

Description

The pneumatic proportional pressure regulator controls the outlet pressure in proportion to an electrical command input signal. It comprises a complete closed loop servo system in a compact monoblock assembly with proportional solenoid valve, electronic regulator and internal pressure transducer.

In the process, the outlet pressure is transformed into a proportional electrical signal and compared with the input signal. If the outlet pressure exceeds the preset setpoint, the valve exhausts down to the pressure desired.

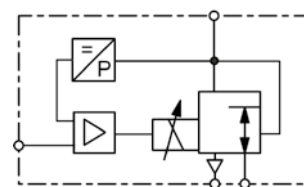
The valve has no constant bleed. At absence of input signal or supply voltage the valve exhausts. The power supply of the setpoint potentiometer is provided by the proportional regulator via connector pin number 5.

Pressure transducer

Open transducers: 100 mbar, 500 mbar, 1/5/10/16/20/30/50 bar and vacuum

Application examples

Proportional pressure regulators are being used for blowing machines, ultrasonic equipments, testing machines, painting systems, contouring systems, laser welding machines, textile machines, cheese presses, pneumatic brakes, clamping devices and medical engineering.



G¹/₈ up to G1

General technical features

Description

3-port/2-way pressure regulator with proportional magnet, integrated hybrid PCB and closed loop with pressure transducer in compact monoblock assembly.

Mounting position

any, preferably upright

Protection class

IP 54 with standard connector, IP 65 with special connector

Shock resistance

3G

Temperature range

0 °C up to 50 °C / 32 °F to 122 °F, high temperature version on request

Material

Body: brass (G¹/₈) and aluminium (G¹/₄, G¹/₂ u. G1) Inner valve: brass and SST
Seals: NBR/Buna-N, on request EPDM or FKM FKM for 50 bar version

Pneumatic features

Media

dry, lubricated, unlubricated and 50 µm filtered compressed air or non-corrosive gases

Supply pressure

see chart, min. 10% above outlet pressure

Flow rate

see chart, at 6 bar inlet pressure and 5 bar outlet pressure

Exhaust

same nominal size as on inlet valve, thus same relief capacity

Air consumption

without air consumption

Electrical features

Supply voltage

24 V DC + 15% - 10%, residual ripple max. 10%

Power consumption

12 W at G¹/₈, 22 W at G¹/₄, 30 W at G¹/₂, 44 W at G1

Current consumption

0.5A at G¹/₈, 1.0A at G¹/₄, 1.25A at G¹/₂, 1.7A at G1

Command signal

0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA, digital or Profibus DB
rising curve as standard, optionally declining curve

Impedance

100 kΩ at voltage signal (0.1 mA current consumption)

500 Ω at current signal

Electrical connector

circular plug according to DIN 43651, 7-pin plug for analogue signal
16-pin plug for digital signal

Accuracy

Linearity/Hysteresis

< 1% FS

Response sensitivity

< 0.1% FS

Repeatability

< 0.1% FS

Over all accuracy

± 0.5%

Regulating time

< 1 s over the range, 70 ms at 10 to 90% or 90 to 10% of the range

Adjustment

Zero point

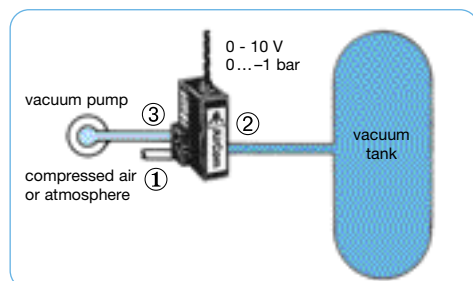
calibration ± 10% FS via potentiometer P2

Range

calibration + 5% FS or -10% FS via potentiometer P1

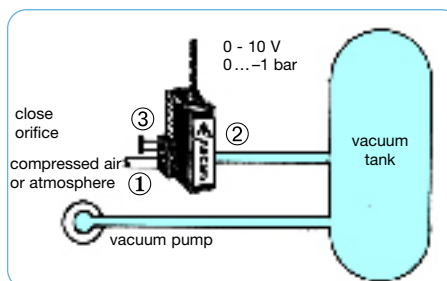
Amplification

calibration 1:1 up to 1:10 via potentiometer P7



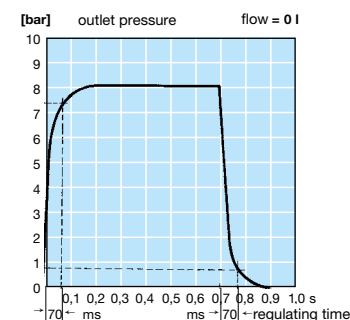
Downstream regulation (V1)

The vacuum pump saves energy and it is easy to fill the tank either with vacuum or pressure. A filter is recommended at orifice ①.

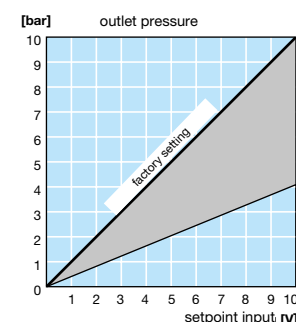


Upstream regulation (V2)

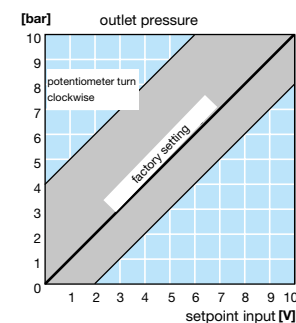
Upstream installation is preferred if rapid evacuation of a tank or system is required. A filter is recommended at orifice ①.



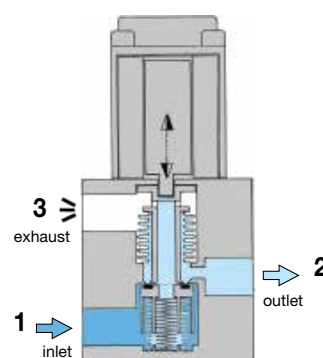
regulating time, step function



slope, range adjustment



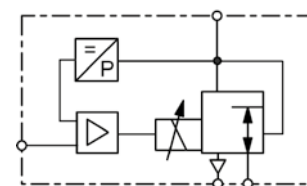
zero point, adjustment



cross-section

Technical features

• Pressure range	0 ... -1.0 bar to 0 ... 50 bar	• Linearity / Hysteresis	< 1% FS
• Command signal	0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA, digital	• Response sensitivity	± 0,5% FS
• Feedback signal	0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA	• Repeatability	± 0,5% FS
• Adjustment	zero point, range and amplification	• Regulating time	< 1 s
• Pressure sensors	100 / 500 mbar, 1/5/10/16/20/30/50 bar	• Power consumption	12 / 22 / 30 / 44 W
• Flow rate	250 / 820 / 1700 / 6500 l/min	• Exhaust	full nominal size



G¹/₈ up to G1
0 ... 100 mbar/50 bar

Dimensions			Nominal	K _v -	Flow	Supply	Connection	Pressure	Order	E*
A	B	C	size	value	rate	max.	thread	range	number	
mm	mm	mm	DN	(m³/h)	l/min*1	bar	G	bar		

Proportional pressure regulator

0-10 V input signal, supply voltage 24 V DC, with coupling socket

PR

35	80	63	3	0.18	210	-1	G ¹ / ₈	0 ... -1.0	PRA00-00V1
						-1		0 ... -0.5	PRA00-00V1A5
						-1		0 ... -0.1	PRA00-00V1A1
						3		-1,0 ... 1.0	PRA00-01V1
						1		0 ... 0.1	PRA00-A100
						2		0 ... 0.5	PRA00-A500
						2		0 ... 1.0	PRA00-0100
						12		0 ... 6.0	PRA00-0600
						12		0 ... 10	PRA00-1000
						22		0 ... 20	PRA00-2000
52	105	74	6	0.6	700	-1	G ¹ / ₄	0 ... -1.0	PR000-00V1
						-1		0 ... -0.5	PR000-00V1A5
						-1		0 ... -0.1	PR000-00V1A1
						3		-1,0 ... 1.0	PR000-01V1
						1		0 ... 0.1	PR000-A100
						2		0 ... 0.5	PR000-A500
						2		0 ... 1.0	PR000-0100
						12		0 ... 6.0	PR000-0600
						12		0 ... 10	PR000-1000
						18		0 ... 16	PR000-1600
						22		0 ... 20	PR000-2000
						40		0 ... 30	PR000-3000
						60		0 ... 50	PR000-5000
70	150	101	12	1.2	1400	-1	G ¹ / ₂	0 ... -1.0	PR100-00V1
						2		0 ... 1.0	PR100-0100
						12		0 ... 6.0	PR100-0600
						12		0 ... 10	PR100-1000
						14		0 ... 12	PR100-1200
96	190	115	20	4.8	5600	-1	G1	0 ... -1.0	PR200-00V1
						2		0 ... 1.0	PR200-0100
						12		0 ... 6.0	PR200-0600
						12		0 ... 10	PR200-1000
						14		0 ... 12	PR200-1200

*1 at 6 bar supply pressure and 5 bar outlet pressure

Technical details: see previous page

PDF CAD

* Product group



Order example:
PRA00-00V1



PRA



PR0



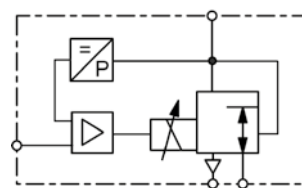
PR1



PR2

Technical features

• Pressure range	0 ... 1.0 bar to 0 ... 50 bar	• Linearity / Hysteresis	< 1% FS
• Command signal	0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA, digital	• Response sensitivity	± 0,5% FS
• Feedback signal	0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA	• Repeatability	± 0,5% FS
• Adjustment	zero point, range and amplification	• Regulating time	< 1 s
• Pressure sensors	100 / 500 mbar, 1/5/10/16/20/30/50 bar	• Power consumption	12 / 22 / 30 / 44 W
• Flow rate	250 / 820 / 1700 / 6500 l/min	• Exhaust	full nominal size



G¹/₈ up to G1
0 ... 100 mbar/50 bar

Special options, add the appropriate letter or number

input signal	0-20 mA		PR .. 1-
	4-20 mA		PR .. 2-
	8 bit digital with hold function		PR .. 3-
	Profibus DP	from G ¹ / ₄ on	PR .. 8-
feedback signal	0-10 V		PR . 1-
	0-20 mA		PR . 2-
	4-20 mA		PR . 3-
external feedback signal	0-10 V		PR . 4-
	0-20 mA		PR . 5-
	4-20 mA		PR . 6-
deviant pressure range	indicate on order		PR ... -XX. .
for vacuum	Bypass version	G ¹ / ₈ and G ¹ / ₄	PR ... - . V2
		G ¹ / ₂	PR1. . . . V2
		G1	PR2. . . . V2
for absolute pressure			PR 0A
protection class IP65	special cable box, PRK-IP65		PR 06
body made of stainless steel	valve body and inner parts , 1.4304, EPDM seals, G ¹ / ₄ and G ¹ / ₂		PR SS
body made of aluminium	nly valve body, max. 20 bar	G ¹ / ₄ only	PR 19
for oxygen	specially cleaned, FKM elastomer		PR 15



example: combination PR with booster

Accessories, enclosed

coupling socket	7-pin with 2 m cable	straight	PRK-A2L
	7-pin with 5 m cable	straight	PRK-A5L
	7-pin with 2 m cable, IP65	straight	PRK- I 2L
	7-pin with 2 m cable	angular	PRK-C2L
	7-pin with 5 m cable	angular	PRK-C5L
other cable length	e.g. 10 m available		

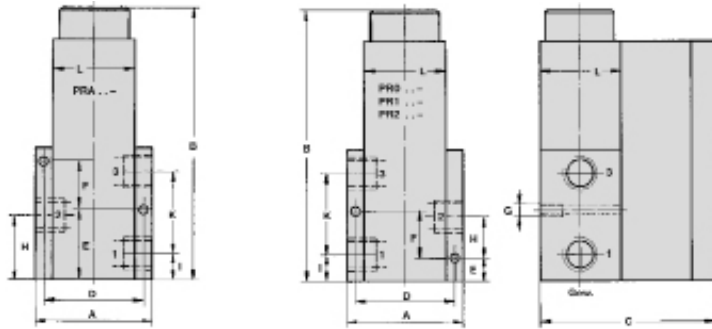


PRK-A

PRK-C



DIMENSIONS AND CONNECTION DIAGRAM "AIRTRONIC"®



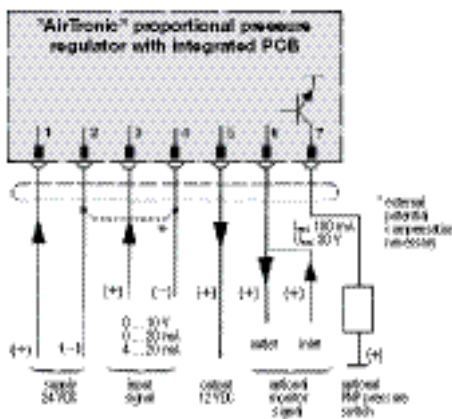
1: inlet
2: outlet
3: exhaust

Proport. regulator	thread	A	B	C	D	E
PRA ...	G 1/8	35	80	63	29	18
PR0 ...	G 1/4	52	105	74	43	10
PR1 ...	G 1/2	70	150	101	57.5	12
PR2 ...	G 1	96	190	115	79	15

Proport. regulator	F	G	H	I	K	L
PRA ...	7	M 4	15	10	16.6	25
PR0 ...	20	M 4	16	11*	34	36
PR1 ...	28	M 6	23	15	48.5	45
PR2 ...	33	M 8	30	20	60	60

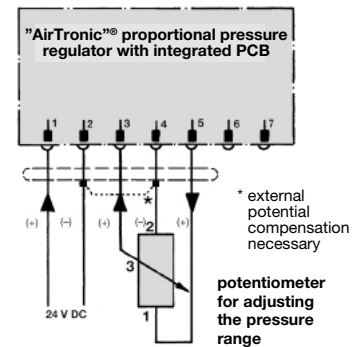
* 14 mm from 30 bar pressure range on

"AIRTRONIC"® PROPORTIONAL PRESSURE REGULATOR WITH INTEGRATED PCB



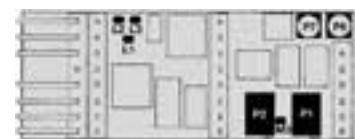
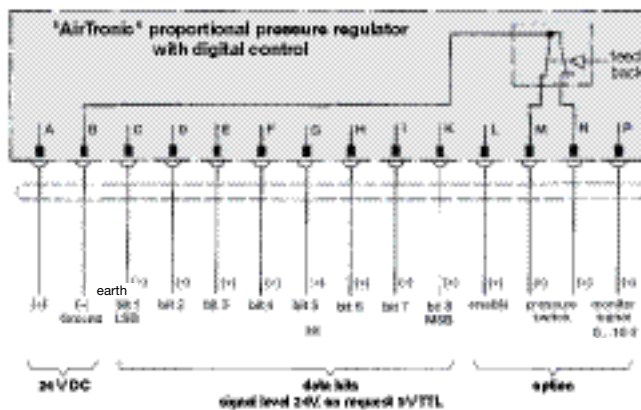
pin	4-wire	7-wire
1	white	grey
2	brown	blue
3	yellow	yellow
4	green	green
5	-	brown
6	-	white
7	-	pink

pin numbers seen from solder pin side



"AIRTRONIC"® CONNECTION DIAGRAM

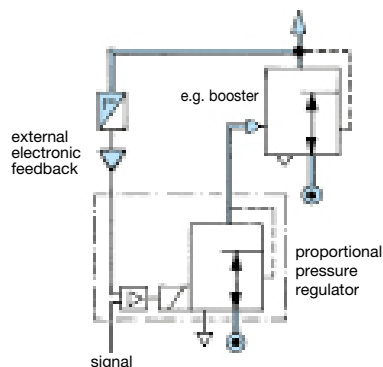
CONNECTION DIAGRAM WITH POTENTIOMETER



P1 range:	-10%...+5%
P2 zero point:	± 10%
P6 option pressure switch:	5...15%
P7 proportional amplification:	1...11
M3 measuring point offset zero	
L1 earth (GND)	
L2 solenoid	+24 V
L3 solenoid (pulse width modulation)	PWM

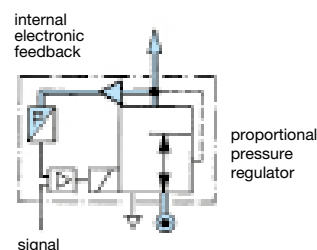
CONNECTION DIAGRAM FOR DIGITALLY CONTROLLED PROPORTIONAL PRESSURE REGULATOR

ADJUSTMENT OF THE PROPORTIONAL REGULATOR



EXTERNAL ELECTRONIC FEEDBACK

0 ... 10 V or 0/4 ... 20 mA



INTERNAL ELECTRONIC FEEDBACK

as standard