

One-way flow control, flow control and functional combinations



- One-way flow control valves for exhaust and supply air flow control
- Flow control valves without non-return function
- For threads M3 ... G $\frac{3}{4}$ and push-in fitting $\varnothing$ 3 ... 12 mm
- Functional combinations with one-way flow control valve and piloted non-return valve
- Polymer and metal designs
- Designs free of copper, PTFE and silicone
- Corrosion resistant designs

Flow control valves and one-way flow control valves

Key features

FESTO

General information

Standard nominal flow rate q_{nN}

The standard nominal flow rate q_{nN} is the flow rate based on standard conditions at an input pressure of $p_1 = 6$ bar and an output pressure of $p_2 = 5$ bar, measured at room temperature $t = 20$ °C.

Standard flow rate q_n

The standard flow rate is measured at an input pressure of $p_1 = 6$ bar and an output pressure with respect to atmospheric pressure ($p_2 = 0$ bar).

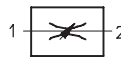
Exhaust air flow control



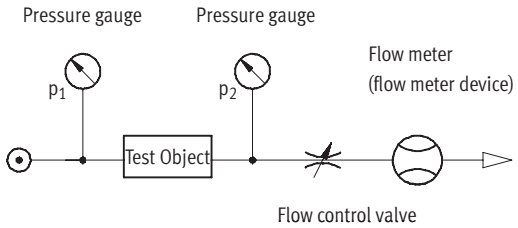
Supply air flow control



Flow control at both sides

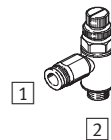


Flow measurement circuit



p_1 Input pressure

p_2 Output pressure

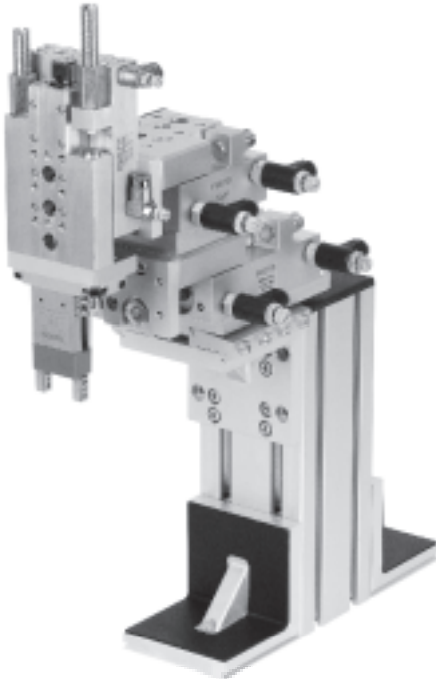


1 Compressed air connection

2 Working connection

Typical applications

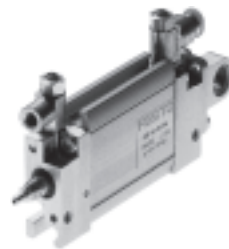
Mini slide SLT with standard flow control valves



Gripper HGW with mini flow control valves



Flat cylinder DZF with mini flow control valves

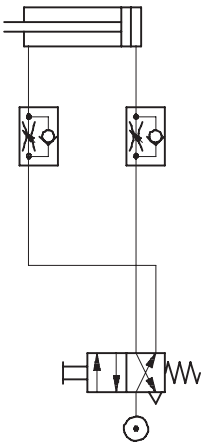
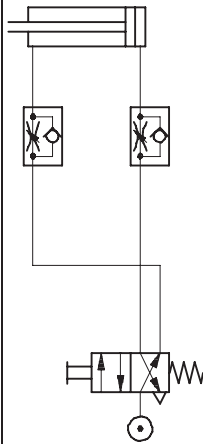
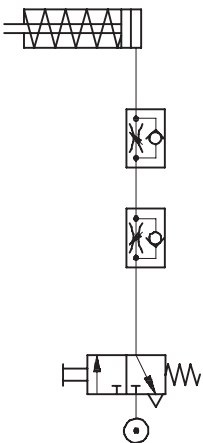
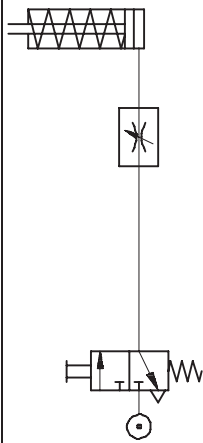


Multimount cylinder DMM with mini flow control valves



Flow control valves and one-way flow control valves

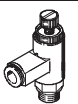
Key features

Flow control functions and range of applications			
Circuit symbol	Description	Circuit symbol	Description
Double-acting cylinder with one-way flow control valve			
Exhaust air flow control		Supply air flow control	
	Speed adjustment through exhaust air flow control. Uncontrolled supply air and controlled exhaust moves the piston between air cushions (improves motion, even with load changes).		Adjustable speed of advance and return strokes. The air flow is identical in both directions.
Single-acting cylinder with one-way flow control valve			
Exhaust and supply air flow control		Single-acting cylinder with flow control valve	
Flow control acting at both sides		Flow control acting at both sides	
	Adjustable speed of advance and return strokes. The air flow can be adjusted differently for both directions.		Speed adjustment through flow control at both sides is often applied in the case of single-acting or small cylinders. The benefit of this application lies in its simplicity.

Flow control valves and one-way flow control valves

Product range overview

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Function	Version	Type	Material	Flow rate characteristic ¹⁾	One-way flow control function		
					Exhaust air	Supply air	Both
					A	Z	O
Standard flow control valve with QS push-in fitting	Rotatable 360° around the screw-in axis after installation						
	Adjustment via slotted head screw						
		GRLA-...-QS-...-D	Metal	Low flow	■	■	–
		GRLZ-...-QS-...-D			■	■	–
					■	–	–
					■	–	–
					■	–	–
	Adjustment via slotted head screw						
		GRLA-...-QS-...-MF-D	Metal	Medium flow	■	–	–
	Adjustment via slotted head screw						
		GRLA-F-...-QS-...-D	Chromed metal	Medium flow	■	–	–
	Adjustment via knurled screw						
		GRLA-...-QS-...-RS-D	Metal	Low flow	■	–	–
					■	–	–
					■	–	–
					■	–	–
					■	–	–
	Adjustment via knurled screw						
		GRLA-...-QS-...-RS-MF-D	Metal	Medium flow	■	–	–
					■	–	–
	Adjustment via slotted head screw, swivel connection rotatable 360°						
		GRXA-...-QS-...-D	Metal	Low flow	■	–	–
					■	–	–
					■	–	–
	Adjustment via knurled screw						
		GRLA-...-QS-...-RS-B	Polymer	High flow	■	–	–
					■	–	–
■					–	–	
Adjustment via rotary knob							
	VFOV-LE...	Polymer	Medium flow	■	–	–	
Adjustment via slotted head screw, push-in sleeve for QS push-in fittings							
	VFOC-E-...	Metal	Low flow	■	–	–	
				■	–	–	

1) Low flow: precision adjustment for low speed
Medium flow: precision adjustment for medium speed
High flow: precision adjustment for high speed

Flow control valves and one-way flow control valves

Product range overview

Type	Pneumatic connection							Free of copper and PTFE	→ Page/Internet	
	Thread	Tubing Ø [mm]								Tubing type ¹⁾
		3	4	6	8	10	12			
Rotatable 360° around the screw-in axis after installation										
Adjustment via slotted head screw										
GRLA-...-QS-...-D	M5	■	■	■	–	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	■	13
GRLZ-...-QS-...-D	G1/8	■	■	■	■	–	–		■	
	G1/4	–	–	■	■	■	–		■	
	G3/8	–	–	■	■	■	–		■	
	G1/2	–	–	–	–	–	■		■	
Adjustment via slotted head screw										
GRLA-...-QS-...-MF-D	G1/8	–	–	■	■	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	■	13
Adjustment via slotted head screw										
GRLA-F-...-QS-...-D	G1/8	–	■	■	■	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	■	20
	G1/4	–	–	■	■	–	–		■	
Adjustment via knurled screw										
GRLA-...-QS-...-RS-D	M5	■	■	■	–	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	■	13
	G1/8	■	■	■	■	–	–		■	
	G1/4	–	–	■	■	■	–		■	
	G3/8	–	–	■	■	■	–		■	
	G1/2	–	–	–	–	–	■		■	
Adjustment via knurled screw										
GRLA-...-QS-...-RS-MF-D	G1/8	–	–	■	■	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	■	13
Adjustment via slotted head screw, swivel connection rotatable 360°										
GRXA-...-QS-...-D	M5	■	■	■	–	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	■	13
	G1/8	■	■	■	■	–	–		■	
	G1/4	–	–	■	■	■	–		■	
Adjustment via knurled screw										
GRLA-...-QS-...-RS-B	G1/8	–	–	■	■	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	–	20
	G1/4	–	–	■	■	–	–		–	
	G3/8	–	–	■	■	–	–		–	
Adjustment via rotary knob										
VFOV-LE...	G1/8	–	■	■	■	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	■	26
Adjustment via slotted head screw, push-in sleeve for QS push-in fittings										
VFOC-E-...	–	–	■	–	–	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	–	29
	–	–	–	■	–	–	–		–	

1) Tubing → Internet: tubing

Flow control valves and one-way flow control valves

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Product range overview

Function	Version	Type	Material	Flow rate characteristic ¹⁾	One-way flow control function		
					Exhaust air	Supply air	Both
					A	Z	O
Standard flow control valve with female threaded connection	Adjustment via slotted head screw						
		GRLA-...-B	Metal	Medium flow	■	■	■
		GRLZ-...-B			■	■	—
		GRLO-...-B			■	■	—
					■	—	—
					■	—	—
					■	—	—
	Adjustment via knurled screw						
		GRLA-...-RS-B	Metal	Medium flow	■	■	—
		GRLZ-...-RS-B			■	■	—
					■	■	—
Standard flow control valve with barbed fitting connection PK	Adjustment via slotted head screw						
		GRLA-...-PK-...-B	Metal	Medium flow	■	■	■ ²⁾
		GRLZ-...-PK-...-B			■	■	—
		GRLO-...-PK-...-B			■	■	—
	Adjustment via knurled screw						
		GRLA-...-PK-...-RS-B	Metal	Medium flow	■	■	—
		GRLZ-...-PK-...-RS-B			■	■	—
					■	■	—

- 1) Low flow: precision adjustment for low speed
Medium flow: precision adjustment for medium speed
High flow: precision adjustment for high speed
- 2) Only for tubing I.D. 3 mm

Flow control valves and one-way flow control valves

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Product range overview

Type	Pneumatic connection							Free of copper and PTFE	→ Page/Internet	
	Thread	Tubing Ø [mm]								Tubing type ¹⁾
		3	4	6	8	10	12			
Adjustment via slotted head screw										
GRLA-...-B	M5	Dependent on fitting						–	47	
GRLZ-...-B	G1/8							–		
GRLO-...-B	G1/4							–		
	G3/8							–		
	G1/2							–		
	G3/4							–		
Adjustment via knurled screw										
GRLA-...-RS-B	M5	Dependent on fitting						–	47	
GRLZ-...-RS-B	G1/8							–		
	G1/4							–		
Adjustment via slotted head screw										
GRLA-...-PK-...-B	M5	■	■	–	–	–	–	PU/PL/PP (standard I.D.)	53	
GRLZ-...-PK-...-B	G1/8	■	■	■	–	–	–			
GRLO-...-PK-...-B	G1/4	–	■	■	–	–	–			
Adjustment via knurled screw										
GRLA-...-PK-...-RS-B	M5	■	–	–	–	–	–	PU/PL/PP (standard I.D.)	53	
GRLZ-...-PK-...-RS-B	G1/8	–	■	■	–	–	–			
	G1/4	–	■	■	–	–	–			

1) Tubing → Internet: tubing

Flow control valves and one-way flow control valves

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Product range overview

Function	Version	Type	Material	Flow rate characteristic ¹⁾	One-way flow control function		
					Exhaust air	Supply air	Both
					A	Z	O
Mini flow control valve with QS push-in fitting	Adjustment via slotted head screw						
		GRLA-...-QS-...	Metal	Low flow	■	■	■
		GRLZ-...-QS-...					
		GRLO-...-QS-...					
		GRLA-...-QS-...-LF-C	Metal	Low flow	■	■	■
		GRLZ-...-QS-...-LF-C					
		GRLO-...-QS-...-LF-C					
		GRGA-...-QS-...	Metal	Low flow	■	■	■
		GRGZ-...-QS-...					
		GRGO-...-QS-...					
	GRGA-...-QS-...LF-C	Metal	Low flow	■	■	■	
	GRGZ-...-QS-...LF-C						
	GRGO-...-QS-...LF-C						
Mini flow control valve with female threaded connection	Adjustment via slotted head screw						
		GRLA-...	Metal	Low flow	■	■	■
		GRLZ-...					
		GRLO-...					
		GRLA-...-LF-C	Metal	Low flow	■	■	■
		GRLZ-...-LF-C					
		GRLO-...-LF-C					
		GRGA-...-PK-...-LF-C	Metal	Low flow	■	■	■
		GRGZ-...-PK-...-LF-C					
		GRGO-...-PK-...-LF-C					
Corrosion resistant one-way flow control valve with female threaded connection	Adjustment via slotted head screw						
		CRGRLA-...-B	Stainless steel	Medium flow	■	—	—
					■	—	—
					■	—	—
					■	—	—
					■	—	—
			Stainless steel	Medium flow	■	—	—
					■	—	—
					■	—	—

- 1) Low flow: precision adjustment for low speed
Medium flow: precision adjustment for medium speed
High flow: precision adjustment for high speed

Flow control valves and one-way flow control valves

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Product range overview

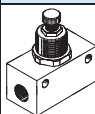
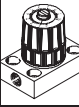
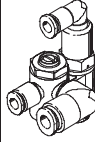
Type	Pneumatic connection							Free of copper and PTFE	➔ Page/Internet		
	Thread	Tubing Ø [mm]								Tubing type ¹⁾	
		3	4	6	8	10	12				
Adjustment via slotted head screw											
GRLA-...-QS-... GRLZ-...-QS-... GRLO-...-QS-...	M3	■	-	-	-	-	-	PUN/PAN/PLN/PFAN (standard O.D.)	-	42	
GRLA-...-QS-...-LF-C GRLZ-...-QS-...-LF-C GRLO-...-QS-...-LF-C	M5	■	■	-	-	-	-		-		
GRGA-...-QS-... GRGZ-...-QS-... GRGO-...-QS-...	M3	■	-	-	-	-	-		-		
GRGA-...-QS-...-LF-C GRGZ-...-QS-...-LF-C GRGO-...-QS-...-LF-C	M5	■	■	-	-	-	-	-			
Adjustment via slotted head screw											
GRLA-... GRLZ-... GRLO-...	M3	Dependent on fitting							-		59
GRLA-...-LF-C GRLZ-...-LF-C GRLO-...-LF-C	M5								-		
Adjustment via slotted head screw											
GRLA-...-PK-...-LF-C GRLZ-...-PK-...-LF-C GRLO-...-PK-...-LF-C	M5	■	-	-	-	-	-	PU/PL/PP (standard I.D.)	-	62	
GRGA-...-PK-...-LF-C GRGZ-...-PK-...-LF-C GRGO-...-PK-...-LF-C	M5	■	-	-	-	-	-		-		
Adjustment via slotted head screw											
CRGRLA-...-B	M5	Dependent on fitting							-	65	
	G1/8								-		
	G1/4								-		
	G3/8								-		
	G1/2								-		

1) Tubing → Internet: tubing

Flow control valves and one-way flow control valves

Product range overview

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Function	Version	Type	Material	Flow rate characteristic ¹⁾	Flow control direction		
					Exhaust air	Supply air	Both
					A	Z	O
Inline flow control valve with QS push-in fitting	Adjustment via knurled screw						
		GR-QS-...	Polymer	Medium flow	■	■	–
		GR-QS-...-LF		Low flow	■	■	–
		GRO-QS-...		Medium flow	–	–	■
Inline flow control valve with female threaded connection	Adjustment via knurled screw						
		GR-...-B	Metal	Medium flow	■	■	–
		GRA-...-B			■	■	–
					■	■	–
					■	■	–
					■	■	–
					■	■	–
					■	■	–
Flow control/silencer combinations, threaded design	Adjustment via slotted head screw, directly screwed into valve						
		GRE-...	Metal	Medium flow	■	–	–
					■	–	–
					■	–	–
					■	–	–
		GRU-...	Polymer	High flow	■	–	–
					■	–	–
					■	–	–
					■	–	–
Standard flow control valve with barbed fitting connection PK, frame assembly	Adjustment via knurled screw						
		GRF-PK-3-...	Metal	Low flow	■	■	–
Precision flow control valve with barbed fitting connection PK	Adjustment via rotary knob						
		GRP-...-PK-... GRPO-...-PK-...	Polymer	Low flow	■	■	■
Precision flow control valve on sub-base		GRP-...-1/8-AL GRPO-...-1/8-AL	Polymer	Low flow	■	■	■
Functional combination with one-way flow control valve and piloted non-return valve	Adjustment via slotted head screw						
		GRXA-HG-...-QS-...	Metal	High flow	■	–	–
					■	–	–
One-way flow control valve with 5 selectable flow control ranges		GRLSA-1/8-QS-6	Metal	Low flow	■	–	–

1) Low flow: precision adjustment for low speed
Medium flow: precision adjustment for medium speed
High flow: precision adjustment for high speed

Flow control valves and one-way flow control valves

Product range overview

FESTO

Type	Pneumatic connection							Free of copper and PTFE	→ Page/Internet	
	Thread	Tubing Ø [mm]								Tubing type ¹⁾
		3	4	6	8	10	12			
Adjustment via knurled screw										
GR-QS-...	–	■	■	■	■	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	–	68
GR-QS-...-LF	–	–	■	■	–	–	–		–	
GRO-QS-...	–	■	■	■	–	–	–		–	
Adjustment via knurled screw										
GR-...-B	M3	Dependent on fitting							–	72
GRA-...-B	M5									
	G1/8									
	G1/4									
	G3/8									
	G1/2									
	G3/4									
Adjustment via slotted head screw, directly screwed into valve										
GRE-...	G1/8	–	–	–	–	–	–	–	–	76
	G1/4								–	
	G3/8								–	
	G1/2								–	
GRU-...	G1/8	–	–	–	–	–	–	–	–	
	G1/4								–	
	G3/8								–	
	G1/2								–	
	G3/4								–	
Adjustment via knurled screw										
GRF-PK-3-...	–	■	–	–	–	–	–	PU/PL/PP (standard I.D.)	–	79
Adjustment via rotary knob										
GRP-...-PK-...	–	■	■	–	–	–	–	PU/PL/PP (standard I.D.)	–	85
GRPO-...-PK-...	–									
GRP-...-1/8-AL	G1/8	–	–	–	–	–	–	–	–	81
GRPO-...-1/8-AL	–									
Adjustment via slotted head screw										
GRXA-HG-...-QS-...	G1/8	–	■	■	–	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	–	38
	G1/4	–	–	■	■	–	–			
Precision adjustment via internal hex and setting of the ranges using a selector switch										
GRLSA-1/8-QS-6	G1/8	–	–	■	–	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	–	29

1) Tubing → Internet: tubing

Flow control valves and one-way flow control valves

FESTO

Type codes

		GRGA	-	M5	-	QS	-	3	-	RS	-	LF	-	C	-	
Type																
Swivel joint, elbow outlet																
GRLA	One-way flow control valve for exhaust air															
CRGRLA	One-way flow control valve for exhaust air, corrosion-resistant															
GRLZ	One-way flow control valve for supply air															
GRLO	Flow control valve without non-return function															
Swivel joint, parallel																
GRGA	One-way flow control valve for exhaust air															
GRGZ	One-way flow control valve for supply air															
GRGO	Flow control valve without non-return function															
Swivel joint, freely rotatable																
GRXA	One-way flow control valve for exhaust air															
Front panel and inline mounting																
GR	One-way flow control valve															
GRA	One-way flow control valve															
GRO	Flow control valve without non-return function															
Screw-in and connecting thread																
M3	Metric thread M3															
M5	Metric thread M5															
1/8	Pipe thread G1/8															
1/4	Pipe thread G1/4															
3/8	Pipe thread G3/8															
1/2	Pipe thread G1/2															
3/4	Pipe thread G3/4															
Tubing connection																
Type of connection																
QS	Push-in connector for standard O.D. tubing															
PK	Barbed fitting connector for standard I.D. tubing															
For tubing O.D. or tubing I.D.																
3	3 mm															
4	4 mm															
6	6 mm															
8	8 mm															
10	10 mm															
Setting component																
RS	Knurled screw															
	Slotted head screw															
Flow rate characteristic																
LF, MF	Low flow, medium flow															
Generation																
	Series A															
B	Series B															
C	Series C															
D ¹⁾	Series D															
Material note																
CT ¹⁾	Free of copper, PTFE and silicone															

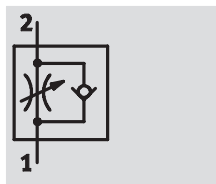
1) The series D is entirely free of copper and PTFE and thus does not have an additional CT note in the type code

Flow control valves and one-way flow control valves

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Technical data – Standard flow control valve with QS push-in connector, series D

Function

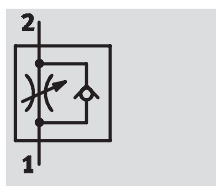


One-way flow control valve
for exhaust air
GRLA/GRXA

- Low flow: Precision adjustment for low speed
- QS push-in connector
- Swivel joint rotatable 360° after installation

Variants:

- Adjustment with slotted head or knurled screw
- Swivel joint, elbow outlet
- Swivel joint, parallel outlet



One-way flow control valve
for supply air
GRLZ

General technical data						
Screw-in thread		M5	G1/8	G1/4	G3/8	G1/2
Valve function	GRLA/GRXA	One-way flow control function for exhaust air				
	GRLZ	One-way flow control function for supply air				
Setting component		Slotted head or knurled screw				
Type of mounting		Can be screwed in				
Assembly position		Any				
Special features	GRLA/GRLZ	Freely rotatable around the screw-in axis after installation				
	GRXA	Swivel joint, freely rotatable				–
Max. tightening torque	GRL...-D	[Nm]	1.5	5.5	11	20
						40

Operating and environmental conditions					
Screw-in thread		M5	G1/8	G1/4	G3/8
Operating medium		Dried air, lubricated or unlubricated, grade of filtration 40µm			
Operating pressure	[bar]	0.2 ... 10			
Storage temperature	[°C]	–10 ... +40			
Ambient temperature	[°C]	–10 ... +60			
Temperature of medium	[°C]	–10 ... +60			

Weights [g]					
Screw-in thread		M5	G1/8	G1/4	G3/8
	GRL...-D	13	22	42	60
	GRXA-...-D	–	16	26	47
	GRLA-...-MF-D	–	32	–	–
	GRLA-...-RS-D	14	23	30	40
	GRLA-...-RS-QS...D	–	24	50	72
	GRLA-...-RS-QS...MF-D	–	40	–	–

Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve with QS push-in connector, series D

Standard nominal flow rate q _N [l/min] at 6 bar → 5 bar								
Screw-in thread			M5	G1/8	G1/4	G3/8	G1/2	
One-way flow control function for exhaust air								
Flow rate characteristic			LF	MF	LF	LF	LF	LF
GRLA-/GRXA- ... -D	QS-3	D ¹⁾	0 ... 100	–	0 ... 130	–	–	–
		R ²⁾	60 ... 100	–	100 ... 130	–	–	–
	QS-4	D	0 ... 100	–	0 ... 160	–	–	–
		R	65 ... 110	–	120 ... 190	–	–	–
	QS-6	D	0 ... 115	0 ... 400	0 ... 185	0 ... 400	0 ... 495	–
		R	70 ... 110	290 ... 420	160 ... 240	290 ... 420	320 ... 495	–
	QS-8	D	–	0 ... 475	0 ... 215	0 ... 475	0 ... 820	–
		R	–	325 ... 500	175 ... 250	325 ... 500	450 ... 850	–
	QS-10	D	–	–	–	0 ... 480	0 ... 900	–
		R	–	–	–	345 ... 500	540 ... 975	–
	QS-12	D	–	–	–	–	–	0 ... 1,580
		R	–	–	–	–	–	925 ... 1,605
One-way flow control function for supply air								
GRLZ-...-D	QS-3	D	0 ... 100	–	0 ... 130	–	–	–
		R	60 ... 100	–	100 ... 130	–	–	–
	QS-4	D	0 ... 100	–	0 ... 160	–	–	–
		R	65 ... 110	–	120 ... 190	–	–	–
	QS-6	D	0 ... 115	–	0 ... 185	–	–	–
		R	70 ... 110	–	160 ... 240	–	–	–
	QS-8	D	–	–	0 ... 215	–	–	–
		R	–	–	175 ... 250	–	–	–

- 1) D: Flow control direction
2) R: Non-return direction

Standard flow rate qn [l/min] at 6 bar → 0 bar								
Screw-in thread			M5	G1/8	G1/4	G3/8	G1/2	
One-way flow control function for exhaust air								
Flow rate characteristic			LF	MF	LF	LF	LF	LF
GRLA-/GRXA- ... -D	QS-3	D ¹⁾	0 ... 145		0 ... 180	–	–	–
		R ²⁾	150 ... 170		200 ... 220	–	–	–
	QS-4	D	0 ... 165		0 ... 250	–	–	–
		R	140 ... 160		270 ... 300	–	–	–
	QS-6	D	0 ... 185	0 ... 600	0 ... 370	0 ... 600	0 ... 740	–
		R	145 ... 170	570 ... 680	330 ... 390	570 ... 680	840 ... 890	–
	QS-8	D	–	0 ... 720	0 ... 400	0 ... 720	0 ... 1,300	–
		R	–	610 ... 760	330 ... 410	610 ... 760	1,080 ... 1,420	–
	QS-10	D	–		–	0 ... 760	0 ... 1,400	–
		R	–		–	630 ... 790	1,160 ... 1,620	–
	QS-12	D	–		–	–	–	0 ... 2,220
		R	–		–	–	–	1,910 ... 2,500
One-way flow control function for supply air								
GRLZ-...-D	QS-3	D	0 ... 135		0 ... 200	–	–	–
		R	130 ... 160		180 ... 200	–	–	–
	QS-4	D	0 ... 160		0 ... 300	–	–	–
		R	150 ... 180		260 ... 290	–	–	–
	QS-6	D	0 ... 170		0 ... 340	–	–	–
		R	160 ... 200		390 ... 460	–	–	–
	QS-8	D	–		0 ... 370	–	–	–
		R	–		390 ... 470	–	–	–

- 1) D: Flow control direction
2) R: Non-return direction

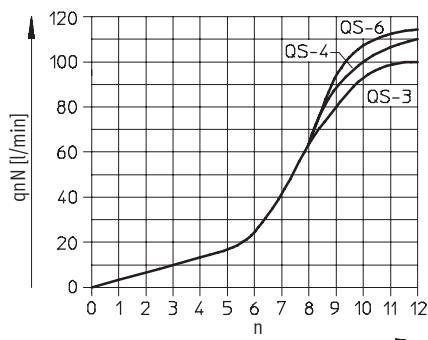
Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve with QS push-in connector, series D

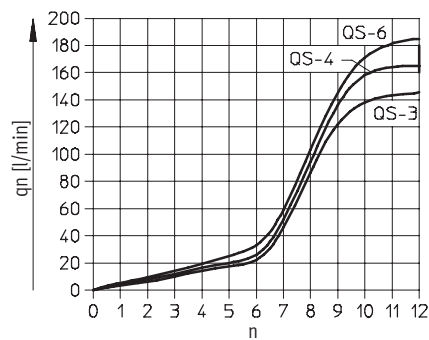
Standard nominal flow rate q_{nN} [l/min] at 6 bar $\rightarrow$ 5 bar
as a function of turns of the adjusting screw n

Screw-in thread M5

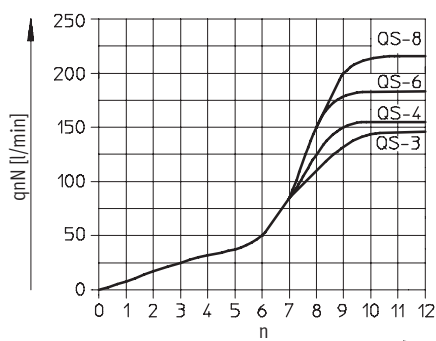


Standard flow rate q_n at 6 bar $\rightarrow$ 0 bar
as a function of turns of the adjusting screw n

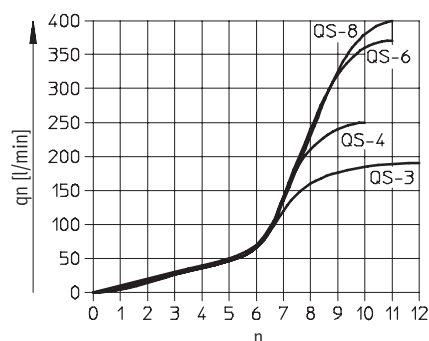
Screw-in thread M5



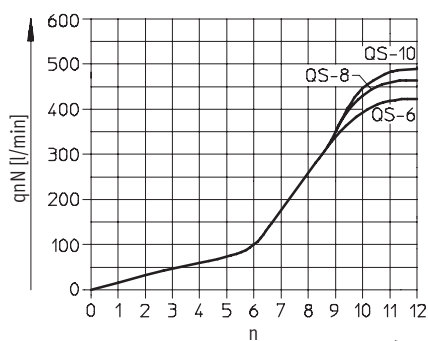
Screw-in thread G1/8



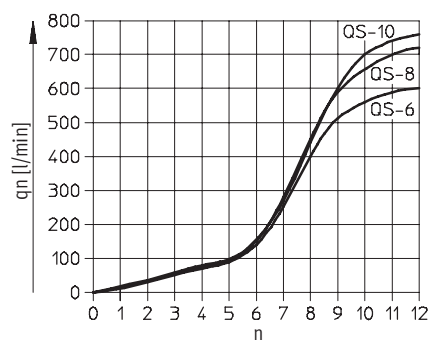
Screw-in thread G1/8



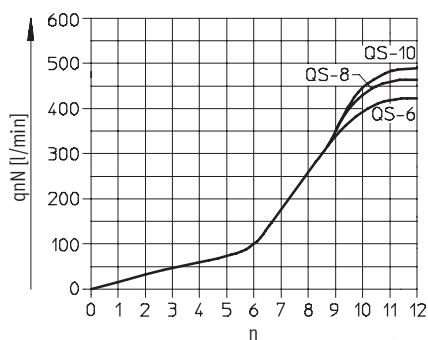
Screw-in thread G1/8 with flow rate MF



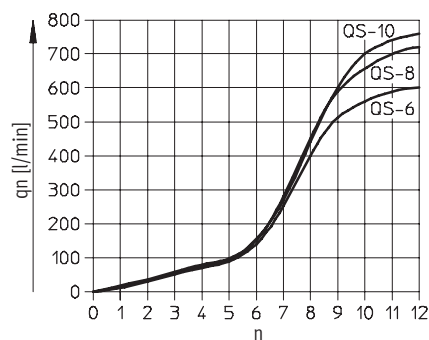
Screw-in thread G1/8 with flow rate MF



Screw-in thread G1/4



Screw-in thread G1/4



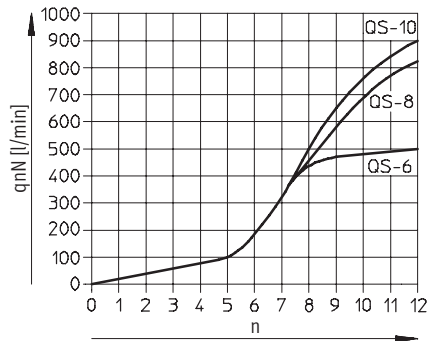
Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve with QS push-in connector, series D

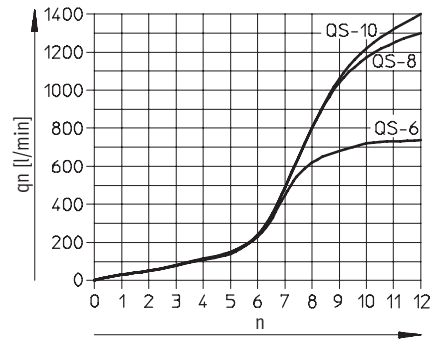
Standard nominal flow rate q_{nN} [l/min] at 6 bar $\rightarrow$ 5 bar
as a function of turns of the adjusting screw n

Screw-in thread $G\frac{3}{8}$

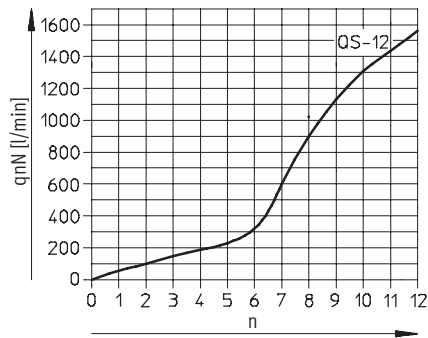


Standard flow rate q_n at 6 bar $\rightarrow$ 0 bar
as a function of turns of the adjusting screw n

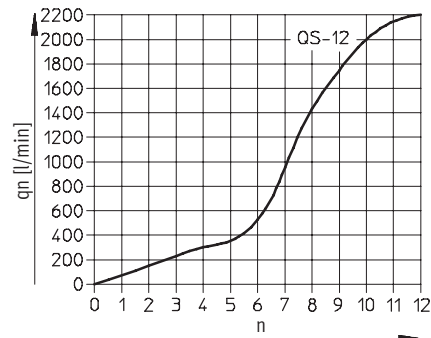
Screw-in thread $G\frac{3}{8}$



Screw-in thread $G\frac{1}{2}$

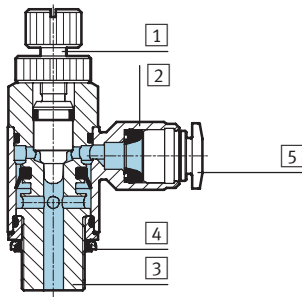


Screw-in thread $G\frac{1}{2}$



Materials

Sectional view



Flow control valve		
1	Regulating screw	Slotted head screw: Brass Knurled screw: Stainless steel
2	Swivel joint	Die-cast zinc
3	Threaded collar	Wrought aluminium alloy (M5: nickel-plated brass)
4	Seal	Nitrile rubber
5	Release ring	Polyacetal
Material note		Designs free of copper, PTFE and silicone $\rightarrow$ Ordering data

Flow control valves and one-way flow control valves

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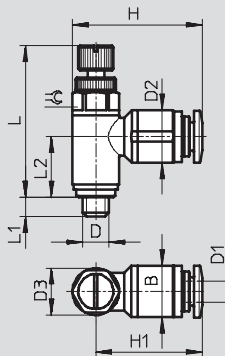
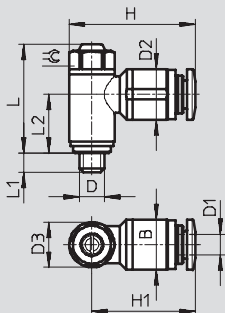
Technical data – Standard flow control valve with QS push-in connector, series D

Dimensions

Download CAD data → www.festo.com

Swivel joint, elbow outlet, slotted head screw

Swivel joint, elbow outlet, knurled screw



Screw-in thread D	Tubing O.D. D1	B	D2 Ø	D3 Ø	H	H1	L max.	L1	L2	⌀
Swivel joint, elbow outlet, slotted head screw										
M5	3	8.9	8.2 +0.15	8.9 ±0.07	22.4	18	21.4	3.7 +0.17/-0.25	11.65	8
	4	9.9	10.0 ±0.2		24.7	20.3			10.65	
	6	12	12.0 ±0.2		26.5	22			10.65	
G1/8	3	13.8	10.2 ±0.2	13.8 ±0.07	31.9	25	26.9	5.1 +0.17/-0.25	14.4	12
	4		12.5 ±0.2		29.4	22.5			13.7	
	6		14.5 ±0.2		32.6	25.7			13.7	
	8		12.5 ±0.2		35.6	28.7			13.7	
G1/8 (MF)	6	17.8	12.5 ±0.2	17.8 ±0.15	36.6	27.7	31.5	5.9 +0.17/-0.25	17.2	15
	8		14.5 ±0.2		39.6	30.7			16.1	
G1/4	6	17.8	12.5 ±0.2	17.8 ±0.15	36.6	27.7	31.5	5.9 +0.17/-0.25	16.1	15
	8		14.5 ±0.2		30.7	30.7			16.1	
	10		17.5 ±0.2		42.0	33.1			16.1	
G3/8	6	22.4	12.5 ±0.2	22.4 ±0.15	39.8	28.6	36.0	6.95 +0.15/-0.3	20.3	19
	8		14.5 ±0.2		44.1	32.9			19.3	
	10		17.5 ±0.2		46.7	35.5			19.3	
G1/2	12	27.8	20.5 ±0.15	27.8 ±0.15	55.3	41.4	42.3	8.15 +0.15/-0.3	23.0	24
Swivel joint, elbow outlet, knurled screw										
M5	3	8.9	8.2 +0.15	8.9 ±0.07	22.4	18	31.3	3.7 +0.17/-0.25	11.65	8
	4	9.9	10.0 ±0.2		24.7	20.3			11.65	
	6	12	12.0 ±0.2		26.5	22			10.65	
G1/8	3	13.8	10.2 ±0.2	13.8 ±0.07	31.9	25	40.4	5.1 +0.17/-0.25	14.4	12
	4		10.2 ±0.2		29.4	22.5			14.4	
	6		12.5 ±0.2		32.6	25.7			13.7	
G1/8 (MF)	6	13.8	12.5 ±0.2	17.8 ±0.15	36.6	27.7	48	5.1 +0.17/-0.25	17.2	15
	8		14.5 ±0.2		39.6	30.7			17.2	
G1/4	6	17.8	12.5 ±0.2	17.8 ±0.15	36.6	27.7	48.3	5.9 +0.17/-0.25	16.1	15
	8		14.5 ±0.2		30.7	30.7			16.1	
	10		17.5 ±0.2		42.0	33.1			16.1	
G3/8	6	22.4	12.5 ±0.2	22.4 ±0.15	39.8	28.6	55.3	6.95 +0.15/-0.3	20.3	19
	8		14.5 ±0.2		44.1	32.9			19.3	
	10		17.5 ±0.2		46.7	35.5			19.3	
G1/2	12	27.8	20.5 ±0.15	27.8 ±0.15	55.3	41.4	65.7	8.15 +0.15/-0.3	23.0	24

Flow control valves and one-way flow control valves

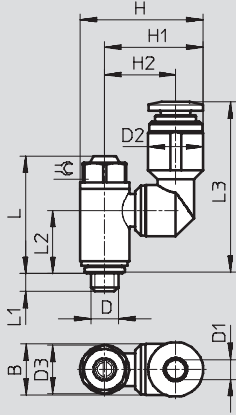
FESTO

Technical data – Standard flow control valve with QS push-in connector, series D

Dimensions

Download CAD data → www.festo.com

Swivel joint, outlet parallel and rotatable, slotted head screw

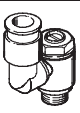


Screw-in thread D	Tubing O.D. D1	B	D2 Ø +0.15/-0.1	D3 Ø	H	H1	H2	L	L1	L2	L3	≙
M5	3	8.9	8.2	8.9 ±0.07	20.7	16.25	12.15	21.4	3.6	11.5	29.6	8
	4	9.9	10		22.4	17.95	12.95	21.4	3.6	11.5	31.3	8
	6	12	12.2		24.7	20.25	14.15	21.4	3.6	11.5	33	8
G ¹ / ₈	3	13.8	10.2	13.8 ±0.07	27.6	20.7	15.6	26.9	4.9	14.1	37	12
	4		10.2		27.6	20.7	15.6	26.9	4.9	14.1	34.5	12
	6		12.2		29.6	22.7	16.6	26.9	4.9	14.1	36.7	12
	8		14.2		31.6	24.7	17.6	26.9	4.9	14.1	38.9	12
G ¹ / ₄	6	17.8	12.2	17.8 ±0.15	33.6	24.7	18.6	31.5	5.7	17.5	40.1	15
	8		14.2		35.6	26.7	19.6	31.5	5.7	17.5	42.3	15
	10		17.5		38.9	30	21.25	31.5	5.7	17.5	44.3	15

Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve with QS push-in connector, series D

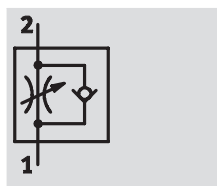
Ordering data						
Design	Screw-in thread	For tubing O.D. [mm]	Flow	One-way flow control function for exhaust air		One-way flow control function for supply air
				Part No.	Type	Part No. Type
Swivel joint, elbow outlet, slotted head screw						
	M5	3	LF	193 137	GRLA-M5-QS-3-D	193 153 GRLZ-M5-QS-3-D
		4	LF	193 138	GRLA-M5-QS-4-D	193 154 GRLZ-M5-QS-4-D
		6	LF	193 139	GRLA-M5-QS-6-D	193 155 GRLZ-M5-QS-6-D
	G1/8	3	LF	193 142	GRLA-1/8-QS-3-D	193 156 GRLZ-1/8-QS-3-D
		4	LF	193 143	GRLA-1/8-QS-4-D	193 157 GRLZ-1/8-QS-4-D
		6	LF	193 144	GRLA-1/8-QS-6-D	193 158 GRLZ-1/8-QS-6-D
		6	MF	537 075	GRLA-1/8-QS-6-MF-D	–
		8	LF	193 145	GRLA-1/8-QS-8-D	193 159 GRLZ-1/8-QS-8-D
		8	MF	537 076	GRLA-1/8-QS-8-MF-D	–
		8	MF	537 076	GRLA-1/8-QS-8-MF-D	–
	G1/4	6	LF	193 146	GRLA-1/4-QS-6-D	–
		8	LF	193 147	GRLA-1/4-QS-8-D	–
		10	LF	193 148	GRLA-1/4-QS-10-D	–
	G3/8	6	LF	193 149	GRLA-3/8-QS-6-D	–
		8	LF	193 150	GRLA-3/8-QS-8-D	–
		10	LF	193 151	GRLA-3/8-QS-10-D	–
	G1/2	12	LF	193 152	GRLA-1/2-QS-12-D	–
Swivel joint, elbow outlet, knurled screw						
Free of copper, PTFE and silicone						
	M5	3	LF	197 576	GRLA-M5-QS-3-RS-D	–
		4	LF	197 577	GRLA-M5-QS-4-RS-D	–
		6	LF	197 578	GRLA-M5-QS-6-RS-D	–
	G1/8	3	LF	197 579	GRLA-1/8-QS-3-RS-D	–
		4	LF	197 580	GRLA-1/8-QS-4-RS-D	–
		6	LF	197 581	GRLA-1/8-QS-6-RS-D	–
		6	MF	537 072	GRLA-1/8-QS-6-RS-MF-D	–
		8	LF	534 337	GRLA-1/8-QS-8-RS-D	–
		8	MF	537 073	GRLA-1/8-QS-8-RS-MF-D	–
		8	MF	537 073	GRLA-1/8-QS-8-RS-MF-D	–
	G1/4	6	LF	534 338	GRLA-1/4-QS-6-RS-D	–
		8	LF	534 339	GRLA-1/4-QS-8-RS-D	–
		10	LF	534 340	GRLA-1/4-QS-10-RS-D	–
	G3/8	6	LF	534 341	GRLA-3/8-QS-6-RS-D	–
		8	LF	534 342	GRLA-3/8-QS-8-RS-D	–
		10	LF	534 343	GRLA-3/8-QS-10-RS-D	–
	G1/2	12	LF	534 344	GRLA-3/8-QS-12-RS-D	–
Swivel joint, outlet parallel and rotatable, slotted head screw						
	M5	3	LF	195 806	GRXA-M5-QS-3-D	–
		4	LF	195 807	GRXA-M5-QS-4-D	–
		6	LF	195 808	GRXA-M5-QS-6-D	–
	G1/8	3	LF	195 809	GRXA-1/8-QS-3-D	–
		4	LF	195 810	GRXA-1/8-QS-4-D	–
		6	LF	195 811	GRXA-1/8-QS-6-D	–
		8	LF	195 812	GRXA-1/8-QS-8-D	–
	G1/4	6	LF	195 813	GRXA-1/4-QS-6-D	–
		8	LF	195 814	GRXA-1/4-QS-8-D	–
		10	LF	195 815	GRXA-1/4-QS-10-D	–

Flow control and one-way flow control valves

Technical data – Standard flow control valve with QS push-in connector, D series

FESTO

Function



One-way flow control valve
GRLA-F

D series:

- QS push-in connector
- Swivel joint rotatable 360° after installation
- Adjustment via slotted head screw
- Surfaces nickel and chrome plated
- Temperature ranges
0 ... +150 °C



GRLA-F...-QS-...-D

General technical data		
Screw-in thread	G1/8	G1/4
Valve function	One-way flow control function for exhaust air	
Adjustment component	Slotted head screw	
Type of actuation	Manual	
Type of mounting	Screw-in	
Installation position	Any	
Special features	Freely rotatable around the screw-in axis after installation	
Max. tightening torque	[Nm]	5.5
		11

Operating and environmental conditions		
Screw-in thread	G1/8	G1/4
Operating medium	Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm	
Operating pressure [bar]	0.2 ... 10	
Storage temperature [°C]	−10 ... +150	
Ambient temperature [°C]	0 ... +150	
Temperature of medium [°C]	0 ... +150	
Corrosion resistance class CRC	3 ¹⁾	

¹⁾ Corrosion resistance class 3 to Festo standard 940 070
Components requiring higher corrosion resistance. External visible parts in direct contact with industrial atmospheres or media such as solvents and cleaning agents, with a predominantly functional requirement for the surface.

Weight [g]					
Screw-in thread/QS push-in connector	G1/8/4	G1/8/6	G1/8/8	G1/4/6	G1/4/8
GRLA-F	25	25	25	37	37

Flow control and one-way flow control valves

Technical data – Standard flow control valve with QS push-in connector, D series

FESTO

Standard nominal flow rate q _{nN} [l/min] at 6 bar → 5 bar				
Screw-in thread		G1/8		G1/4
One-way flow control function for exhaust air				
GRLA-F-... -D	QS-4	D ¹⁾	0 ... 180	–
		R ²⁾	103 ... 188	–
	QS-6	D	0 ... 255	0 ... 430
		R	111 ... 280	384 ... 478
	QS-8	D	0 ... 275	0 ... 530
		R	132 ... 307	402 ... 578

1) D: Flow control direction

2) R: Non-return direction

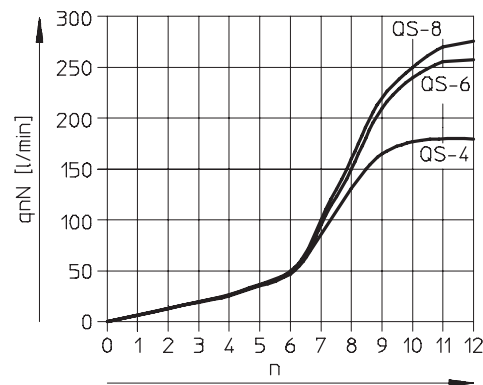
Standard flow rate qn [l/min] at 6 bar → 0 bar				
Screw-in thread		G1/8		G1/4
One-way flow control function for exhaust air				
GRLA-F-... - D	QS-4	D ¹⁾	250	–
		R ²⁾	270 ... 300	–
	QS-6	D	370	600
		R	330 ... 390	570 ... 680
	QS-8	D	400	720
		R	330 ... 410	610 ... 760

1) D: Flow control direction

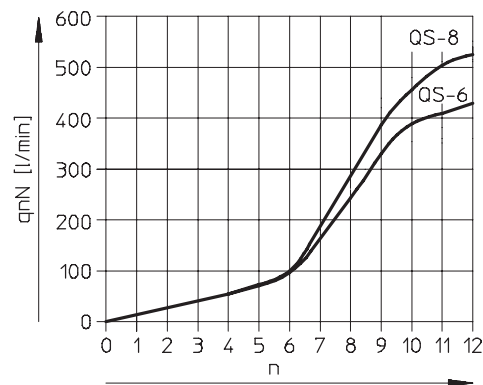
2) R: Non-return direction

Standard nominal flow rate q_{nN} at 6 bar → 5 bar as a function of turns of the adjusting screw n

Screw-in thread G $\frac{1}{8}$

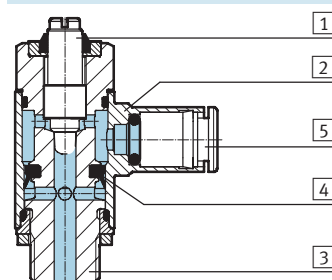


Screw-in thread G $\frac{1}{4}$



Materials

Sectional view



One-way flow control valve

1	Regulating screw	High-alloy stainless steel
2	Swivel joint	Nickel and chrome plated brass
3	Hollow bolt	Wrought aluminium alloy
4	Seal	Fluorocarbon rubber
5	Release ring	Nickel and chrome plated brass
–		Free of copper and PTFE

Flow control and one-way flow control valves

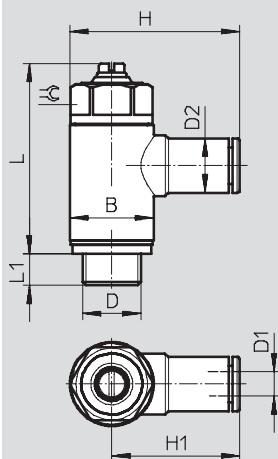
Technical data – Standard flow control valve with QS push-in connector, D series

FESTO

Dimensions

Download CAD data → www.festo.com

Swivel joint, elbow outlet, slotted head screw



Screw-in thread D	Tubing outer Ø D1	D2 Ø	B	H	H1	L max.	L1	⌀
G1/8	4	9	13.8	28.0	21.1	31.6	5.2	12
	6	11		31.0	24.1			
	8	13		31.9	25.0			
G1/4	6	11	17.8	35.1	26.2	34.9	5.9	15
	8	13		35.9	27.0			

Ordering data

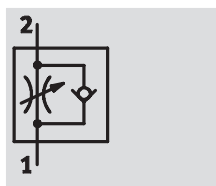
Constructional design	Screw-in thread	For tubing O.D. [mm]	One-way flow control function for exhaust air	
			Part No.	Type
Swivel joint, elbow outlet, slotted head screw				
	G1/8	4	195 597	GRLA-F-1/8-QS-4-D
		6	195 598	GRLA-F-1/8-QS-6-D
		8	195 599	GRLA-F-1/8-QS-8-D
	G1/4	6	195 600	GRLA-F-1/4-QS-6-D
		8	195 601	GRLA-F-1/4-QS-8-D

Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve with QS push-in connector, series B

Function



One-way flow control valve
for exhaust air
GRLA

Series B:

- High flow: Precision adjustment for high speed
- QS push-in connector
- Swivel joint rotatable 360° after installation
- Adjustment via knurled screw



General technical data				
Screw-in thread		G1/8	G1/4	G3/8
Valve function		One-way flow control function for exhaust air		
Setting component		Knurled screw		
Type of mounting		Can be screwed in		
Assembly position		Any		
Special features		Freely rotatable around the screw-in axis after installation		
Max. tightening torque	[Nm]	4	11	40
Permissible actuation torque for the regulating screw	[Nm]	0.4		

Operating and environmental conditions				
Screw-in thread		G1/8	G1/4	G3/8
Operating medium		Filtered compressed air, lubricated or unlubricated, grade of filtration 40µm		
Operating pressure	[bar]	0.2 ... 10		
Ambient temperature	[°C]	-10 ... +60		
Temperature of medium	[°C]	-10 ... +60		

Weights [g]				
Screw-in thread		G1/8	G1/4	G3/8
GRLA		25	30	40

Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve with QS push-in connector, series B

Standard nominal flow rate q_{nN} [l/min] at 6 bar $\rightarrow$ 5 bar					
Screw-in thread			G $\frac{1}{8}$	G $\frac{1}{4}$	G $\frac{3}{8}$
One-way flow control function for exhaust air					
GRLA	QS-6	D ¹⁾	0 ... 520	0 ... 520	0 ... 530
		R ²⁾	400 ... 550	400 ... 550	400 ... 550
	QS-8	D	0 ... 650	0 ... 650	0 ... 650
		R	600 ... 750	600 ... 750	600 ... 750

1) D: Flow control direction

2) R: Non-return direction

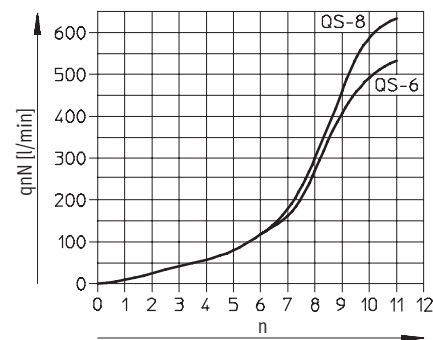
Standard flow rate q_n [l/min] at 6 bar $\rightarrow$ 0 bar					
Screw-in thread			G $\frac{1}{8}$	G $\frac{1}{4}$	G $\frac{3}{8}$
One-way flow control function for exhaust air					
GRLA	QS-6	D ¹⁾	0 ... 720	0 ... 740	0 ... 740
		R ²⁾	600 ... 750	620 ... 760	620 ... 760
	QS-8	D	0 ... 1,080	0 ... 1,130	0 ... 1,130
		R	800 ... 1,250	900 ... 1,260	900 ... 1,260

1) D: Flow control direction

2) R: Non-return direction

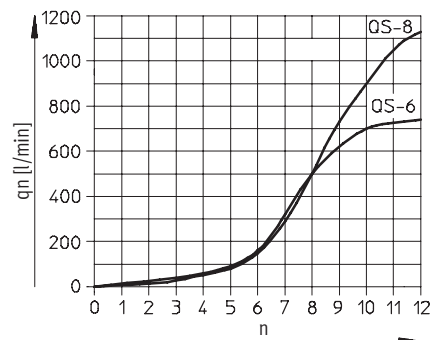
Standard nominal flow rate q_{nN} at 6 bar $\rightarrow$ 5 bar as a function of turns of the adjusting screw n

Screw-in thread G $\frac{1}{8}$, G $\frac{1}{4}$, G $\frac{3}{8}$



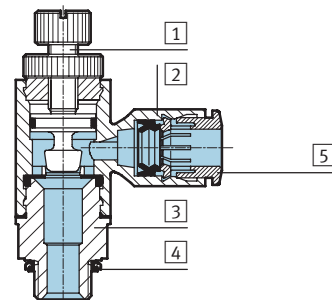
Standard flow rate q_n at 6 bar $\rightarrow$ 0 bar as a function of turns of the adjusting screw n

Screw-in thread G $\frac{1}{8}$, G $\frac{1}{4}$, G $\frac{3}{8}$



Materials

Sectional view



Flow control valve		
1	Regulating screw	Brass
2	Swivel joint	PBT-reinforced
3	Threaded collar	Wrought aluminium alloy
4	Seal	Nitrile rubber
5	Release ring	Polyacetal

Flow control valves and one-way flow control valves

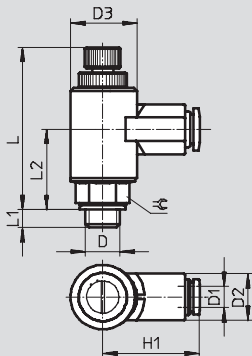
FESTO

Technical data – Standard flow control valve with QS push-in connector, series B

Dimensions

Download CAD data → www.festo.com

Swivel joint, elbow outlet, knurled screw



Screw-in thread D	Tubing O.D. D1	D2 Ø	D3 Ø -0.1	H1	L max.	L1	L2	⌀
G $\frac{1}{8}$	6	13	17.9	27.2	53	4.7	22.8	13
	8	17		35.4				
G $\frac{1}{4}$	6	13	17.9	27.2	53.6	5.8	22.3	17
	8	17		35.4				
G $\frac{3}{8}$	6	13	17.9	27.2	54.6	6	23.1	19
	8	17		35.4				

Ordering data

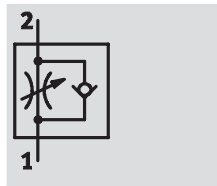
Design	Screw-in thread	For tubing O.D. [mm]	One-way flow control function for exhaust air	
			Part No.	Type
Swivel joint, elbow outlet, knurled screw				
	G $\frac{1}{8}$	6	162 965	GRLA- $\frac{1}{8}$ -QS-6-RS-B
		8	162 966	GRLA- $\frac{1}{8}$ -QS-8-RS-B
	G $\frac{1}{4}$	6	162 967	GRLA- $\frac{1}{4}$ -QS-6-RS-B
		8	162 968	GRLA- $\frac{1}{4}$ -QS-8-RS-B
	G $\frac{3}{8}$	6	162 969	GRLA- $\frac{3}{8}$ -QS-6-RS-B
		8	162 970	GRLA- $\frac{3}{8}$ -QS-8-RS-B

Flow control valves and one-way flow control valves

Technical data – VFOV

FESTO

Function



One-way flow control valve

VFOV series:

- QS push-in fitting
- Swivel connection, rotatable 360° after installation
- Adjustment via knob



General technical data				
Screw-in thread 2		G1/8		
QS push-in fitting 1	[mm]	4	6	8
Valve function	One-way flow control function for exhaust air			
Actuation type	Manual			
Means of setting	Rotary knob			
Type of mounting	Screw-in			
Mounting position	Any			
Special features	Freely rotatable around the screw-in axis after installation			
Max. tightening torque	[Nm]	3		

Operating and environmental conditions		
Screw-in thread		G1/8
Operating medium		Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm
Operating pressure	[bar]	0.2 ... 10
Storage temperature	[°C]	-10 ... +40
Ambient temperature	[°C]	-10 ... +60
Temperature of medium	[°C]	-10 ... +60

Flow control valves and one-way flow control valves

FESTO

Technical data – VFOV

Standard nominal flow rate qnN [l/min] at 6 bar → 5 bar			
Screw-in thread			G1/8
One-way flow control function for exhaust air			
VFOV	QS-4	D ¹⁾	0 ... 260
		R ²⁾	130 ... 230
	QS-6	D	0 ... 325
		R	150 ... 370
	QS-8	D	0... 325
		R	170 ... 330

1) D: Flow control direction

2) R: Non-return direction

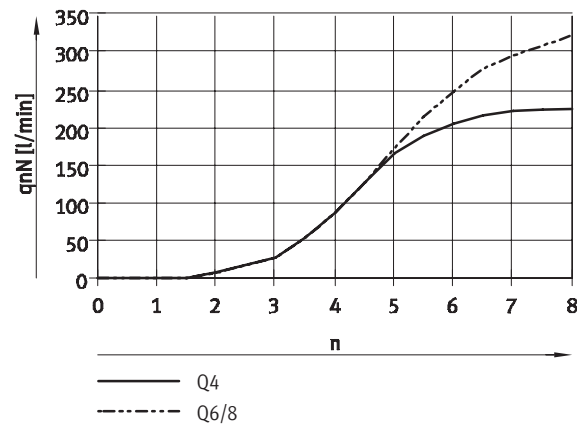
Standard flow rate qn [l/min] at 6 bar → 0 bar			
Screw-in thread			G1/8
One-way flow control function for exhaust air			
VFOV	QS-4	D ¹⁾	0 ... 325
		R ²⁾	300 ... 410
	QS-6	D	0 ... 510
		R	280 ... 660
	QS-8	D	0 ... 510
		R	320 ... 600

1) D: Flow control direction

2) R: Non-return direction

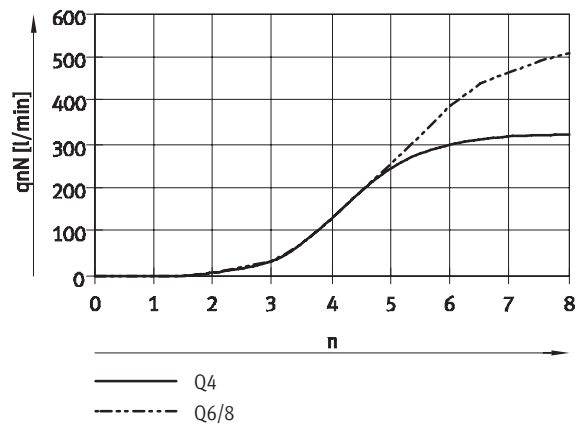
Standard nominal flow rate q_{nN} at 6 bar $\rightarrow$ 5 bar
as a function of the turns of the adjusting screw n

Screw-in thread G1/8



Standard flow rate q_n at 6 bar $\rightarrow$ 0 bar
as a function of the turns of the adjusting screw n

Screw-in thread G1/8



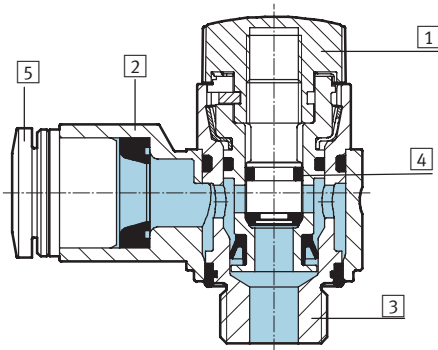
Flow control valves and one-way flow control valves

Technical data – VFOV

FESTO

Materials

Sectional view



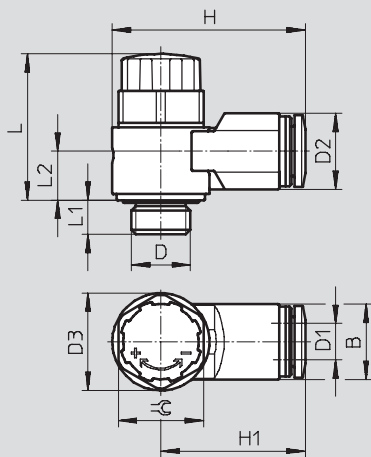
Flow control valve

1	Rotary knob	Reinforced PA
2	Swivel connection	Reinforced PA
3	Hollow bolt	Wrought aluminium alloy, anodised
4	Seal	NBR
5	Release ring	POM
–		Free of copper and PTFE

Dimensions

Download CAD data → www.festo.com

Swivel connection, elbow outlet



Type	Screw-in thread D	Tubing O.D. D1	B	D2	D3	H	H1	L	L1	L2	⌀C
VFOV-LE-G18-Q4	G1/8	4	10.8	10.4	16	30.1	22.1	24.2	5.5	7.2	14
VFOV-LE-G18-Q6		6	12.8	12.5		31.8	23.8			8.3	
VFOV-LE-G18-Q8		8	14.8	14.4		36.2	28.2			9.4	

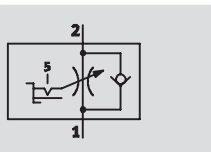
Ordering data

Constructional design	Screw-in thread	QS push-in fitting	Weight [g]	Part No.	Type
Swivel connection, elbow outlet					
	G1/8	4	10	549 155	VFOV-LE-G18-Q4
		6	10	549 156	VFOV-LE-G18-Q6
		8	12	549 157	VFOV-LE-G18-Q8
Cover cap					
				549 159	VAMC-F4-18-C

One-way flow control valves GRLSA

Technical data

Function



One-way flow control valve with
5 selectable flow control ranges

- QS push-in fittings
- 5 flow control ranges selectable via a rotary switch
- Continuous precision adjustment via internal hex on a reference scale marked with 30 degrees (10 positions)
- Exhaust air flow control



General technical data	
Screw-in thread	G1/8
Valve function	One-way flow control function for exhaust air
Means of adjustment	Internal hex
Actuation type	Manual
Type of mounting	Screw-in
Mounting position	Any
Special features	Freely rotatable around the screw-in axis after installation
Max. tightening torque [Nm]	5.5

Operating and environmental conditions	
Screw-in thread	G1/8
Operating/control medium	Dried air, lubricated or unlubricated, grade of filtration 40 µm
Operating pressure [bar]	0.2 ... 10
Storage temperature [°C]	-10 ... +40
Ambient temperature [°C]	-10 ... +60
Temperature of medium [°C]	-10 ... +60
Pneumatic connection 2	G1/8
Pneumatic connection 1	QS-6

Weight	
Screw-in thread	G1/8
Weight [g]	19.5

Standard nominal flow rate q _{nN} at 6 bar → 5 bar	
Screw-in thread	G1/8
Flow control direction [l/min]	0 ... 250
Non-return direction [l/min]	180 ... 310

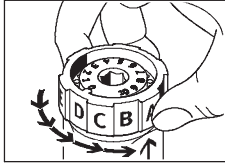
Standard flow rate q _n at 6 bar → 0 bar	
Screw-in thread	G1/8
Flow control direction [l/min]	0 ... 410
Non-return direction [l/min]	430 ... 540

One-way flow control valves GRLSA

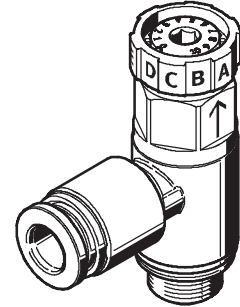
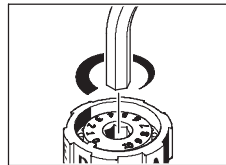
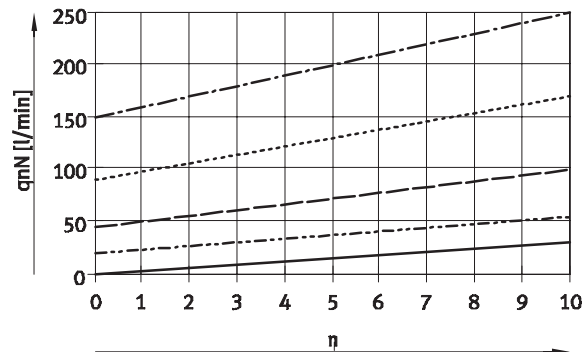
Technical data

FESTO

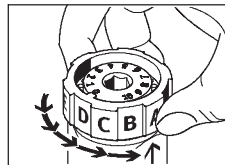
Standard nominal flow rate q_{nN} at 6 bar $\rightarrow$ 5 bar as a function of spindle swivel angle $n = 300$ degrees



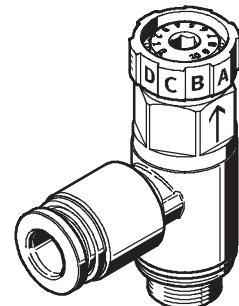
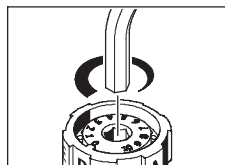
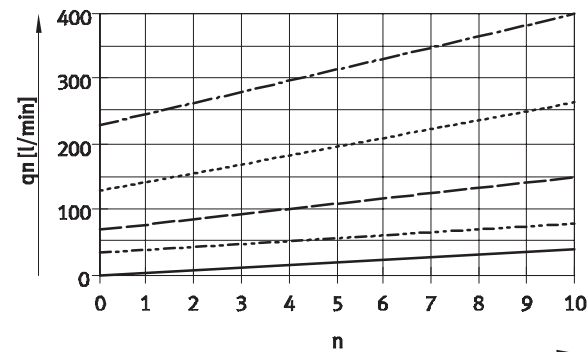
- Setting: A
- - - Setting: B
- · — Setting: C
- · · · · Setting: D
- · - · - Setting: E



Standard flow rate q_n at 6 bar $\rightarrow$ 0 bar as a function of spindle swivel angle $n = 300$ degrees



- Setting: A
- - - Setting: B
- · — Setting: C
- · · · · Setting: D
- · - · - Setting: E

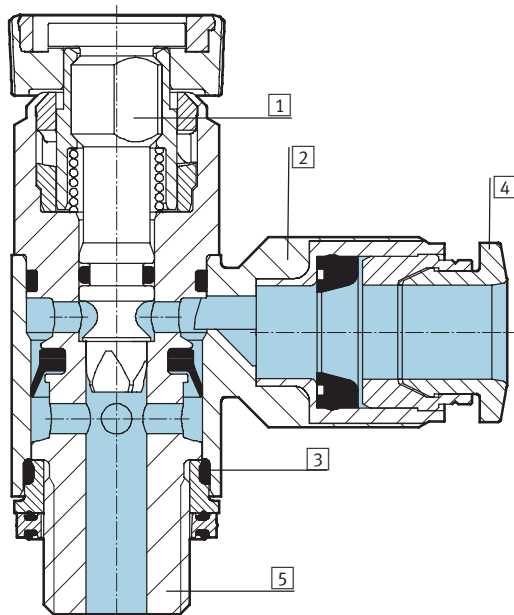


One-way flow control valves GRLSA

Technical data

Materials

Sectional view

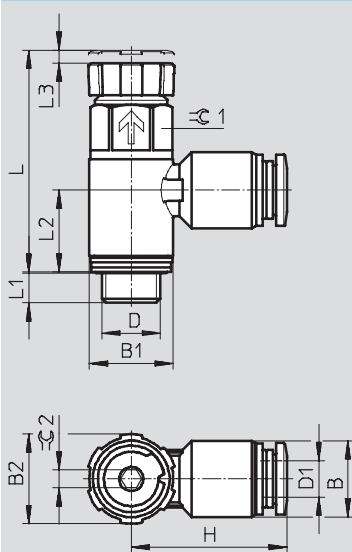


One-way flow control valve

1	Regulating screw	Reinforced polyamide
2	Swivel connection	Die-cast zinc
3	Seal	Nitrile rubber
4	Release ring	Polyacetate
5	Hollow bolt	Wrought aluminium alloy, anodised
		Free of copper and PTFE

Dimensions

Download CAD data → www.festo.com



Type	D	D1	B	B1	B2	H	L	L1	L2	L3	⌀ 1	⌀ 2
GRLSA-1/8-QS-6	G1/8	6	12.5	13.8	15	25.7	36.6	5.1	13.6	2	12	3

Ordering data

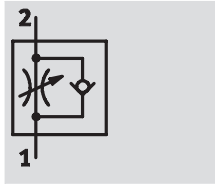
Design	Screw-in thread	QS [mm]	Part No.	Type
	G1/8	6	540 661	GRLSA-1/8-QS-6

Flow control and non-return valves

FESTO

Technical data – Standard flow control valve with QS push-in fitting, series B, in bulk packs of 20

Function



One-way flow control valve
for exhaust air
GRLA

Series B:

- High flow: Precision adjustment for high speed
- QS push-in fitting
- Rotatable connection, rotatable 360° after installation
- Adjustment via slotted head screw
- Bulk pack of 20 pieces



GRLA-...-QS-...-B-20

General technical data		
Screw-in thread	G1/8	G1/4
Valve function	One-way flow control function for exhaust air	
Setting component	Slotted head screw	
Type of mounting	Threaded	
Assembly position	Any	
Special features	Freely rotatable around the screw-in axis after installation	
Max. tightening torque [Nm]	4	11
Permissible actuation torque for the regulating screw [Nm]	0.4	

Operating and environmental conditions		
Screw-in thread	G1/8	G1/4
Operating medium	Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm	
Operating pressure [bar]	0.2 ... 10	
Storage temperature [°C]	-10 ... +40	
Ambient temperature [°C]	-10 ... +60	
Temperature of medium [°C]	-10 ... +60	

Flow control and non-return valves

FESTO

Technical data – Standard flow control valve with QS push-in fitting, series B, bulk packs of 20

Standard nominal flow rate qnN [l/min] at 6 bar → 5 bar				
Screw-in thread			G1/8	G1/4
One-way flow control function for exhaust air				
GRLA	QS-6	D ¹⁾	0 ... 520	–
		R ²⁾	400 ... 550	–
	QS-8	D	0 ... 650	0 ... 650
		R	600 ... 750	600 ... 750

1) D: Flow control direction

2) R: Non-return direction

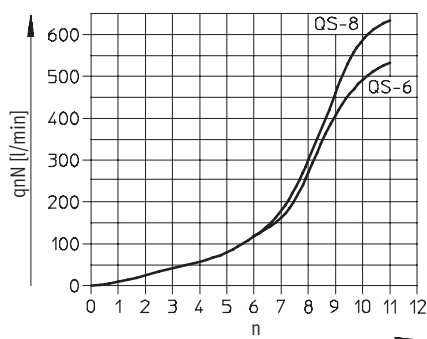
Standard flow rate qn [l/min] at 6 bar → 0 bar				
Screw-in thread			G1/8	G1/4
One-way flow control function for exhaust air				
GRLA	QS-6	D ¹⁾	0 ... 720	–
		R ²⁾	600 ... 750	–
	QS-8	D	0 ... 1,080	0 ... 1,130
		R	800 ... 1,250	900 ... 1,260

1) D: Flow control direction

2) R: Non-return direction

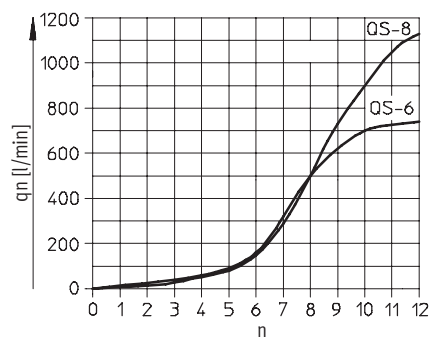
Standard nominal flow rate q_{nN} at 6 bar → 5 bar as a function of turns of the adjusting screw n

Screw-in thread G1/8, G1/4



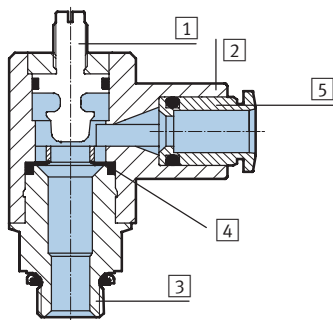
Standard flow rate q_n at 6 bar → 0 bar as a function of turns of the adjusting screw n

Screw-in thread G1/8, G1/4



Materials

Sectional view



Flow control valve		
1	Regulating screw	Brass
2	Rotatable connection	Polybutylene terephthalate, reinforced
3	Threaded spigot	Wrought aluminium alloy
4	Seal	Nitrile rubber
5	Release ring	Polyacetate

Flow control and non-return valves

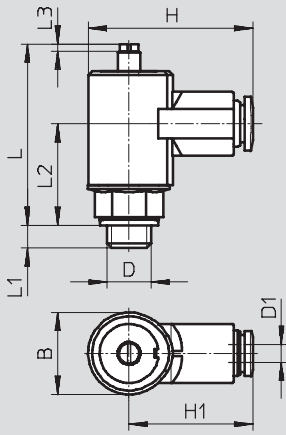
FESTO

Technical data – Standard flow control valve with QS push-in fitting, series B, bulk packs of 20

Dimensions

Download CAD data → www.festo.com

Rotatable connection, elbow outlet, slotted head screw



Screw-in thread D	Tubing O.D. D1	B Ø -0.1	H	H1	L max.	L1	L2
G1/8	6	17.9	36.2	27.2	40.1	4.7	22.8
	8		44.4	35.4			
G1/4	8				39.6	5.8	22.8

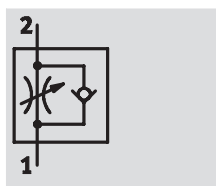
Ordering data Bulk packs of 20

Design	Screw-in thread	For tubing O.D. [mm]	One-way flow control function for exhaust air	
			Part No.	Type
Rotatable connection, elbow outlet, slotted head screw				
	G1/8	6	540 358	GRLA-1/8-QS-6-B-20
		8	540 359	GRLA-1/8-QS-8-B-20
	G1/4	8	540 360	GRLA-1/4-QS-8-B-20

One-way flow control valves VFOC

Technical data

Function



One-way flow control valve

- QS push-in connection
- Adjustment via slotted head screw
- Push-in sleeve for QS push-in fittings
- Exhaust air flow control



General technical data		
Push-in connector	QS-4	QS-6
Valve function	One-way flow control function for exhaust air	
Adjusting facility	Slotted head screw	
QS push-in connectors for tubing O.D. [mm]	4	6
Type of mounting	Push-in sleeve	
Mounting position	Any	

Operating and environmental conditions		
Push-in connector	QS-4	QS-6
Operating medium / pilot medium	Dried air, lubricated or unlubricated, grade of filtration 40µm	
Operating pressure [bar]	0.2 ... 10	
Storage temperature [°C]	-10 ... +40	
Ambient temperature [°C]	-10 ... +60	
Temperature of medium [°C]	-10 ... +60	

Weight		
Push-in connector	QS-4	QS-6
Weight [g]	9.2	21.6

Standard nominal flow rate q _N [l/min] at 6 bar → 5 bar		
Push-in connector	QS-4	QS-6
Flow control direction	See graph	See graph
Non-return direction	60 ... 100	170 ... 260

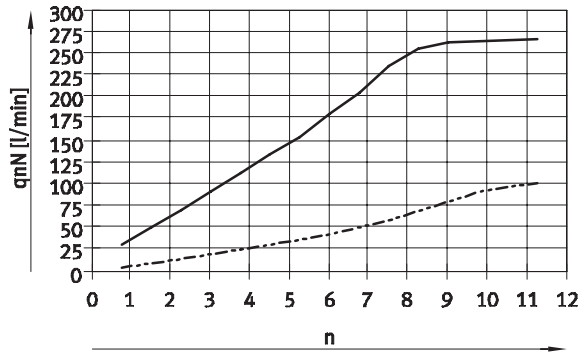
Standard flow rate q _n [l/min] at 6 bar → 0 bar		
Push-in connector	QS-4	QS-6
Flow control direction	See graph	See graph
Non-return direction	130 ... 160	330 ... 400

One-way flow control valves VFOC

Technical data

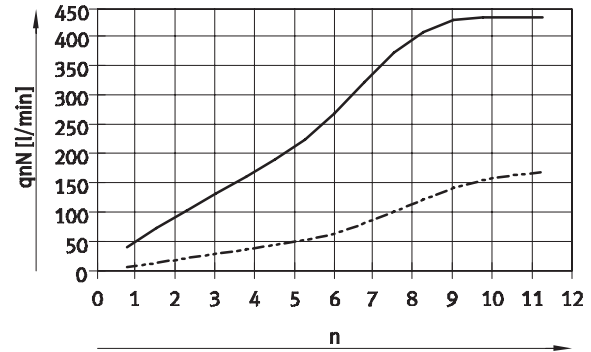
FESTO

Standard nominal flow rate q_{nN} at 6 bar $\rightarrow$ 5 bar
as a function of turns of the adjusting screw n



— S6-Q6
- - - S4-Q4

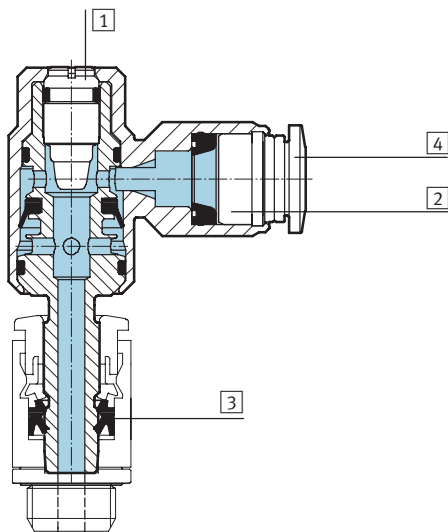
Standard flow rate q_n at 6 bar $\rightarrow$ 0 bar
as a function of turns of the adjusting screw n



— S6-Q6
- - - S4-Q4

Materials

Sectional view



One-way flow control valve

1	Adjusting screw	Stainless steel
2	Rotatable connection	Die-cast zinc
3	Seal	Nitrile rubber
4	Release ring	Polyacetate

 Note

The push-in sleeves of the one-way flow control valves VFOC are exclusively matched to QS fittings from Festo,
→ www.festo.com

This combination alone guarantees a secure fit in the push-in fitting.

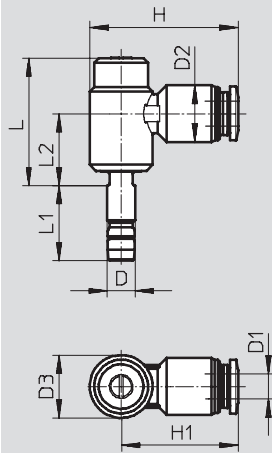
One-way flow control valves VFOC

Technical data

FESTO

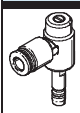
Dimensions

Download CAD data → www.festo.com



Type	D	D1	D2 Ø	D3 Ø	H	H1	L	L1	L2
VFOC-E-S4-Q4	S4	QS-4	8.9 ±0.07	10 ±0.2	24.3	20.3	23.2	14.8	13.2
VFOC-E-S6-Q6	S6	QS-6	13.8 ±0.07	12.5 ±0.2	32.6	25.7	28	16.5	15.8

Ordering data

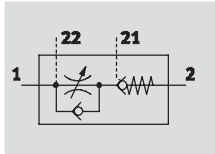
Design	Push-in connector	For tubing O.D.	Part No. Type	
		[mm]		
	QS-4	4	540 362	VFOC-E-S4-Q4
	QS-6	6	540 363	VFOC-E-S6-Q6

Functional combination GRXA-HG

Technical data

FESTO

Function



Functional combination with one-way flow control valve and piloted non-return valve

- Holding function and speed setting in one housing
- QS push-in fittings
- Adjustment via slotted head screw
- Additional pilot port 1 for interlinking with a second unit at port 21



General technical data		
Screw-in thread	G1/8	G1/4
Valve function	One-way flow control function for exhaust air and additional piloted non-return valve	
Setting component	Slotted head screw	
QS push-in fittings for tubing O.D.	[mm] 4; 6	6; 8
Type of mounting	Screw in via male thread	
Assembly position	Any	
Max. tightening torque	[Nm] 5.5	11

Operating and environmental conditions		
Screw-in thread	G1/8	G1/4
Operating medium / pilot medium	Dried air, lubricated or unlubricated, grade of filtration 40 µm	
Operating pressure	[bar] 0.5 ... 10	
Pilot pressure	[bar] 2 ... 10	
Storage temperature	[°C] -10 ... +40	
Ambient temperature	[°C] -10 ... +60	
Temperature of medium	[°C] -10 ... +60	

Weights		
Screw-in thread / push-in fitting	G1/8	G1/4
	[g] 27	58

-  - Note The GRXA-HG product family and all of its design variants must ONLY be used in safety-relevant applications in combination with additional measures detailed in EN 954-1.		A supplementary risk analysis by the user/designer is essential. The instructions and notices on the enclosed product leaflets must be observed.
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Functional combination

Technical data

FESTO

Standard nominal flow rate qnN [l/min] at 6 bar → 5 bar				
Screw-in thread			G1/8	G1/4
One-way flow control function for exhaust air and piloted non-return valve				
GRXA-HG	QS-4	D ¹⁾	130	–
		R ²⁾	100 ... 140	–
		B ³⁾	100 ... 140	–
	QS-6	D	140	280
		R	115 ... 165	200 ... 260
		B	120 ... 160	180 ... 140
	QS-8	D	–	280
		R	–	200 ... 280
		B	–	190 ... 260

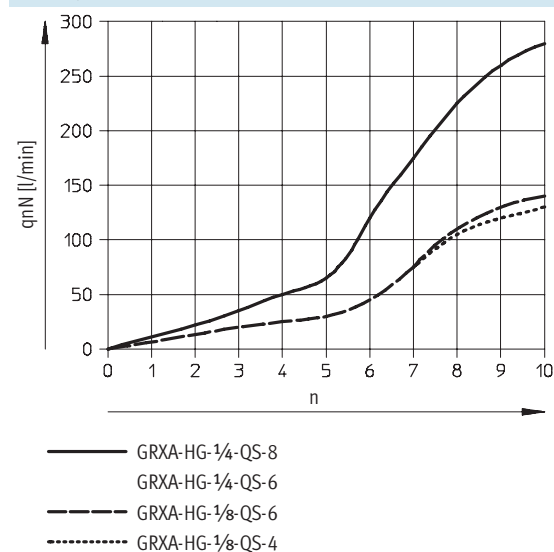
- 1) D: Flow control direction
2) R: Non-return direction
3) B: Non-return direction actuated

Standard flow rate qn [l/min] at 6 bar → 0 bar				
Screw-in thread			G1/8	G1/4
One-way flow control function for exhaust air and piloted non-return valve				
GRXA-HG	QS-4	D ¹⁾	210	–
		R ²⁾	230 ... 260	–
		B ³⁾	220 ... 250	–
	QS-6	D	280	430
		R	270 ... 300	430 ... 490
		B	260 ... 300	410 ... 470
	QS-8	D	–	470
		R	–	460 ... 520
		B	–	440 ... 500

- 1) D: Flow control direction
2) R: Non-return direction
3) B: Non-return direction actuated

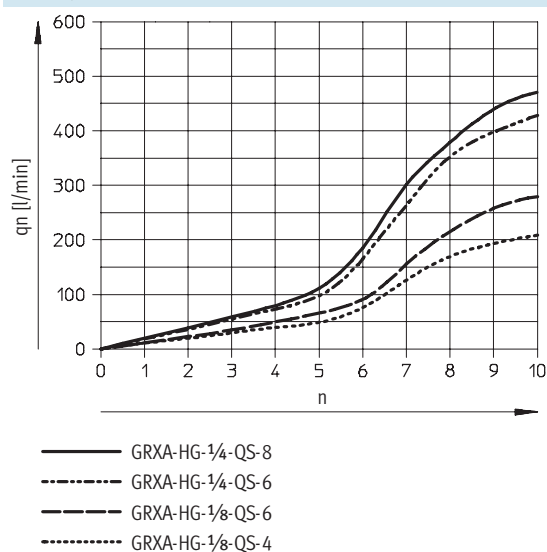
Standard nominal flow rate q_{nN} at 6 bar → 5 bar
as a function of turns of the adjusting screw n

One-way flow control valve



Standard flow rate q_n at 6 bar → 0 bar
as a function of turns of the adjusting screw n

One-way flow control valve



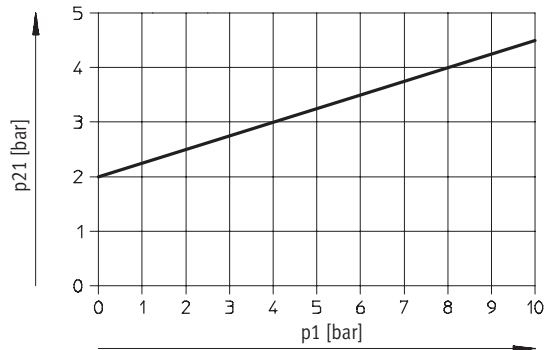
Functional combination

Technical data

FESTO

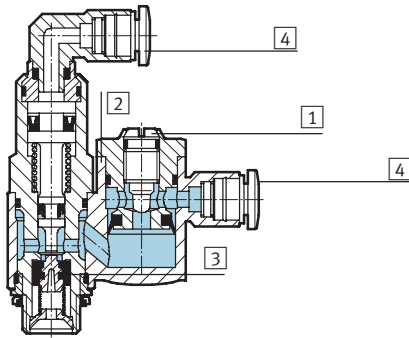
Minimum pilot pressure as a function of operating pressure

Non-return valve, piloted



Materials

Sectional view



Functional combination

1	Adjusting screw	Brass
2	Rotatable connection	Die-cast zinc
3	Seal	Nitrile rubber
4	Release ring	Polyacetate

Functional combination

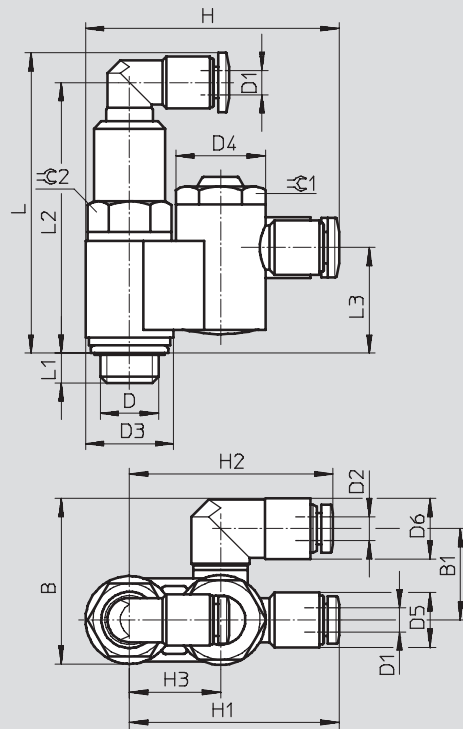
Technical data

FESTO

Dimensions

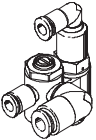
Download CAD data → www.festo.com

Rotatable connection, elbow outlet, slotted head screw



Pneumatic connection D	B	B1	D1 Ø	D2 Ø	D3	D4 Ø	D5 Ø	D6	H	H1	H2	H3	L	L1	L2	L3	≈ 1	≈ 2
G ¹ / ₈	27.3	15	4	4	14.5	14.8	9	10	41.8	34.5	33.5	15	49.5	4.9	44.6	17.4	13	12
	30.8	17.3		6				12.5										
G ¹ / ₄	35.3	19.5	4	6	19	19	9	12.5	52.2	42.7	40.5	21	56.3	5.6	51.4	21.1	17	16
	39.5	21.5		8				17										

Ordering data

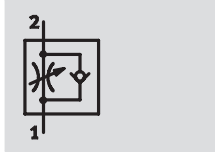
Design	Screw-in thread	For tubing Outside [mm]	Part No.	Type
	G ¹ / ₈	4	525 667	GRXA-HG- ¹ / ₈ -QS-4
		6	525 668	GRXA-HG- ¹ / ₈ -QS-6
	G ¹ / ₄	6	525 669	GRXA-HG- ¹ / ₄ -QS-6
		8	525 670	GRXA-HG- ¹ / ₄ -QS-8

Flow control valves and one-way flow control valves

FESTO

Technical data – Mini flow control valve with QS push-in connector

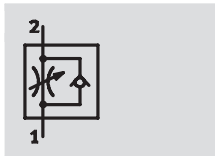
Function



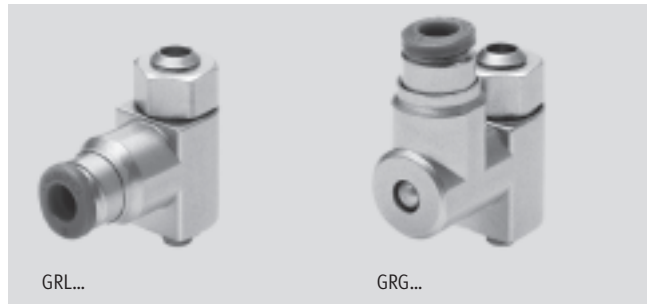
One-way flow control for exhaust air
GRLA/GRGA



Flow control acting at both sides
GRLO/GRGO



One-way flow control for supply air
GRLZ/GRGZ



- Low flow: Precision adjustment for low speed
- QS push-in connector
- Adjustment with slotted head screw

Variants:

- Swivel joint, elbow outlet
- Swivel joint, parallel outlet

General technical data			
Screw-in thread		M3	M5
Valve function	GRLA/GRGA	One-way flow control function for exhaust air	
	GRLZ/GRGZ	One-way flow control function for supply air	
	GRLO/GRGO	Flow control function	
Setting component		Slotted head screw	
Type of mounting		Threaded	
Mounting position		Any	
Max. tightening torque		[Nm] 0.3	1.5

Operating and environmental conditions			
Screw-in thread		M3	M5
Operating medium		Compressed air, filtered (to 40µm), lubricated or unlubricated	
Operating pressure	GRL.../GRG... [bar]	0.2 ... 10	
	GRLO/GRGO [bar]	0 ... 10	
Ambient temperature		[°C] -10 ... +60	
Temperature of medium		[°C] -10 ... +60	

Weights [g]			
Screw-in thread		M3	M5
GRL...		7	9
GRG...		14	14

Flow control valves and one-way flow control valves

FESTO

Technical data – Mini flow control valve with QS push-in connector

Standard nominal flow rate q _{nN} [l/min] at 6 bar → 5 bar				
Screw-in thread			M3	M5
One-way flow control function for exhaust air				
GRLA/GRGA	QS-3	F ¹⁾	0 ... 41	0 ... 40
		N ²⁾	27 ... 50	46 ... 70
	QS-4	F	–	0 ... 40
		N	–	50 ... 75
One-way flow control function for supply air				
GRLZ/GRGZ	QS-3	F	0 ... 41	0 ... 48
		N	27 ... 44	36 ... 52
	QS-4	F	–	0 ... 48
		N	–	40 ... 65
Flow control function, acting at both sides				
GRLO/GRGO	QS-3	F	0 ... 18	0 ... 40
		N	0 ... 41	0 ... 48
	QS-4	F	–	0 ... 40
		N	–	0 ... 48

- 1) F: Flow control direction
2) N: Non-return direction

Standard flow rate qn [l/min] at 6 bar → 0 bar				
Screw-in thread			M3	M5
One-way flow control function for exhaust air				
GRLA/GRGA	QS-3	F ¹⁾	0 ... 95	0 ... 95
		N ²⁾	75 ... 110	90 ... 130
	QS-4	F	–	0 ... 95
		N	–	95 ... 140
One-way flow control function for supply air				
GRLZ/GRGZ	QS-3	F	0 ... 95	0 ... 105
		N	75 ... 100	80 ... 110
	QS-4	F	–	0 ... 105
		N	–	85 ... 115
Flow control function, acting at both sides				
GRLO/GRGO	QS-3	F	0 ... 50	0 ... 90
		N	0 ... 95	0 ... 105
	QS-4	F	–	0 ... 90
		N	–	0 ... 105

- 1) F: Flow control direction
2) N: Non-return direction

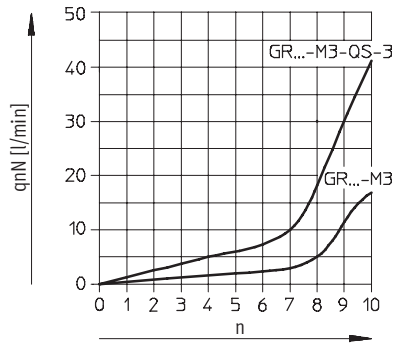
Flow control valves and one-way flow control valves

FESTO

Technical data – Mini flow control valve with QS push-in connector

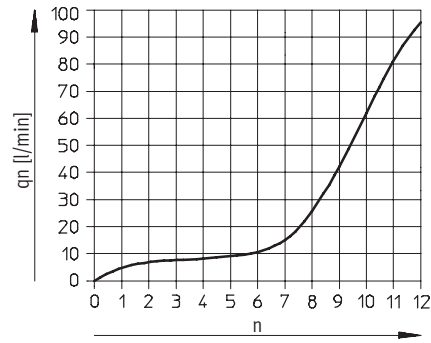
Standard nominal flow rate q_{nN} at 6 bar $\rightarrow$ 5 bar
as a function of turns of the adjusting screw n

Screw-in thread M3

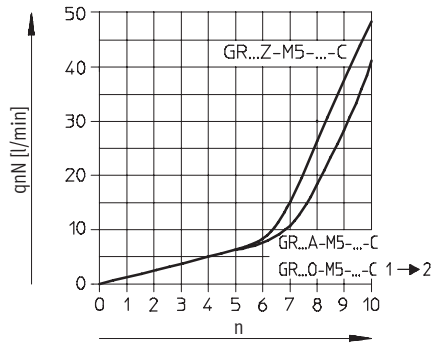


Standard flow rate q_n at 6 bar $\rightarrow$ 0 bar
as a function of turns of the adjusting screw n

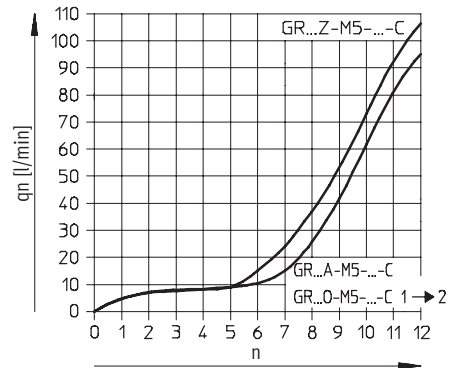
Screw-in thread M3



Screw-in thread M5



Screw-in thread M5



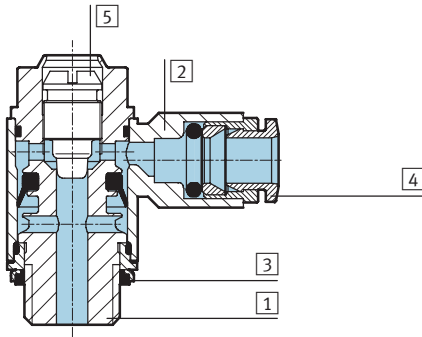
Flow control valves and one-way flow control valves

FESTO

Technical data – Mini flow control valve with QS push-in connector

Materials

Sectional view

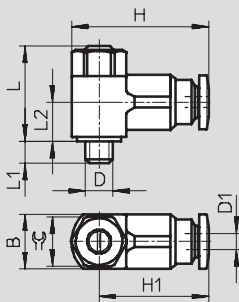


Flow control valve

1	Threaded collar	Brass
2	Swivel joint	Die-cast zinc
3	Seal	Polyamide
4	Release ring	Polyacetal
5	Regulating screw	Brass

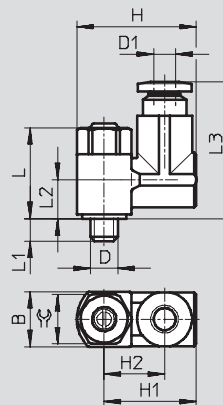
Dimensions GRL...

Swivel joint, elbow outlet, slotted head screw



Dimensions GRG...

Swivel joint, parallel outlet, slotted head screw



Screw-in thread D	Tubing O.D. D1	B -0.15	H	H1	H2	L	L1	L2	L3	≙
Swivel joint, elbow outlet, slotted head screw										
M3	3	8	20	15.8	–	16.6	2.3 +0.15/-0.3	7	–	7
M5	3	9.8	22.4	18.4	–	17.7	3.1 +0.15/-0.35	7.3	–	7
	4	9.8	22.2	18.2	–	17.7	3.1 +0.15/-0.35	7.3	–	7
Swivel joint, parallel outlet, slotted head screw										
M3	3	8	18	14	9.25	16.6	2.3 +0.15/-0.3	7.5	22	7
M5	3	9.8	19.8	15.8	10	17.7	3.1 +0.15/-0.35	8.3	26.2	7
	4	9.8	19.8	15.8	10	17.7	3.1 +0.15/-0.35	8.3	25.7	7

Flow control valves and one-way flow control valves

FESTO

Technical data – Mini flow control valve with QS push-in connector

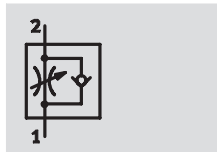
Ordering data								
Design	Screw-in thread	For tubing O.D.	One-way flow control function for exhaust air		One-way flow control function for supply air		Flow control function acting at both sides	
		[mm]	Part No.	Type	Part No.	Type	Part No.	Type
QS push-in connector, elbow outlet, slotted head screw								
	M3	3	175 041	GRLA-M3-QS-3	175 043	GRLZ-M3-QS-3	175 042	GRLO-M3-QS-3
	M5	3	175 053	GRLA-M5-QS-3-LF-C	175 055	GRLZ-M5-QS-3-LF-C	175 054	GRLO-M5-QS-3-LF-C
		4	175 056	GRLA-M5-QS-4-LF-C	175 058	GRLZ-M5-QS-4-LF-C	175 057	GRLO-M5-QS-4-LF-C
QS push-in connector, parallel outlet, slotted head screw								
	M3	3	175 044	GRGA-M3-QS-3	175 046	GRGZ-M3-QS-3	175 045	GRGO-M3-QS-3
	M5	3	175 062	GRGA-M5-QS-3-LF-C	175 064	GRGZ-M5-QS-3-LF-C	175 063	GRGO-M5-QS-3-LF-C
		4	175 065	GRGA-M5-QS-4-LF-C	175 067	GRGZ-M5-QS-4-LF-C	175 066	GRGO-M5-QS-4-LF-C

Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve with female thread

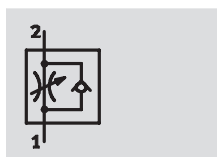
Function



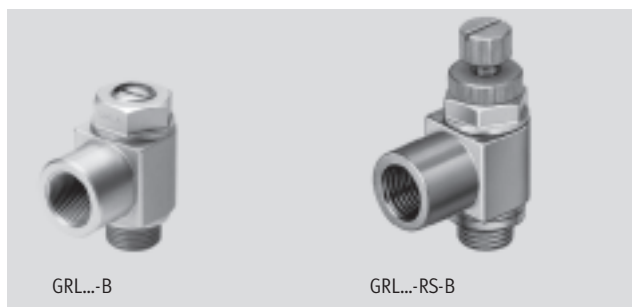
One-way flow control for exhaust air
GRLA



Flow control acting at both sides
GRLO



One-way flow control for supply air
GRLZ



- Mid flow:
Precision adjustment for average speed
- Adjustment with slotted head screw
- Adjustment with knurled screw

General technical data							
Screw-in thread		M5	G1/8	G1/4	G3/8	G1/2	G3/4
Valve function	GRLA	One-way flow control function for exhaust air					
	GRLZ	One-way flow control function for supply air					
	GRLO	Flow control function					
Setting component		Slotted head or knurled screw					
Type of mounting		Threaded					
Mounting position		Any					
Max. tightening torque [Nm]		1.5	6	11	20	40	60

• Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Operating and environmental conditions								
Screw-in thread			M5	G1/8	G1/4	G3/8	G1/2	G3/4
Operating medium			Compressed air, filtered (to 40µm), lubricated or unlubricated					
Operating pressure	GRLA/GRLZ	[bar]	0.2 ... 10	0.3 ... 10				
	GRLO	[bar]	0 ... 10	–				
Ambient temperature		[°C]	–10 ... +60					
Temperature of medium		[°C]	–10 ... +60					

Weights [g]						
Screw-in thread	M5	G1/8	G1/4	G3/8	G1/2	G3/4
GRL...-B	11	28	60	97	204	377
GRL...-RS-B	12	30	59	–	–	–

Flow control valves and one-way flow control valves



Technical data – Standard flow control valve with female thread

Standard nominal flow rate q _N [l/min] at 6 bar → 5 bar							
Screw-in thread		M5	G1/8	G1/4	G3/8	G1/2	G3/4
One-way flow control function for exhaust air							
GRLA	F ¹⁾	0 ... 95	0 ... 340	0 ... 610	0 ... 1 450	0 ... 2 100	0 ... 4 320
	N ²⁾	76 ... 95	260 ... 420	450 ... 820	970 ... 1 600	1 550 ... 2 200	3 220 ... 4 720
One-way flow control function for supply air							
GRLZ	F	0 ... 95	0 ... 340	0 ... 610	–	–	–
	N	76 ... 95	260 ... 420	450 ... 820	–	–	–
Flow control function							
GRLO	F	0 ... 95	–	–	–	–	–

1) F: Flow control direction

2) N: Non-return direction

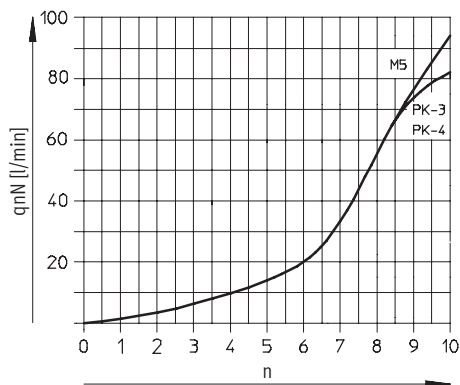
Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve with female thread

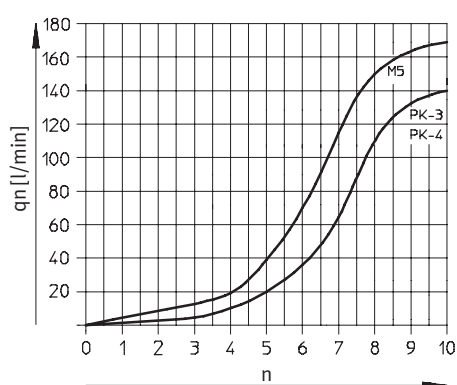
Standard nominal flow rate q_{nN} at 6 bar $\rightarrow$ 5
as a function of turns of the adjusting screw n

Screw-in thread M5

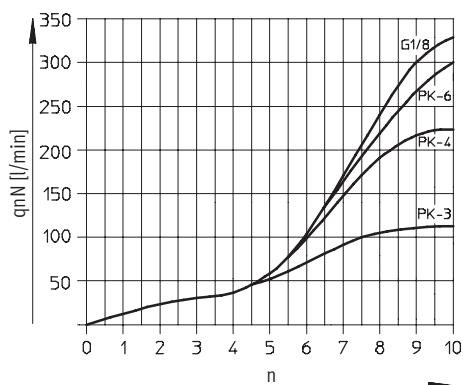


Standard flow rate q_n at 6 bar $\rightarrow$ 0 bar
as a function of turns of the adjusting screw n

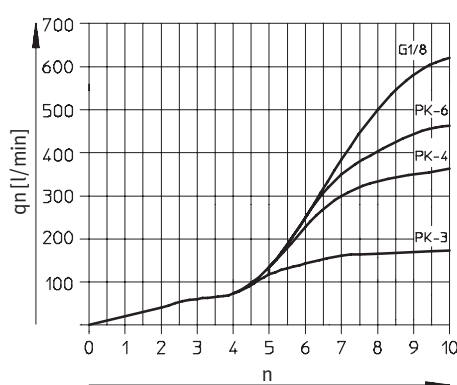
Screw-in thread M5



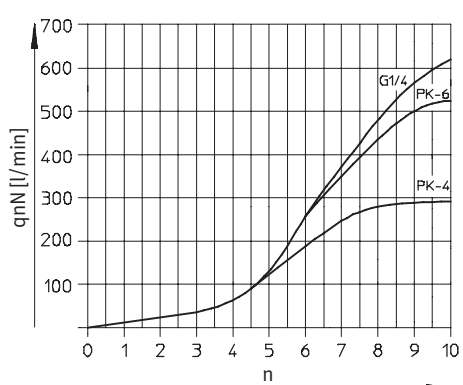
Screw-in thread G1/8



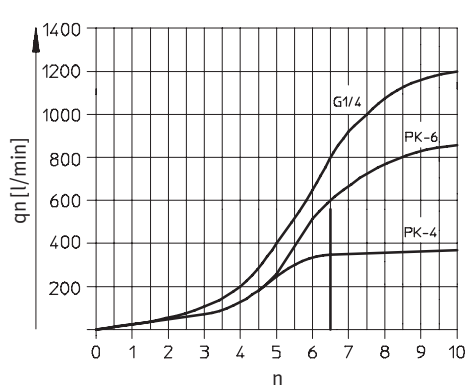
Screw-in thread G1/8



Screw-in thread G1/4



Screw-in thread G1/4



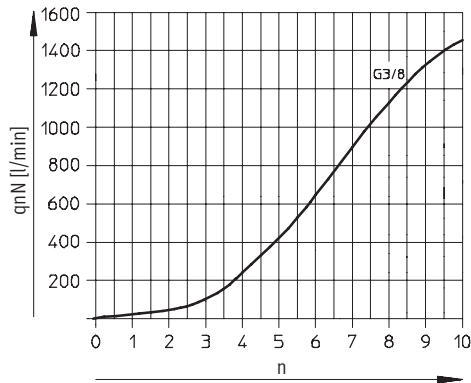
Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve with female thread

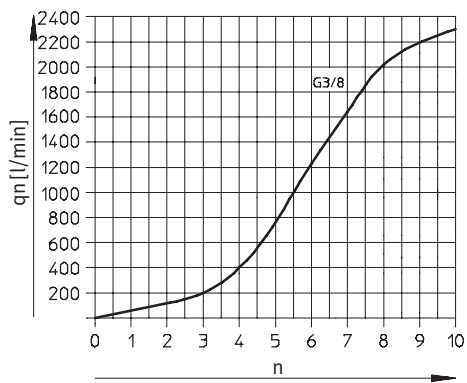
Standard nominal flow rate q_{nN} at 6 bar $\rightarrow 5$
as a function of turns of the adjusting screw n

Screw-in thread $G\frac{3}{8}$

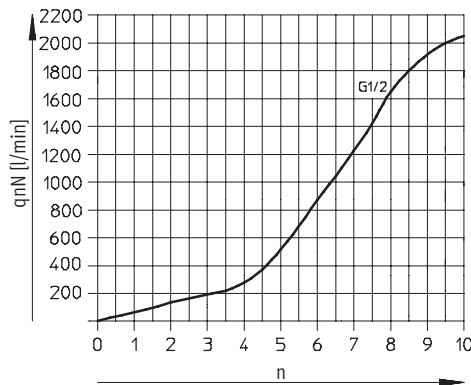


Standard flow rate q_n at 6 bar $\rightarrow 0$ bar
as a function of turns of the adjusting screw n

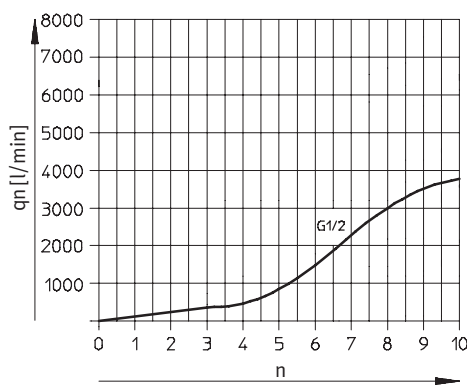
Screw-in thread $G\frac{3}{8}$



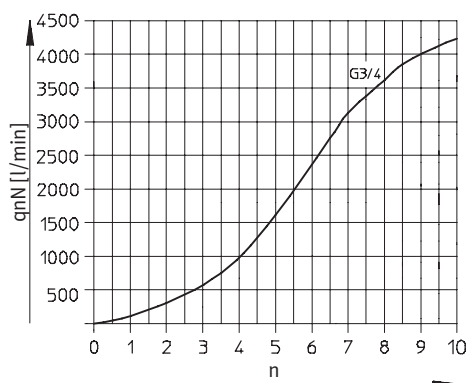
Screw-in thread $G\frac{1}{2}$



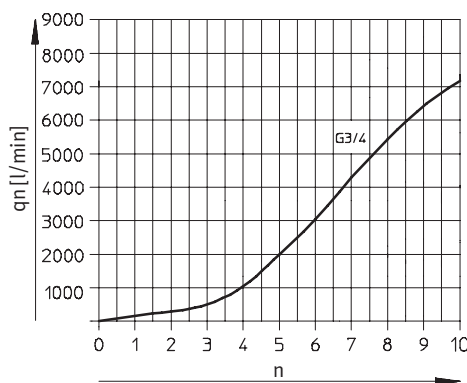
Screw-in thread $G\frac{1}{2}$



Screw-in thread $G\frac{3}{4}$



Screw-in thread $G\frac{3}{4}$



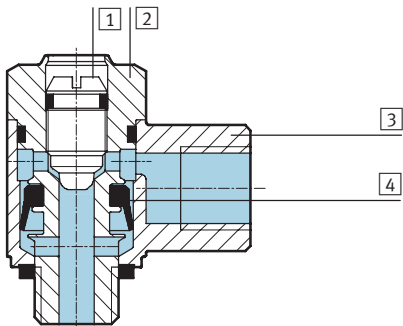
Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve with female thread

Materials

Sectional view

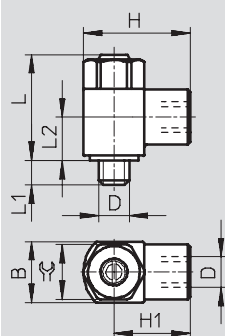


Flow control valve

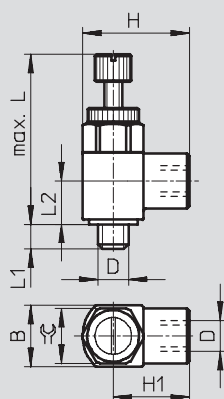
1	Regulating screw	Brass
		Designs free of copper, PTFE and silicone : wrought aluminium alloy
2	Threaded collar	G thread: wrought aluminium alloy
		M5: brass, nickel-plated
3	Swivel joint	Die-cast zinc
4	Seals	Nitrile rubber
Note on material		Designs free of copper, PTFE and silicone → Ordering data

Dimensions

Slotted head screw



Knurled screw



Screw-in thread D	Connecting thread D	B	H	H1	L max.	L1	L2	≡C
Slotted head screw								
M5	M5	10 -0.15	17.5	12.5	17.6	4 ±0.3	7.1	9
G1/8	G1/8	16 -0.15	28	20	25.2	5.3 +0.45/-0.35	10.3	14
G1/4	G1/4	20 -0.2	36	26	30.8	8.2 +0.45/-0.35	13.2	17
G3/8	G3/8	25 -0.2	41	28.5	37.2	8.8 +0.45/-0.35	15.5	22
G1/2	G1/2	32 -0.2	53	37	48.6	12.8 ±0.45	18.9	27
G3/4	G3/4	41 -0.3	64	43.5	60.2	13.5 ±0.5	24.5	36
Knurled screw								
M5	M5	10 -0.15	17.5	12.5	27.3	4 ±0.3	7.1	9
G1/8	G1/8	16 -0.15	28	20	38.6	5.3 +0.45/-0.35	10.3	14
G1/4	G1/4	20 -0.2	36	26	54.8	8.2 +0.45/-0.35	13.2	17

• ≡ - Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve with female thread

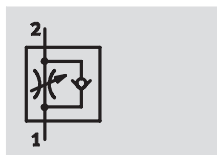
Ordering data						
Design	Screw-in thread	Connecting thread	One-way flow control function for exhaust air		One-way flow control function for supply air	
			Part No.	Type	Part No.	Type
Female thread, elbow outlet, slotted head screw						
	M5	M5	151 160	GRLA-M5-B	151 183	GRLZ-M5-B
	G1/8	G1/8	151 165	GRLA-1/8-B	151 188	GRLZ-1/8-B
	G1/4	G1/4	151 172	GRLA-1/4-B	151 195	GRLZ-1/4-B
	G3/8	G3/8	151 178	GRLA-3/8-B	–	–
	G1/2	G1/2	151 179	GRLA-1/2-B	–	–
	G3/4	G3/4	151 180	GRLA-3/4-B	–	–
Female thread, elbow outlet, knurled screw						
	M5	M5	151 163	GRLA-M5-RS-B	151 186	GRLZ-M5-RS-B
	G1/8	G1/8	151 169	GRLA-1/8-RS-B	151 192	GRLZ-1/8-RS-B
	G1/4	G1/4	151 175	GRLA-1/4-RS-B	151 198	GRLZ-1/4-RS-B
Female thread, elbow outlet, slotted head screw						
Free of copper, PTFE and silicone						
	M5	M5	165 663	GRLA-M5-B-CT	–	–
	G1/8	G1/8	165 654	GRLA-1/8-B-CT	–	–
	G1/4	G1/4	165 648	GRLA-1/4-B-CT	–	–
	G3/8	G3/8	165 662	GRLA-3/8-B-CT	–	–
	G1/2	G1/2	165 647	GRLA-1/2-B-CT	–	–
	G3/4	G3/4	165 661	GRLA-3/4-B-CT	–	–

Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve with barbed fitting connection PK

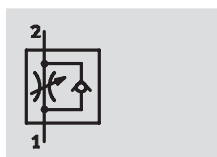
Function



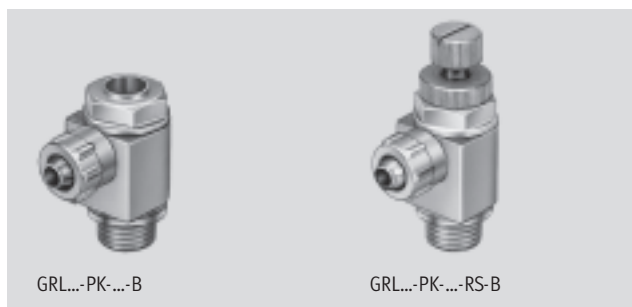
One-way flow control for exhaust air
GRLA



Flow control acting at both sides
GRLO



One-way flow control for supply air
GRLZ



Series B:

- Mid flow:
Precision adjustment for average speed
- Adjustment with slotted head screw
- Adjustment with knurled screw
- With screw-in thread G $\frac{1}{8}$ and G $\frac{1}{4}$ with union nut

General technical data				
Screw-in thread		M5	G $\frac{1}{8}$	G $\frac{1}{4}$
Valve function	GRLA	One-way flow control function for exhaust air		
	GRLZ	One-way flow control function for supply air		
	GRLO	Flow control function		
Setting component		Slotted head or knurled screw		
Type of mounting		Threaded		
Mounting position		Any		
Max. tightening torque		[Nm]	1.5	6
				11

Operating and environmental conditions				
Screw-in thread		M5	G $\frac{1}{8}$	G $\frac{1}{4}$
Operating medium		Compressed air, filtered (to 40µm), lubricated or unlubricated		
Operating pressure	GRLA/GRLZ [bar]	0.2 ... 10	0.3 ... 10	
	GRLO [bar]	0 ... 10	–	
Ambient temperature		[°C]	–10 ... +60	
Temperature of medium		[°C]	–10 ... +60	

Weights [g]				
Screw-in thread		M5	G $\frac{1}{8}$	G $\frac{1}{4}$
	GRL...-B [g]	10	25	44
	GRL...-RS-B [g]	11	26	45

Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve with barbed fitting connection PK

Standard nominal flow rate qnN [l/min] at 6 bar → 5 bar					
Screw-in thread			M5	G1/8	G1/4
One-way flow control function for exhaust air					
GRLA	PK-3	F ¹⁾	0 ... 83	0 ... 110	–
		N ²⁾	72 ... 83	100 ... 110	–
	PK-4	F	0 ... 83	0 ... 230	0 ... 260
		N	76 ... 88	190 ... 240	220 ... 260
	PK-6	F	–	0 ... 300	0 ... 540
		N	–	210 ... 290	410 ... 585
One-way flow control function for supply air					
GRLZ	PK-3	F	0 ... 83	0 ... 110	–
		N	72 ... 83	100 ... 110	–
	PK-4	F	0 ... 83	0 ... 230	0 ... 260
		N	76 ... 88	190 ... 240	220 ... 260
	PK-6	F	–	0 ... 300	0 ... 540
		N	–	210 ... 290	410 ... 585
Flow control function					
GRLO	PK-3	F	0 ... 83	–	–

1) F: Flow control direction

2) N: Non-return direction

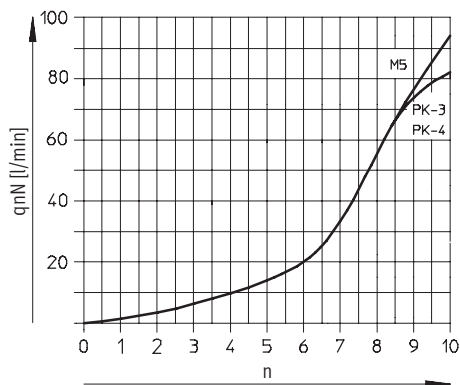
Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve with barbed fitting connection PK

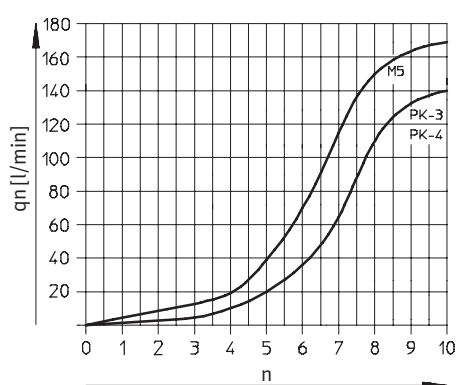
Standard nominal flow rate q_{nN} at 6 bar $\rightarrow$ 5
as a function of turns of the adjusting screw n

Screw-in thread M5

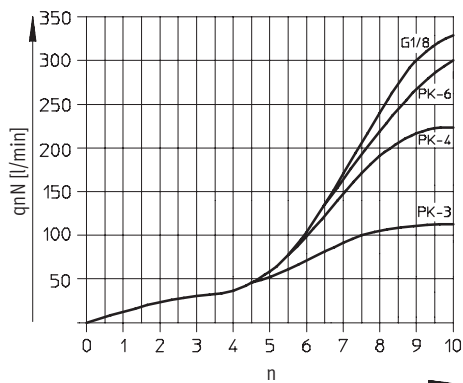


Standard flow rate q_n at 6 bar $\rightarrow$ 0 bar
as a function of turns of the adjusting screw n

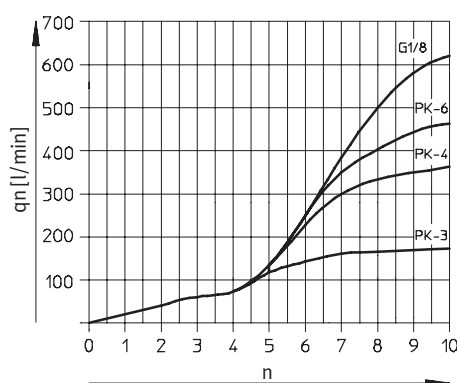
Screw-in thread M5



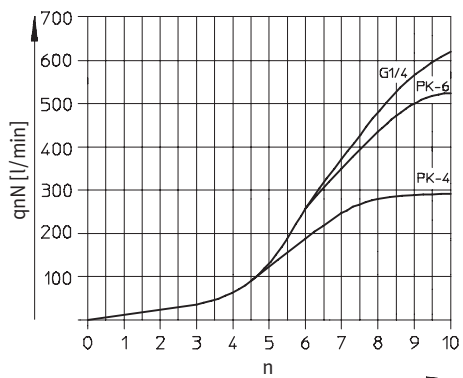
Screw-in thread G1/8



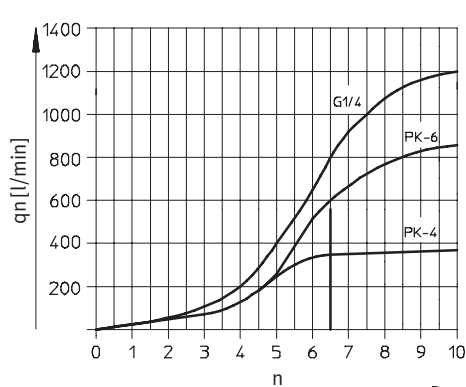
Screw-in thread G1/8



Screw-in thread G1/4



Screw-in thread G1/4



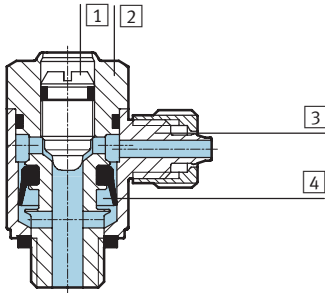
Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve with barbed fitting connection PK

Materials

Sectional view

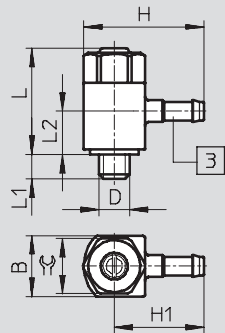


Flow control valve	
1	Regulating screw
	Brass
	Designs free of copper, PTFE and silicone : wrought aluminium alloy
2	Threaded collar
	G thread: wrought aluminium alloy
	M5: brass, nickel-plated
3	Swivel joint
	Die-cast zinc
4	Seals
	Nitrile rubber
Note on material	
Designs free of copper, PTFE and silicone	
→ Ordering data	

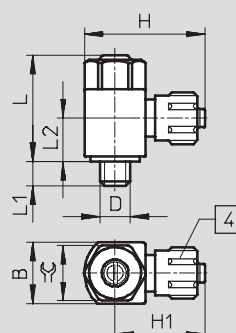
Dimensions

Slotted head screw, screw-in thread M5

Slotted head screw, screw-in thread G $\frac{1}{8}$, G $\frac{1}{4}$



3 Barbed fitting



4 Union nut

Screw-in thread D	Tubing I.D.	B	H	H1	L	L1	L2	⌀C
M5	3	10 -0.15	19.7	14.7	17.6	4 ±0.3	8.5	9
	4	10 -0.15	21.7	16.7	17.6	4 ±0.3	8.5	9
G $\frac{1}{8}$	3	16 -0.15	27.1	19.1	25.2	5.3 +0.45/-0.35	13.4	14
	4	16 -0.15	30.2	22.2	25.2	5.3 +0.45/-0.35	13.4	14
	6	16 -0.15	30.3	22.3	25.2	5.3 +0.45/-0.35	12	14
G $\frac{1}{4}$	4	20 -0.2	34.2	24.2	30.8	8.2	16.9	17
	6	20 -0.2	34.3	24.3	30.8	8.2	17.2	17

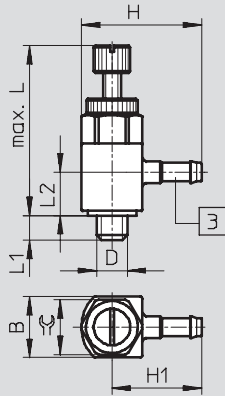
Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve with barbed fitting connection PK

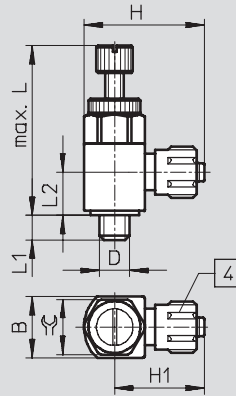
Dimensions

Knurled screw, screw-in thread M5



3 Barbed fitting

Knurled screw, screw-in thread G $\frac{1}{8}$, G $\frac{1}{4}$



4 Union nut

Screw-in thread D	Tubing I.D.	B	H	H1	L max.	L1	L2	⌀
M5	3	10 -0.15	19.7	14.7	27.3	4 ±0.3	8.5	9
G $\frac{1}{8}$	4	16 -0.15	30.2	22.2	38.6	5.3 +0.45/-0.35	13.4	14
	6	16 -0.15	30.3	22.3	38.6	5.3 +0.45/-0.35	12	14
G $\frac{1}{4}$	4	20 -0.2	34.2	24.2	54.8	8.2 +0.45/-0.35	16.9	17
	6	20 -0.2	34.3	24.3	54.8	8.2 +0.45/-0.35	17.2	17

Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve with barbed fitting connection PK

Ordering data							
Version ¹⁾	Screw-in thread	For tubing I.D. [mm]	One-way flow control function for exhaust air		One-way flow control function for supply air		Flow control function acting at both sides
			Part No.	Type	Part No.	Type	Part No. Type
Barbed fitting, elbow outlet, slotted head screw							
	M5	3	151 161	GRLA-M5-PK-3-B	151 184	GRLZ-M5-PK-3-B	151 182 GRLO-M5-PK-3-B
		4	151 162	GRLA-M5-PK-4-B	151 185	GRLZ-M5-PK-4-B	–
	G1/8	3	151 166	GRLA-1/8-PK-3-B	151 189	GRLZ-1/8-PK-3-B	–
		4	151 167	GRLA-1/8-PK-4-B	151 190	GRLZ-1/8-PK-4-B	–
		6	151 168	GRLA-1/8-PK-6-B	151 191	GRLZ-1/8-PK-6-B	–
	G1/4	4	151 173	GRLA-1/4-PK-4-B	151 196	GRLZ-1/4-PK-4-B	–
		6	151 174	GRLA-1/4-PK-6-B	151 197	GRLZ-1/4-PK-6-B	–
Barbed fitting, elbow outlet, knurled screw							
	M5	3	151 164	GRLA-M5-PK-3-RS-B	151 187	GRLZ-M5-PK-3-RS-B	–
	G1/8	4	151 170	GRLA-1/8-PK-4-RS-B	151 193	GRLZ-1/8-PK-4-RS-B	–
		6	151 171	GRLA-1/8-PK-6-RS-B	151 194	GRLZ-1/8-PK-6-RS-B	–
	G1/4	4	151 176	GRLA-1/4-PK-4-RS-B	151 199	GRLZ-1/4-PK-4-RS-B	–
		6	151 177	GRLA-1/4-PK-6-RS-B	151 200	GRLZ-1/4-PK-6-RS-B	–
Barbed fitting, elbow outlet, slotted head screw Free of copper, PTFE and silicone							
	M5	3	165 664	GRLA-M5-PK-3-B-CT	–	–	–
		4	165 666	GRLA-M5-PK-4-B-CT	–	–	–
	G1/8	3	165 655	GRLA-1/8-PK-3-B-CT	–	–	–
		4	165 656	GRLA-1/8-PK-4-B-CT	–	–	–
		6	165 658	GRLA-1/8-PK-6-B-CT	–	–	–
	G1/4	4	165 649	GRLA-1/4-PK-4-B-CT	–	–	–
		6	165 651	GRLA-1/4-PK-6-B-CT	–	–	–

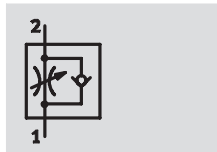
1) Union nut for barbed fitting only with screw-in thread G1/8 and G1/4

Flow control valves and one-way flow control valves

FESTO

Technical data – Mini flow control valve with female thread

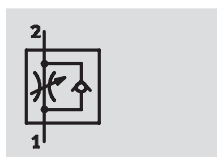
Function



One-way flow control for exhaust air
GRLA



Flow control acting at both sides
GRLO



One-way flow control for supply air
GRLZ



- Low flow:
Precision adjustment for low speed
- Adjustment with slotted head screw

General technical data			
Screw-in thread		M3	M5
Valve function	GRLA	One-way flow control function for exhaust air	
	GRLZ	One-way flow control function for supply air	
	GRLO	Flow control function	
Setting component		Slotted head or knurled screw	
Type of mounting		Threaded	
Mounting position		Any	
Max. tightening torque		[Nm] 0.3	1.5

Operating and environmental conditions			
Screw-in thread		M3	M5
Operating medium		Compressed air, filtered (to 40µm), lubricated or unlubricated	
Operating pressure	GRLA/GRLZ [bar]	0.2 ... 10	0.2 ... 10
	GRLO [bar]	0 ... 10	–
Ambient temperature		–10 ... +60 [°C]	
Temperature of medium		–10 ... +60 [°C]	

Weights [g]			
Screw-in thread		M3	M5
Product weight		[g] 2	7

Flow control valves and one-way flow control valves

FESTO

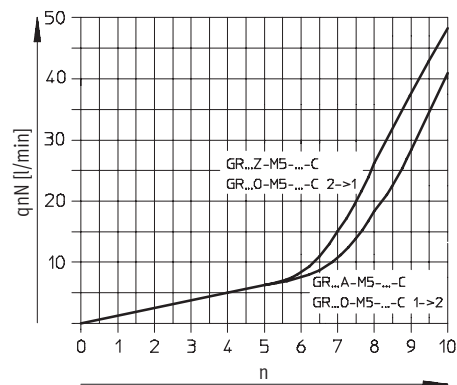
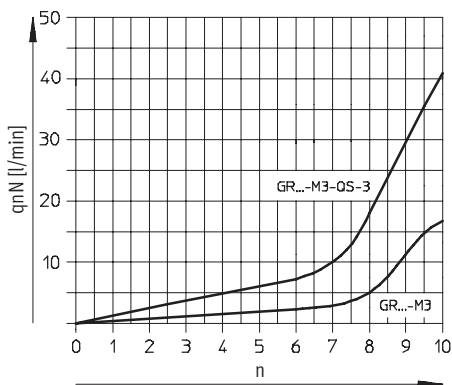
Technical data – Mini flow control valve with female thread

Standard nominal flow rate q_{nN} [l/min] at 6 bar $\rightarrow$ 5 bar			
Screw-in thread		M3	M5
One-way flow control function for exhaust air			
GRLA	F ¹⁾	0 ... 18	0 ... 40
	N ²⁾	18 ... 20	50 ... 75
One-way flow control function for supply air			
GRLZ	F	0 ... 18	0 ... 40
	N	18 ... 20	40 ... 65
Flow control function			
GRLO	F	0 ... 18	0 ... 40
	N	0 ... 18	0 ... 48

1) F: Flow control direction

2) N: Non-return direction

Standard nominal flow rate q_{nN} at 6 bar $\rightarrow$ 5 bar as a function of turns of the adjusting screw n	
Screw-in thread M3	Screw-in thread M5



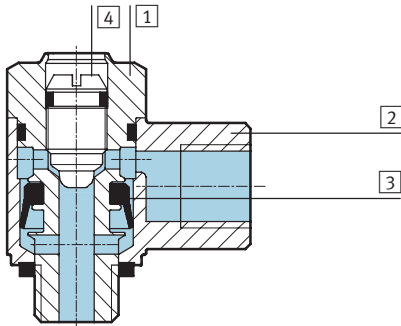
Flow control valves and one-way flow control valves

FESTO

Technical data – Mini flow control valve with female thread

Materials

Sectional view

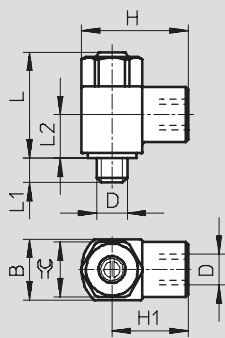


Flow control valve

1	Threaded collar	Brass, nickel-plated
2	Swivel joint	Die-cast zinc
3	Seals	Nitrile rubber
4	Regulating screw	Brass

Dimensions

Screw-in thread M3/M5



Screw-in thread D	Connecting thread D	B	H	H1	L	L1	L2	⌀C
M3	M3	5	9	6.5	13.3	2.5	6.4	4.5
M5	M5	8	16	12	17.7	3.1	8.2	7

Ordering data

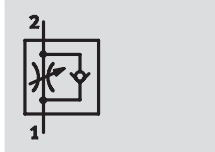
Version	Screw-in thread	Connecting thread	One-way flow control function for exhaust air		One-way flow control function for supply air		Flow control function acting at both sides	
			Part No.	Type	Part No.	Type	Part No.	Type
	M3	M3	175 038	GRLA-M3	175 040	GRLZ-M3	175 039	GRLO-M3
	M5	M5	175 047	GRLA-M5-LF-C	175 049	GRLZ-M5-LF-C	175 048	GRLO-M5-LF-C

Flow control valves and one-way flow control valves

FESTO

Technical data – Mini flow control valve with barbed fitting connection PK

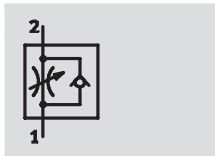
Function



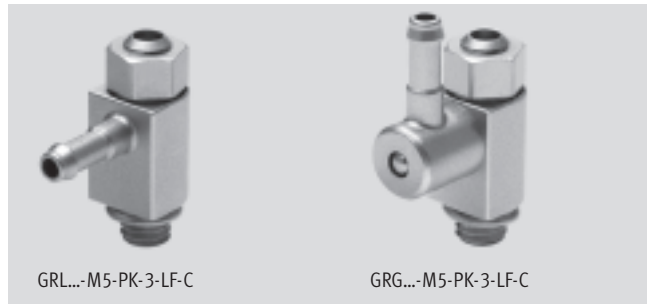
One-way flow control for exhaust air
GRLA



Flow control acting at both sides
GRLO



One-way flow control for supply air
GRLZ



GRL...-M5-PK-3-LF-C

GRG...-M5-PK-3-LF-C

- Low flow: Precision adjustment for low speed
- Barbed fitting connection
- Adjustment with slotted head screw

Variants:

- Swivel joint, elbow outlet
- Swivel joint, parallel outlet

General technical data		
Screw-in thread		M5
Valve function	GRLA	One-way flow control function for exhaust air
	GRLZ	One-way flow control function for supply air
	GRLO	Flow control function
Setting component		Slotted head or knurled screw
Type of mounting		Threaded
Mounting position		Any
Max. tightening torque		[Nm] 1.5

Operating and environmental conditions		
Screw-in thread		M5
Operating medium		Compressed air, filtered (to 40µm), lubricated or unlubricated
Operating pressure	GRLA/GRLZ	[bar] 0.2 ... 10
	GRLO	[bar] –
Ambient temperature		[°C] –10 ... +60
Temperature of medium		[°C] –10 ... +60

Weights [g]		
Screw-in thread		M5
Product weight		[g] 7

Flow control valves and one-way flow control valves

FESTO

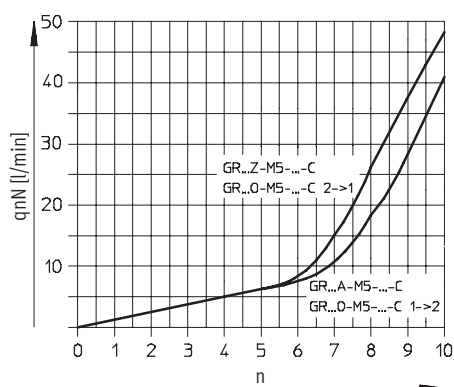
Technical data – Mini flow control valve with barbed fitting connection PK

Standard nominal flow rate qnN [l/min] at 6 bar → 5 bar			
Screw-in thread			M5
One-way flow control function for exhaust air			
PK-3	GRLA/GRGA	F ¹⁾	0 ... 40
		N ²⁾	42 ... 63
One-way flow control function for supply air			
PK-3	GRLZ/GRGZ	F	0 ... 40
		N	35 ... 58
Flow control function			
PK-3	GRLO/GRGO	F	0 ... 40
		N	0 ... 48

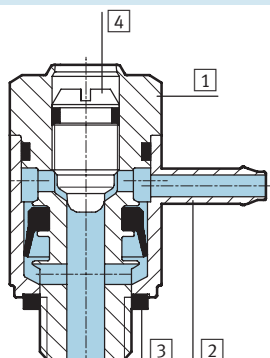
1) F: Flow control direction

2) N: Non-return direction

Standard nominal flow rate q_{nN} at 6 bar → 5 bar as a function of turns of the adjusting screw n	
Screw-in thread M5	



Materials	
Sectional view	



Flow control valve		
1	Threaded collar	Brass, nickel-plated
2	Swivel joint	Die-cast zinc
3	Seals	Nitrile rubber
4	Regulating screw	Brass

Flow control valves and one-way flow control valves

FESTO

Technical data – Mini flow control valve with barbed fitting connection PK

Dimensions										
Swivel joint, elbow outlet						Swivel joint, parallel outlet				
Barbed fitting						Barbed fitting				

Screw-in thread D	Tubing I.D.	B	H	H1	H2	L	L1	L2	L3	
Swivel joint, elbow outlet										
M5	3	8	17.7	13.7	–	17.7	3.1	9.4	–	7
Swivel joint, parallel outlet										
M5	3	8	15.8	11.8	8.3	17.7	3.1	8.7	21	7

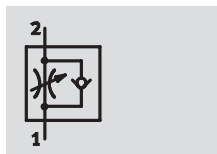
Ordering data								
Version	Screw-in thread	For tubing I.D. [mm]	One-way flow control function for exhaust air		One-way flow control function for supply air		Flow control function acting at both sides	
			Part No.	Type	Part No.	Type	Part No.	Type
Barbed fitting, elbow outlet, slotted head screw								
	M5	3	175 050	GRLA-M5-PK-3-LF-C	175 052	GRLZ-M5-PK-3-LF-C	175 051	GRLO-M5-PK-3-LF-C
Swivel joint, parallel outlet, slotted head screw								
	M5	3	175 059	GRGA-M5-PK-3-LF-C	175 061	GRGZ-M5-PK-3-LF-C	175 060	GRGO-M5-PK-3-LF-C

Flow control valves and one-way flow control valves

FESTO

Technical data – Corrosion resistant flow control valve with female thread

Function



One-way flow control for exhaust air
CRGRLA

- Mid flow: Precision adjustment for average speed
- Adjustment with slotted head screw



CRGRLA-...-B

General technical data					
Screw-in thread	M5	G1/8	G1/4	G3/8	G1/2
Valve function	One-way flow control function for exhaust air				
Setting component	Slotted head screw				
Type of mounting	Threaded				
Mounting position	Any				
Max. tightening torque [Nm]	1.5	6	11	20	40

• Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Operating and environmental conditions					
Screw-in thread	M5	G1/8	G1/4	G3/8	G1/2
Operating medium	Compressed air, filtered (to 40µm), lubricated or unlubricated				
Operating pressure [bar]	0.2 ... 10	0.3 ... 10			
Ambient temperature [°C]	-20 ... +80				
Temperature of medium [°C]	-10 ... +60				

Weights [g]					
Screw-in thread	M5	G1/8	G1/4	G3/8	G1/2
	14	44	83	150	315

Standard nominal flow rate q _N [l/min] at 6 bar → 5 bar					
Screw-in thread	M5	G1/8	G1/4	G3/8	G1/2
One-way flow control function for exhaust air					
F ¹⁾	0 ... 95	0 ... 340	0 ... 610	0 ... 1 450	0 ... 2 100
N ²⁾	77 ... 95	260 ... 420	450 ... 820	970 ... 1 600	1 550 ... 2 200

1) F: Flow control direction

2) N: Non-return direction

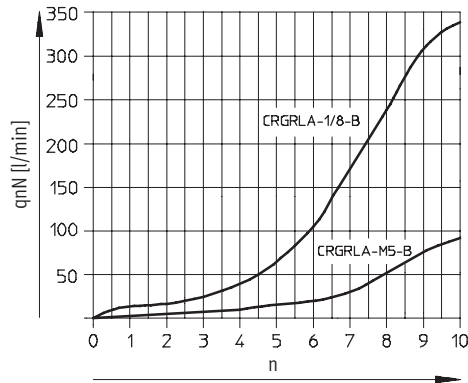
Flow control valves and one-way flow control valves

FESTO

Technical data – Corrosion resistant flow control valve with female thread

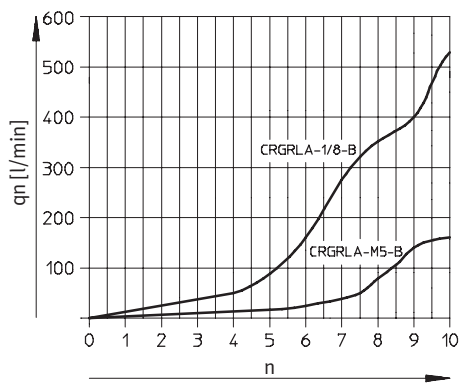
**Standard nominal flow rate q_{nN} at 6 bar $\rightarrow$ 5 bar
as a function of turns of the adjusting screw n**

Screw-in thread M5, $G\frac{1}{8}$

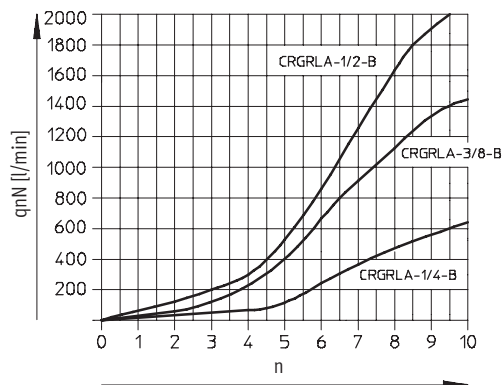


**Standard flow rate q_n at 6 bar $\rightarrow$ 0 bar
as a function of turns of the adjusting screw n**

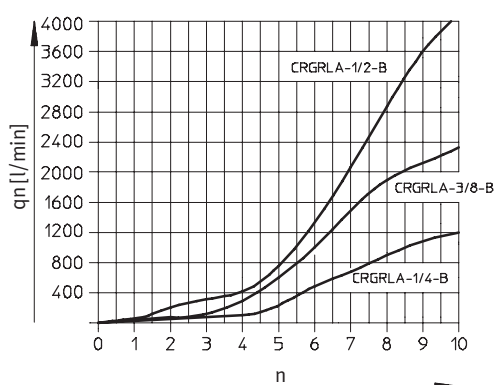
Screw-in thread M5, $G\frac{1}{8}$



Screw-in thread $G\frac{1}{4}$, $G\frac{3}{8}$, $G\frac{1}{2}$



Screw-in thread $G\frac{1}{4}$, $G\frac{3}{8}$, $G\frac{1}{2}$



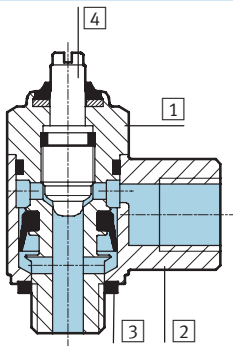
Flow control valves and one-way flow control valves

FESTO

Technical data – Corrosion resistant flow control valve with female thread

Materials

Sectional view

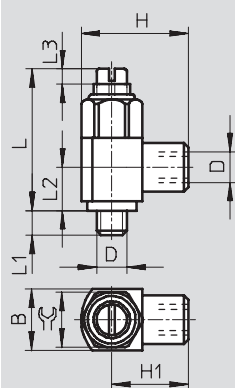


Flow control valve

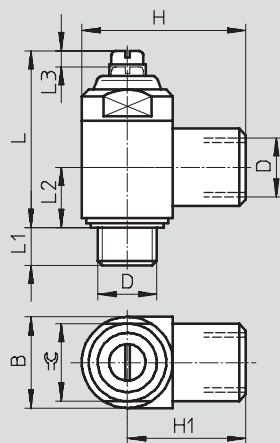
1	Threaded collar	High-alloy stainless steel
2	Swivel joint	High-alloy stainless steel
3	Seals	Fluorocarbon, nitrile rubber
4	Regulating screw	High-alloy stainless steel

Dimensions

Screw-in thread M5



Screw-in thread G $\frac{1}{8}$, G $\frac{1}{4}$, G $\frac{3}{8}$, G $\frac{1}{2}$



Screw-in thread D	Connecting thread D	B	H	H1	L	L1	L2	L3	$\approx \varnothing$
M5	M5	10 -0.25	17.5 ±0.3	12.5	23.2	4	7.1	2.5	9
G $\frac{1}{8}$	G $\frac{1}{8}$	16 -0.4	28 +0.4/-0.3	20	33.7	5.5	10.3	3.5	14
G $\frac{1}{4}$	G $\frac{1}{4}$	20 -0.3	36 +0.4/-0.2	26	38.8	6.5	13.2	3.5	17
G $\frac{3}{8}$	G $\frac{3}{8}$	25 -0.3	41 +0.4/-0.2	28.5	48.5	7.5	15.4	5	22
G $\frac{1}{2}$	G $\frac{1}{2}$	32 -0.4	53 ±0.5	37	62.2	9	18.9	7.5	27

• Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Ordering data

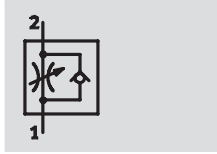
Version	Screw-in thread	Connecting thread	One-way flow control function for exhaust air Part No. Type
	M5	M5	161 403 CRGRLA-M5-B
	G $\frac{1}{8}$	G $\frac{1}{8}$	161 404 CRGRLA- $\frac{1}{8}$ -B
	G $\frac{1}{4}$	G $\frac{1}{4}$	161 405 CRGRLA- $\frac{1}{4}$ -B
	G $\frac{3}{8}$	G $\frac{3}{8}$	161 406 CRGRLA- $\frac{3}{8}$ -B
	G $\frac{1}{2}$	G $\frac{1}{2}$	161 407 CRGRLA- $\frac{1}{2}$ -B

Flow control valves and one-way flow control valves

Technical data – Inline flow control valve with QS push-in connectors

FESTO

Function



One-way flow control

GR-QS/GR-QS-LF

- Low flow:
Precision adjustment for low speed
- Mid flow:
Precision adjustment for average speed
- Adjustment with knurled screw



Flow control acting at both sides

GRO-QS

General technical data				
Push-in connector ¹⁾	QS-3	QS-4	QS-6	QS-8
Valve function	One-way flow control function			
Setting component	Knurled screw			
Type of mounting	Front panel mounting, in-line installation, via through-holes, with accessories			
Mounting position	Any			
Max. tightening torque [Nm]	0.9			

1) For standard O.D. tubing

Operating and environmental conditions				
Push-in connector	QS-3	QS-4	QS-6	QS-8
Operating medium	Compressed air, filtered (to 40µm), lubricated or unlubricated			
Operating pressure [bar]	0.2 ... 10			
Ambient temperature [°C]	-10 ... +60			
Temperature of medium [°C]	-10 ... +60			

Weights [g]				
Push-in connector	QS-3	QS-4	QS-6	QS-8
[g]	15	15	25	26

Flow control valves and one-way flow control valves

Technical data – Inline flow control valve with QS push-in connectors

Standard nominal flow rate q_{nN} [l/min] at 6 bar → 5 bar					
Push-in connector		QS-3	QS-4	QS-6	QS-8
GR	F ¹⁾	0 ... 25	0 ... 85	0 ... 160	0 ... 225
	N ²⁾	65 ... 70	100 ... 110	260 ... 270	350 ... 400
GR-LF	F	–	0 ... 40	0 ... 75	–
	N	–	100 ... 110	260 ... 270	–
GRO	F	0 ... 25	0 ... 85	0 ... 160	–

1) F: Flow control direction

2) N: Non-return direction

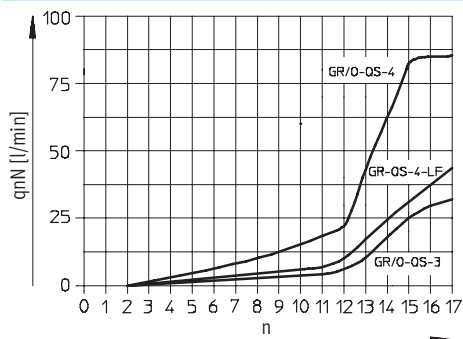
Standard flow rate q_n [l/min] at 6 bar → 0 bar					
Push-in connector		QS-3	QS-4	QS-6	QS-8
GR	F ¹⁾	0 ... 100	0 ... 150	0 ... 205	0 ... 390
	N ²⁾	125 ... 135	170 ... 185	500 ... 510	610 ... 640
GR-LF	F	–	0 ... 130	0 ... 110	–
	N	–	170 ... 185	500 ... 510	–
GRO	F	0 ... 100	0 ... 150	0 ... 205	–

1) F: Flow control direction

2) N: Non-return direction

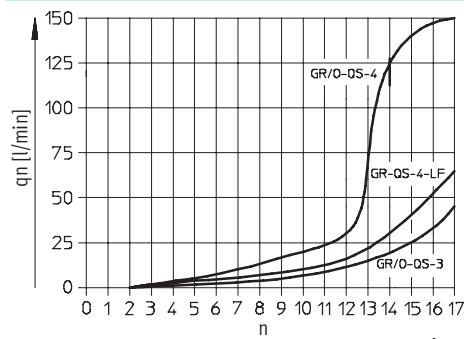
Standard nominal flow rate q_{nN} at 6 bar → 5 bar
as a function of turns of the adjusting screw n

Push-in connector QS-3/QS-4

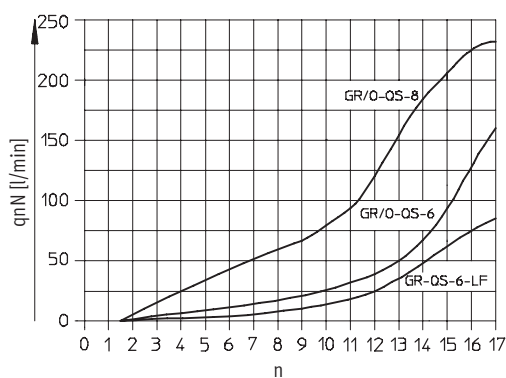


Standard flow rate q_n at 6 bar → 0 bar
as a function of turns of the adjusting screw n

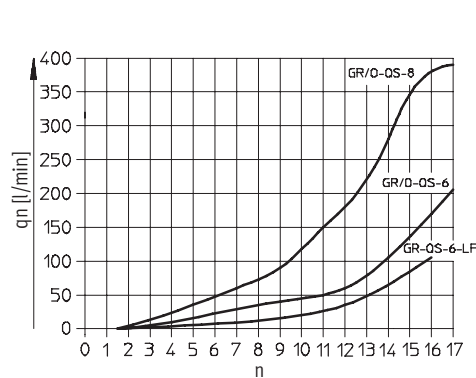
Push-in connector QS-3/QS-4



Push-in connector QS-6/QS-8



Push-in connector QS-6/QS-8



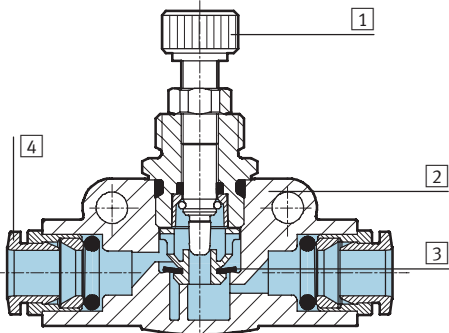
Flow control valves and one-way flow control valves

FESTO

Technical data – Inline flow control valve with QS push-in connectors

Materials

Sectional view

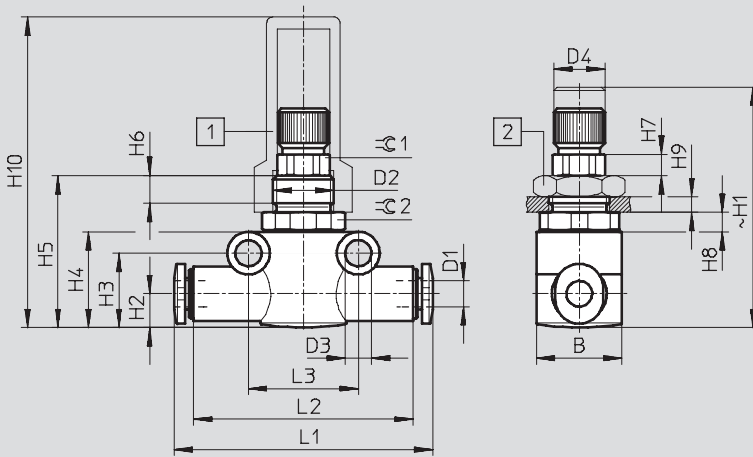


Flow control valve

1	Regulating screw	Brass, nickel-plated
2	Housing	Reinforced polybutylene terephthalate
3	Seals	Nitrile rubber
4	Release ring	Polyacetal

Dimensions

Download CAD data → www.festo.com



- 1 Tamper-proof cap GRK
- 2 Hex nut GRM

Push-in connector	Tubing O.D. D1	B	D2	D3 Ø ±0.1	D4 Ø -0.3	H1		H2	H3	H4
						min.	max.			
QS-3	3	14	M10x1	4.3	8	36	40	5.55	12.2	15.7
QS-4	4	14	M10x1		8	36	40	5.55	12.2	15.7
QS-6	6	16	M12x1		10.1	40.5	44.5	8.4	17.3	21.3
QS-8	8	16	M12x1		10.1	40.5	44.5	8.4	17.3	21.3

Push-in connector	~ H5	~ H6	H7 ±0.1	H8	H9 max.	H10	L1	L2	L3	≈C1	≈C2
QS-3	24.9	4.5	3.5	3.2	2.5	50.9	41.8	36	18	8	13
QS-4	24.9			3.2	2.5	50.9	42.4	36	18		13
QS-6	30.1			2.8	3.5	46.1	51.6	43	24		14
QS-8	30.1			2.8	3.5	46.1	53.4	43	24		14

Ordering data

Push-in connector	For tubing O.D. [mm]	Flow rate characteristic ¹⁾	One-way flow control function		Flow control function at both sides	
			Part No.	Type	Part No.	Type
QS-3	3	Mid flow	193 965	GR-QS-3	193 971	GRO-QS-3
QS-4	4	Mid flow	193 967	GR-QS-4	193 972	GRO-QS-4
		Low flow	193 966	GR-QS-4-LF	–	–
QS-6	6	Mid flow	193 969	GR-QS-6	193 973	GRO-QS-6
		Low flow	193 968	GR-QS-6-LF	–	–
QS-8	8	Mid flow	193 970	GR-QS-8	–	–

1) Low flow: Precision adjustment for low speed
Mid flow: Precision adjustment for average speed

Flow control valves and one-way flow control valves

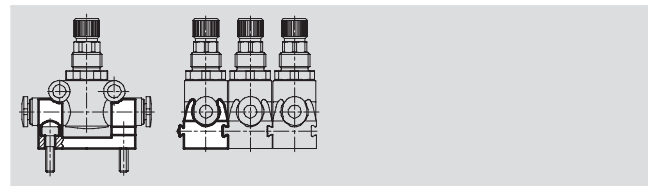
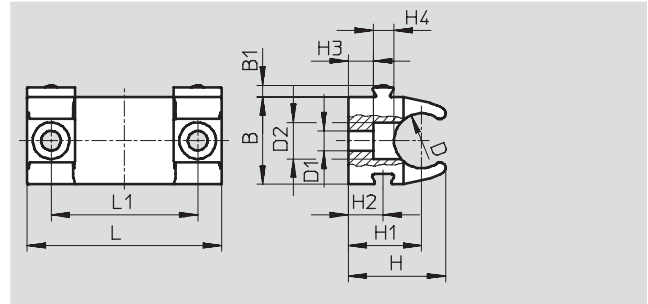
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Accessories – Inline flow control valve with QS push-in connectors

Retainer GR-H-QS

for front panel mounting

Material: Polyacetal



Dimensions and ordering data								
For push-in fitting	B	B1	D	D1	D2	H	H1	H2
QS-3/QS-4	14.3	1.9	9	3.2	6	16	12	5.7
QS-6/QS-8	19.8	1.9	14.5	3.2	6	19.2	13	5.7

For push-in fitting	H3	H4	L	L1	Product weight [g]	Part No.	Type
QS-3/QS-4	4.1	3.4	31.8	24	4	195 495	GR-H-QS-3-4
QS-6/QS-8	2.3	3.4	31.8	24	5	195 496	GR-H-QS-6-8

Hex nut GRM

for front panel mounting

Material: Steel

Tamper-proof cap GRK

Material: Polypropylene



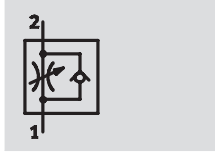
Ordering data			
For push-in fitting	Hex nut GRM		Tamper-proof cap GRK
	Part No.	Type	Part No. Type
QS-3/QS-4	6 444	GRM-M5	6 436 GRK-M5
QS-6/QS-8	2 107	GRM-1/8	2 105 GRK-1/8

Flow control valves and one-way flow control valves

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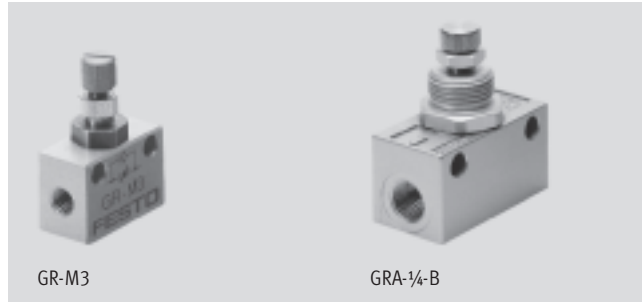
Technical data – Standard flow control valve with female thread

Function



One-way flow control
GR/GRA

- Mid flow: Precision adjustment for average speed
- Adjustment with knurled screw



General technical data							
Connecting thread	M3	M5	G1/8	G1/4	G3/8	G1/2	G3/4
Valve function	One-way flow control function						
Setting component	Knurled screw						
Type of mounting	Through-hole						
	–	Front panel mounting					
Mounting position	Any						
Max. tightening torque [Nm]	0.15	0.9	0.9	0.8	1	1.2	2

– † – Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Operating and environmental conditions							
Connecting thread	M3	M5	G1/8	G1/4	G3/8	G1/2	G3/4
Operating medium	Filtered compressed air, lubricated or unlubricated						
Grade of filtration of medium [µm]	5	40	40	40	40	40	40
Temperature of medium [°C]	–10 ... +60	–20 ... +60	–20 ... +60	–20 ... +75	–20 ... +75	–20 ... +75	–10 ... +60
Ambient temperature [°C]	–10 ... +60	–20 ... +60	–20 ... +60	–20 ... +75	–20 ... +75	–20 ... +75	–10 ... +60

Weights [g]							
Connecting thread	M3	M5	G1/8	G1/4	G3/8	G1/2	G3/4
	2.5	21	34	180	225	517	1 100

Standard nominal flow rate q _N [l/min] at 6 bar → 5 bar							
Connecting thread	M3	M5	G1/8	G1/4	G3/8	G1/2	G3/4
F ¹⁾	0 ... 29.5	0 ... 94	0 ... 220	0 ... 420	0 ... 1 010	0 ... 1 620	0 ... 3 300
N ²⁾	26 ... 27.5	0 ... 115	0 ... 217	0 ... 780	0 ... 1 150	0 ... 2 760	0 ... 4 800

- 1) F: Flow control direction
2) N: Non-return direction

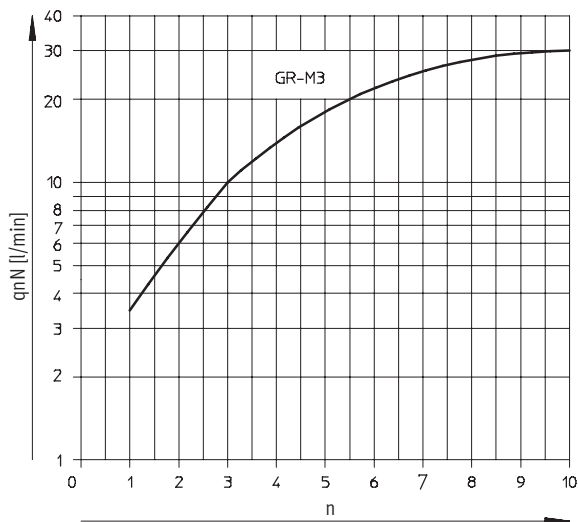
Flow control valves and one-way flow control valves

FESTO

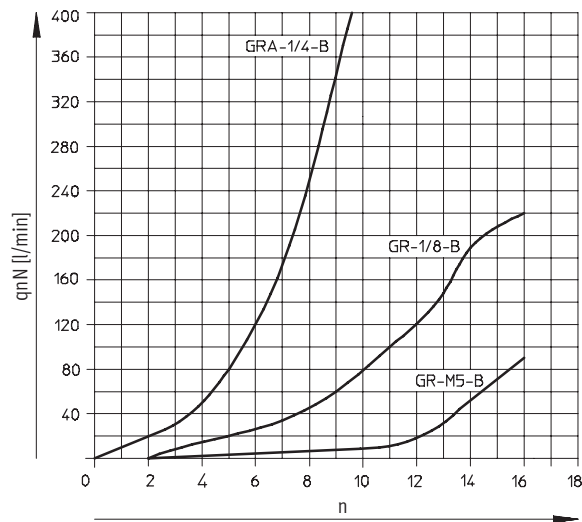
Technical data – Standard flow control valve with female thread

Standard nominal flow rate q_{nN} at 6 bar $\rightarrow$ 5 bar as a function of turns of the adjusting screw n

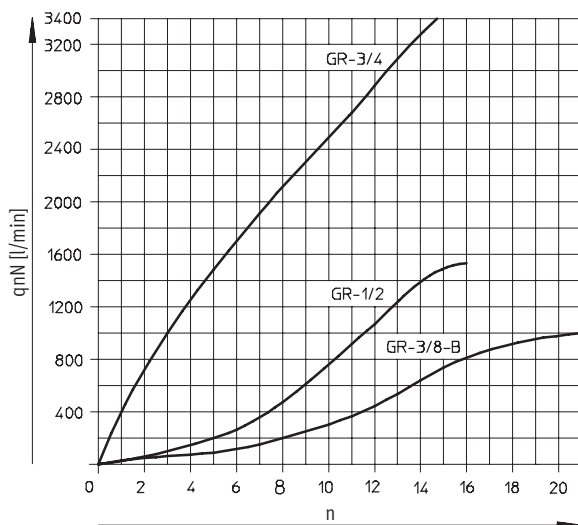
Connecting thread M3



Connecting thread M5, G1/8, G1/4



Connecting thread G3/8, G1/2, G3/4



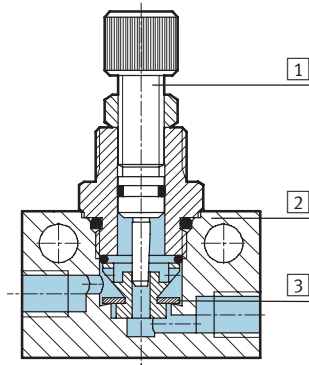
Flow control valves and one-way flow control valves

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Technical data – Standard flow control valve with female thread

Materials

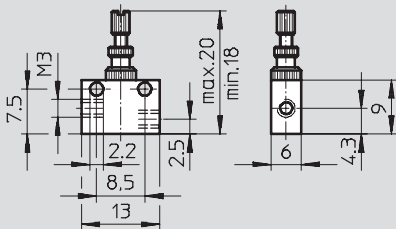
Sectional view



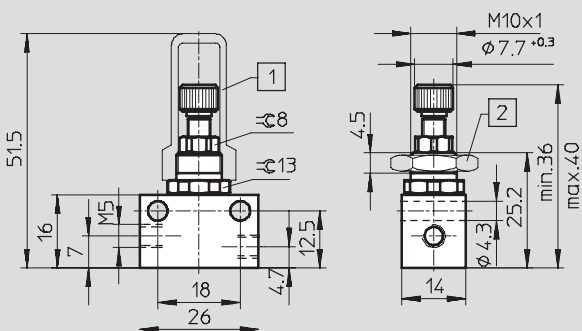
Connecting thread	M3	M5	G1/8	G1/4	G3/8	G1/2	G3/4
1 Regulating screw	Brass						
2 Housing	Wrought aluminium alloy			Die-cast zinc			Wrought aluminium alloy
3 Seal	NBR						

Dimensions

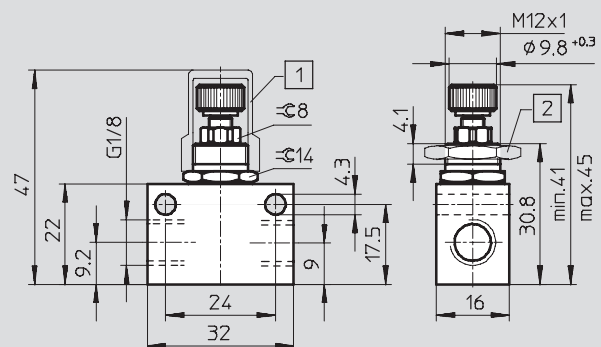
Connecting thread M3



Connecting thread M5



Connecting thread G1/8



- 1 Tamper-proof cap GRK
- 2 Hex nut GRM

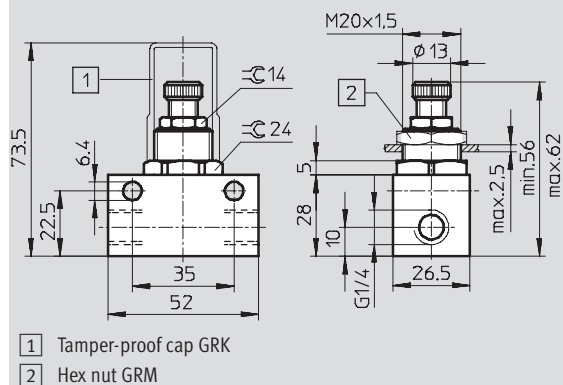
Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve with female thread

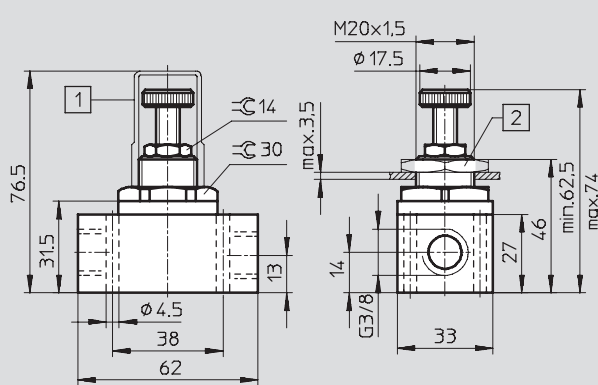
Dimensions

Connecting thread G1/4



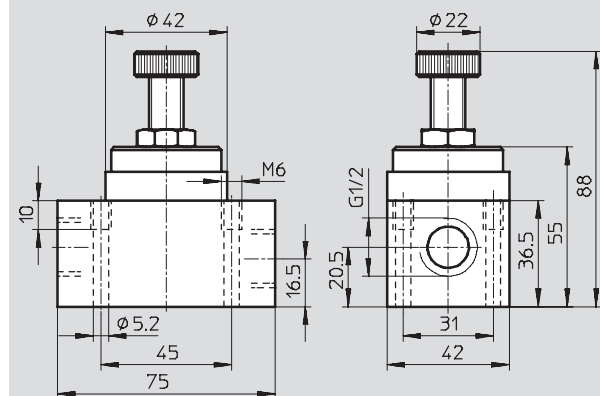
Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Connecting thread G3/8



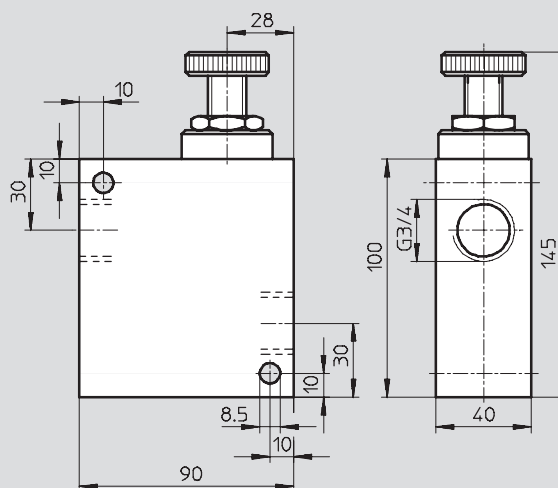
Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Connecting thread G1/2



Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Connecting thread G3/4



Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Ordering data

Version	Connecting thread	One-way flow control function	
		Part No.	Type
	M3	15 899	GR-M3
	M5	151 213	GR-M5-B
	G1/8	151 215	GR-1/8-B
	G1/4	6 509	GRA-1/4-B
	G3/8	6 308	GR-3/8-B
	G1/2	3 720	GR-1/2
	G3/4	2 103	GR-3/4

Ordering data for accessories

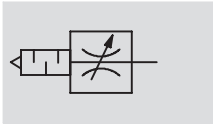
		For connecting thread M5		For connecting thread G1/8		For connecting thread G1/4, G3/8	
		Part No.	Type	Part No.	Type	Part No.	Type
	Hex nut	6 444	GRM-M5	2 107	GRM-1/8	204 596	GRM-3/8
	Tamper-proof cap	6 436	GRK-M5	2 105	GRK-1/8	6 309	GRK-3/8-B

Flow control valves and one-way flow control valves

FESTO

Technical data – Flow control/silencer combinations

Function



Flow control/silencer
GRE, GRU

- Mid flow:
Precision adjustment for average speed
- Adjustment with slotted head screw
- Metal design GRE
- Polymer design GRU



General technical data							
Screw-in thread			G $\frac{1}{8}$	G $\frac{1}{4}$	G $\frac{3}{8}$	G $\frac{1}{2}$	G $\frac{3}{4}$
Valve function		Flow control/silencer function					
Setting component		Slotted head screw					
Noise level	GRE	[dB (A)]	85	80	87	90	–
	GRU	[dB (A)]	74	80	74	76	80
Type of mounting		Threaded					
Mounting position		Any					
Max. tightening torque		[Nm]	6	11	20	40	60

Operating and environmental conditions							
Screw-in thread			G $\frac{1}{8}$	G $\frac{1}{4}$	G $\frac{3}{8}$	G $\frac{1}{2}$	G $\frac{3}{4}$
Operating medium	GRE	Filtered compressed air, lubricated or unlubricated					
	GRU	Dried and filtered compressed air, lubricated or unlubricated					
Operating pressure		[bar]	0 ... 10				
Temperature of medium		[°C]	–10 ... 70				
Ambient temperature		[°C]	–10 ... 70				

Weights [g]							
Screw-in thread			G $\frac{1}{8}$	G $\frac{1}{4}$	G $\frac{3}{8}$	G $\frac{1}{2}$	G $\frac{3}{4}$
	GRE		15	25	50	75	–
	GRU		10	25	55	100	170

Standard flow rate q _n [l/min] at 6 bar → 0 bar							
Female thread			G $\frac{1}{8}$	G $\frac{1}{4}$	G $\frac{3}{8}$	G $\frac{1}{2}$	G $\frac{3}{4}$
GRE			2 ... 520	2 ... 996	3 ... 2 000	3 ... 3 600	–
GRU			0 ... 1000	0 ... 1 500	0 ... 1 700	0 ... 4 000	0 ... 8 000

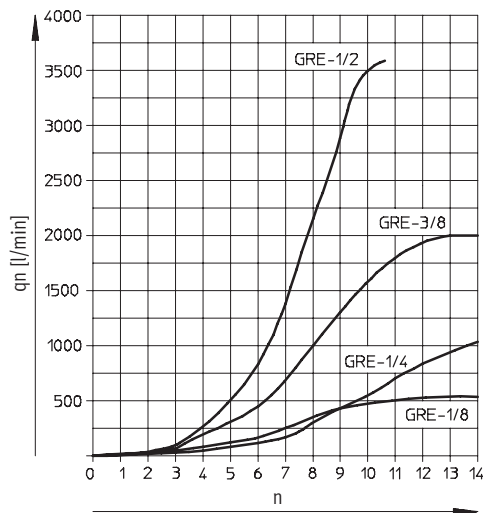
Flow control valves and one-way flow control valves

FESTO

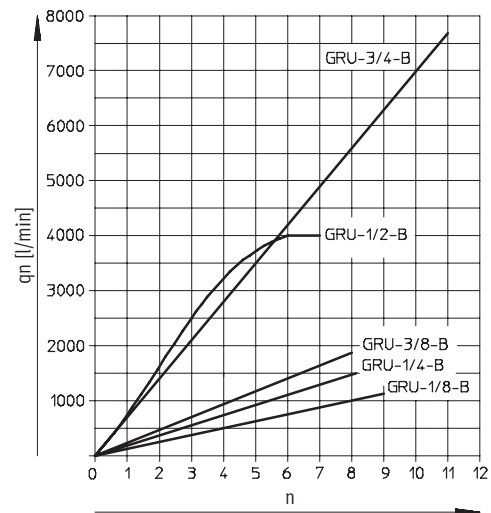
Technical data – Flow control/silencer combinations

Standard nominal flow rate q_{nN} at 6 bar $\rightarrow$ 5 bar as a function of turns of the adjusting screw n

GRE

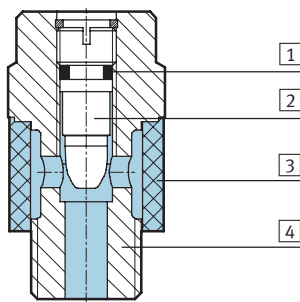


GRU

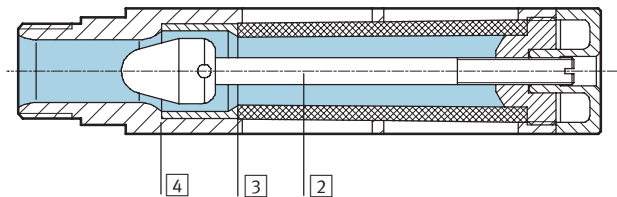


Materials

Sectional view GRE



Sectional view GRU



	Metal design GRE	Polymer design GRU
1 Seal	Nitrile rubber	–
2 Regulating screw	Brass	Polyacetal
3 Silencer	Bronze	Polyethylene
4 Housing	Wrought aluminium alloy	Die-cast aluminium

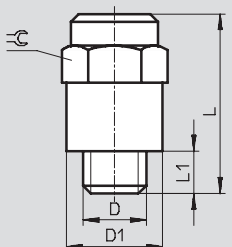
Flow control valves and one-way flow control valves

FESTO

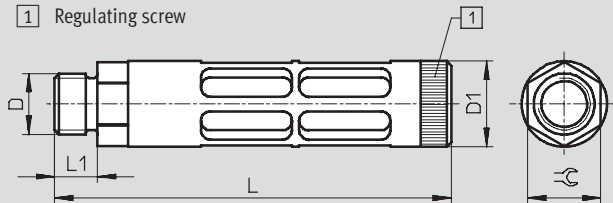
Technical data – Flow control/silencer combinations

Dimensions

Metal design GRE



Polymer design GRU



Download CAD data → www.festo.com

Screw-in thread D	D1 Ø	L	L1	⌀
GRE				
G1/8	15	28.5	6.5	14
G1/4	18.2	34	8	17
G3/8	25	42	8	22
G1/2	27	48	12	24
GRU				
G1/8	16	46	5.4	14
G1/4	19.5	63.3	6.4	17
G3/8	25	95.3	7.5	19
G1/2	28	130	14	24
G3/4	38	157	16	32

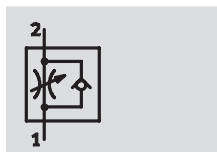
Ordering data										
Version	G1/8		G1/4		G3/8		G1/2		G3/4	
	Part No.	Type	Part No.	Type	Part No.	Type	Part No.	Type	Part No.	Type
Metal design										
	10 351	GRE-1/8	10 352	GRE-1/4	35 310	GRE-3/8	10 353	GRE-1/2	–	
Polymer design										
	9 516	GRU-1/8-B	9 517	GRU-1/4-B	9 518	GRU-3/8-B	9 519	GRU-1/2-B	9 520	GRU-3/4-B

Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve for M5 compact system

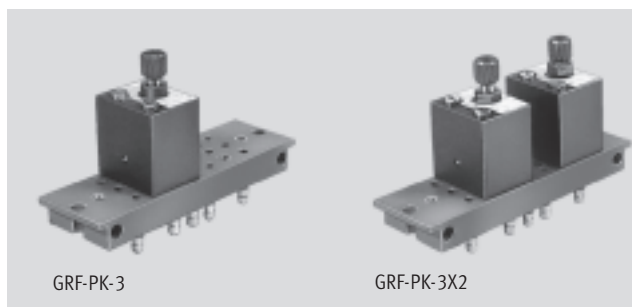
Function



One-way flow control

GRF-PK

- Low flow:
Precision adjustment for low speed
- Adjustment with knurled screw



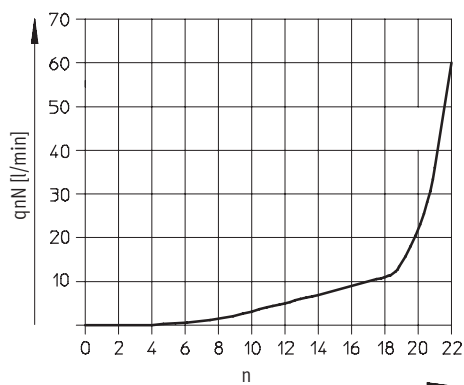
General technical data		
Type	GRF-PK-3	GRF-PK-3X2
Valve function	One-way flow control function	
Pneumatic connection	Barbed fitting PK-3	Barbed fitting PK-3
Setting component	Knurled screw	
Type of mounting	Via through-holes	
Mounting position	Any	
Max. tightening torque	[Nm] 6	11

Operating and environmental conditions		
Type	GRF-PK-3	GRF-PK-3X2
Operating medium	Filtered compressed air, lubricated or unlubricated	
Operating pressure	[bar] 0.5 ... 8	
Temperature of medium	[°C] -10 ... 60	
Ambient temperature	[°C] -10 ... 60	

Weights [g]		
Type	GRF-PK-3	GRF-PK-3X2
	95	145

Standard nominal flow rate q _N [l/min] at 6 bar → 5 bar		
Type	GRF-PK-3	GRF-PK-3X2
GRF	0 ... 45	0 ... 45

Standard nominal flow rate q _N [l/min] at 6 bar → 5 bar as a function of turns of the adjusting screw n	
GRF	



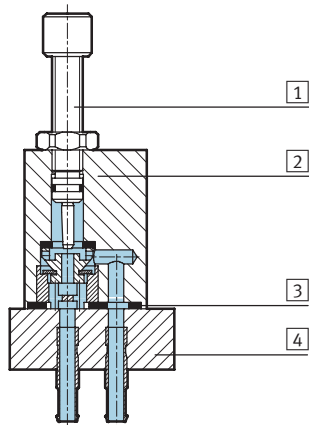
Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve for M5 compact system

Materials

Sectional view

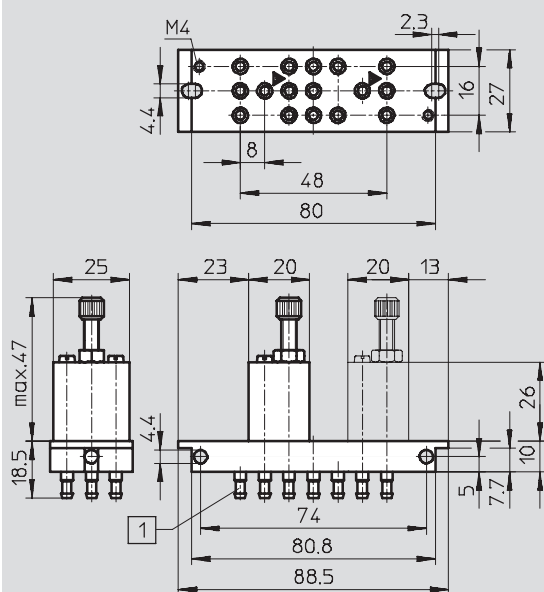


Flow control valve

1	Regulating screw	Brass
2	Housing	Corrosion resistant cast steel
3	Seals	Nitrile rubber
4	Sub-base	Polyamide

Dimensions

GRF-PK-3/GRF-PK-3X2



1 Barbed fitting PK-3

Ordering data

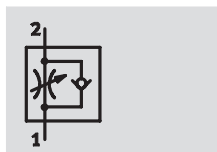
Version	For tubing I.D. [mm]	One-way flow control valve Part No. Type	Two one-way flow control valves Part No. Type
	3	4 565 GRF-PK-3	4 566 GRF-PK-3X2

Flow control and one-way flow control valves

FESTO

Technical data – Precision flow control valve on sub-base

Function



One-way flow control valve
GRP



Flow control valve, operative in both
directions
GRPO

- Low flow:
Precision adjustment for low speed
- Adjustment via rotary knob



General technical data		
Type	GRP/GRPO-70-1/8-AL	
Valve function	GRP	One-way flow control function
	GRPO	Bi-directional flow control function
Pneumatic connection	G1/8	
Means of setting	Rotary knob	
Type of mounting	On sub-base	
Installation position	Any	
Type of actuation	Manual	

- - Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Operating and environmental conditions		
Type	GRP/GRPO-70-1/8-AL	
Operating medium	Filtered compressed air, lubricated or unlubricated, neutral gases	
Operating pressure	[bar]	0 ... 8
Operating pressure 2 → 1	[bar]	GRP: 0 ... 8, GRPO: 0 ... 0.5
Temperature of medium	[°C]	-10 ... 50
Ambient temperature	[°C]	-10 ... 50

Weight [g]		
Type	GRP/GRPO-70-1/8-AL	
	110	110

Standard flow rate qn [l/min] 1 bar → 0 bar		
Type	GRP/GRPO-70-1/8-AL	
GRP	D ¹⁾	0 ... 19
	R ²⁾	20 ... 60
GRPO	D ¹⁾	0 ... 19
	R ²⁾	25 ... 90

1) D: Flow control direction

2) R: Non-return direction

Flow control and one-way flow control valves

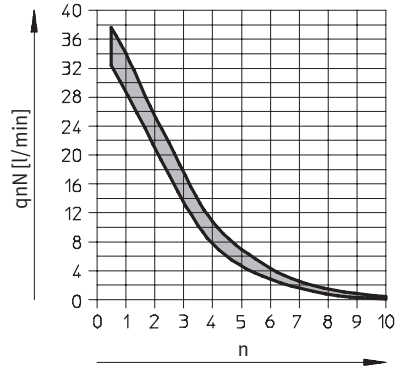
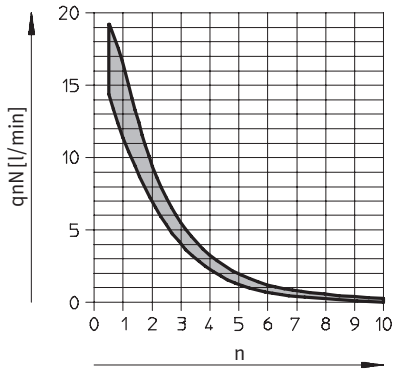
Technical data – Precision flow control valve

FESTO

Standard flow rate q_N [l/min] 1 bar $\rightarrow$ 0 bar as a function of turns of the adjusting screw n

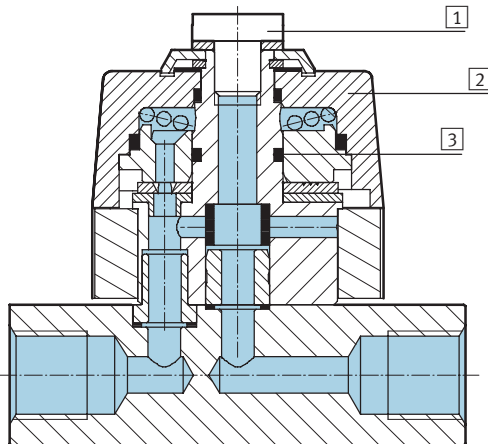
GRP/GRPO-70-1/8-AL

GRP/GRPO-160-1/8-AL



Materials

Sectional view



Flow control valve

1	Locking screw	Brass
2	Rotary knob	Reinforced polyamide
3	Seals	Nitrile rubber

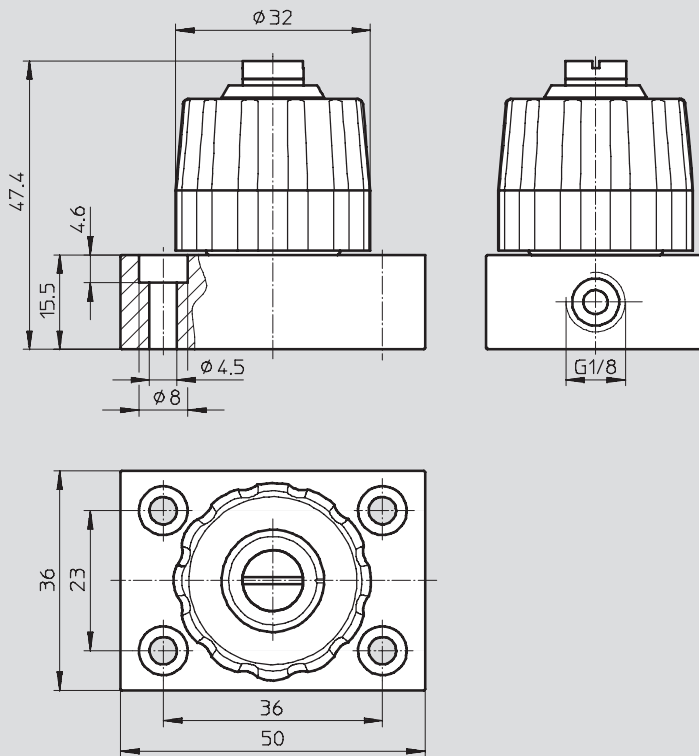
Flow control and one-way flow control valves

Technical data – Precision flow control valve

FESTO

Dimensions

Download CAD data → www.festo.com



• Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1.

Ordering data

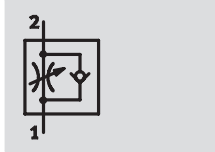
Version	One-way flow control valve		Bi-directional flow control valve	
	Part No.	Type	Part No.	Type
	542 022	GRP-70-1/8-AL	542 024	GRPO-70-1/8-AL
	542 023	GRP-160-1/8-AL	542 025	GRPO-160-1/8-AL

Flow control and one-way flow control valves

FESTO

Technical data – Precision flow control valve for front panel mounting

Function



One-way flow control valve
GRP

- Low flow:
Precision adjustment for low speed
- Adjustment via rotary knob



Flow control valve, operative in both
directions
GRPO

General technical data			
Type	GRP/GRPO-10-PK-3	GRP/GRPO-70-PK-3	GRP/GRPO-160-PK-4
Valve function	GRP	One-way flow control function	
	GRPO	Bi-directional flow control function	
Pneumatic connection	Barbed connector PK-3	Barbed connector PK-3	Barbed connector PK-4
Means of setting	Rotary knob		
Type of mounting	Front panel mounting or on sub-base		
Installation position	Any		

Operating and environmental conditions			
Type	GRP/GRPO-10-PK-3	GRP/GRPO-70-PK-3	GRP/GRPO-160-PK-4
Operating medium	Filtered compressed air, lubricated or unlubricated, neutral gases		
Operating pressure	[bar]	0 ... 6	
Operating pressure 2 → 1	[bar]	GRP: 0 ... 8, GRPO: 0 ... 0.5	
Temperature of medium	[°C]	-10 ... 50	
Ambient temperature	[°C]	-10 ... 50	

Weight [g]			
Type	GRP/GRPO-10-PK-3	GRP/GRPO-70-PK-3	GRP/GRPO-160-PK-4
	48	48	48

Standard flow rate qn [l/min] 1 bar → 0 bar			
Type	GRP/GRPO-10-PK-3	GRP/GRPO-70-PK-3	GRP/GRPO-160-PK-4
GRP	D ¹⁾	0 ... 1.7	0 ... 38
	R ²⁾	15 ... 50	25 ... 90
GRPO	D ¹⁾	0 ... 1.7	0 ... 38

- 1) D: Flow control direction
2) R: Non-return direction

Flow control and one-way flow control valves

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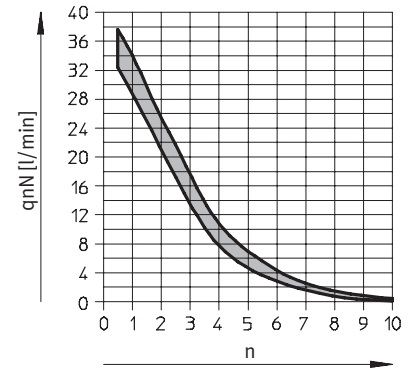
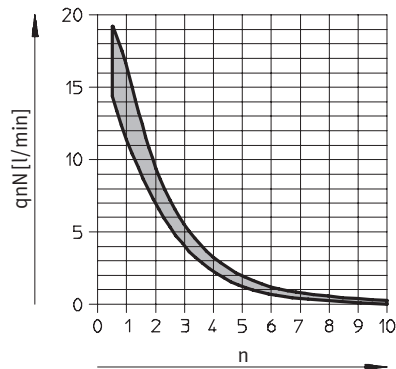
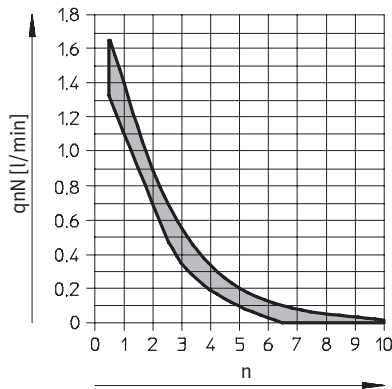
Technical data – Precision flow control valve

Standard flow rate q_N [l/min] 1 bar $\rightarrow$ 0 bar as a function of turns of the adjusting screw n

GRP/GRPO-10-PK-3

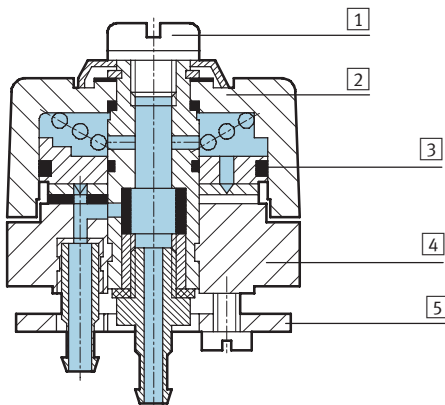
GRP/GRPO-70-PK-3

GRP/GRPO-160-PK-4



Materials

Sectional view



Flow control valve

1	Locking screw	Brass
2	Rotary knob	Reinforced polyamide
3	Seals	Nitrile rubber
4	Back plate	Wrought aluminium alloy
5	Mounting plate	Wrought aluminium alloy

Flow control and one-way flow control valves

Technical data – Precision flow control valve

FESTO

Dimensions

$\varnothing 32$

44

31.2

$\varnothing 30$

X = 1.5 ... 10 mm

Mounting aperture

22.5

2.2

24

Ports

2

1

1 → 2 Flow control direction
2 → 1 Non-return direction

Download CAD data → www.festo.com

Ordering data					
Version	For tubing I.D. [mm]	One-way flow control function		Bi-directional flow control function	
		Part No.	Type	Part No.	Type
	3	12 743	GRP-10-PK-3	13 229	GRPO-10-PK-3
		10 802	GRP-70-PK-3	10 803	GRPO-70-PK-3
	4	12 961	GRP-160-PK-4	13 230	GRPO-160-PK-4

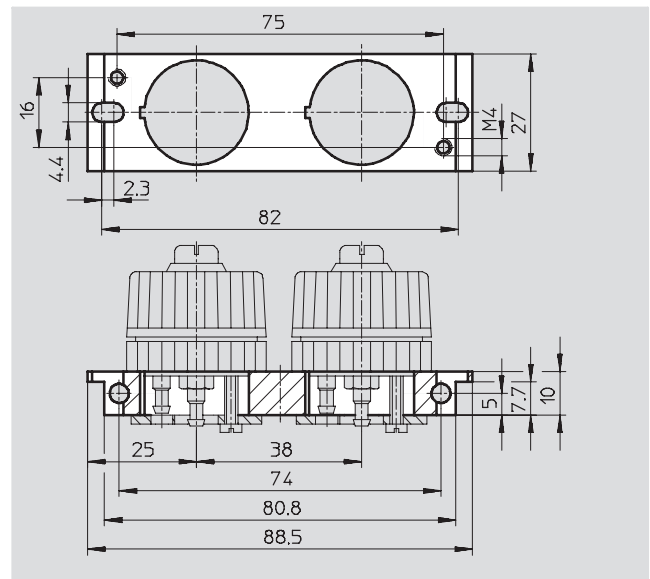
Flow control and one-way flow control valves

FESTO

Accessories – Precision flow control valve

Mounting plate APL-2N-GRP
for precision flow control valves

Material:
Polyamide



Ordering data					
	For no. of flow control valves	Hole Ø [mm]	Product weight [g]	Part No.	Type
	1	22.5	16	10 391	APL-2N-GRP
	2	2 x 22.5	22	10 392	APL-2N-GRPX2