Electric Drives and Controls | Hydraulics | Linear Motion and Assembly Technologies | Pneumatics | Service

Rexroth
Bosch Group

Electro-Pneumatic Devices

Valves and Positioners

The Drive & Control Company

Electro-Pneumatic Devices

Dynamic precision from Rexroth

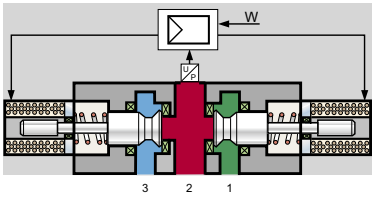
Rexroth
Bosch Group

Why choose Rexroth E/P's?

Rexroth electro-pneumatic pressure control valves are direct acting poppet valves which offer superior response and better hysteresis than the competition. Rexroth E/P's are also more tolerant of air line contamination. A broad range of flow requirements are covered, and you can choose from pilot control or direct control. Rexroth application experience and technical leadership insures successful results.

Bus Protocols supported:

Ethernet/IP	EtherCAT	ControlNet
DeviceNet	INTERBUS-S	MODBUS TCP
ProfiBus-DP	CANopen	TCP/IP



Features	Description	Direct Acting ED02	Pilot Control EV04	Direct Acting ED05	Pilot Control EV07	Direct Acting ED07	Direct Acting ED12
Technical Data	Flow l/min (SCFM)	100 (3.53)	350 (12.35)	1000 (35.3)	1300 (45.9)	1300 (45.9)	2600 (91.8)
	Port size	G1/8	*Universal 1/8	*Universal 1/4	G3/8	G3/8	G3/4
	Hysteresis	<0.05 bar	0.1 bar	<0.06 bar	<0.03 bar	<0.03 bar	<0.03 bar
	Repeatability <0.1psi (0.01bar)	X		X		X	X
	Response time < 0.05 sec.	X	X	X	X	X	X
	Limiting frequency > 5 Hz.	X	X	X	X	X	X
	Operating pressure 232psi (16bar)					**optional	optional
	Pressure control range to 145psi (10bar)	X	X	X	X	X	X
	Temperature range to 158°F (70°C)	X	X	X	X	X	X
	No continuous air consumption	X	X	X	X	X	X
	Long service Life	X	X	X	X	X	X
	Manifoldable (stackable)	X		X		X	X
	No switching noise, silent operation	X		X		X	X
Electrical Data	Current consumption < 0.5A	X	X		X		
	External sensor capable optional					X	
	Integrated pressure sensor	X	X	X	X	X	X
	Nominal input value current or voltage	X	X	X	X	X	X
	Digital control		X				
	Serial control			X	X	X	
	Factory adjustable offset and range	X	X	X	X	X	X
	Actual Value Output	X	X	X	X	X	X
Safety	Fail safe - Normally closed	X	X		X	X	X
	Fail safe - Normally Open			X			
	Pressure control with power cutoff		X				
	Protection class NEMA 4 (IP 65)	X	X	X	X	X	X
	Filter 50 micron sufficient	X	X	X	X	X	X

*Universal thread, suitable for NPT and ISO-G(BSPP)

**Models of ED07 available for vacuum and for pressures up to 20 bar.

E/P (Electro-Pneumatic) Pressure Control Valves

Index

Rexroth
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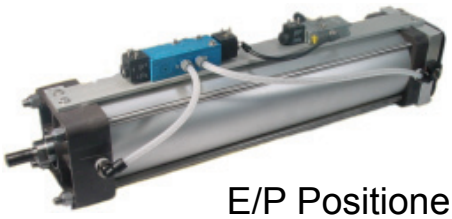
ED02
(3.53 SCFM)

EVO4
(12.35 SCFM)

ED05
(35.3 SCFM)

ED07
(45.9 SCFM)

ED12
(91.8 SCFM)

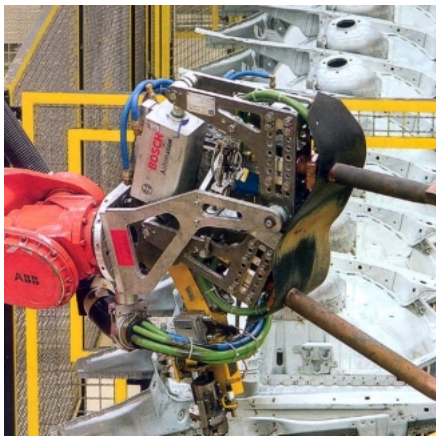


E/P Positioner

Flowmeter

What are Electro-Pneumatic [E-P] Devices?

Electro-Pneumatic devices deliver proportional pressure relative to an analog signal.
E/P devices use voltage signals; I/P devices use current as a signal.
These act like electrically operated pressure regulators.
Electronic signals can control pneumatic actuators, cylinders, brakes, clutches, and process control functions.
These devices bridge the gap between electronics and pneumatics, and offer new opportunities in the world of automation.



When deciding which E-P to use, consider the following:
1. Supply and operating pressure range
2. Temperature range
3. Volume of the load (to determine flow requirement)
4. Vibration the unit will be subject to
5. Output pressure requirement on power failure
6. Accuracy requirements
7. Location of the converter (protected or exposed environment)
8. Command signal
9. Power supply availability.

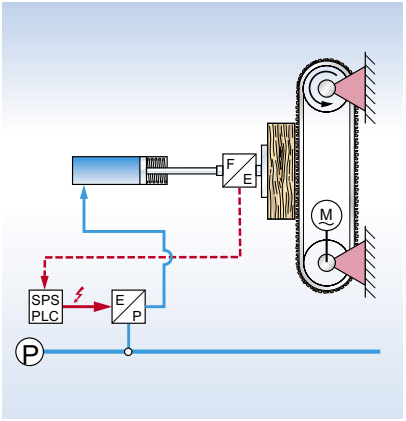
Some rules to keep in mind when applying an E-P to your application:
To insure the fastest response–
a. The E-P should be located as close as possible to the controlled device.
b. The air supply should have ample reserve at the E-P location to support a surge in demand. This is usually accomplished by placing a supply volume close to the E-P.
c. For subfreezing operation, the air supply must be free of all condensate.

Many pressure ranges are accomodated by our factory calibrated devices, which are listed along with the standard part numbers.

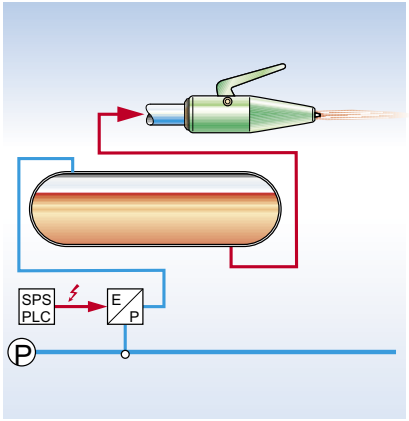
Note: Please be aware that most of our competitors use a different calculation to determine flow ratings which result in their comparable sized E/P's to show artificially higher flows. Bosch Rexroth uses a pressure drop of only 2.9 psi (0.2 bar) instead of 14.5 psi (1.0 bar). This results in a more realistic rating for the user. As an example, the flow of our ED02 would increase by 24% (1.2 SCFM higher) if we used the other calculation method. Our ED05 would increase 22% (8.3 SCFM higher).

Sample applications

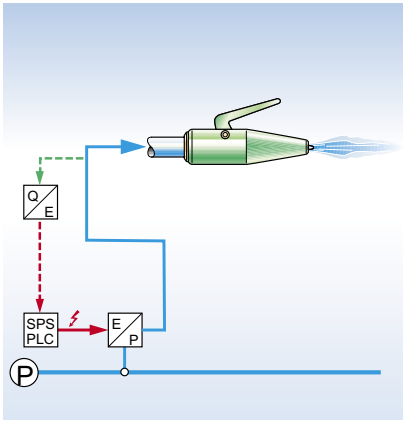
Shown at top right: Rexroth E-P used in a Weld Dense Pack application (see additional information on page 56.)



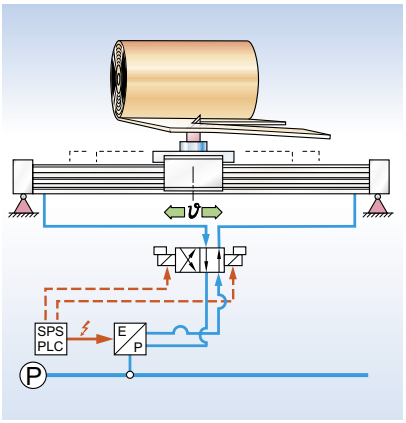
Contact pressure control
Keeping the surface pressure of the tool constant provides uniform results for surface processing.



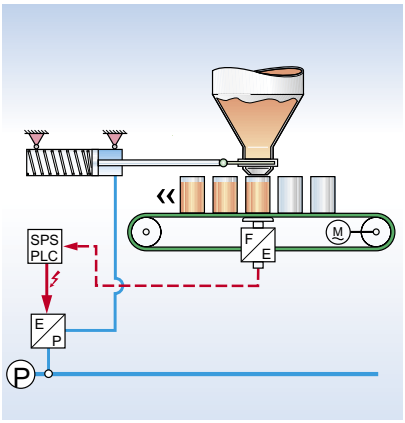
Paint quantity control
The EP pressure control valve keeps the pressure in the container constant, which allows for even painting.



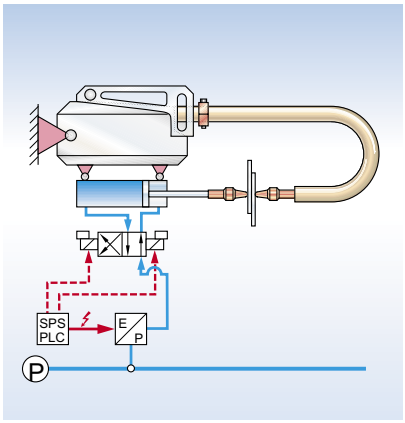
Air quantity control
The air flow through a nozzle can be adjusted exactly using controlled pressure. Precision can be optimized by installing a flow rate sensor and an overriding rate control.



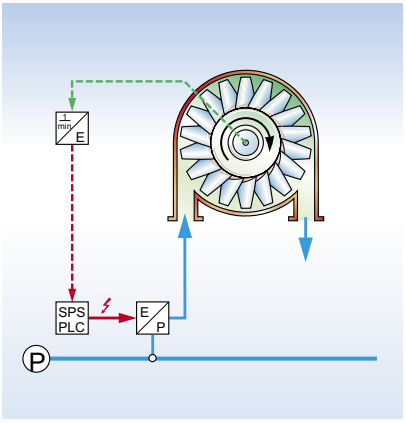
Speed control
By controlling the pressure in the cylinder chamber, defined movement of the piston with various speed profiles is possible.



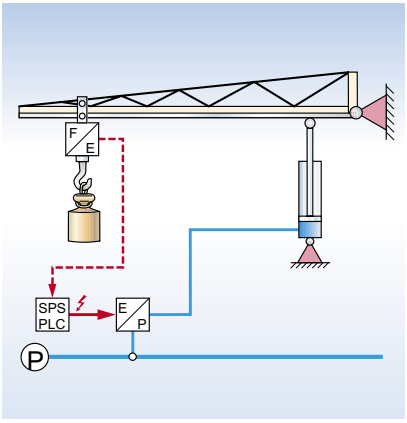
Capacity control
Electro-pneumatically controlled metering valves allow containers to be filled precisely down to the gram with high cycle time and repetitive precision.



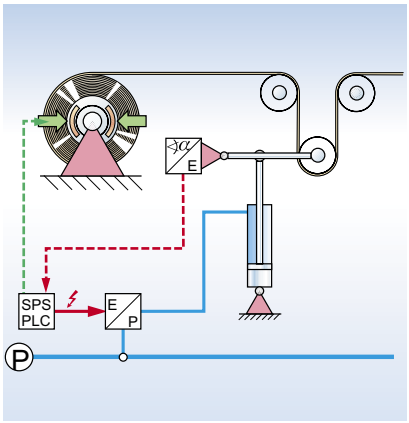
Welding tips
Electro-pneumatic pressure control in welding tips makes it possible to quickly and gently close the tips and enable welding forces with repetitive precision.



Rpm control
Controlled air flow pressure provides an even and easily adjustable rpm for pneumatic motors/turbines. An extremely precise control can be achieved using an rpm sensor.



Counter-balancing control
A cylinder with applied pressure helps to handle heavy loads. Using an EP control, the supporting force can always be adapted optimally to the load to be moved.



Compensating roller control
Pressure-controlled tensioning devices prevent lengths of fabric from tearing or getting tangled and provide an optimal material flow.

E/P Pressure control valves

E/P Pressure control valve, Series ED02
with proportional solenoid, analog control

Rexroth
Bosch Group

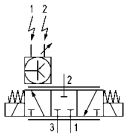
Technical Data

Type		Poppet valve
Supply pressure		see table
Output pressure		see table
Hysteresis		< 0.05 bar (<1 psi)
Nominal flow rate at supply pressure = 7 bar (102 psi), at output pressure = 6 bar (87 psi), and pressure drop Δp = 0.2 bar (3 psi)	Q_n	100 l/min (3.53 SCFM)
Ambient temperature range	min./max.	0 °C / +70 °C (+32 °F / +158 °F)
Medium		Condensate-free and non-lubricated compressed air, filtered 50 µm
Weight		0,32 kg (0,71 lbs)
Materials	Body	Al, chromated steel
	Seals	HNBR, VMQ
Supply voltage		24 V DC ± 20 %
Permissible ripple		5%
Current consumption		0,3 A
Protection with plug		IP65 - IEC 60529 (DIN VDE 0470-1) (NEMA 4)
Installation position		optional, (Housing ventilation port must remain open)

Application area

Electro-pneumatic pressure control valves convert an electrical signal (current, voltage, resistance) proportionally into pneumatic pressure. They are used where electrical control is required to act directly on a change of pressure or force.

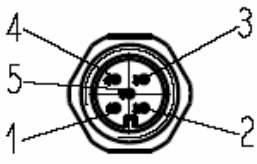
Part no.

	Supply pressure min./max. [bar](psi)	Output pressure min./max. [bar](psi)	Nominal input value	Actual output value	Part no.
	6 / 7 (87/102)	0 / 6 (0/87)	0 - 20 mA	0 - 20 mA	**R414002400**
			4 - 20 mA	4 - 20 mA	**R414002401**
			0 - 10 V	–	**R414002402**
			0 - 10 V	0 - 10 V	**R414002403**
	10 / 11 (145/160)	0 / 10 (0/145)	0 - 20 mA	0 - 20 mA	**R414002410**
			4 - 20 mA	4 - 20 mA	R**414002411**
			0 - 10 V	–	**R414002412**
			0 - 10 V	0 - 10 V	**R414002413**

Accessories (to be ordered separately)

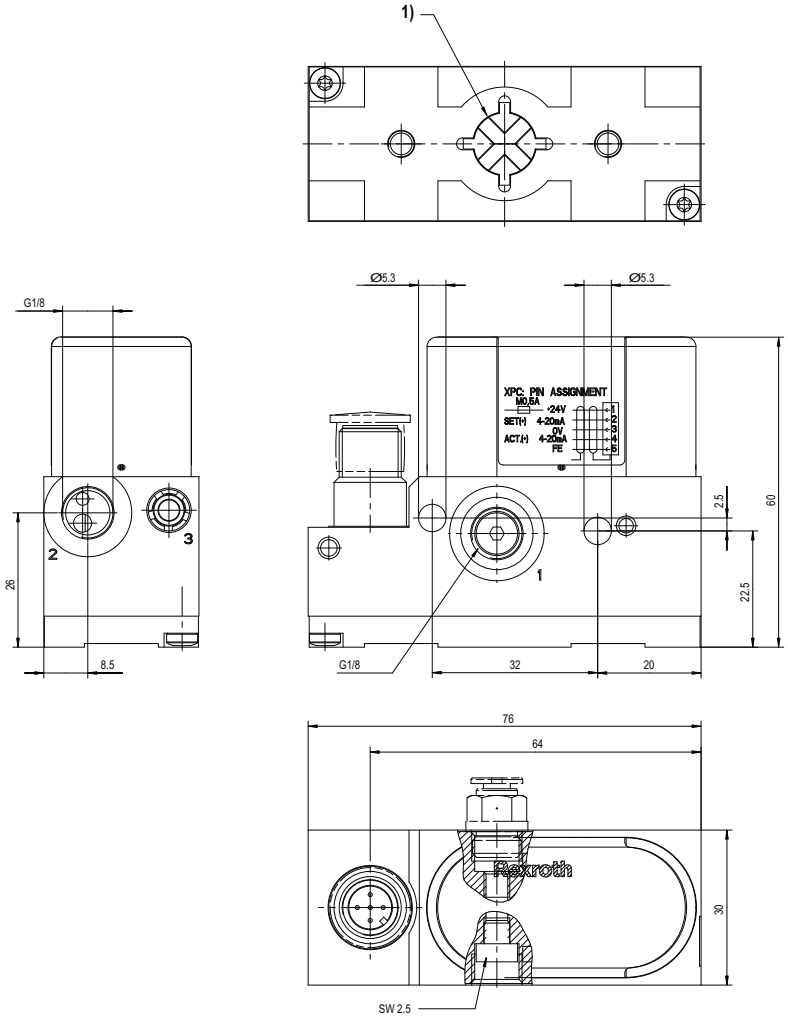
	Accessory	Part no.
	Connection cable to connect XPC, 2,5 m (8.2 ft.)	**R419800109**
	Connection cable to connect XPC, 5 m (16.4 ft.)	**R419800110**
	Plug connection, 5-pin threaded connector, M12x1	
	Kit for linking of 2 units	**R414002579**
	Kit for linking of 3 units	**R414002580**
	Kit for linking of 4 units	**R414002581**
	Mounting kit	**R414002582**
	Mounting kit for DIN rails	**R414002583**

1 = Brown
2 = White
3 = Blue
4 = Black
5 = Grey



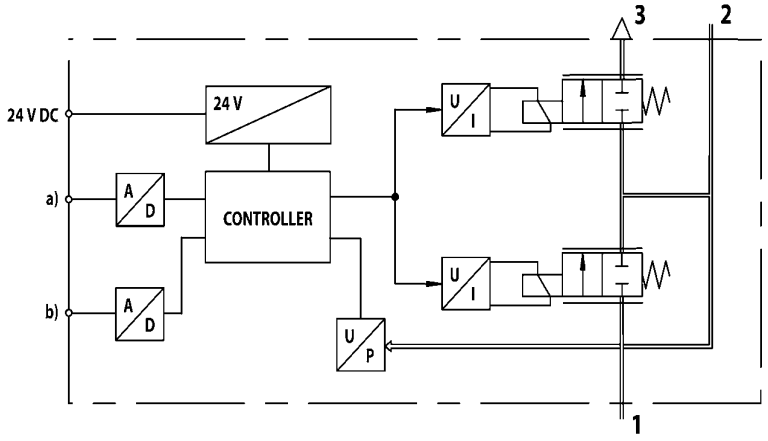
Standard Rexroth 12mm connection cable pin-out

Drawing



1) Housing exhaust

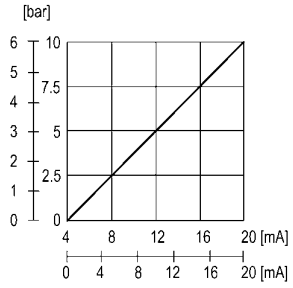
Functional diagram

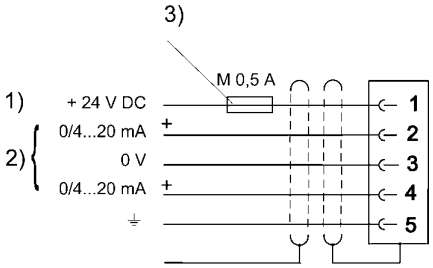


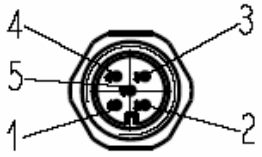
a) Nominal input value b) Actual output value

The E/P pressure control valve modulates the pressure corresponding to an analogue electrical nominal input value. The integrated electronics make a comparison between the nominal input value and the pressure in the output line (actual value), which is measured by a piezo-resistive pressure sensor. The controller generates an output positioning signal which controls via PWM voltage/current converter and proportional solenoid either the charging or bleeding proportional valve, in order to obtain the required pressure in the output line.

Characteristic and pin assignment for current control with actual output value (R414002400, R414002401, R414002410, R414002411)



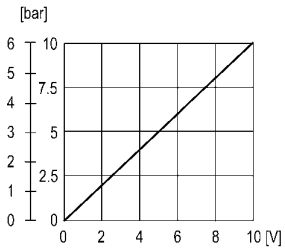


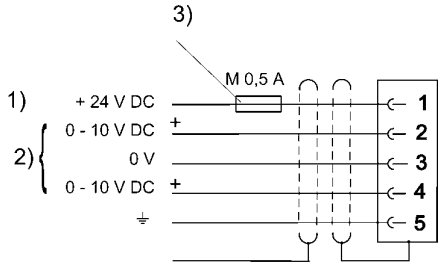


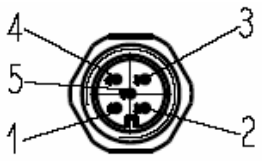
1 = +24VDC
2 = Command signal (voltage or current)
3 = 0VDC
4 = Actual value (feedback, voltage or curr.)
5 = Earth ground

1) Supply voltage
2) Actual value (Pin 4) and nominal value (Pin 2) are related to 0 V. Nominal input value current (Ohmic load 100 Ω). Actual output value (Max. total resistance of downstream devices < 500 Ω).
3) The supply voltage must be protected by an external M 0,5 A fuse.
Shielding must comply with local limiting conditions. In extreme cases the power supply must also be shielded.

Characteristic and pin assignment for tension control with actual output value (R414002403, R414002413)



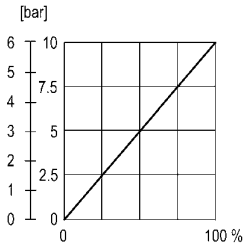


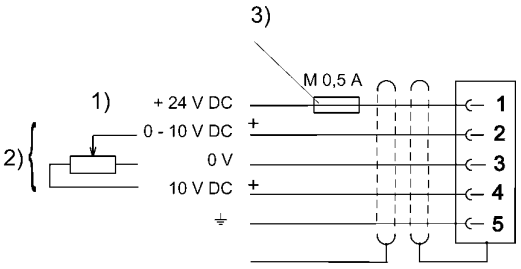


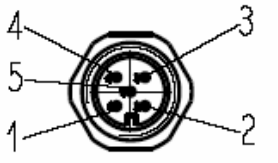
1 = +24VDC
2 = Command signal (voltage or current)
3 = 0VDC
4 = Actual value (feedback, voltage or curr.)
5 = Earth ground

1) Supply voltage
2) Actual value (Pin 4) and nominal value (Pin 2) are related to 0 V (Control voltage). Min. load resistance of set value = 1 kΩ
3) The supply voltage must be protected by an external M 0,5 A fuse.
Shielding must comply with local limiting conditions. In extreme cases the power supply must also be shielded.

Characteristic and pin assignment for potentiometer control without actual output value (R414002402, R414002412)







1 = +24VDC
2 = Command signal (voltage or current)
3 = 0VDC
4 = 10VDC constant for pot control
5 = Earth ground

1) Supply voltage
2) Potentiometer control (Pin 4) and nominal value (Pin 2) are related to 0 V (potentiometer-cor
3) The supply voltage must be protected by an external M 0,5 A fuse.
Shielding must comply with local limiting conditions. In extreme cases the power supply must also be shielded.

E/P Pressure control valves

E/P Pressure control valve, Series EV04
Pilot control, analogue

Rexroth
Bosch Group

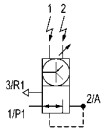
Technical Data

Type		Poppet valve
Supply pressure		See table
Output pressure		See table
Hysteresis		0,1 bar (1.45 psi)
Nominal flow rate at supply pressure = 7 bar (102 psi), at output pressure = 6 bar (87 psi), and pressure drop Δp = 0,2 bar (3 psi)	Q_n	350 l/min (12.35 SCFM)
Ambient temperature range	min./max.	0 °C / +50 °C (+32 °F / +122 °F)
Medium		Condensate-free and non-lubricated compressed air, filtered 50 µm
Weight		0,6 kg (1.323 lbs)
Materials	Body	Zn-diecasting, Al
	Seals	NBR (Nitrile Butadiene Rubber)
Supply voltage		24 V DC ± 10 %
Permissible ripple		5%
Current consumption	max.	0,2 A
Protection with plug		IP 55 to IEC 529 (DIN VDE 0470)
Installation position		Vertical

Application area

Electro-pneumatic pressure control valves convert an electrical signal (current, voltage, resistance) proportionally into pneumatic pressure. They are used where electrical control is required to act directly on a change of pressure or force.

Part no.



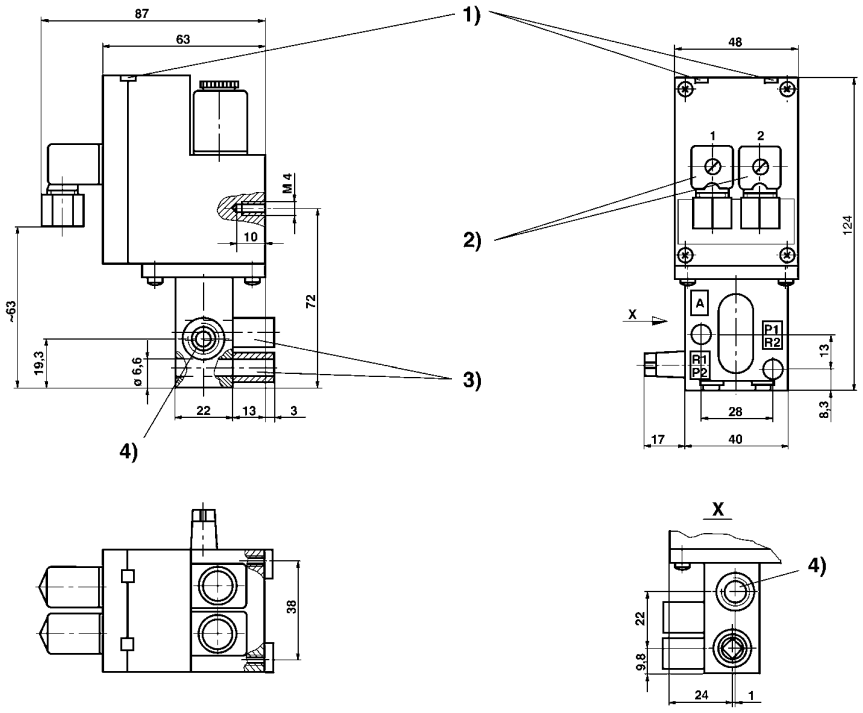
Supply pressure max.* [bar] (psi)	Output pressure min./max. [bar] (psi)	Nominal input value	Actual output value	Part no.
8 (116)	0,1 / 6 (1 / 87)	0 - 20 mA	0 - 20 mA	**5610111000**
8 (116)	0,1 / 6 (1 / 87)	4 - 20 mA	4 - 20 mA	**5610111010**
8 (116)	0,1 / 6 (1 / 87)	0 - 10 V	0 - 20 mA	**5610111110**
8 (116)	0,1 / 6 (1 / 87)	0 - 10 V or potentiometri	–	**5610111100**
11 (160)	0,1 / 10 (1 / 145)	0 - 20 mA	0 - 20 mA	**5610111020**
11 (160)	0,1 / 10 (1 / 145)	0 - 10 V or potentiometer	–	**5610111120**

* Min. supply pressure: 0,5 bar (7 psi)+ output pressure (max)
Additional pressure ranges on request.

Accessories (to be ordered separately)

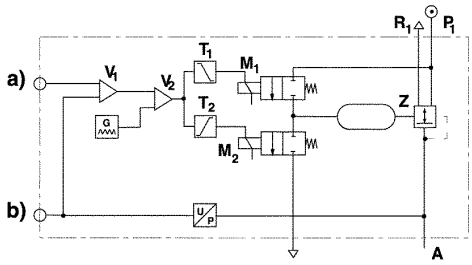
Accessory	Part no.	Type
Silencer G 1/8	**1827000000**	
Connector for plug 1	**8946201612**	with 5 m (16.4 ft.) cable
Connector for plug 2	**8946201602**	with 5 m (16.4 ft.) cable
Mounting for DIN-rail	**5610111042**	
Mounting kit	**5610120512**	

Drawing



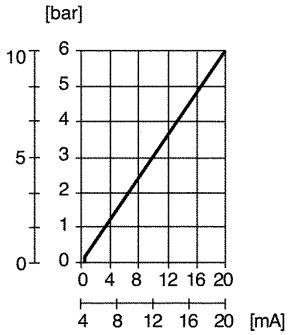
1) Mounting space for nameplate. 2) El. connector can be fixed at 90° intervals. 3) 2 spacer bushings are supplied loose.
4) Universal threaded connection, suitable for G1/8 to ISO 228/1 and 1/8-27 NPTF

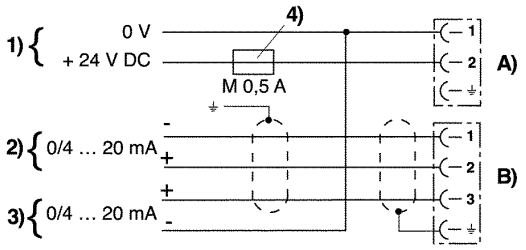
Functional diagram



a) Nominal input value b) Actual output value
The Electro-pneumatic pressure control valve modulates the pressure corresponding to an analogue electrical nominal input value. The integrated electronics make a comparison between the nominal input value and the pressure in the output line (actual value), which is measured by a piezo-resistive pressure sensor. The controller generates an electrical signal, which either charges or bleeds control area Z of the relay valve by means of two pilot valves (M1, M2), in order to obtain the required pressure in the working line.

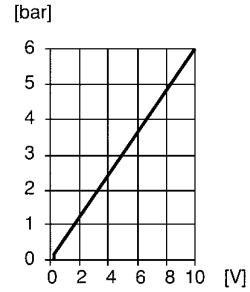
Characteristic and pin assignment for current control with actual output value (5610111000, 5610111010 and 5610111020)

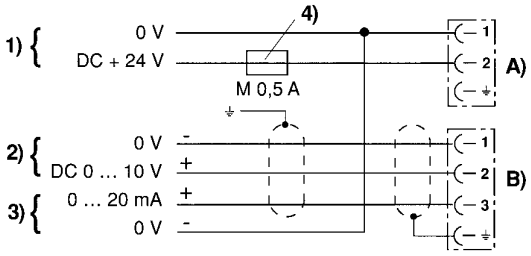




1) Supply voltage 2) Nominal input value current (Ohmic load 100 Ω, max. 50 mA)
The potential (+) and (-) connection must be in the range 0-12 V related to plug 1, pin 1.
3) Actual output value (Max. total resistance of downstream devices < 250 Ω).
The actual value is measured between plug 2, pin 3 and plug 1, pin 1)
4) The supply voltage must be protected by an external M 0,5 A fuse.
Shielding must comply with local limiting conditions. In extreme cases the power supply must also be shielded. A) Plug 1 B) Plug 2

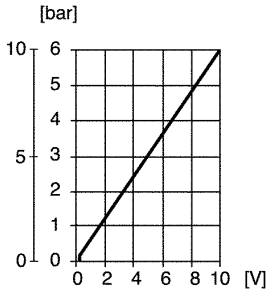
Characteristic and pin assignment for voltage control with actual output value (5610111110)

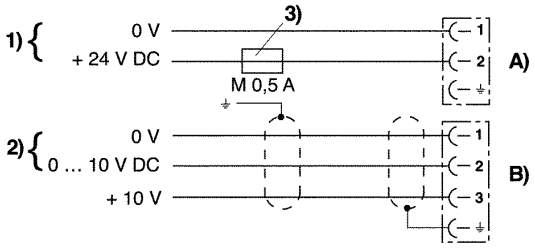




1) Supply voltage. 2) Nominal input value voltage. 3) Actual output value (Max. total resistance of downstream devices < 250 Ω).
4) The supply voltage must be protected by an external M 0,5 A fuse.
Shielding must comply with local limiting conditions. In extreme cases the power supply must also be shielded. A) Plug 1 B) Plug 2

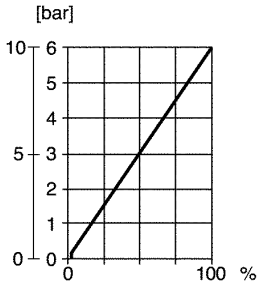
Characteristic and pin assignment for voltage control without actual output value (5610111100 and 5610111120)

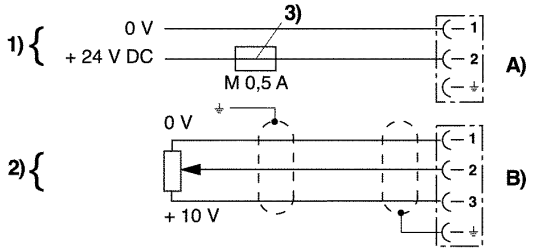




1) Supply voltage 2) Nominal input value voltage 3) The supply voltage must be protected by an external M 0,5 A fuse.
Shielding must comply with local limiting conditions. In extreme cases the power supply must also be shielded.
A) Plug 1 B) Plug 2

Characteristic and pin assignment for potentiometer control without actual output value (5610111100 and 5610111120)





1) Supply voltage 2) Potentiometer control (0 - 2 kΩ min, 0 - 10 kΩ max.)
3) The supply voltage must be protected by an external M 0,5 A fuse.
Shielding must comply with local limiting conditions. In extreme cases the power supply must also be shielded.
A) Plug 1 B) Plug 2

E/P Pressure control valves

E/P Pressure control valve, Series ED05
Proportional solenoid, analog link

Rexroth
Bosch Group

★

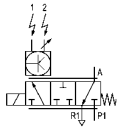
Technical Data

Type		Poppet valve
Supply pressure		see table
Output pressure		see table
Hysteresis		< 0,06 bar (<1 psi)
Nominal flow rate at supply pressure = 7 bar (102 psi), at output pressure = 6 bar (87 psi), and pressure drop Δp = 0,2 bar (3 psi)	Q_n	1000 l/min (35.3 SCFM)
Ambient temperature range	min./max.	0 °C / +70 °C (+32 °F / +158 °F)
Medium		Condensate-free and non-lubricated compressed air, filtered 50 µm
Weight		1,1 kg (2.425 lbs)
Materials	Body	Zn-diecasting, Al, POM, chromated steel (POM-Polyoxymethylene)
	Seals	NBR (Nitrile Botadiene Rubber)
Supply voltage		24 V DC ± 20 %
Permissible ripple		5%
Current consumption	max.	1,3 A
Protection with plug		IP 55 to IEC 529 (DIN VDE 0470) IP 65 (NEMA 4)optional
Installation position		optional, if condensate-free and non lubricated compressed air is guaranteed, otherwise see drawing

Application area

Electro-pneumatic pressure control valves convert an electrical signal (current, voltage, resistance) proportionally into pneumatic pressure. They are used where electrical control is required to act directly on a change of pressure or force.

Part no.

	Supply pressure*) [bar] (psi)	Output pressure min./max. [bar] (psi)	Nominal input value	Actual output value	Part no.
	7 (102)	0 / 6 (0 / 87)	0 - 20 mA	0 - 20 mA	**5610141300**
	7 (102)	0 / 6 (0 / 87)	4 - 20 mA	4 - 20 mA	**5610141310**
	7 (102)	0 / 6 (0 / 87)	0 - 10 V or potentiometer	-	**5610141320**
	7 (102)	0 / 6 (0 / 87)	0 - 10 V	0 - 10 V	**5610141330**
	11 (160)	0 / 10 (0 / 145)	0 - 20 mA	0 - 20 mA	**5610141500**
	11 (160)	0 / 10 (0 / 145)	4 - 20 mA	4 - 20 mA	**5610141510**
	11 (160)	0 / 10 (0 / 145)	0 - 10 V or potentiometer	-	**5610141520**
	11 (160)	0 / 10 (0 / 145)	0 - 10 V	0 - 10 V	**5610141530**

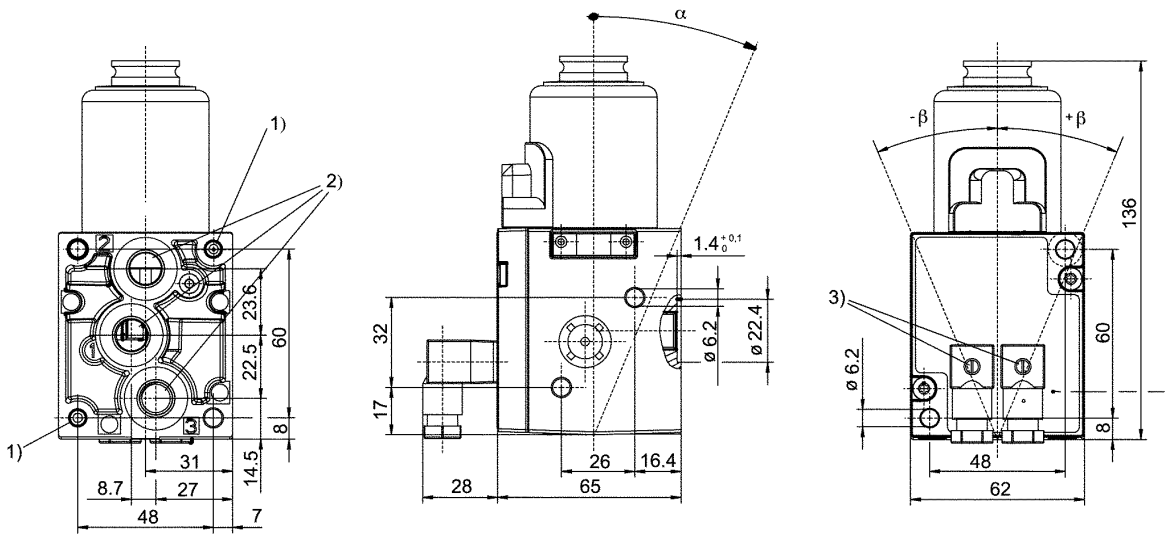
* min. supply pressure: 0,5 bar (7 psi)+ max. required output pressure

Accessories (to be ordered separately)

	Accessory	Part no.
	Connector for plug X2A, with 5 m (16.4 ft.) cable	**8946201602**
	Connector for plug X2A, with 10 m (32.8 ft.) cable	**R414002160**
	Connector for plug X1S, with 5 m (16.4 ft.) cable	**8946201612**
	Connector for plug X1S, with 10 m (32.8 ft.) cable	**R414002161**
	Base plate, 1x, flat, D12*	**R414002184**
	Base plate, 1x*	**5610141002**
	Base plate, 2x*	**5610141012**
	Base plate, 3x*	**5610141022**
	Base plate, 4x*	**R414000105**
	Base plate, 5x*	**R414000106**
	Base plate, 6x*	**5610141052**
	Base plate, 7x*	**R414000908**
	Base plate, 8x*	**5610141072**
	Base plate, 9x*	**R414000910**
	Base plate, 10x*	**5610141092**
	Coupling kit (2 screws, 3 base plate gasket) for mounting on a base plate	**5610140302**
	Silencer G 1/4	**1827000001**
	Silencer G3/8 for base plate	**1827000002**

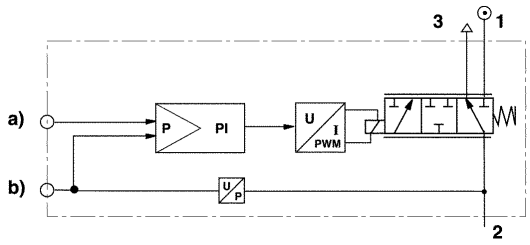
* incl. the appropriate number of mounting kits

Drawing



1) Core hole is deep for automatic ridge screws M6
2) Universal threaded connection, suitable for G1/4 to ISO 228/1 and 1/4-27 NPTF
3) El. connector can be fixed at 90° intervals
Fitting position: Alpha = 0 ... 90°
± Beta = 0 ... 90°
G ports are to ISO 1179-1 with ISO 228-1 threads.

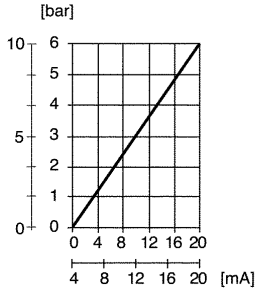
Functional diagram

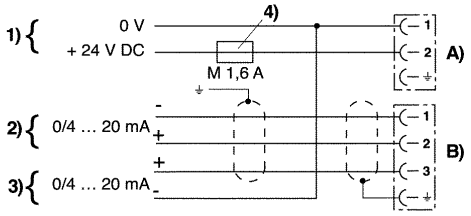


a) Nominal input value. b) Actual output value.

The E/P pressure control valve modulates the pressure corresponding to an analogue electrical nominal input value. The integrated electronics make a comparison between the nominal input value and the pressure in the output line (actual value), which is measured by a piezo-resistive pressure sensor. The controller generates a setting, which is controlled by a voltage/current converter and a proportional solenoid, in order to obtain the required pressure.

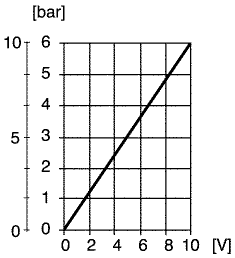
Characteristic and pin assignment for current control with actual output value (5610141300, 5610141310, 5610141500 and 5610141510)

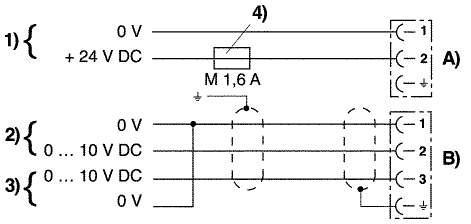




1) Supply voltage 2) Nominal input value current (Ohmic load 100 Ω max. 50 mA; max. 12 V; to plug 1; pin 1)
3) Actual output value (Max. total resistance of downstream devices < 300 Ω.
The actual value is measured between plug 2, pin 3 and plug 1, pin 1)
4) The supply voltage must be protected by an external M 1,6 A fuse. Shielding must comply with local limiting conditions. In extreme cases the power supply must also be shielded.
A) Plug 1 B) Plug 2

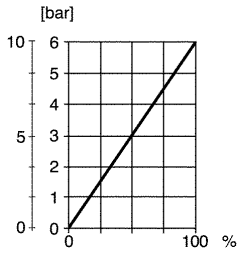
Characteristic and pin assignment for voltage control with actual output value (5610141330 and 5610141530)

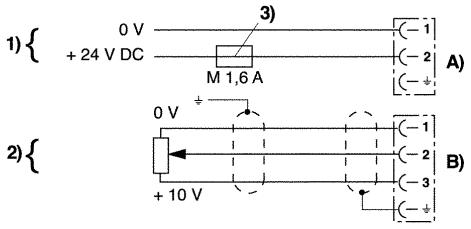




1) Supply voltage. 2) Nominal Input value voltage. 3) Actual output value.
4) The supply voltage must be protected by an external M 1,6 A fuse.
Shielding must comply with local limiting conditions. In extreme cases the power supply must also be shielded. A) Plug 1 B) Plug 2

Characteristic and pin assignment for potentiometer control without actual output value (5610141320 and 5610141520)





1) Supply voltage 2) Potentiometer control (0 ... 2 kΩ min., 0 ... 10 kΩ max.) 3) The supply voltage must be protected by an external M 1,6 A fuse. 4) Shielding must comply with local limiting conditions. In extreme cases the power supply must also be shielded.
A) Plug 1 B) Plug 2

E/P Pressure control valves

E/P Pressure control valve, Series ED05
with proportional solenoid, analog control, 5-pin threaded connector, 1 x M12

Rexroth
Bosch Group

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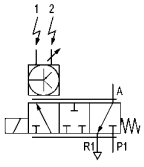
Technical Data

Type		Poppet valve
Supply pressure		see table
Output pressure		see table
Hysteresis		< 0.06 bar (<1 psi)
Nominal flow rate at supply pressure = 7 bar (102 psi), at output pressure = 6 bar (87 psi), and pressure drop Δp = 0.2 bar (3 psi)	Q_n	1000 l/min (35.3 SCFM)
Ambient temperature range	min./max.	0 °C / +70 °C (+32 °F / +158 °F)
Medium		Condensate-free and non-lubricated compressed air, filtered 50 µm
Weight		0.95 kg (2.09 lbs.)
Materials	Body	Zn-diecasting, Al, POM, chromated steel
	Seals	HNBR (Nitrile Botadien Rubber)
Supply voltage		24 V DC ± 20 %
Permissible ripple		5%
Current consumption		1.3 A
Protection with plug		IP65 - IEC 60529 (DIN VDE 0470-1) (NEMA 4)
Installation position		optional, if condensate-free and non lubricated compressed air is guaranteed, otherwise see drawing

Application area

Electro-pneumatic pressure control valves convert an electrical signal (current, voltage, resistance) proportionally into pneumatic pressure. They are used where electrical control is required to act directly on a change of pressure or force.

Part no.

	Supply pressure min./max. [bar] (psi)	Output pressure min./max. [bar] (psi)	Nominal input value	Actual output value	Part no.
	6 / 7 (87 / 102)	0 / 6 (0 / 87)	0 - 20 mA	0 - 20 mA	**R414002003**
			4 - 20 mA	4 - 20 mA	**R414002004**
			0 - 10 V	0 - 10 V	**R414002005**
			0 - 20 mA	24 V [1])	**R414002006**
			4 - 20 mA	24 V [1])	**R414002294**
			0 - 10 V	24 V [1])	**R414002295**
	10 / 11 (145 / 160)	0 / 10 (0 / 145)	0 - 20 mA	0 - 20 mA	**R414002007**
			4 - 20 mA	4 - 20 mA	**R414002008**
			0 - 10 V	0 - 10 V	**R414002009**
			0 - 20 mA	24 V [1])	**R414002010**
			4 - 20 mA	24 V [1])	**R414002296**
			0 - 10 V	24 V [1])	**R414002297**

[1]) Acknowledge signal

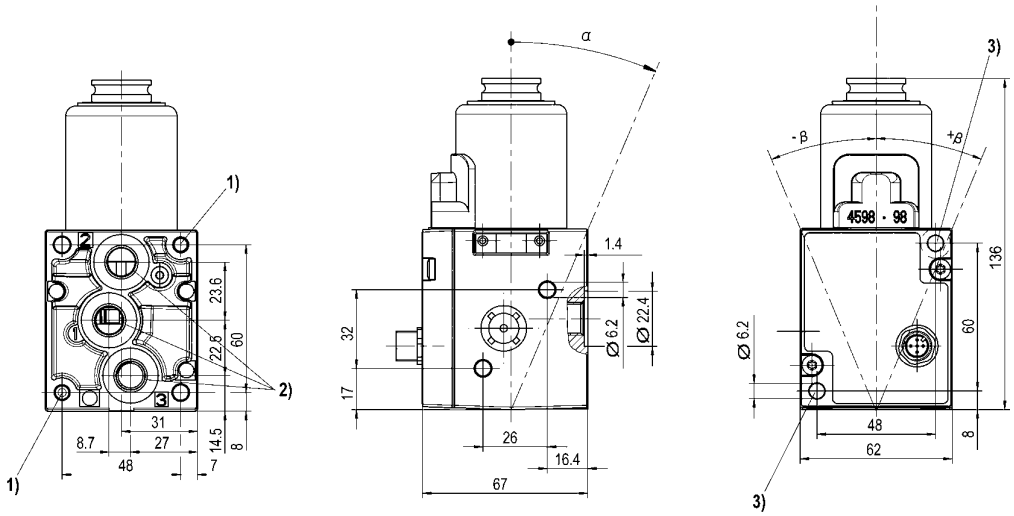
Accessories (to be ordered separately)

	Accessory	Part no.
	Connection cable to connect XPC, 2,5 m (8.2 ft.)	**R419800109**
	Connection cable to connect XPC, 5 m (16.4 ft.)	**R419800110**
	Plug connection, 5-pin threaded connector, M12x1	**1824484029**
	Silencer G1/4	**1827000001**
	Silencer G3/8 for base plate	**1827000002**
	Coupling kit (2 screws, 3 base plate gaskets) for mounting on a base plate	**5610140302**
	Base plate, 1x, flat, D12	**R414002184**
	Base plate, 1x*	**5610141002**
	Base plate, 2x*	**5610141012**
	Base plate, 3x*	**5610141022**
	Base plate, 4x*	**R414000105**
	Base plate, 5x*	**R414000106**
	Base plate, 6x*	**5610141052**
	Base plate, 7x*	**R414000908**
	Base plate, 8x*	**5610141072**
	Base plate, 9x*	**R414000910**
	Base plate, 10x*	**5610141092**

* incl. the appropriate number of mounting kits

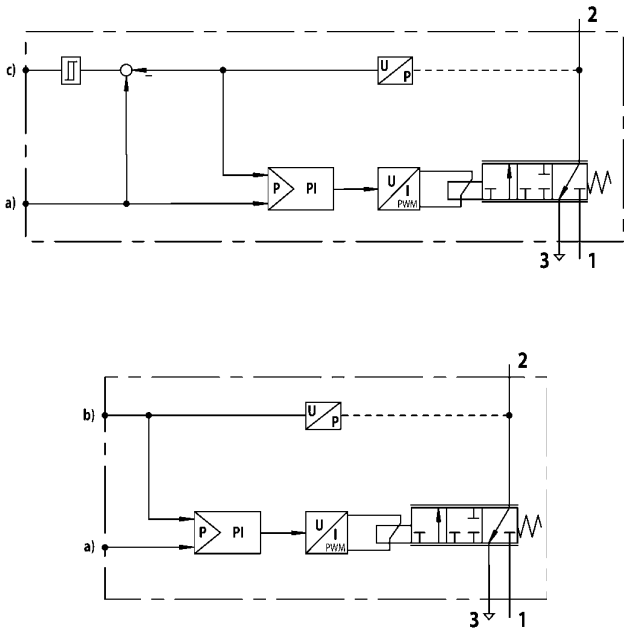
For standard Rexroth 12mm connection cable pin-out, see page 4.

Drawing



1) Core hole 15 deep for automatic ridge screws M6
2) Universal threaded connection, suitable for G1/4 to ISO 228/1 and 1/4-27 NPTF
3) Through hole
Fitting position: Alpha = 0 ... 90°
± Beta = 0 ... 90°
G ports are to ISO 1179-1 with ISO 228-1 threads.

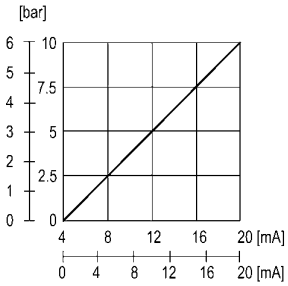
Functional diagram

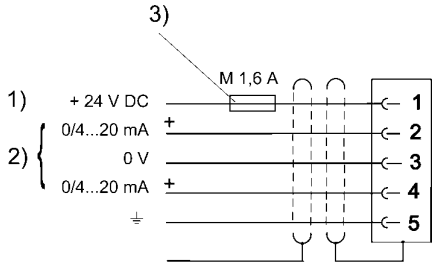


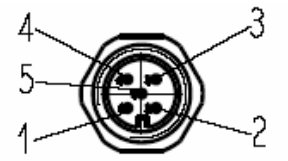
a) Nominal input value b) Actual output value

The E/P pressure control valve modulates the pressure corresponding to an analogue electrical nominal input value. The integrated electronics make a comparison between the nominal input value and the pressure in the output line (actual value), which is measured by a piezo-resistive pressure sensor. The controller generates a setting, which is controlled by a voltage/current converter and a proportional solenoid, in order to obtain the required pressure.

Characteristic and pin assignment for current control with actual output value (R414002003, R414002004, R414002007, R414002008)



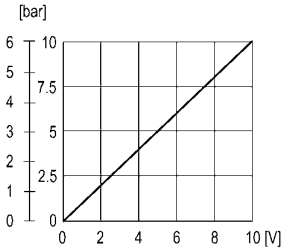


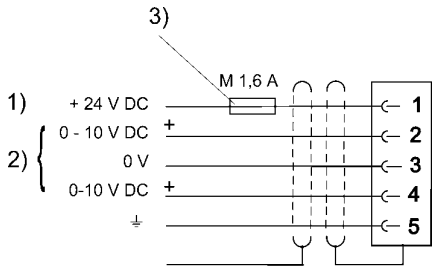


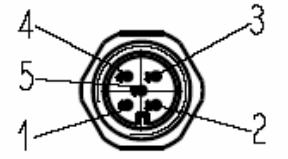
1 = +24VDC
2 = Command signal (voltage or current)
3 = 0VDC
4 = Actual value (feedback, voltage or curr.)
5 = Earth ground

1) Supply voltage
2) Actual value (Pin 4) and nominal value (Pin 2) are related to 0 V. Nominal input value current (Ohmic load 100 Ω). Actual output value (Max. total resistance of downstream devices < 300 Ω).
3) The supply voltage must be protected by an external M 1,6 A fuse.
Shielding must comply with local limiting conditions. In extreme cases the power supply must also be shielded.

Characteristic and pin assignment for voltage control with actual output value (R414002005, R414002009)



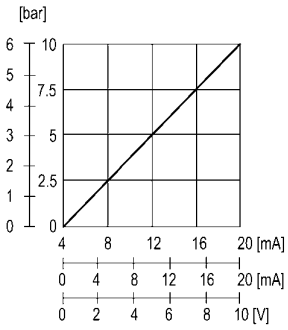


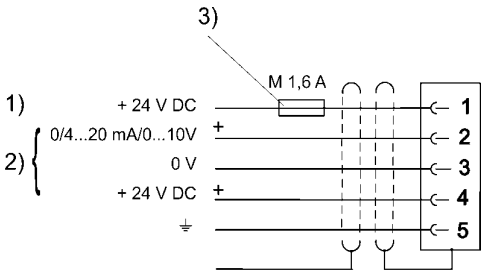


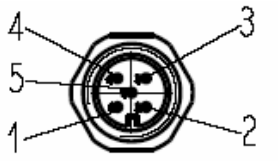
1 = +24VDC
2 = Command signal (voltage or current)
3 = 0VDC
4 = Actual value (feedback, voltage or curr.)
5 = Earth ground

1) Supply voltage
2) Actual value (Pin 4) and nominal value (Pin 2) are related to 0 V. Min load resistance = 1 kΩ
3) The supply voltage must be protected by an external M 1,6 A fuse.
Shielding must comply with local limiting conditions. In extreme cases the power supply must also be shielded.

Characteristic and pin assignment for current and voltage control with actual output value (R414002006, R414002010, R414002294, R414002296, R414002295, R414002297)







1 = +24VDC
2 = Command signal (voltage or current)
3 = 0VDC
4 = 24VDC acknowledge
5 = Earth ground

1) Supply voltage
2) Nominal value (Pin 2) and switch output (Pin 4) are related to 0 V. Acknowledge signal
3) The supply voltage must be protected by an external M 1,6 A fuse.

E/P Pressure control valves

E/P Pressure control valve, Series ED05
Proportional solenoid, VDS link

Rexroth
Bosch Group

Technical Data

Type		Poppet valve
Supply pressure	max.	11 bar (160psi)
Output pressure		see table
Hysteresis		< 0,06 bar (<1 psi)
Nominal flow rate at supply pressure = 7 bar (102 psi), at output pressure = 6 bar (87 psi), and pressure drop Δp = 0,2 bar (3 psi)	Q_n	1000 l/min (35.3 SCFM)
Ambient temperature range	min./max.	0 °C / +70 °C (+32 °F / +158 °F)
Medium		Condensate-free and non-lubricated compressed air, filtered 50 µm
Weight		1,1 kg (2.425 lbs)
Materials	Body	Zn-diecasting, Al, POM, chromated steel
	Seals	NBR (Nitrile Botadien Rubber)
Supply voltage		24 V DC ± 20 %
Permissible ripple		5 %
Current consumption		1,3 A
Resolution		10 bit (0.1 bar (1 psi) - 1 bit)
Length code		16 bit input and output
Protection with plug		IP 55 to IEC 529 (DIN VDE 0470) IP 65 (NEMA 4)optional
Installation position		optional, if condensate-free and non lubricated compressed air is guaranteed, otherwise see drawing

Application area

Electro-pneumatic pressure control valves convert an electrical signal (current, voltage, resistance) proportionally into pneumatic pressure. They are used where electrical control is required to act directly on a change of pressure or force.

Part no.

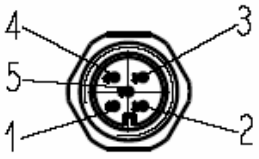
	Supply pressure min./max. [bar] (psi)	Output pressure min./max. [bar] (psi)	Part no.	Manual no.
	10 / 12 (145 / 172)	0 / 10 (0 / 145)	**5610141540**	**8858903883**

Accessories (to be ordered separately)

Accessory	Part no.	Type
Silencer G1/4	**1827000001**	
Subbase single	**5610141002**	incl. screws and sealings
Subbase double	**5610141012**	incl. screws and sealings
Subbase triple	**5610141022**	incl. screws and sealings
Connection cable 300 mm (1.0 ft.)	**8946202852**	VDS
Connection cable 500 mm (1.6 ft.)	**8946202802**	VDS
Connection cable 1000 mm (3.3 ft.)	**8946202812**	VDS
Connection cable 2000 mm (6.6 ft.)	**8946202822**	VDS
Connection cable 5000 mm (16.4 ft.)	**8946202832**	VDS
Connection cable 10000 mm (32.8 ft.)	**8946202842**	VDS
Connection MiniDin - M12 1000 mm (3.3 ft.)	**5460424342**	VDS
Plug 24 V, M12 4-pole female	**8941054324**	straight
Plug 24 V, M12 4-pole female	**8941054424**	angled

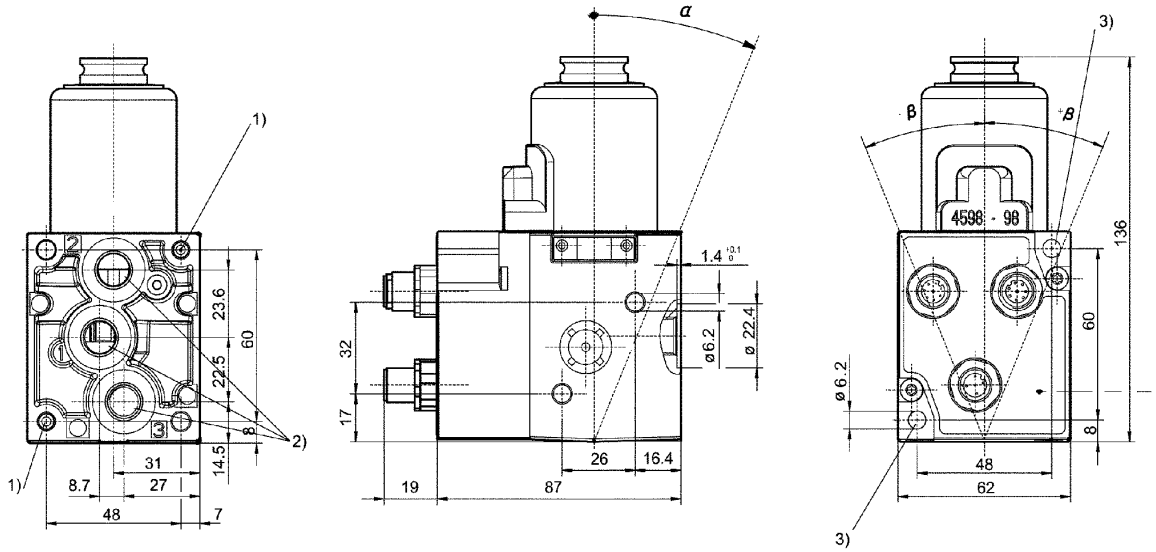
For bus modules and cables see bus sections of this chapter

1 = Brown
2 = White
3 = Blue
4 = Black
5 = Grey



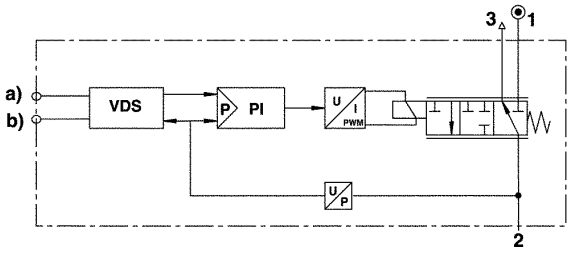
Standard Rexroth 12mm connection cable pin-out

Drawing



1) Core hole 15 deep for automatic ridge screws M6
2) Universal threaded connection, suitable for G1/4 to ISO 228/1 and 1/4-27 NPTF
3) Through hole
Fitting position: Alpha = 0 ... 90°
± Beta = 0 ... 90°
G ports are to ISO 1179-1 with ISO 228-1 threads.

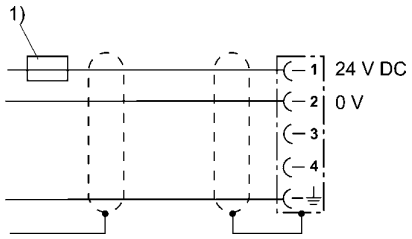
Functional diagram



a) Nominal input value. b) Actual output value.

The VDS E/P pressure control valve modulates the pressure corresponding to a digital electrical nominal input value (10 bit). The integrated electronics make a comparison between the nominal input value and the pressure in the output line (actual value), which is measured by a piezo-resistive pressure sensor. The controller generates a setting, which is controlled by a voltage/current converter and a proportional solenoid, in order to obtain the required pressure.

Pin assignment for power supply



1) The supply voltage must be protected by an external M 2,5 A safety use.

Pin assignment VDS

With the connectors for VDS the controller is connected to the fieldbus module, respectively with more devices on the VDS
In the accessories is a list with the available cables.
VDS- and DDL-devices can not be used together.

Data format

Nominal input / Actual output value
The controller has a resolution of 10 bit (bit 0 ... 9, bit 0 is LSB, least significant bit) for the serial nominal input value and the serial actual value. The range for the 10 bar (145 psi) device is 0 - 1000 (03E8 hex) with a resolution of 10 mbar.
The minimum for the command value is 0,030 bar (0.44 psi).

Testbit
With the testbit (bit 15, MSB, most significant bit) the master can check the data transfer from the master to slave and back. If the master sets/resets this bit in the nominal input value, the slave will set/reset this bit in the actual value.

E/P Pressure control valves

E/P Pressure control valve, Series ED05
Proportional solenoid, DDL link

Rexroth
Bosch Group

★

Technical Data

Type		Poppet valve
Supply pressure	max.	11 bar (160psi)
Output pressure		see table
Hysteresis		< 0,06 bar (<1 psi)
Nominal flow rate	Q_n	1000 l/min (35.3 SCFM)
at supply pressure = 7 bar (102 psi)		
output pressure = 6 bar (87 psi)		
and Δp = 0,2 bar (3 psi)		
Ambient		
temperature range	min./max.	0 °C / +70 °C (+32 °F / +158 °F)
Medium		Condensate-free and non-lubricated compressed air, filtered 50 µm
Weight		1,1 kg (2.425 lbs)
Materials	Body	Zn-diecasting, Al, POM, chromated steel (POM-Polyoxymethylene)
	Seals	NBR (Nitrile Botadiene Rubber)
Supply voltage		24 V DC ± 20 %
Permissible ripple		5 %
Resolution		10 bit (0.1 bar (1 psi) - 1 bit)
Length code		16 bit input and output
Protection with plug		IP 55 to IEC 529 (DIN VDE 0470) IP 65 (NEMA 4)optional
Installation position		optional, if condensate-free and non lubricated compressed air is guaranteed, otherwise see drawing

Application area

Electro-pneumatic pressure control valves convert an electrical signal (current, voltage, resistance) proportionally into pneumatic pressure. They are used where electrical control is required to act directly on a change of pressure or force.

Part no.

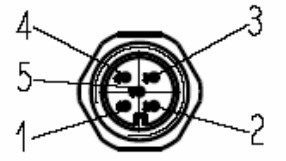
	Supply pressure min./max. [bar] (psi)	Output pressure min./max. [bar] (psi)	Part no.	Manual no.
	10 / 11 (145 / 160)	0 / 10 (0 / 145)	**5610141550**	**8858904323**

Accessories (to be ordered separately)

Accessory	Part no.	Type
Silencer G1/4	**1827000001**	
Subbase single	**5610141002**	incl. screws and sealings
Subbase double	**5610141012**	incl. screws and sealings
Subbase triple	**5610141022**	incl. screws and sealings
Connection cable 300 mm (1.0 ft.)	**8946054662**	DDL
Connection cable 500 mm (1.6 ft.)	**8946054672**	DDL
Connection cable 1000 mm (3.3 ft.)	**8946054682**	DDL
Connection cable 2000 mm (6.6 ft.)	**8946054692**	DDL
Connection cable 5000 mm (16.4 ft.)	**8946054702**	DDL
Connection cable 10000 mm (32.8 ft.)	**8946054712**	DDL
Plug 24 V, M12 4-pole female	**8941054324**	straight
Plug 24 V, M12 4-pole female	**8941054424**	angled

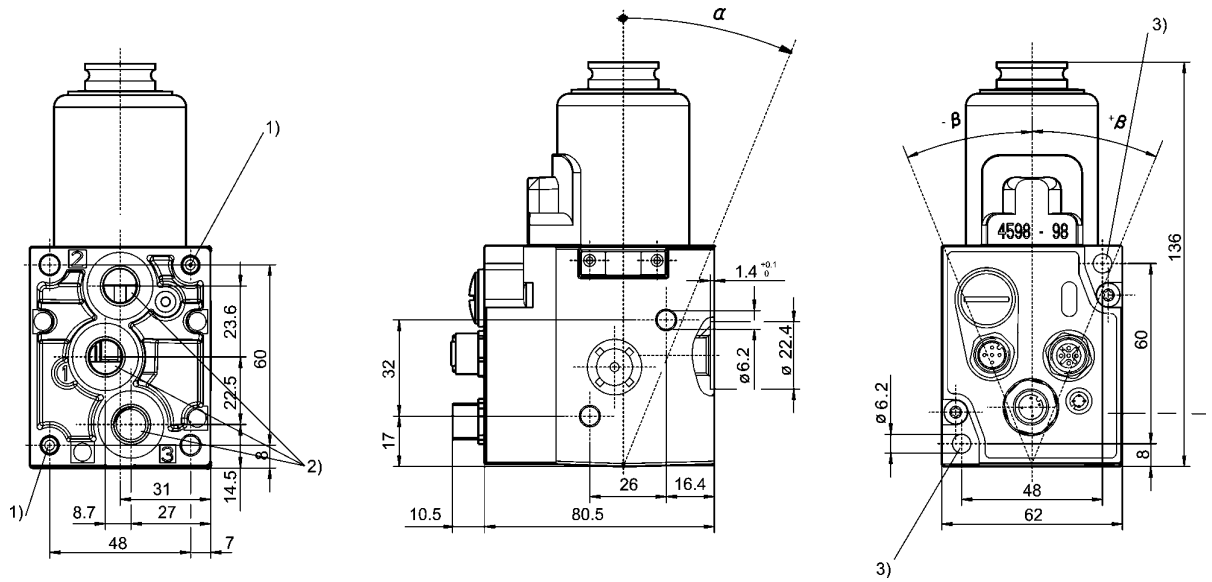
For bus modules and cables see bus section of this chapter

1 = Brown
2 = White
3 = Blue
4 = Black
5 = Grey



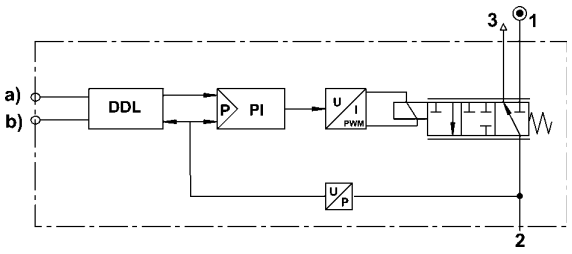
Standard Rexroth 12mm connection cable pin-out

Drawing



1) Core hole 15 deep for automatic ridge screws M6
2) Universal threaded connection, suitable for G1/4 to ISO 228/1 and 1/4-27 NPTF
3) Through hole
Fitting position: Alpha = 0 ... 90°
± Beta = 0 ... 90°
G ports are to ISO 1179-1 with ISO 228-1 threads.

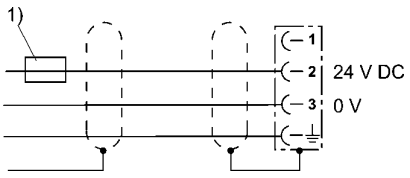
Functional diagram



a) Nominal input value. b) Actual output value.

The DDL E/P pressure control valve modulates the pressure corresponding to a digital electrical nominal input value (10 bit). The integrated electronics make a comparison between the nominal input value and the pressure in the output line (actual value), which is measured by a piezo-resistive pressure sensor. The controller generates a setting, which is controlled by a voltage/current converter and a proportional solenoid, in order to obtain the required pressure.

Pin assignment for power supply



1) The supply voltage must be protected by an external M 1,6 A safety use.

Pin assignment DDL

With the connectors for DDL the controller is connected to the fieldbus module, respectively with more devices on the DDL.
In the accessories is a list with the available cables.
VDS- and DDL-devices can not be used together.

Data format

Nominal input / Actual output value
The controller has a resolution of 10 bit (bit 0 ... 9, bit 0 is LSB, least significant bit) for the serial nominal input value and the serial actual value. The range for the 10 bar (145 psi) device is 0 - 1000 (03E8 hex) with a resolution of 10 mbar.
The minimum for the command value is 0,03 bar (0.44 psi).

Testbit
With the testbit (bit 15, MSB, most significant bit) the master can check the data transfer from the master to slave and back. If the master sets/resets this bit in the nominal input value, the slave will set/reset this bit in the actual value.

E/P Pressure control valves

E/P Pressure control valve, Series ED07
with proportional solenoid, analog control, 5-pin threaded connector, 1 x M12

Rexroth
Bosch Group

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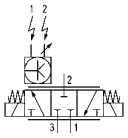
Technical Data

Type		Poppet valve
Supply pressure		see table
Output pressure		see table
Hysteresis		< 0,03 bar (<0.44 psi)
Nominal flow rate at supply pressure = 7 bar (102 psi), at output pressure = 6 bar (87 psi), and pressure drop Δp = 0.2 bar (3 psi)	Q_n	1300 l/min (45.9 SCFM)
Ambient temperature range	min./max.	-5 °C / +50 °C (+23 °F / +122 °F)
Medium		Condensate-free and non-lubricated compressed air, filtered 50 µm
Weight		2.05 kg (4.52 lbs.)
Materials	Body	Zn-diecasting, Al, POM, chromated steel
	Seals	HNBR (Nitrile Botadien Rubber)
Supply voltage		24 V DC -20% +30%
Permissible ripple		5%
Current consumption		1,4 A
Protection with plug		IP 65 - IEC 60529 (DIN VDE 0470-1) (NEMA 4)
Installation position		optional, (Housing ventilation port must remain open)

Application area

Electro-pneumatic pressure control valves convert an electrical signal (current, voltage, resistance) proportionally into pneumatic pressure. They are used where electrical control is required to act directly on a change of pressure or force.

Part no.

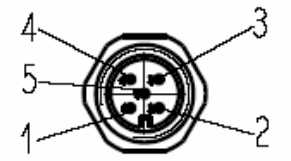
	Supply pressure min./max. [bar] (psi)	Output pressure min./max. [bar] (psi)	Nominal input value	Actual output value	Part no.
	1 / 3 (15 / 44)	-1 / 1 (-15 /15)	0 - 20 mA	0 - 20 mA	**R414000686**
	6 / 8 (87 / 116)	0 / 6 (0 / 87)	0 - 20 mA	0 - 20 mA	**R414000690**
			4 - 20 mA	4 - 20 mA	**R414000691**
	10 / 12 (145 / 174)	0 / 10 (0 / 145)	0 - 20 mA	0 - 20 mA	**R414000700**
			4 - 20 mA	4 - 20 mA	**R414000701**
	20 / 21 (290 / 305)	0 / 20 (0 / 290)	0 - 20 mA	0 - 20 mA	**R414000785**
			4 - 20 mA	4 - 20 mA	**R414000786**

Accessories (to be ordered separately)

	Accessory	Note	Part no.
	Plug connection, 5-pin threaded connector, M12x1		**1824484029**
	ED07 subbase with D12 plug cartridge and silencer	can be installed in the ISO1 size	**5610231002**
	Sheet metal to mount the ED07 subbase flat (5610231002)		**5530010522**
	Single Subbase ED07		**5610211052**
	Intermediate (stacking) base ED07		**8985049932**
	End plate kit for intermediate base ED07		**R434002771**
	Coupling kit (4 screws, 1 base plate gasket)		**R414001681**
	Silencer for subbase and sandwich base ED07		**1827000002**

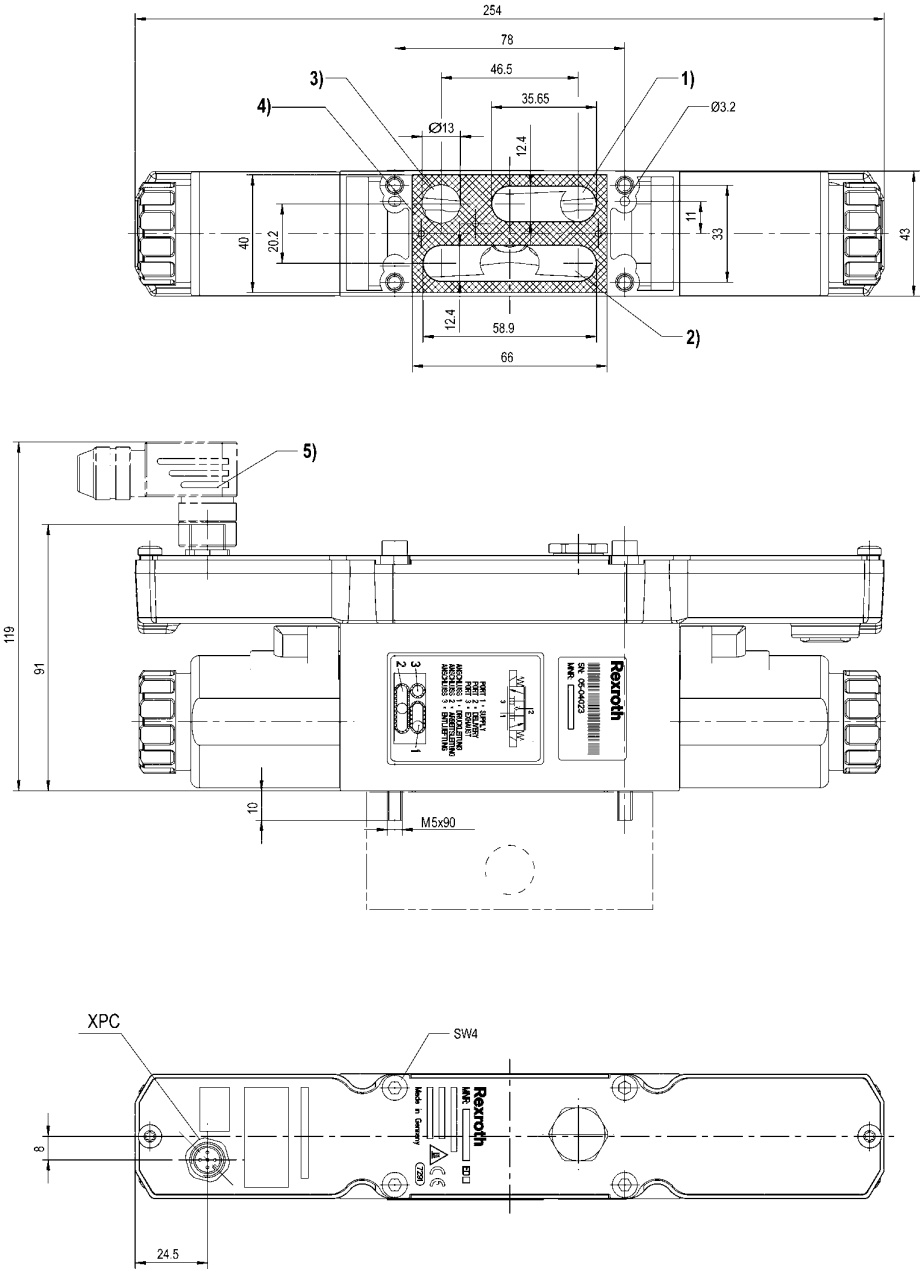
Note: For ED07 pressure regulators with a pressure range of 16/20, only use the ED07 subbase (material no. 5610211052).

1 = Brown
2 = White
3 = Blue
4 = Black
5 = Grey



Standard Rexroth 12mm connection cable pin-out

Drawing



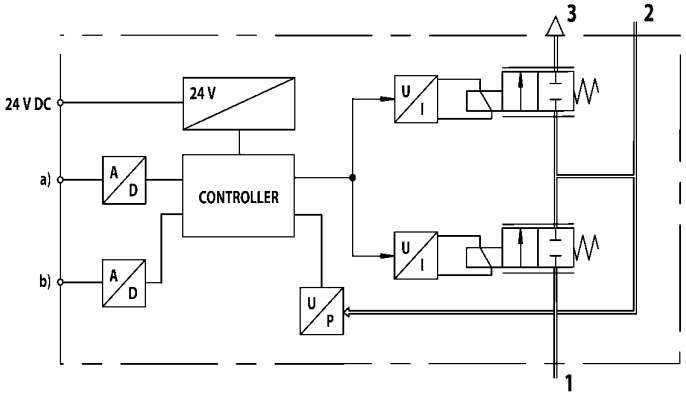
1) Supply
2) Delivery
3) Exhaust
4) Gasket
5) Accessory not supplied

E/P Pressure control valves

E/P Pressure control valve, Series ED07
with proportional solenoid, analog control, 5-pin threaded connector, 1 x M12

Rexroth
Bosch Group

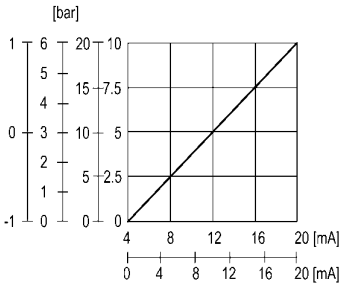
Functional diagram

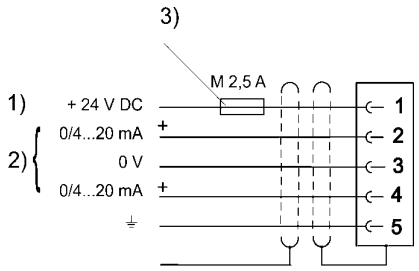


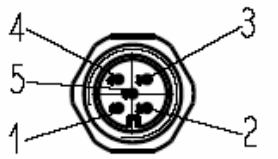
a) Nominal input value b) Actual output value

The E/P pressure control valve modulates the pressure corresponding to an analogue electrical nominal input value. The integrated electronics make a comparison between the nominal input value and the pressure in the output line (actual value), which is measured by a piezo-resistive pressure sensor. The controller generates an output positioning signal which controls via PWM voltage/current converter and proportional solenoid either the charging or bleeding proportional valve, in order to obtain the required pressure in the output line.

Characteristic and pin assignment for current control with actual output value (R414000686, R414000690, R414000691, R414000700, R414000701, R414000785, R414000786)







1 = +24VDC
2 = Command signal (voltage or current)
3 = 0VDC
4 = Actual value (feedback, voltage or curr.)
5 = Earth ground

1) Supply voltage
2) Actual value (Pin 4) and nominal value (Pin 2) are related to 0V. Nominal input value current (Ohmic load 100 Ω). Actual output value (Max. total resistance of downstream devices < 300 Ω).
3) The supply voltage must be protected by an external M 2,5 A fuse.
Shielding must comply with local limiting conditions. In extreme cases the power supply must also be shielded.

E/P Pressure control valves

E/P Pressure control valve, Series ED07
with proportional solenoid, analog control, 5-pin threaded connector, 2 x M12

Rexroth
Bosch Group

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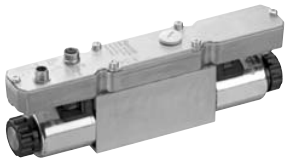
Technical Data

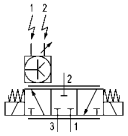
Type		Poppet valve
Supply pressure		see table
Output pressure		see table
Hysteresis		< 0,03 bar (0.44 psi)
Nominal flow rate at supply pressure = 7 bar (102 psi), at output pressure = 6 bar (87 psi), and pressure drop Δp = 0.2 bar (3 psi)	Q_n	1300 l/min (45.9 SCFM)
Ambient temperature range	min./max.	-5 °C / +50 °C (+23 °F / +122 °F)
Medium		Condensate-free and non-lubricated compressed air, filtered 50 µm
Weight		2.05 kg (4.52 lbs.)
Materials	Body	Zn-diecasting, Al, POM, chromated steel
	Seals	HNBR (Nitrile Botadien Rubber)
Supply voltage		24 V DC -20% +30%
Permissible ripple		5%
Current consumption		1,4 A
Protection with plug		IP 65 - IEC 60529 (DIN VDE 0470-1) (NEMA 4)
Installation position		optional, (Housing ventilation port must remain open) see drawing



Application area

Electro-pneumatic pressure control valves convert an electrical signal (current, voltage, resistance) proportionally into pneumatic pressure. They are used where electrical control is required to act directly on a change of pressure or force.

Part no.



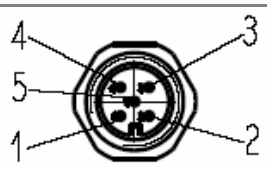
Supply pressure min./max. [bar] (psi)	Output pressure min./max. [bar] (psi)	Nominal input value	Actual output value	Part no.
6 / 8 (87 /116)	0 / 6 (0 / 87)	0 - 20 mA	0 - 20 mA	**5610264800**
		4 - 20 mA	4 - 20 mA	**5610264810**
		0 - 10 V	–	**5610264820**
		0 - 10 V	0 - 10 V	**5610264830**
10 / 12 (145 /174)	0 / 10 (0 / 145)	0 - 20 mA	0 - 20 mA	**5610264500**
		4 - 20 mA	4 - 20 mA	**5610264510**
		0 - 10 V	–	**5610264520**
		0 - 10 V	0 - 10 V	**5610264530**
20 / 21 (290 / 305)	0 / 20 (0 / 290)	0 - 20 mA	0 - 20 mA	**5610264200**
		4 - 20 mA	4 - 20 mA	**5610264210**
		0 - 10 V	–	**5610264220**
		0 - 10 V	0 - 10 V	**5610264230**

Accessories (to be ordered separately)

Accessory	Note	Part no.
Plug connection, 5-pin threaded connector, M12x1 to connect X2M		**1824484028**
Plug connection, 5-pin threaded connector, M12x1 to connect X1S		**1824484029**
ED07 subbase with D12 plug cartridge and silencer	can be installed in the ISO1 size	**5610231002**
Sheet metal to mount the ED07 subbase flat (5610231002)		**5530010522**
Single Subbase ED07		**5610211052**
Intermediate (stacking) base ED07		**8985049932**
End plate kit for intermediate base ED07		**R434002771**
Silencer for subbase and sandwich base ED07		**1827000002**
Coupling kit (4 screws, 1 base plate gasket)		**R414001681**

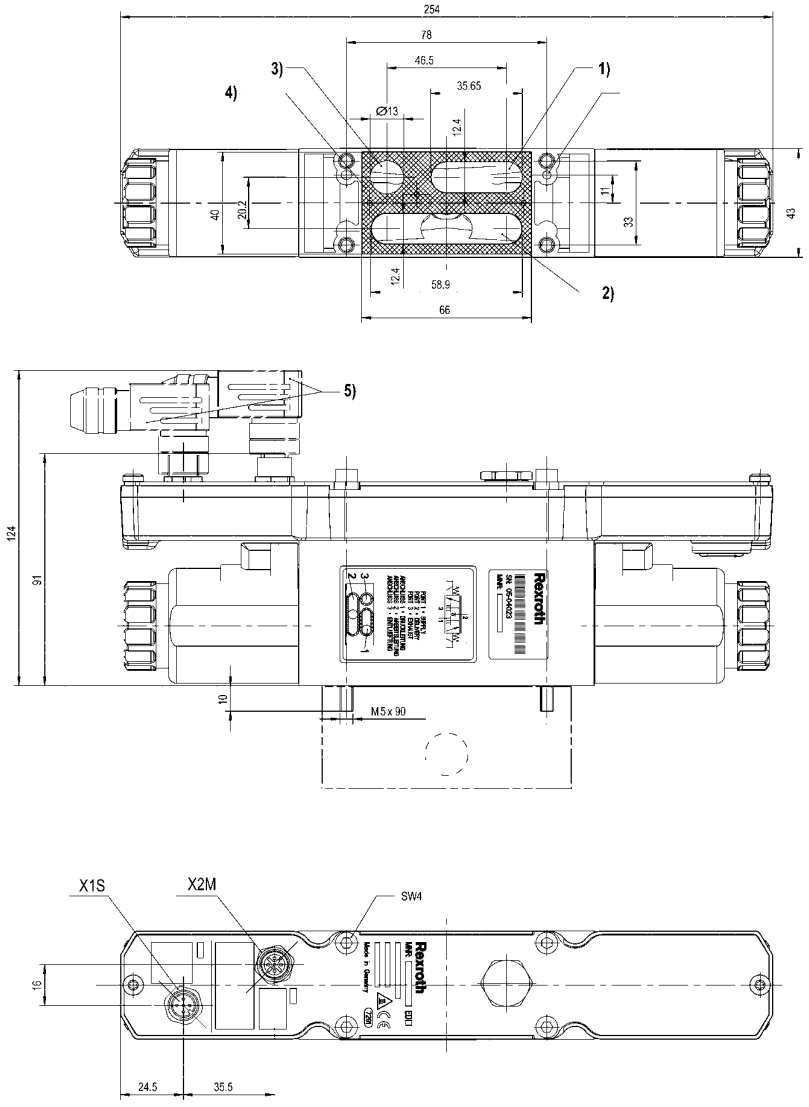
Note: For ED07 pressure regulators with a pressure range of 16/20, only use the ED07 subbase (material no. 5610211052).

1 = Brown
2 = White
3 = Blue
4 = Black
5 = Grey



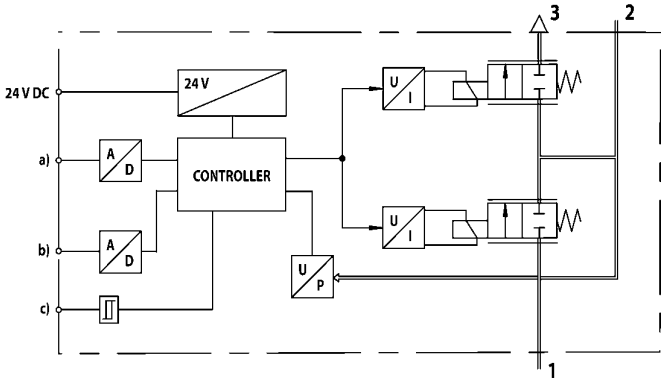
Standard Rexroth 12mm connection cable pin-out

Drawing



1) Supply
2) Delivery
3) Exhaust
4) Gasket
5) Accessory not supplied

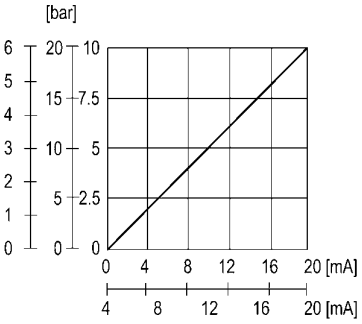
Functional diagram

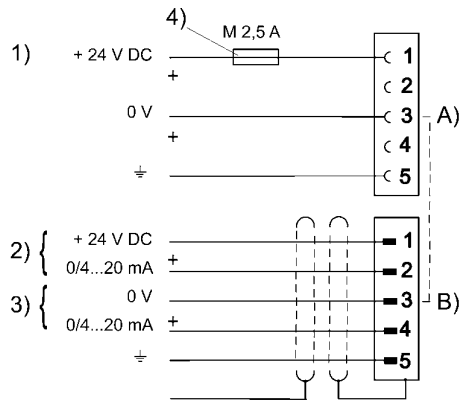


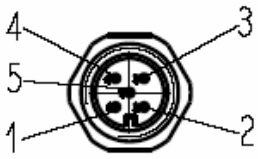
a) Nominal input value b) Actual output value c) Switch output (Acknowledge signal)

The E/P pressure control valve modulates the pressure corresponding to an analogue electrical nominal input value. The integrated electronics make a comparison between the nominal input value and the pressure in the output line (actual value), which is measured by a piezo-resistive pressure sensor. The controller generates an output positioning signal which controls via PWM voltage/current converter and proportional solenoid either the charging or bleeding proportional valve, in order to obtain the required pressure in the output line.

Characteristic and pin assignment for current control with actual output value (5610264800, 5610264810, 5610264500, 5610264510, 5610264200, 5610264210)





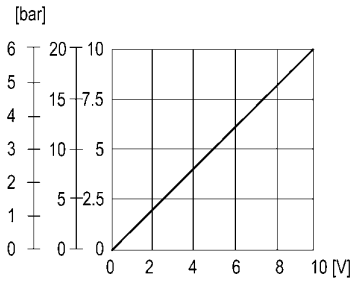


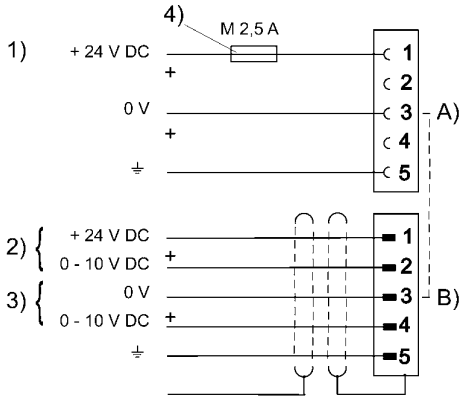
1 = +24VDC
2 = Command signal (voltage or current)
3 = 0VDC
4 = Actual value (feedback, voltage or curr.)
5 = Earth ground

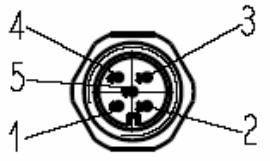
1) Supply voltage
2) Switch output (Pin 1) and nominal value (Pin 2) are related to 0 V. Nominal input value current (Ohmic load 100 Ω). Actual output value (Max. total resistance of downstream devices <300Ω)
3) Actual value (Pin 4) is related to 0V. Current control (ohmic load 100 Ω).
4) The supply voltage must be protected by an external M 2,5 A fuse. Shielding must comply with local limiting conditions. In extreme cases the power supply must also be shielded.

A) Plug X1S B) Plug X2M

Characteristic and pin assignment for voltage control with actual output value (5610264830, 5610264530, 5610264230)





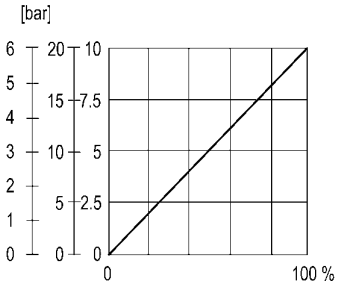


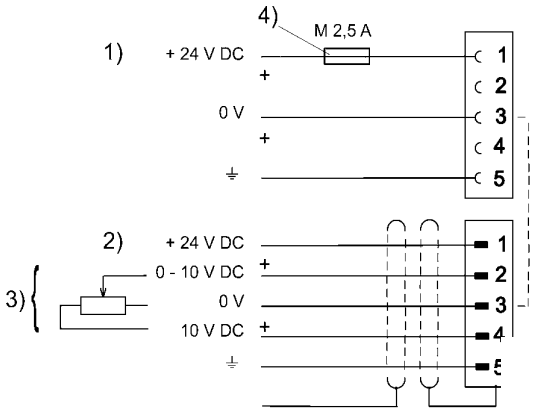
1 = +24VDC
2 = Command signal (voltage or current)
3 = 0VDC
4 = Actual value (feedback, voltage or curr.)
5 = Earth ground

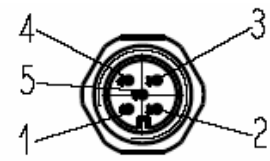
1) Supply voltage
2) Switch output (Pin 1) and nominal value (Pin 2) are related to 0 V
3) Actual value (Pin 4) is related to 0 V (min. load resistance 1 kΩ)
4) The supply voltage must be protected by an external M 2,5 A fuse. Shielding must comply with local limiting conditions. In extreme cases the power supply must also be shielded.

A) Plug X1S B) Plug X2M

Characteristic and pin assignment for potentiometer control without actual output value (5610264820, 5610264520, 5610264220)







1 = +24VDC
2 = Command signal (voltage or current)
3 = 0VDC
4 = 10VDC constant for pot control
5 = Earth ground

1) Supply voltage
2) Switch output (Pin 1) and nominal value (Pin 2) are related to 0 V.
3) Potentiometer-control (min. 0-2 kΩ, max. 0-10 kΩ)
4) The supply voltage must be protected by an external M 2,5 A fuse. Shielding must comply with local limiting conditions. In extreme cases the power supply must also be shielded.

A) Plug X1S B) Plug X2M

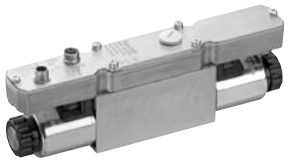
E/P Pressure control valves

E/P Pressure control valve, Series ED07
with proportional solenoid, DDL link, 5-pin threaded connector, 2 x M12

Rexroth
Bosch Group

.78 Technical Data

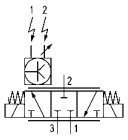
Type		Poppet valve
Supply pressure		see table
Output pressure		see table
Hysteresis		< 0,03 bar (0.44 psi)
Nominal flow rate at supply pressure = 7 bar (102 psi), at output pressure = 6 bar (87 psi), and pressure drop Δp = 0.2 bar (3 psi)	Q_n	1300 l/min (45.9 SCFM)
Ambient temperature range	min./max.	-5 °C / +50 °C (+23 °F / +122 °F)
Medium		Condensate-free and non-lubricated compressed air, filtered 50 µm
Weight		2.05 kg (4.52 lbs.)
Materials	Body	Zn-diecasting, Al, POM, chromated steel
	Seals	HNBR (Nitrile Botadien Rubber)
Supply voltage		24 V DC -20% +30%
Permissible ripple		5%
Current consumption		1,4 A
Protection with plug		IP 65 - IEC 60529 (DIN VDE 0470-1)(NEMA 4)
Installation position		optional, (Housing ventilation port must remain open) see drawing



Application area

Electro-pneumatic pressure control valves convert an electrical signal (current, voltage, resistance) proportionally into pneumatic pressure. They are used where electrical control is required to act directly on a change of pressure or force.

Part no.

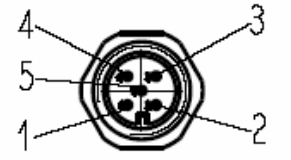
	Supply pressure min./max. [bar] (psi)	Output pressure min./max. [bar] (psi)	Nominal input value	Actual output value	Part no.
	10 / 12 (145 / 174)	0 / 10 (0 / 145)	DDL	DDL	**R414001600**
	20 / 21 (290 /305)	0 / 20 (0 / 290)	DDL	DDL	**R414001748**

Accessories (to be ordered separately)

	Accessory	Note	Part no.
	Plug connection, 5-pin threaded connector, M12x1 to connect X1S		**1824484029**
	Cable DDL, 0,3 m (1.0 ft.)		**8946054662**
	Cable DDL, 0,5 m (1.6 ft.)		**8946054672**
	Cable DDL, 1 m (3.8 ft.)		**8946054682**
	Cable DDL, 2 m (6.6 ft.)		**8946054692**
	Cable DDL, 5 m (16.4 ft.)		**8946054702**
	Cable DDL, 10 m (32.8 ft.)		**8946054712**
	ED07 subbase with D12 plug cartridge and silencer		**5610231002**
	Sheet metal to mount the ED07 subbase flat (5610231002)		**5530010522**
	Single subbase ED07		**5610211052**
	Intermediate (stacking) base ED07	can be installed in the ISO1 size	**8980549932**
	End plate kit for intermediate base ED07		**R434002771**
	Coupling kit (4 screws, 1 base plate gasket)		**R414001681**
	Silencer for subbase and intermediate base		**1827000002**

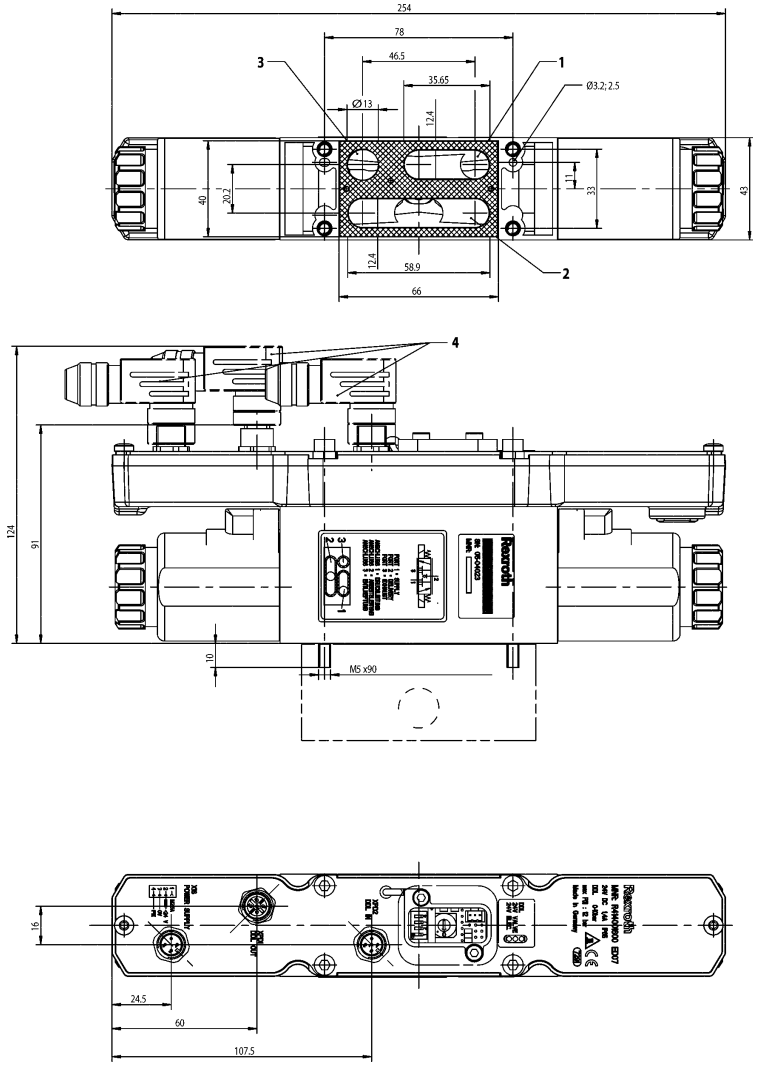
Note: For ED07 pressure regulators with a pressure range of 16/20, only use the ED07 subbase (material no. 5610211052).

1 = Brown
2 = White
3 = Blue
4 = Black
5 = Grey



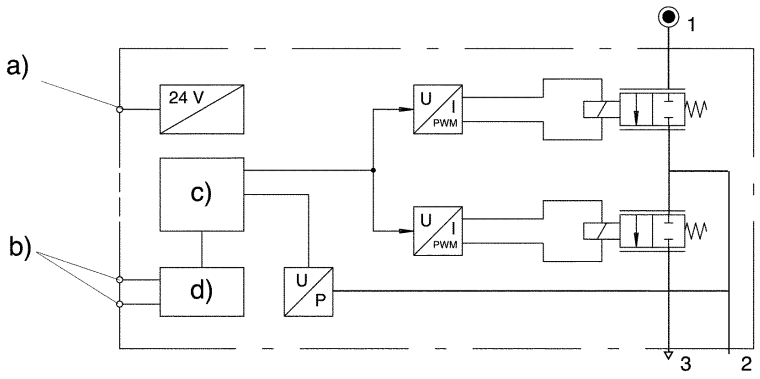
Standard Rexroth 12mm connection cable pin-out

Drawing



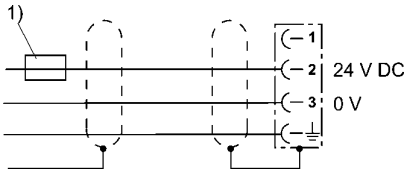
1) Supply
2) Delivery
3) Exhaust
4) Gasket
5) Accessory not supplied

Functional diagram



a) Supply voltage b) Interface Data c) Controller d) DDL
The integrated electronics make a comparison between the nominal input value and the pressure in the output line (actual value), which is measured by a piezo-resistive pressure sensor. The controller generates a signal, which controls a proportional solenoid by means of a voltage/current converter, either charging or bleeding the proportional valve in order to obtain the required pressure.

Pin assignment for power supply



1) The supply voltage must be protected by an external M 2,5 A safety fuse.

Pin assignment DDL

With the connectors for DDL the controller is connected to the fieldbus module, respectively with more devices on the DDL.
In the accessories is a list with the available cables.
VDS and DDL devices can not be used together.

Data format

Nominal input / Actual output value
The controller has a resolution of 10 bit (bit 0 ... 9, bit 0 is LSB, least significant bit) for the serial nominal input value and the serial actual output value. The range for the 10 bar device is 0 - 1000 (03E8 hex) with a resolution of 0.10 bar (1 psi)
The minimum for the nominal input value is 0,030 bar (0.44 psi).

Testbit
With the testbit (bit 15, MSB, most significant bit) the master can check the data transfer from the master to slave and back. If the master sets/resets this bit in the nominal input value, the slave will set/reset this bit in the actual output value.

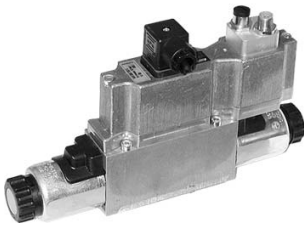
E/P Pressure control valves

E/P Pressure control valve, Series ED07
Proportional solenoid, VDS link

Rexroth
Bosch Group

Technical Data

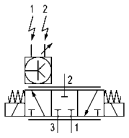
Type		Poppet valve
Supply pressure	max.	see table
Output pressure		see table
Hysteresis		0,03 bar (0.44 psi)
Repeatability		0,01 bar (0.15 psi)
Nominal flow rate	Q_n	1300 l/min (45.9 SCFM)
at supply pressure = 7 bar (102 psi) and output pressure = 6 bar (87 psi) pressure drop Δp = 0,2 bar (3 psi)		
Ambient temperature range	min./max.	0 °C / +50 °C (+32 °F / +122 °F)
Medium		Condensate-free and non-lubricated compressed air, filtered 50 µm
Weight		2,1 kg (4.630 lbs)
Materials	Body	Al, chromium steel
	Seals	NBR (Nitrile Botadiene Rubber)
Supply voltage		24 V DC ± 20%
Permissible ripple		5 %
Power consumption		1,4 A
Protection with plug		IP 55 -IEC 529 (DIN VDE 0470)
Resolution		10 bit (0.1 bar (1 psi) - 1 bit)
Length code		16 bit input and output



Application area

Electro-pneumatic pressure control valves convert an electrical signal (current, voltage, resistance) proportionally into pneumatic pressure. They are used where electrical control is required to act directly on a change of pressure or force.

Part no.

	Supply pressure [bar] (psi)	Output pressure min./max. [bar](psi)	Serial link type	Part no.	Manual no.
	12 (174)	0 / 10 (0 / 145)	VDS	**5610219000**	**8858903163**

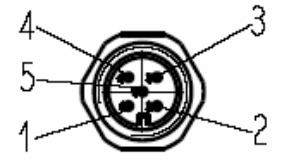
Accessories (to be ordered separately)

Type	Part no.	
Single subplate	**5610211052**	
Intermediate (stacking)plate	**8985049932**	**c**an be built into size ISO 1
Connection cable 300 mm (1.0 ft.)	**8946202852**	
Connection cable 500 mm (1.6 ft.)	**8946202802**	
Connection cable 1000 mm (3.3 ft.)	**8946202812**	
Connection cable 2000 mm (6.6 ft.)	**8946202822**	
Connection cable 5000 mm (16.4 ft.)	**8946202832**	
Connection cable 10000 mm (32.8 ft.)	**8946202842**	
Connection MiniDin - M12 1000 mm (3.3 ft.)	**5460424342**	

For bus modules and cables see bus sections of this chapter

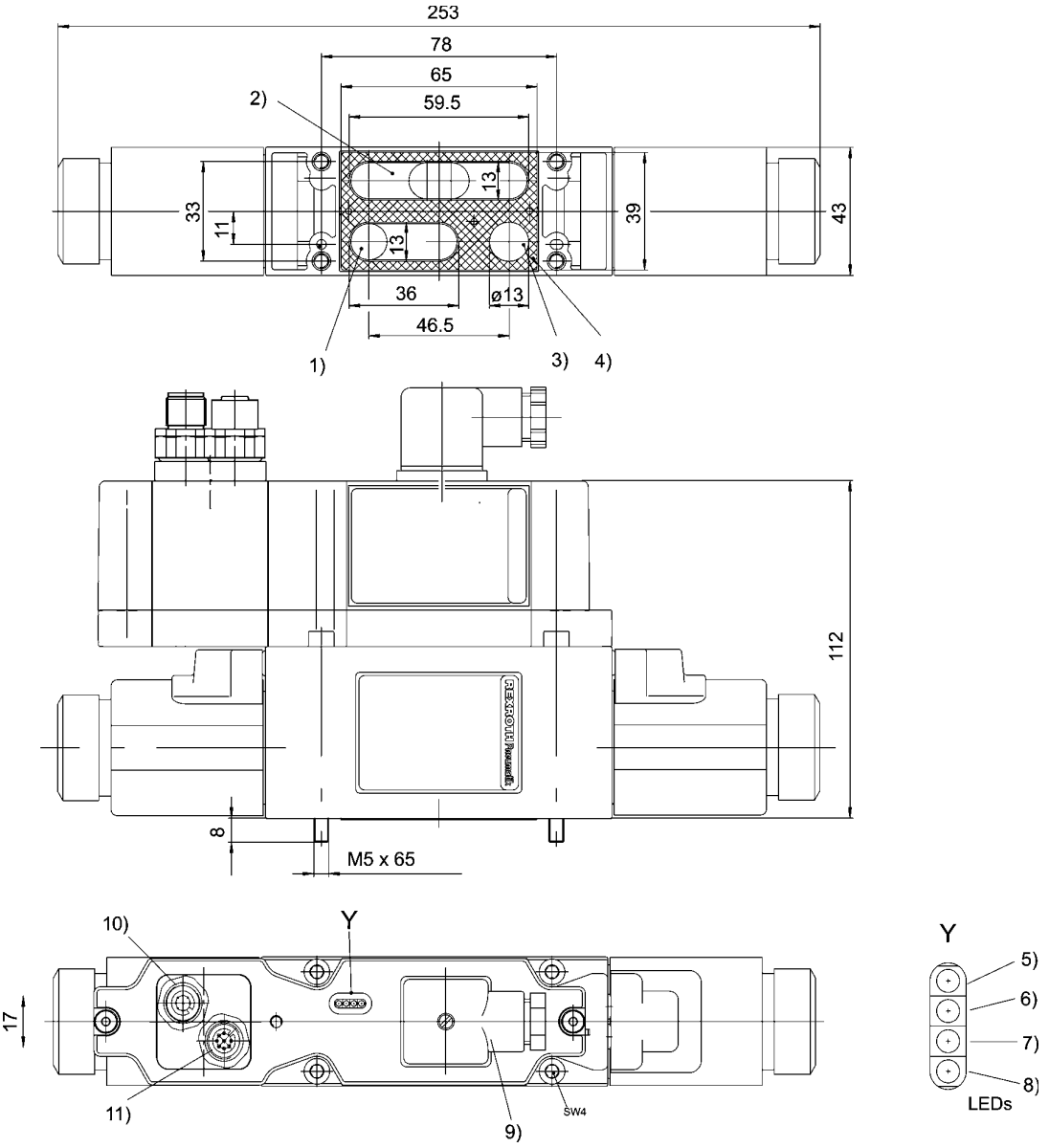
End plate kit ISO 1 G3/8 for intermediate base: part no. R434002771

1 = Brown
2 = White
3 = Blue
4 = Black
5 = Grey



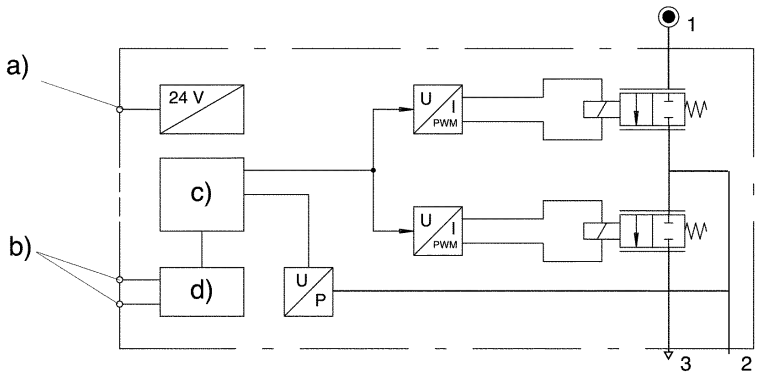
Standard Rexroth 12mm connection cable pin-out

Drawing



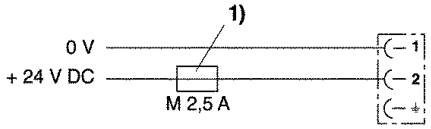
1) Port 1 2) Port 2 3) Port 3 4) Gasket 5) Data exchange 6) No data exchange 7) 24 V - VDS
8) 24 V - Controller 9) El. Connector can be fixed at 90° intervals
10) VDS Data input 11) VDS Data output

Functional diagram



a) Supply voltage b) Interface Data c) Controller d) VDS
The integrated electronics make a comparison between the nominal input value and the pressure in the output line (actual value), which is measured by a piezo-resistive pressure sensor. The controller generates a signal, which controls a proportional solenoid by means of a voltage/current converter, either charging or bleeding the proportional valve in order to obtain the required pressure.

Pin assignment for power supply



1) The supply voltage must be protected by an external M 2,5 A safety fuse.

Pin assignment VDS

With the connectors for VDS the controller is connected to the fieldbus module, respectively with more devices on the VDS.
In the accessories is a list with the available cables.
VDS and DDL devices can not be used together.

Data format

Nominal input / Actual output valuee
The controller has a resolution of 10 bit (bit 0 ... 9, bit 0 is LSB, least significant bit) for the serial nominal input value and the serial actual output value. The range for the 10 bar device is 0 - 1000 (03E8 hex) with a resolution of 0.10 bar (1 psi)
The minimum for the nominal input value is 0,030 bar (0.44 psi).

Testbit
With the testbit (bit 15, MSB, most significant bit) the master can check the data transfer from the master to slave and back. If the master sets/resets this bit in the nominal input value, the slave will set/reset this bit in the actual output value.

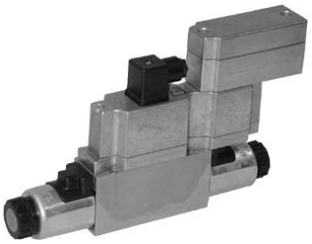
E/P Pressure control valves

E/P Pressure control valve, Series ED07
PROFIBUS DP link, proportional solenoid

Rexroth
Bosch Group

Technical Data

Type		Poppet valve
Supply pressure	max.	see table
Output pressure		see table
Hysteresis		0,03 bar (0.44 psi)
Repeatability		0,01 bar (0.15 psi)
Nominal flow rate	Q_n	1300 l/min (45.9 SCFM)
at supply pressure = 7 bar (102 psi)		
and output pressure = 6 bar (87 psi)		
pressure drop Δp = 0,2 bar (3 psi)		
Ambient temperature range	min./max.	0 °C / +50 °C (+32 °F / +122 °F)
Medium		Condensate-free and non-lubricated compressed air, filtered 50 µm
Weight		2,1 kg (4.630 lbs)
Materials	Body	Al, chromium steel
	Seals	NBR (Nitrile Botadien Rubber)
Supply voltage		24 V DC ± 20%
Permissible ripple		5 %
Power consumption		1,4 A
Protection with plug		IP 55 -IEC 529 (DIN VDE 0470)
Resolution		10 bit (0.10 bar (1 psi) - 1 bit)
Length code		2 data byte for input and output



Application area

Electro-pneumatic pressure control valves convert an electrical signal (current, voltage, resistance) proportionally into pneumatic pressure. They are used where electrical control is required to act directly on a change of pressure or force.

Part no.

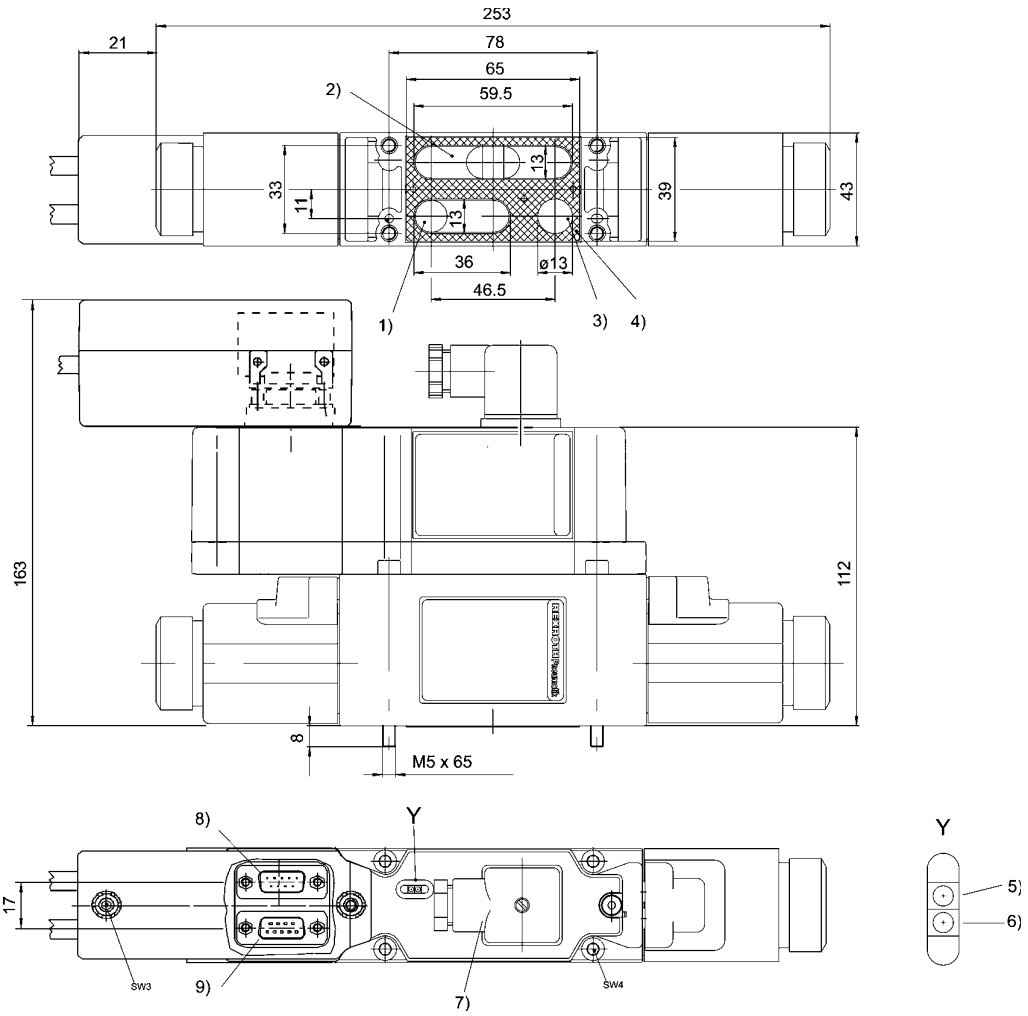
	Supply pressure [bar] (psi)	Output pressure min./max. [bar](psi)	Fieldbus type	Part no.	Manual no.
	12 (174)	0 / 10 (0 / 145)	PROFIBUS-DP	**5610219100**	**8858903493**

Accessories (to be ordered separately)

	Type	Part no.	
	Single subplate	**5610211052**	
	Intermediate (stacking) plate	**8985049932**	Can be built into size ISO 1

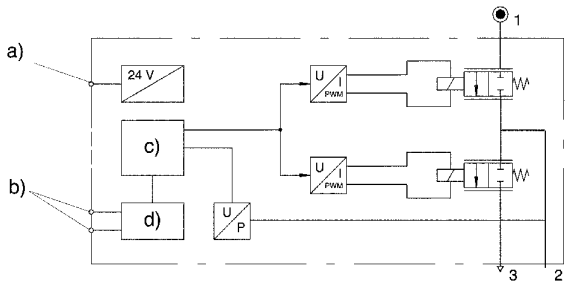
End plate kit ISO 1 G3/8 for intermediate base: part no. R434002771

Drawing



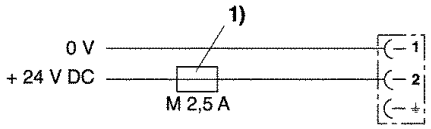
1) Port 1 2) Port 2 3) Port 3 4) Gasket 5) Bus - Error 6) + 5 V
7) Electrical connector is at every 90° pluggable
8) connector for adress switch 9) PROFIBUS-DP Data Plug

Functional diagram



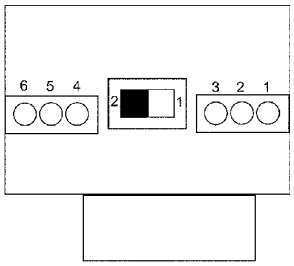
a) Supply voltage. b) Interface Data. c) Controller. d) PROFIBUS - DP.
The electropneumatic pressure control valve modulates the pressure corresponding to a serial nominal input value. The integrated electronics make a comparison between the nominal input value and the pressure in the output line (actual value), which is measured by a piezo-resistive pressure sensor. The controller generates a signal, which controls a proportional solenoid by means of a voltage/current converter, either the charging or the bleeding proportional valve in order to obtain the required pressure.

Pin assignment for power supply



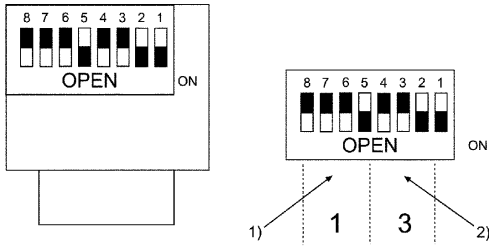
1) The supply voltage must be protected by an external M 2,5 A safety fuse.

Pin Assignment PROFIBUS DP



Terminal Connection board

The A-line is connected to terminals 1 or 4, while terminals 2 or 5, are used for the B-line.
The shield can be connected to terminals 3 or 6, or assembled at the strain relief. The connections 1,2 and 4,5 for A and B are equal, i.e. both can be used for BUS-IN and BUS-OUT.
Switch for bus terminating resistor
Switch position 1: Resistor not connected
Switch position 2: Resistor connected
Setting of the address
The address can be switched between 01 and 99 (decimal).
With switches 1 to 4, defining the 'units' digits, and switches 5 to 8 are for 'tens' digits (in 4 bit binary code).
If the switch rocker position is towards 'OPEN', this means a '1' on this position.



1) Tens digit. 2) Units digit.
PROFIBUS Address Adjustment

Data format

Nominal input / Actual output value
The controller has a resolution of 10 bit (bit 0 ... 9, bit 0 is LSB, least significant bit) for the serial nominal input value and the serial actual output value. The range for the 10 bar device is 0 - 1000 (03E8 hex) with a resolution of 0,010 bar (0.15 psi)
The minimum for the nominal input value is 0.030 bar (0.44 psi).

Testbit
With the testbit (bit 15, MSB, most significant bit) the master can check the data transfer from the master to slave and back. If the master sets/resets this bit in the nominal input value, the slave will set/reset this bit in the actual output value.

E/P Pressure control valves

E/P Pressure control valve, Series ED12
with proportional solenoid, analog control, 5-pin threaded connector, 1 x M12

Rexroth
Bosch Group

★

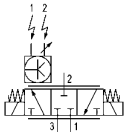
Technical Data

Type		Poppet valve
Supply pressure		see table
Output pressure		see table
Hysteresis		< 0,03 bar (<0.44 psi)
Nominal flow rate at supply pressure = 7 bar (102 psi), at output pressure = 6 bar (87 psi), and pressure drop Δp = 0.2 bar (3 psi)	Q_n	2600 l/min (91.8 SCFM)
Ambient temperature range min./max.		-5 °C / +50 °C
Medium		Condensate-free and non-lubricated compressed air, filtered 50 µm
Weight		2.3 kg (5.07 lbs.)
Materials	Body	Aluminium,
	Seals	HNBR
Supply voltage		24 V DC -20% +30%
Permissible ripple		5%
Current consumption		1,4 A
Protection with plug		IP 65 - IEC 60529 (DIN VDE 0470-1)(NEMA 4)
Installation position		optional, (Housing ventilation port must remain open)

Application area

Electro-pneumatic pressure control valves convert an electrical signal (current, voltage, resistance) proportionally into pneumatic pressure. They are used where electrical control is required to act directly on a change of pressure or force.

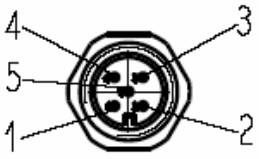
Part no.

	Supply pressure min./max. [bar](psi)	Output pressure min./max. [bar] (psi)	Nominal input value	Actual output value	Part no.
	10 / 12 (145 / 172)	0 / 10 (0 / 145)	0 - 20 mA	0 - 20 mA	**R414001635**
			4 - 20 mA	4 - 20 mA	**R414001636**

Accessories (to be ordered separately)

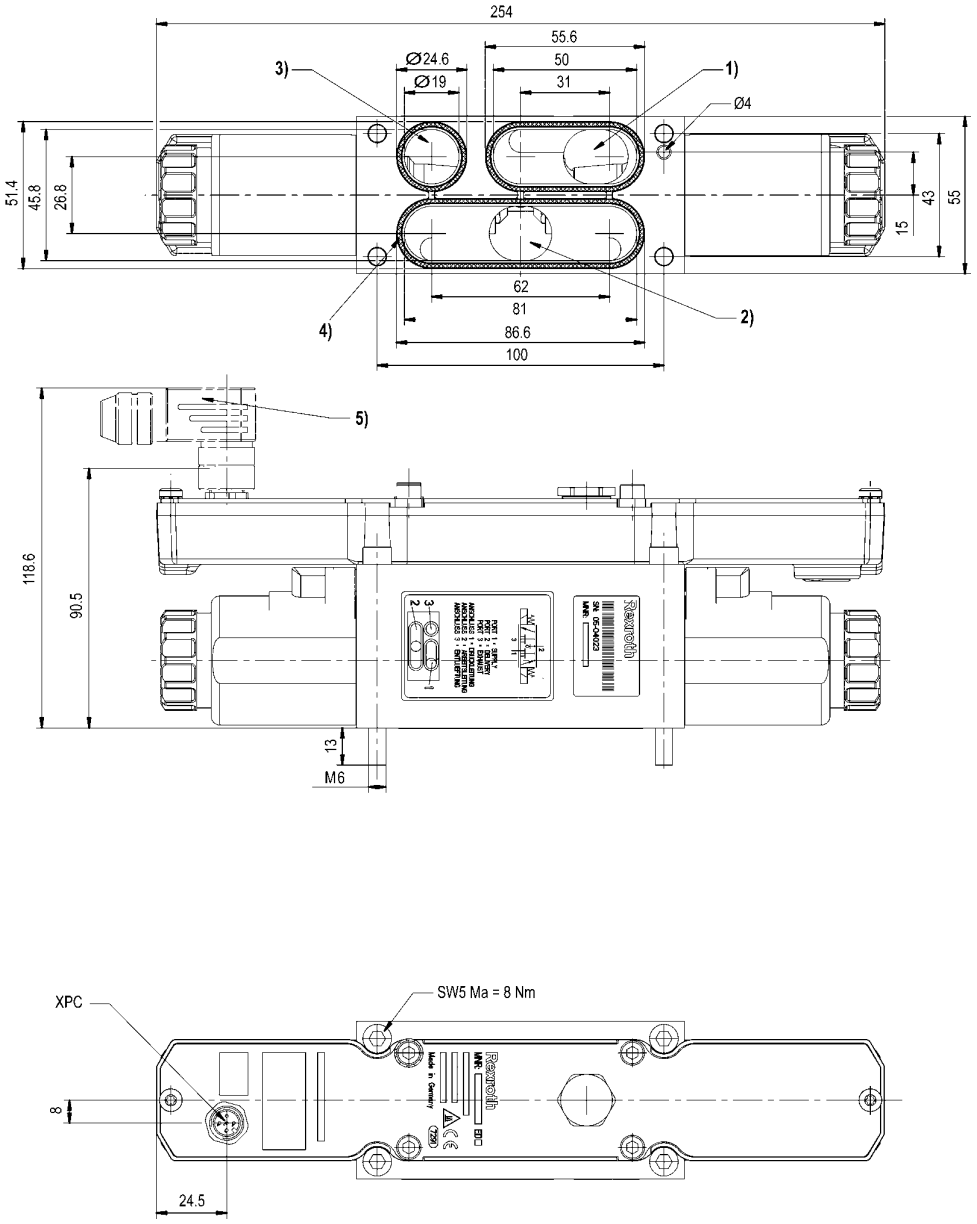
	Accessory	Part no.
	Plug connection, 5-pin threaded connector, M12x1 to connect XPC	**1824484029**
	Subbase ED12	**5610221012**
	Silencer for subbase ED12	**1827000004**
	Mounting kit (4 screws, 1 base plate sealing)	**5610220092**

1 = Brown
2 = White
3 = Blue
4 = Black
5 = Grey



Standard Rexroth 12mm connection cable pin-out

Drawing



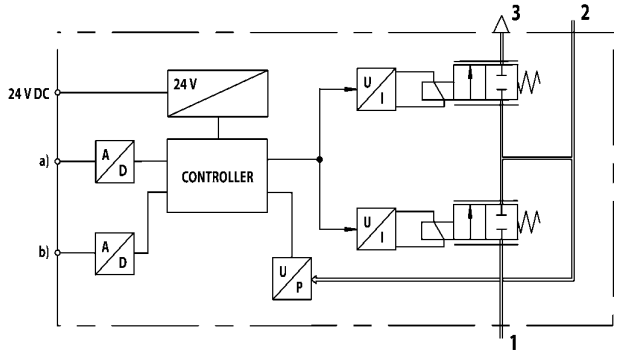
1) Supply
2) Delivery
3) Exhaust
4) Gasket (not assembled)
5) Accessory not supplied

E/P Pressure control valves

E/P Pressure control valve, Series ED12
with proportional solenoid, analog control, 5-pin threaded connector, 1 x M12

Rexroth
Bosch Group

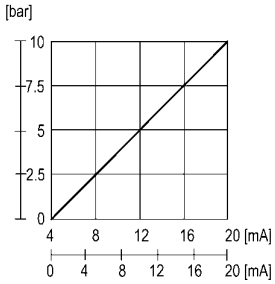
Functional diagram

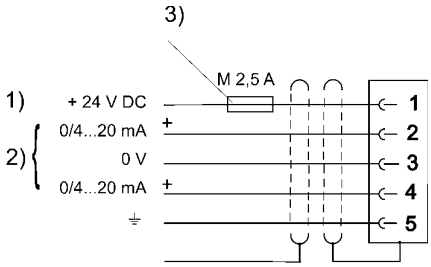


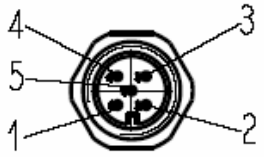
a) Nominal input value b) Actual output value

The E/P pressure control valve modulates the pressure corresponding to an analogue electrical nominal input value. The integrated electronics make a comparison between the nominal input value and the pressure in the output line (actual value), which is measured by a piezo-resistive pressure sensor. The controller generates an output positioning signal which controls via PWM voltage/current converter and proportional solenoid either the charging or bleeding proportional valve, in order to obtain the required pressure in the output line.

Characteristic and pin assignment for current control with actual output value (R414001635 / R414001636)







1 = +24VDC
2 = Command signal (voltage or current)
3 = 0VDC
4 = Actual value (feedback, voltage or curr.)
5 = Earth ground

1) Supply voltage
2) Actual value (Pin 4) and nominal value (Pin 2) are related to 0 V. Nominal input value current (Ohmic load 100 Ω). Actual output value (Max. total resistance of downstream devices < 300 Ω).
3) The supply voltage must be protected by an external M 2,5 A fuse.
Shielding must comply with local limiting conditions. In extreme cases the power supply must also be shielded.

E/P Pressure control valves

E/P Pressure control valve, Series ED12
with proportional solenoid, analog control, 5-pin threaded connector, 2 x M12

Rexroth
Bosch Group

★

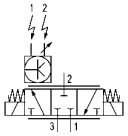
Technical Data

Type		Poppet valve
Supply pressure		see table
Output pressure		see table
Hysteresis		< 0,03 bar (<0.44 psi)
Nominal flow rate at supply pressure = 7 bar (102 psi), at output pressure = 6 bar (87 psi), and pressure drop Δp = 0.2 bar (3 psi)	Q_n	2600 l/min (91.8 SCFM)
Ambient temperature range min./max.		-5 °C / +50 °C (+23 °F / +122 °F)
Medium		Condensate-free and non-lubricated compressed air, filtered 50 µm
Weight		2.3 kg (5.07 lbs.)
Materials	Body	Aluminium, chromated steel
	Seals	NBR (Nitrile Botadien Rubber)
Supply voltage		24 V DC ± 20 % +30%
Permissible ripple		5%
Current consumption		1,4 A
Protection with plug		IP 65 - IEC 60529 (DIN VDE 0470-1)(NEMA 4)
Installation position		optional, (Housing ventilation port must remain open)

Application area

Electro-pneumatic pressure control valves convert an electrical signal (current, voltage, resistance) proportionally into pneumatic pressure. They are used where electrical control is required to act directly on a change of pressure or force.

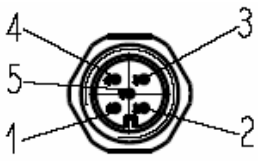
Part no.

	Supply pressure min./max. [bar] (psi)	Output pressure min./max. [bar] (psi)	Nominal input value	Actual output value	Part no.
	10 / 12 (145 / 172)	0 / 10 (0 / 145)	0 - 20 mA	0 - 20 mA	**R414000728**
			4 - 20 mA	4 - 20 mA	**R414000729**
			0 - 10 V	–	**R414000730**
			0 - 10 V	0 - 10 V	**R414000731**

Accessories (to be ordered separately)

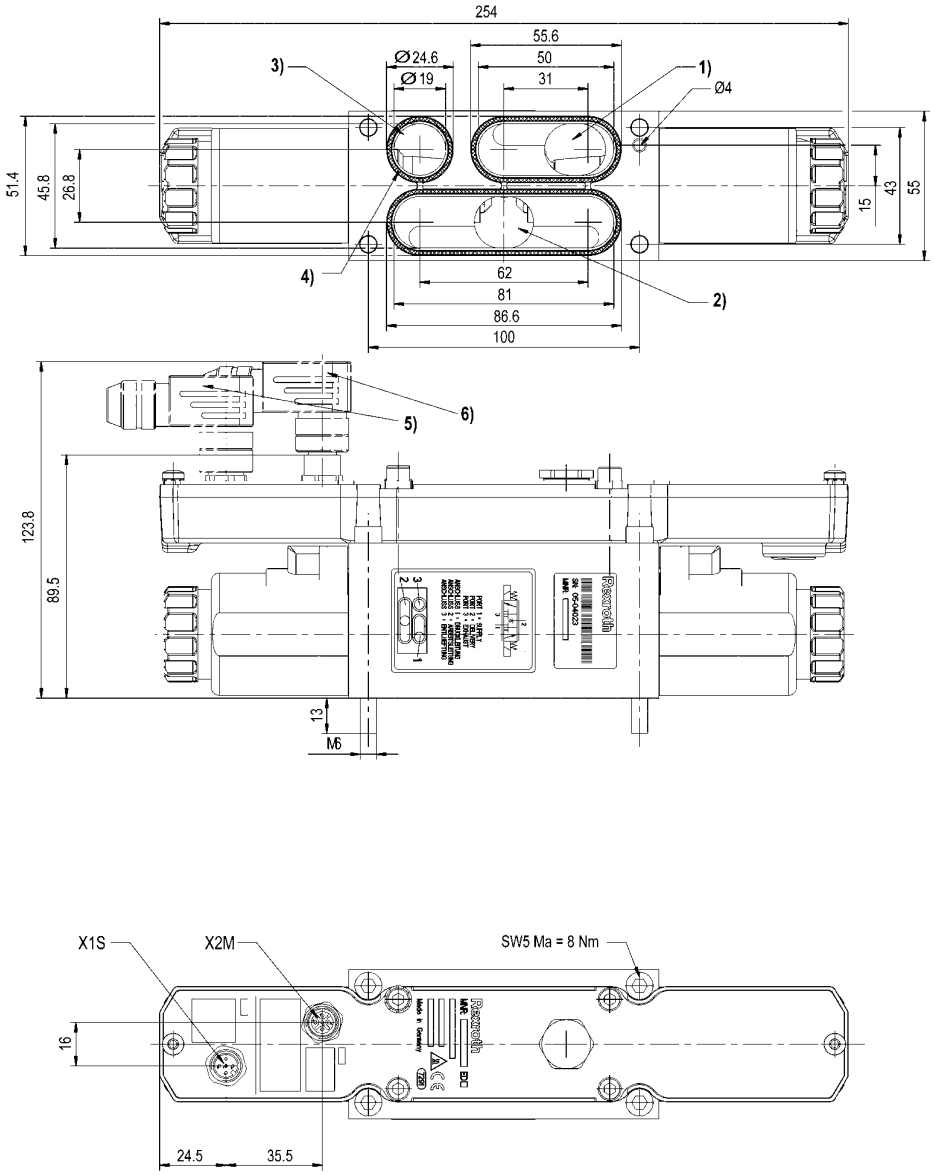
	Accessory	Part no.
	Plug connection, 5-pin threaded connector, M12x1, X2M	**1824484028**
	Plug connection, 5-pin threaded connector, M12x1, X1S	**1824484029**
	Subbase ED12	**5610221012**
	Silencer for subbase ED12	**1827000004**
	Mounting kit (4 screws, 1 base plate sealing)	**5610220092**

1 = Brown
2 = White
3 = Blue
4 = Black
5 = Grey



Standard Rexroth 12mm connection cable pin-out

Drawing



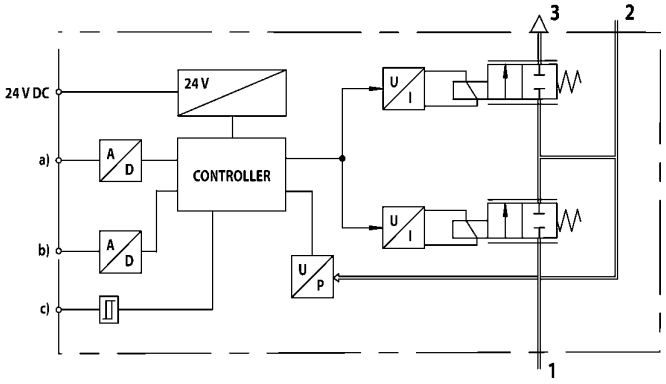
1) Supply
2) Delivery
3) Exhaust
4) Gasket (not assembled)
5) Accessory not supplied

E/P Pressure control valves

E/P Pressure control valve, Series ED12
with proportional solenoid, analog control, 5-pin threaded connector, 2 x M12

Rexroth
Bosch Group

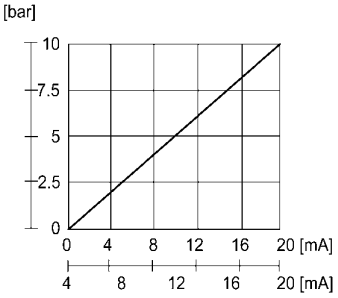
Functional diagram

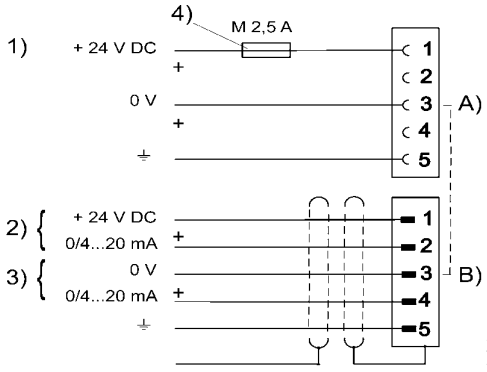


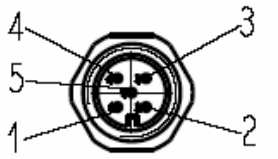
a) Nominal input value b) Actual output value c) Switch output (Acknowledge signal)

The E/P pressure control valve modulates the pressure corresponding to an analogue electrical nominal input value. The integrated electronics make a comparison between the nominal input value and the pressure in the output line (actual value), which is measured by a piezo-resistive pressure sensor. The controller generates an output positioning signal which controls via PWM voltage/current converter and proportional solenoid either the charging or bleeding proportional valve, in order to obtain the required pressure in the output line.

Characteristic and pin assignment for current control with actual output value (R414000728, R414000729)





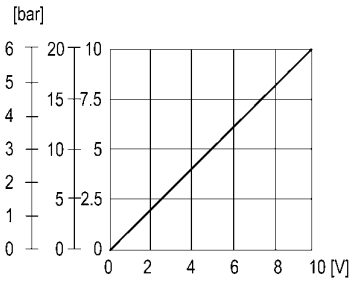


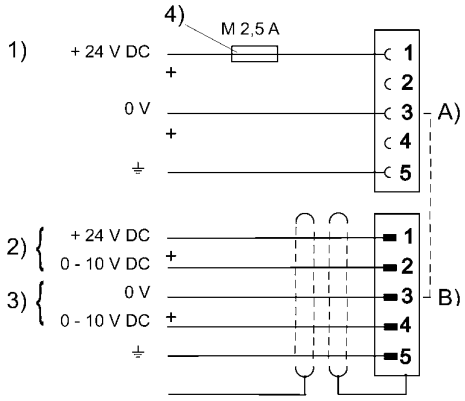
1 = +24VDC
2 = Command signal (voltage or current)
3 = 0VDC
4 = Actual value (feedback, voltage or curr.)
5 = Earth ground

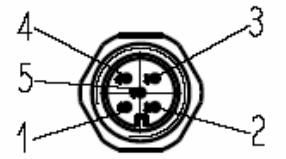
1) Supply voltage
2) Switch output (Pin 1) and nominal value (Pin 2) are related to 0 V. Nominal input value current (Ohmic load 100 Ω).
3) Actual value (Pin 4) is related to 0V (max. total resistance of downstream devices < 300 Ω).
4) The supply voltage must be protected by an external M 2,5 A fuse. Shielding must comply with local limiting conditions. In extreme cases the power supply must also be shielded.

A) Plug X1S B) Plug X2M

Characteristic and pin assignment for tension control with actual output value (R414000731)





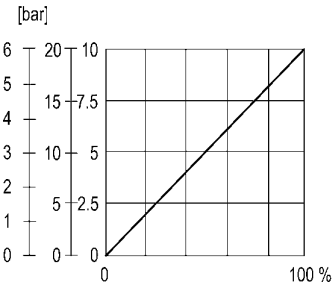


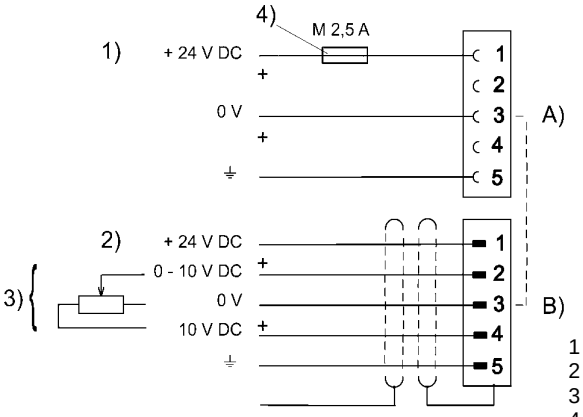
1 = +24VDC
2 = Command signal (voltage or current)
3 = 0VDC
4 = Actual value (feedback, voltage or curr.)
5 = Earth ground

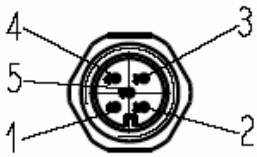
1) Supply voltage
2) Switch output (Pin 1) and nominal value (Pin 2) are related to 0 V (min load resistance = 1 kΩ,
3) Actual value (Pin 4) is related to 0 V (min. load resistance 1 kΩ)
4) The supply voltage must be protected by an external M 2,5 A fuse. Shielding must comply with local limiting conditions. In extreme cases the power supply must also be shielded.

A) Plug X1S B) Plug X2M

Characteristic and pin assignment for potentiometer control without actual output value (R414000730)





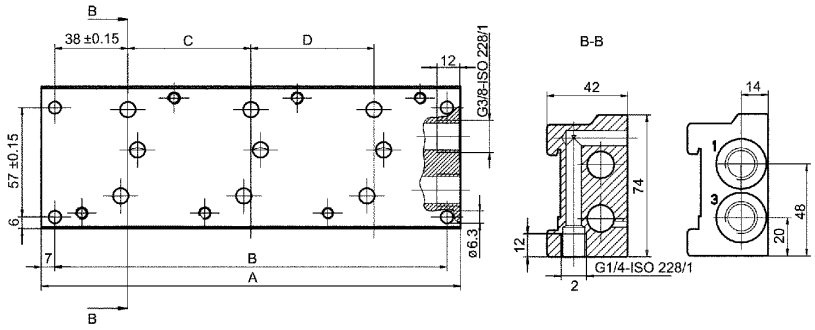


1 = +24VDC
2 = Command signal (voltage or current)
3 = 0VDC
4 = 10VDC constant for pot control
5 = Earth ground

1) Supply voltage
2) Switch output (Pin 1) and nominal value (Pin 2) are related to 0 V.
3) Potentiometer-control (min. 0-2 kΩ, max. 0-10 kΩ)
4) The supply voltage must be protected by an external M 2,5 A fuse. Shielding must comply with local limiting conditions. In extreme cases the power supply must also be shielded.

A) Plug X1S B) Plug X2M

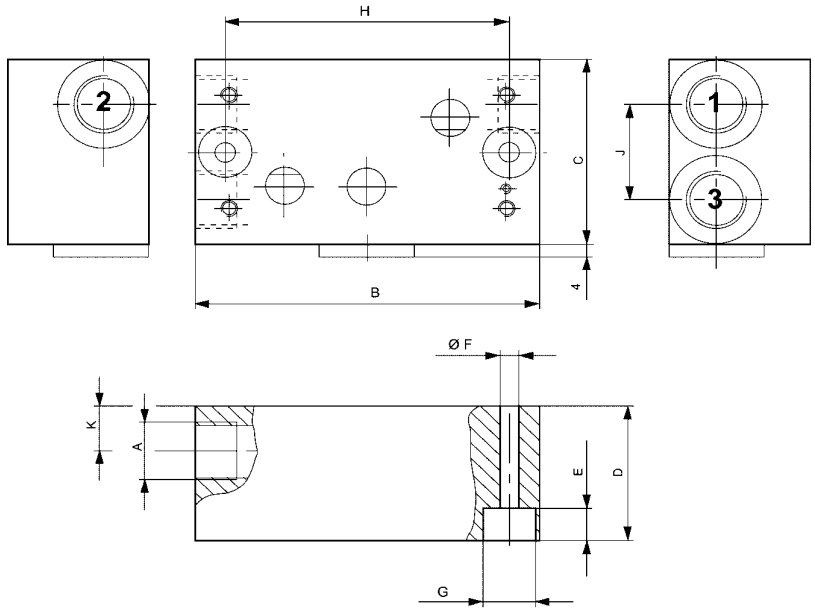
▲★ Subbase for pressure control valve ED05



Type	Part no.	A	B	C	D
Subbase single	**561 014 100 2**	90	76	-	-
Subbase double	**561 014 101 2**	154	140	64	-
Subbase triple	**561 014 102 2**	218	204	64	64

Additonal bases for the ED05 are availbable on the online catalog, www.boschrexroth-us.com

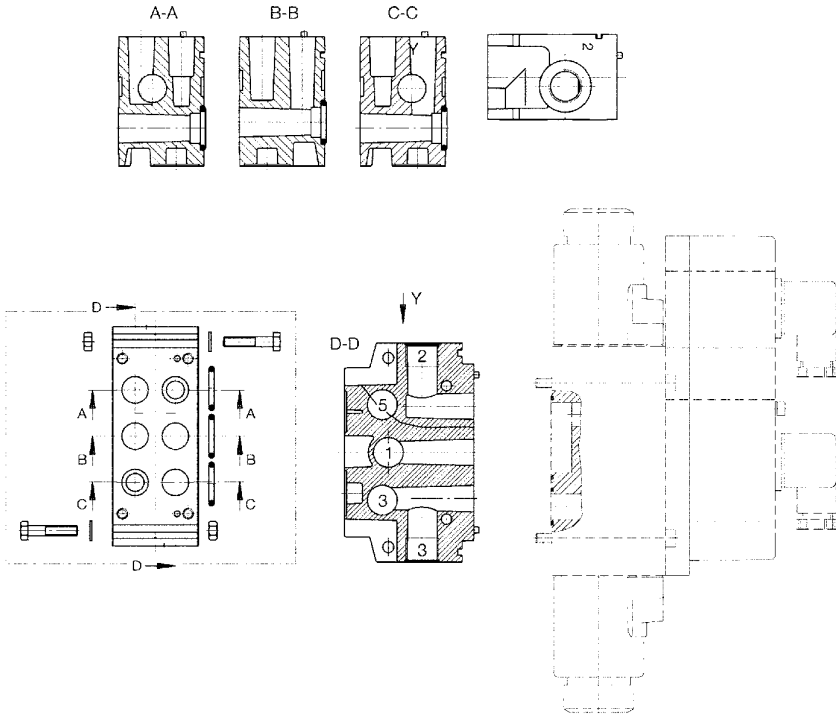
▲★ Single subplate for pressure control valves ED07 and ED12

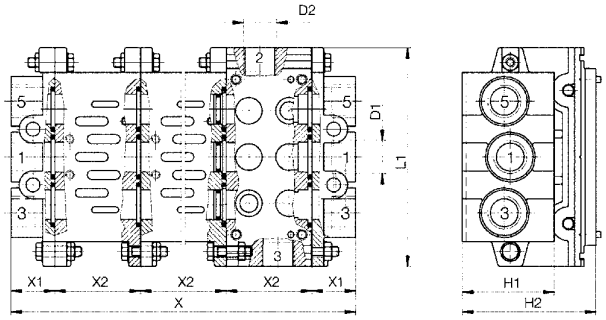


Size	Part no.	A	B	C	D	E	F	G	H	J	K
ED07	**5610211052**	G 3/8	97	54	40	10	6,5	15	80	28	13,5
ED12	**5610221012**	G 3/4	120	80	54	14	8,5	18	100	43	18

Material : Al, chromated steel

▲★ Intermediate base for pressure control valve ED07





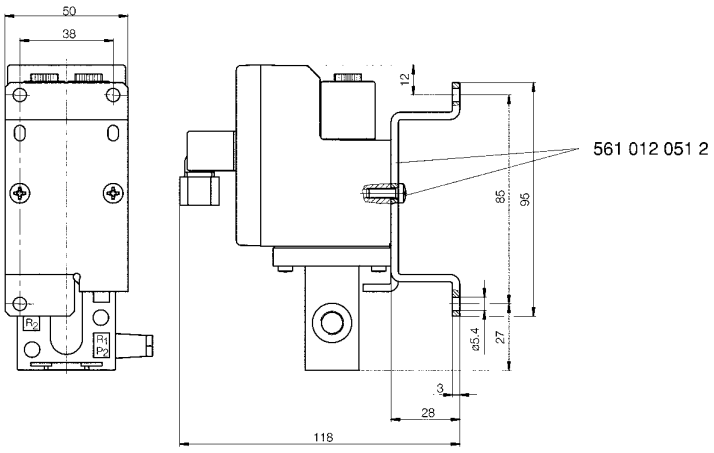
Type	D1	D2	L1	H1	H2	X1	X2	Part no.
Intermediate base **	G3/8	G3/8	110	46	67	22	43	**8985049932 ***

* Stacking screws included
** Intermediate base can be built-in with intermediate base size 1 to DIN ISO 5599

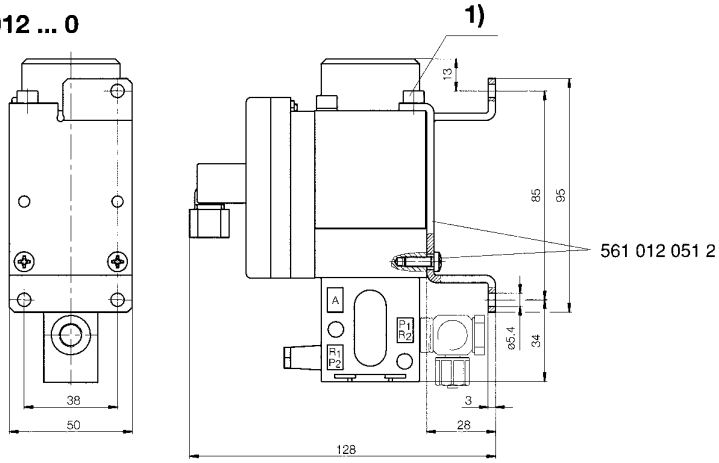
End plate kit ISO 1 G3/8 for intermediate base: part no. R434002771

▲★ Mounting kit for pressure control valves EV04 and ED04

561 011 ... 0



561 012 ... 0



1) For assembly of the angled bracket use one screw from the proportional-solenoid

Part no.
5610120512

Material : Mounting plate (steel, colorless chromated); 2 screws M4x12 DIN 7985, galvanized

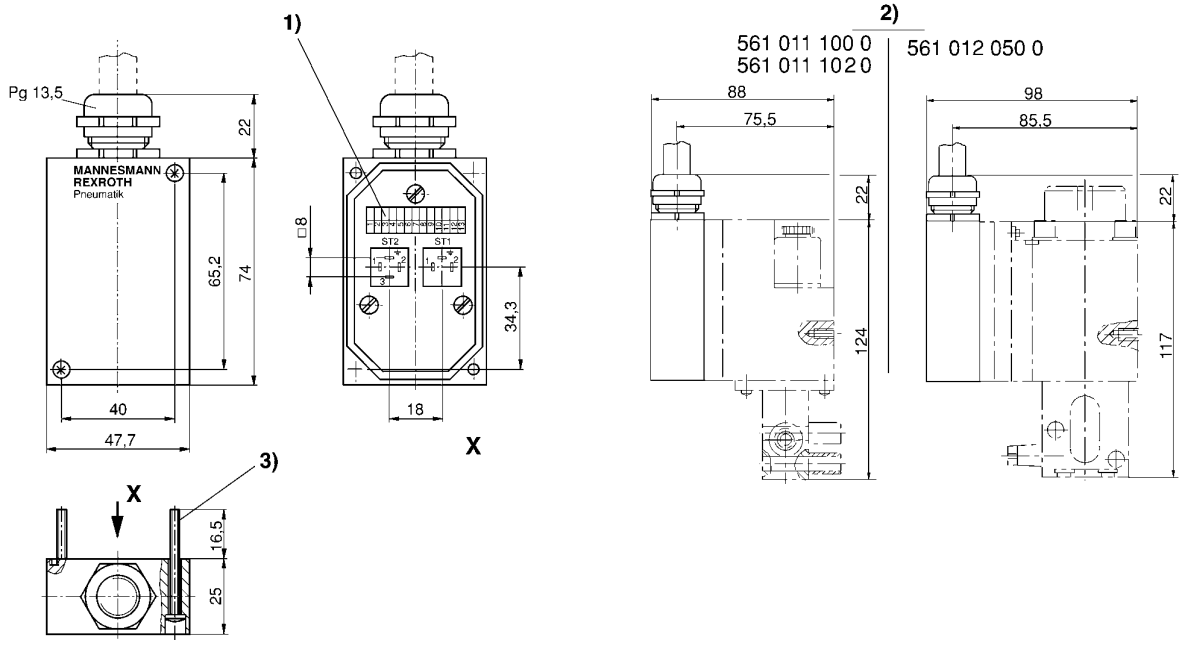
★ Digital control, 8 bit, for pressure control valves EV04 and ED04

Ambient temperature range		0 °C to +50 °C (+32 °F to +122 °F)
Operating voltage		24 V DC ± 10 %
Permissible ripple		± 5 %
Current consumption		60 mA + current consumption of the downstream E/P pressure control valve
Weight		0,165 kg (0.364 lbs)
Materials	Body	Al
Binary input (nominal value)*		8 bits
	logic 0	0 ... 10 V DC
	logic 1	15 ... 30 V DC
Memory (connection 9)*		
	logic 0	0 ... 10 V DC = data stored
	logic 1	15 ... 30 V DC = data transmitted
* max. current		3 mA at 24 V DC

★ Part no.

	for E/P pressure control valve	Part no. of D/A converter
	**5610111000, 5610120500 and 5610111020**	**5610113102**

Drawing



1) For wire cross-sections up to max. 0,5 mm² (21 AWG)
2) Mounting dimensions of D/A converter in combination with pressure control valve.
3) Screw M 3 x 35 DIN 7985

Caracteristics

Fig. 1

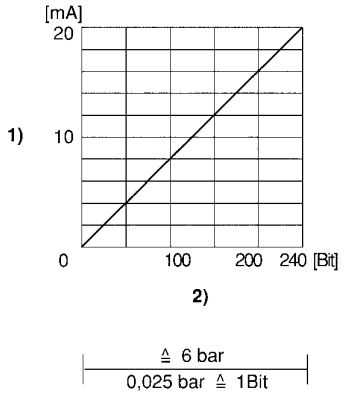


Fig. 2

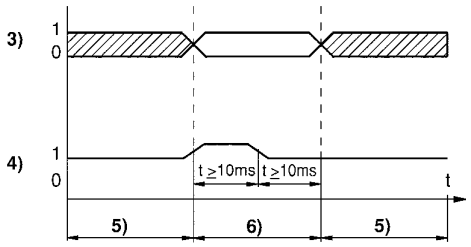
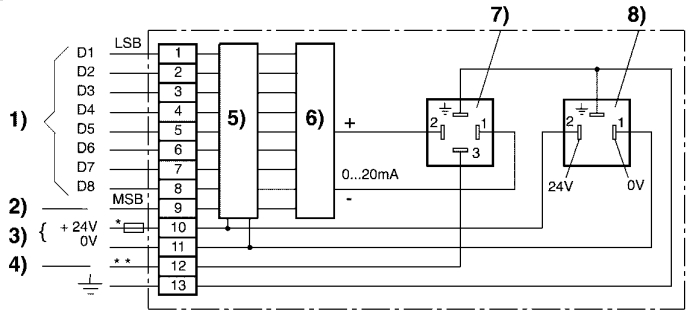


Fig. 1 Characteristic
1) Analogue output. 2) Binary input.

Fig. 2 Time-dependency diagram showing storage of the binary input value:
3) Binary input value. 4) Memory function. 5) Data invalid. 6) Data valid.

Connection diagram

Fig. 3



1) Digital data inputs. 2) Memory. 3) Supply. 4) Signal output. 5) 8-Bit memory. 6) D/A - converter. 7) Plug 2. 8) Plug 1 (supply).
* The supply voltage must be protected with an external fuse. The fuse to be used is that specified for the basic version.
** The signal from plug 2, pin 3 is connected to pin 12 on the terminal strip.

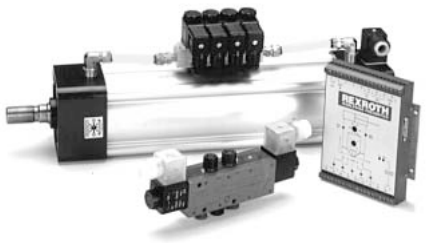
E/P Pressure control

E/P Positioner Assembly

Rexroth
Bosch Group

Electro-Pneumatic Positioner Specifications

Stroke	Any length in 1" increments, to 10" 2" increments between 10" and 16" strokes
Accuracy	+/- .050" or 1 percent full stroke, whichever is greater
Repeatibility	+/- .050"
Stroking Speed	Approx.: Fast 2"/sec., slow .5"/sec.
Operating Temp.	41°F to 122°F
Power Requirements	24vdc, 600 ma
Signal Options	0–10vdc, 0–20ma, 5k ohm pot.
Feedback Device	Linear potentiometer, internally mounted
Supply Pressure	100 psi nominal,125 psi max. at 5 micron filtration recommended
Optional Meter Drive	0-20 ma



Application

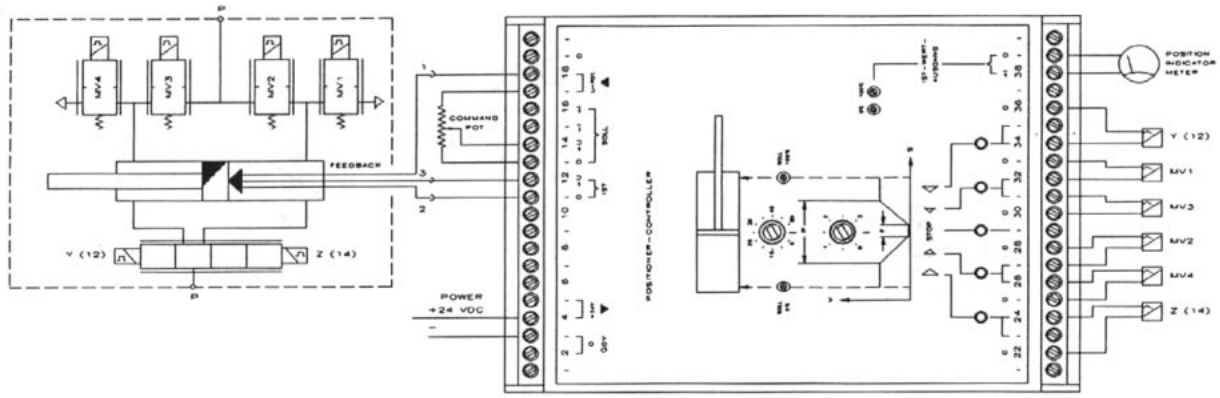
Wherever infinite positioning requirements allow electrical analog control signals.
Interfaces with computer, PLC or simple potentiometer.
Consists of cylinder with integral sensor, optimized valving, and an electronic controller.
Available in bore sizes 1-1/2 thru 4" and strokes up to 16"; single or dual stroking speed control available.

Load Capacities per Bore Size

Bore size (inches)	1.5	2	2.5	3.25	4
Load rating (lbs)	35	63	98	166	250

At 100 psi supply pressure, 1 percent positioning accuracy.

FIGURE 1.



The basic concept involves a cylinder with integral feedback potentiometer in conjunction with a controller and matched solenoid valves.
Figure 1 represents the system layout. The figure represents a 2 speed system utilizing (4) 2-way solenoid valves (energized in pairs) for slow speed and a double solenoid, 4-way, closed center for fast speed.
The two speed feature offers the fastest response without sacrificing accuracy.
The single speed positioners are applied in areas that require accuracy and only slow speed, or fast speeds that do not require 1% accuracy.
For single speed applications, only one set of valves is necessary.
For the slow retract, (mv1) and (mv3) solenoid valves are energized simultaneously.
Valves (mv2) and (mv4) are energized for the slow extend command.
The double solenoid valve is energized for either the fast retract or for fast extend.
The controller constantly monitors the command signal and compares the feedback signal the position sensor located in the cylinder.
If the command signal is greater than the feedback, the controller will energize the solenoid valves associated with extension.
The retract solenoid valves are energized when the command signal is less than the feedback signal.
If the command equals the feedback signal, all of the solenoid valves are De-energized and position is maintained.
The two speed controller consists of a narrow window and a wide window comparator.
A large difference between the command and feedback results in energization of both sets of solenoid valves.
When the position approaches the set-point command, only the slow speed valves are energized.
A unique feature is that each set of solenoids is pulsed before complete shut-off to provide a stepped, gradual deceleration of the load.
The width of sensitivity and the width of deceleration is adjustable on the controller to allow tailoring of the positioner for each application.

E-P Positioner Selection

HOW TO SELECT:

1. Determine the amount of force required for the application.
2. Determine the available supply pressure.
3. Note length of stroke required.
4. Check and note accuracy and speed requirements.
5. Determine if meter drive output is desired.
6. Contact sales representative or factory for component selection.

Flowmeter
Electronic volume measurement

Rexroth
Bosch Group

Technical Data

Operating Pressure	max. 145 psi (10 bar)	
Flow Range	See table.	
Accuracy	< ± 2% FS (1:10 of Flow Range)	
Response Time	< 15 ms	
Temperature Range	+41 to +122 °F (+5 to +50 °C)	
Medium	Condensate and Oil Free Compressed Air, filtered 50 µm	
Supply Voltage	24 VDC ± 10%	
Current Consumption	max. 300 mA	
Protection	IP54-IEC 529 (DIN VDE 0470)	
Installation Position	Optional / Free	
Output (Selectable)	Frequency	200-1200 Hz
	Analog Voltage	0-10 VDC
	Analog Current	4-20 mA
Output Signal Flow Characteristic Specification	DIN 1343 or ISO 6358	Selectable

Application Area

The VolumeMeter uses the orifice gauge principle and differential pressure sensors to accurately measure volume flow rate. The output electrical signal is proportional to this flow rate measurement. This robust principle offers special features such as an inherent immunity to overpressure and a high common mode pressure ratio.
An integrated Zero Point adjustment assures accurate readings of the internal pressure sensors, improves long-term stability of the unit and prevents problems associated with temperature drifts. State of the art electronics compensate for the non-linearity effects of the orifice.

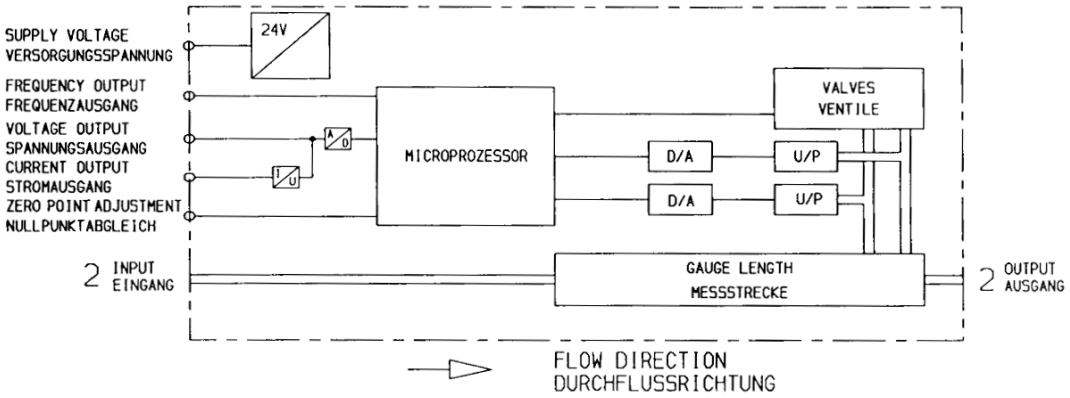
Code No. Flow Range	Code No.
0 - 8.8 SCFM (0 - 250 Nl/min)	**5530011000**
0 -17.7 SCFM (0 - 500 Nl/min)	**5530011100**
0 - 35.3 SCFM (0 - 1000 Nl/min)	**5530011200**

Accessories (to be ordered separately)

Type	Code No.
Operating Manual	**8858903553**

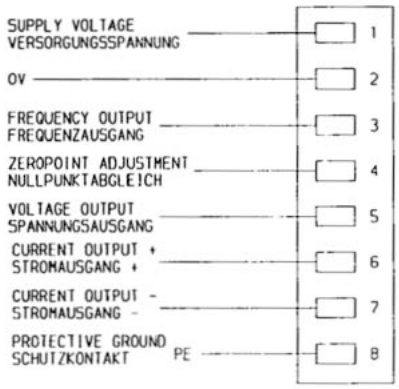
Functional Schematic

Block Diagram / Funktionsschema



Connection / Anschluß

PLUG
STECKER

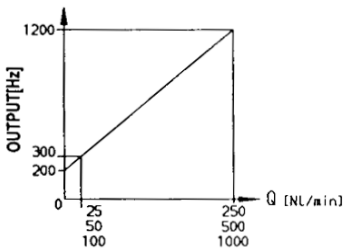


SHIELD IS CONNECTED TO PLUG BODY
SCHIRM LIEGT AUF STECKERGEHAEUSE

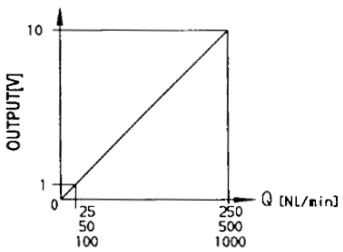
Output Characteristics Curves / Kennlinien

for / für 553 001 100 0, 553 001 110 0, 553 001 120 0

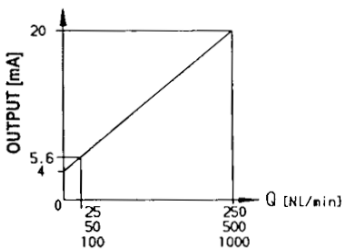
CHARACTERISTIC CURVE FRQUENCY
KENNLINIE FREQUENZ



CHARACTERISTIC CURVE VOLTAGE
KENNLINIE SPANNUNG

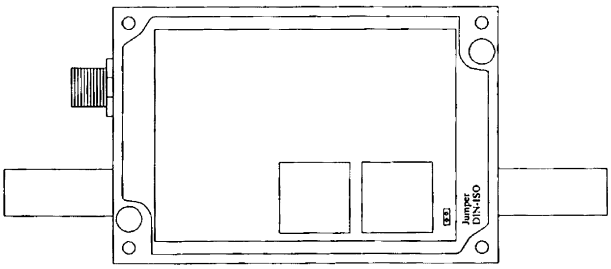


CHARACTERISTIC CURVE CURRENT
KENNLINIE STROM



Switching of flow characteristic
Umschaltung der Kalibrierung

Jumper ON / aufgesteckt calibration to DIN 1343 / Kalibrierung nach DIN 1343
Jumper OFF / nicht aufgesteckt calibration to ISO 6358 / Kalibrierung nach ISO 6358



Flowmeter/Other Product Ideas

Electronic volume measurement. Other useful product ideas.

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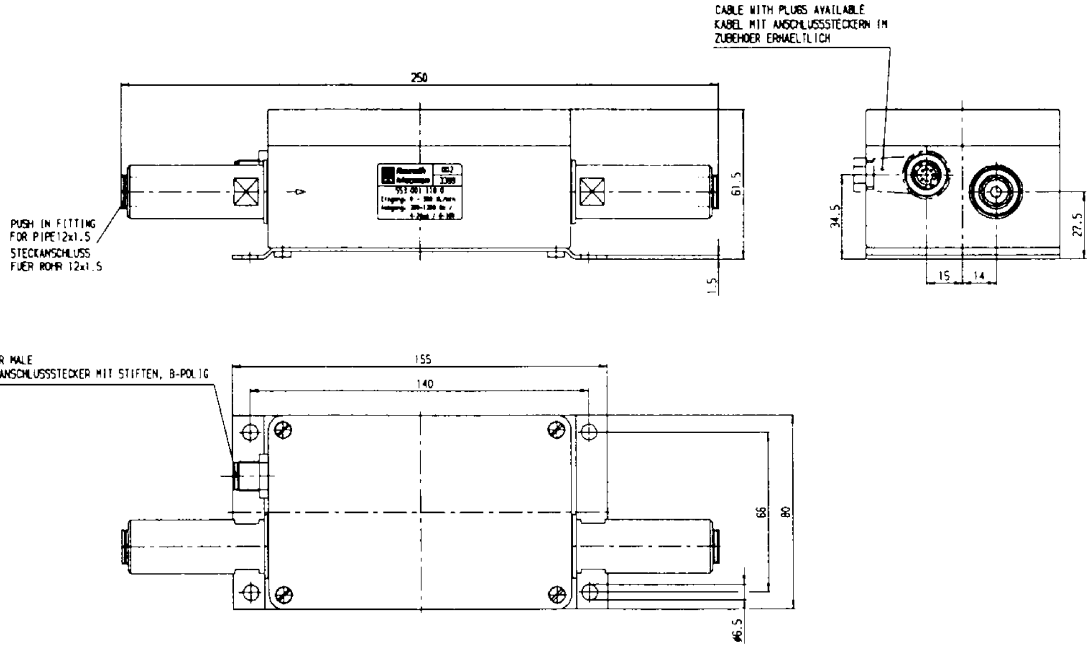
Dimensions



Other product ideas:

Weld Dense Pack

The Weld Dense Pack is an integrated, yet configurable solution that combines the high performance ED07 proportional pressure regulator with ISO standard directional valves to control force and direction of pneumatic weld guns. This configuration can be used in other cylinder force and direction control applications. The Dense Pack includes modular discrete I/O modules and serial link to all main fieldbus protocols.

Air Volume Booster

Combine an ED02 E/P with a Rexroth S Relay valve for a low-cost, high-flow solution. The resulting control performance from the 2/2 ED02 combined with flows in excess of 150 SCFM from the 1” version of the S Relay. The ED02 with direct control will not bleed the pilot chamber of the S Relay, so if power is lost the output from the Relay valve will not be lost.

ED07 with External Sensor input

A special version of the ED07 controls pressure based on feedback from an external sensor. The controller of the D07 compares the set value from a process with the actual feedback from an external sensor. For example, a load cell, pressure sensor, force gauge, air flowmeter or linear transducer.

NOTICES TO PRODUCT USERS

1. WARNING: FLUID MEDIA

Bosch Rexroth pneumatic devices are designed and tested for use with filtered, clean, dry, chemical free air at pressures and temperatures within the specified limits of the device. For use with media other than air or for human life support systems, Bosch Rexroth must be consulted. Hydraulic cylinders are designed for operation with filtered, clean, petroleum based hydraulic fluid; operation using fire-resistant or other special types of fluids may require special packing and seals. Consult the factory.

2. WARNING: MATERIAL COMPATIBILITY

Damage to product seals or other parts caused by the use of non-compatible lubricants, oil additives or synthetic lubricants in the air system compressor or line lubrication devices voids Bosch Rexroth's warranty and can result in product failure or other malfunction. See lubrication recommendations below.

AIR LINE LUBRICANTS! In service higher than 18 cycles per minute or with continuous flow of air through the device, an air line lubricator is recommended. * (Do not use line lubrication with vacuum products.) However, the lubricator must be maintained since the oil will wash out the grease, and lack of lubrication will greatly shorten the life expectancy. The oils used in the lubricator must be compatible with the elastomers in the device. The elastomers are normally BUNA-N, NEOPRENE, VITON, SILICONE and HYTREL. Bosch Rexroth recommends the use of only petroleum-based oils without synthetic additives, and with an aniline point between 180° and 210° F.

COMPRESSOR LUBRICANTS! All compressors (with the exception of special "oil free" units) pass oil mist or vapor from the internal crankcase lubricating system through to the compressed air. Since even small amounts of non-compatible lubricants can cause severe seal deterioration (which could result in component and system failure) special care should be taken in selecting compatible compressor lubricants. It is recommended that users review the National Fluid Power Association "Recommended Guide Lines For Use Of Synthetic Lubricants In Pneumatic Fluid Power Systems" (NFPA T1-1978).

3. WARNING: INSTALLATION AND MOUNTING

The user of these devices must conform to all applicable electrical, mechanical, piping and other codes in the installation, operation or repair of these devices.

INSTALLATION! Do not attempt to install, operate or repair these devices without proper training in the technique of working on pneumatic or hydraulic systems and devices, unless under trained supervision. Compressed air and hydraulic systems contain high levels of stored energy. Do not attempt to connect, disconnect or repair these products when system is under pressure. Always exhaust or drain the pressure from system before performing any service work. Failure to do so can result in serious personal injury.

MOUNTING! Devices should be mounted and positioned in such manner that they cannot be accidentally operated.

4. WARNING: APPLICATION AND USE OF PRODUCTS

The possibility does exist for any device or accessory to fail to operate properly through misuse, wear or malfunction. The user must consider these possibilities and should provide appropriate safe guards in the application or system design to prevent personal injury or property damage in the event of malfunction.

5. WARNING: CONVERSION, MAINTENANCE AND REPAIR

When a device is disassembled for conversion to a different configuration, maintenance or repair, the device must be tested for leakage and proper operation after being reassembled and prior to installation.

MAINTENANCE AND REPAIR! Maintenance periods should be scheduled in accordance with frequency of use and working conditions. All Bosch Rexroth products should provide minimum of 1,000,000 cycles of maintenance free service when used and lubricated as recommended. However, these products should be visually inspected for defects and given an "in system" operating performance and leakage test once a year. Where devices require major repair as result of the one million cycles, one year, or routine inspection, the device must be disassembled, cleaned, inspected, parts replaced as required, rebuilt and tested for leakage and proper operation prior to installation. See individual catalogs for specific cycle life estimates.

6. PRODUCT CHANGES

Product changes including specifications, features, designs and availability are subject to change at any time without notice. For critical dimensions or specifications, contact factory.

*Many Bosch Rexroth pneumatic components can operate with or without air line lubrication; see individual sales catalogs for details.

--Refer to the appropriate service catalog for parts and service information.

LIMITATIONS OF WARRANTIES & REMEDIES

Bosch Rexroth warrants its products sold by it to be free from defects in material and workmanship to the following:
For twelve months after shipment Bosch Rexroth will repair or replace (F.O.B. our works), at its option, any equipment which under normal conditions of use and service proves to be defective in material or workmanship at no charge to the purchaser. No charge will be made for labor with respect to defects covered by this Warranty, provided that the work is done by Bosch Rexroth or any of its authorized service facilities. However, this Warranty does not cover expenses incurred in the removal and reinstallation of any product, nor any downtime incurred, whether or not proved defective.
All repairs and replacement parts provided under this Warranty policy will assume the identity, for warranty purposes, of the part replaced, and the warranty on such replacement parts will expire when the warranty on the original part would have expired. Claims must be submitted within thirty days of the failure or be subject to rejection.
This Warranty is not transferable beyond the first using purchaser. Specifically, excluded from this Warranty are failures caused by misuse, neglect, abuse, improper operation or filtration, extreme temperatures, or unauthorized service or parts. This Warranty also excludes the use of lubricants, fluids or air line additives that are not compatible with seals or diaphragms used in the products. This Warranty sets out the purchaser's exclusive remedies with respect to products covered by it, whether for negligence or otherwise. Neither, Bosch Rexroth nor any of its affiliates will be liable for consequential or incidental damages or other losses or expenses incurred by reason of the use or sale of such products. Our liability (except as to title) arising out of the sale, use or operation of any product or parts, whether on warranty, contract or negligence (including claims for consequential or incidental damage) shall not in any event exceed the cost of replacing the defective products and, upon expiration of the warranted period as herein provided, all such liability is terminated. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, WHETHER FOR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE. No attempt to alter, amend or extend this Warranty shall be effective unless authorized in writing by an officer of Bosch Rexroth Corporation.
Bosch Rexroth reserves the right to discontinue manufacture of any product, or change product materials, design or specifications without notice.

Rexroth
Bosch Group

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The data specified herein only serves to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The given information does not release the user from obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.

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