

PROPORTIONAL FLOW VALVES AND MEASUREMENT DEVICE

Prop.-V.



11

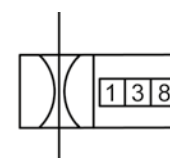
	DESCRIPTION	DN/ Ø	FLOW RATE l/min	CONNECTION thread	SERIES	PAGE
MEASURING DEVICE	portable		0.02 ... 0.1 / 450	G¼ u. G½	VGM	11.02
	portable, hand-operated		0.02 ... 0.1 / 450	G¼ u. G½	VGR	11.03
PROP. FLOW VALVES	w/o power consumption	0.2 /.../ 1.5	0 ... 3 / 24	M5	PVK	11.05
	motorised, for liquids	15 / 20	0 ... 1000 / 3500	G½ - G1	P8	11.06
	for air and water	0.1 /.../ 20	0 ... 0.3 / 1185	G½ - G1	PV21...PV40	11.08
	pulse-width-modulated, mini	0.2 /.../ 0.8	0 ... 1 / 20	Flansch	PV202	11.10
	stainless steel	1.2 / 7.1	0 ... 70 / 420	G½ - G¾	PV202-S	11.10
	for water	12.5	0 ... 35 / 37	G¾ u. G½	PV203	11.10
NEEDLE VALVES	compact	Ø 1.0 - 6.5	0 ... 0,3 / 425	G¼ u. G½	VR6	11.04
	Edelstahl, miniatur	Ø 3.0 - 4.5	0 ... 32	Nippel	NV30	20.02
QUETSCHVENTILE	POM or Aluminium			G¾ - G3, DN150	Q	11.11
	stainless steel			G¼ - G2	QE	15.37



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Description	Thermal mass flow meter based on high precision MEMS technology (CMOS sensor). Pressure and temperature-insensitive according to the CTA constant temperature principle. Also insensitive to pressure surges.		
Media	compressed air or non-corrosive gases	Operating pressure	max. 10 bar
Supply voltage	Standard AA battery or Micro-USB power supply (DIN62684), optionally external power +12 ...+30 V DC (max. 200 mA)		
Display	Touch-display 128 x 64 px, backlit only with external power supply (Micro-USB or 24 V DC)		
Electrical connector	optionally length 2.0 m, with free ends at 24 V DC	Function	totalisator included, physical units can be changed
Alarm functions	3 configurable alarms, programmable as : low alarm, high alarm, window alarm and totalizer alarm. The alarms can be configured with different parameters: delay and alarm duration. Relais: switching current up to 1A, switching voltage 30 V DC		
Accuracy	± 2% FS, from 200 l/min ± 3% FS	Response time	500 ms at 99% accuracy
Turndown ratio	1:50 (Eco) or 1:1000 (Special)	Protection class	IP 50
Flow regulation	manual fine adjustment by 15 turns	Mounting position	any, horizontal from 5 bar on
Temperature range	0 °C to 50 °C / 32 °F to 122 °F	Warm-up time	< 1 sec. for full accuracy
Material	Body: aluminium, optionally electropolished stainless steel 316 Elastomer: FKM, optionally EPDM		



**2 ... 100 ml/min/450 l/min
compressed air or gases
accurate to 2%**



**VGM-G_{1/4}
mass flow meter**



**VGM-G_{1/2}
mass flow meter**

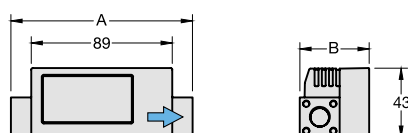
Specific gas calibration			
gas species			max. l/min
nitrogen	07	N ₂	450
oxygen	15	O ₂	450
argon	05	Ar	300
helium	09	He	450
hydrogen	11	H ₂	300
carbon dioxide	03	CO ₂	150
propane	16	C ₃ H ₈	80
methane	13	CH ₄	100

Dimensions			Operating pressure	Accuracy	Connection thread	Flow rate	Order number
A	B	C	max. bar	%	G	ml/min / l/min	
mm	mm	mm					

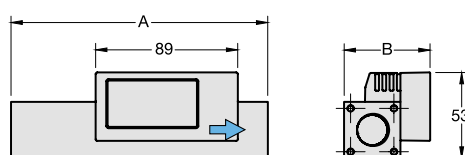
Mass flow meter						w/o manual control valve, LCD-Display, battery mode, portable, aluminium, FKM	VGM*1
114	44	12.5	10	2	G _{1/4}	2 ... 100 ml/min	VGM-A1
				2		4 ... 200 ml/min	VGM-A2
				2		10 ... 500 ml/min	VGM-A5
				2		0.02 ... 1 l/min	VGM-B1
				2		0.04 ... 2 l/min	VGM-B2
				2		0.1 ... 5 l/min	VGM-B5
				2		0.2 ... 10 l/min	VGM-C1
				2		0.4 ... 20 l/min	VGM-C2
				2		1 ... 50 l/min	VGM-C5
160	54	17.5	10	2	G _{1/2}	2 ... 100 l/min	VGM-D1
				2		4 ... 200 l/min	VGM-D2
				3		4 ... 300 l/min	VGM-D3
				3		9 ... 450 l/min	VGM-D4

Special options, add the appropriate letter oder number

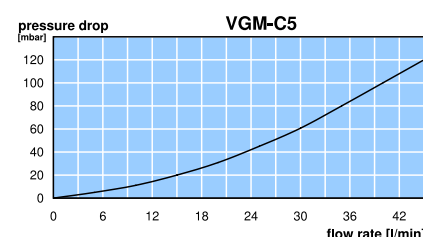
deviant volume flow	indicate on order	VGM-XX
limit switch	min. / max.-alarm, 1 A SPDT switch, incl. 24 V DC supply	VGM- . . G2
stainless steel body	1.4305, electropolished throughout (<1,6 µm)	VGM- . . S
EPDM elastomer	(FDA) for VGM-A1 to -C5	VGM- . . E
24 V DC supply	cable attached on the device, length 2 m, with free ends	VGM- . . 2
panel mounting	cut-out 48 x 96 mm, protection class IP50 in the front	VGM- . . T
1% accuracy	for G _{1/4}	VGM- . . H
carbon dioxide	CO ₂	VGM- . . 03
argon	Ar	VGM- . . 05
nitrogen	N ₂	VGM- . . 07
helium	He	VGM- . . 09
hydrogen	H ₂	VGM- . . 11
methane	CH ₄	VGM- . . 13
oxygen	O ₂	VGM- . . 15
propane	C ₃ H ₈	VGM- . . 16
nitrous oxide	N ₂ O	VGM- . . 17
gases	see above for G _{1/2}	VGM- D . .



VGM-A/-B/-C



VGM-D



* Product group

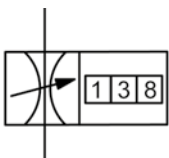
Calibration or test chart: see chapter for technical informations
*1 Note: indicate media, supply and outlet pressure on order

PDF CAD
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Order example:
VGM-A1

Description	Thermal mass flow meter based on high precision MEMS technology (CMOS sensor). Pressure and temperature-insensitive according to the CTA constant temperature principle. Also insensitive to pressure surges.		
Media	compressed air or non-corrosive gases		
Supply voltage	Standard AA battery or Micro-USB power supply (DIN62684), optionally external power +12 ...+30 V DC (max. 200 mA)		
Display	Touch-display 128 x 64 px, backlit only with external power supply (Micro-USB or 24 V DC)		
Electrical connector	optionally length 2.0 m, with free ends at 24 V DC		
Alarm functions	3 configurable alarms, programmable as : low alarm, high alarm, window alarm and totalizer alarm. The alarms can be configured with different parameters: delay and alarm duration. Relais: switching current up to 1A, switching voltage 30 V DC		
Accuracy	± 2% FS, from 200 l/min ± 3% FS		
Turndown ratio	1:50 (Eco) or 1:1000 (Special)		
Flow regulation	manual fine adjustment by 15 turns		
Temperature range	0 °C to 50 °C / 32 °F to 122 °F		
Material	Body: aluminium, optionally electropolished stainless steel 316		
	Response time	500 ms at 99% accuracy	
	Protection class	IP 50	
	Mounting position	any, horizontal from 5 bar on	
	Warm-up time	< 1 sec. for full accuracy	
		Elastomer: FKM, optionally EPDM	

**2 ... 100 ml/min/450 l/min
compressed air or gases
accurate to 2%**

Prop.-V.
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Dimensions			Operating pressure	Accuracy	Connection thread	Flow rate	Order number
A	B	C	max. bar	%	G	ml/min / l/min	
mm	mm	mm					

Mass flow meter			with manual control valve, LCD-Display, needle valve battery mode, portable, aluminium, FKM			VGR*1	
114	44	12.5	10	2	G¼	2 ... 100 ml/min	VGR-A1
				2		4 ... 200 ml/min	VGR-A2
				2		10 ... 500 ml/min	VGR-A5
				2		0.02 ... 1 l/min	VGR-B1
				2		0.04 ... 2 l/min	VGR-B2
				2		0.1 ... 5 l/min	VGR-B5
				2		0.2 ... 10 l/min	VGR-C1
				2		0.4 ... 20 l/min	VGR-C2
				2		1 ... 50 l/min	VGR-C5
160	54	17.5	10	2	G½	2 ... 100 l/min	VGR-D1
				2		4 ... 200 l/min	VGR-D2
				3		4 ... 300 l/min	VGR-D3
				3		9 ... 450 l/min	VGR-D4



VGR-G¼
mass flow meter
with manual control valve

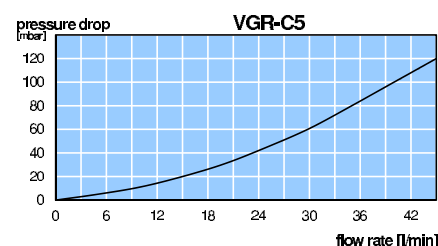
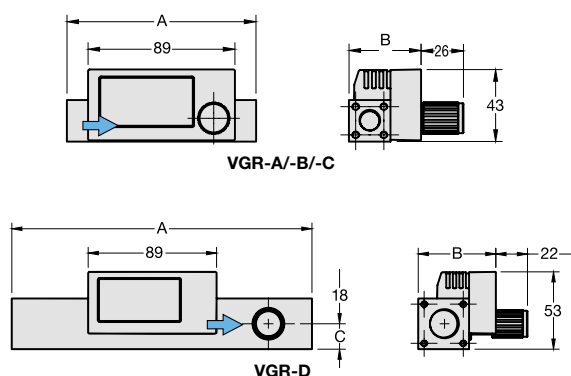


VGR-G½
mass flow meter

Special options, add the appropriate letter oder number

deviant volume flow	indicate on order	VGR-XX
limit switch	min. / max.-alarm, 1 A SPDT switch, incl. 24 V DC supply	VGR- . . G2
stainless steel body	1.4305, electropolished throughout (<1,6 µm)	VGR- . . S
EPDM elastomer	(FDA) for VGR-A1 to -C5	VGR- . . E
24 V DC supply	cable attached on the device, length 2 m, with free ends	VGR- . . 2
panel mounting	cut-out 48 x 96 mm, protection class IP50 in the front	VGR- . . T
1% accuracy	for G¼	VGR- . . H
carbon dioxide	CO ₂	VGR- . . 03
argon	Ar	VGR- . . 05
nitrogen	N ₂	VGR- . . 07
helium	He	VGR- . . 09
hydrogen	H ₂	VGR- . . 11
methane	CH ₄	VGR- . . 13
oxygen	O ₂	VGR- . . 15
propane	C ₃ H ₈	VGR- . . 16
nitrous oxide	N ₂ O	VGR- . . 17
gases	see above for G½	VGR- D . .

Specific gas calibration			
gas species			max. l/min
nitrogen	07	N ₂	450
oxygen	15	O ₂	450
argon	05	Ar	300
helium	09	He	450
hydrogen	11	H ₂	300
carbon dioxide	03	CO ₂	150
propane	16	C ₃ H ₈	80
methane	13	CH ₄	100



* Product group

Calibration or test chart: see chapter for technical informations
*1 Note: indicate media, supply and outlet pressure on order

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Order example:
VGR-A1



Description	The modular, compact micro needle valve is for fine-flow adjustment of gases and liquids. It consists of an inner valve and body with straight or angle connector. The valve is free from oil and grease.		
Media	5 µm filtered compressed air, non-corrosive gases or liquids		
Operating pressure	vacuum up to positive pressure of max. 40 bar		
Adjustment	The micro valve has a 15-turn spindle to fully open from a closed condition. It operates with virtually no hysteresis and closes clockwise or optionally counterclockwise. The valve needle is non-rotating and thus provides a stable adjustment.		
Panel mounting	borehole 15 mm,	mounting through two screws M4x10	
Temperature range	-40 °C to 100 °C / -40 °F to 212 °F		
Material	Body: anodized aluminium, optionally stainless steel	Elastomer: FKM, optionally EPDM	
	Inner valve: nickel-plated brass, optionally stainless steel	Knob: plastic	



Ø 1/6.5 mm
compressed air or liquids

Dimensions			Needle size mm	K _v -value (m³/h)	Flow rate		Connection thread G	Order number	D*
A	B	C			water l/min*2	air l/min*1			
mm	mm	mm	mm						

Precision needle valve					with straight pass, right-hand closing, with knob, aluminium/brass/FKM, supply: max. 40 bar			VR	
54	64	10	1.0	0.0007	0... 0.01	0... 0.3	G¼	VR6-02A	
			1.5	0.005	0... 0.10	0... 2.5		VR6-02B	
			2.0	0.01	0... 0.15	0... 7.0		VR6-02C	
			2.5	0.04	0... 0.60	0... 17		VR6-02D	
			3.0	0.10	0... 2.30	0... 60		VR6-02E	
62	80	17.5	4.0	0.58	0... 8.00	0... 250	G½	VR6-04A	
			6.5	1.00	0... 16	0... 425		VR6-04B	



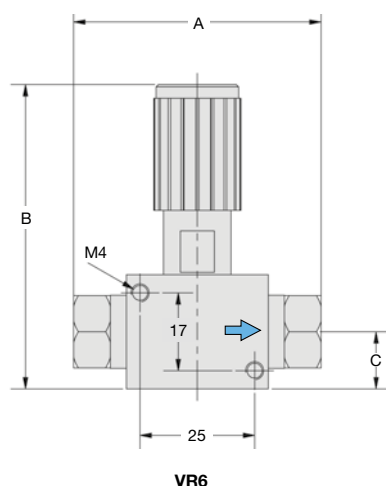
VR6-02

Special options, add the appropriate letter

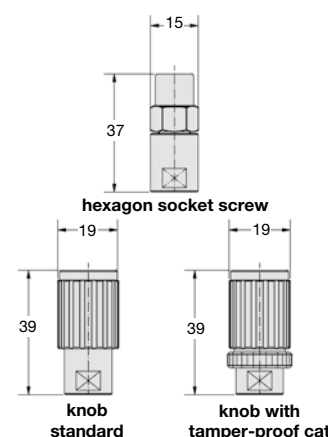
stainless steel body	body and valve made of stainless steel 316	for G¼	VR6-02.S	
EPDM elastomer	SST body only	for G¼	VR6-02.SE	
FFKM elastomer	SST body only	for G¼	VR6-02.SX29	
amper-proof cap	on valve with knob, standard		VR6-0..T	
hexagon socket screw	and locknut		VR6-0..I	
rotary knob with display	100 graduation, with star grip		VR6-0..R	+12,00



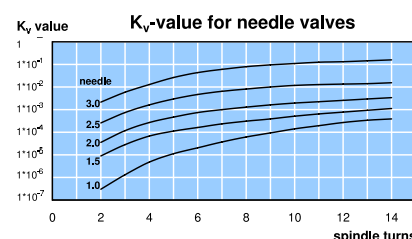
VR6-04



VR6



Options



*1 at 1 bar operating pressure and open outlet
*2 at 1 bar pressure difference



Description	Small proportional flow valve for regulating both air and non-corrosive gases. Voltage signal 10 V as standard or optionally 5 V or 20 V DC.				
Media	50 µm filtered compressed air or non-corrosive gases				
Operating pressure	see chart, max. 7 bar				
Electrical specification	command signal	max. voltage	resistance	current consumption	power consumption
	0 - 5 V DC	0 - 6.2 V DC	13 Ω	0 - 370 mA	1.9 W
	0 - 10 V DC	0 - 12.4 V DC	54 Ω	0 - 185 mA	1.9 W
	0 - 20 V DC	0 - 24.8 V DC	218 Ω	0 - 92 mA	1.9 W
Electrical connection	solder lug or terminal lug, 2.5 x 0.5 mm				
Mounting position	any				
Hysteresis	± 10% FS		Repeatability ± 3% FS		
Temperature range	0 °C to 60 °C / 32 °F to 140 °F				
Material	Body: nickel-plated brass Inner valve: stainless steel and brass		Elastomer: NBR/Buna-N, optionally FKM or EPDM		

Dimensions			Nominal size	K _v -value	Flow rate	Operating pressure	Connection thread	Order number
A	B	C	DN	(m³/h)	l/min*1	max. bar	M5	
mm	mm	mm						

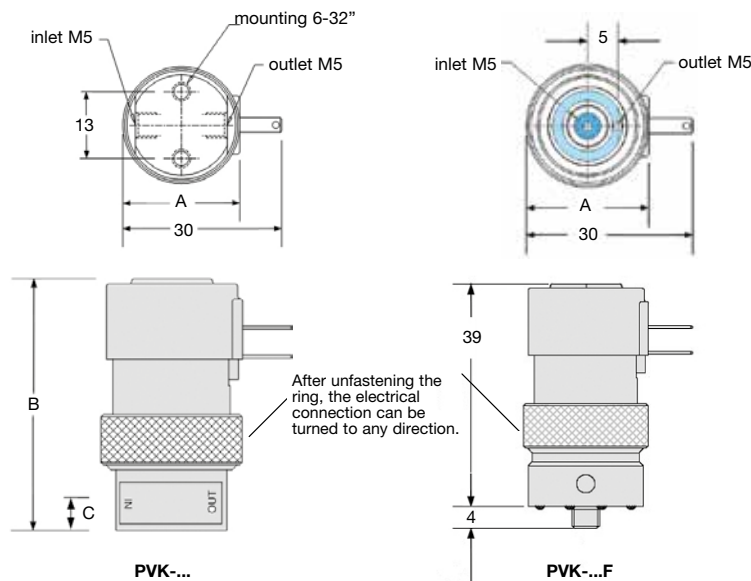
Volume flow regulator M5								PVK
0-10 V DC, 2-port/2-way valve for compressed air or non corrosive gases, with terminal lug, brass, NBR/Buna-N								
20	40	5	0.2	0.03	0...3	1.7	M5	PVK-092
						3.5		PVK-093
						7.0		PVK-097
20	40	5	0.3	0.07	0...7	1.7	M5	PVK-132
						3.5		PVK-133
						7.0		PVK-137
20	40	5	0.6	0.24	0...24	1.7	M5	PVK-252
						3.5		PVK-253
						7.0		PVK-257
20	40	5	1.0	0.18	0...19	1.7	M5	PVK-402
						3.5		PVK-403
20	40	5	1.5	0.14	0...14	1.7	M5	PVK-602

Special options, add the appropriate letter

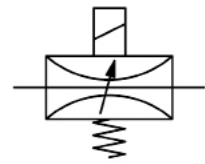
0 - 5 V	input signal max. 6.2 V,	0 - 370 mA,	13 Ω	PVK-. . .A
0 - 20 V	input signal max. 25 V,	0 - 92 mA,	218 Ω	PVK-. . .C
flange connection	for panel mounting			PVK-. . .F
FKM elastomer				PVK-. . .V
EPDM elastomer				PVK-. . .E

Accessories, enclosed

manifold block for valve with flange connection, for 2, 4 ... 12 valves



*1 at max. current consumption and max. operating pressure



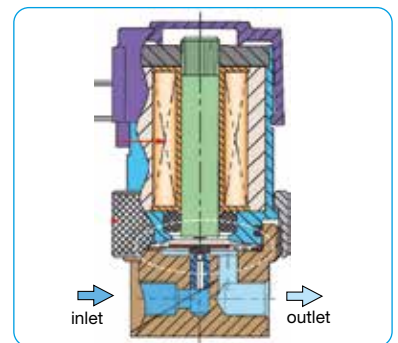
DN 0.2 up to DN 1.5
0 - 5 / 10 / 20 V DC



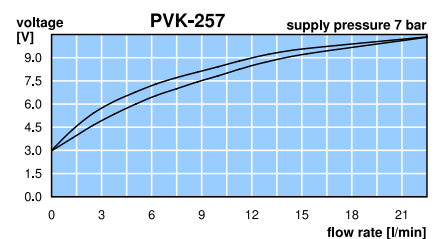
PVK-257
with M5 connection



PVK-092AF
with flange connection



cross section



* Product group

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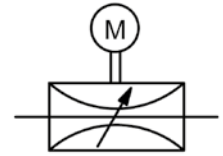
Order example:
PVK-092

Prop.-V.



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Description	Motorised proportional flow valve with low power consumption and resistance to contamination. Throttle setting by wear-resistant control drives made of oxide ceramic. Throttling occurs with drip-tight zero shut-off but no gas tightness.	
Media	compressed air, vacuum or liquids up to viscosity of 40 mm ² /s	Hysteresis ± 4%
Operation	DC, synchronous or stepping motor with standard voltage of 24 V DC or AC 10% residual ripple. All motors fulfil standards EN 61000-6-3, EN 61000-6 and 2014/30/EU.	
DC motor (15 / 24)	Motor with feedback potentiometer for servo-amplifier. Resistor 1kΩ ± 20 %, control e.g. by servo-amplifier. Only part of potentiometer range is used. Voltage for potentiometer: 12 V, max. 10 mA.	
DC motor (50 / 51)	With integrated position controller. Setpoint input using jumpers: 0...10 V, 0/4...20 mA. Input resistance: 200 kΩ at voltage signal, 500 Ω at current signal.	
Stepper motor (38)	Bipolar, by means of SAA1042A (Motorola) with drop resistance of 44 Ω per phase at a driver (full-step) operating voltage of 24 V ± 5%. 2028 steps for 90° control disc turn, 200 Hz nominal step frequency.	
Temperature range	-10 °C to 90 °C / 14 °F to 194 °F	
Material	Body: brass Elastomer: NBR/Buna-N, optionally FKM or EPDM	Protection class IP 54 Control discs: oxide ceramic Mounting position: vertical upwards ± 60 °C



G¹/₂ up to G1
compressed air or liquids

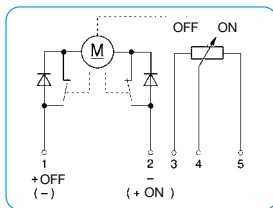
Dimensions			Nominal size	K _v -value	Flow rate		Supply max.	Connection thread	Order number
A	B	C	DN	(m ³ /h)	water l/min*1	air l/min*1	bar	G	
mm	mm	mm							

Proportional flow valve					DC motor type 50, with potentiometer, 120 Ncm, 24 V DC, switching time 5 s ^{*2}				P8
65	147	13	15	1.1	0...20	0...1 000	16	G½	P822-50
65	147	13	20	3.4	0...60	0...3 000	6	G½	P82A-50
95	164	24	20	4.4	0...70	0...3 500	6	G¾	P823-50
95	164	24	20	4.4	0...70	0...3 500	6	G1	P824-50

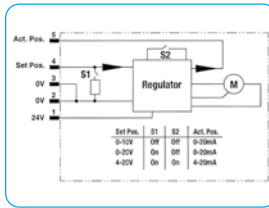
Special options, add the appropriate letter

cartridge installation instead of thread for DN 15 P825-..

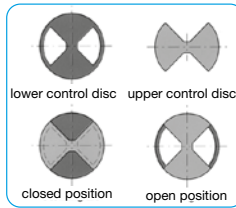
Description	Figure-No.	Watt	Δp max./Torque	Switching time*2
DC motor w/ potentiometer, 120 Ncm	①	1,5 W	10 bar/120 Ncm f. G ¹ / ₂	10-14 s
DC motor w/ potentiometer, 120 Ncm	①	1,5 W	6 bar/120 Ncm f. G ³ / ₄ , G1	10-14 s
DC motor w/ controllerr	②	3,8 W	16 bar/220 Ncm f. G ¹ / ₂	10-11 s
AC motor 50 Hz	③	3,0 W	6 bar/120 Ncm f. G ³ / ₄ , G1	10 s
stepper motor	④	5,0 W	6 bar/120 Ncm f. G ³ / ₄ , G1	10 s
FKM elastomer				P82...V
EPDM elastomer				P82...E
free of grease and oil				P82...L
			specifically cleaned, suitable for oxygen	



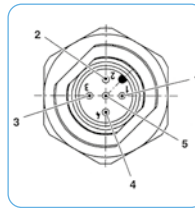
① DC motor w/ potentiometer 15



② with position controller 51



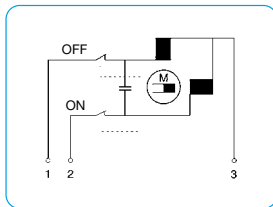
control disc



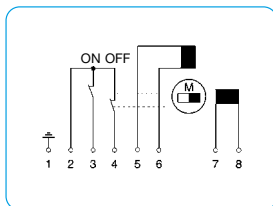
pin configuration 50

PIN	Description
Pin 1	supply voltage 24 Volt
Pin 2	supply voltage 0 Volt
Pin 3	ground potential for set value input and feedback outlet
Pin 4	set value input 0 - 10 V / 0 (4) - 20 mA
Pin 5	feedback outlet 0 (4) - 20 mA

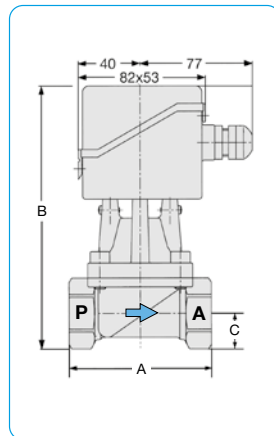
connection diagram



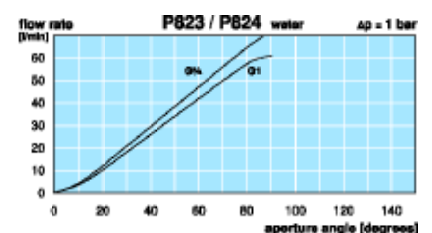
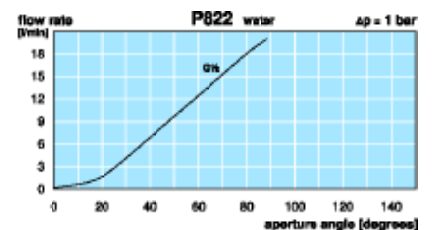
③ synchronous motor 36



④ stepper motor 38



P8



* Product group

*1 at 6 bar supply pressure and Δp = 1 bar

*2 subject to supply pressure

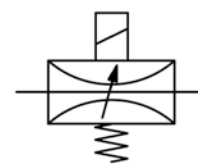
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Order example:
P822-50



Description	2-way proportional flow valve controls the volume flow of maximum 1185 l/min for air in proportion to the input signal of 0 to 10 V or 0/4 to 20 mA. The proportional valve and the electronic control unit are ordered separately.
Product selection	To achieve the best linear flow characteristics, it is advisable not to reduce the flow too much and to have enough pressure drop at the valve for good control. Reference value: at the valve > 30% of the total pressure drop.
Installation hint	The nominal width of the orifice following the proportional valve should not be smaller than the nominal width of the valve. A constriction of the cross-section after the valve should be categorically avoided!



**G¹/₈ up to G1
compressed air or liquids**

General technical features

Design	2-way proportional flow valve, normally closed during absence of current, with additional control module in cable plug or in housing for DIN rail mounting.		
Mounting position	any, preferably upright		
Protection class	IP 65 with coupling socket, IP 40 for DIN rail version		
Temperature range	-10 °C to 90 °C / 14 °F to 194 °F for media -10 °C to 55 °C / 14 °F to 131 °F for electronics		
Material	Body: brass Elastomer: FKM, optionally EPDM	Inner valve: brass and stainless steel Control housing: plastic	

Pneumatic features

Media	compressed air, non-corrosive gases or liquids, max. viscosity 21 mm ² /s, PV40 for liquids only
Operating pressure	see chart, max. 16 bar
Flow rate	0...2 / 1185 l/min for air, 0...0.03 / 83 l/min for liquids in detail see chart, at max. supply pressure and Δp = 1 bar

Electrical features

Supply voltage 24 V DC ± 10%, residual ripple max. 5%, with reverse voltage protection

	electronic	PV21	PV21	PV22	PV34	PV40-04	PV40-06	PV40-08
Power consumption	1 W	2 W to DN 0.6	5 W from DN 0.8 on	9 W	16 W	8 W	10 W	15 W

Command signal 0-5 V, 0-10 V, 0-20 mA or 4-20 mA selectable

Impedance > 20 kΩ at voltage signal
< 200 Ω at current signal

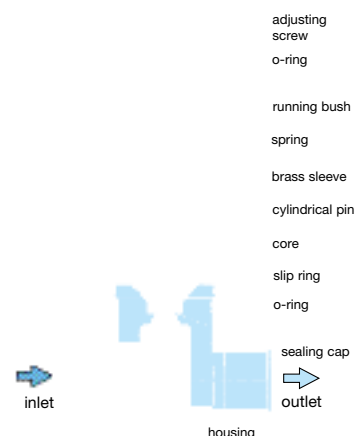
Electrical connector PV21: square connector according to DIN 43650 form B
PV22...PV40: square connector according to DIN 43650 form A

Accuracy

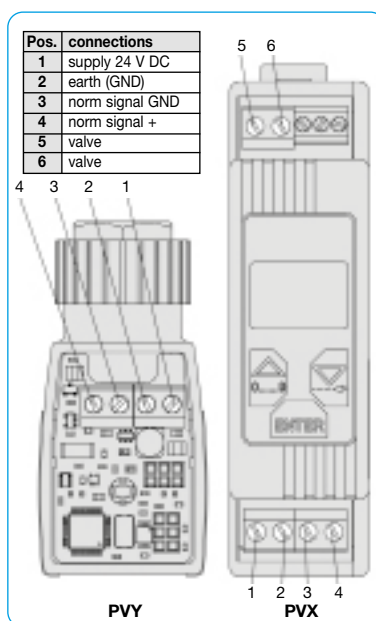
Linearity	< 10 % FS		
Hysteresis	< 5 % FS		
Response sensitivity	< 0.1% FS at DN < 0,8 mm,	< 0.25% FS at DN ≥ 0,8 mm,	< 1% FS at PV40
Repeatability	< 0.25% FS at PV22 < 0.5% FS		
Regulating time	PV21: < 15 ms,	PV22: < 20 ms,	PV34: < 50 ms, PV40: < 200 ms each for 90% of the range

Adjustment

Zero point	The zero point can be decreased or increased.
Range	The range can be decreased or increased.
Ramp	The ramping potentiometer adjusts the time delay with a range of 0 to 10 s in order to dampen sudden changes of the setpoint. Increasing and decreasing ramps have the same delay.
Zero point switch	Using a DIP switch, the zero point switch can be activated or deactivated. It is not necessary to have another switch-off valve.



cross section

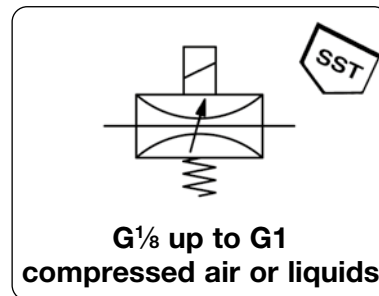


control electronics

* Product group

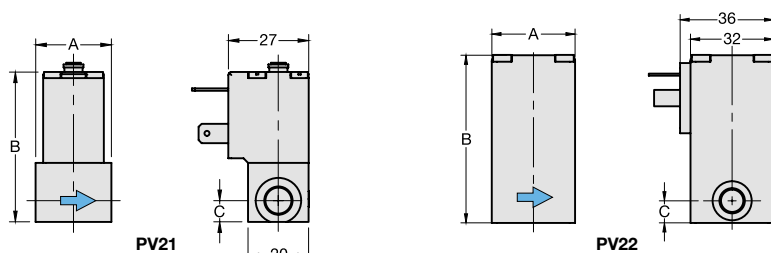


Technical features	
• Media	compressed air, non-corrosive gases or liquids, except for PV40*3
• Signal range	0-5 V, 0-10 V, 0-20 mA, 4-20 mA
• Pressure range	vacuum ... 2 / 16 bar
• Orifice	DN 0.1 ... DN 20
• Flow rate	max. 1185 l/min for air, max. 90 l/min for water
• Adjustment	zero point, range and ramp
• Zero switch-off	ensures reliable closure of the valve
• Linearity	< 10% FS
• Hysteresis	< 5% FS
• Response sensitivity	< 0.1% FS at DN < 0.8 mm < 0.25% FS at DN ≥ 0.8 mm < 1% FS at PV40 < 0.25% FS, < 0.5% FS at PV22
• Repeatability	
• Regulating time	depending on type: < 15 ms, < 20 ms, < 50 ms or < 200 ms
• Protection class	IP65 with plug
• Impedance	> 20 kΩ at V, < 200 Ω at mA



Dimensions	Nominal K _v -	Flow rate	Operating	Differ.-Connection	Order
A B C	size	value	pressure	press. thread	number
mm mm mm	DN	(m³/h)	max. bar	max. bar G	

Proportional flow valve								without electronics, brass, FKM, for compressed air, vacuum or liquids			PV	
25	50	7	0.1	0.00025	0...	0.004	0...	0.27	10	10	G ¹ / ₈	PV21-01
25	50	7	0.2	0.001	0...	0.017	0...	1.0	10	10	G ¹ / ₈	PV21-02
25	50	7	0.3	0.002	0...	0.033	0...	2.2	10	10	G ¹ / ₈	PV21-03
25	50	7	0.4	0.004	0...	0.067	0...	4.0	8	8	G ¹ / ₈	PV21-04
25	50	7	0.6	0.010	0...	0.167	0...	11	6	6	G ¹ / ₈	PV21-06
25	50	7	0.8	0.018	0...	0.3	0...	19	12	6	G ¹ / ₈	PV21-08
25	50	7	0.8	0.018	0...	0.3	0...	19	12	12	G ¹ / ₈	PV21-08B
25	50	7	1.0	0.027	0...	0.3	0...	19	10	5	G ¹ / ₈	PV21-10
25	50	7	1.0	0.027	0...	0.3	0...	19	10	10	G ¹ / ₈	PV21-10B
25	50	7	1.2	0.038	0...	0.633	0...	41	8	4	G ¹ / ₈	PV21-12
25	50	7	1.2	0.038	0...	0.633	0...	41	8	8	G ¹ / ₈	PV21-12B
25	50	7	1.6	0.055	0...	0.917	0...	59	6	3	G ¹ / ₈	PV21-16
25	50	7	1.6	0.055	0...	0.917	0...	59	6	6	G ¹ / ₈	PV21-16B
25	50	7	2.0	0.090	0...	1.5	0...	97	3	1.5	G ¹ / ₈	PV21-20
25	50	7	2.0	0.090	0...	1.5	0...	97	3	3	G ¹ / ₈	PV21-20B
32	66	8.5	0.8	0.018	0...	0.3	0...	19	16	8	G ¹ / ₈	PV22-08
32	66	8.5	0.8	0.018	0...	0.3	0...	19	16	16	G ¹ / ₈	PV22-08B
32	66	8.5	1.0	0.027	0...	1.0	0...	65	14	7	G ¹ / ₈	PV22-10
32	66	8.5	1.0	0.027	0...	1.0	0...	65	14	14	G ¹ / ₈	PV22-10B
32	66	8.5	1.2	0.040	0...	0.67	0...	43	12	6	G ¹ / ₈	PV22-12
32	66	8.5	1.2	0.040	0...	0.67	0...	43	12	12	G ¹ / ₈	PV22-12B
32	66	8.5	1.5	0.060	0...	1.0	0...	65	10	5	G ¹ / ₈	PV22-15
32	66	8.5	1.5	0.060	0...	1.0	0...	65	10	10	G ¹ / ₈	PV22-15B
46	72	8.5	2.0	0.10	0...	1.66	0...	108	8	4	G ¹ / ₄	PV22-20
46	72	8.5	2.0	0.10	0...	1.66	0...	108	8	8	G ¹ / ₄	PV22-20B
46	72	8.5	2.5	0.15	0...	2.5	0...	162	5	2.5	G ¹ / ₄	PV22-25
46	72	8.5	2.5	0.15	0...	2.5	0...	162	5	5	G ¹ / ₄	PV22-25B
46	72	8.5	3.0	0.22	0...	3.67	0...	237	3.5	1.8	G ¹ / ₄	PV22-30
46	72	8.5	3.0	0.22	0...	3.67	0...	237	3.5	3.5	G ¹ / ₄	PV22-30B
46	72	8.5	4.0	0.32	0...	5.33	0...	345	2	1	G ¹ / ₄	PV22-40
46	72	8.5	4.0	0.32	0...	5.33	0...	345	2	2	G ¹ / ₄	PV22-40B



*1 at max. operating pressure and Δp = 1 bar *2 at pressure drop from 6 bar down to 5 bar
*3 PV40 is not suitable for compressed air and vacuum as it is pilot operated

* Product group

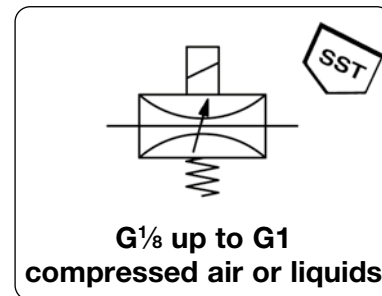
Technische Daten: siehe vorherige Seite

PDF CAD
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Order example:
PV21-01

- Media - Signal range - Pressure range - Orifice - Flow rate - Adjustment - Zero switch-off	Technical features compressed air, non-corrosive gases or liquids, except for PV40*3		- Linearity - Hysteresis - Response sensitivity - Repeatability - Regulating time - Protection class - Impedance		< 10% FS < 5% FS < 0.1% FS at DN < 0.8 mm < 0.25% FS at DN ≥ 0.8 mm < 1% FS at PV40 < 0.25% FS, < 0.5% FS at PV22 depending on type: < 15 ms, < 20 ms, < 50 ms or < 200 ms IP65 with plug > 20 kΩ at V, < 200 Ω at mA
	0-5 V, 0-10 V, 0-20 mA, 4-20 mA				
	vacuum...2 / 16 bar				
	DN 0.1 ... DN 20				
	max. 1185 l/min for air, max. 90 l/min for water				
	zero point, range and ramp				
		ensures reliable closure of the valve			



Dimensions			Nominal K _v -size		Flow rate		Operating pressure		Differ.-Connection		Order number	
A	B	C	size	value	water	air	max. bar	max. bar	press.	thread		
mm	mm	mm	DN	(m ³ /h)	l/min*1	l/min*2			max. bar	G		

Proportional flow valve											PV
											without electronics, brass, FKM, for compressed air, vacuum or liquids
55	105	11	4.0	0.45	0... 7.5	0... 485	8	4	G ³ / ₈		PV34-40
55	105	11	4.0	0.45	0... 7.5	0... 485	8	8	G ³ / ₈		PV34-40B
55	105	11	6.0	0.80	0... 13.3	0... 860	4	2	G ¹ / ₂		PV34-60
55	105	11	6.0	0.80	0... 13.3	0... 860	4	4	G ¹ / ₂		PV34-60B
55	105	11	8.0	1.10	0... 18.3	0... 1185	2	1	G ¹ / ₂		PV34-80
55	105	11	8.0	1.10	0... 18.3	0... 1185	2	2	G ¹ / ₂		PV34-80B
50	89	12	10	1.4	0... 25.0*3	-	10		G ¹ / ₂		PV40-04
58	110	14	13	2.5	0... 45.0*3	-	10		G ³ / ₄		PV40-06
80	155	16	20	5.0	0... 90.0*3	-	10		G1		PV40-08



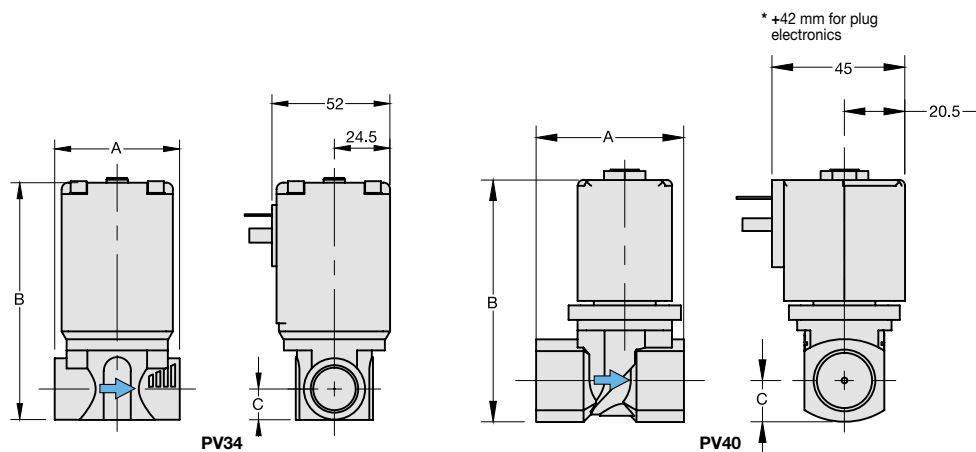
Special options, add the appropriate letter

NPT	connection thread	PV... .N
stainless steel body	SST 316, W.-No. 1.4401	PV... .S
EPDM elastomer		PV... .E
FFKM elastomer		PV22... .X29

for PV21 to PV34
for PV22

Accessories, enclosed

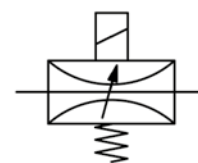
plug electronics	24 V DC, 0-5 V, 0-10 V, 0/4 mA-20 mA	for PV22 to PV40	PVY-06
clip-on electronics	24 V DC, 0-5 V, 0-10 V, 0/4 mA-20 mA	for PV21	PVX-01
		for PV22 to PV40	PVX-02
coupling socket	according to DIN 43650 form B	for PV21	2285-0
	according to DIN 43650 form A	for PV22 to PV40	2286-0



*1 at max. operating pressure and Δp = 1 bar *2 at pressure drop from 6 bar down to 5 bar
*3 PV40 is not suitable for compressed air and vacuum as it is pilot operated



Description	The proportional flow valve can be controlled either by 24 V DC or optionally by a plug amplifier with switchable signals. 50 µm filtered compressed air, vacuum, non-corrosive gases or liquids Conversion of the analogue signal into a pulse-wide modulated current.		
Media	Supply voltage: 24 V DC, max. 1.1 A Switchable signal: 0...10 V, 0...20 mA, 4...20 mA Close function: < 2% of max. signal plug, 3-pin, with coupling socket (Pg 9P or PG 11P) IP 65 with coupling socket		
Electrical connector	Adjustment: zero point and range Time ramp: 0.1 to 3 s selectable Hum frequency: 40 to 700 Hz selectable		
Protection class	Operating pressure see chart, max. 12 bar		
Temperature range	Mounting position any		
Viscosity max.	PV202, G½	PV202, G¾ / G¾	PV203, G¾ / G½
Power consumption	-	21 mm²/s	40 mm²/s
Hysteresis / Sensitivity	100...450 mA, 8.6 W	100...500 mA, 11 W	100...500 mA, 11 W
Repeatability	< 5% FS / < 1% FS	< 5% FS / < 2% FS	< 7.5% FS / < 2% FS
Body / Inner valve	brass/SST, PTFE, FKM	brass/SST, PTFE, FKM	brass/SST, PTFE, NBR/Buna-N



SST

**DN 1.2 up to DN 12.5
compressed air or liquids**

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



Proportional flow valve

24 V DC, direct control, without amplifier,
with coupling socket, made of brass

PV202 / PV203

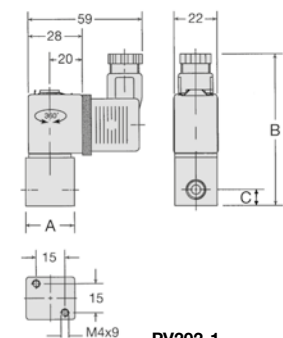
25	78	8	A	1.2	0.05	0... 70	8.0	G½	PV202-1-12
				1.6	0.07	0...110	6.0		PV202-1-16
				2.4	0.13	0... 70	4.0		PV202-1-24
				3.2	0.18	0...105	2.5		PV202-1-32
40	95	20	A/W*3	1.2	0.05	0... 60	16	G¾	PV202-2-12
				2.4	0.12	0...110	8.0		PV202-2-24
				3.2	0.24	0...170	4.0		PV202-2-32
				4.0	0.42	0...280	2.5		PV202-2-40
				5.6	0.72	0...310	1.4		PV202-2-56
				7.1	0.90	0...390	1.0		PV202-2-71
48	97	14	A/W*3	3.2	0.24	0...190	4.0	G¾	PV202-3-32
				4.0	0.42	0...300	2.5		PV202-3-40
				5.6	0.72	0...330	1.4		PV202-3-56
				7.1	0.90	0...420	1.0		PV202-3-71
52	105	14	W	12.5	2.10	0... 35*2	10	G¾	PV203-3-125W
				12.5	2.10	0... 37*2	10	G½	PV203-4-125W

Special options, add the appropriate letter

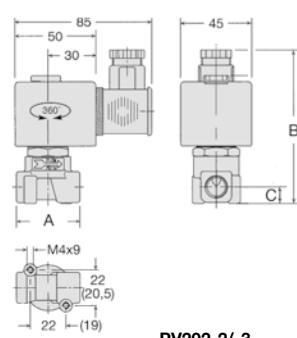
for water or oil		for PV202, G¾ and G¾	PV202-..W
stainless steel body	NPT connection thread, FKM elastomere	for PV202	PV202-..S
12 V DC	voltage signal		PV0..-..12V

Accessories, enclosed

plug amplifier	24 V DC, switchable 0-10 V, 0-20 mA, 4-20 mA	for PV202, G½	PVY-03
		for all others	PVY-04
plug amplifier	12 V DC, switchable 0-10 V, 0-20 mA, 4-20 mA	für PV202, G¾	PVY-08
		for all others	PVY-09



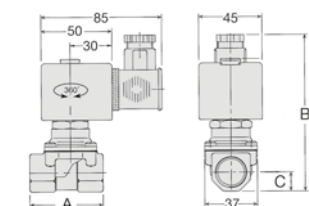
PV202-1



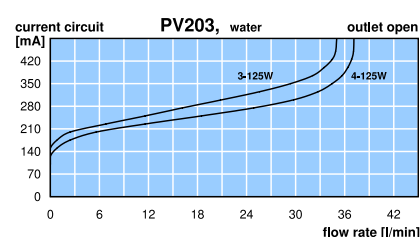
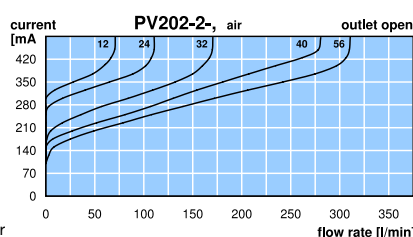
PV202-2/-3



cross-section



PV203-3/-4



*1 for compressed air at operating pressure 6 bar and Δp = 1 bar
*2 flow rate for water since valve is pilot-controlled
*3 for liquids add **W** to order number of type PV202-2/-3

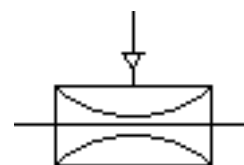
* Product group

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Order example:
PV202-1-12

Description	The 2-port/2-way valve functions as a pinch valve in a new design of housing with full flow cross-section. Since the straight valve passage has neither constrictions nor back-points, there is no danger of clogging or blockage. Frictional loss is at a minimum.	
Media	Compressed air, non-corrosive gases, liquids or other paste-like or powdery media. Solids are enclosed by the flexible sleeve at shut-off.	
Sleeve	Highly flexible with double-woven reinforcement in eight different grades. Sleeve simple to change.	
Pressures	Operating pressure: max. 4.0 bar Pilot pressure: max. 6.5 Differential pressure: max. 2.5 bar Closing pressure: $P_1 + 2.5$ bar to DN32, $P_1 + 2$ bar from DN40 on	
Vacuum	If vacuum is greater than -100 mbar, vacuum compensation should be provided on the control side.	
Mounting position	any	
Temperature range	0 °C to max. 100 °C / 32 °F to max. 212 °F, subject to sleeve material	
Material	Body: POM at model QP or aluminium die-cast at model QS Sleeve: depending on selected version	



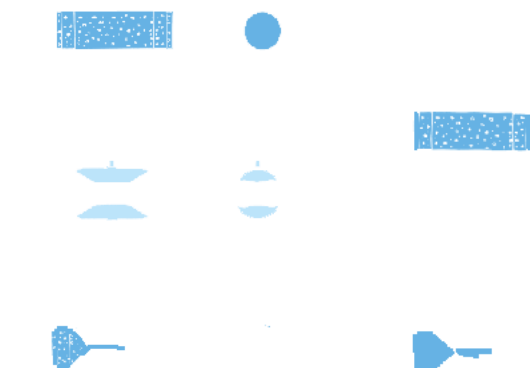
DN10 up to DN150

Dimensions	Nominal size	Volume of control chamber	Pilot port	Operating pressure	Connection thread	Order number
A mm	Ø mm	DN	I	G	max. bar	G / flange

Flow control valve				operating pressure max. 4 bar, pilot pressure max. 2.5 bar above operating pressure				Q
80	44	10	0.03	G $\frac{1}{4}$	4	G $\frac{3}{8}$	QP10 -03NR	
95	50	15	0.04	G $\frac{1}{4}$	4	G $\frac{1}{2}$	QP15 -04NR	
110	58	20	0.05	G $\frac{1}{4}$	4	G $\frac{3}{4}$	QP20 -06NR	
125	65	25	0.07	G $\frac{1}{4}$	4	G1	QP25 -08NR	
140	83	32	0.10	G $\frac{1}{4}$	4	G1 $\frac{1}{4}$	QP32 -10NR	
150	95	40	0.13	G $\frac{1}{4}$	4	G1 $\frac{1}{2}$	QP40 -12NR	
200	100	50	0.23	G $\frac{1}{4}$	4	G2	QS50 -16NR	
240	134	65	0.49	G $\frac{1}{4}$	4	G2 $\frac{1}{2}$	QS65 -20NR	
290	154	80	0.95	G $\frac{1}{4}$	4	G3	QS80 -24NR	
280	220	100	1.80	G $\frac{3}{8}$	4	flange	QS100-FLNR	
350	250	125	3.30	G $\frac{3}{8}$	4	flange	QS125-FLNR	
420	285	150	6.40	G $\frac{3}{8}$	4	flange	QS150-FLNR	

Special options, add the appropriate letter

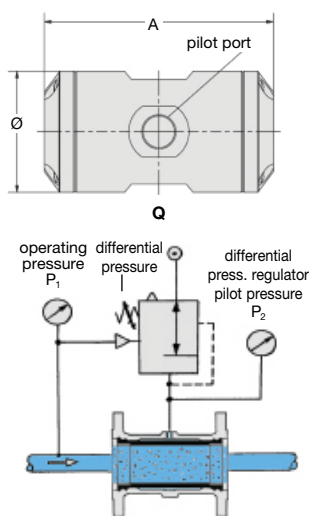
flange connection	according to DIN 2532, PN10	from G1 $\frac{1}{4}$ on	Q ... -FL ...
sleeve NR	natural rubber, black	80 °C / 176 °F	Q ... - ... NR
sleeve NRL	rubber, suitable for food, black	70 °C / 158 °F	Q ... - ... NL
sleeve NRLH	rubber, suitable for food, light	70 °C / 158 °F	Q ... - ... NH
sleeve NBR	nitrile rubber / Buna-N, suitable for food	80 °C / 176 °F	Q ... - ... NB
sleeve EPDM	ethylene-propylene rubber, suitable for food, black	100 °C / 212 °F	Q ... - ... EP
sleeve FKM	fluorine rubber, black	100 °C / 212 °F	Q ... - ... FK
sleeve CR	chloroprene rubber / neoprene, black	80 °C / 176 °F	Q ... - ... CR
sleeve CSM	natural rubber, chlorosulphonylpolyethylene	80 °C / 176 °F	Q ... - ... CS



closing sequence



solenoid valve control



constant cross section at changing pressure



QP made of POM, DN10 - DN25



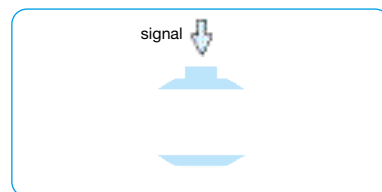
QP made of POM, DN32 - DN40



QS50 made of aluminium with POM thread



QS100 made of aluminium die-cast



cross section

