Chapter 11 - Proportional Flow Valves

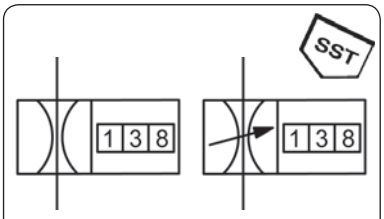
Description	Flow rate	Connection thread	Device	Page
portable flow meter, for many gases	2 … 100 ml / 450 l/min	G¼, G½	VG	**11.02**
mass flow meter for gases	5 … 100 ml / 6000 l/min	G¼ - G1	PVM	**11.04**
mass flow regulator for gases	5 … 100 ml / 2000 l/min	G¼, G½	PVR	**11.05**
for gases and liquids „AirProp“	0 … 2 / 1185 l/min	G⅛ - G1	PV12...PV40	**11.07**
piezo valve	0 … 6 / 7 l/min	flange	PV630	**11.08**
flow valve, flangeable	0 … 11 / 28 l/min	flange	PV202	**11.09**
flow valve, also made of stainless steel	0 … 70 / 420 l/min	G⅛ - G½	PV202, PV203	**11.10**
motorised, robust	0 … 1000 / 3500 l/min	G½ - G1	P8	**11.11**
low power consumption	0 … 3 / 14 l/min	M5	PVK	**11.12**
flow valve, Y-type, for liquids	0 … 77 / 1233 l/min	G½ - G2½	PVE	**11.13**
needle valve	0 … 32 l/min	3.0 mm, 4.5 mm	NV30	**11.14**
precision needle valve	0 … 0.3 / 425 l/min	G¼, G½	VR5, VR6	**11.15**
precision restrictor in brass body		nipple Ø 2; 2.2; 10-32”	RF	**11.16**
precision restrictor in plastic body		nipple Ø 2.3; 2.7; 4.7	R0	**11.17**
restrictor with filter		nipple Ø 2.3; 2.7; 4.7	F950	**11.17**
micro in-line filter		nipple Ø 2.7; 4.7; 10-32”	F900	**11.18**
check valve and restrictor check valve		nipple Ø 2.4; 2.7; 4.7; 10-32”	F2804	**11.19**
flow meter for compressed air	30...300 ml / 7000 l/min	G¼ - G¾	VPF	**11.20**

11

Proportional Flow Valves

Portable Mass Flow Meter, also Hand-Operated VG

Description	Thermal mass flow meter and hand-operated flow regulator 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	lithium-type AA battery with 2-year life cycle as standard, optionally 24 V DC ± 10%
Display	4-digit LCD display with 9 mm tall black numbers
Electrical connector	optionally 8-wire cable, length 3.0 m — **Heating-up period** **none,** 30 min. for optimal accuracy
Limit switch	24 V DC SPDT switch, max. 1 A power consumption, potential-free, for max. and min. signal, adjustable over range. Failsafe mode and alarm suppression can be enabled. Alarm retardation 0…180 s, without hysteresis. Alarm reset manual or automatic.
Accuracy	± 2% FS, from 200 l/min ± 3% FS, for butane ± 5% FS
Protection class	IP 50 — **Flow regulation** **manual fine adjustment by 15 turns**
Mounting position	preferably horizontal from 5 bar on
Temperature range	0 °C to 50 °C / 32 °F to 122 °F — **Response time** 500 ms at 99% accuracy
Material	Body: aluminium, optionally electropolished stainless steel 316 Transducer: PBT Elastomer: FKM, optionally EPDM



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

Dimensions A mm	B mm	C mm	Operating pressure max. bar	Accuracy %	Connection thread G	Flow rate ml/min / l/min	Order number
Mass flow meter					LCD display, battery operation, portable, aluminium, FKM		**VGM*1**
114	44	12.5	10	2	G¼	2 …100 ml/min	**VGM-A1**
				2		4 …200 ml/min	**VGM-A2**
				3		10 …500 ml/min	**VGM-A5**
				3		0.02 … 1 l/min	**VGM-B1**
				3		0.04 … 2 l/min	**VGM-B2**
				3		0.1 … 5 l/min	**VGM-B5**
				3		0.2 … 10 l/min	**VGM-C1**
				3		0.4 … 20 l/min	**VGM-C2**
				3		1 … 50 l/min	**VGM-C5**
160	54	17.5	10	2	G½	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**
Hand-operated mass flow meter					LCD display and needle valve, battery operation 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**
				3		10 …500 ml/min	**VGR-A5**
				3		0.02 … 1 l/min	**VGR-B1**
				3		0.04 … 2 l/min	**VGR-B2**
				3		0.1 … 5 l/min	**VGR-B5**
				3		0.2 … 10 l/min	**VGR-C1**
				3		0.4 … 20 l/min	**VGR-C2**
				3		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**

VGM
portable mass flow meter

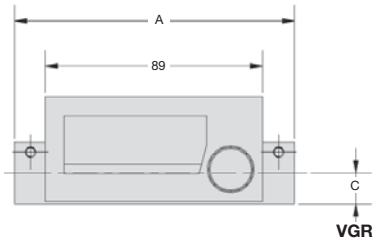
VGR
hand-operated mass flow meter with display

Special options, add the appropriate letter oder number

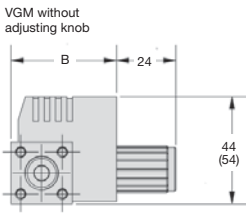
deviant volume flow	indicate on order		VG . -**XFX**
limit switch	min. / max.-alarm, 1 A SPDT switch, incl. 24 V DC supply		VG . - . .**G**
stainless steel body	electropolished throughout	for VGM	VGM- . .**S**
		for VGR	VGR- . .**S**
EPDM elastomer		for VGM-A1 to -C5	VGM- . .**E**
		for VGR-A1 to -C5	VGR- . .**E**
24 V DC supply	cable attached on the device, length 3 m		VG . - . .**2**
panel mounting	cut-out 48 x 96 mm, protection class IP65 in the front		VG . - . .**T**
0.1% accuracy			VG . - . .**H**

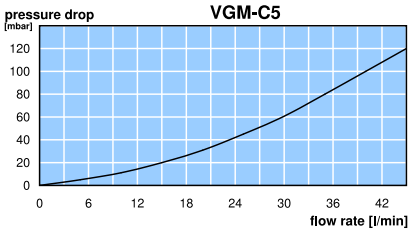
nitrogen	N_2:	**07**	**carbon dioxide**	CO_2:	**03**	**argon**	Ar:	VG . - . .**05**
helium	He:	**09**	**hydrogen**	H_2:	**11**	**methane**	CH_4:	VG . - . .**13**
oxygen	O_2:	**15**	**propane**	C_3H_6:	**16**	**nitrous oxide**	N_2O:	VG . - . .**17**
gases			see above			for G½		VG . - **D** . . .

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_3H_8	80
methane	13	CH_4	100



VGR





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

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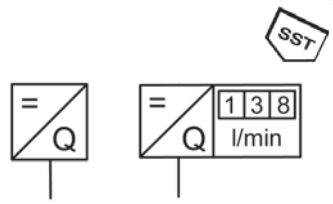
Order example:
VGM-A1

Technical features

Benefits:

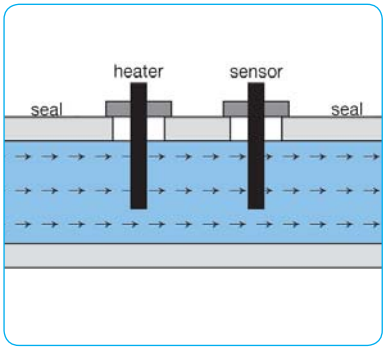
- suitable for nearly all gases and gas mixtures
- no moving parts
- short response time
- unaffected of mounting position
- optionally with unit counter and / or flow meter
- maintenance-free
- low pressure drop



5 ... 100 ml/min / 6000 l/min compressed air or gases

General technical features

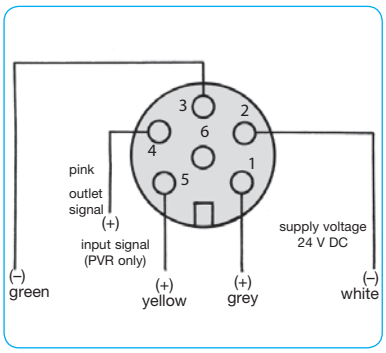
Mounting position	any
Protection class	IP 40
Temperature range	0 °C to 50 °C / 32 °F to 122 °F
Material	Body: aluminium, optionally stainless steel 316L Elastomer: FKM, optionally EPDM or Kalrez Sensor: stainless steel 316L Filter/strainer: stainless steel



functional principle

Pneumatic features

Media	compressed air as well as virtually all gases and mixtures of gases
Operating pressure	max. 10 bar
Mass flow rate	0 ... 100 ml/min / 2000 l/min, for PVR 0 ... 100 ml/min / 6000 l/min, for PVM



PVM and PVR connecting plan

Electrical features

Supply voltage	24 V DC + 10%
Current consumption	max. 75 mA for PVM 11, all other devices max. 250 mA
Signal ranges	4-20 mA, optionally 0-5 V DC
Impedance	> 10 kΩ at voltage signal, < 375 Ω at current signal
Connection	round connector M16x1, 6-pin
EMC	according to CE
Note	at < 100 mbar inlet path is required (PVM only)

gas \ model	PVM23 - PVM27	PVM11
air	1.00	1.00
argon	2.01	1.40
CO_2	1.20	0.74
helium	/	1.41
hydrogen	/	1.01
NH_3	0.80	0.77
N_2O_2	1.00	1.00
C_2H_2	0.75	0.61
C_3H_6	/	0.34
C_3H_8	0.63	0.34
CH_4	0.67	0.76
CO	1.04	1.00
C_2H_4	0.89	0.60
NO	1.02	0.97
HCL	1.58	0.99

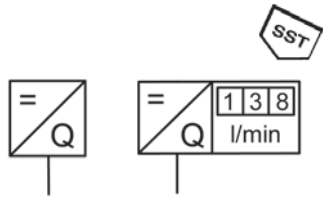
conversion factors for max. flow rate for other gases

Accuracy

Linearity / Hysteresis	> ± 3 % FS
Repeatability	> ± 0.5% FS
Pressure sensitivity	> ± 0.3% FS/bar typ. (air)
Temperature sensitivity	< ± 0.3% / °C (air)
Mounting sensitivity	< 0.3% FS at 90°
Operating time	25 s at 100% of the range
Tightness	< 2 x 10^{-8} mbar l/s He

Mass Flow Meter, Based on CTA Principle — PVM

Description	Mass flow meter directly measuring flow according to constant temperature anemometer principle. PVM 11 measures via a bypass, the other types measure the flow directly.
Features	Low pressure drop and immunity against dirt and humidity. Measurement unaffected by pressure and temperature changes. No moving parts, installation in virtually any position.
Principle	Two stainless steel probes - a heater and temperature probe - protrude inside the bore. A constant difference in temperature is created. The energy required is proportional to flow.
Media	compressed air, air as well as virtually all gases and gas mixtures
Compensation	Neither temperature nor pressure have to be compensated. There are no moving parts within the flow meter, therefore it is virtually wear-free.
Pressure drop	Low pressure drop because solely two stainless steel probes protrude inside the smooth, round measurement cell. The use of screw connections with a nominal size as big as possible is suggested.
Temperature range	0 °C to 50 °C / 32 °F to 122 °F — **Operating pressure** max. 10 bar
Material	Body: aluminium, optionally SST 316L; Sensor: stainless steel 316L; Elastomer: FKM, optionally EPDM or Kalrez; Filter/strainer: stainless steel



5…100 ml/min/6000 l/min compressed air or gases

Dimensions A mm	B mm	C mm	Operating pressure max. bar	Connection thread G	Flow rate ml/min*1 / l/min*1	Order number
Mass flow meter			4-20 mA output signal, supply voltage 24 V DC, w/o display, with coupling socket, for compressed air			**PVM*2**
95	94.5	15	10	G¼	5… 100 ml/min	**PVM11-12**
					10… 200 ml/min	**PVM11-22**
					25… 500 ml/min	**PVM11-52**
					50…1000 ml/min	**PVM11-13**
95	94.5	15	10	G¼	0.10… 2 l/min	**PVM11-23**
					0.25… 5 l/min	**PVM11-53**
					0.50… 10 l/min	**PVM11-14**
95	94.5	15	10	G¼	1… 20 l/min	**PVM23-24**
					2… 50 l/min	**PVM23-54**
					5… 100 l/min	**PVM23-15**
95	98.5	15	10	G½	5… 100 l/min	**PVM25-15**
					10… 200 l/min	**PVM25-25**
					20… 400 l/min	**PVM25-45**
116	123	25	10	G½	20… 400 l/min	**PVM27-45**
					50…1000 l/min	**PVM27-16**
					100…2000 l/min	**PVM27-26**
130	143	35	10	G1	150…2000 l/min	**PVM28-26**
					200…4000 l/min	**PVM28-46**
					250…5000 l/min	**PVM28-56**
160	172	55	10	G1	250…5000 l/min	**PVM29-56**
					300…6000 l/min	**PVM29-66**

PVM23

PVM27

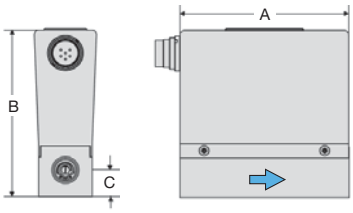
Special options, add the appropriate letter oder number

special calibration	range or gas to be indicated on order		PVM . . - . . **Y**
monitor signal	0-5 V, load resistance > 10 kΩ		PVM . . - . . **U**
stainless steel body	316L	for PVM11 to PVM28	PVM . . - . . **S**
		PVM29	PVM . . - . . **S**
EPDM elastomer			PVM . . - . . **E**
Kalrez elastomer			PVM . . - . . **K**
LCD display	black figures, 12 mm tall	for counter, 8-digit	PVM . . - . . **B**
		for flow, 3½-digit	PVM . . - . . **M**
free of oil and grease	for oxygen and different gases		PVM . . - . . **L**

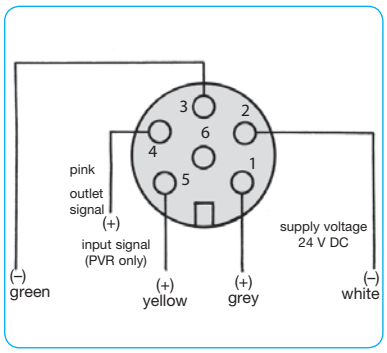
nitrogen	N_2:	**07**	**carbon dioxide**	CO_2:	**03**	**argon**	Ar: PVM . . - . . . **05**
helium	He:	**09**	**hydrogen**	H_2:	**11**	**methane**	CH_4: PVM . . - . . . **13**
oxygen	O_2:	**15**	**propane**	C_3H_6:	**16**	**nitrous oxide**	N_2O: PVM . . - . . . **17**

Accessories, enclosed

coupling socket	M16x1, 6-pin with 3 m Kabel	straight	**KM16-A6-3**
other cable length	5 m or 10 m available		



PVM



connecting plan

*1 valid for compressed air at Δp= 5 bar and open outlet. For other gases please apply conversion factor.

*2 Note: indicate media, supply and outlet pressure, temperature on order

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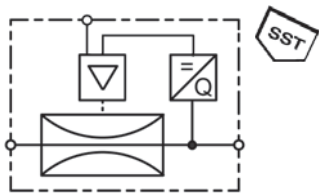
Order example: PVM11-12

Proportional Mass Flow Regulator, Based on CTA Principle PVR

Description	Direct measurement principle for thermal mass flow meter with sensor working according to constant temperature anemometer principle. A constant difference in temperature is created. The energy required is proportional to flow.
Mechanical design	PVR11/23: flow regulator and flow meter in the same housing PVR25: flow regulator and flow meter on the same measurement body PVR27: flow regulator and flow meter are individual components assembled jointly.
Media	compressed air, air, as well as virtually all gases and mixtures of gases
Compensation	Neither temperature nor pressure have to be compensated. There are no moving parts within the flow meter, therefore it is virtually wear-free.
Pressure drop	Low pressure drop because solely two stainless steel probes protrude inside the smooth, round measurement cell. The use of screw connections with a nominal size as big as possible is suggested.
Temperature range	0 °C to 50 °C / 32 °F to 122 °F — **Operating pressure** max. 10 bar
Material	Body: aluminium, optionally SST 316L — Elastomer: FKM, optionally EPDM or Kalrez Sensor: stainless steel 316L — Filter/strainer: stainless steel



5 … 100 ml/min / 2000 l/min compressed air or gases

Dimensions A mm	B mm	C mm	K_v-value (m^3/h)	Operating pressure max. bar	Connection thread G	Flow rate ml/min*1 / l/min*1	Order number
Mass flow regulator				4-20 mA input and output signal, supply voltage 24 V DC, w/o display, with coupling socket, for compressed air			**PVR*3**
95	94.5	15	0.066	10	G¼	5 … 100 ml/min	**PVR11-12**
						10 … 200 ml/min	**PVR11-22**
						25 … 500 ml/min	**PVR11-52**
						50 … 1000 ml/min	**PVR11-13**
95	94.5	15	0.066	10	G¼	0.10 … 2 l/min	**PVR11-23**
						0.25 … 5 l/min	**PVR11-53**
						0.50 … 10 l/min	**PVR11-14**
95	97	15	0.066	10	G¼*2	0.50 … 10 l/min	**PVR12-14**
						1.00 … 20 l/min	**PVR12-24**
						2.50 … 50 l/min	**PVR12-54**
95	94.5	15	0.066	10	G¼	1 … 20 l/min	**PVR23-24**
						2 … 50 l/min	**PVR23-54**
						5 … 100 l/min	**PVR23-15**
145	132	16	0.30	10	G½	5 … 100 l/min	**PVR25-15**
						10 … 200 l/min	**PVR25-25**
						20 … 400 l/min	**PVR25-45**
257	163	25	1.0	10	G½	25 … 400 l/min	**PVR27-45**
						50 … 1000 l/min	**PVR27-16**
						100 … 2000 l/min	**PVR27-26**

PVR23

PVR25

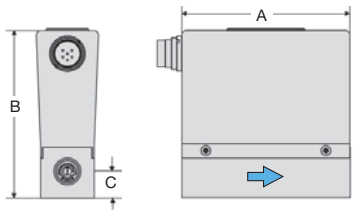
Special options, add the appropriate letter oder number

special calibration	range or gas to be indicated on order		PVR . . - . . **Y**
setpoint/monitor signal 0-5 V	load resistance > 10 kΩ		PVR . . - . . **U**
stainless steel body	316L	for PVR11 to PVR25-25	PVR . . - . . **S**
		PVR25-45 to PVR27	PVR . . - . . **S**
EPDM elastomer			PVR . . - . . **E**
Kalrez elastomer			PVR . . - . . **K**
LCD display	black figures, 12 mm tall	for counter, 8-digit	PVR . . - . . **B**
		for flow, 3½-digit	PVR . . - . . **M**
free of oil and grease	for oxygen and different gases		PVR . . - . . **L**
potentiometer in cover	for flow regulation, height + 40 mm		PVR . . - . . **X67**

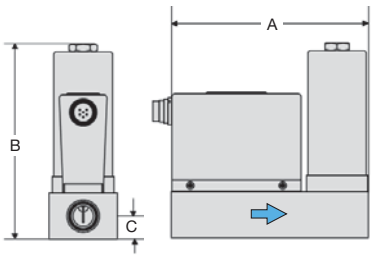
nitrogen	N_2:	**07**	**carbon dioxide**	CO_2:	**03**	**argon**	Ar:	PVR . . - . . . **05**
helium	He:	**09**	**hydrogen**	H_2:	**11**	**methane**	CH_4:	PVR . . - . . . **13**
oxygen	O_2:	**15**	**propane**	C_3H_6:	**16**	**nitrous oxide**	N_2O:	PVR . . - . . . **17**

Accessories, enclosed

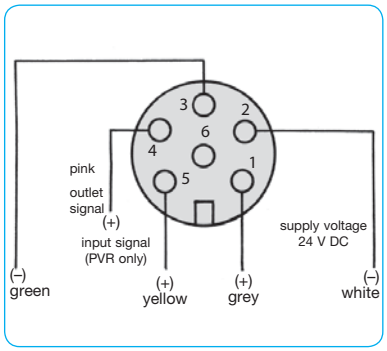
coupling socket	M16x1, 6-pin with 3 m Kabel	straight	**KM16-A6-3**
other cable length	5 m or 10 m available		



PVR11 … PVR23



PVR25 / PVR27



connecting plan

*3 Note: indicate media, supply and outlet pressure, temperature on order

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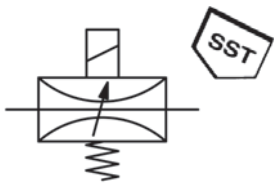
Order example: PVR11-12

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!



G⅛ up to G1
compressed air or liquids

General technical features

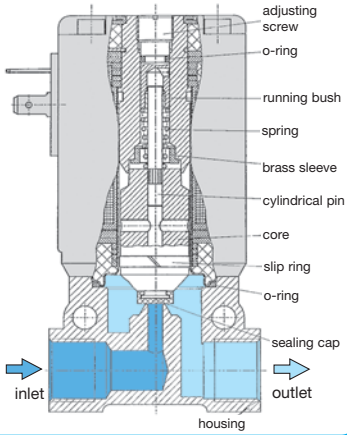
Design 2-way proportional flow valve, normally closed during absence of current, with additional control module in cable plug or in housing for DIN rail mounting.

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 mediua
-10 °C to 55 °C / 14 °F to 131 °F for electronics

Material Body: brass; Elastomer: FKM; Inner valve: brass and stainless steel; Control housing: plastic



cross section

Pneumatic features

Media compressed air, non-corrosive gases or liquids, max. viscosity 21 mm²/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

Power consumption

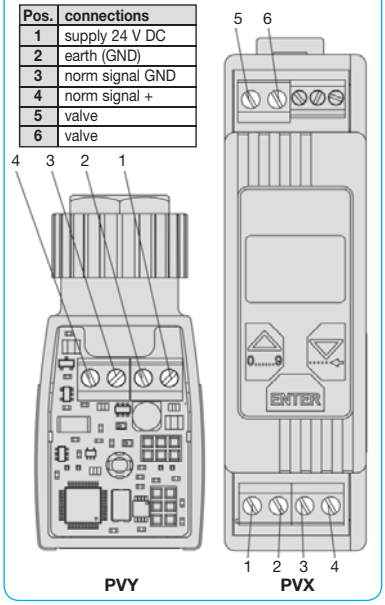
electronic	PV12	PV12	PV21	PV22	PV34	PV40-04	PV40-06	PV40-08
1 W	1 W up to DN 0.4	4 W from DN 0.6 on	5 W	9 W	16 W	8 W	10 W	15 W

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 PV12: connecting wires, length 30 cm
PV21: square connector according to DIN 43650 form B
PV22…PV40: square connector according to DIN 43650 form A

Pos.	connections
1	supply 24 V DC
2	earth (GND)
3	norm signal GND
4	norm signal +
5	valve
6	valve



control electronics

Accuracy

Linearity < 10% FS

Hysteresis < 5 % FS, for PV12 < 10% FS

Response sensitivity < 0.1% FS, for PV40 < 1% FS

Repeatability < 0.25% FS, for PV22 < 0.5% FS

Regulating time PV12: < 10 ms, PV21/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.

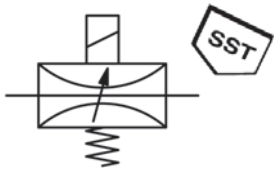
Range The range can be decreased or increased.

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.

Technical features

• **Media**	compressed air, non-corrosive gases or liquids, except for PV40	• **Linearity**	< 10% FS
• **Signal range**	0…5 V, 0…10 V, 0…20 mA, 4…20 mA	• **Hysteresis**	< 5% FS, at PV12 < 10% FS
• **Pressure range**	vacuum…2 / 16 bar	• **Response sensitivity**	< 0.1% FS, at PV40 < 1% FS
• **Orifice**	DN 0.3…DN 20	• **Repeatability**	< 0.25% FS, at PV22 < 0.5% FS
• **Flow rate**	max. 1185 l/min for air, max. 83 l/min for liquids	• **Regulating time**	depending on type < 10 ms, < 20 ms, < 50 ms or < 200 ms
• **Adjustment**	zero point, range and ramp	• **Protection class**	IP 65 with plug
• **Zero switch-off**	ensures reliable closure of the valve	• **Impedance**	> 20 kΩ at voltage signal < 200 Ω at current signal



G⅛ up to G1 compressed air or liquids

Dimensions A mm	B mm	C mm	Nominal size DN	K_v-value (m^3/h)	Flow rate water l/min*1	air l/min*1	Operating pressure max. bar	Connection thread G	Order number
Proportional flow valve without electronics, brass, FKM, for compressed air, vacuum or liquids*2									**PV**
25	50	7	0.3	0.002	0… 0.03	0… 2	10	G⅛	**PV12-03**
			0.4	0.004	0… 0.06	0… 4	8		**PV12-04**
			0.6	0.010	0… 0.16	0… 11	6		**PV12-06**
			0.8	0.018	0… 0.30	0… 19	3		**PV12-08**
			1.0	0.027	0… 0.45	0… 29	2		**PV12-10**
25	50	7	0.8	0.02	0… 0.3	0… 19	12	G⅛	**PV21-08**
			1.2	0.04	0… 0.6	0… 41	8		**PV21-12**
			1.6	0.05	0… 0.8	0… 59	6		**PV21-16**
32	66	8.5	0.8	0.02	0… 0.3	0… 22	16	G⅛	**PV22-08**
32	66	8.5	1.5	0.06	0… 0.3	0… 22	10	G⅛	**PV22-10**
46	72	8.5	2.0	0.10	0… 1.6	0… 110	8	G¼	**PV22-20**
46	72	8.5	4.0	0.33	0… 5.5	0… 360	2	G¼	**PV22-40**
55	105	11	4.0	0.45	0… 7.0	0… 425	8	G⅜	**PV34-40**
			6.0	0.80	0…12.0	0… 860	4	G⅜	**PV34-60**
			8.0	1.10	0…17.0	0…1185	2	G½	**PV34-80**
50	89	12	10	1.4	0…23.0*2	-	10	G½	**PV40-04**
58	110	14	13	2.5	0…42.0*2	-	10	G¾	**PV40-06**
80	155	16	20	5.0	0…83.0*2	-	10	G1	**PV40-08**

PV12 **PV21**

PV22 **PV40**

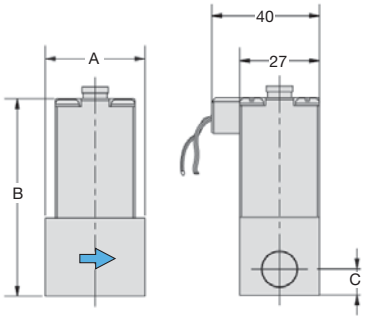
Special options, add the appropriate letter

stainless steel body	SST 316, W.-No. 1.4401	for PV12 to PV34	PV . . - . . **S**

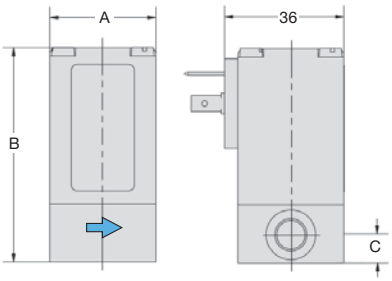
Accessories, enclosed

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 PV12, PV21	**PVX-01**
		PV22, PV34, 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**

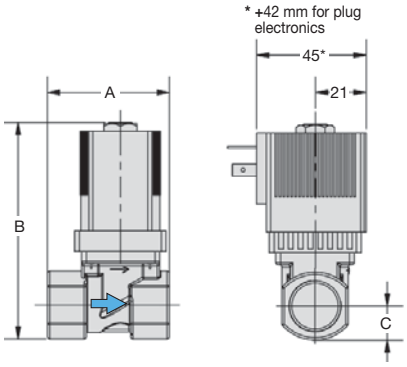
PVY **PVX**



PV12 with wire



PV22



PV40

*1 at max. operating pressure and Δp = 1 bar

*2 PV40 is not suitable for compressed air and vacuum, since pilot-controlled

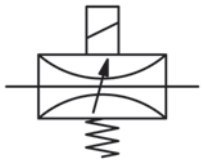
Technical details: see previous page

PDF CAD
www.aircom.net

Order example: PV12-03

Miniature Piezo Proportional Flow Valve, 7 mW PV630/PV631

Description	The piezo miniature flow valve is highly reliable and combines precise control of flow rates with power consumption under 7 mW. It is extremely compact and weighs only 23 g. Therefore, it is very suitable for battery-operated portable devices. Preferred application in medical engineering. Electronics are not necessary.
Media	50 µm filtered compressed air or non-corrosive gases
Flange connection	according to CNOMO E06.36.120N (15 x 15 mm) or CNOMO E06.05.80 (30 x 30 mm) with adapter
Operating pressure	see chart, max. 8 bar
Supply voltage	0…40 V DC, residual ripple < 10%, without reverse voltage protection
Electrical connector	plug, contact gap 9.4 mm, 3-pin, with coupling socket (Pg 7P), optionally with wire, red (+), black (-)
Note	The current is to be limited by a > 30 Ω resistor connected in series.
Life cycle	< 1 billion switching cycles at 6 bar
Power consumption	< 100 µA, i.e. 7 mW — **Switch-on consumption** 0.6 W
Response time	50 ms — **Protection class** IP 65 with coupling socket
Mounting position	any — **Temperature range** 0 °C to 60 °C / 32 °F to 140 °F
Material	Body: PPS plastic — Elastomer: NBR/Buna-N Inner valve: piezoelectric ceramics — Manifold block: brass (M5), zinc die-cast (G⅛), polyamide (Ø4)



DN 0.3 and DN 0.4 piezo-controlled, 7 mW

Description	Dimensions A mm	B mm	C mm	K_v-value (m^3/h)	Flow rate l/min*1	Operating pressure max. bar	Nominal size DN	Order number
Flow valve (flangeable without manifold block, with coupling socket, 0-40 V DC)								**PV630**
NC	15	48	51	0.005	0…6	8	0.3	**PV630-03**
				0.006	0…7	4	0.4	**PV630-04**
NO	15	48	51	0.005	0…6	8	0.3	**PV631-03**
				0.006	0…7	4	0.4	**PV631-04**

PV630-04

PV630-03L
with wire

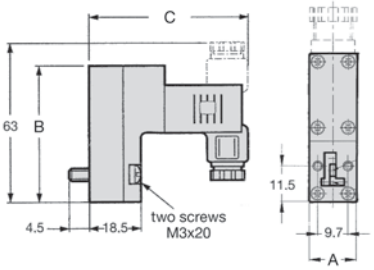
PV630-04
accessory: manifold block M5

Special options, add the appropriate letter

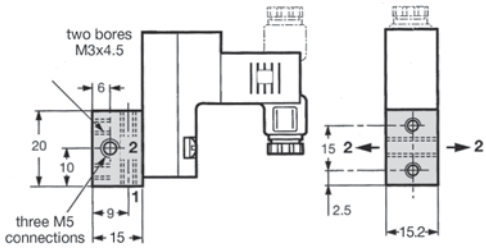
w/o coupling socket	protection class IP00	PV63 . -0 . **X**
with wire	lenght 1 m, red (+), black (-)	PV63 . -0 . **L**

Accessories, enclosed

manifold block	**M5**	**AP-01**
	G⅛	**AP-02**
	Ø4	**AP-03**
in-line manifold block	**Ø4**	**AP-04**
	G⅛	**AP-05**

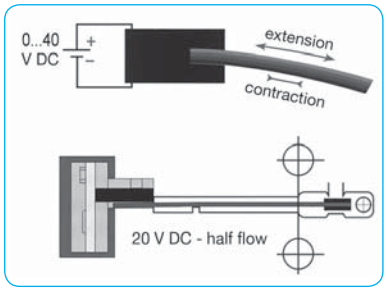


PV630

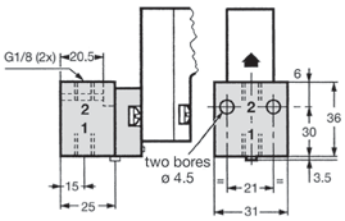


AP-01

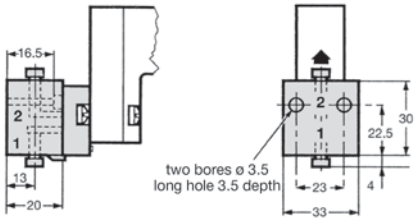
1: inlet
2: outlet



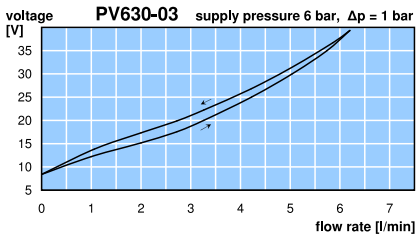
functional principle



AP-02



AP-03



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

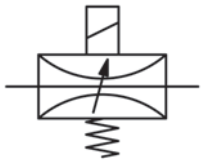
More miniature valves: see catalogue MV, also in ATEX version

PDF CAD
www.aircom.net

Order example:
PV630-03

Miniature Piezo Proportional Flow Valve PV202

Description	The miniature flow valve is highly reliable and combines precise control of flow rate with compact design and only 80 g weight. It can be used for vacuum or pressure up to 12 bar. Plug amplifier required.
Media	50 µm filtered compressed air, vacuum or non-corrosive gases
Plug amplifier	Conversion of the analogue signal into a pulse-wide modulated current. Supply voltage: 24 V DC, max. 1.1 A — Adjustment: zero point and range Switchable signal: 0…10 V, 0…20 mA, 4…20 mA — Time ramp: 0.1 to 3 s selectable Close function: < 2% of max. signal — Hum frequency: 40 to 700 Hz selectable
Power consumption	< 170 mA, i.e. < 4 W, with plug amplifier additional 0.8 W own consumption
Electrical connector	plug, contact gap 9.4 mm, 3-pin, with coupling socket (Pg 7P)
Operating pressure	see chart, max. 12 bar — **Life cycle** > 100 million cycles
Repeatability	< 3% FS — **Linearity** < 8% FS
Response sensitivity	< 2% FS — **Hysteresis** < 5% FS
Polarity	any for valve — **Protection class** IP 65 with coupling socket
Mounting position	any — **Temperature range** 0 °C to 60 °C / 32 °F to 140 °F
Material	Body: brass — Elastomer: NBR/Buna Inner valve: stainless steel and brass — Manifold: brass (M5), zinc die-cast (G⅛), polyamide (Ø4)



DN 0.8 to DN 2.0
compressed air or gases

Proportional flow valve

flangeable, w/o manifold block, with coupling socket, for compressed air, 24 V DC, direct control, w/o amplifier **PV202**

Description	Dimensions A mm	B mm	C mm	K_v-value (m^3/h)	Flow rate l/min*1	Operating pressure max. bar	Nominal size DN	Order number
NC	15	48	53	0.01	0…11	12	0.8	**PV202-008**
				0.02	0…22	7	1.2	**PV202-012**
				0.025	0…22	4	1.6	**PV202-016**
				0.045	0…28	2,5	2.0	**PV202-020**

PV202

Special options, add the appropriate letter

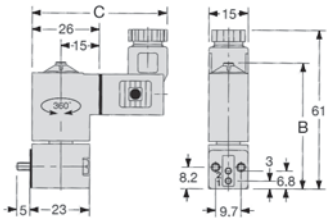
12 V DC	voltage signal	PV202-0 . . **V**

PV202
accessory: manifold block M5

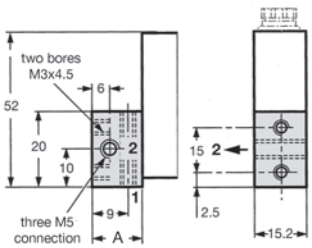
Accessories, enclosed

plug amplifier	24 V DC, switchable 0-10 V, 0-20 mA, 4-20 mA	**PVY-05**
manifold block	**M5**	**AP-01**
	G⅛	**AP-02**
	Ø4	**AP-03**
in-line manifold	**Ø4**	**AP-04**
	G⅛	**AP-05**

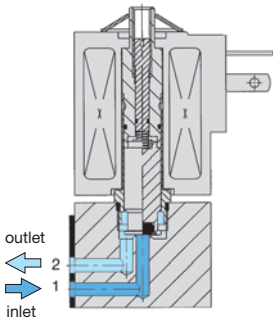
PVY-05



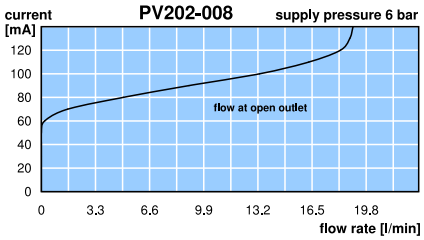
PV202

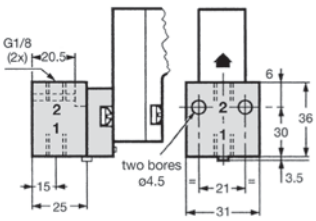


AP-01

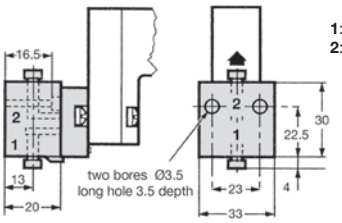


cross section



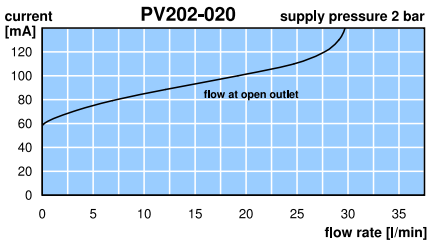


AP-02



AP-03

1: inlet
2: outlet



*1 at supply pressure 6 bar at DN 0.8 and DN 1, DN 2, 4 bar at DN 1, DN 6, 2 bar at DN 2 and Δp = 1 bar

More miniature valves: see catalogue MV, also in Ex ATEX version

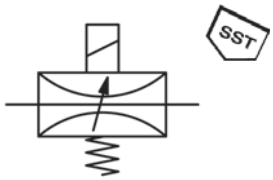
PDF CAD
www.aircom.net

Order example:
PV202-008

Proportional Flow Valve PV202 / PV203

Description	The proportional flow valve can be controlled either by 24 V DC or optionally by a plug amplifier with switchable signals.
Media	50 µm filtered compressed air, vacuum, non-corrosive gases or liquids
Plug amplifier	Conversion of the analogue signal into a pulse-wide modulated current. 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 Adjustment: zero point and range Time ramp: 0.1 to 3 s selectable Hum frequency: 40 to 700 Hz selectable
Electrical connector	plug, 3-pin, with coupling socket (Pg 9P or PG 11P)
Operating pressure	see chart, max. 12 bar
Protection class	IP 65 with coupling socket
Mounting position	any
Temperature range	-10 °C to 90 °C / 14 °F to 194 °F at **G⅛: 0 °C to 50°C / 32 °F to 122 °F**

	PV202, G⅛	PV202, G¼ / G⅜	PV203, G⅜ / G½
Viscosity max.	-	21 mm²/s	40 mm²/s
Power consumption	100…450 mA, 8.6 W	100…500 mA, 11 W	100…500 mA, 11 W
Hysteresis / Sensitivity	< 5% FS / < 1% FS	< 5% FS / < 2% FS	< 7.5% FS / < 2% FS
Repeatability	< 1% FS	< 3% FS	< 3% FS
Body / Inner valve	brass/SST, PTFE, FKM	brass/SST, PTFE, FKM	brass/SST, PTFE, NBR/Buna-N



DN 1.2 up to DN 12.5
compressed air or liquids

Dimensions A mm	B mm	C mm	Media L: air W: water	Nominal size DN	K_v-value (m³/h)	Flow rate l/min*1	Supply max. bar	Connection thread G	Order number
Proportional flow valve									**PV202 / PV203**
							24 V DC, direct control, without amplifier, with coupling socket, made of brass		
17	78	8	L	1.2	0.05	0… 70	8.0	G⅛	**PV202-1-12**
				1.6	0.07	0…110	6.0		**PV202-1-16**
				2.4	0.10	0… 70	4.0		**PV202-1-24**
				3.2	0.16	0…105	2.5		**PV202-1-32**
40	95	20	L/W*3	1.2	0.04	0… 60	16	G¼	**PV202-2-12**
				2.4	0.10	0…110	8.0		**PV202-2-24**
				3.2	0.26	0…170	4.0		**PV202-2-32**
				4.0	0.42	0…280	2.5		**PV202-2-40**
				5.6	0.70	0…310	1.4		**PV202-2-56**
				7.1	0.88	0…390	1.0		**PV202-2-71**
48	97	14	L/W*3	3.2	0.28	0…190	4.0	G⅜	**PV202-3-32**
				4.0	0.45	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	G⅜	**PV203-3-125W**
				12.5	2.20	0… 37*2	10	G½	**PV203-4-125W**

PV202-1

PV202-2

PV203-4

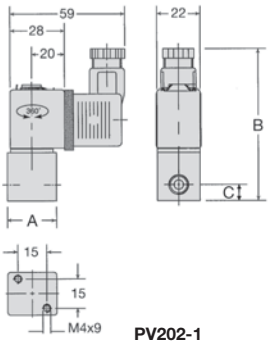
PVY-03

Special options, add the appropriate letter or number

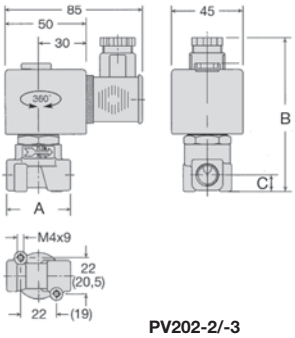
for water or oil		for PV202, G¼ and G⅜	PV202- . - . . **W**
stainless steel body	NPT connection thread, FKM elastomere	for PV202	PV202- . - . . **S**
12 V DC	voltage signal		PV20 . - . - . . **12V**

Accessories, enclosed

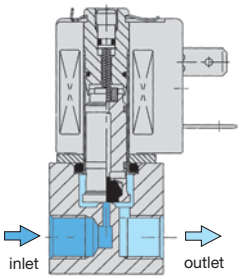
plug amplifier	24 V DC, switchable 0-10 V, 0-20 mA, 4-20 mA	for PV202, G⅛	**PVY-03**
		for all others	**PVY-04**
plug amplifier	12 V DC, switchable 0-10 V, 0-20 mA, 4-20 mA	für PV202, G⅛	**PVY-08**
		for all others	**PVY-09**



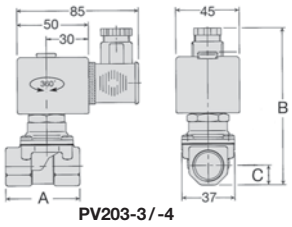
PV202-1



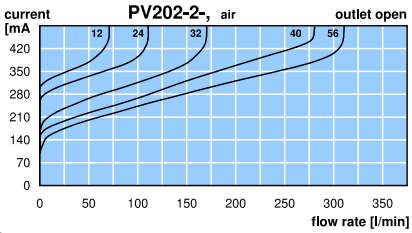
PV202-2/-3

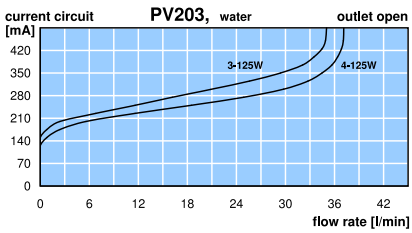


cross section



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

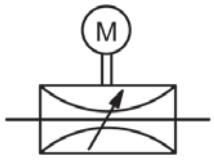
More miniature valves: see catalogue MV, also in Ex ATEX version

PDF CAD
www.aircom.net

Order example:
PV202-1-12

Motorised Proportional Flow Valve P8

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 mm²/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 EN50.081-1, EN50.082-2 and 89/336/EEC.
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 — **Protection class** IP 54
Material	Body: brass; Elastomer: NBR/Buna-N, optionally FKM or EPDM — Control discs: oxide ceramic



G½ up to G1
compressed air or liquids

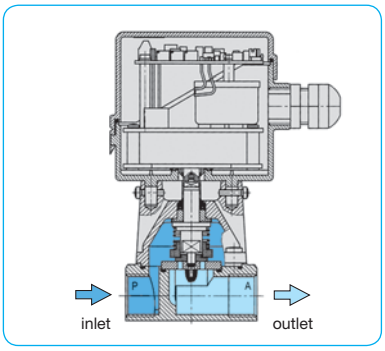
P822-15

Dimensions A mm	B mm	C mm	Nominal size DN	K_v-value (m³/h)	Flow rate water l/min*1	Flow rate air l/min*1	Supply max. bar	Connection thread G	Order number
Proportional flow valve DC motor type 15, with potentiometer, 120 Ncm, 24 V DC, switching time 10…14 s*2									**P8**
55	147	13	15	1.1	0…20	0…1000	10	G½	**P822-15**
55	147	13	20	3.4	0…60	0…3000	6	G½	**P82A-15**
95	164	24	20	4.4	0…70	0…3500	6*3	G¾	**P823-15**
95	164	24	20	4.4	0…70	0…3500	6*3	G1	**P824-15**

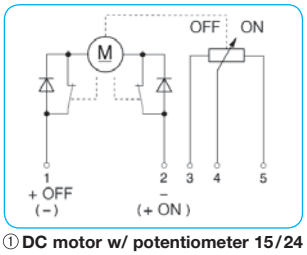
Special options, add the appropriate letter or number

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

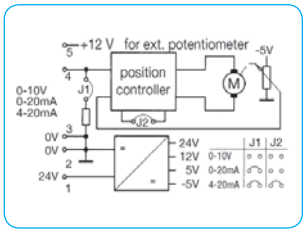
Description	Figure-No.	Watt	Δp max./Torque	Switching time*2	
DC motor w/ potentiometer, 120 Ncm	①	1,5 W	6 bar/120 Ncm	10-14 s	P82 . -**15**
DC motor w/ potentiometer, 200 Ncm	①	2,0 W	10 bar/200 Ncm	13 s	P82 . -**24**
DC motor w/ controller	②	1,5 W	6 bar/120 Ncm	10-16 s	P82 . -**50**
DC motor w/ controller	②	2,5 W	10 bar/200 Ncm	13-16 s	P82 . -**51**
AC motor 50 Hz	③	3,0 W	6 bar/120 Ncm	10 s	P82 . -**36**
stepper motor	④	5,0 W	6 bar/120 Ncm	10 s	P82 . -**38**
FKM elastomer					P82 . - . . **V**
EPDM elastomer					P82 . - . . **E**
free of grease and oil	specially cleaned, suitable for oxygen				P82 . - . . **L**
body nickel-plated					P82 . - . . **X25**
body made of stainless steel					P82 . - . . **S**



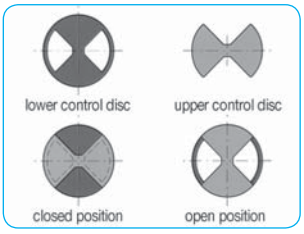
cross section



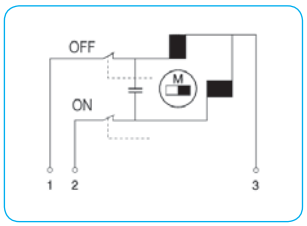
① DC motor w/ potentiometer 15/24



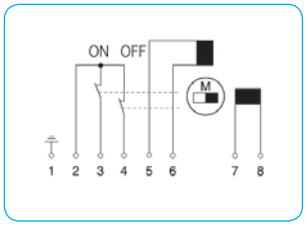
② with position controller 50 and 51



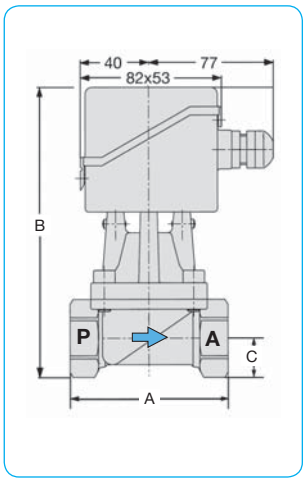
control disc



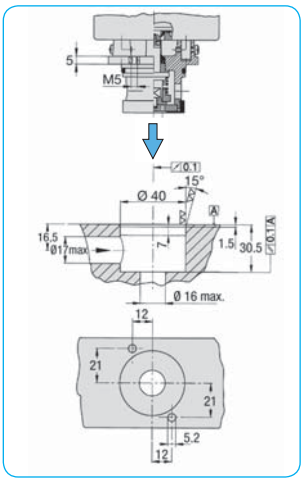
③ synchronous motor 36



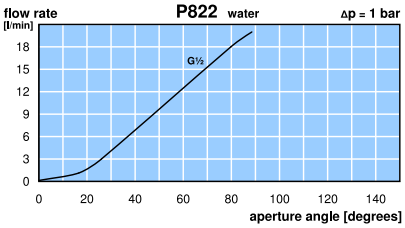
④ stepper motor 38

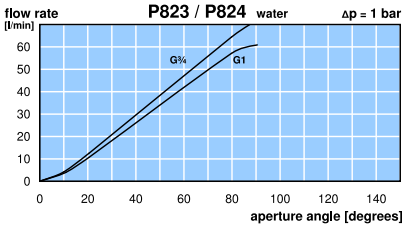


P8



cartridge connection P825





*1 at 6 bar supply pressure and Δp = 1 bar
*2 subject to supply pressure
*3 10 bar at motor for 200 Ncm

PDF CAD
www.aircom.net

Order example:
P822-15

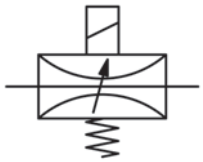
Miniature Proportional Volume Flow Regulator PVK

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



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

Dimensions A mm	B mm	C mm	Nominal size DN	K_v-value (m^3/h)	Flow rate l/min*1	Operating pressure max. bar	Connection thread M5	Order number
Volume flow regulator M5 0-10 V DC, 2-port/2-way valve for compressed air or non corrosive gases, with terminal lug, brass, NBR/Buna-N								**PVK**
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**

PVK-257
with M5 connection

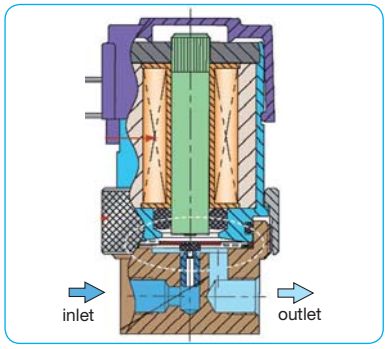
PVK-092AF
with flange connection

Special options, add the appropriate letter

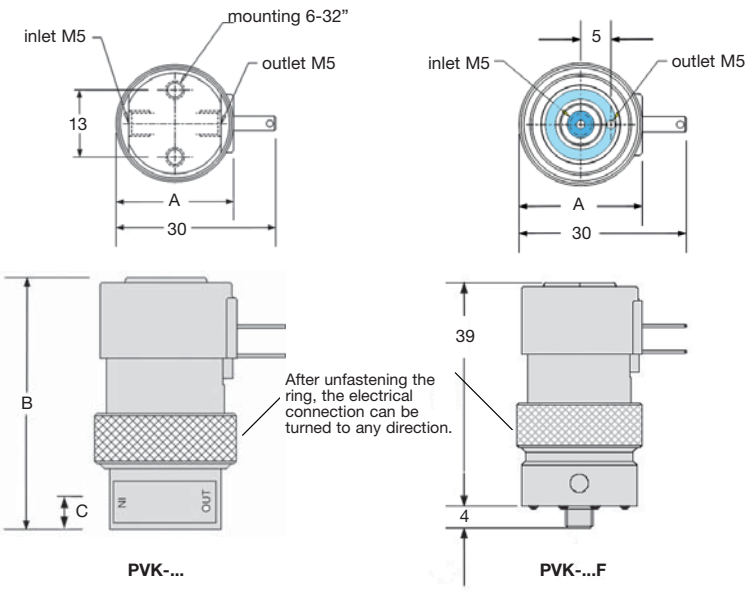
0 - 5 V	input signal max. 6,2 V,	0 - 370 mA,	13 Ω	PVK-. . .**A**
0 - 20 V	input signal max. 25 V,	0 - 92 mA,	218 Ω	PVK-. . .**C**
flange connection	for panel mounting			PVK-. . .**F**
FKM elastomer				PVK-. . .**V**
EPDM elastomer				PVK-. . .**E**

Accessories, enclosed

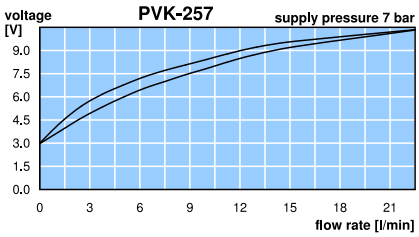
manifold block for valve with flange connection, for 2, 4 ... 12 valves



cross section



PVK-... **PVK-...F**



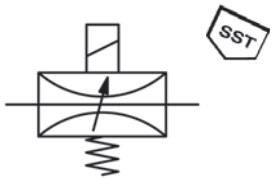
*1 at max. current consumption and max. operating pressure

More miniature valves: see catalogue MV, also in ATEX version

PDF CAD
www.aircom.net

Order example:
PVK-092

Description	Compact positioner with analogue control. Compressed air for remote control necessary. The stroke is made proportional to the flow through the parabolic contour of the piston. The valve shuts tight and is of anti-water hammer design.
Media	compressed air, vacuum up to 10^{-2} mbar or liquids up to viscosity of max. 600 cST (mm^2/s)
Control	pneumatic: lubricated, unlubricated and 50 µm filtered compressed air, 4…8 bar, port G⅛ electrical: 0-10 V, optionally 4-20 mA, supply 24 V DC ± 10%, power consumption 150 mA/3.6 W analog position feedback signal 0-10 V / 4-20 mA (after automatic balance)
Control element	2-port/2-way valve, NC (normally closed) as standard, optionally NO (normally open) as option 3-port/2-way valve for mixing different media, with standard piston
Electrical connection	cable gland, optionally M12
Mounting position	any
Protection Class	IP 66
Linearity / Hysteresis	< 2% FS
Repeatability	< 1.0% FS
Failsafe	valve closes (NC) in the event of voltage failure, optionally outlet fail freeze feature
Temperature range	Ambient: 0 °C to 50 °C / 32 °F to 122 °F Medium: -10 °C to 180 °C / 14 °F to 356 °F
Material	Control valve body: bronze, optionally SST 316L Cone seal: PTFE Proportional valve body: aluminium, PA and FV



0…77 / 1233 l/min compressed air or liquids

PVE1
with 2-port/2-way valve

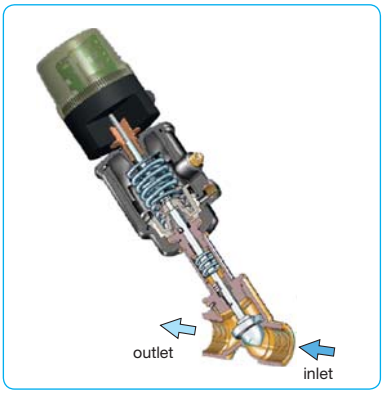
Proportional flow valve

2-port/2-way valve NC, bronze, pilot pressure 4…8 bar, for air or water, 0-10 V, 24 V DC, failsafe

Dimensions A mm	B mm	Ø*1 mm	Nominal size DN	K_v-value (m^3/h)	Supply max. bar	Flow rate water l/min	air l/min	Connection thread G	Order number PVE
65	155	50	15	4.6	16	0… 77	5000	G½	**PVE1-04B**
75	185	63	20	7.1	16	0… 118	7700	G¾	**PVE1-06C**
90	209	90	25	15	16	0… 250	16250	G1	**PVE1-08D**
110	246	90	32	21	12	0… 350	22750	G1¼	**PVE1-10D**
110	298	125	32	22	16	0… 367	23800	G1¼	**PVE1-10E**
120	245	63	40	29	4	0… 483	31400	G1½	**PVE1-12C**
120	262	90	40	29	8	0… 483	31400	G1½	**PVE1-12D**
120	314	125	40	44	16	0… 733	47600	G1½	**PVE1-12E**
150	259	63	50	40	2	0… 667	43300	G2	**PVE1-16C**
150	276	90	50	40	6	0… 667	43300	G2	**PVE1-16D**
150	328	125	50	66	10	0…1100	71500	G2	**PVE1-16E**
190	300	90	65	68	2	0…1133	73600	G2½	**PVE1-20D**
190	352	125	65	74	6	0…1233	80000	G2½	**PVE1-20E**

Special options, add the appropriate letter

NO, normally open	open in basic position	PVE**2**-. . .
3-port/2-way valve	for mixing different media, bronze version only	PVE**3**-. . .
fail freeze	if supply voltage fails, outlet pressure will be frozen	PVE.-. . .**3**
SST body	stainless steel 316L, material no. 1.4401	PVE.-. . .**S**
4-20 mA	input signal	PVE.-. . .**I**
for oxygen *2	specially cleaned, with oxygen grease, for G½ to G2	PVE.-. . .**15**
cascade control	double loop, 0-10 V	PVE.-. . .**KU**
	double loop, 4-20 mA	PVE.-. . .**KI**
	double loop, frequency input	PVE.-. . .**KF**
electr. connection M12	with coupling socket	PVE.-. . .**M12**



cross section

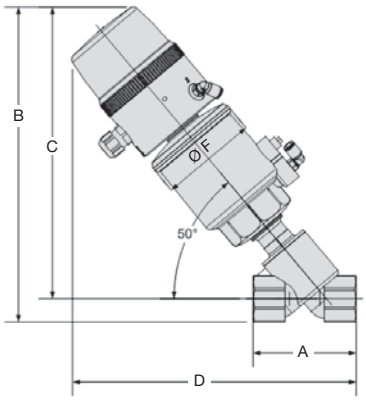
PVE with regulator control	
1	24 V DC supply voltage
2	GND (earth) supply
3	+ setpoint (0-10 V / 4-20 mA)
4	GND (earth) setpoint
5	
6	position feedback
7	+24 V DC ON/OFF output signal

PVE with cascade control	
1	24 V DC supply voltage
2	GND (earth) supply
3	+ setpoint (0-10 V / 4-20 mA)
4	GND (earth) setpoint
5	external signal input
6	
7	+24 V DC ON/OFF output signal

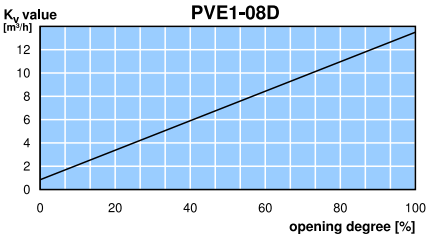
connecting plan

parabolic piston enables stroke-proportional K_v value change

Ø head*1	thread	C	D	ØF
50 mm	½	213	212	69
63 mm	¾	242	245	85
	1½	287	294	85
	2	296	319	85
90 mm	1	261	267	118
	1¼	293	306	118
	1½	304	313	118
	2	313	337	118
	2½	329	369	118
125 mm	1¼	445	354	156
	1½	356	361	156
	2	365	385	156
	2½	380	417	156



PVE1



*1 Ø of pilot head
*2 max. 15 bar operating pressure and 60 °C / 140 °F media temperature

Order example: PVE1-04B

Precision Needle Valve, Ø 0 to 0.65 mm NV30

Description	The precision needle valve is an manually adjustable flow control valve used in pneumatic and fluid systems. Unique laminar flow design ensures sensitive reproducible control. Ideal for precision gas metering and circuit speed or sequencing control.
Media	5 µm filtered compressed air, non-corrosive gases or liquids
Operating pressure	vacuum up to positive pressure of max. 12 bar
Adjustment	The flow control needle needs 8 screw turns for maximum flow, approximately equal to an 0.65 mm / 0.025″ orifice.
Panel mounting	borehole 8 mm / 0.312″, max. panel thickness 3.5 mm / 0.15″
Temperature range	-40 °C to 95 °C / -40 °F to 203 °F
Material	Body and needle: nickel-plated brass Elastomer: NBR/Buna-N

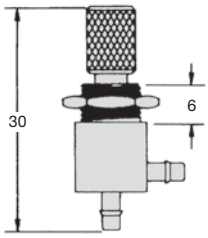
Ø 0…0.65 mm
compressed air or liquids

Flow adjustment mit	Operating pressure max. bar	Volume flow at 3.5 bar and 6 turns l/min	Nipple diameter Ø mm	Nipple diameter inch	Order number
Needle valve with knurled screw (operating pressure max. 12 bar, nickel-plated brass, Ø 0…0.65 mm)					**NV30-K**
knurled-head	12	0…32	3.0	1/16″	**NV30-2K**
			4.5	1/8″	**NV30-4K**
Needle valve with slotted screw (operating pressure max. 12 bar, nickel-plated brass, Ø 0…0.65 mm)					**NV30-S**
slotted screw	12	0…32	3.0	1/16″	**NV30-2S**
			4.5	1/8″	**NV30-4S**

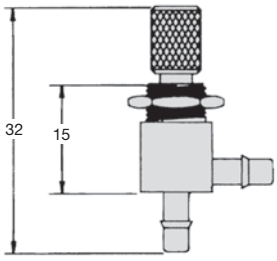
NV30-2K
with knurled-head

NV30-4S
with slotted screw

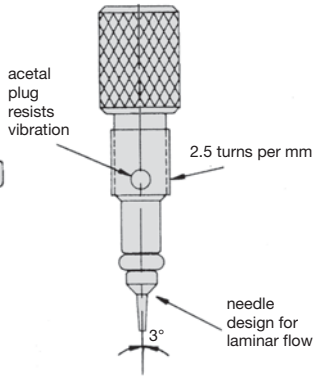
NV30-2K

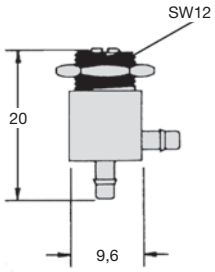


NV30-2K

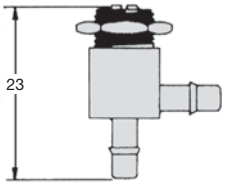


NV30-4K

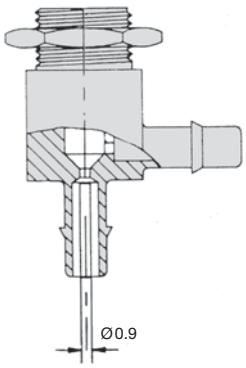


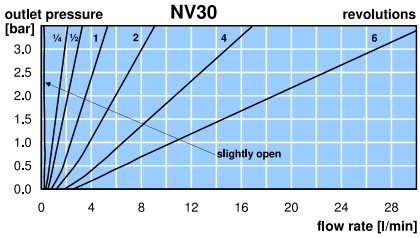


NV30-2S



NV30-4S





PDF CAD
www.aircom.net

Order example:
NV30-2K

Precision Needle Valve VR5 / VR6

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. 20 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	-20 °C to 150 °C / - 4 °F to 302 °F for FKM, -40 °C to 90 °C / -40 °F to 194 °F for EPDM; -30 °C to 90 °C / -22 °F to 194 °F for NBR/Buna-N,
Material	Body: anodized aluminium, optionally SST; Inner valve: brass, optionally stainless steel; Elastomer: NBR/Buna-N; Knob: aluminium and plastic

Ø 0…1 / 6.5 mm
compressed air or liquids

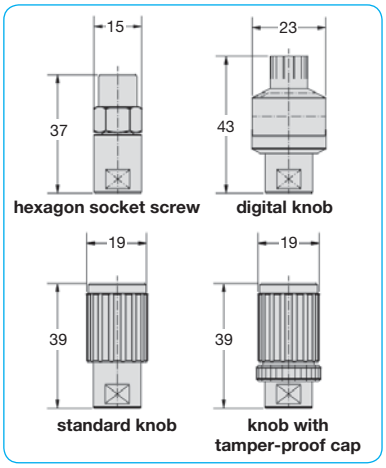
VR6
straight-way valve

VR5
angle valve

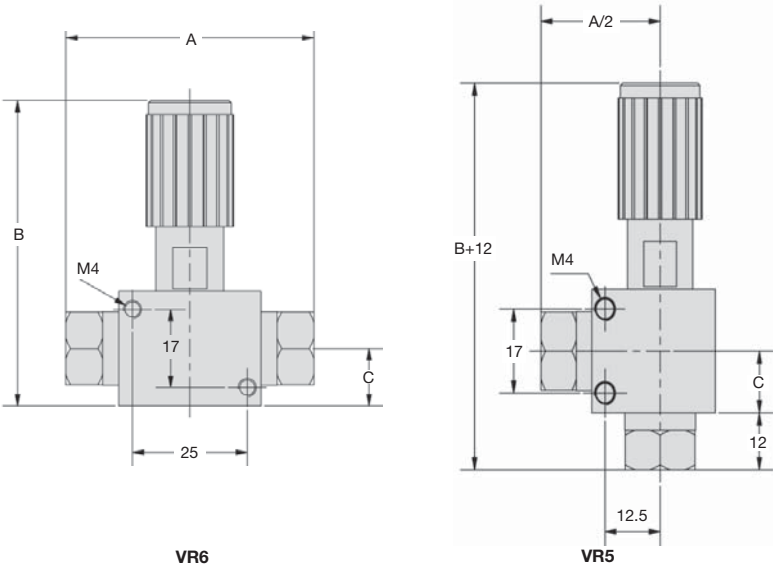
Dimensions A mm	B mm	C mm	Needle size mm	K_v-value (m^3/h)	Flow rate water l/min*2	Flow rate air l/min*1	Connection thread G	Order number
Precision needle valve with straight pass, right-hand closing, with knob, aluminium/brass/FKM, supply: max. 20 bar								**VR**
54	64	10	1.0	0.0007	0… 0.01	0… 0.3	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**

Special options, add the appropriate letter

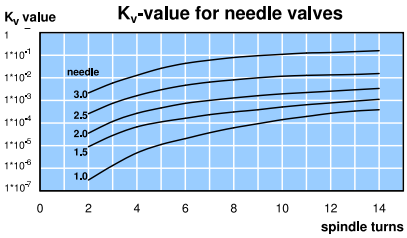
angle valve	corner version	for G¼	VR**5**-02.
left-hand closing	closing counterclockwise	for G¼	VR.-02.**L**
stainless steel body	body and valve made of stainless steel 316	for G¼	VR.-02.**S**
EPDM elastomer	-40 °C to 90 °C / -40 °F to 194 °F, SST body only	for G¼	VR.-02.S**E**
tamper-proof cap	on valve with knob		VR.-02.**T**
digital knob	with 100 increments, left-hand closing	for G¼	VR.-02.**R**
hexagon socket screw	and locknut		VR.-02.**I**



Optionen



VR6 **VR5**



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

PDF CAD
www.aircom.net

Order example:
VR6-02A

Precision Restrictor in Brass Body RF

Description	Precision sapphire restrictor for reducing the flow of air or gas. Fixed flow restrictors are used in back pressure and air jet sensing circuits.
Media	5 µm filtered compressed air, non-corrosive gases or liquids
Diameter tolerances	-3% to +10% of nominal diameter
Operating pressure	vacuum up to positive pressure of max. 12 bar
Temperature range	5 °C to 50 °C / 41 °F to 122 °F
Material	Body: brass Restrictor: sapphire

Ø 0.06 up to 0.64 mm compressed air or liquids

Nominal size Ø mm	Order number 10-32″ / nipple Ø 2 RF1	nipple Ø 2.2 RF2	10-32″ RF3	10-32″ / open orifice RF4

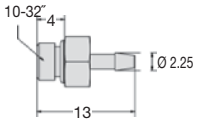
Restrictor

operating pressure max. 12 bar **RF**

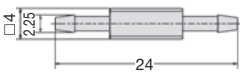
0.06	RF106	RF206	RF306	RF406
0.07	RF107*	RF207	RF307	RF407
0.08	RF108*	RF208*	RF308*	RF408*
0.09	RF109	RF209	RF309	RF409
0.10	RF110*	RF210*	RF310*	RF410*
0.11	RF111	RF211	RF311	RF411
0.12	RF112	RF212	RF312	RF412
0.13	RF113	RF213	RF313	RF413
0.14	RF114	RF214	RF314	RF414
0.15	RF115*	RF215*	RF315*	RF415*
0.16	RF116	RF216	RF316	RF416
0.17	RF117	RF217	RF317	RF417
0.18	RF118	RF218	RF318	RF418
0.20	RF120	RF220	RF320	RF420
0.22	RF122*	RF222*	RF322*	RF422*
0.24	RF124	RF224	RF324	RF424
0.26	RF126	RF226	RF326	RF426
0.28	RF128	RF228	RF328	RF428
0.30	RF130	RF230	RF330	RF430
0.32	RF132*	RF232*	RF332*	RF432*
0.34	RF134	RF234	RF334	RF434
0.36	RF136	RF236	RF336	RF436
0.40	RF140	RF240	RF340	RF440
0.44	RF144*	RF244*	RF344*	RF444*
0.48	RF148	RF248	RF348	RF448
0.52	RF152	RF252	RF352	RF452
0.54	RF154	RF254	RF354	RF454
0.58	RF158	RF258	RF358	RF458
0.64	RF164*	RF264*	RF364*	RF464*

RF2 RF1

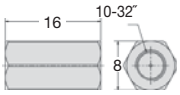
RF3 RF4



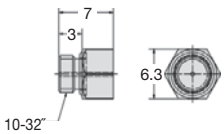
RF1



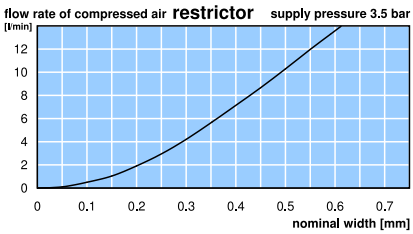
RF2



RF3



RF4



* preferred stock items

PDF CAD
www.aircom.net

Order example: RF106

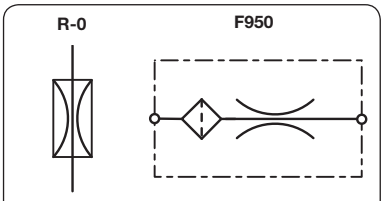
Precision Restrictor in Plastic Body R-0/F950

Precision Restrictor R-0

Description	Precision sapphire restrictor for reducing the flow of air or gas.
Media	compressed air or non-corrosive gases
Diameter tolerance	± 0.005 mm or ± 3% of flow
Operating pressure	vacuum up to positive pressure of max. 7 bar **Temperature range** 5 °C to 50 °C / 41 °F to 122 °F
Material	Body: polycarbonate, FDA-approved Restrictor: sapphire Filter element: stainless steel fabric

Restrictor with Filter F950

Description	Disposable in-line-filter with Dutch weave screen of 304 stainless steel. Flow direction and filter size in µm are clearly marked. The colour indicates the nominal size.
Diameter tolerance	-3% to +10% of nominal diameter
Filter element	5 µm at DN 0.10 to DN 0.15, 43 µm at DN 0.18 to DN 0.41, 73 µm at DN 0.51 to DN 0.76
Operating pressure	max. 7 bar **Temperature range** 5 °C to 50 °C / 41 °F to 122 °F
Material	Body: polysulphone Restrictor: sapphire Filter element: stainless steel fabric



0.08 to 1.02 mm | **0.1 to 0.76 mm 5 / 43 / 73 µm**

Dimensions A mm	Connection inlet / outlet	Nominal size colour / DN Ø mm	Order number	Nominal size colour / DN Ø mm	Order number

Restrictor, barbed fittings Ø 2.7 — operating pressure max. 7 bar — R-0..-6

30	fittings Ø 2,7	gold	0.08	**R-003-6**	orange	0.36	**R-014-6**
		purple	0.10	**R-004-6***	grey	0.41	**R-016-6***
		white	0.13	**R-005-6**	brown	0.43	**R-017-6**
		yellow	0.18	**R-007-6**	red	0.48	**R-019-6**
		light green	0.20	**R-008-6***	dark blue	0.51	**R-020-6***
		lavender	0.23	**R-009-6**	black	0.64	**R-025-6**
		light blue	0.25	**R-010-6**	beige	0.76	**R-030-6**
		green	0.30	**R-012-6***	dark grey	0.89	**R-035-6***
					cyan	1.02	**R-040-6***

R-0...-1 R-0...-6

Restrictor, barbed fittings Ø 4,7 — operating pressure max. 7 bar — R-0..-1

34	fittings Ø 4.7	gold	0.08	**R-003-1**	orange	0.36	**R-014-1**
		purple	0.10	**R-004-1***	grey	0.41	**R-016-1***
		white	0.13	**R-005-1**	brown	0.43	**R-017-1**
		yellow	0.18	**R-007-1**	red	0.48	**R-019-1**
		light green	0.20	**R-008-1***	dark blue	0.51	**R-020-1***
		lavender	0.23	**R-009-1**	black	0.64	**R-025-1**
		light blue	0.25	**R-010-1**	beige	0.76	**R-030-1**
		green	0.30	**R-012-1***	dark grey	0.89	**R-035-1***
					cyan	1.02	**R-040-1***

R-0...-0
with plain fittings

Restrictor with filter — operating pressure max. 7 bar, nipple Ø 2.7 mm, 5/43/73 µm — F950

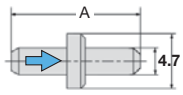
34	fittings Ø 2.7	purple	0.10	5 µm	**F950- 5-041-B80***
		light green	0.13	5 µm	**F950- 5-050-B80**
		red	0.15	5 µm	**F950- 5-051-B80**
		cyan	0.18	43 µm	**F950-43-071-B80***
		yellow	0.25	43 µm	**F950-43-101-B80**
		black	0.30	43 µm	**F950-43-121-B80***
		grey	0.41	43 µm	**F950-43-161-B80**
		blue	0.51	73 µm	**F950-73-201-B80***
		brown	0.64	73 µm	**F950-73-251-B80**
		beige	0.76	73 µm	**F950-73-301-B80***

F950-...B85/ ...B80

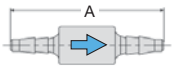
Special options, add the appropriate letter or number

plain fittings Ø 2.3 A = 9.9 mm — for R-0 — R-0 . . -**0**

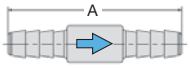
barbed fittings Ø 4.7 A = 34 mm — for F950 — F950-. . -. . . -**B85**



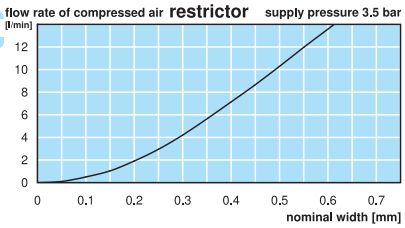
plain fittings
R-0..-0

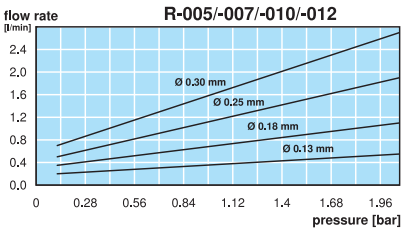


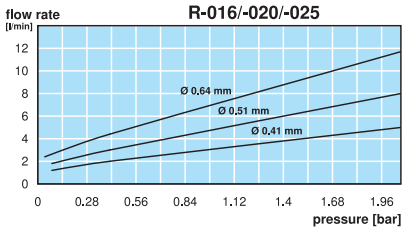
barbed fittings Ø 2.7
R-0..-6
F950-.-...B80



barbed fittings Ø 4.7
R-0..-1
F950-.-...B85







* preferred stock items

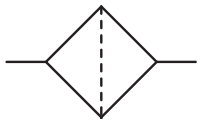
*1 nominal size see RF2

PDF CAD
www.aircom.net

Order example
R-003-6

Micro In-Line Filter F900

Description	Compact in-line filter with fittings or threaded connection. Flow direction and filter size in µm are clearly marked.
Media	compressed air or non-corrosive gases
Diameter tolerances	-3% to +10% of nominal diameter
Filter element	5 µm, 25 µm, 43 µm or 73 µm
Operating pressure	max. 8.6 bar
Temperature range	5 °C to 50 °C / 41 °F to 122 °F
Material	Body: polysulphone Filter element: Dutch weave stainless steel



5/25/43/73 µm
compressed air or gases

Dimensions A mm	Operating pressure max. bar	Connection inlet / outlet	Filter element µm	Order number
Micro pressure filter		operating pressure max. 8.6 bar		**F900**
26	8.6	fittings Ø 2.7	5	**F950-05B80**
			25	**F950-25B80**
			43	**F950-43B80**
			73	**F950-73B80**
30	8.6	fittings Ø 4.7	5	**F950-05B85**
			25	**F950-25B85**
			43	**F950-43B85**
			73	**F950-73B85**
24	8.6	10-32″ / fittings Ø 2.7	5	**F960-05B80**
			25	**F960-25B80**
			43	**F960-43B80**
			73	**F960-73B80**
28	8.6	10-32″ / fittings Ø 4.7	5	**F960-05B85**
			25	**F960-25B85**
			43	**F960-43B85**
			73	**F960-73B85**
15	8.6	10-32″ / 10-32″	5	**F970-05**
			25	**F970-25**
			43	**F970-43**
			73	**F970-73**

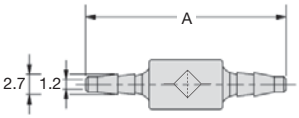
F950

F960

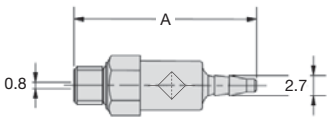
F970

Accessories, enclosed

connecting nipple	for F960 and F970	10-32″ / fitting Ø 2.7	**F3120-80**
		Ø 4.7	**F3120-85**
		Ø 5.6	**F3120-86**

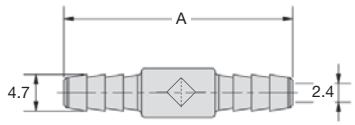


F950-..B80

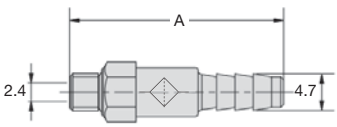


F960-..B80

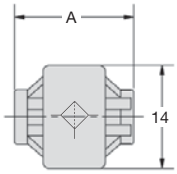
fitting		for tube	
B80	Ø 2.7	1/16″	Ø 1.6 mm
B85	Ø 4.7	1/8″	Ø 3.2 mm
B86	Ø 5.6	0.17″	Ø 4.3 mm



F950-..B85



F960-..B85



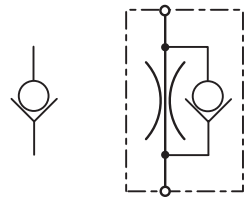
F970

PDF CAD
www.aircom.net

Order example:
F950-05B80

Check Valve and Restrictor Check Valve F2804

Check valve	The check valve permits flow in one direction only. A small check disc within the housing ensures free flow in one direction and at the same time seals off on the other side.
Restrictor check valve	The restrictor check valve provides a constant flow in one direction, defined through the orifice size, and a flow of the full nominal size towards the other direction.
Media	5 µm filtered compressed air or non-corrosive gases
Diameter tolerance	-3% to +10% of nominal diameter
Operating pressure	max. 0.7 bar at F2804-400/1/2/3, max. 5.2 bar at F2804-404
Cracking pressure	< 20 mbar at F2804-400/1/2/3, < 25 mbar at F2804-404
Temperature range	5 °C to 50 °C / 41 °F to 122 °F
Material	Body: polysulphone at F2804-400/1/2/3, polypropylene at F2804-404 Check disc: Celcon at F2804-401/2, silicone at F2804-400/3/4



3.4/57 l/min **Ø 0.1 to 1.0 mm**

Dimensions A mm	Operating pressure max. bar	Check disk made of	Connection	Leakage rate < ml/min*3	Flow rate l/min*2	Nominal size colour / DN	Order number
Check valve			operating pressure max. 0.7 / 5.2 bar				**F2804**
12	0.7	silicone	plain fittings Ø 2.4	3	3.4	red 1.5	**F2804-400*1**
		Celcon		51		orange 1.5	**F2804-401**
		Celcon		17		green 1.5	**F2804-402**
		silicone		3		blue 1.5	**F2804-403**
26	0.7	Celcon	fittings Ø 2.7	51		grey 1.5	**F2804-401-B80**
		Celcon		17		grey 1.5	**F2804-402-B80**
		silicone		3		grey 1.5	**F2804-403-B80*1**
30	0.7	Celcon	fittings Ø 4.7	51		grey 1.5	**F2804-401-B85**
		Celcon		17		grey 1.5	**F2804-402-B85**
		silicone		3		grey 1.5	**F2804-403-B85*1**
15	5.2	silicone	10-32″	1	57	grey 3.8	**F2804-404*1**
		silicone	fittings Ø 2.7	1		grey 3.8	**F2804-404-B80**
		silicone	fittings Ø 4.7	1		grey 3.8	**F2804-404-B85**

Restrictor check valve

operating pressure max. 5.2 bar — **F2804**

15	5.2	silicone	10-32″	0.10 **F2804-404-041*1**
				0.13 **F2804-404-050**
				0.15 **F2804-404-051**
				0.18 **F2804-404-071**
				0.25 **F2804-404-101*1**
				0.30 **F2804-404-121**
				0.41 **F2804-404-161**
				0.51 **F2804-404-201**
				0.64 **F2804-404-251*1**
				0.76 **F2804-404-301**
				1.02 **F2804-404-401*1**

Special options, add the appropriate number

increased cracking pressure	for check valve, with spring	35 mbar: **05**	140 mbar	**F2804-404-2**
		280 mbar: **4**	350 mbar	**F2804-404-5**

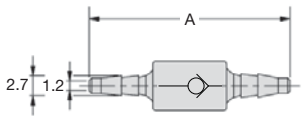
Accessories, enclosed

connecting nipple	for F2804-404	10-32″ / fitting Ø 2.7	**F3120-80**
		Ø 4.7	**F3120-85**
		Ø 5.6	**F3120-86**

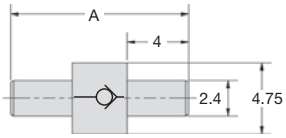
F2804-400/1/2/3 check valve

F2804-404-B85/...-B80 check valve

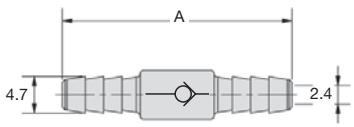
F2804-404-071/-301 restrictor check valve



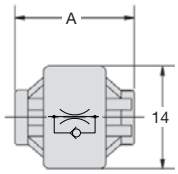
F2804-40.-B80



F2804-40.- with plain fittings



F2804-40.B85



F2804-404

fitting		for tube	
B80	Ø 2.7	1/16″	Ø 1.6 mm
B85	Ø 4.7	1/8″	Ø 3.2 mm
B86	Ø 5.6	0.17″	Ø 4.3 mm

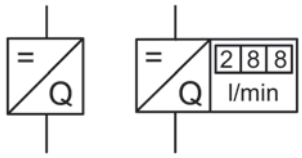
*1 preferred stock items *2 at max. operating pressure *3 at Δp or P_1 = 70 mbar, at type F2804-404: P_1 = 5.2 bar

PDF CAD
www.aircom.net

Order example: F2804-400

Flow Monitor Based on Differential Pressure Technology VPF

Description	The flow measurement device works with differential pressure technology. It allows active flow control through continuous real time measurement, realised within 1 ms. There are no moving parts within the flow monitor, therefore it is virtually wear-free.		
Media	compressed air		
Operating pressure	max. 11 bar		
Supply voltage	15…24 V DC, max. power consumption 80 mA		
Display	without display as standard, optionally 4-digit LCD display with 12 mm tall, red figures		
Electrical connector	square connector, 6-pin with coupling socket		
Output signal	0…10 V, optionally 4…20 mA or 20…4 mA	**Accuracy**	< 4% FS at 10% to 100% range
Repeatability	< 0.25% FS	**Temperature sensitivity**	0.25% per °C / K
Detectable flow	> 4% FS	**Shock resistance**	25 g
Response time	1 ms	**Protection class**	IP 54 / Nema 4
Mounting position	any	**Temperature range**	0 °C to 50 °C / 32 °F to 122 °F
Material	Body: anodized aluminium Transducer: aluminium	Elastomer:	NBR/Buna-N



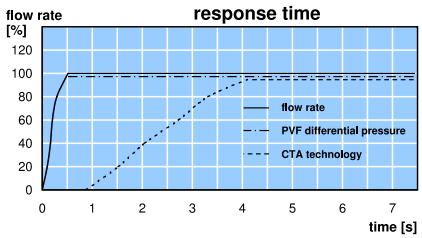
30…300 ml/min / 7000 l/min compressed air, 1 ms fast

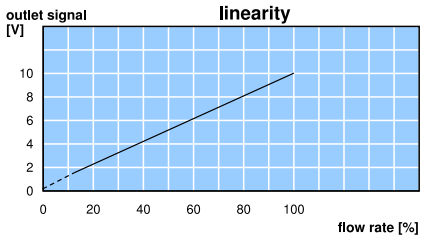
Dimensions A mm	B mm	C mm	Operating pressure max. bar	Connection thread G	Flow rate ml/min*1	Order number
Flow meter			for compressed air, 0…10 V output signal, supply 24 V DC, without display, with coupling socket, open outlet			**VPF**
102	106	10	11	G¼	30… 300	**VPF-2**
102	119	19	11	G⅜	70… 700	**VPF-3**
102	119	19	11	G½	300…3000	**VPF-4**
102	132	25	11	G¾	700…7000	**VPF-5**

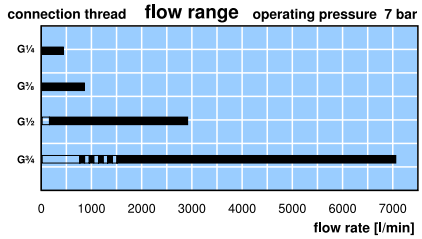
VPF

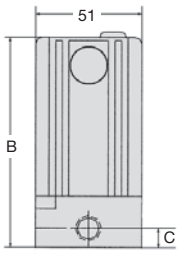
Special options, add the appropriate letter or number

monitor signal	4-20 mA, proportional to flow rate increase				VPF- . **I**
	20-4 mA, proportional to flow rate increase				VPF- . **L**
LED display	4-digit, red figures 12 mm tall				VPF- . **A**
carbon dioxide	CO_2:	**03**	**argon**	Ar:	VPF- . **05**
nitrogen	N_2:	**07**	**helium**	He:	VPF- . **09**

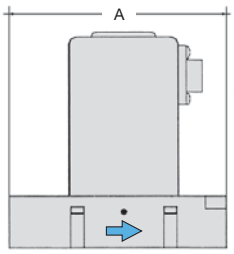




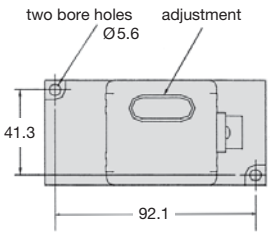




side view



front view



top view

VPF

*1 at 10 bar operating pressure and open outlet

PDF CAD
www.aircom.net

Order example: VPF-2