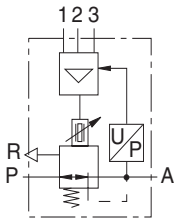
Pressure Regulating Valve

G1/8, NW 2.5

Electronically controlled (proportional pressure regulating valve with piezo pilot)

airfit tecno

PRE-.



Versions

- Voltage controlled (Type PRE-U)
- Current controlled (Type PRE-I)
- 3 pressure ranges
- Option: actual value output
- Option: EMV-mass

Electronically controlled pressure regulating valve with actual value feed-back.
The unit is highly adaptable to prevailing operating conditions.
Remote controlled.

Characteristics to VDI 3292	Pressures are quoted as gauge pressures				
System			3 way proportional pressure regulator with PIEZO pilot control and pneumatic and electronic feedback.		
Reaction to power failure			Port 2 vents to 0 bar		
Mounting			Flange		
Port size			NW 2.5 without base plate G1/8 with base plate		
Installation			In any position		
Weight (mass)		kg	0.160 without base plate 0.215 with base plate		
Flow direction			In: from 1 to 2 Out: from 2 to 3		
Medium and ambient temperature range	ϑ_{min} ϑ_{max}	°C °C	0 +50		
Medium			Filtered, dry, lubricated [1] or oil-free compressed air		
Filtration		µm	30; recommended: 5		
Materials Housing Internal parts Seals			Anodized aluminium, plastic Aluminium, brass, plastic NBR		
Pneumatic Characteristics					
Version			**0-8 bar**	**0-2 bar**	**0-200 mbar**
Pressure range, inlet	$p_{1\ min}$ $p_{1\ max}$	bar bar	1.5 10	1.5 6	1.5 2,5
Pressure range, outlet	$p_{2\ min}$ $p_{2\ max}$	bar bar	0[2 8	0 2	0 0.2
Nominal flow rate	Q_N	l/min	200		
Maximum flow rate [3	Q_N	l/min	350		
Hysteresis [5	Δp_2	%	< 0.2	< 0.2	< 0.5
Repeatability	Δp_2	%	< 0.2	< 0.2	< 0.5
Responsiveness [5	Δp_2	%	< 0.1	< 0.1	< 0.5
Linearity [4 [5	$\Delta p_{2\ max}$	%	< 0.5	< 0.5	< 1
Own air consumption [6		Nl/min	≤ 0.6	≤ 0.5	≤ 0.4
Electrical Characteristics see page 2					

1) oil-free air is recommended.
If the system must have lubricated air, sparing lubrication (max. 30 mg/m3) is recommended.
2) other pressure ranges on request.
3) at p_1=10 bar and p_2=6.3 bar, Dp=1 bar.
4) at ambient temperature 20 °C.
5) relative to p_{2max}.
6) at p_1 max.

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Continuation of Characteristics Pressures are quoted as gauge pressures			
Electrical Characteristics, General			
Connector			3-pin connector M8 [7 or to DIN 43650-1 C
Electromagnetic Compatibility (EMC)			To comply with the specification, shielded connecting cables must be used
Resistance to interference			EN 50 082-2
Interference emissions			EN 50 081-1
Actual value output [8			
Output voltage	U_X	V	0 bar → 1.25 V $p_{2\,max}$ → 6.25 V
Output current max.	I_X max	mA	1
Output resistance	R_A	Ω	100
Electrical Characteristics for Type PRE-U			
Nominal voltage	U_N	V DC	24 ±10 %
Nominal power max.	P_N	W	0.4
Residual ripple max.		%	10
Current consumption	I_{Bmax}	mA	15
Set value input	W	V	0-10
Version 0 - 8 bar			0 V → 0 bar, 8 V → 8 bar
Version 0 - 2 bar			0 V → 0 bar, 10 V → 2 bar
Version 0 - 0.2 bar			0 V → 0 bar, 10 V → 0.2 bar
Input resistance	R_E	kΩ	61,5
Electrical Characteristics for Type PRE-I			
Power supply [9	I_B	mA	4
Power supply [9	W	mA	4...20
Max. voltage at input [10	U_{Wmax}	V	12.5
Version 0 - 8 bar			4 mA → 0 bar, 20 mA → 8 bar
Version 0 - 2 bar			4 mA → 0 bar, 20 mA → 2 bar
Version 0 - 0.2 bar			4 mA → 0 bar, 20 mA → 0.2 bar
Input resistance	R_E	Ω	≤ 550

7) depending on version, see Order No.'s, Page 6.
8) optional, see Order No.'s, page 6.
9) 2-wire technology, i.e. power supply and set value via the same cable.
10) higher voltage will damage the valve.

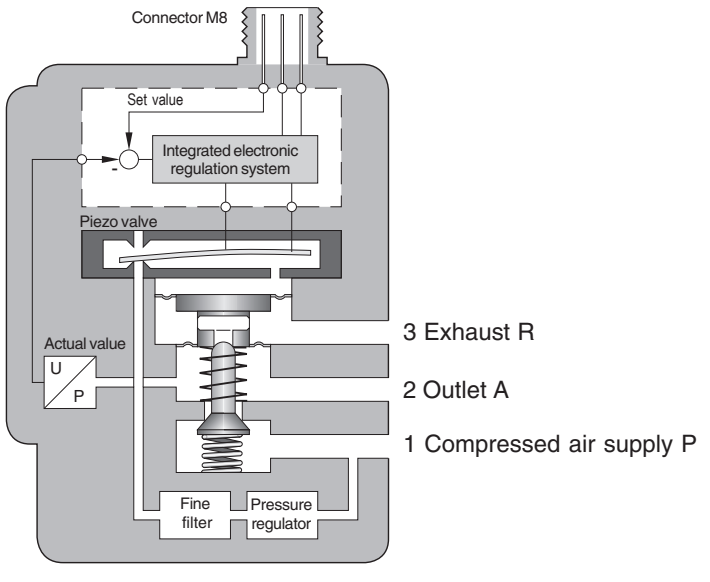
How it Works

The actuating element in the **tecno valve** is not a solenoid system, as in conventional proportional pressure regulating valves, but a piezo valve – an encapsulated Piezo-ceramic element based on the jet-and- baffle principle.

The piezo valve makes use of the Piezo effect: the Piezo-ceramic element bends when a voltage is applied to it.

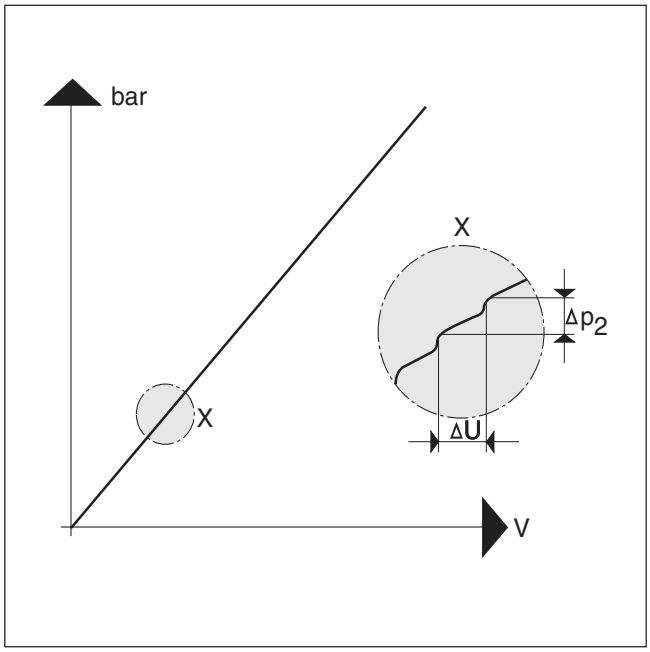
A built-in electronic control system applies variable voltage to the element, producing variable bending and therefore variable pressure on the diaphragm in the pilot chamber. Diaphragm movement is transferred to the main valve by a plunger acting against a spring.

The pressure thus produced at the valve outlet is compared via a sensor with the preset value and if necessary corrected by the electronic control system.



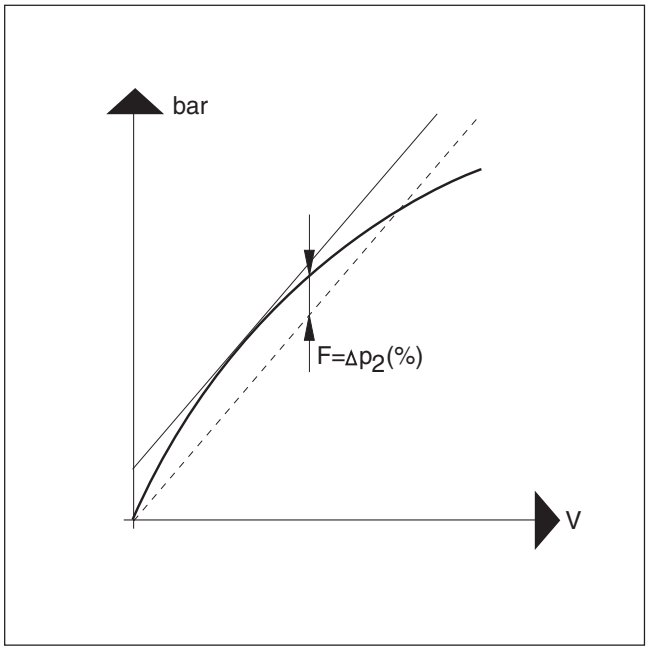
Sensitivity

The smallest change in the electronic input signal which leads to a change in actual output pressure is referred to as sensitivity.This is expressed as a percentage of maximum output pressure. For the Tecno this value is < 0.1% to < 0.5% depending on the version.



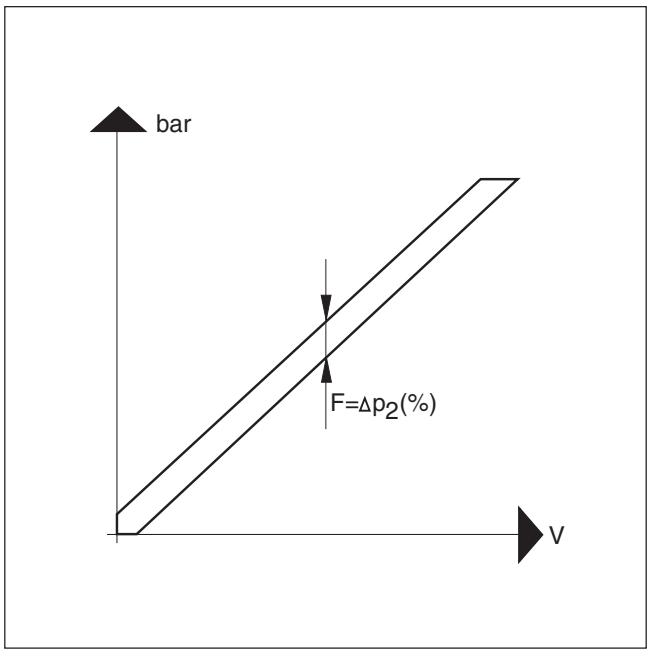
Linearity

The ideal curve showing output pressure in relation to electronic signal would be a straight line. Linearity is the maximum deviation from the straight line, expressed as a percentage of maximum output pressure.



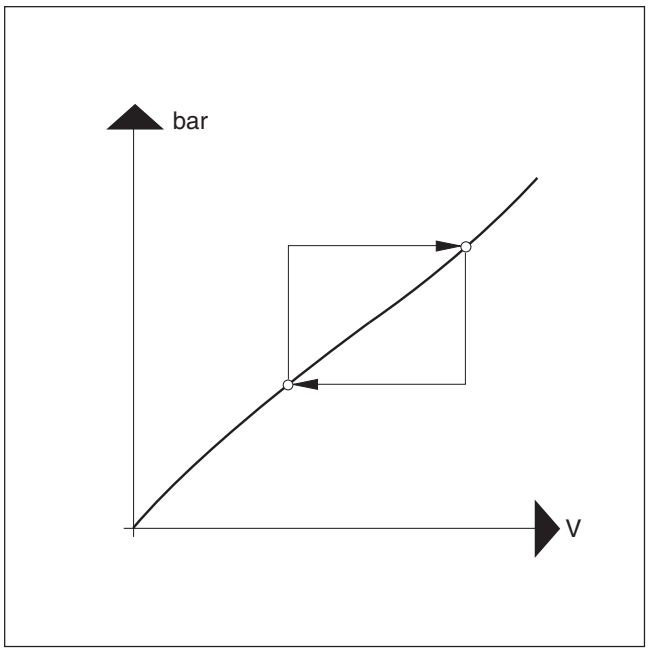
Hysteresis

The same electronic signal generates slightly different actual output pressures, depending on whether the previous signal was higher or lower. This difference, known as hysteresis, is caused by friction and temporary deformation of elastic components.
The hysteresis of the electronically operated pressure regulating valve **AIRFIT tecno** from HOERBIGER is between < 0.2 % and < 0.5 % of the output pressure.

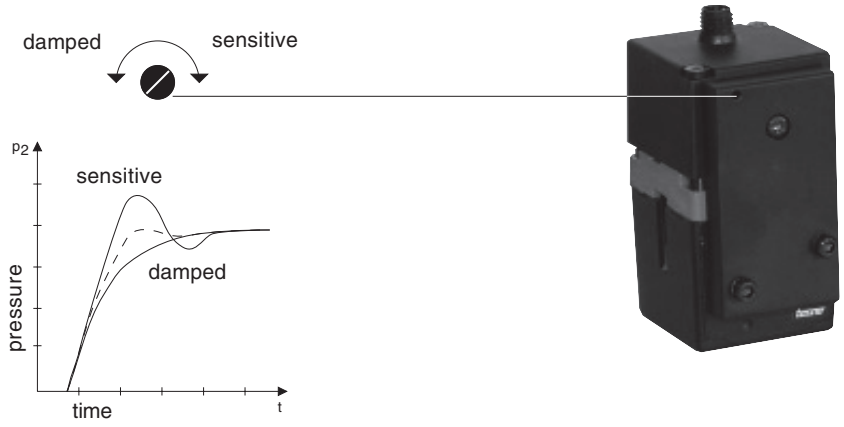


Repeatability

Control components, for a given set value, usually produce repeated actual values which differ less from each other than from the absolute set value, because the relatively large linearity deviation is excluded.

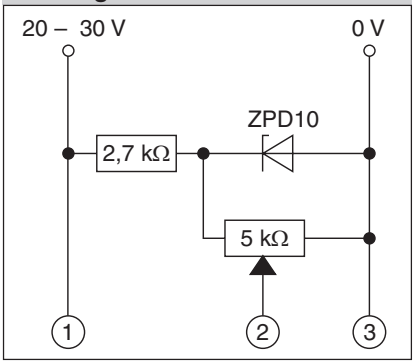


Adjustment



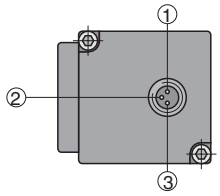
The regulation amplification of the electronic regulation system is designed for universal use of the valve and is preset at the factory for a minimum volume of ca. 5 ml.
If required the regulation amplification can be adjusted for higher sensitivity (with larger volume) - see diagram. However if the setting is too sensitive the outlet pressure can tend towards instability.

Examples of Connections – Voltage controlled 0-10 V



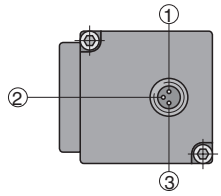
Connection Diagram for 3-pole plug

Connections Diagram No. 1



Voltage-controlled 0-10 V, Type PRE-U
1 = power supply 24 V DC / 15 mA
2 = set value 0-10 V
3 = GND set value and power supply

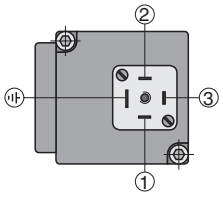
Connections Diagram No. 2



Current-controlled 4-20 mA, Type PRE-I (2-wire technology)
1 = free
2 = set value 4-20 mA, +
3 = set value GND

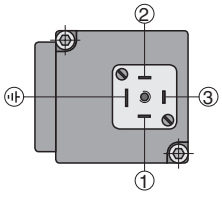
Connection Diagram for plug to 43650-1C

Connections Diagram No. 3



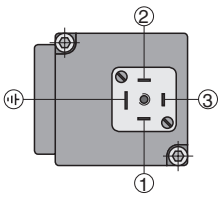
Voltage-controlled 0-10 V, Type PRE-U with actual value output
1 = power supply 24 V DC
2 = set value 0-10 V
3 = actual value output 1.25 V (0 bar output), – 6.25 V (p_{max} output)
⏚ GND set value and power supply

Connections Diagram No. 4



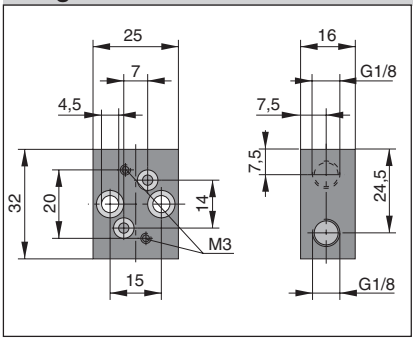
Voltage-controlled 0-10 V, Type PRE-U with EMC mass
1 = power supply 24 V DC
2 = set value 0-10 V
3 = GND set value and power supply
⏚ EMC mass

Connections Diagram No. 5



Current-controlled 4-20 mA, Type PRE-I with EMC mass
1 = free
2 = set value 4-20 mA, +
3 = set value GND
⏚ EMC mass

Dimensions (mm)
Single Base Plate G1/8



Dimensions (mm)
Multiple Base Plate G1/8

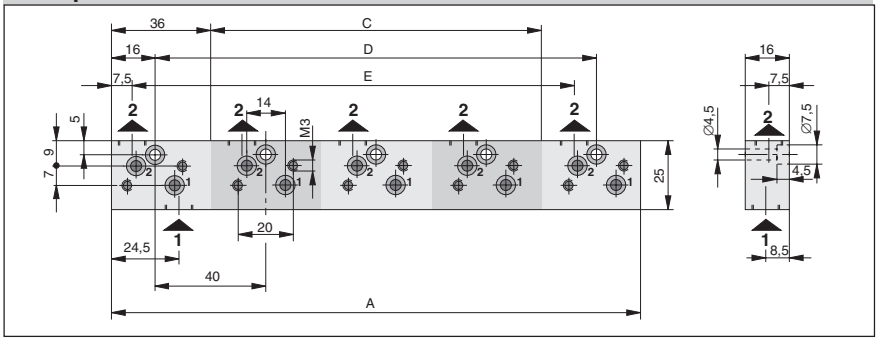
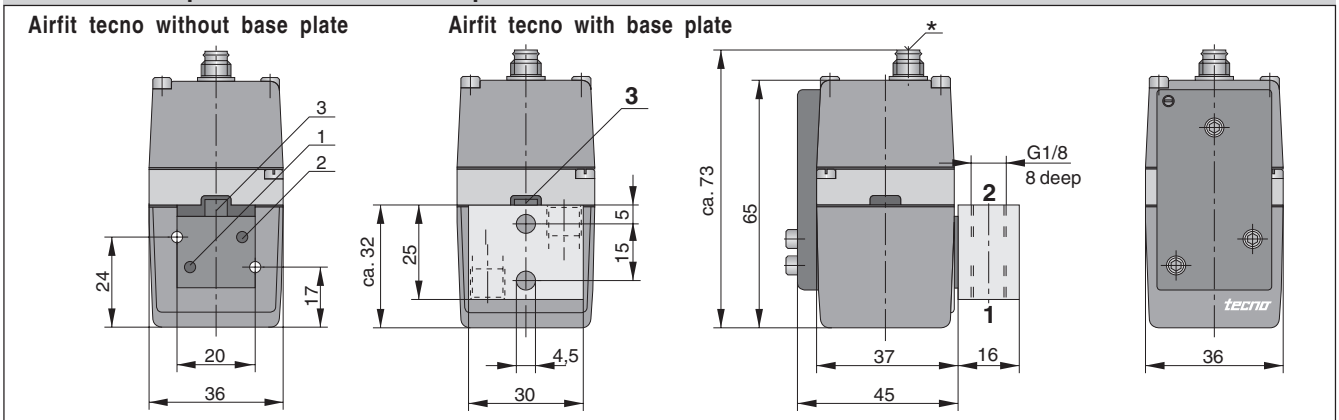


Table of dimensions (mm) and Weight (mass)
Multiple Base Plate G1/8

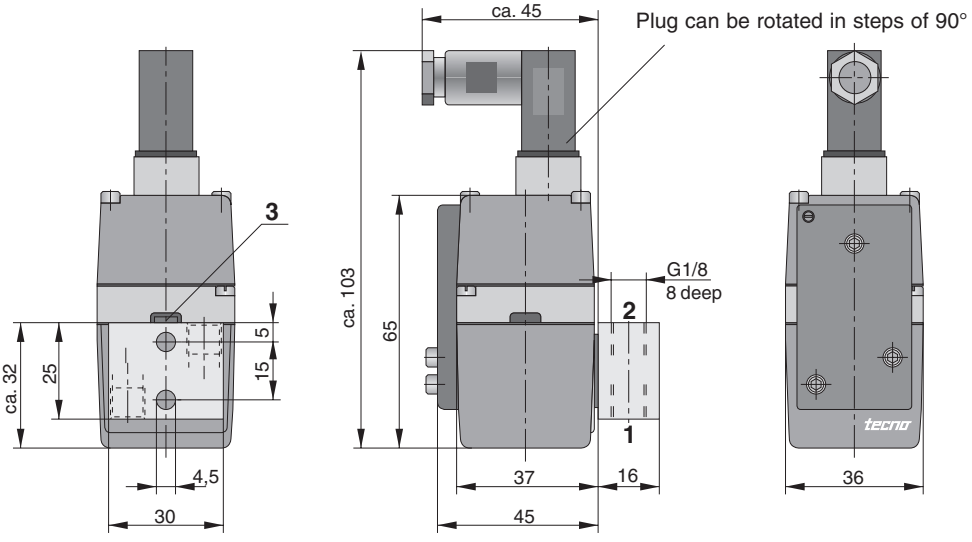
Number of valves	Dimensions (mm)				Weight (mass) (kg)
	A	C	D	E	
2	72	0	40	40	0,07
3	112	40	80	80	0,11
4	152	80	120	120	0,15
5	192	120	160	160	0,19
6	232	160	200	200	0,23

Dimensional Diagram No.1 (dimensions in mm)
Version with 3-pole connector and base plate



* Connection for 3-pole Plug M8 (KC3104, KC3106)

Dimensional Diagram No.2 (dimensions in mm)
Version with plug to DIN 43650-1C and base plate



Order Instructions

Version	Elec. Conn. Diagram No.	Dimensional Diagram No.	Order Instructions Type	Order No.
Sets, complete, (0-8 bar) consisting of				
Prop.-Pressure Regulating Valve, 0-8 V Base Plate G1/8, Cable Set straight (2m)	1	1	**PRE-U-01**	**PS11140-B-01**
Prop.-Pressure Regulating Valve, 0-10V Base Plate G1/8, Cable Set bended (2m)	1	1	**PRE-U-01**	**PS11150-B-01**
Prop.-Pressure Regulating Valve, 4-20 mA Base Plate G1/8, Cable Set straight (2m)	2	1	**PRE-I-01**	**PS11141-B-01**
Prop.-Pressure Regulating Valve, 4-20 mA Base Plate G1/8, Cable Set bended (2m)	2	1	**PRE-I-01**	**PS11151-B-01**

Prop.-Pressure Regulating Valve NW 2.5 (without accessories)				
Prop.-Pressure Regulating Valve, 0-8 V, 0-8 bar	1	1	**PRE-U**	**PS11110-B**
Prop.-Pressure Regulating Valve, 4-20 mA, 0-8 bar	2	1	**PRE-I**	**PS11111-B**
Prop.-Pressure Regulating Valve, 0-10 V, 0-2 bar	1	1	**PRE-U**	**PS11130-B-20**
Prop.-Pressure Regulating Valve, 4-20 mA, 0-2 bar	2	1	**PRE-I**	**PS11139-B-20**
Prop.-Pressure Regulating Valve, 0-10 V, 0-200 mbar	1	1	**PRE-U**	**PS11130-B-02**
Prop.-Pressure Regulating Valve, 4-20 mA, 0-200 mbar	2	1	**PRE-I**	**PS11139-A-02**

Prop.-Pressure Regulating Valve NW 2.5 with actual value output and plug to DIN 43650-1C (single units without accessories) *				
Prop.-Pressure Regulating Valve, 0-8 V, 0-8 bar, Actual Value Output 1.25 V (0 bar) – 6.25 V (8 bar)	3	2	**PRE-U**	**PS11113-B**
Prop.-Pressure Regulating Valve, 0-10 V, 0-2 bar, Actual Value Output 1.25 V (0 bar) - 6.25 V (2 bar)	3	2	**PRE-U**	**PS11162-B-20**
Prop.-Pressure Regulating Valve, 0 -10 V, 0-0.2 bar, Actual Value Output 1.25 V (0 bar) - 6.25 V (0,2 bar)	3	2	**PRE-U**	**PS11162-B-02**

Prop.-Pressure Regulating Valve NW 2.5 with EMV-mass and plug to DIN 43650-1C (single units without accessories) *				
Prop.-Pressure Regulating Valve, 0-8 V, 0-8 bar	4	2	**PRE-U**	**PS11164-B**
Prop.-Pressure Regulating Valve, 0-10 V, 0 -2 bar	4	2	**PRE-U**	**PS11165-B-20**
Prop.-Pressure Regulating Valve, 0-10 V, 0-0.2 bar	4	2	**PRE-U**	**PS11165-B-02**
Prop.-Pressure Regulating Valve, 4-20 mA, 0-8 bar	5	2	**PRE-I**	**PS11168-B**
Prop.-Pressure Regulating Valve, 4-20 mA, 0-2 bar	5	2	**PRE-I**	**PS11169-B-20**
Prop.-Pressure Regulating Valve, 4-20 mA, 0-0.2 bar	5	2	**PRE-I**	**PS11169-B-02**

* Corresponding connector included

Accessories	
Single Base Plate G1/8	**PS11112-A-01**
Multiple Base Plate G1/8, for 2 valves	**PS11112-A-02**
Multiple Base Plate G1/8, for 4 valves	**PS11112-A-04**
Multiple Base Plate G1/8, for 6 valves	**PS11112-A-06**
Cover Plate, complete	**PS11160-A**
Cable Set straight (5 m)	**KC3104**
Cable Set bended (5 m)	**KC3106**