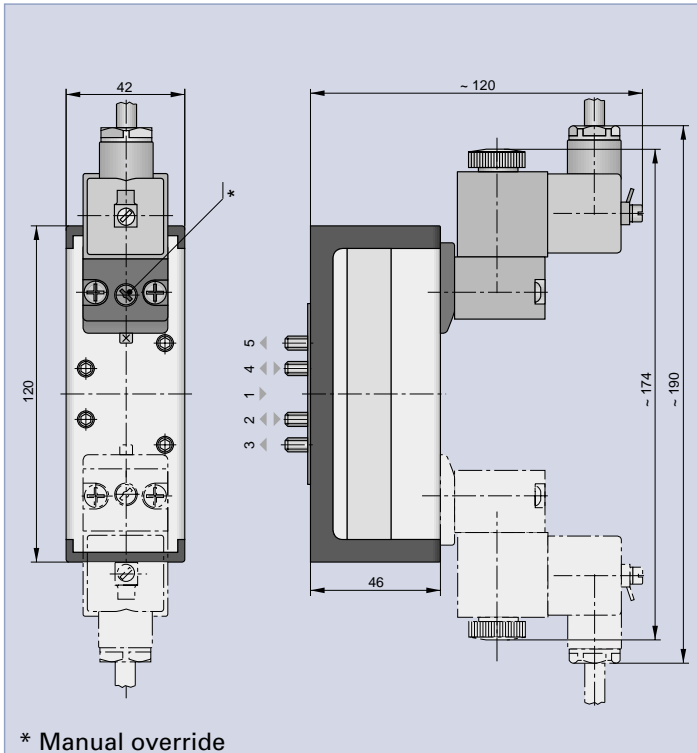
* Manual override

Weight (mass) kg

Description	Type	Weight (mass)
Electrical, by perm. signal	S20 581RF(R)-1-..	0.460
Electrical, by impulse	S20 581-1-..	0.590
Electrical, by perm. signal *	S20 581RF-1-..	0.590
Electrical, by perm. signal	S20 581RF(R)-2-..	0.700
Electrical, by impulse	S20 581-2-..	0.830
Electrical, by perm. signal *	S20 581RF-2-..	0.830
Electrical, by perm. signal	S20 581RF(R)-3-..	1.230
Electrical, by impulse	S20 581-3-..	1.370
Electrical, by perm. signal *	S20 581RF-3-..	1.370

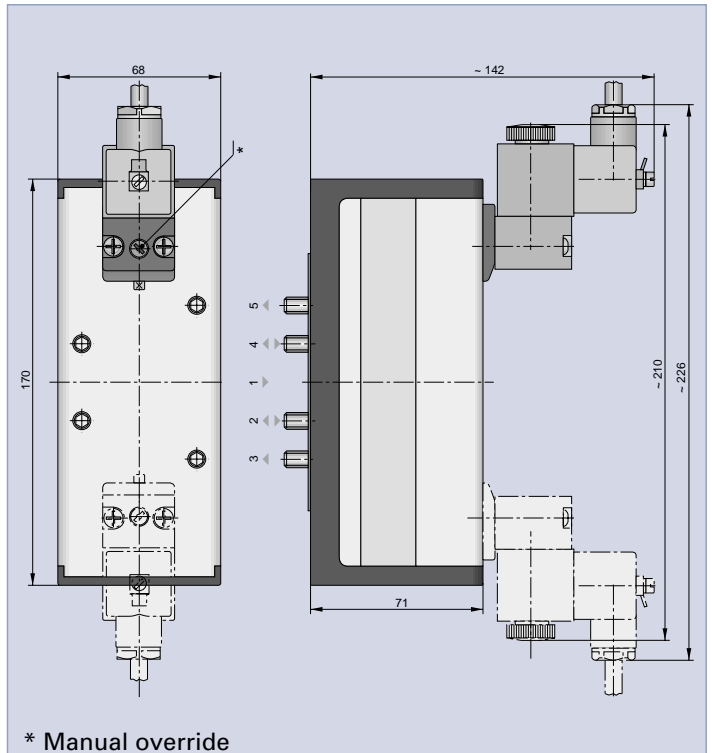
* Middle position variants RFG, RFE, RFB

5/2 and 5/3 Way Valve to ISO 5599 Size 1 Type: S20 581..-1-.., S20 581RF-1-..



* Manual override

5/2 and 5/3 Way Valve to ISO 5599 Size 3 Type: S20 581..-3-.., S20 581RF-3-..



* Manual override

Order Instructions see page 26, Characteristics see page 29
Base Plates see pages 48-51

P-Supply Manifolds for Directional Valves, Series S9-1/8

Series PL-1/8-..

Material

Description	Material
P-supply manifold	Al, anodized
Mounting bracket	Steel, passivated
Screws	Galvanized steel
O-ring	Oil-resistant rubber

Accessories

Description	Order No.
Complete cover plate	PD 34694
Flow divider	PD 42483

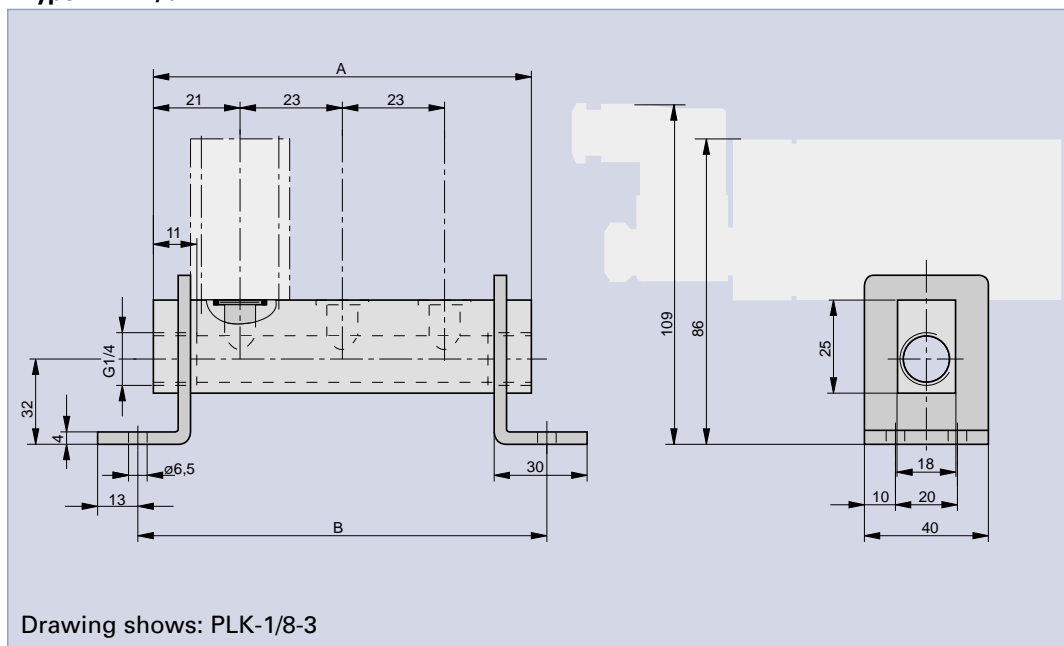


P-Supply Manifolds for Way Valve Series S9-1/8

Versions

- Type PLK-1/8 (short mounting bracket)
- Type PL-1/8 (long mounting bracket)

P-Supply Manifold Type: PLK-1/8-..



P-supply manifolds reduce and simplify tubing. They allow a compact and clear design. 3/2, 5/2 and 5/3 directional valves with different types of actuation can be mounted in groups of 2-10 pieces.

The use of impulse solenoid valves is only possible with P-supply manifold type PLK-..

The delivery includes

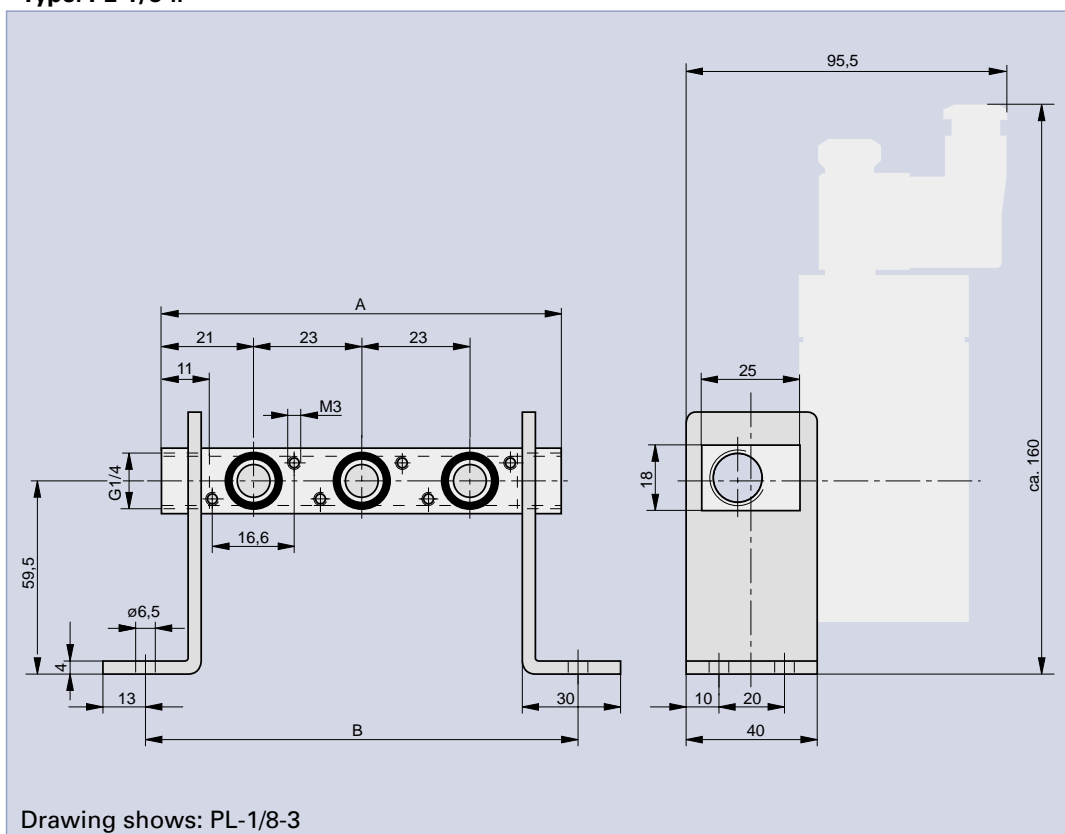
- P-supply manifold
- Mounting bracket
- Mounting screws
- O-rings

Dimensions, Order Instructions and Weight (mass)

Type	Order No.	No. of valves	Dim.		consisting of				Weight (kg)
			A	B	Manif.	Bracket	Screw	O-ring	
PLK-1/8-2	PD37174-0002	2	65	79	1	2	4	2	0.28
PLK-1/8-3	PD37174-0003	3	88	102	1	2	6	3	0.31
PLK-1/8-4	PD37174-0004	4	111	125	1	2	8	4	0.34
PLK-1/8-5	PD37174-0005	5	134	148	1	2	10	5	0.37
PLK-1/8-6	PD37174-0006	6	157	171	1	2	12	6	0.40
PLK-1/8-7	PD37174-0007	7	180	194	1	2	14	7	0.43
PLK-1/8-8	PD37174-0008	8	203	217	1	2	16	8	0.47
PLK-1/8-9	PD37174-0009	9	226	240	1	2	18	9	0.50
PLK-1/8-10	PD37174-0010	10	249	263	1	2	20	10	0.53

P-Supply Manifolds for Directional Valves, Series S9-1/8 and S9-1/4 Series PL-1/8-..

P-Supply Manifold
Type: PL-1/8-..



Dimensions, Order Instructions and Weight (mass)

Type	Order No.	No. of valves	Dim.		consisting of				Weight (kg)
			A	B	Manif.	Bracket	Screw	O-ring	
PL-1/8-2	PD 32763-0002	2	65	79	1	2	4	2	0.28
PL-1/8-3	PD 32763-0003	3	88	102	1	2	6	3	0.31
PL-1/8-4	PD 32763-0004	4	111	125	1	2	8	4	0.34
PL-1/8-5	PD 32763-0005	5	134	148	1	2	10	5	0.37
PL-1/8-6	PD 32763-0006	6	157	171	1	2	12	6	0.40
PL-1/8-7	PD 32763-0007	7	180	194	1	2	14	7	0.43
PL-1/8-8	PD 32763-0008	8	203	217	1	2	16	8	0.47
PL-1/8-9	PD 32763-0009	9	226	240	1	2	18	9	0.50
PL-1/8-10	PD 32763-0010	10	249	263	1	2	20	10	0.53

Series PL-1/4-..

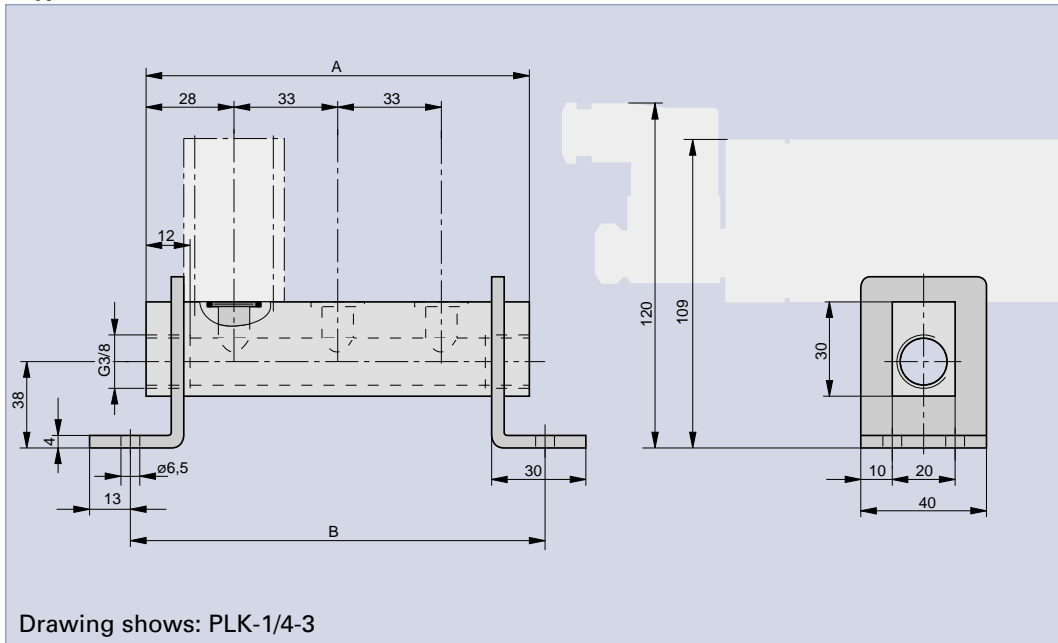
Material

Description	Material
P-supply manifold	Al, anodized
Mounting bracket	Steel, passivated
Screws	Galvanized steel
O-ring	Oil-resistant rubber

Accessories

Description	Order No.
Complete cover plate	PD 34695
Flow divider	PD 42516

P-Supply Manifold Type: PLK-1/8-..



Drawing shows: PLK-1/4-3

Dimensions, Order Instructions and Weight (mass)

Type	Order No.	No. of valves	Dim.		consisting of				Weight (kg)
			A	B	Manif.	Bracket	Screw	O-ring	
PLK-1/4-2	PD 37175-0002	2	89	99	1	2	4	2	0.31
PLK-1/4-3	PD 37175-0003	3	122	132	1	2	6	3	0.35
PLK-1/4-4	PD 37175-0004	4	155	165	1	2	8	4	0.39
PLK-1/4-5	PD 37175-0005	5	188	198	1	2	10	5	0.43
PLK-1/4-6	PD 37175-0006	6	221	231	1	2	12	6	0.47
PLK-1/4-7	PD 37175-0007	7	254	264	1	2	14	7	0.51
PLK-1/4-8	PD 37175-0008	8	287	297	1	2	16	8	0.55
PLK-1/4-9	PD 37175-0009	9	320	330	1	2	18	9	0.59
PLK-1/4-10	PD 37175-0010	10	353	363	1	2	20	10	0.63



P-Supply Manifolds for Way Valve Series S9-1/4

Versions

- Type PLK-1/4 (short mounting bracket)
- Type PL-1/4 (long mounting bracket)

P-supply manifolds reduce and simplify tubing. They allow a compact and clear design.

3/2, 5/2 and 5/3 directional valves with different types of actuation can be mounted in groups of 2-10 pieces.

The use of impulse solenoid valves is only possible with P-supply manifold type PLK-..

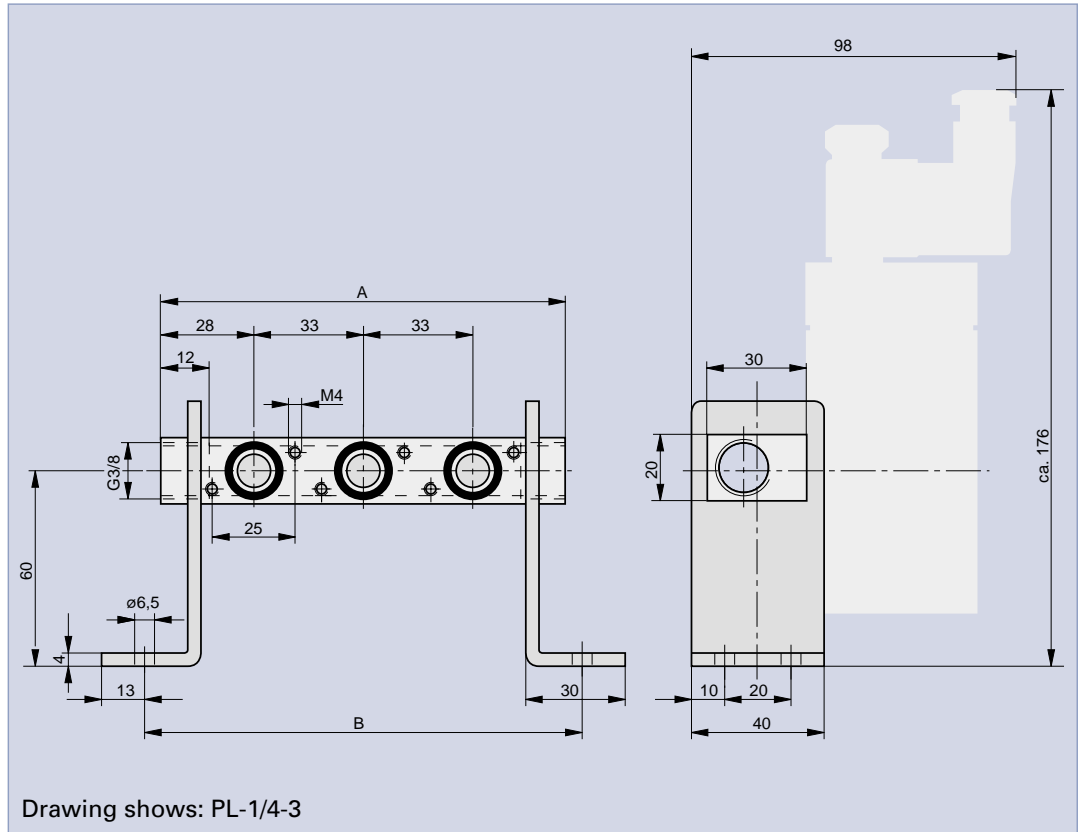
The delivery includes

- P-supply manifold
- Mounting bracket
- Mounting screws
- O-rings

P-Supply Manifolds for Directional Valves, Series S9-1/4 and S9-1/2

Series PL-1/4-..

P-Supply Manifold
Type: PL-1/4-..



Dimensions, Order Instructions and Weight (mass)

Type	Order No.	No. of valves	Dim.		consisting of				Weight (kg)
			A	B	Manif.	Bracket	Screw	O-ring	
PL-1/4-2	PD 32765-0002	2	89	99	1	2	4	2	0.31
PL-1/4-3	PD 32765-0003	3	122	132	1	2	6	3	0.35
PL-1/4-4	PD 32765-0004	4	155	165	1	2	8	4	0.39
PL-1/4-5	PD 32765-0005	5	188	198	1	2	10	5	0.43
PL-1/4-6	PD 32765-0006	6	221	231	1	2	12	6	0.47
PL-1/4-7	PD 32765-0007	7	254	264	1	2	14	7	0.51
PL-1/4-8	PD 32765-0008	8	287	297	1	2	16	8	0.55
PL-1/4-9	PD 32765-0009	9	320	330	1	2	18	9	0.59
PL-1/4-10	PD 32765-0010	10	353	363	1	2	20	10	0.63

Series PL-1/2-

Material

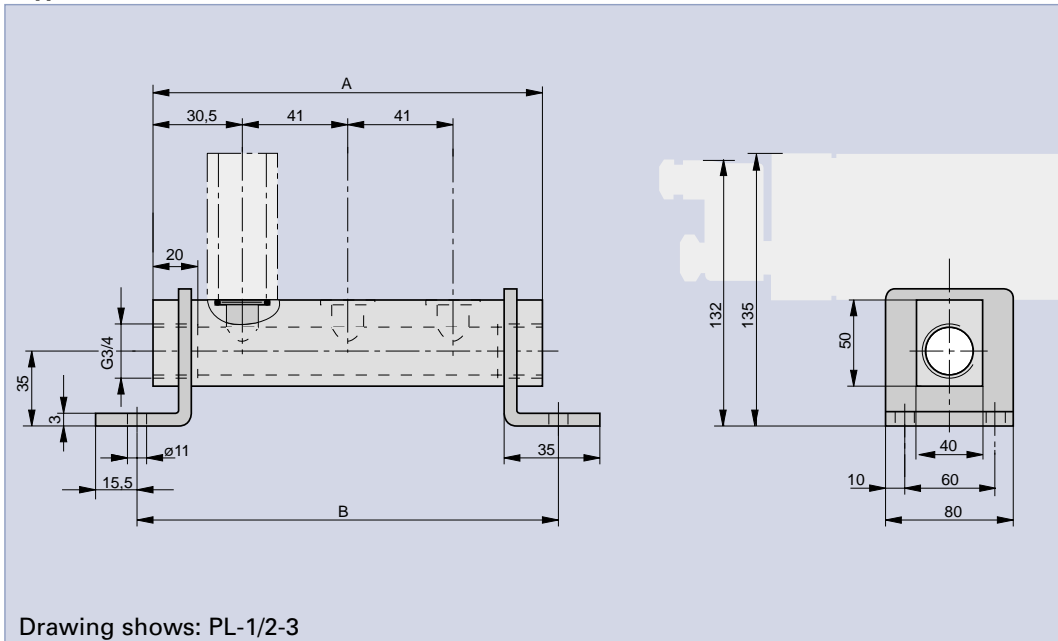
Description	Material
P-supply manifold	Al, anodized
Mounting bracket	Steel, passivated
Screws	Galvanized steel
O-ring	Oil-resistant rubber

Accessories

Description	Order No.
Complete cover plate	PD 39138
Flow divider	PD 40012

P-Supply Manifold

Type: PL-1/2-



Drawing shows: PL-1/2-3

Dimensions, Order Instructions and Weight (mass)

Type	Order No.	No. of valves	Dim.		consisting of				Weight (kg)
			A	B	Manif.	Bracket	Screw	O-ring	
PL-1/2-2	PD 39016-0002	2	102	122	1	2	4	2	0.45
PL-1/2-3	PD 39016-0003	3	143	163	1	2	6	3	0.60
PL-1/2-4	PD 39016-0004	4	184	204	1	2	8	4	0.80



P-Supply Manifolds for Way Valve Series S9-1/2

Versions

- Type PL-1/2 (short mounting bracket)

P-supply manifolds reduce and simplify tubing. They allow a compact and clear design.

3/2, 5/2 and 5/3 directional valves with different types of actuation can be mounted in groups of 2-4 pieces.

The delivery includes

P-supply manifold
Mounting bracket
Mounting screws
O-rings

RPS-Supply Manifold for Directional Valves, Series S9-1/8 and S9-1/4

Series RPSL-1/8-..

RPS-Supply Manifolds for Way Valve Series S9-1/8



Material

Description	Material
RPS-supply manifold	Al, anodized
Screws	Galvanized steel
O-ring	Oil-resistant rubber

Accessories

Description	Order No.
Complete cover strip	PD 32956
Flow divider	PD 42483

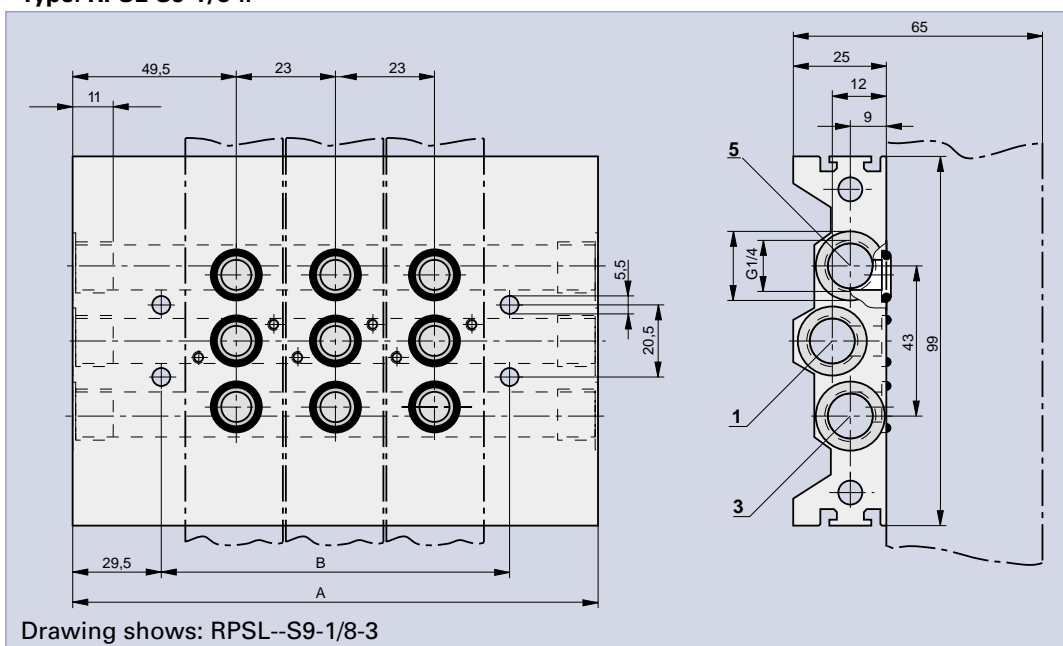
RPS-Supply Manifold Type: RPSL-S9-1/8-..

RPS-supply manifolds reduce and simplify tubing. They allow a compact and clear design.

The RPS manifolds have a common compressed air supply (P) and common vent lines (R, S).

Valves can be mounted in groups of 2-10 pieces.

The delivery includes
RPS-supply manifold
Mounting screws
O-rings



Dimensions, Order Instructions and Weight (mass)

Type	Order No.	No. of valves	Dimensions		consisting of			Weight (kg)
			A	B	Manifold	Screw	O-ring	
RPSL-S9-1/8-2	PD 44813-0002	2	122	63	1	4	6	0.47
RPSL-S9-1/8-3	PD 44813-0003	3	145	86	1	6	9	0.57
RPSL-S9-1/8-4	PD 44813-0004	4	168	109	1	8	12	0.67
RPSL-S9-1/8-5	PD 44813-0005	5	191	132	1	10	15	0.77
RPSL-S9-1/8-6	PD 44813-0006	6	214	155	1	12	18	0.87
RPSL-S9-1/8-7	PD 44813-0007	7	237	178	1	14	21	0.97
RPSL-S9-1/8-8	PD 44813-0008	8	260	201	1	16	24	1.07
RPSL-S9-1/8-9	PD 44813-0009	9	283	224	1	18	27	1.17
RPSL-S9-1/8-10	PD 44813-0010	10	306	247	1	20	30	1.27

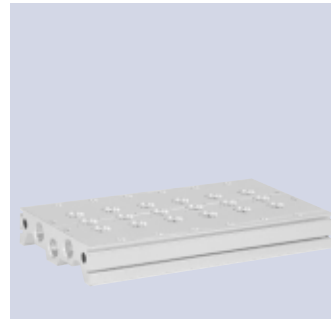
Series RPSL-1/4-..

Material

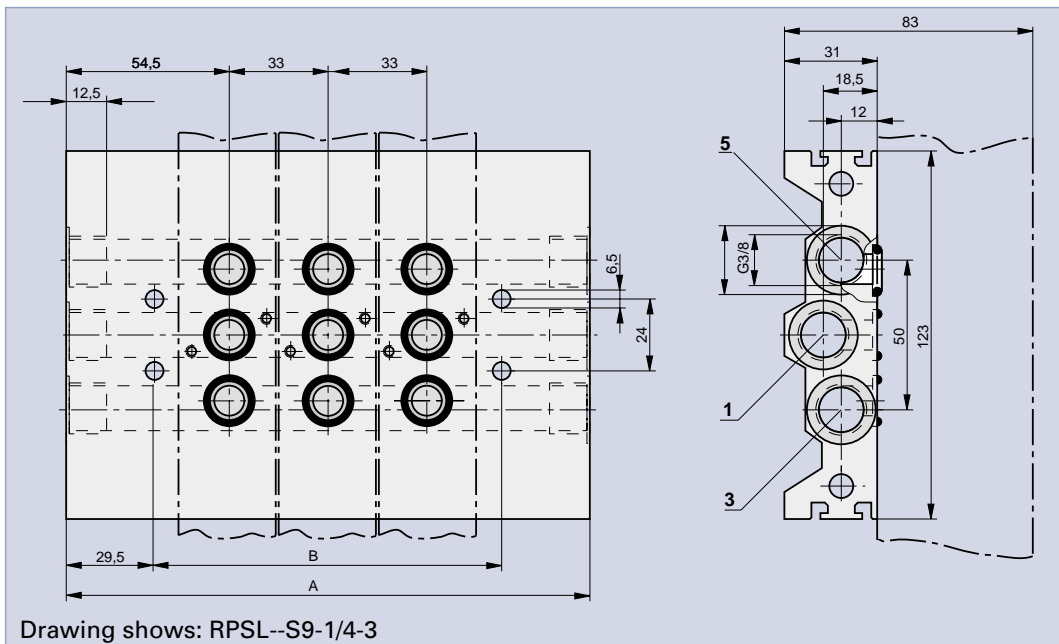
Description	Material
RPS-supply manifold	Al, anodized
Screws	Galvanized steel
O-ring	Oil-resistant rubber

Accessories

Description	Order No.
Complete cover strip	PD 32957
Flow divider	PD 42516



RPS-Supply Manifolds for Way Valve Series S9-1/4



RPS-supply manifolds reduce and simplify tubing. They allow a compact and clear design. The RPS manifolds have a common compressed air supply (P) and common vent lines (R, S). Valves can be mounted in groups of 2-10 pieces.

The delivery includes
 RPS-supply manifold
 Mounting screws
 O-rings

Dimensions, Order Instructions and Weight (mass)

Type	Order No.	No. of valves	Dimensions		consisting of			Weight (kg)
			A	B	Manifold	Screw	O-ring	
RPSL-S9-1/4-2	PD 44814-0002	2	142	83	1	4	6	0.845
RPSL-S9-1/4-3	PD 44814-0003	3	175	116	1	6	9	1.045
RPSL-S9-1/4-4	PD 44814-0004	4	208	149	1	8	12	1.245
RPSL-S9-1/4-5	PD 44814-0005	5	241	182	1	10	15	1.445
RPSL-S9-1/4-6	PD 44814-0006	6	274	215	1	12	18	1.645
RPSL-S9-1/4-7	PD 44814-0007	7	307	248	1	14	21	1.845
RPSL-S9-1/4-8	PD 44814-0008	8	340	281	1	16	24	2.045
RPSL-S9-1/4-9	PD 44814-0009	9	373	314	1	18	27	2.245
RPSL-S9-1/4-10	PD 44814-0010	10	406	347	1	20	30	2.445

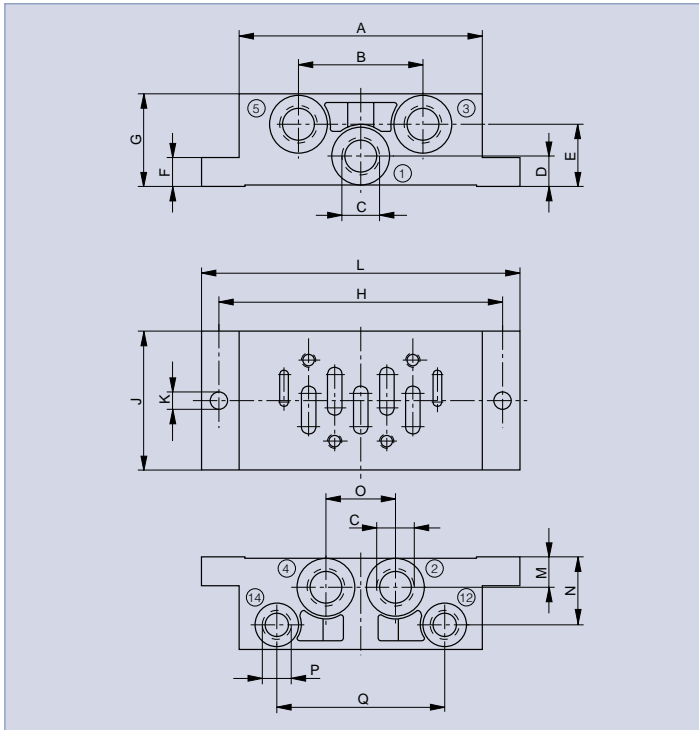
Base Plates to ISO 5599 Sizes 1, 2, 3

Versions

- Single base plates according to VDMA 24345 form A
- Single base plates according to VDMA 24345 form B



Single Base Plate, Form A Type: S9-.-A

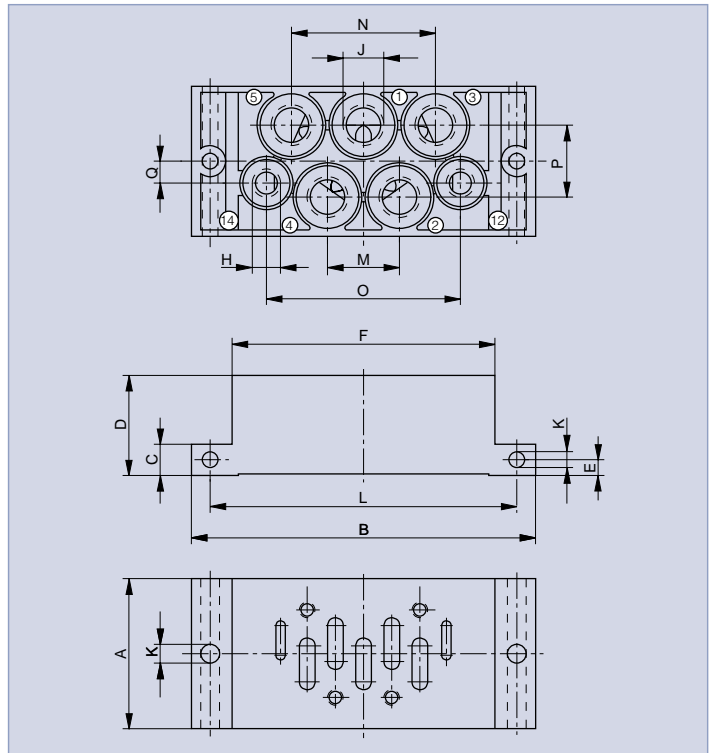


Dimensions Table (mm), Single Base Plate, Form A

ISO-Size	A	B	C	D	E	F	G	H
1	84	43	G1/4	10.5	21.5	10	32	98
2	95	56	G3/8	14	26	13	40	112
3	119	68	G1/2	17	17	18	32	136

ISO-Size	J	K	L	M	N	O	P	Q
1	48	5.5	110	10.5	23.5	24	G1/8	58
2	57	6.6	124	14	30	30	G1/8	74
3	71	6.6	149	17	22	32	G1/8	90

Single Base Plate, Form B Type: S9-.-B



Dimensions Table (mm), Single Base Plate, Form B

ISO-Size	A	B	C	D	E	F	H	J
1	46	110	10	30	5	84	G1/8	G1/4
2	56	124	13	35	6.5	95	G1/8	G3/8
3	71	149	18	32	9	119	G1/8	G1/2

ISO-Size	K	L	M	N	O	P	Q
1	5.5	98	23	46	62	23	7.5
2	6.6	112	28	56	73	27	7.5
3	6.6	136	34	68	90	35	10

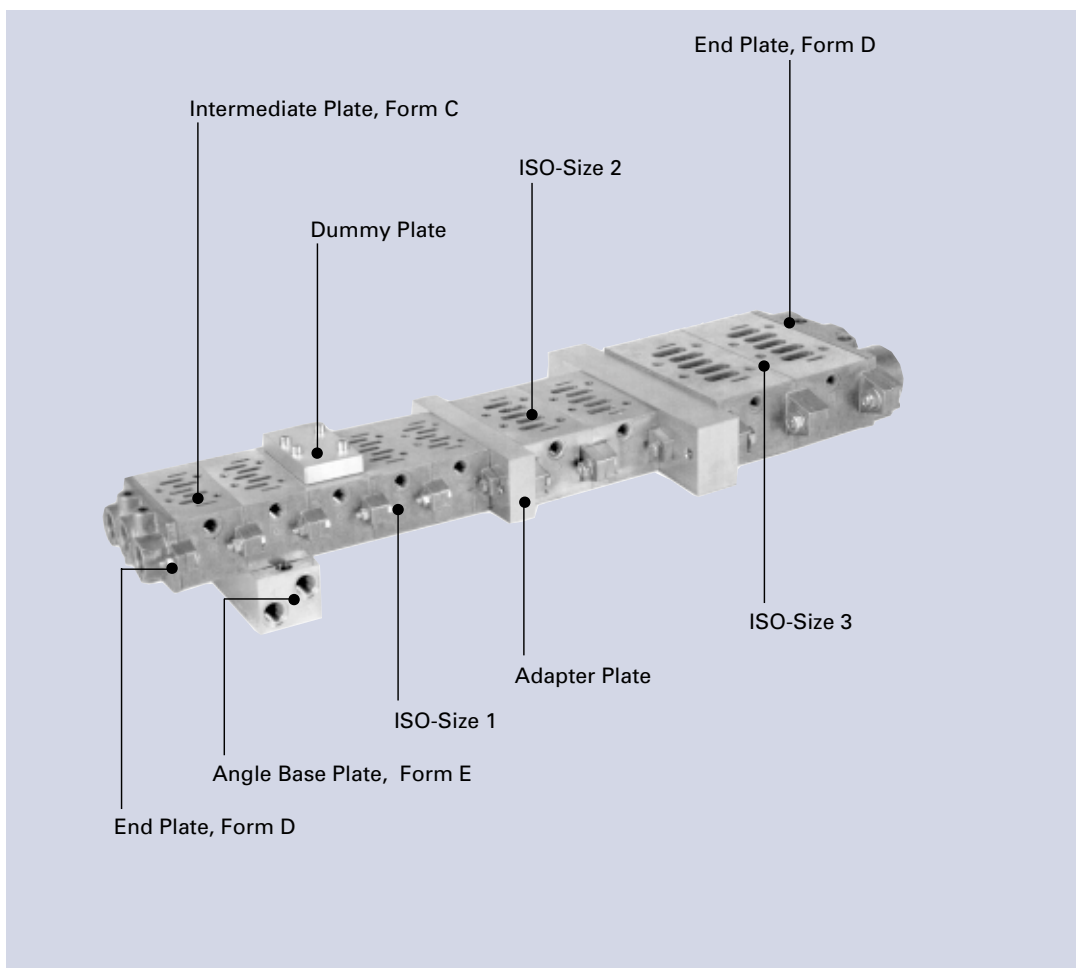
Order Instructions

ISO-Size	Order Instructions Type	Order No.
1	S9-1-A	KX 9076
2	S9-2-A	KX 9433
3	S9-3-A	KX 9434

Order Instructions

ISO-Size	Order Instructions Type	Order No.
1	S9-1-B	KX 9077
2	S9-2-B	KX 9436
3	S9-3-B	KX 9437

Base Plates Combinations



Base Plates to ISO 5599 Sizes 1, 2, 3

- Versions to VDMA 24345**
- End plate set, form D to intermediate plate form C
 - Intermediate plate, form C
 - Plate combinations of forms C and D
 - Angle base plate, form E, for intermediate plate, form C
 - Accessories

End Plate Set, Form D for Intermediate Plate



Order Instructions

ISO-Size	Order Instructions	
	Type	Order No.
1	S9-1-D	KX 9078
2	S9-2-D	KX 9421
3	S9-3-D	KX 9422

Comprises
End plate set, complete with screws

Intermediate Plate, Form C



Order Instructions

ISO-Size	Order Instructions	
	Type	Order No.
1	S9-1-C	KX 9079
2	S9-2-C	KX 9419
3	S9-3-C	KX 9420

Comprises
Intermediate plate, complete with O-rings and screws

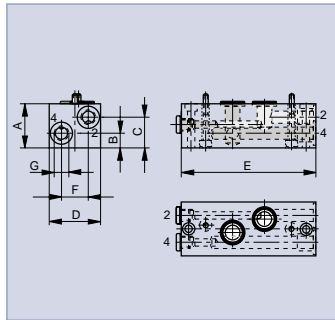
Angle Base Plate, Form E for Intermediate Base Plate, Form C



Dimensions Table (mm) and Order Instructions

Order Instructions		ISO-Size	A	B	C	D	E	F	G
Type	Order No.								
S9-1-E	KX 9081	1	37	12	25	42	110	22	G1/4
-	-	2	-	-	-	-	-	-	-
S9-3-E	KX 9425	3	45	17	29	70	190	36	G1/2

Comprises
Angle base plate, complete with O-rings and screws



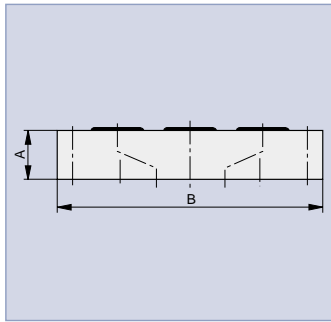
Base Plates Combinations

Base Plates to ISO 5599 Sizes 1, 2, 3

Versions to VDMA 24345

- End plate set, form D to intermediate plate form C
- Intermediate plate, form C
- Plate combinations of forms C and D
- Angle base plate, form E, for intermediate plate, form C
- Accessories

Adapter Plate for combining ISO Sizes 1, 2, 3



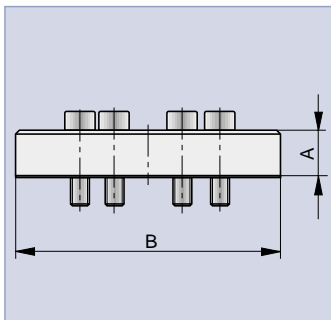
Dimensions Table (mm) and Order Instructions

Order Instructions Type	Order No.	ISO Size	A	B	Width
S9-1-2-KP	KX 9430	1 to 2	20	135	45
S9-2-3-KP	KX 9431	2 to 3	25	190	55
S9-1-3-KP	KX 9432	1 to 3	35	190	50

Comprises

Adapter plate with O-rings and screws

Dummy Plate



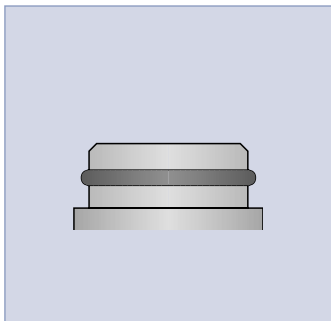
Dimensions Table (mm) and Order Instructions

Order Instructions Type	Order No.	ISO Size	A	B	Width
S9-1-BP	KX 9082	1	12	70	40
S9-2-BP	KX 9423	2	12	90	55
S9-3-BP	KX 9424	3	12	110	70

Comprises

Dummy plate with gasket and screws

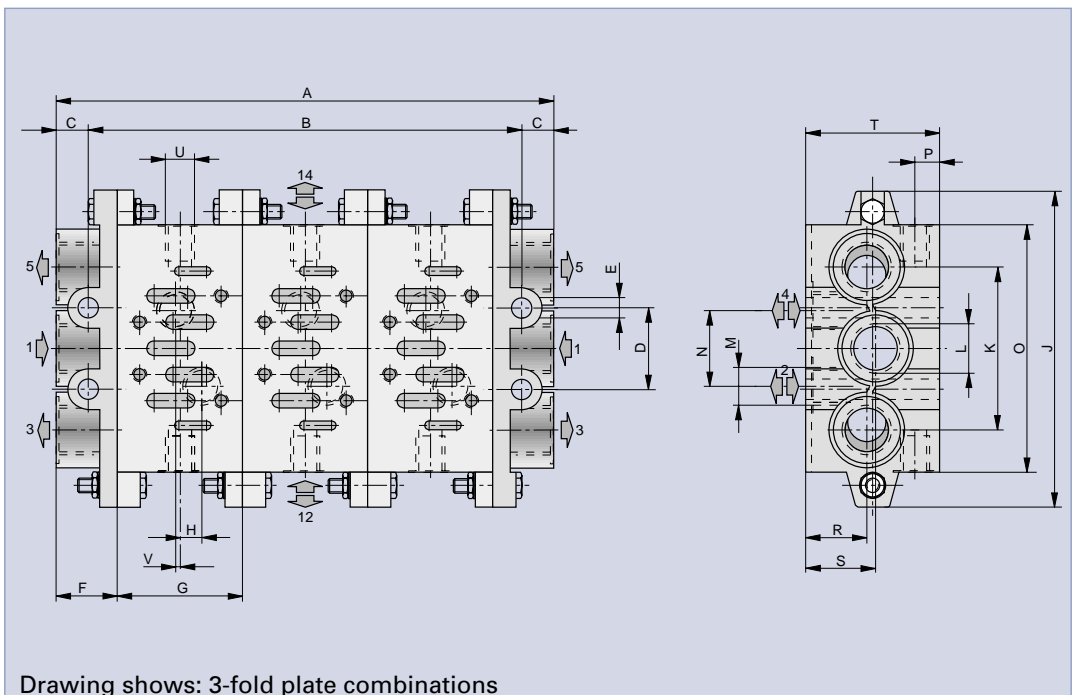
Plug



Order Instructions

Order Instructions Type	Order No.	For ISO Size
S9-1-VS	KX 5789	1
S9-2-VS	KX 9426	2
S9-3-VS	KX 9427	3

Base Plate Combinations of Forms C and D



Drawing shows: 3-fold plate combinations

Dimensions Table (mm)

ISO Size	Number of Plates	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R	S	T	U	V
1	2	130	108	11	28	Ø7	22	43	7.5	110	56	G3/8	G1/4	26	85	8.5	21	24	46	G1/8	1.5
1	3	173	151	11	28	Ø7	22	43	7.5	110	56	G3/8	G1/4	26	85	8.5	21	24	46	G1/8	1.5
1	4	216	194	11	28	Ø7	22	43	7.5	110	56	G3/8	G1/4	26	85	8.5	21	24	46	G1/8	1.5
1	5	259	237	11	28	Ø7	22	43	7.5	110	56	G3/8	G1/4	26	85	8.5	21	24	46	G1/8	1.5
1	6	302	280	11	28	Ø7	22	43	7.5	110	56	G3/8	G1/4	26	85	8.5	21	24	46	G1/8	1.5
2	2	164	138	13	35	Ø9	26	56	6	135	68	G1/2	G3/8	30	100	9	22	24	47	G1/8	5
2	3	220	194	13	35	Ø9	26	56	6	135	68	G1/2	G3/8	30	100	9	22	24	47	G1/8	5
2	4	276	250	13	35	Ø9	26	56	6	135	68	G1/2	G3/8	30	100	9	22	24	47	G1/8	5
2	5	332	306	13	35	Ø9	26	56	6	135	68	G1/2	G3/8	30	100	9	22	24	47	G1/8	5
2	6	388	362	13	35	Ø9	26	56	6	135	68	G1/2	G3/8	30	100	9	22	24	47	G1/8	5
3	2	202	172	15	52	Ø12	30	71	8	190	104	G1	G1/2	38	140	10	31	34	56	G1/8	6
3	3	273	243	15	52	Ø12	30	71	8	190	104	G1	G1/2	38	140	10	31	34	56	G1/8	6
3	4	344	314	15	52	Ø12	30	71	8	190	104	G1	G1/2	38	140	10	31	34	56	G1/8	6
3	5	415	385	15	52	Ø12	30	71	8	190	104	G1	G1/2	38	140	10	31	34	56	G1/8	6
3	6	486	456	15	52	Ø12	30	71	8	190	104	G1	G1/2	38	140	10	31	34	56	G1/8	6

Order Instructions for Base Plate Combinations

Description	ISO Size	Order Instructions	
		Type	Order No.
Plate combination for 2 valves	1	S9-1-002	PD 30076-0002
	2	S9-2-002	PD 32951-0002
	3	S9-3-002	PD 32952-0002
Plate combination for 3 valves	1	S9-1-003	PD 30076-0003
	2	S9-2-003	PD 32951-0003
	3	S9-3-003	PD 32952-0003
Plate combination for 4 valves	1	S9-1-004	PD 30076-0004
	2	S9-2-004	PD 32951-0004
	3	S9-3-004	PD 32952-0004
Plate combination for 5 valves	1	S9-1-005	PD 30076-0005
	2	S9-2-005	PD 32951-0005
	3	S9-3-005	PD 32952-0005
Plate combination for 6 valves	1	S9-1-006	PD 30076-0006
	2	S9-2-006	PD 32951-0006
	3	S9-3-006	PD 32952-0006

Plate combinations made up to customer's requirements on request

Accessories			
Adapter plate for pressure switch *	1	S9-1-DR	KX 9293
	2	S9-2-DR	KX 9428
	3	S9-3-DR	KX 9429
Adapter plate with built-in pressure regulator	1	S9-1-RE	PD 31826
	3	S9-3-RE	PD 33098

* Pressure switches available on request

Intrinsically safe field bus interfaces

Manufacturer	Voltage variants			
	M (6–9VDC)	N (7–16VDC)	L (12–24VDC)	E (24–30VDC)
Pepperl+Fuchs	Profibus-PA: KFD2-GT(2)-DP(R).xPA			ASI: VAA-2EA-G5-NV1-Ex
Turck	Profibus PA	Sensoplex ExCom	ExCom	ExCom
Bartec (for Profibus-DP) (for Interbus-S)		07-7331-2305/0000 07-7331-2105/0000		07-7331-2305/1000 07-7331-2105/1000

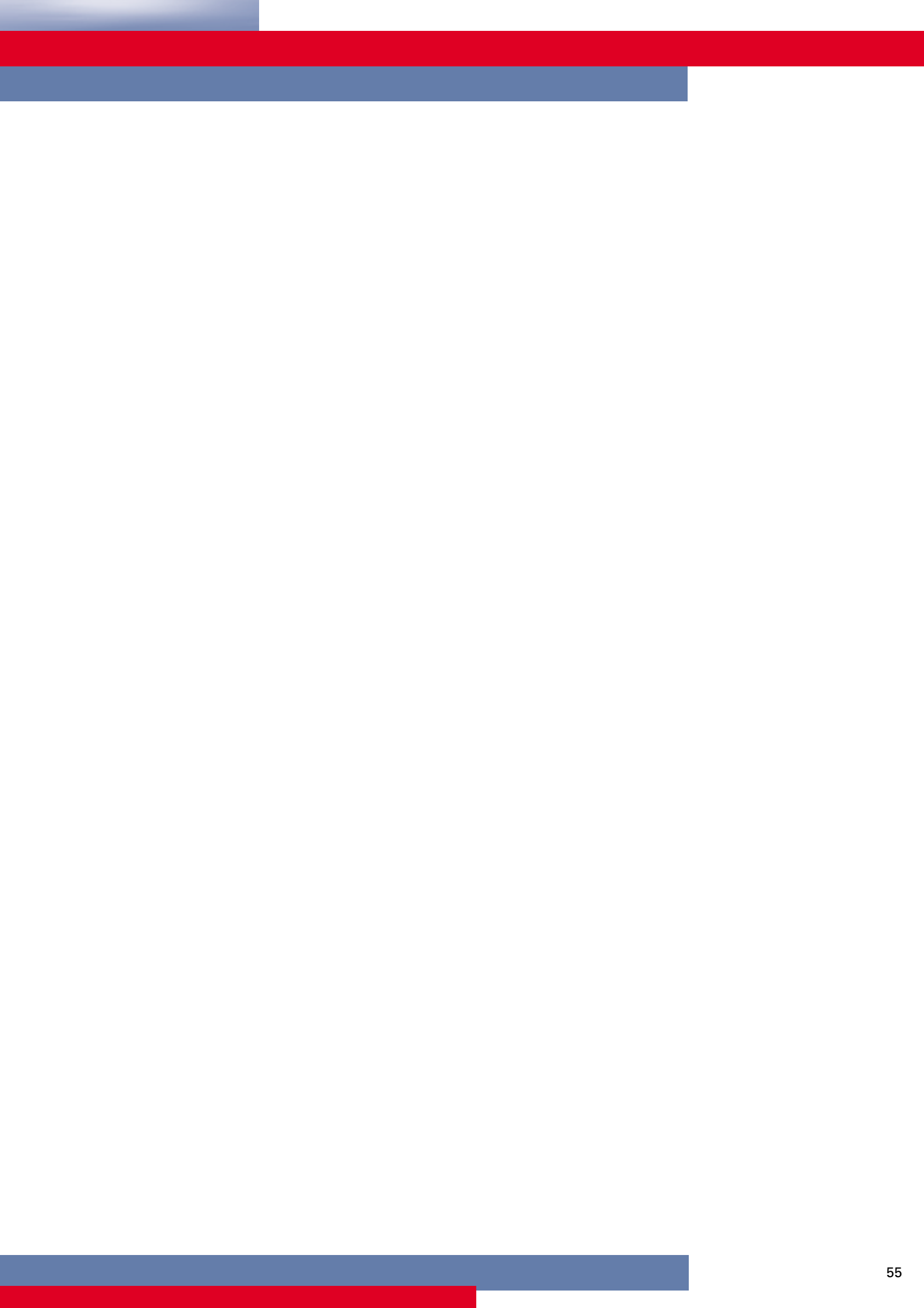
Electrically isolated Valve Control (Zener barrir) ?

Manufacturer	Voltage variants			
	M (6–9VDC)	N (7–16VDC)	L (12–24VDC)	E (24–30VDC)
STAHL (built-on types)	9351/10-11-10	9351/10-11-10 9351/10-12-10 9351/10-13-10	9351/10-12-10 9351/10-13-10 9351/10-14-10 9351/10-15-10	9351/10-15-10 9351/10-16-10
STAHL (Europa cards)		9651/40-12-10	9651/40-14-10	9651/40-16-10 9651/40-19-10
STAHL (module)	9151/10-11-10			9151/10-16-10
Pepperl+Fuchs (valve control modules)		KHD2SRÜ-Ex1.W.LB	KFD2-SD-Ex1.17	KFD2-SD-Ex1.36 KFD2-SD-Ex1.48 KFD2-SL-Ex1.48 KSD2-BO-Ex EGA-041 und ...-3
Turck (multimodul)		MK72-S01-Ex MK72-S03-Ex MK72-S04-Ex MK72-S05-Ex MK72-S06-Ex MK72-S07-Ex	MK72-S01-Ex MK72-S04-Ex	MK72-S02-Ex
Turck (multicart)		MC72-41Ex-T/24VDC MC72-43Ex-T	MC72-41Ex-T/24VDC MC72-43Ex-T	MC72-42Ex-T/24VDC MC72-44Ex-T
Turck (multisafe)		MS13-231Ex0-T/24VDC		
Bartec		07-7311-93MT/AAA0		

Safety barriers (Zener barriers)

Manufacturer	Voltage variants			
	M (6–9VDC)	N (7–16VDC)	L (12–24VDC)	E (24–30VDC)
Pepperl+Fuchs	Z 757	Z 710 Z710.CL Z 715 Z 715.CL Z 715.1K Z 764 Z 765	Z 715 Z 715.CL Z 715.1K Z 722 Z 722.CL Z 765 Z772	Z728 Z728.CL Z778 Z796 Z787 Z787.H
Stahl	9001/01-083-442-10 9001/01-086-390-10 9001/01-086-150-10 9001/01-086-050-10	9001/01-158-150-10 9001/01-158-390-10	9004/01-168-050-10 9001/01-199-390-10 9001/01-199-150-10 9001/01-199-100-10 9001/01-199-000-10	9004/51-206-050-00 9004/01-280-050-00 9004/01-315-025-00 9001/01-280-165-10 9001/01-280-100-10 9001/01-280-085-10 9001/01-280-050-10 9001/01-280-000-10 9002/11-260-138-00 9002/13-280-093-00 9002/13-280-110-00 9002/33-280-000-00
Weidmüller				Serie WIS1200
Bartec				07-7311-93M8/Q010





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AIRFIT CONTROL

Electronically controlled Pressure Regulating Valves



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ORIGA

AIRFIT TECNO: SPEED, ACCURACY AND DYNAMICS IN A MINIATURE FORMAT

The *airfit tecno* proportional pressure regulator combines Piezo technology, precision engineering and electronics in a highly compact arrangement, resulting in outstanding regulation speed and accuracy. To illustrate the unit's fast response, less than 7 milliseconds are required from the command to change pressure until the changing pressure is registered at the outlet. The dynamic characteristics are outstanding: with small air volumes the *airfit tecno* achieves a limiting frequency of 43 Hz, i.e. 43 pressure changes per second.

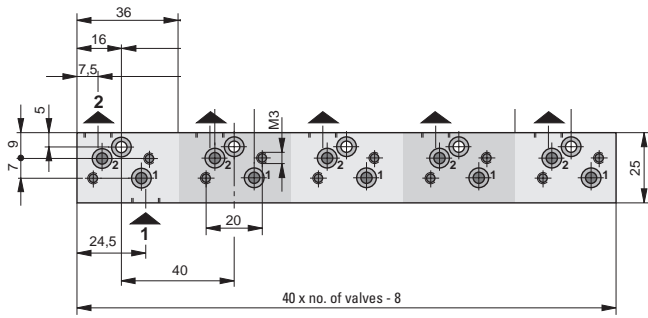
Reduced to the Maximum

Despite its maximised performance capabilities, the minimised dimensions and weight of the *airfit tecno* are remarkable. The exclusive use of proportional components - instead of switching valves - contributes to an unusually long service life. For users who want to install the *airfit tecno* in their own control circuits the unit is also available in an OEM version, i.e. without the electronic regulation system.

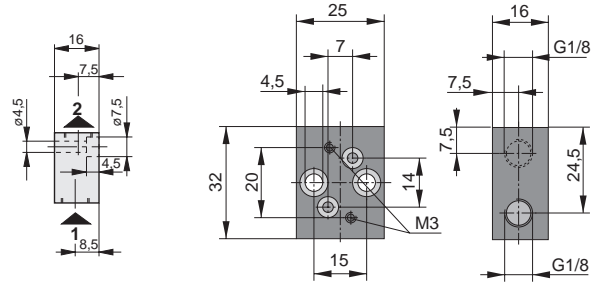
airfit tecno



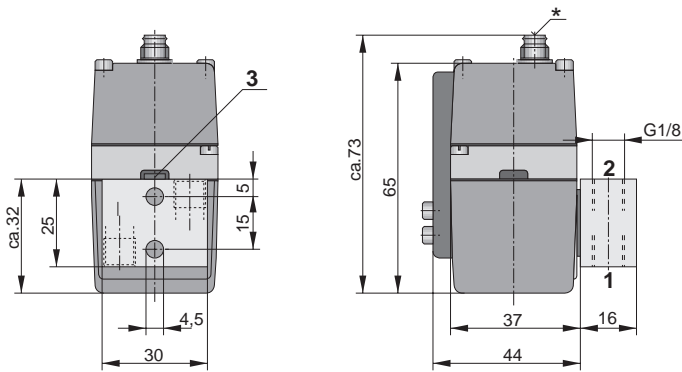
**Dimensions (mm)
Manifold Base Plate G1/8**



**Dimensions (mm)
Single Base Plate G1/8**

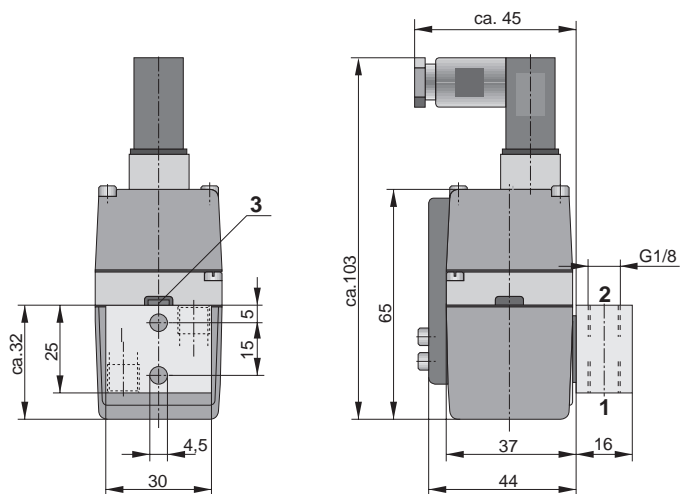


**Dimensions (mm), Type: tecno
Version with 3-pin plug and base plate**



* Connection for 3-pin socket M8 (KC3104, KC3106)

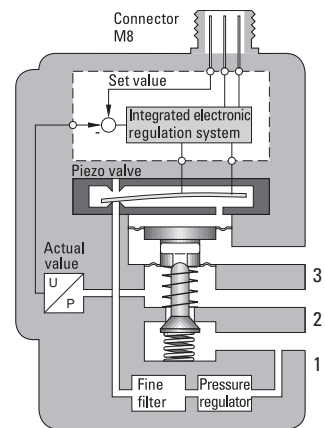
**Dimensions (mm), Type: tecno
Version with socket to DIN 43650-1 C and base plate for units
with actual value output or EMC ground**



Socket with 90° mounting

**Design and Function
Type airfit tecno**

airfit tecno uses the proven HOERBIGER-ORIGA Piezo valve as its pilot unit. In its proportional version this Piezo valve provides the regulator's 'main stage' with a fast and highly dynamic pilot signal. Air supply to the Piezo valve is via an integrated miniature pressure regulator and fine filter. For the main stage a proportional diaphragm pressure regulator is used, with two separate seats for pressurising and venting. The outlet pressure is compared with the set pressure via a pressure sensor and is constantly corrected by the electronic control system.



3 (R) exhaust
2 (A) outlet
1 (P) compressed air supply

PARAMETERS TO VDI 3292

Mounting			Flange
Port size			NW 2 without base plate G1/8 with base plate
Installation			In any position
Weight (mass)		kg	0.145 without base plate 0.180 with base plate
Flow direction			On: from 1 to 2 Off: from 2 to 3
Medium and ambient temperature range	T_{min} T_{max}	°C °C	0 + 50
Medium			Dry, filtered air (5 µm)
Lubrication			None, or sparing oil mist lubrication (max. 30 mg/m ³)

PNEUMATIC PARAMETERS PRESSURES ARE GAUGE PRESSURES

Input pressure range	p_{1min} p_{1max}	bar	1.5 10		
Output pressure range	p_{2min} p_{2max}	bar	0** 8	0 2	0 0.2
Nominal flow rate	Q_n	l/min	210		
Max. flow rate*	Q_{max}	l/min	350		
Hysteresis	p_{2max}	%	< 0.2	< 0.2	< 0.5
Repeatability	p_{2max}	%	< 0.2	< 0.2	< 0.5
Responsiveness	p_{2max}	%	< 0.1	< 0.1	< 0.5
Linearity	p_{2max}	%	< 0.5	< 0.5	< 1

ELECTRICAL PARAMETERS

Nominal voltage	U_N	V DC	24 = ± 10 %		
Nominal power	P_N	W	0.25		
Residual ripple		%	10		
Power consumption***	I_{Bmax}	mA	10		
Set value input	W		Type: PRE-U	Type: PRE-I	
Version 0–8 bar			0 V ' 0 bar 8 V ' 8 bar	4 mA ' 0 bar 20 mA ' 8 bar	
Version 0–2 bar			0 V ' 0 bar 10 V ' 2 bar	4 mA ' 0 bar 20 mA ' 2 bar	
Version 0–0.2 bar			0 V ' 0 bar 10 V ' 0.2 bar	4 mA ' 0 bar 20 mA ' 0.2 bar	
Input resistance	R_E	kΩ Ω	61.5 with 0–10 V actuation 550 with 4–20 mA actuation		
Protection system		IP	IP52 to DIN 45322		
Connection			3-pin socket M8 or to DIN 43650-1 C		

* at $p_1 = 10$ bar and $p_2 = 6.3$ bar, $\Delta p = 1$ bar

** other pressure ranges on request

*** 0–10 V version

ORDER INSTRUCTIONS, TECNO

VERSION	TYPE	ORDER NO.
COMPLETE SETS (0-8 BAR) CONSISTING OF		
Prop. pressure regulator, 0–8 V, base plate G1/8, cable set straight (2 m)	PRE-U-01	PS11140-B-01
Prop. pressure regulator, 0–8 V, base plate G1/8, cable set angled (2 m)	PRE-U-01	PS11150-B-01
Prop. pressure regulator, 4–20 mA, base plate G1/8, cable set straight (2 m)	PRE-I-01	PS11141-B-01
Prop. pressure regulator, 4–20 mA, base plate G1/8, cable set angled (2 m)	PRE-I-01	PS11151-B-01

PROP. PRESSURE REGULATORS NW 2 (SINGLE UNITS WITHOUT ACCESSORIES)

Prop. pressure regulator, 0–8 V, 0–8 bar	PRE-U	PS11110-B
Prop. pressure regulator, 4–20 mA, 0–8 bar	PRE-I	PS11111-B
Prop. pressure regulator, 0–10 V, 0–2 bar	PRE-U	PS11130-B-20
Prop. pressure regulator, 4–20 mA, 0–2 bar	PRE-I	PS11139-B-20
Prop. pressure regulator, 0–10 V, 0–200 mbar	PRE-U	PS11130-B-02
Prop. pressure regulator, 4–20 mA, 0–200 mbar	PRE-I	PS11139-B-02

ACCESSORIES

Single base plate G1/8		PS11112-A-01
Manifold base plate, 2-fold	G1/8	PS11112-A-02
Manifold base plate, 4-fold	G1/8	PS11112-A-04
Manifold base plate, 6-fold	G1/8	PS11112-A-06
Blind plate complete		PS11160-A
Cable set straight (5 m)		KC3104
Cable set angled (5 m)		KC3106

PROP. PRESSURE REGULATORS NW 2, WITH ACTUAL VALUE OUTPUT AND SOCKET TO DIN 43650-1C (SINGLE UNITS WITHOUT ACCESSORIES) *

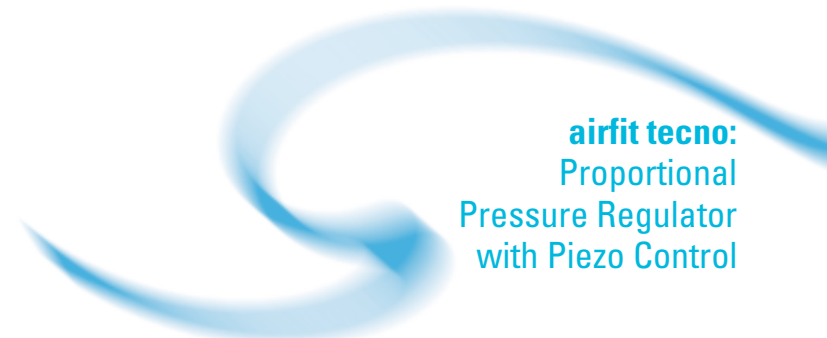
Prop. pressure regulator, 0–8 V, 0–8 bar, actual value output 1.25 V (0 bar)–6.25 V (8 bar)	PRE-U	PS11113-B
Prop. pressure regulator, 0–10 V, 0–2 bar, actual value output 1.25 V (0 bar)–6.25 V (2 bar)	PRE-U	PS11162-B-20
Prop. pressure regulator, 0–10 V, 0–0.2 bar, actual value output 1.25 V (0 bar)–6.25 V (0.2 bar)	PRE-U	PS11162-B-02

PROP. PRESSURE REGULATORS NW 2, WITH EMC MASS AND SOCKET TO DIN 43650-1C (SINGLE UNITS WITHOUT ACCESSORIES) *

Prop. pressure regulator, 0–8 V, 0–8 bar	PRE-U	PS11164-B
Prop. pressure regulator, 0–10 V, 0–2 bar	PRE-U	PS11165-B-20
Prop. pressure regulator, 0–10 V, 0–0.2 bar	PRE-U	PS11165-B-02
Prop. pressure regulator, 4–20 mA, 0–8 bar	PRE-I	PS11168-B
Prop. pressure regulator, 4–20 mA, 0–2 bar	PRE-I	PS11169-B-20
Prop. pressure regulator, 4–20 mA, 0–0.2 bar	PRE-I	PS11169-B-02

* cable KC3104 or KC3106 is not required

For detailed technical data please see Data Sheet 5.96.002



airfit tecno:
Proportional
Pressure Regulator
with Piezo Control

The Benefits

- Accurate regulation
- High dynamics
- Long service life
- Low power consumption
- Also available in an OEM version (without electronic regulation system) s. p. 14
- Manifold mounting options

Applications

- Pneumatic brakes
- Tension control in winding machines
- Ultrasonic welding
- Vacuum generation
- Metering technology
- Artificial respiration equipment (OEM version)

Technical Highlights

- Port size G1/8
- Responsiveness < 0.1 %
- Reaction time < 7 ms
- Limiting frequency 43 Hz
- Weight 0.18 kg
- Maximum flow rate 350 l/min
- Pressure ranges 0-8 bar
- 0-2 bar
- 0-200 mbar

airfit tecno without regulation system on request: e-mail: interface@hoerbiger-origa.com

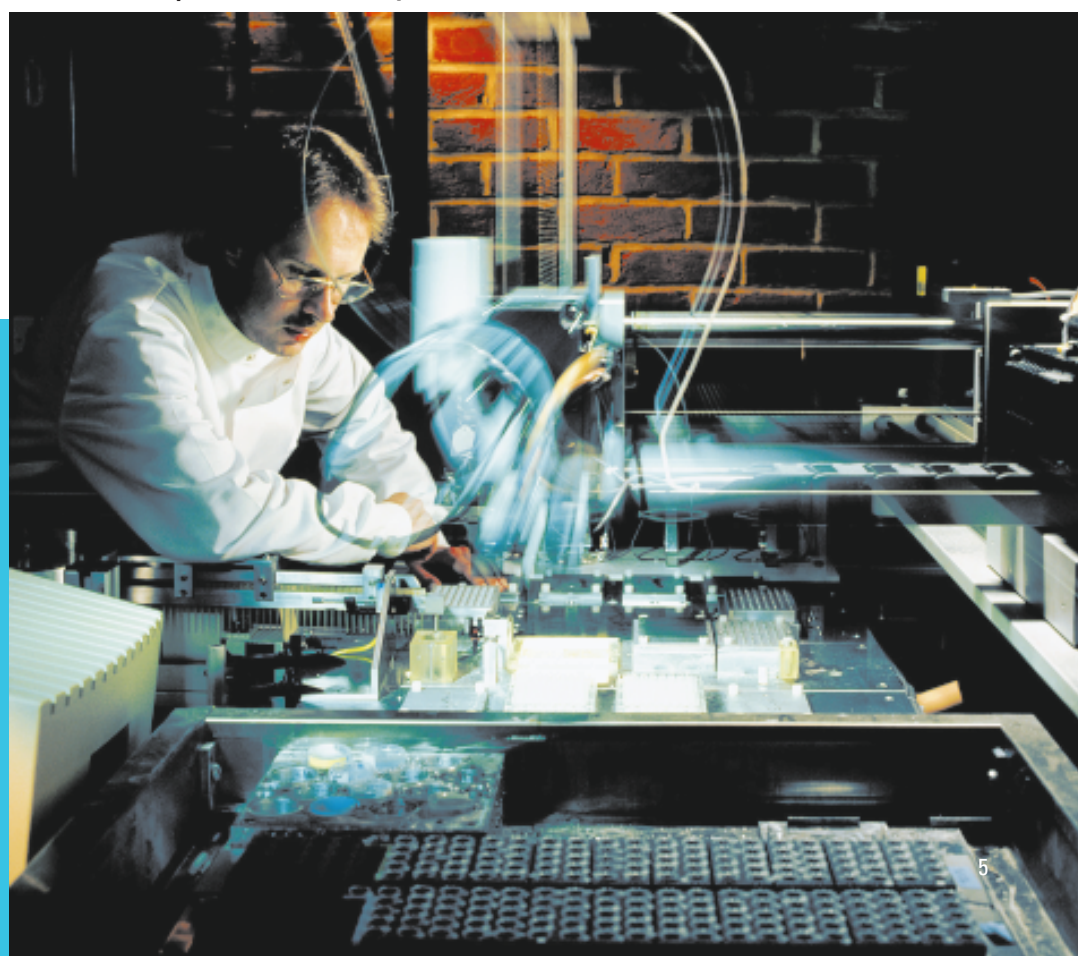
AIRFIT SRE AND CRE:
SUPERIOR MANAGEMENT OF LARGE, RAPID PRESSURE CHANGES

The *airfit SRE* and *CRE* electronically controlled pressure regulators were specially developed for applications where pressure must be accurately regulated despite large, rapid pressure changes. The interface function between electronics and pneumatics is provided by two poppet valves, which pressurise and vent the pilot chamber. This results in extremely low air consumption during the regulation process.

Perfect performance even at low pressures

For some applications, for example in testing and measurement technology, the *airfit SRE* and *CRE* have the decisive advantage of outstanding performance even at the lowest pressures. Under certain conditions the regulation range can even start at 0 bar. There is no stick-slip effect. Self-regulating seals provide an absolutely smooth regulation function and this leads to a significantly lengthened service life.

airfit tecno in the pharmaceutical industry

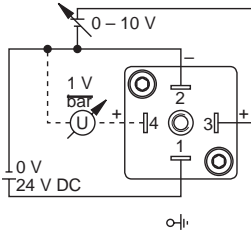


airfit SRE airfit CRE

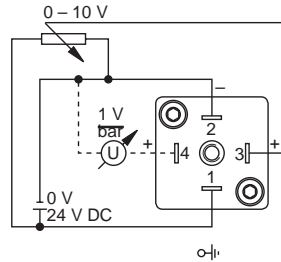


Control Possibilities

Analogue Voltage

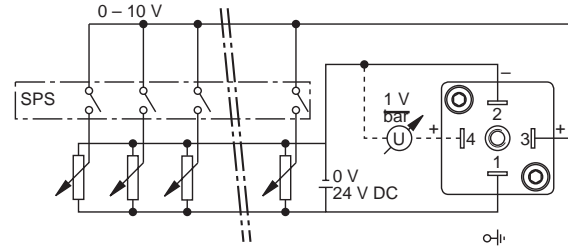


With Single Potentiometer



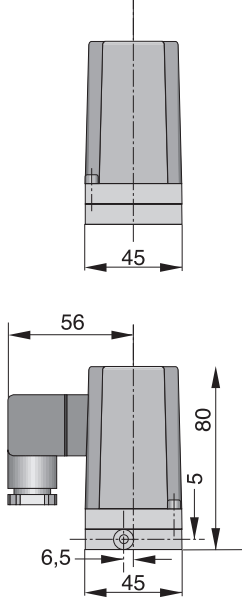
Resistance of potentiometer should be between 500 Ω and 100 kΩ

PLC Combined with Several Potentiometers

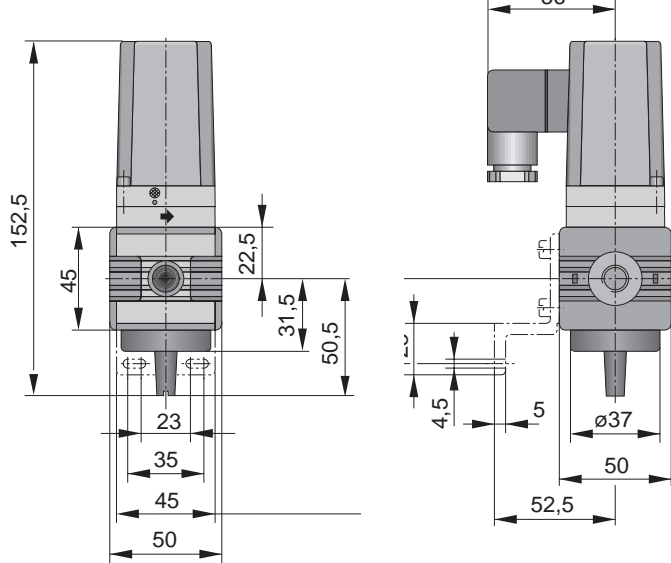


Total resistance of potentiometer series should be not less than 500 Ω

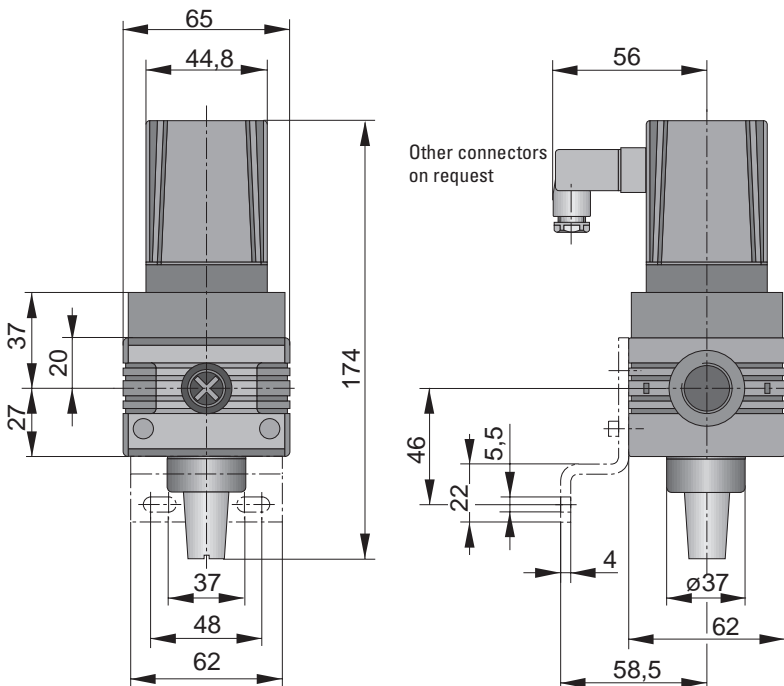
Dimensions (mm) Type: MRE-M5



Dimensions (mm) Type: SRE-1/4



Dimensions (mm) Type: CRE-1/2



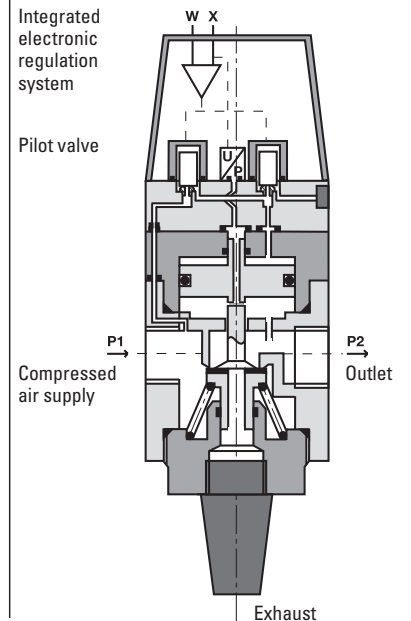
**Design and Function
Type SRE and CRE**

Two poppet valves convert electrical impulses into the pilot pressure. This positive pressurisation of the pilot chamber eliminates permanent air consumption. Air consumption during the regulation process is extremely low.

The main stage is a piston-type pressure regulator.

The self-regulating seal between the pilot chamber and the outlet p2 prevents the so-called stick-slip effect and thus lengthens the service life of the regulator.

The *airfit* SRE and CRE can be controlled by a PLC or a potentiometer, optionally with 0–10 V, 0–20 mA or 4–20 mA. A fast exhaust system is built into the *airfit* SRE and CRE.



PARAMETERS TO VDI 3292

			MRE	SRE		CRE	
			M5	G1/4	G3/8	G3/8	G1/2
Port size							
Installation			In any position				
Weight (mass)		kg	0.3	0.6	0.95		
Medium and ambient temperature range	T_{min} T_{max}	$^{\circ}C$ $^{\circ}C$	0 + 50				
Medium			Filtered, lubricated or unlubricated compressed air				
Lubrication			Not required				

PNEUMATIC PARAMETERS

PRESSURES ARE GAUGE PRESSURES

Nominal pressure	p_n	bar	6.3				
Inlet pressure range	p_{1min}	bar	0		0		
	p_{1max}	bar	10		16		
Outlet pressure range	p_{2min}	bar	0**				
	p_{2max}	bar	10				
Maximum flow rate*	Q_{max}	l/min	10	2200	2500	7000	7500
Hysteresis	p_{2max}	%	< 1				
Repeatability	p_{2max}	%	< 0.5				
Responsiveness	p_{2max}	%	< 0.5				
Linearity	p_{2max}	%	< 1				

ELECTRICAL PARAMETERS

Nominal voltage	U_N	V DC	24 V = ± 10 %				
Residual ripple		%	10				
Power consumption	I_{Bmax}	A	0.15				
Set value - input	U_W I	V mA	0-10 0-20, 4-20				
Input resistance	R_E	k Ω	200				
Actual value - output	U_x	V	0-10				
Output current	I_{Amax}	mA	20				
Protection system		IP	IP65 to DIN 40050, EN 60529				

* at $p_1 = 10$ bar and $p_2 = 6.3$ bar, $\Delta p = 1$ bar

** if $p_1 > 1.2$ bar

ORDER INSTRUCTIONS FOR MRE, SRE, CRE

BASIC VERSION FOR 0-10 V CONTROL, NG (NORMALLY CLOSED)

PORT SIZE	MAX. OUTPUT PRESSURE (BAR)	TYPE	ORDER NO.
M5	10	MRE-U-M5 NG	PB60349-000
G1/4	10	SRE-U-1/4 NG	PB59849-000
G3/8	10	SRE-U-3/8 NG	PB59949-000
G3/8	10	CRE-U-3/8 NG	PB60149-000
G1/2	10	CRE-U-1/2 NG	PB60249-000

VERSION FOR 4-20 mA CONTROL

M5	10	SRE-I-M5 NG	PB60349-002
G1/4	10	SRE-I-1/4 NG	PB59849-002
G3/8	10	SRE-I-3/8 NG	PB59949-002
G3/8	10	CRE-I-3/8 NG	PB60149-002
G1/2	10	CRE-I-1/2 NG	PB60249-002

VERSION FOR 0-20 mA CONTROL

M5	10	SRE-M5 NG	PB60349-001
G1/4	10	SRE-I-1/4 NG	PB59849-001
G3/8	10	SRE-I-3/8 NG	PB59949-001
G3/8	10	CRE-I-3/8 NG	PB60149-001
G1/2	10	CRE-I-1/2 NG	PB60249-001

VERSION FOR 0-10 V CONTROL, NO (NORMALLY OPEN)

M5	10	SRE-U-M5 NO	PB60349-010
G1/4	10	SRE-U-1/4 NO	PB59849-010
G3/8	10	SRE-U-3/8 NO	PB59949-010
G3/8	10	CRE-U-3/8 NO	PB60149-010
G1/2	10	CRE-U-1/2 NO	PB60249-010

ACCESSORIES

Mounting kit	SRE	PL16965
Mounting kit	CRE	PL17518
Coupling kit	SRE	PL16959
Coupling kit	CRE	PL17608
Adapter plate kit	G3/4 for CRE	PL17682

airfit SRE and CRE: Proportional Pressure Regulators with Poppet-Valve Pilot Control

The Benefits

- No permanent air consumption
- Accurate pressure regulation
- High dynamics
- High connection flexibility (electrical and pneumatic)
- High flow rates in both directions
- Long service life

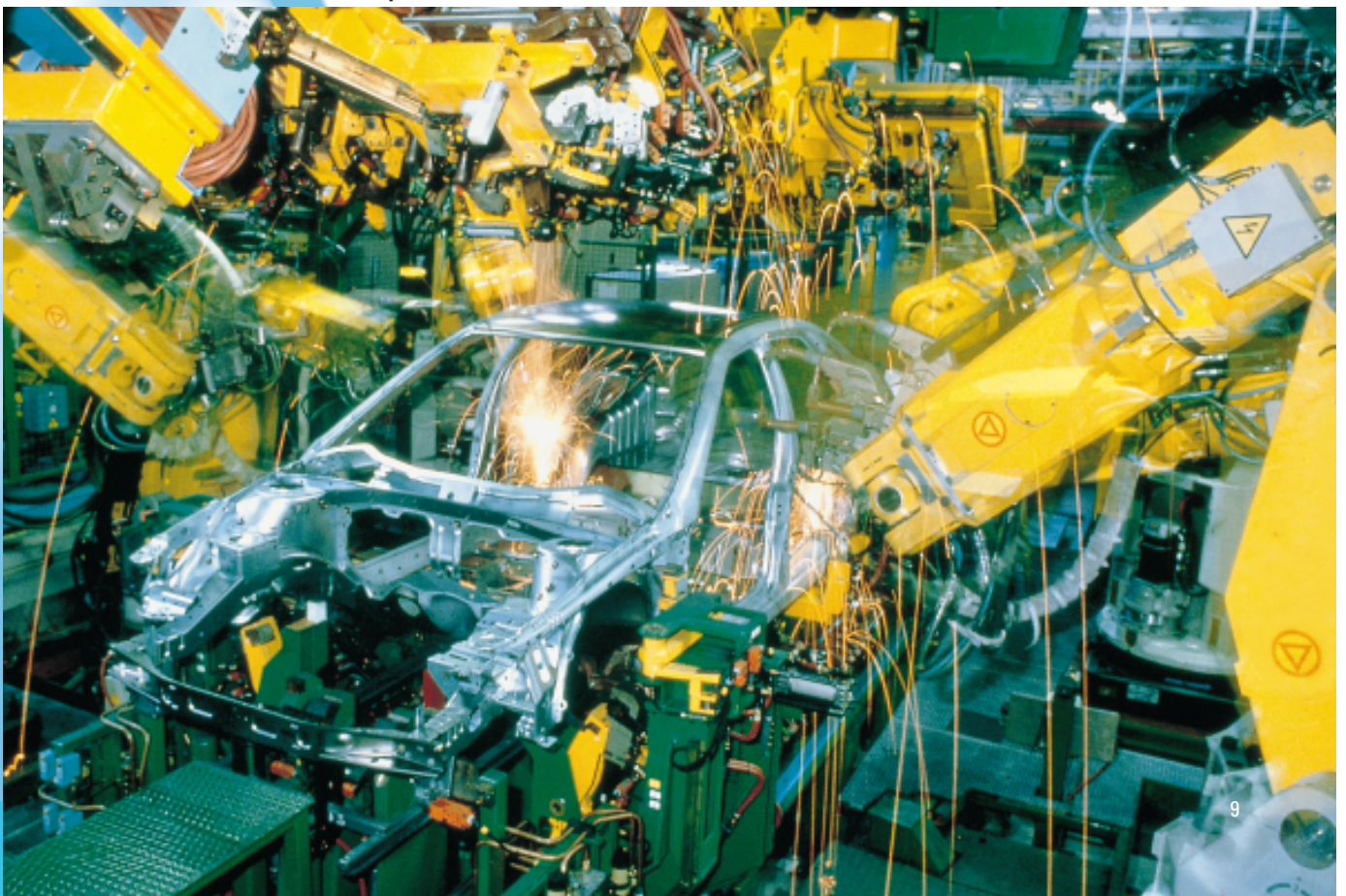
Applications

- Welding robots
- Erosion machines
- Assembly/nut tightening operations
- Testing and measurement technology (liquids and gases)
- Conveyor belt positioning
- Grinding and polishing machines

Technical Highlights

	airfit SRE	airfit CRE
Port sizes	G1/4, G3/8	G3/8, G1/2
Maximum flow rate	2500 l/min	7500 l/min
Protective system	IP 65	IP 65
Responsiveness	< 0.5 %	< 0.5 %
Input pressures	0–10 bar	0–16 bar
Actual value output	standard	standard
Allocation	1 V Δ 1 bar	1 V Δ 1 bar

airfit SRE and CRE in the automotive industry



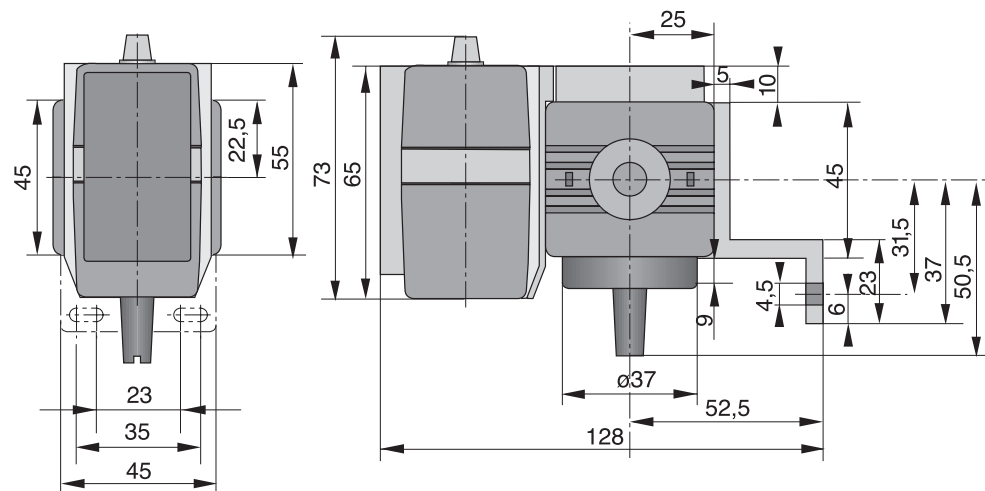
AIRFIT SRT AND CRT: THE COMBINATION OF POWER AND SPEED

The *airfit SRT* and *CRT* electronically controlled pressure regulators are especially recommended for applications that demand extremely fast pressure changes at high flow rates. The combination of *airfit tecno* as the pilot valve and *airfit SRE* or *CRE* as the pneumatic amplifier provides a unique solution for such a requirements profile.

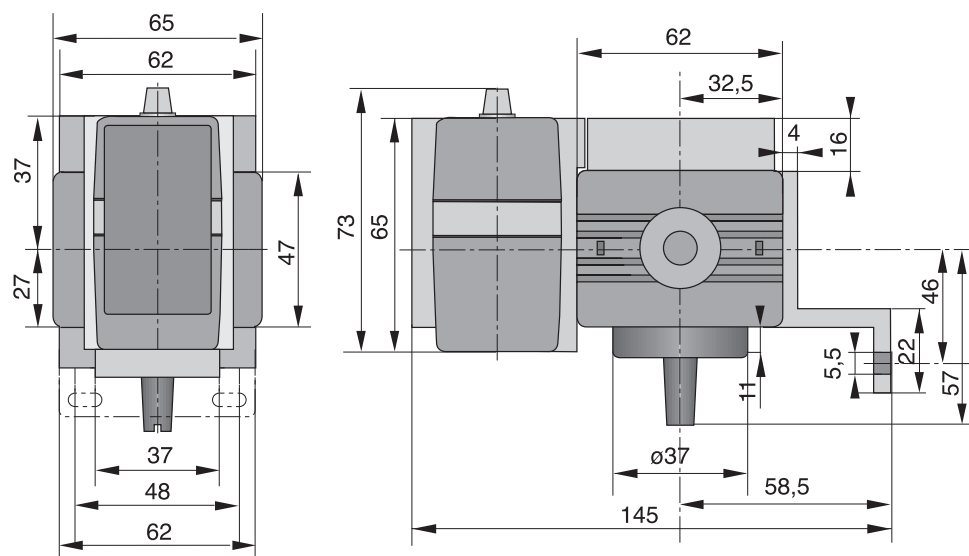
airfit SRT *airfit CRT*



Dimensions (mm) Type: SRT-1/4

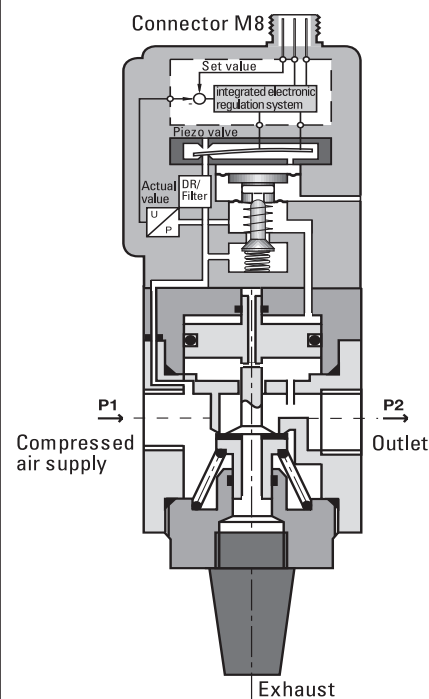


Dimensions (mm) Type: CTR-1/2



**Design and Function
Type *airfit* SRT and CRT**

The *airfit tecno* is used as the pilot control in the *airfit SRT* and *CRT* pressure regulators and contributes significantly to the highly dynamic performance capabilities. The main stage uses the *airfit SRE* or *CRE* piston-type pressure regulator. The unit does not have a closed control circuit, i.e. there is no feedback of the output pressure signal.



PARAMETERS TO VDI 3292

GENERAL			
System		Piston-type pressure regulator with Piezo pilot control, without electrical feedback	
Type		SRT	CRT
Port size		G1/4	G1/2
Installation		In any position	
Weight (mass)	kg	0.8	1.15
Medium and ambient temperature range	T_{min} T_{max}	$^{\circ}C$ $^{\circ}C$	0 50
Medium		Dried and filtered air (5 μ), with or without sparing oil mist lubrication (max. 30 mg/m ³)	

PNEUMATIC PARAMETERS PRESSURES ARE GAUGE PRESSURES

Nominal pressure	p_n	bar	6.3
Inlet pressure range	p_{1min} p_{1max}	bar bar	1.5 10
Outlet pressure range	p_{2min} p_{2max}	bar bar	0 8
Maximum flow rate*	Q_{max}	l/min	2000 7500
Hysteresis	p_{2max}	%	< 5 < 15
Repeatability	p_{2max}	%	< 1 < 2
Responsiveness	p_{2max}	%	< 5 < 15
Linearity	p_{2max}	%	< 1 < 2
Reaction time	t_1	ms	< 16 < 19

ELECTRICAL PARAMETERS

Nominal Voltage	U_N	V DC	24 V \pm 10 %
Nominal power rating	P_N	W	0.25
Set value input			0–8 V 4–20 mA
Input resistance	R_E	k Ω Ω	61.5 with 0-10 V control 550 with 4-20 mA control
Protection system			IP52 to DIN 45322
Connection			3-pin socket M8 or to DIN 43650-1C

DYNAMIC PARAMETERS

Pressure build-up from 0 to 6 bar at flow rate of 500 l/min	t	ms	< 100
Pressure build-up from 3 to 6 bar with a volume of 1.3 l	t	ms	< 50

* at $p_1 = 10$ bar and $p_2 = 6.3$ bar, $\Delta p = 1$ bar

For detailed technical data please see Data Sheet 5.96.006.

ORDER INSTRUCTIONS FOR SRT, CRT

VERSION	TYPE	ORDER NO.
PROP. PRESSURE REGULATOR G1/4		
Prop. pressure regulator, 0–8 V, 0–8 bar	SRT-U-1/4	PS11230-A
Prop. pressure regulator, 4–20 mA, 0–8 bar	SRT-I-1/4	PS11231-A

PROP. PRESSURE REGULATOR G1/2		
Prop. pressure regulator, 0–8 V, 0–8 bar	CRT-U-1/2	PS11240-A
Prop. pressure regulator, 4–20 mA, 0–8 bar	CRT-I-1/2	PS11241-A

ACCESSORIES

Mounting kit	SRT-1/4	PL16965
Mounting kit	CRT-1/2	PL17518
Cable set straight (5 m)		KC3104
Cable set angled (5 m)		KC3106

airfit SRT and CRT: Pressure Regulators with Piezo Pilot Control and Piston-Type Regulator Main Stage

The Benefits

- Extremely fast pressure changes
- Long service life
- Low power consumption (0.25 W)

Applications

- Welding robots
- Paint spraying equipment

Technical Data

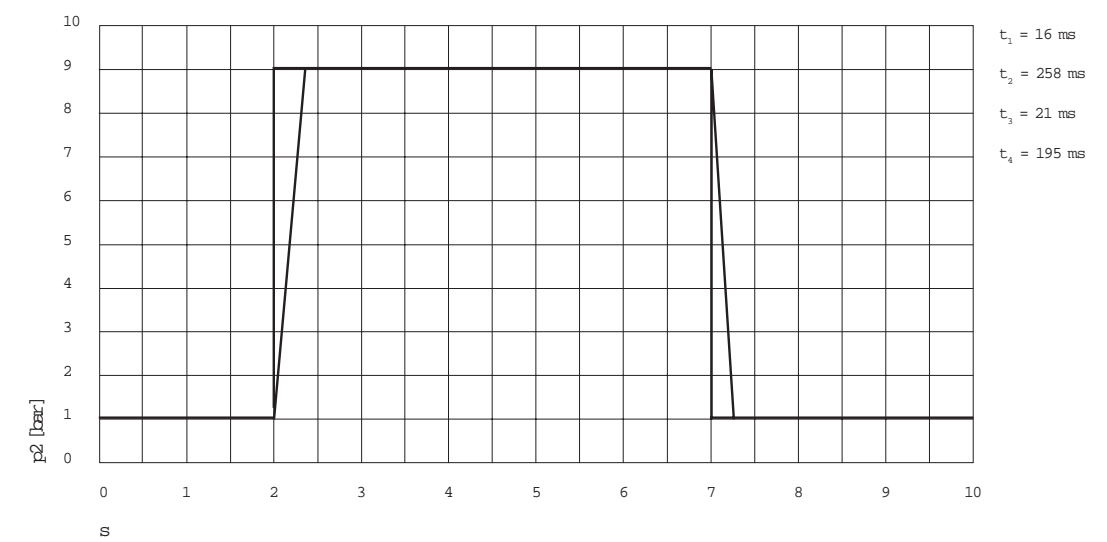
	airfit SRT	airfit CRT
Port sizes	G1/4	G1/2
Weight	0.8 kg	1.15 kg
Pressure range	0–8 bar	0–8 bar
Maximum flow rate	2200 l/min	7500 l/min
Responsiveness	< 5 %	< 15 %
Reaction time	< 15 ms	< 15 ms

airfit SRT and CRT in painting technology



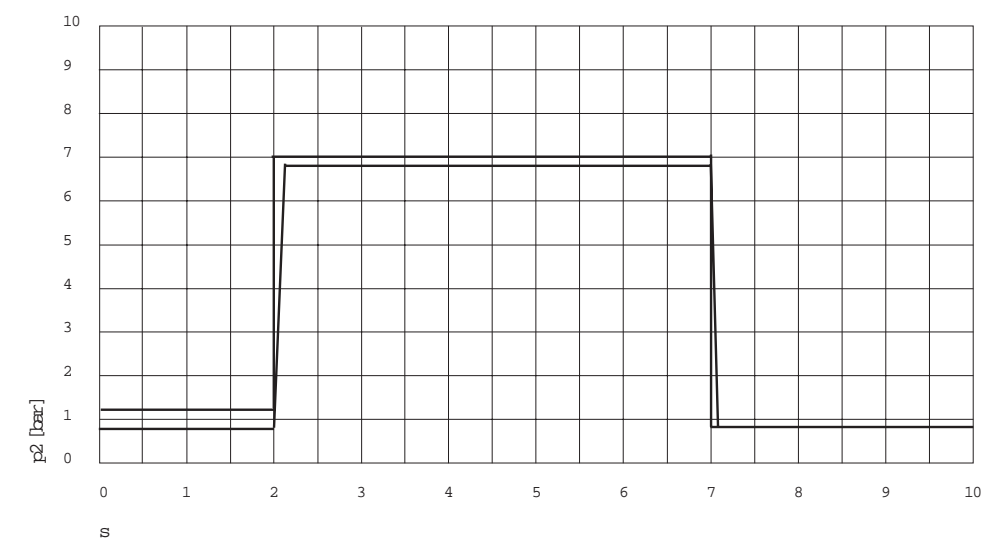
Sprungantwort SRE

Sprungantwort 10: 1-9-1



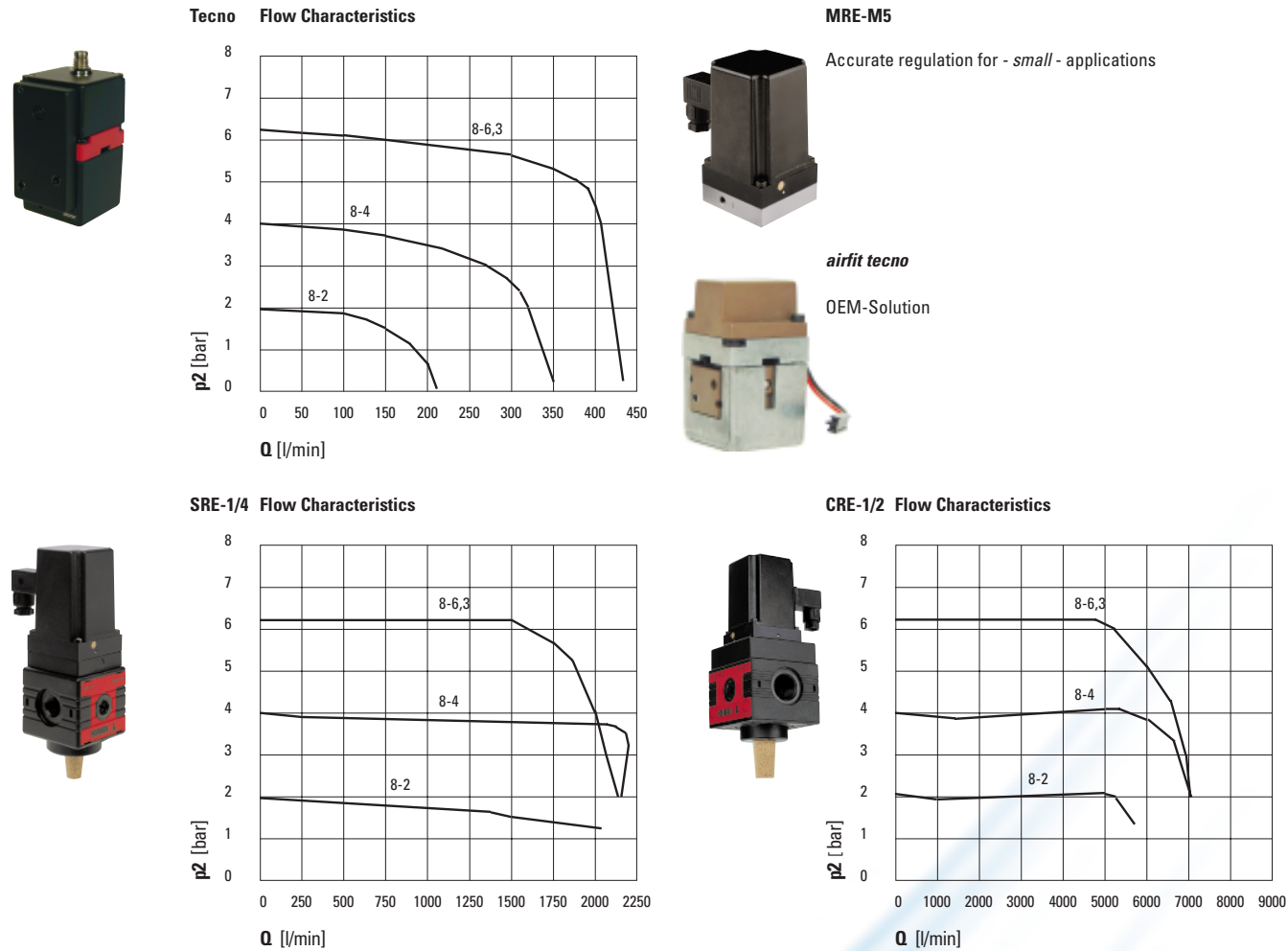
Sprungantwort Tecno, SRE und SRT 1/4-Booster

Sprungantwort 10: 1,29-7,05-0,75



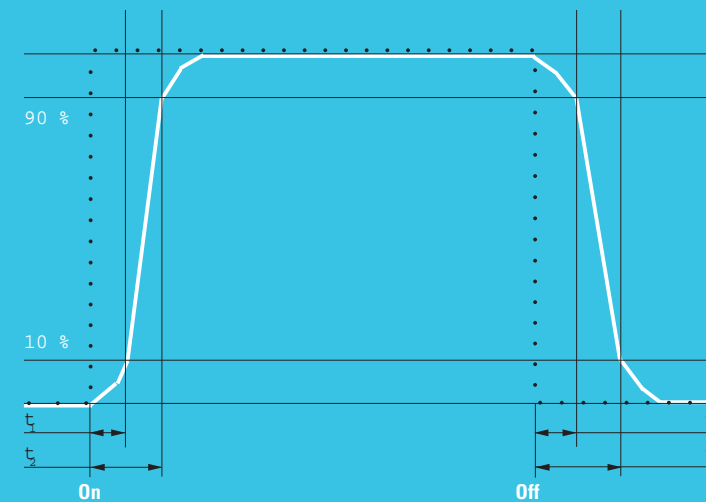
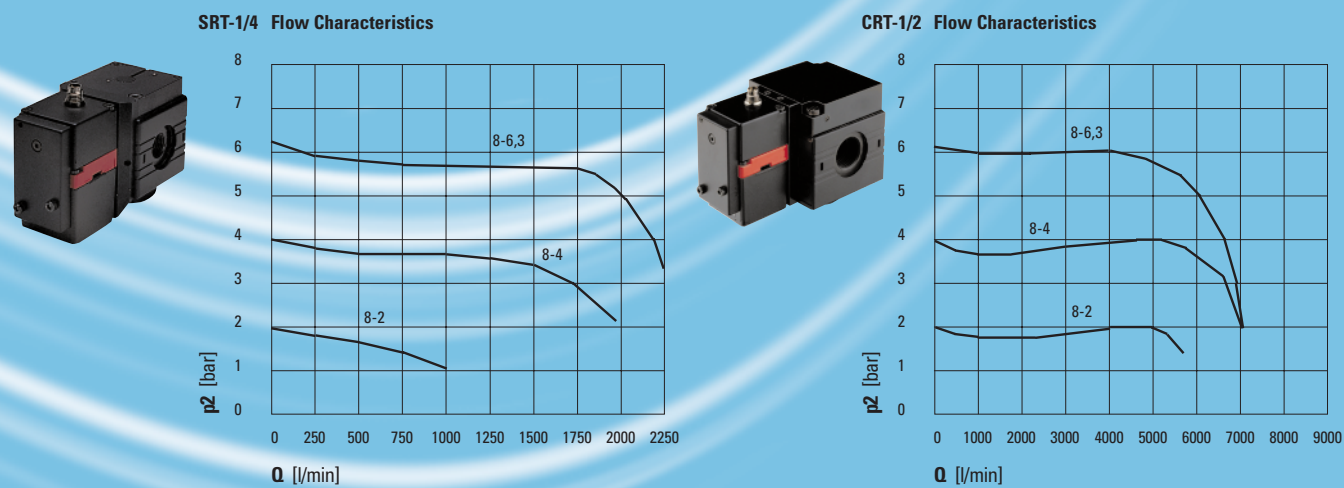
AIRFIT CONTROL: MAKING THE RIGHT CHOICE

With *airfit control*, HOERBIGER-ORIGA offers a pressure regulator programme that delivers the right solution for every application. This table will make it easier for you to select the optimum regulator for your specific application.



Type	UNITS WITH CLOSED LOOP						WITHOUT CLOSED LOOP	
	TECNO	MRE-M5	SRE-1/4	SRE-3/8	CRE-3/8	CRE-1/2	SRT-1/4	CRT-1/2
System	Diaphragm-type pressure regulator with Piezo pilot control	Pulsed 2/2 way electronic valves, electronically regulated	Piston-type pressure regulator with electromagnetic pilot control	Piston-type pressure regulator with electromagnetic pilot control	Piston-type pressure regulator with electromagnetic pilot control	Piston-type pressure regulator with electromagnetic pilot control	Piston-type pressure regulator with Tecno pilot control	Piston-type pressure regulator with Tecno pilot control
Port size	G1/8	M5	G1/4	G3/8	G3/8	G1/2	G1/4	G1/2
Inlet pressure	1.5–10 bar	0–10 bar	0–10 bar	0–10 bar	0–16 bar	0–16 bar	1.5–10 bar	1.5–10 bar
Outlet pressure	0–8 bar 0–2 bar 0–0.2 bar*	0–10 bar	0–10 bar	0–10 bar	0–10 bar	0–10 bar	0–8 bar	0–8 bar
Q_{max} [l/min]	350	10	2200	2500	7000	7500	2000	7500
Hysteresis	< 0.2 % (< 0.5 %)*	< 1 %	< 1 %	< 1 %	< 1 %	< 1 %	< 5 %	< 15 %
Repeatability	< 0.2 % (< 0.5 %)*	< 0.5 %	< 0.5 %	< 0.5 %	< 0.5 %	< 0.5 %	< 1 %	< 2 %
Responsiveness	< 0.1 % (< 0.5 %)*	< 0.5 %	< 0.5 %	< 0.5 %	< 0.5 %	< 0.5 %	< 5 %	< 15 %
Linearity	< 0.5 % (< 1 %)*	< 1 %	< 1 %	< 1 %	< 1 %	< 1 %	< 1 %	< 2 %
Set value input	0–10 V 4–20 mA	0–10 V 4–20 mA 0–20 mA	0–10 V 4–20 mA 0–20 mA	0–10 V 4–20 mA 0–20 mA	0–10 V 4–20 mA 0–20 mA	0–10 V 4–20 mA 0–20 mA	0–10 V 4–20 mA	0–10 V 4–20 mA
Actual value output	1.25–6.25 V (optional)	0–10 V	0–10 V	0–10 V	0–10 V	0–10 V	–	–
Reaction times [ms]**								
t ₁	7	11	26		39		16	19
t ₂	17	70	258		311		57	53
t ₃	6	16	21		35		16	18
t ₄	28	128	195		236		80	85

** Set value change from 10 % to 90 % and from 90 % to 10 % of maximum output size, no output volume (pressure sensor)



Change Response Diagram

AIRFIT CONTROL: INTELLIGENT PRESSURE REGULATION FOR SPECIFIC APPLICATIONS

airfit control:
in use

Proportional pressure regulators from the *airfit control* programme are used for a wide variety of applications, a selection of which are shown here. For further information on these or your particular application, don't hesitate to contact us.

Tension Regulation in Winding Machines

To ensure consistent high quality in winding processes, the correct speed and tension are critical. *airfit tecno* and *airfit SRE* are used here for the control of pneumatic brakes and dancer rollers.

Ultrasonic Welding

In ultrasonic welding machines it is important to apply the welding head with exactly defined force to ensure consistent quality. *airfit tecno* and *airfit SRE* control the pneumatic cylinder which applies this force.

Welding

Proportional regulators are used here to control the gripping force of the welding gun accurately, rapidly and according to the nature and thickness of the material.

Metering of Liquids

In the metering or mixing of sealants, adhesives or chemical compounds, proportional valves are used which are pneumatically pilot-controlled by *airfit tecno*. In this way the mixture ratio or metering can be set by the control system.

Vacuum Generation

Vacuum generation ejectors use an input pressure to generate a vacuum. The vacuum may be regulated by varying the input pressure. *airfit tecno* and *airfit SRE* provide optimum pressure regulation and thus improve the performance of the ejector.

Paint Spraying Equipment

airfit tecno and *airfit SRE* are used to regulate the speed of the turbine which is required to atomise the paint. They also control the air pressure at the sprayhead, which directs the paint spray. The fast pressure regulation at high flow rates greatly improves the quality and speed of the paint spraying operation.

Mills, Grinding and Polishing Machines

Accurate application pressure is essential here to achieve safe processing and high product quality. However, the pressure must be varied to suit the material, the type of operation and the particular tool. *airfit tecno* or *airfit SRE* satisfy these requirements completely.

Positioning

With pneumatic positioning axes two *airfit tecno* or *airfit SRE* units are used to precisely control the cylinder position by pressurising or venting the cylinder. The command signals for the pressure regulators come from analogue or digital linear measurement systems.

Auxiliary Air in Plastics Processing

The pre-moulds for plastic bottles and containers have to be heated before the final blow-moulding operation. *airfit tecno* is used to maintain a low positive pressure to ensure that the heated pre-mould keeps its optimum shape before further processing.

Artificial Respiration Equipment

Artificial respiration equipment demands accurate regulation of pressures and flow rates in a low range of pressures. The application is often ideally satisfied by the *airfit tecno OEM*, which can be completely integrated into the purpose-designed regulation systems. In mobile equipment its light weight and low power consumption are especially important.

Conveyor Belt Positioning

Precise positioning of conveyor belts and winding rollers is especially important over long distances. The regulation system receives signals from a belt edge position sensor. The *airfit tecno* or *airfit SRE* generates the pressure to drive the pneumatic cylinder connected to the guide roller.

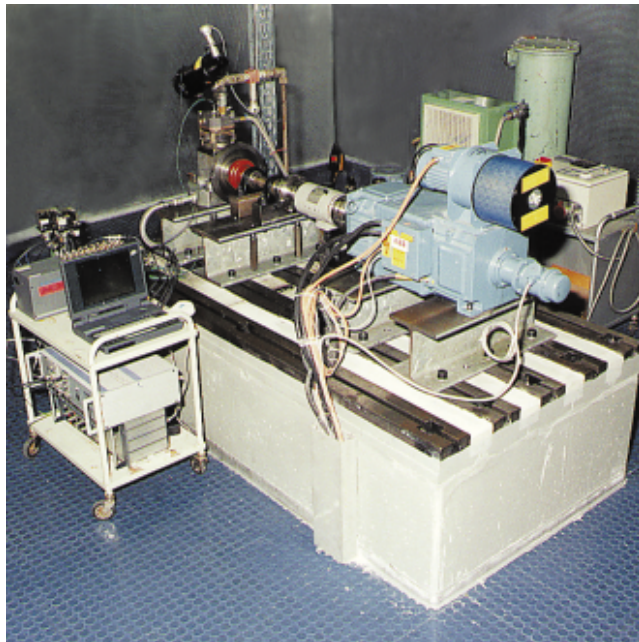
Rolling

airfit control enables the pressure of the rollers to be varied, to achieve consistent quality in spite of different material thicknesses and other variable process influences.

WORTH KNOWING:

THE FINE DISTINCTION BETWEEN CONTROL AND REGULATION

Basically there are two possible ways of maintaining the pressure in a pneumatic system at a certain level or generating a defined pressure profile - either a control system or a regulation system. The fine distinction can be seen in the accuracy and in the costs of the equipment.



Control for test equipment

The Control System – Open Circuit Control

In an open circuit control system the input signal (set value) is converted into the output value (actual value) in the control unit. There is no monitoring of the correctness of the output value and no guarantee that the set value and the actual value really agree. The effects of external disturbing influences on the system are not taken into account.

Controlled Pressure Regulators from HOERBIGER-ORIGA

In the *airfit control* programme, the *airfit tecno OEM* and *airfit SRT* and *CRT* operate as controlled systems.

Taking the function of the *airfit SRT* as an example:

When a set value is defined via the input signal (e.g. 0–10 V), the pressure regulator sets the corresponding output pressure (e.g. 0–10 bar). This output pressure is not however monitored by the unit, i.e. there is no compensation for influences such as air usage or hysteresis of the regulator. Therefore, these units are designed primarily for integration into control systems which include monitoring of the output pressure.

The Regulation System – Closed Circuit Control

A regulation system is a closed circuit. The input signal (set value) is converted into the output value (actual value) - as in control systems - but this output value is continuously measured and compared with the input signal. If they are different, the regulation unit intervenes and adjusts the output value to correspond to the set value.

Regulated Pressure Regulators from HOERBIGER-ORIGA

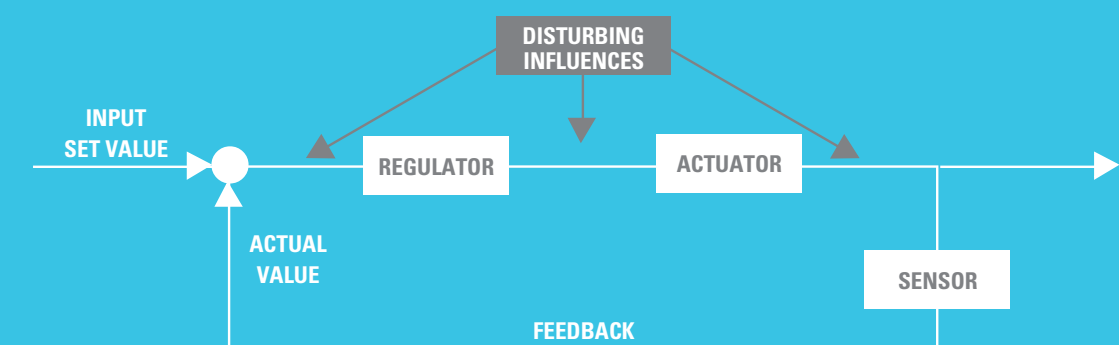
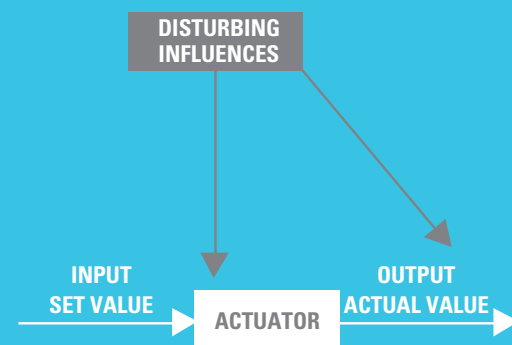
The *airfit tecno*, *airfit SRE* and *CRE* are regulated systems.

Taking the function of the *airfit SRE* as an example:

When a set value is defined via the input signal (e.g. 0–10 V), the pressure regulator sets the corresponding output pressure (e.g. 0–10 bar). At the same time the integrated pressure sensor measures the actual pressure at the unit's outlet (actual value). If the electronic regulation system finds that the actual value has deviated from the set value, it immediately corrects the actual value. This process goes on continuously and ensures fast, accurate pressure regulation.



Regulation system in the paper industry



RELIABLE SERVICE FOR LONG-TERM CUSTOMER SATISFACTION

With over 30 years' expertise in the design, development and manufacture of compressed air preparation systems, HOERBIGER-ORIGA is a specialist supplier of high quality control, regulation, filtration and centralised systems for comprehensive compressed air management.

Customer service is our highest priority, matching the needs of our customer with quality products and support. An internationally active company, we place special value on long-term partnerships.

Our service includes:

- 50 locations worldwide offering service and support
- CAD catalogues
- Technical documentation in several languages
- Training

Private Label: *airfit control* with your corporate identity

The *airfit control* pressure regulators are flexible in terms of colour and imprint and may be supplied in your own company livery, thereby contributing significantly to your company profile.



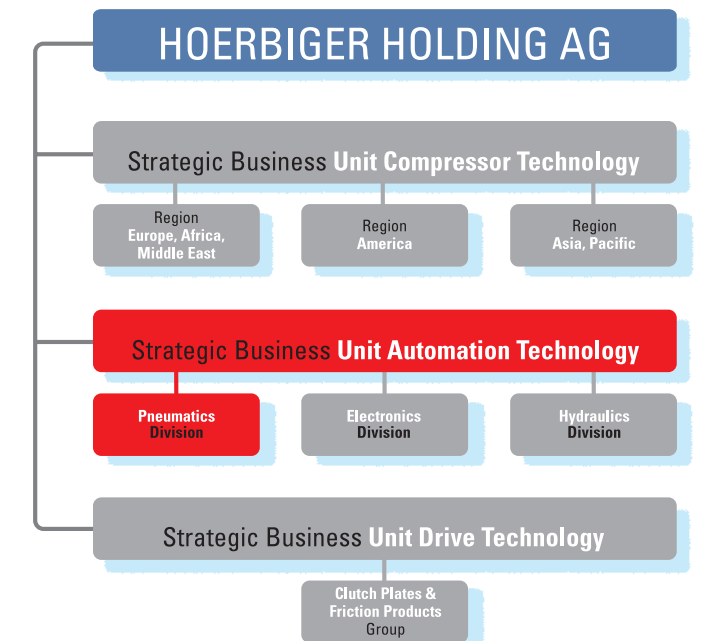
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