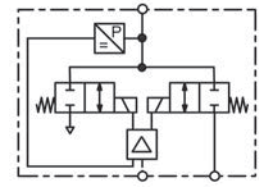


Proportional Pressure Regulator with Single or Double Loop, Accurate to 0.2% PQ

Technical features

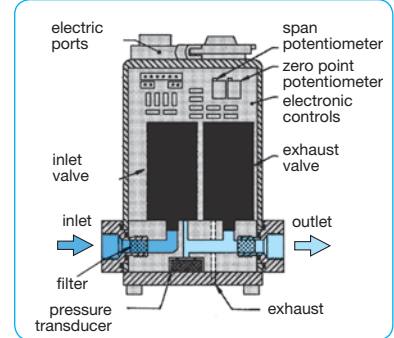
• Pressure range	0... 10 mbar up to 0... 35 bar	• Linearity	± 0.15% FS
• Input signal	0... 10 V and 4... 20 mA	• Hysteresis	± 0.15% FS
• Security	constant outlet pressure at voltage drop	• Response sensitivity	< 0.1% FS
• Response time	10 to 15 ms	• Repeatability	± 0.02% FS
• Adjustment	zero point and span	• Protection class	IP 65
• Sensitivity	immune to shock and vibration up to 90 g	• Air consumption	without constant bleed



accurate to 0.2%

General technical features

Description	Two solenoid valves control the system pressure. One valve is for inlet control, the other for outlet control. A strain gauge pressure transducer measures system pressure and provides a feedback signal to the electronic controls. Any difference between command and feedback signals causes one of the solenoid valves to open, causing system pressure to increase or decrease.		
Mounting position	any, immune to shock and vibration up to 90 g		
Protection class	IP 65 housing		
Temperature range	-5 °C to 70 °C / 23 °F to 158 °F		
Material	Body: aluminium	Elastomer: FKM	Ports: brass
	Transducer: aluminium and silicon	Valves: nickel-plated brass	



cross section PQ1

Pneumatic features

Media	dry, oil-free and 5 µm filtered compressed air or non-corrosive gases
Supply pressure	see chart, minimum 10% above outlet pressure
Flow rate	35 l/min at 7 bar supply pressure and open outlet, optionally 100 l/min 3 l/min at controlled outlet pressure
Exhaust	same nominal size as on inlet valve, thus same relief capacity
Air consumption	without constant bleed

Electrical features

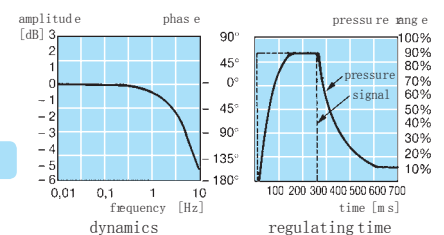
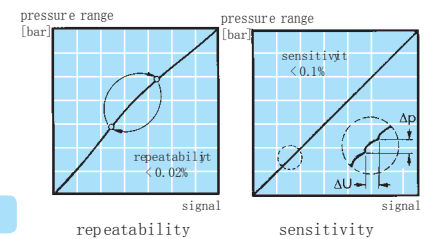
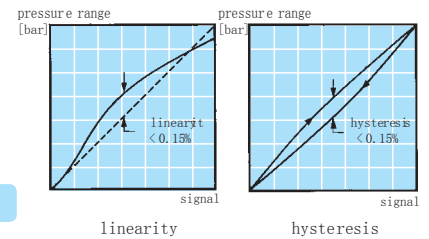
Supply voltage	15 ... 24 V DC, reverse voltage protection existing		
Power consumption	3.6 W for regulation, 0.5 W non-regulating		
Command signal	0 ... 10 V, optionally 4 ... 20 mA		
Command signal impedance	4.7 kΩ at voltage signal, 100 Ω at current signal	100 Ω at current signal, 100 Ω at voltage signal,	for external feedback
Monitor signal impedance	4.7 kΩ at voltage signal, 100 Ω at current signal		
Electrical connector	plug M16x0.75, 7-pin, with coupling socket		
Monitor signal	0 ... 10 V, optionally 4 ... 20 mA		
Security	constant outlet pressure at voltage drop		

Accuracy

Linearity/Hysteresis	± 0.15% FS
Response sensitivity	< 0.1% FS
Response time	10 to 15 ms
Repeatability	± 0.02% FS
Temperature influence	< 0.01% FS per °C/K at 0 °C to 50 °C / 32 °F to 122 °F < 1.00% FS per °C/K at 50 °C to 70 °C / 122 °F to 158 °F
Regulating time	< 2 s to fill 0.1 l volume to 90% of the initial pressure (or to exhaust) < 40 s to fill 2 l volume to 90% of the initial pressure (< 80 s to exhaust)

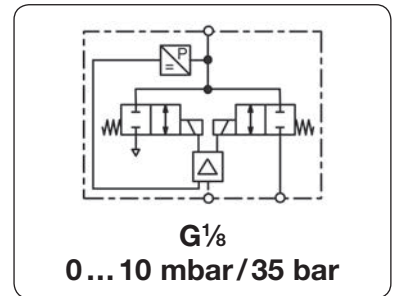
Adjustment

Zero point	The zero point can be increased by up to 20% of full scale, e.g. from 0 bar to 1.2 bar at a 6 bar regulator. External adjustment via potentiometer Z "zero".
Span	The maximum pressure value of the control range can be reduced by up to 20% depending on the selected pressure range, e.g. from 6 to 4.8 bar. External adjustment via potentiometer S "span".



Proportional Pressure Regulator with Single Loop, Accurate to 0.2% PQ1

Description	The pneumatic proportional valve produces outlet pressure in proportion to an electrical command input signal. It comprises a complete closed loop servo system consisting of valves, manifold, housing and electronic controls.
Single loop	Pressure is controlled by two solenoid valves. One valve functions as inlet control, the other as exhaust. The pressure outlet is measured by an internal pressure transducer which provides a feedback signal to the electronic controls. This feedback signal is compared with the command input signal. Any difference between the two signals causes one of the two solenoid valves to open, allowing flow into or out of the system. Accurate pressure is maintained by these two valves.
Accuracy	Linearity / Hysteresis: 0.2% from 400 mbar Response sensitivity: < 0.1% FS Repeatability: < 0.02% FS



Dimensions			Flow rate	Supply pressure	Accuracy	Connection thread	Pressure range	Order number
A	B	C	l/min*1	max. mbar/bar*2	%	G	mbar/bar	

Single loop regulator			0 ... 10 V input and feedback signal, supply voltage 24 V DC, 35 l/min*1, with coupling socket			PQ1		
68	96	18	35	20 mbar	5	G ¹ / ₈	0 ... 10 mbar	PQ1EE-B1
				40 mbar	3		0 ... 20 mbar	PQ1EE-B2
				100 mbar	1		0 ... 50 mbar	PQ1EE-B5
				200 mbar	0.8		0 ... 100 mbar	PQ1EE-C1
				400 mbar	0.5		0 ... 200 mbar	PQ1EE-C2
				800 mbar	0.2		0 ... 400 mbar	PQ1EE-C4
			1000 mbar	0.2		0 ... 600 mbar	PQ1EE-C6	
68	96	18	35	2 bar	0.2	G ¹ / ₈	0 ... 1 bar	PQ1EE-01
				3 bar			0 ... 2 bar	PQ1EE-02
				9 bar			0 ... 4 bar	PQ1EE-04
				9 bar			0 ... 6 bar	PQ1EE-06
				9 bar			0 ... 8 bar	PQ1EE-08
				15 bar			0 ... 10 bar	PQ1EE-10
				15 bar			0 ... 12 bar	PQ1EE-12
				24 bar			0 ... 16 bar	PQ1EE-16
				24 bar			0 ... 20 bar	PQ1EE-20
				38 bar			0 ... 25 bar	PQ1EE-25
				38 bar			0 ... 30 bar	PQ1EE-30
				38 bar			0 ... 35 bar	PQ1EE-35
				68	96		18	35
2 bar		-1 ... +1 bar	PQ1EE-V1					



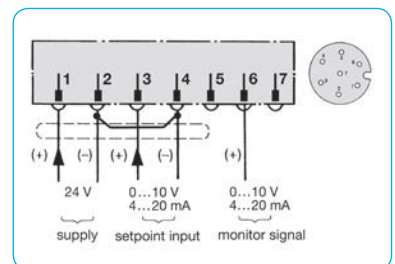
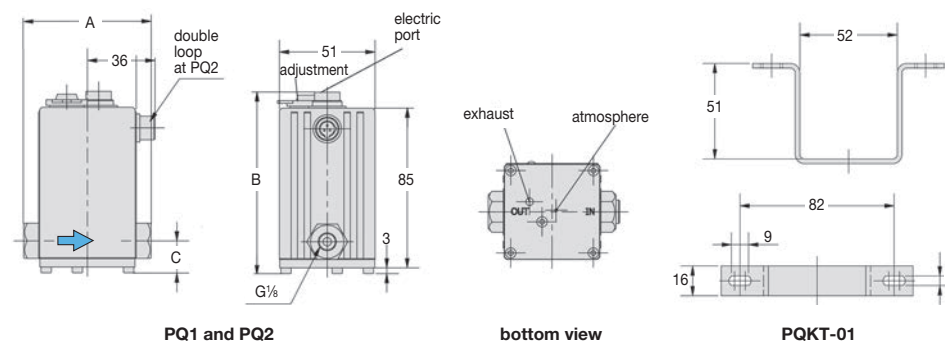
Special options, add the appropriate letter or number

4...20 mA	input and monitor signal	PQ1 IC-...
flow 100 l/min	increased flow rate	PQ1...HF
continuous regulation	improved characteristic curve through proportional inlet valve, max. 10 bar	PQ1...X58
declining curve	inverted outlet	PQ1...X59



Accessories, enclosed

coupling socket	M16x0.75, 7-pin with 2 m cable	straight	PRK-A2L
		angular	PRK-C2L
mounting bracket	made of steel		PQKT-01



*1 at 7 bar supply pressure and open outlet, at regulated flow rate of 3 l/min

*2 higher supply pressures on request



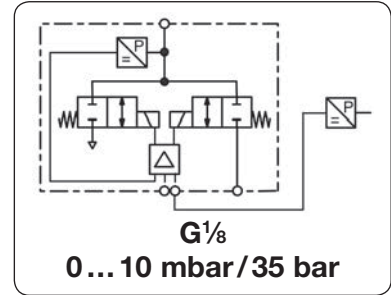
Order example:
PQ1EE-B1
China website: www.duray-control.cn

Proportional Pressure Regulator with Double Loop, Accurate to 0.2% PQ2

Description The pneumatic proportional valve produces outlet pressure in proportion to an electrical command input signal. It comprises a complete closed loop servo system consisting of valves, manifold, housing and electronic controls.

Double loop The servo valve expands in single loop operation by combining an additional feedback from an external sensing device with the internal transducer. The external sensor provides information on the control status. The PQ2 then compares the command signal with the second loop feedback signal. Should there be a difference in the signal comparisons, the servo valve will make adjustments to the internal loop to bring the system into balance. This provides accurate final outlet. The acceptance of electrical feedback from an external sensor enables precise control of conditions such as pressure, force, torque, position or flow.

External pressure transducer An auxiliary electrical receptacle is integrated into the device for external feedback. If using PQ2 in conjunction with a volume booster, Duray pressure transducers are ideal for the second loop feedback signal.



Dimensions			Flow rate	Supply pressure	Accuracy	Connection thread	Pressure range	Order number
A	B	C						
mm	mm	mm	l/min*1	max. mbar/bar*2	%	G	mbar/bar	

Double loop regulator				0 ... 10 V input / feedback / second loop signal, supply voltage 24 V DC, 35 l/min*1, with both coupling sockets				PQ2
66	96	18	35	20 mbar	5	G ¹ / ₈	0 ... 10 mbar	PQ2EE-B1
				40 mbar	3		0 ... 20 mbar	PQ2EE-B2
				100 mbar	1		0 ... 50 mbar	PQ2EE-B5
				200 mbar	0.8		0 ... 100 mbar	PQ2EE-C1
				400 mbar	0.5		0 ... 200 mbar	PQ2EE-C2
				800 mbar	0.2		0 ... 400 mbar	PQ2EE-C4
				1000 mbar	0.2		0 ... 600 mbar	PQ2EE-C6
66	96	18	35	2 bar	0.2	G ¹ / ₈	0 ... 1 bar	PQ2EE-01
				3 bar			0 ... 2 bar	PQ2EE-02
				9 bar			0 ... 4 bar	PQ2EE-04
				9 bar			0 ... 6 bar	PQ2EE-06
				9 bar			0 ... 8 bar	PQ2EE-08
				15 bar			0 ... 10 bar	PQ2EE-10
				15 bar			0 ... 12 bar	PQ2EE-12
				24 bar			0 ... 16 bar	PQ2EE-16
				24 bar			0 ... 20 bar	PQ2EE-20
				38 bar			0 ... 25 bar	PQ2EE-25
				38 bar			0 ... 30 bar	PQ2EE-30
				38 bar			0 ... 35 bar	PQ2EE-35
66	96	18	35	0 bar	0.2	G ¹ / ₈	0 ... -1 bar	PQ2EE-V0
				2 bar			-1 ... +1 bar	PQ2EE-V1



PQ2



combination example:
booster with proportional valve and second loop via pressure transducer

Special options, add the appropriate letter or number

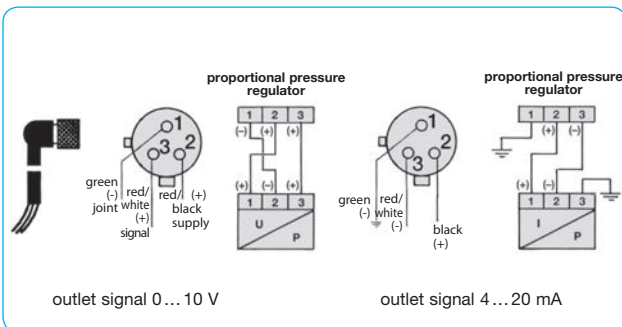
4 ... 20 mA	input / feedback / second loop signal	PQ2 IC- . . .
flow 100 l/min	increased flow rate	PQ2 HF
continuous regulation	improved characteristic curve through proportional inlet valve, max. 10 bar	PQ2 X58
declining curve	inverted outlet	PQ2 X59

Accessories, enclosed

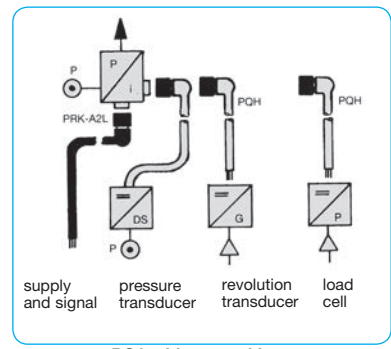
coupling socket	M16x0.75, 7-pin with 2.0 m cable, supply and signal, straight	PRK-A2L
		PRK-C2L
coupling socket	1/2" UNF, 3-pin with 0.9 m cable, for second loop, straight	PQH-L1
		PQH-L2
mounting bracket	made of steel, angular	PQKT-01



PRK-A PRK-C



connection diagram for second electrical loop



PQ2 with second loop

*1 at 7 bar supply pressure and open outlet at regulated flow rate of 3 l/min

*2 higher supply pressures on request



Order example:
PQ2EE-B1
China website: www.duray-control.cn

