

One-way flow control, flow control and functional combinations

FESTO



- 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



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



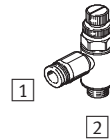
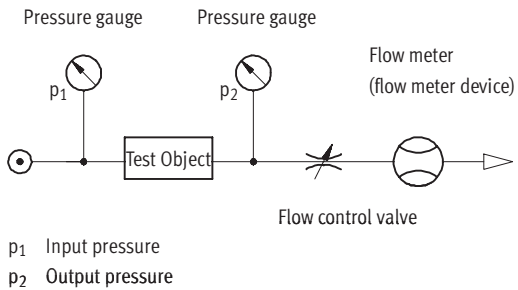
Supply air flow control



Flow control at both sides



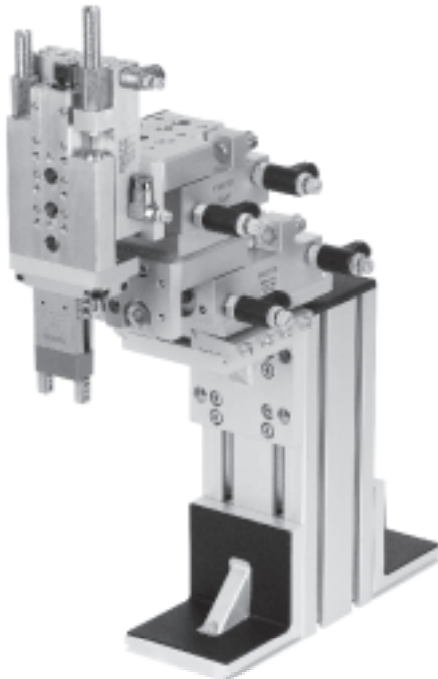
Flow measurement circuit



- 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

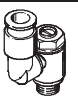
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Flow control functions and range of applications			
Circuit symbol	Description	Circuit symbol	Description
Double-acting cylinder with one-way flow control valve			
Exhaust air flow control		Supply air flow control	
	Speed adjustment through exhaust 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 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	At both ends
					A	Z	O
Standard flow control valve with QS push-in connector	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	Chrome plated 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 joint rotatable 360°						
		GRXA-...-QS-...-D	Metal	Low flow	■	–	–
					■	–	–
					■	–	–
	Adjustment via knurled screw						
		GRLA-...-QS-...-RS-B	Polymer	High 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 and one-way flow control valves

Product range overview

FESTO

Type	Pneumatic connection							Free of copper, PTFE and silicone	→ Page	
	Thread	Tubing ∅ [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.)	■	2 / 5.6-13
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.)	■	2 / 5.6-13
Adjustment via slotted head screw										
GRLA-F-...-QS-...-D	G1/8	–	■	■	■	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	■	2 / 5.6-20
	G1/4	–	–	■	■	–	–		■	
Adjustment via knurled screw										
GRLA-...-QS-...-RS-D	M5	■	■	■	–	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	■	2 / 5.6-13
	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.)	■	2 / 5.6-13
Adjustment via slotted head screw, swivel joint rotatable 360°										
GRXA-...-QS-...-D	M5	■	■	■	–	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	■	2 / 5.6-13
	G1/8	■	■	■	■	–	–		■	
	G1/4	–	–	■	■	■	–		■	
Adjustment via knurled screw										
GRLA-...-QS-...-RS-B	G1/8	–	–	■	■	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	–	2 / 5.6-20
	G1/4	–	–	■	■	–	–		–	
	G3/8	–	–	■	■	–	–		–	

1) Tubing → Volume 3

Flow control and one-way flow control valves

Product range overview

FESTO

Function	Version	Type	Material	Flow rate characteristic ¹⁾	One-way flow control function		
					Exhaust air	Supply air	At both ends
					A	Z	O
Standard flow control valve with female thread 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 and one-way flow control valves

Product range overview

FESTO

Type	Pneumatic connection							Free of copper, PTFE and silicone	→ Page	
	Thread	Tubing Ø [mm]								Tubing type ¹⁾
		3	4	6	8	10	12			
Adjustment via slotted head screw										
GRLA-...-B	M5	Dependent on fitting						-	2 / 5.6-34	
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						-	2 / 5.6-34	
GRLZ-...-RS-B	G1/8							-		
	G1/4							-		
Adjustment via slotted head screw										
GRLA-...-PK-...-B	M5	■	■	-	-	-	-	PU/PL/PP (standard I.D.)	2 / 5.6-40	
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.)	2 / 5.6-40	
GRLZ-...-PK-...-RS-B	G1/8	-	■	■	-	-	-			-
	G1/4	-	■	■	-	-	-			-

1) Tubing → Volume 3

Flow control and one-way flow control valves

Product range overview

FESTO

Function	Version	Type	Material	Flow rate characteristic ¹⁾	One-way flow control function		
					Exhaust air	Supply air	At both ends
					A	Z	O
Mini flow control valve with QS push-in connector	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-...			■	■	■
		GRGZ-...-QS-...					
		GRGO-...-QS-...-LF-C					
Mini flow control valve with female thread connection	Adjustment via slotted head screw						
		GRLA-...	Metal	Low flow	■	■	■
		GRLZ-...					
		GRLO-...					
		GRLA-...-LF-C	Metal	Low flow	■	■	■
GRLZ-...-LF-C							
Mini flow control valve with barbed fitting connection PK	Adjustment via slotted head screw						
		GRLA-...-PK-...-LF-C	Metal	Low flow	■	■	■
		GRLZ-...-PK-...-LF-C					
		GRLO-...-PK-...-LF-C					
		GRGA-...-PK-...-LF-C	Metal	Low flow	■	■	■
GRGZ-...-PK-...-LF-C							
Corrosion resistant one-way flow control valve with female thread connection	Adjustment via slotted head screw						
		CRGRLA-...-B	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 and one-way flow control valves

Product range overview

FESTO

Type	Pneumatic connection							Free of copper, PTFE and silicone	→ Page	
	Thread	Tubing ∅ [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.)	-	2 / 5.6-29
GRLA-...-QS-...-LF-C GRLZ-...-QS-...-LF-C GRLO-...-QS-...-LF-C	M5	■	■	-	-	-	-		-	
GRGA-...-QS-... GRGZ-...-QS-... GRGO-...-QS-...	M3	■	-	-	-	-	-		PUN/PAN/PLN/PFAN (standard O.D.)	
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							-	2 / 5.6-46
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.)	-	2 / 5.6-49
GRGA-...-PK-...-LF-C GRGZ-...-PK-...-LF-C GRGO-...-PK-...-LF-C	M5	■	-	-	-	-	-		-	
Adjustment via slotted head screw										
CRGRLA-...-B	M5	Dependent on fitting							-	2 / 5.6-52
	G1/8								-	
	G1/4								-	
	G3/8								-	
	G1/2								-	

1) Tubing → Volume 3

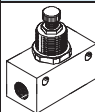
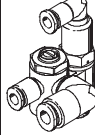
Flow, non-return and regulating valves
Flow control valves and one-way flow control valves

5.6

Flow control 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	At both ends
					A	Z	O
Inline flow control valve with QS push-in connections	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 connections	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 connections PK, frame assembly	Adjustment via knurled screw						
		GRF-PK-3-...	Metal	Low flow	■	■	–
Precision flow control valve with barbed fitting connections 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	■	–	–
					■	–	–

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

Flow control and one-way flow control valves

Product range overview

FESTO

Type	Pneumatic connection							Tubing type ¹⁾	Free of copper, PTFE and silicone	→ Page
	Thread	Tubing ∅ [mm]								
		3	4	6	8	10	12			
Adjustment via knurled screw										
GR-QS-...	–	■	■	■	■	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	–	2 / 5.6-55
GR-QS-...-LF	–	–	■	■	–	–	–		–	
GRO-QS-...	–	■	■	■	–	–	–		–	
Adjustment via knurled screw										
GR-...-B	M3	Dependent on fitting							–	2 / 5.6-59
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	–	–	–	–	–	–	–	–	2 / 5.6-63
	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.)	–	2 / 5.6-66
Adjustment via rotary knob										
GRP-...-PK-...	–	■	■	–	–	–	–	PU/PL/PP (standard I.D.)	–	2 / 5.6-72
GRPO-...-PK-...										
GRP-...-1/8-AL	G1/8	–	–	–	–	–	–	–	–	2 / 5.6-68
GRPO-...-1/8-AL										
Adjustment via slotted head screw										
GRXA-HG-...-QS-...	G1/8	–	■	■	–	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	–	2 / 5.6-75
	G1/4	–	–	■	■	–	–			

1) Tubing → Volume 3

5.6

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

2 / 5.6-12

Flow control valves and one-way flow control valves

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

Function



One-way flow control valve
for exhaust air

GRLA/GRXA



One-way flow control valve
for supply air

GRLZ

- 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



GRL...-QS-...-D

GRL...-QS-...-RS-D

GRXA-...-QS-...D

General technical data						
Screw-in thread		M5	G $\frac{1}{8}$	G $\frac{1}{4}$	G $\frac{3}{8}$	G $\frac{1}{2}$
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	G $\frac{1}{8}$	G $\frac{1}{4}$	G $\frac{3}{8}$
Operating medium		Dried air, lubricated or unlubricated, grade of filtration 40µm			
Operating pressure	[bar]	0.2 ... 10			
	[°C]	–10 ... +40			
Ambient temperature	[°C]	–10 ... +60			
Temperature of medium	[°C]	–10 ... +60			

Weights [g]					
Screw-in thread		M5	G $\frac{1}{8}$	G $\frac{1}{4}$	G $\frac{3}{8}$
	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

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

FESTO

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

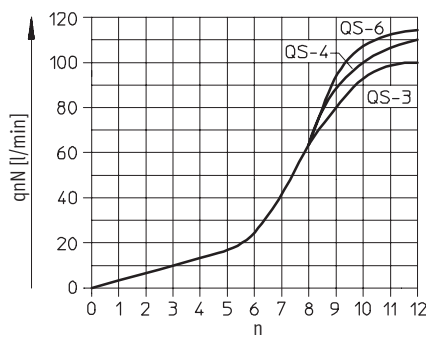
Flow control valves and one-way flow control valves

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

FESTO

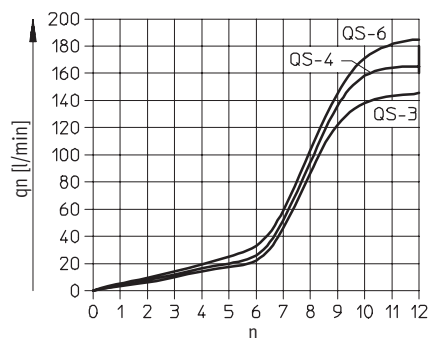
Standard nominal flow rate q_{nN} [l/min] at 6 bar > 5 bar as a function of turns of the adjusting screw n

Screw-in thread M5

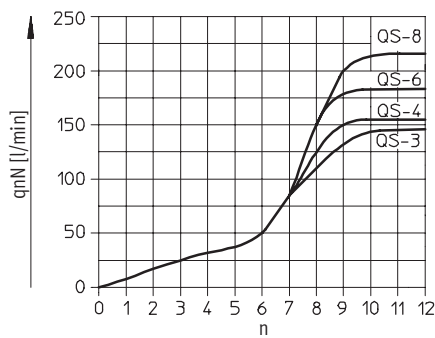


Standard flow rate q_n at 6 bar > 0 bar as a function of turns of the adjusting screw n

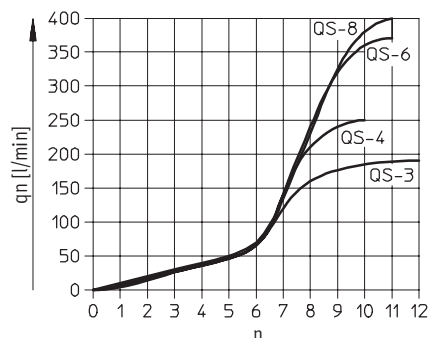
Screw-in thread M5



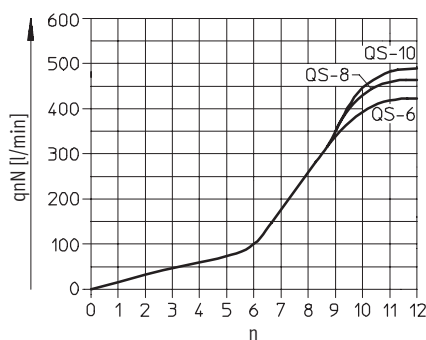
Screw-in thread G $\frac{1}{8}$



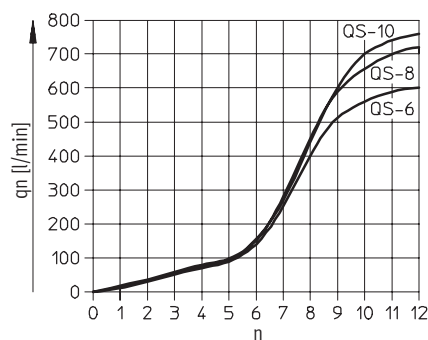
Screw-in thread G $\frac{1}{8}$



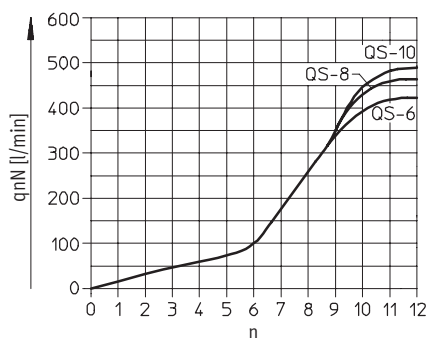
Screw-in thread G $\frac{1}{8}$ with flow rate MF



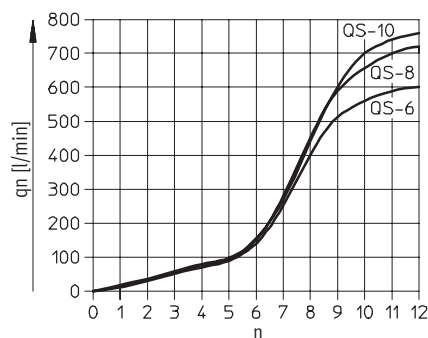
Screw-in thread G $\frac{1}{8}$ with flow rate MF



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



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



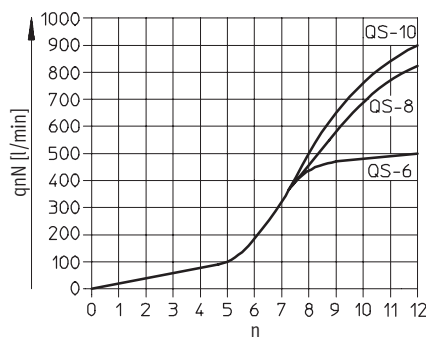
Flow control valves and one-way flow control valves

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

FESTO

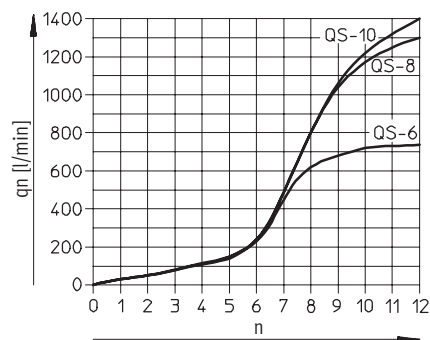
**Standard nominal flow rate q_{nN} [l/min] at 6 bar > 5 bar
as a function of turns of the adjusting screw n**

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

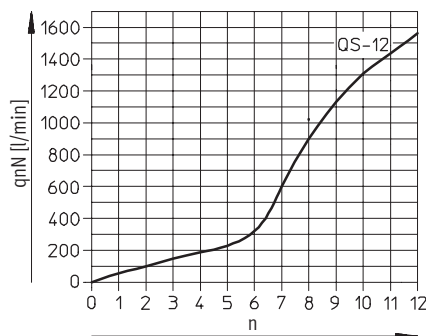


**Standard flow rate q_n at 6 bar > 0 bar
as a function of turns of the adjusting screw n**

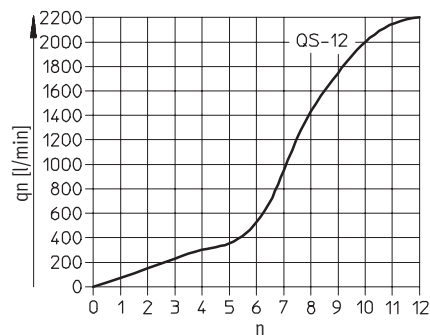
Screw-in thread G $\frac{3}{8}$



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

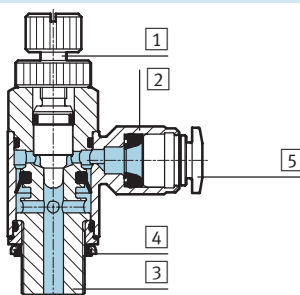


Screw-in thread G $\frac{1}{2}$



Materials

Sectional view



Flow control valve		
1	Regulating screw	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		Free of copper, PTFE and silicone

Flow control valves and one-way flow control valves

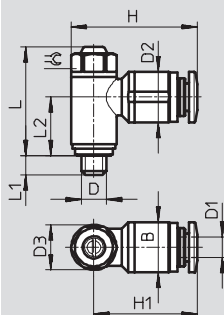
Technical data – Standard flow control valve with QS push-in connector, series D

FESTO

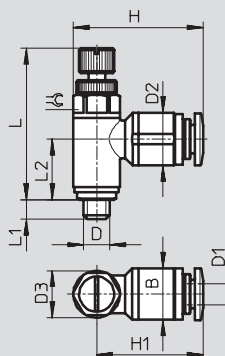
Dimensions

Download CAD data → www.festo.com/en/engineering

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				
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				
G1/8 (MF)	8		12.5 ±0.2	17.8 ±0.15	35.6	28.7	31.5	5.9 +0.17/-0.25	17.2	15
	8	17.8	14.5 ±0.2		36.6	27.7			16.1	
G1/4	6		12.5 ±0.2		36.6	27.7				
	8		14.5 ±0.2		30.7	30.7				
	10		17.5 ±0.2		42.0	33.1				
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				
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				
G1/4	6	17.8	12.5 ±0.2		36.6	27.7	48.3	5.9 +0.17/-0.25	16.1	
	8		14.5 ±0.2		30.7	30.7				
	10		17.5 ±0.2		42.0	33.1				
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				
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

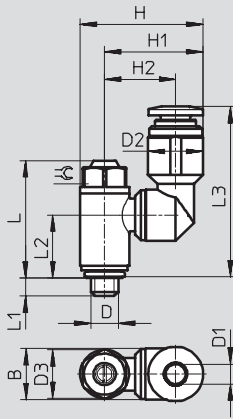
Technical data – Standard flow control valve with QS push-in connector, series D

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Dimensions

Download CAD data → www.festo.com/en/engineering

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 $\frac{1}{8}$	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 $\frac{1}{4}$	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

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

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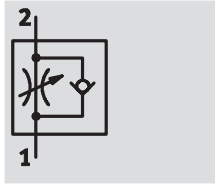
Ordering data						
Design	Screw-in thread	For tubing O.D. [mm]	Flow	One-way flow control function for exhaust air		One-way flow control function for supply air
				Part No.	Type	Part No. Type
Swivel joint, elbow outlet, slotted head screw						
	M5	3	LF	193 137	GRLA-M5-QS-3-D	193 153 GRLZ-M5-QS-3-D
		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	–
	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						
	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	–
	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, DF series

FESTO

Function



One-way flow control valve
GRLA-F

DF 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, DF series

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				
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

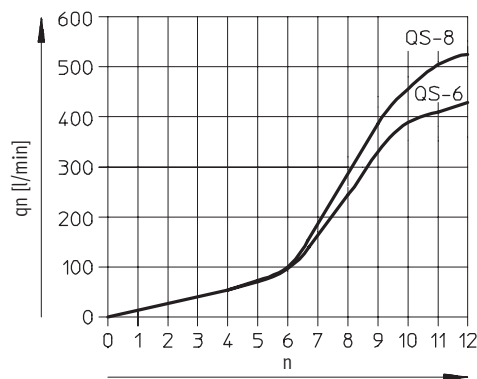
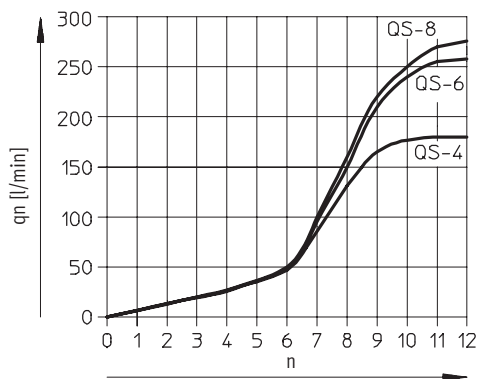
2) R: Non-return direction

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⁾	–	–
		R ²⁾	245 ... 300	–
	QS-6	D	–	–
		R	294 ... 410	627 ... 726
	QS-8	D	–	–
		R	307 ... 425	664 ... 833

1) D: Flow control direction

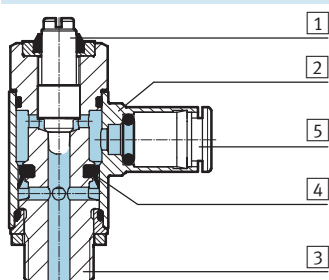
2) R: Non-return direction

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

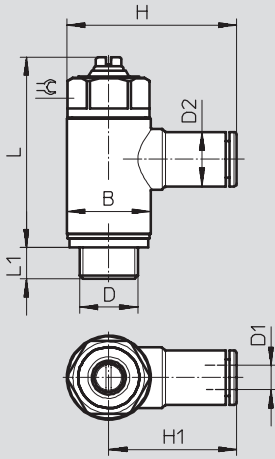
Technical data – Standard flow control valve with QS push-in connector, DF series

FESTO

Dimensions

Download CAD data → www.festo.com/en/engineering

Swivel joint, elbow outlet, slotted head screw



Screw-in thread D	Tubing outer Ø D1	D2 Ø	B	H	H1	L max.	L1	⌀
G $\frac{1}{8}$	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			
G $\frac{1}{4}$	6	11	17.8	35.1	26.2	34.9	5.9	15
	8	13		35.9	27.0			

Ordering data

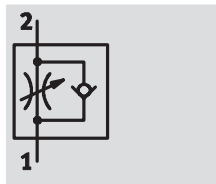
Constructional design	Screw-in thread	For tubing O.D. [mm]	One-way flow control function for exhaust air	
			Part No.	Type
Swivel joint, elbow outlet, slotted head screw				
	G $\frac{1}{8}$	4	195 597	GRLA-F- $\frac{1}{8}$ -QS-4-D
		6	195 598	GRLA-F- $\frac{1}{8}$ -QS-6-D
		8	195 599	GRLA-F- $\frac{1}{8}$ -QS-8-D
	G $\frac{1}{4}$	6	195 600	GRLA-F- $\frac{1}{4}$ -QS-6-D
		8	195 601	GRLA-F- $\frac{1}{4}$ -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
	25	30	40

Flow control valves and one-way flow control valves

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

FESTO

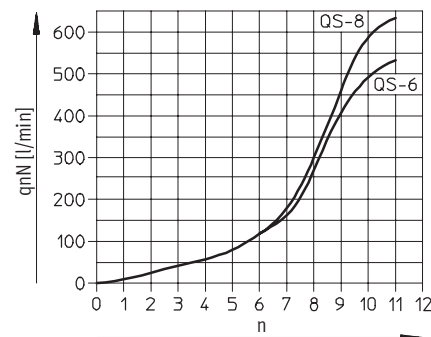
Standard nominal flow rate q_{nN} [l/min] at 6 bar $\rightarrow$ 5 bar				
Screw-in thread		G $\frac{1}{8}$	G $\frac{1}{4}$	G $\frac{3}{8}$
One-way flow control function for exhaust air				
QS-6	D ¹⁾	0 ... 520	0 ... 520	0 ... 530
	R ²⁾	400 ... 550	400 ... 550	400 ... 550
QS-8	D	0 ... 650	0 ... 650	0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

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

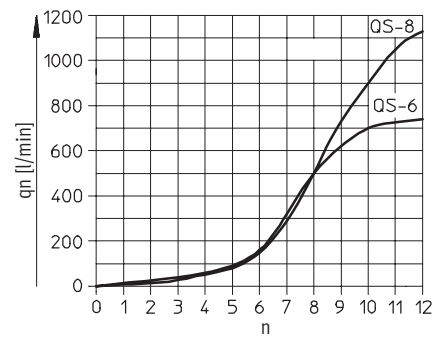
Standard flow rate q_n [l/min] at 6 bar $\rightarrow$ 0 bar				
Screw-in thread		G $\frac{1}{8}$	G $\frac{1}{4}$	G $\frac{3}{8}$
One-way flow control function for exhaust air				
QS-6	D ¹⁾	0 ... 720	0 ... 740	0 ... 740
	R ²⁾	600 ... 750	620 ... 760	620 ... 760
QS-8	D	0 ... 1,080	0 ... 1,130	0 ... 1,130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

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

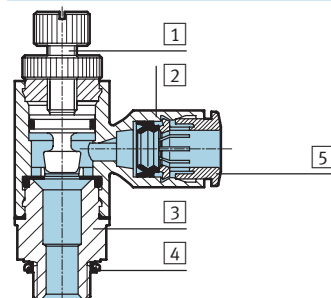
Standard nominal flow rate q_{nN} at 6 bar $\rightarrow$ 5 bar as a function of turns of the adjusting screw n	
Screw-in thread G $\frac{1}{8}$, G $\frac{1}{4}$, G $\frac{3}{8}$	



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

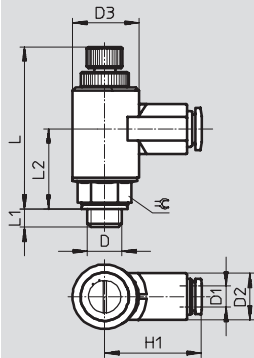
FESTO

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

Dimensions

Download CAD data → www.festo.com/en/engineering

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	⌀
G1/8	6	13	17.9	27.2	53	4.7	22.8	13
	8	17		35.4				
G1/4	6	13	17.9	27.2	53.6	5.8	22.3	17
	8	17		35.4				
G3/8	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				
	G1/8	6	162 965	GRLA-1/8-QS-6-RS-B
		8	162 966	GRLA-1/8-QS-8-RS-B
	G1/4	6	162 967	GRLA-1/4-QS-6-RS-B
		8	162 968	GRLA-1/4-QS-8-RS-B
	G3/8	6	162 969	GRLA-3/8-QS-6-RS-B
		8	162 970	GRLA-3/8-QS-8-RS-B

Flow, non-return and regulating valves
Flow control valves and one-way flow control valves

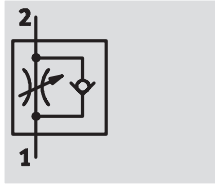
5.6

Flow control and non-return valves

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

FESTO

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

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

Standard nominal flow rate q_{nN} [l/min] at 6 bar $\rightarrow$ 5 bar			
Screw-in thread		G $\frac{1}{8}$	G $\frac{1}{4}$
One-way flow control function for exhaust air			
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

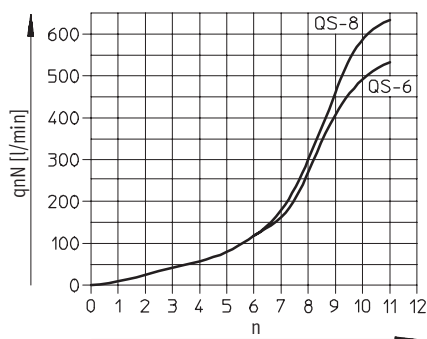
Standard flow rate q_n [l/min] at 6 bar $\rightarrow$ 0 bar			
Screw-in thread		G $\frac{1}{8}$	G $\frac{1}{4}$
One-way flow control function for exhaust air			
QS-6	D ¹⁾	0 ... 720	–
	R ²⁾	600 ... 750	–
QS-8	D	0 ... 1,080	0 ... 1,130
	R	800 ... 1,250	900 ... 1,260

1) D: Flow control direction

2) R: Non-return direction

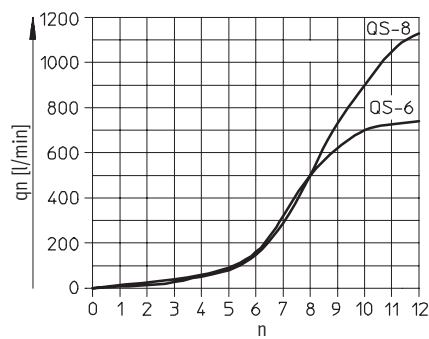
Standard nominal flow rate q_{nN} at 6 bar $\rightarrow$ 5 bar as a function of turns of the adjusting screw n

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



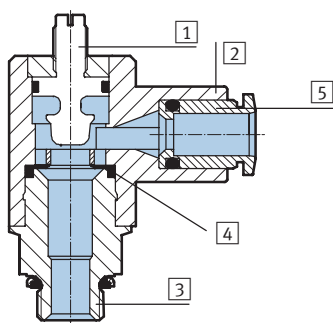
Standard flow rate q_n at 6 bar $\rightarrow$ 0 bar as a function of turns of the adjusting screw n

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



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

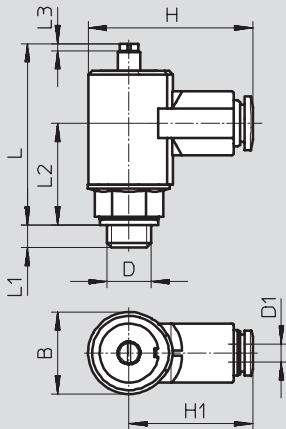
FESTO

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

Dimensions

Download CAD data → www.festo.com/en/engineering

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
G $\frac{1}{8}$	6	17.9	36.2	27.2	40.1	4.7	22.8
	8		44.4	35.4			
G $\frac{1}{4}$	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				
	G $\frac{1}{8}$	6	540 358	GRLA-$\frac{1}{8}$-QS-6-B-20
		8	540 359	GRLA-$\frac{1}{8}$-QS-8-B-20
	G $\frac{1}{4}$	8	540 360	GRLA-$\frac{1}{4}$-QS-8-B-20

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



One-way flow control for supply air
GRLZ/GRGZ

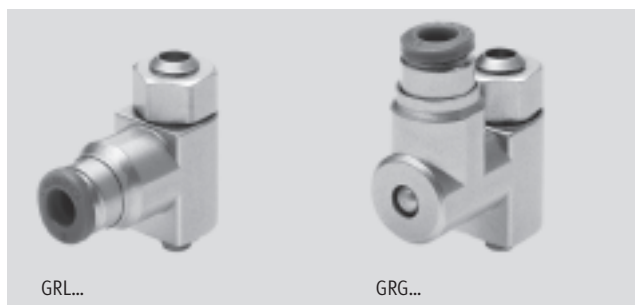


Flow control acting at both sides
GRLO/GRGO

- 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

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

FESTO

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	F1)	0 ... 95	0 ... 95
		N2)	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

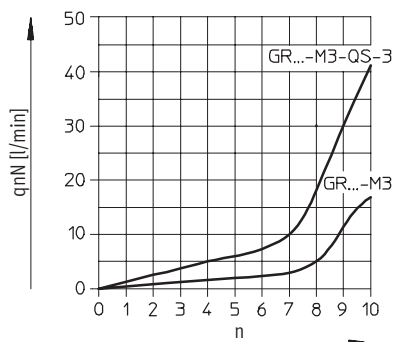
Flow control valves and one-way flow control valves

FESTO

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

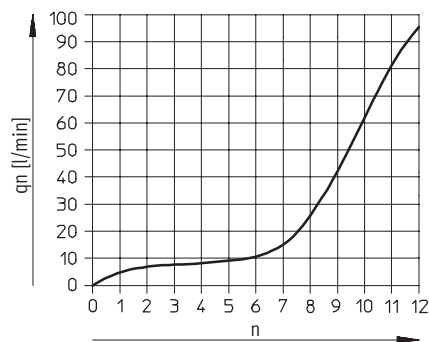
**Standard nominal flow rate q_{nN} at 6 bar $\rightarrow$ 5 bar
as a function of turns of the adjusting screw n**

Screw-in thread M3

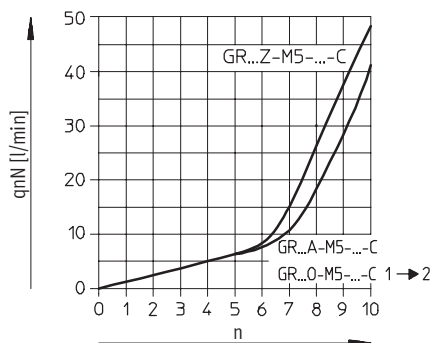


**Standard flow rate q_n at 6 bar $\rightarrow$ 0 bar
as a function of turns of the adjusting screw n**

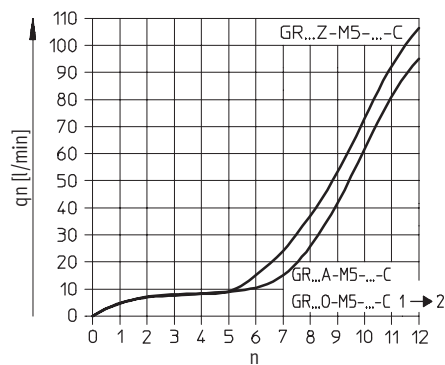
Screw-in thread M3



Screw-in thread M5



Screw-in thread M5



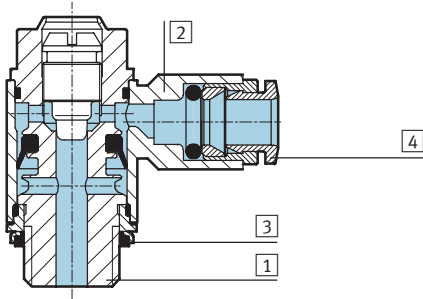
Flow control valves and one-way flow control valves

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

FESTO

Materials

Sectional view

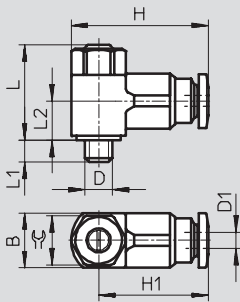


Flow control valve

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

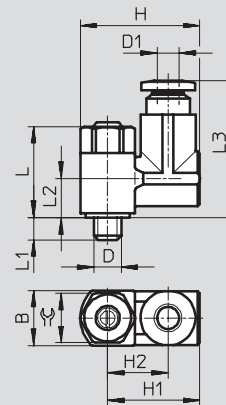
Dimensions GRL...

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

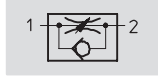
Ordering data								
Design	Screw-in thread	For tubing O.D.	One-way flow control function for exhaust air		One-way flow control function for supply air		Flow control function acting at both sides	
		[mm]	Part No.	Type	Part No.	Type	Part No.	Type
QS push-in connector, elbow outlet, slotted head screw								
	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

Technical data – Standard flow control valve with female thread

FESTO

Function



One-way flow control for exhaust air
GRLA

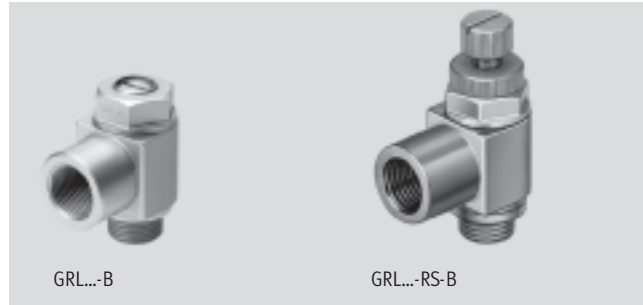


One-way flow control for supply air
GRLZ



Flow control acting at both sides
GRLO

- 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

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	[g]	11	28	60	97	204	377
	GRL...-RS-B	[g]	12	30	59	–	–	–

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} [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

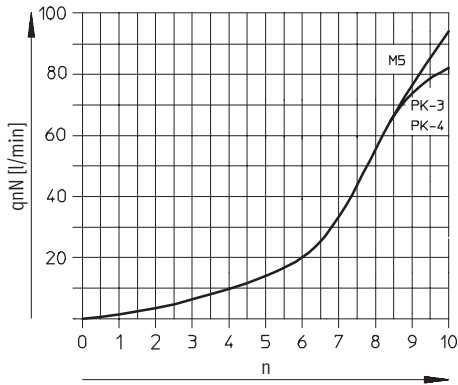
Flow control valves and one-way flow control valves

Technical data – Standard flow control valve with female thread

FESTO

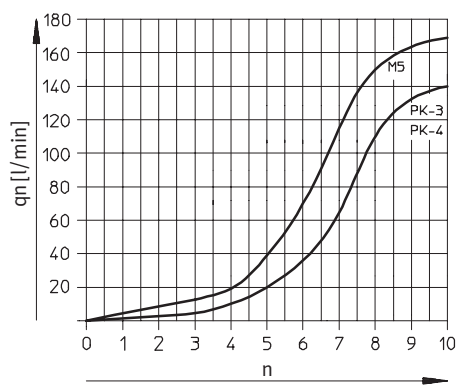
Standard nominal flow rate q_{nN} at 6 bar > 5
as a function of turns of the adjusting screw n

Screw-in thread M5

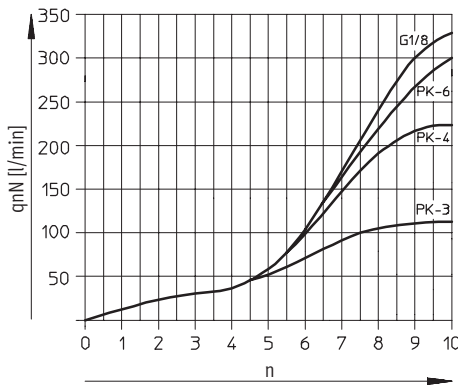


Standard flow rate q_n at 6 bar > 0 bar
as a function of turns of the adjusting screw n

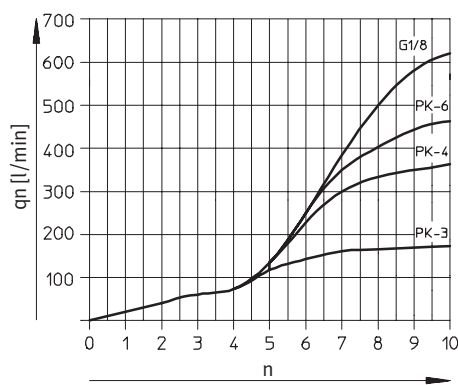
Screw-in thread M5



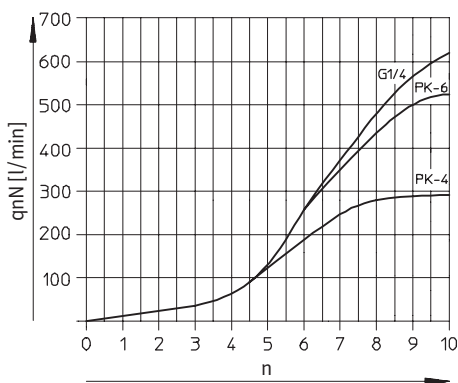
Screw-in thread G1/8



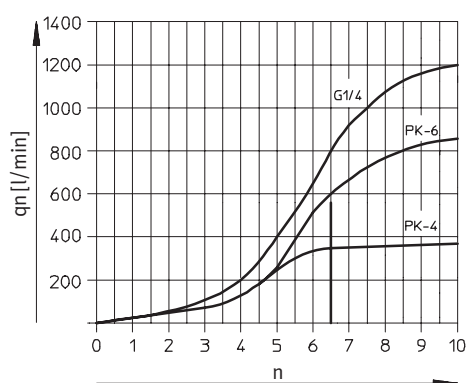
Screw-in thread G1/8



Screw-in thread G1/4



Screw-in thread G1/4



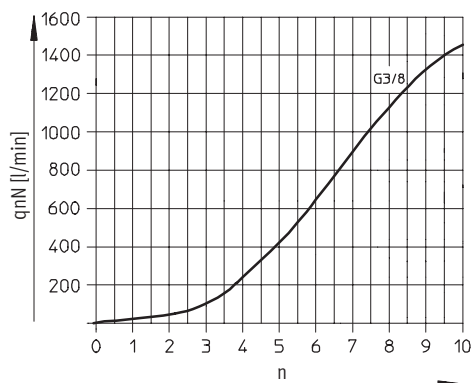
Flow control valves and one-way flow control valves

FESTO

Technical data – Standard flow control valve with female thread

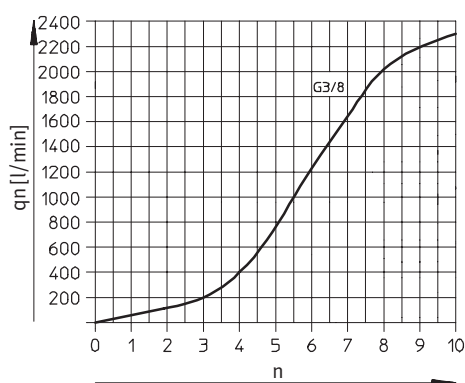
Standard nominal flow rate q_{nN} at 6 bar > 5
as a function of turns of the adjusting screw n

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

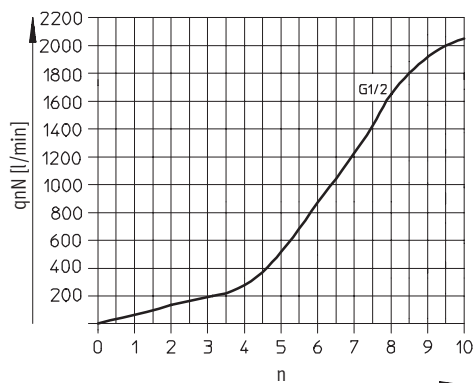


Standard flow rate q_n at 6 bar > 0 bar
as a function of turns of the adjusting screw n

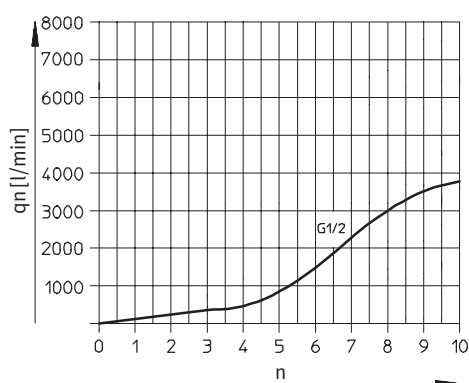
Screw-in thread $G\frac{3}{8}$



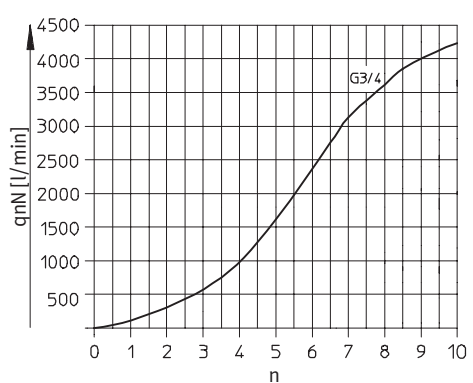
Screw-in thread $G\frac{1}{2}$



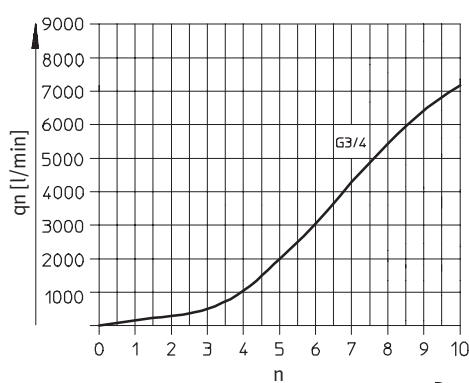
Screw-in thread $G\frac{1}{2}$



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



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



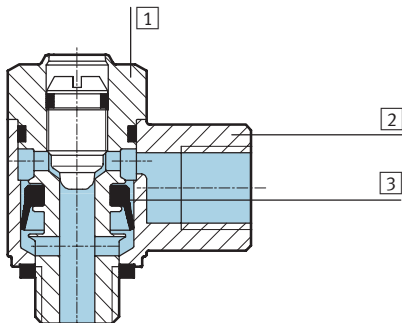
Flow control valves and one-way flow control valves

Technical data – Standard flow control valve with female thread

FESTO

Materials

Sectional view



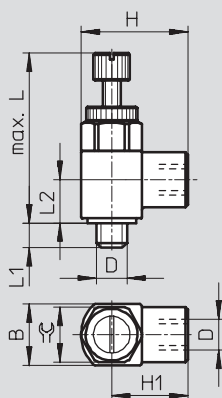
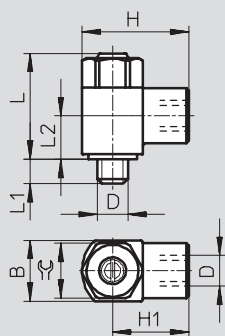
Flow control valve

1	Threaded collar	Wrought aluminium alloy (M5: brass, nickel-plated)
2	Swivel joint	Die-cast zinc
3	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	⌀
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

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

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



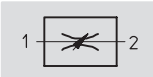
Function



One-way flow control for exhaust air
GRLA



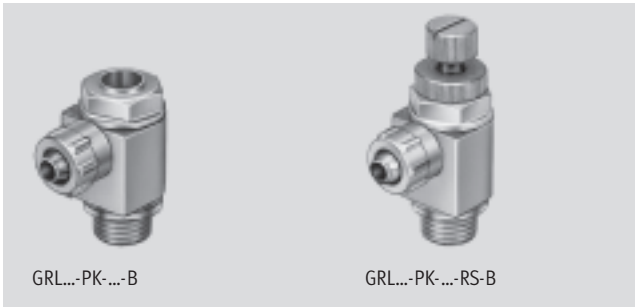
One-way flow control for supply air
GRLZ



Flow control acting at both sides
GRLO

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
	GRL...-RS-B	[g]	11	26
				44
				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 q _{nN} [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

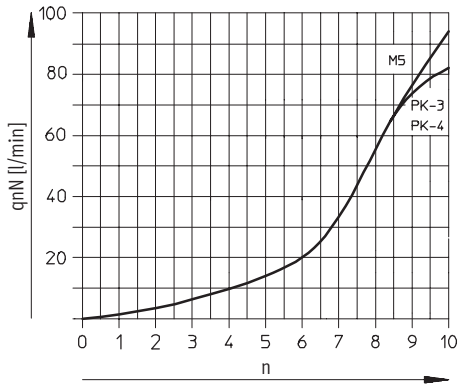
Flow control valves and one-way flow control valves

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

FESTO

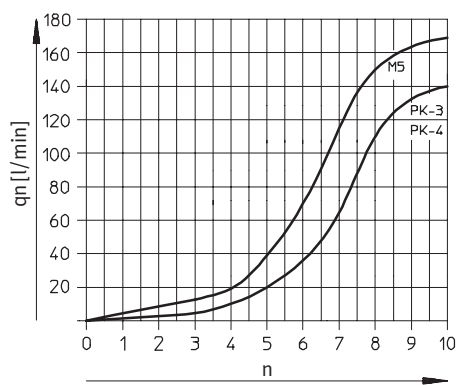
Standard nominal flow rate q_{nN} at 6 bar > 5
as a function of turns of the adjusting screw n

Screw-in thread M5

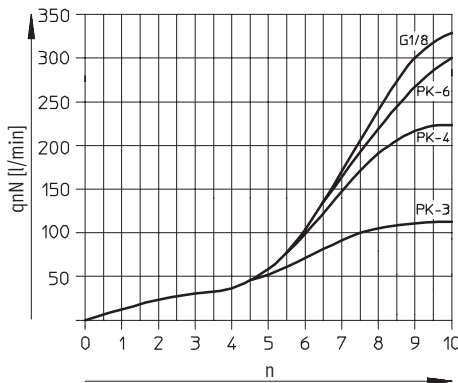


Standard flow rate q_n at 6 bar > 0 bar
as a function of turns of the adjusting screw n

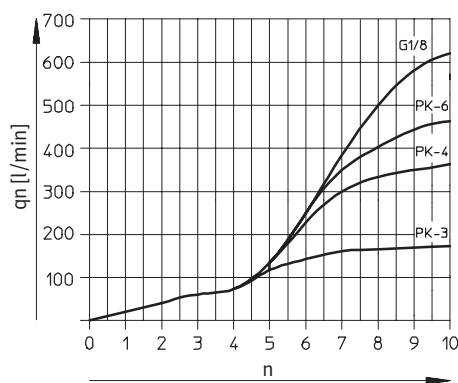
Screw-in thread M5



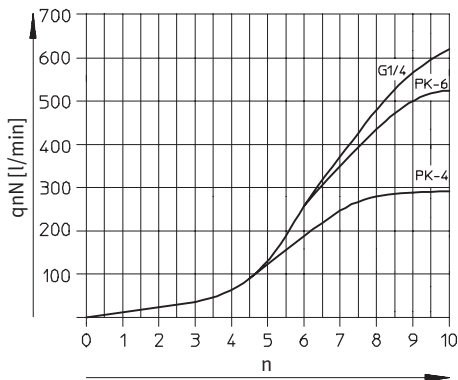
Screw-in thread G1/8



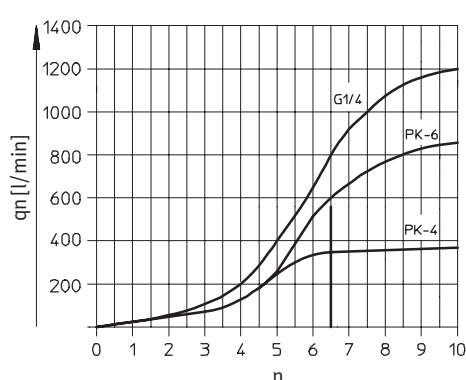
Screw-in thread G1/8



Screw-in thread G1/4



Screw-in thread G1/4



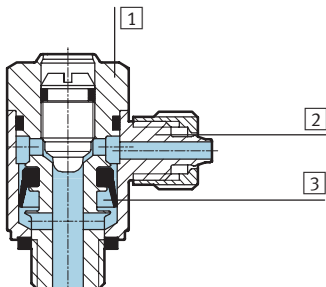
Flow control valves and one-way flow control valves

FESTO

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

Materials

Sectional view



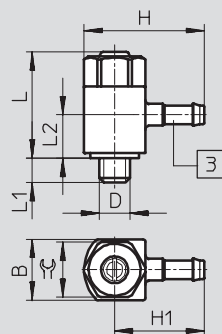
Flow control valve

1	Threaded collar	Wrought aluminium alloy (M5: brass, nickel-plated)
2	Swivel joint	Die-cast zinc
3	Seals	Nitrile rubber
Note on material		Designs free of copper, PTFE and silicone ➔ Ordering data

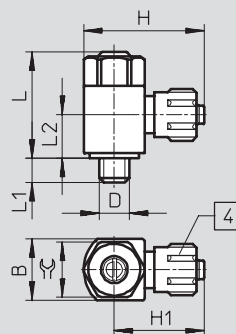
Dimensions

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	⌀
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

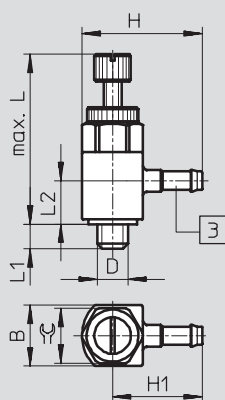
Flow control valves and one-way flow control valves

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

FESTO

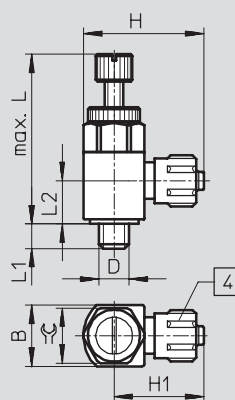
Dimensions

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	–		–	

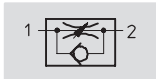
1) Union nut for barbed fitting only with screw-in thread G1/8 and G1/4

Flow control valves and one-way flow control valves

Technical data – Mini flow control valve with female thread



Function



One-way flow control for exhaust air
GRLA



One-way flow control for supply air
GRLZ



Flow control acting at both sides
GRLO

- 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
	GRLO	[bar]	0 ... 10
Ambient temperature		[°C]	–10 ... +60
Temperature of medium		[°C]	–10 ... +60

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 > 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

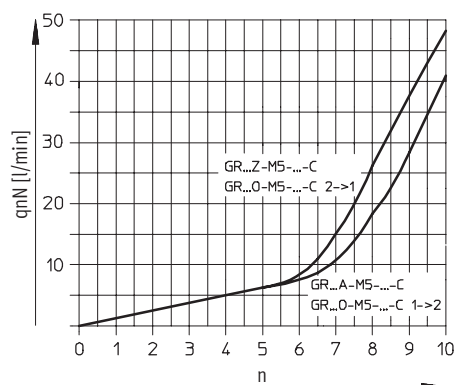
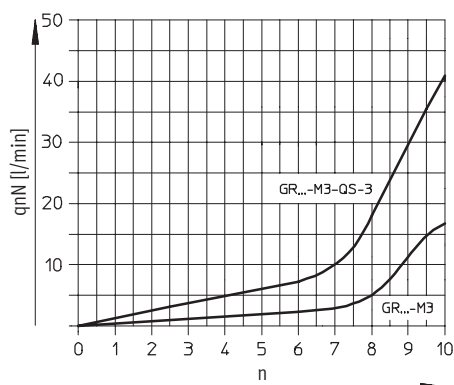
1) F: Flow control direction

2) N: Non-return direction

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

Screw-in thread M3

Screw-in thread M5



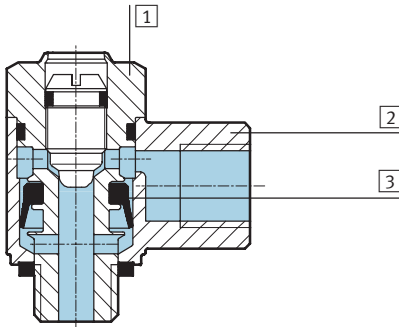
Flow control valves and one-way flow control valves

Technical data – Mini flow control valve with female thread

FESTO

Materials

Sectional view

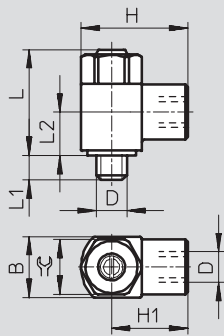


Flow control valve

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

Dimensions

Screw-in thread M3/M5



Screw-in thread D	Connecting thread D	B	H	H1	L	L1	L2	⌀
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 Part No. Type	One-way flow control function for supply air Part No. Type	Flow control function acting at both sides 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



One-way flow control for supply air
GRLZ

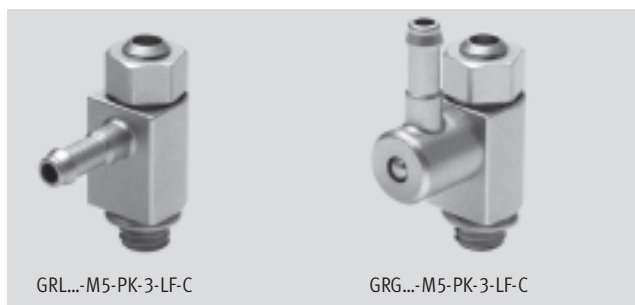


Flow control acting at both sides
GRLO

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

Variants:

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



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

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

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

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

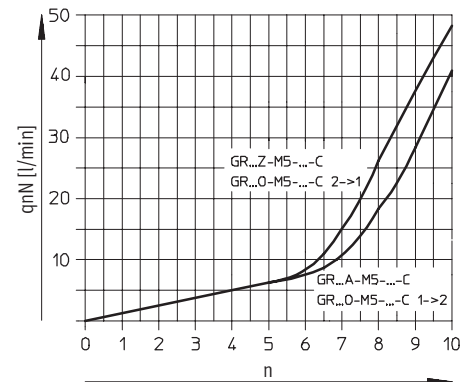
FESTO

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	F1)	0 ... 40	
		N2)	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

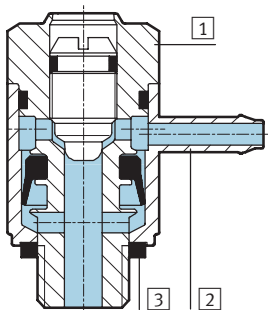
Standard nominal flow rate q_{nN} at 6 bar > 5 bar as a function of turns of the adjusting screw n

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

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				
[3] Barbed fitting						[3] 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

Technical data – Corrosion resistant flow control valve with female thread

FESTO

Function



One-way flow control for exhaust air

CRGRLA

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



General technical data					
Screw-in thread	M5	G $\frac{1}{8}$	G $\frac{1}{4}$	G $\frac{3}{8}$	G $\frac{1}{2}$
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

Operating and environmental conditions					
Screw-in thread	M5	G $\frac{1}{8}$	G $\frac{1}{4}$	G $\frac{3}{8}$	G $\frac{1}{2}$
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	G $\frac{1}{8}$	G $\frac{1}{4}$	G $\frac{3}{8}$	G $\frac{1}{2}$
	14	44	83	150	315

Standard nominal flow rate q _N [l/min] at 6 bar > 5 bar					
Screw-in thread	M5	G $\frac{1}{8}$	G $\frac{1}{4}$	G $\frac{3}{8}$	G $\frac{1}{2}$
One-way flow control function for exhaust air					
	F ¹⁾	0 ... 95	0 ... 340	0 ... 610	0 ... 1 450
	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

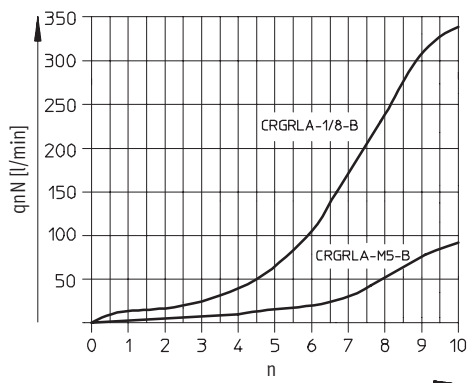
Flow control valves and one-way flow control valves

FESTO

Technical data – Corrosion resistant flow control valve with female thread

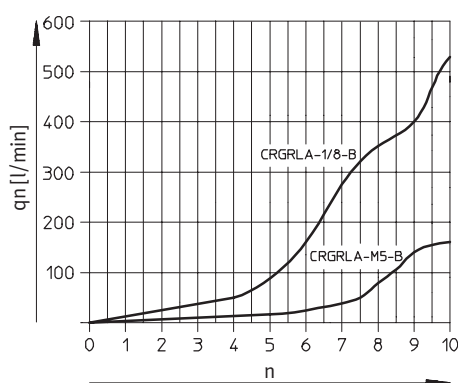
Standard nominal flow rate q_{nN} at 6 bar > 5 bar
as a function of turns of the adjusting screw n

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

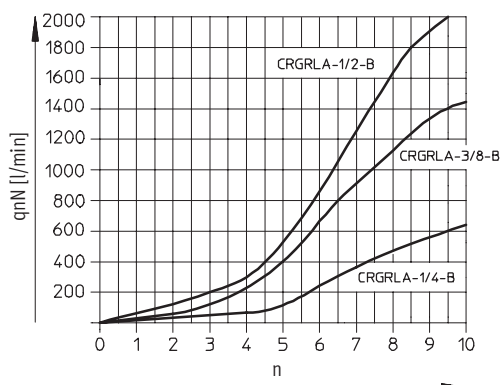


Standard flow rate q_n at 6 bar > 0 bar
as a function of turns of the adjusting screw n

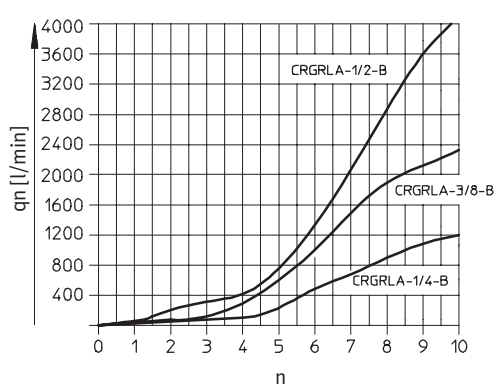
Screw-in thread M5, G $\frac{1}{8}$



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 $\frac{1}{2}$



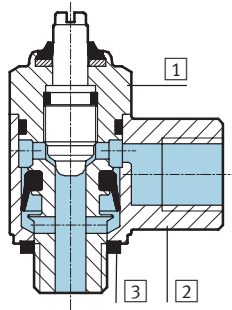
Flow control valves and one-way flow control valves

Technical data – Corrosion resistant flow control valve with female thread

FESTO

Materials

Sectional view

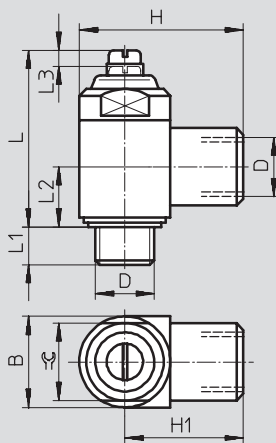
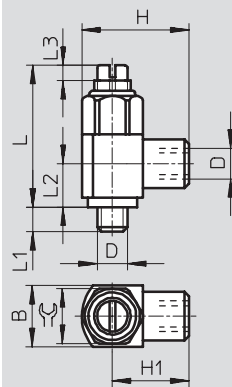


Flow control valve		
1	Threaded collar	High-alloy stainless steel
2	Swivel joint	High-alloy stainless steel
3	Seals	Fluorocautchouc, nitrile rubber

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	$\approx$
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

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

FESTO

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

Function



One-way flow control
GR-QS/GR-QS-LF



Flow control acting at both sides
GRO-QS

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



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

FESTO

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	–

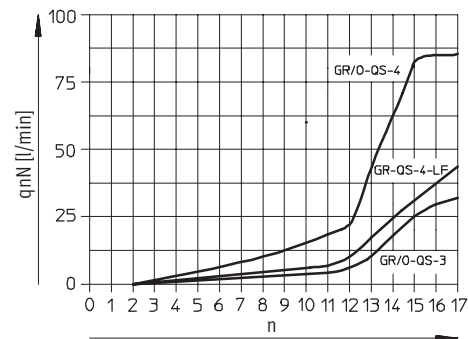
- 1) F: Flow control direction
2) N: Non-return direction

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

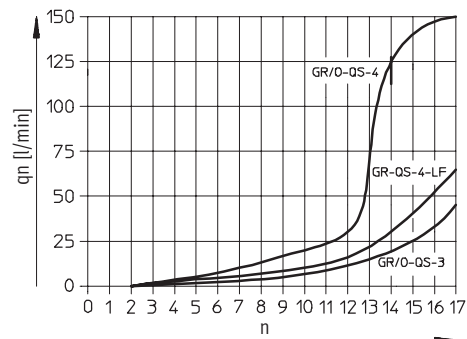
Standard nominal flow rate q_{nN} at 6 bar > 5 bar
as a function of turns of the adjusting screw n

Push-in connector QS-3/QS-4

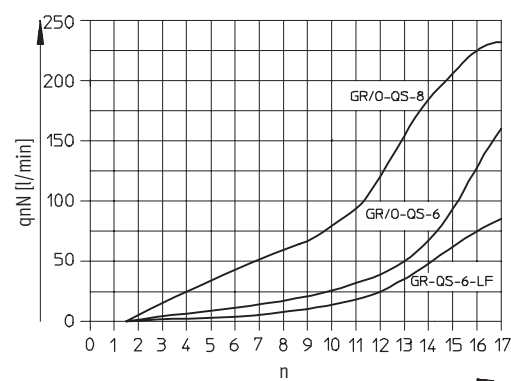


Standard flow rate q_n at 6 bar > 0 bar
as a function of turns of the adjusting screw n

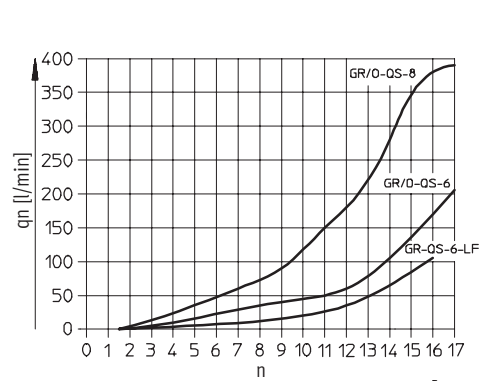
Push-in connector QS-3/QS-4



Push-in connector QS-6/QS-8



Push-in connector QS-6/QS-8



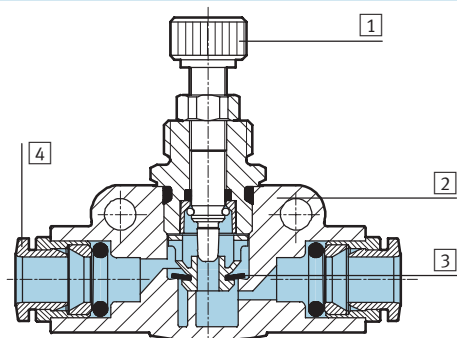
Flow control valves and one-way flow control valves

FESTO

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

Materials

Sectional view

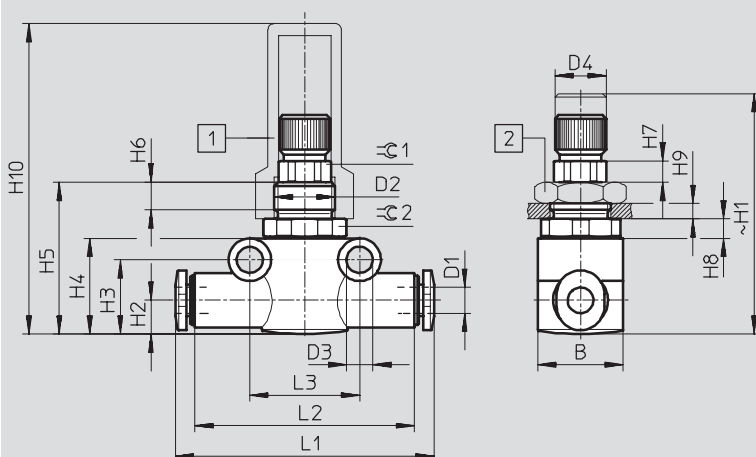


Flow control valve

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/en/engineering



- 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

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

FESTO

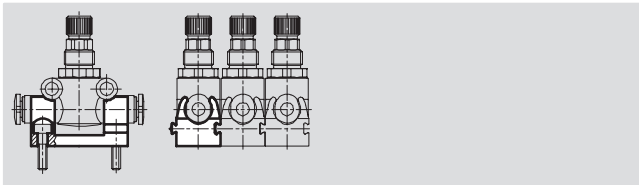
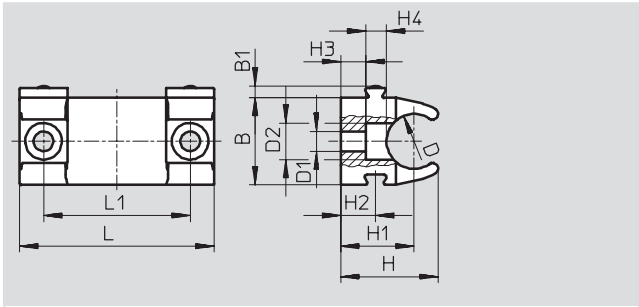
Retainer GR-H-QS

for front panel mounting

Material: Polyacetal



GR-H-QS



Dimensions and ordering data								
For push-in fitting	B	B1	D Ø	D1 Ø	D2 Ø	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



GRM



GRK

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

FESTO

Technical data – Standard flow control valve with female thread

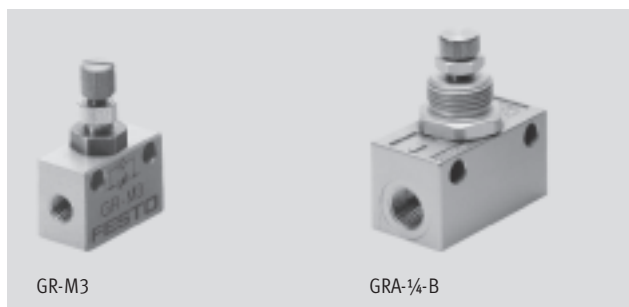
Function



One-way flow control

GR/GRA

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



GR-M3

GRA-1/4-B

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

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 qnN [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

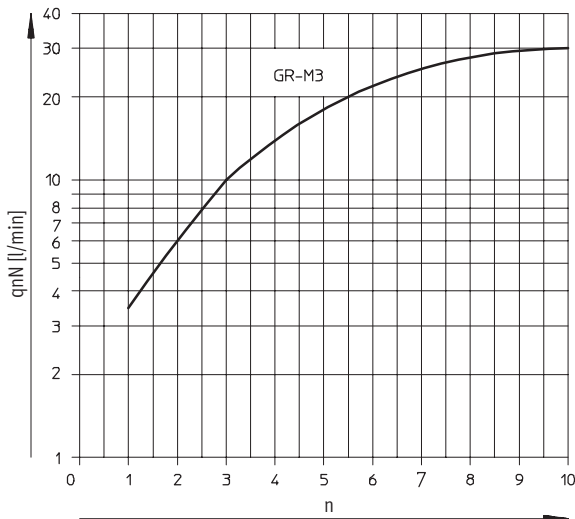
Flow control valves and one-way flow control valves

Technical data – Standard flow control valve with female thread

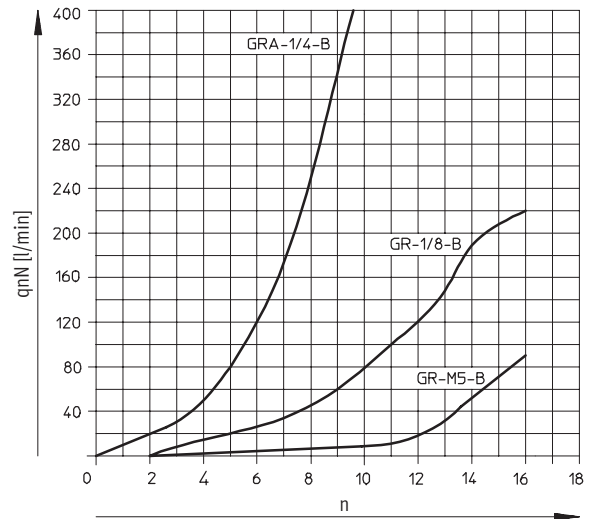
FESTO

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

Connecting thread M3

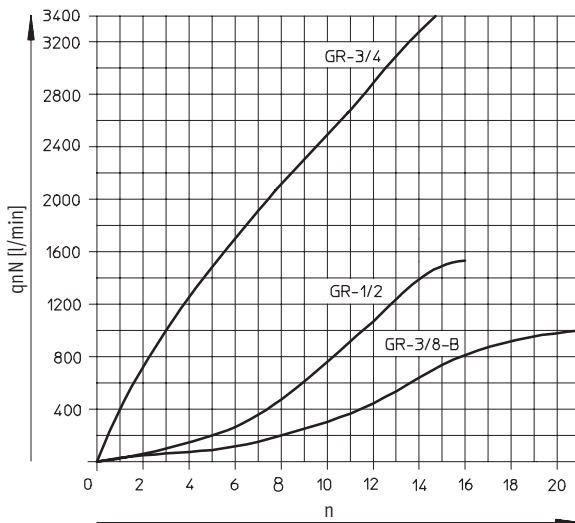


Connecting thread M5, G $\frac{1}{8}$, G $\frac{1}{4}$



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

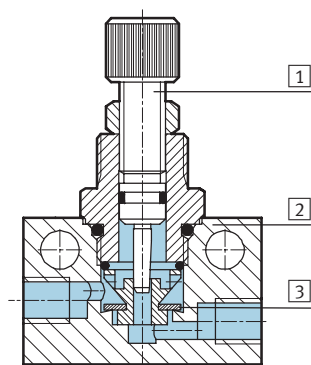
Connecting thread G $\frac{3}{8}$, G $\frac{1}{2}$, G $\frac{3}{4}$



FESTO

Materials

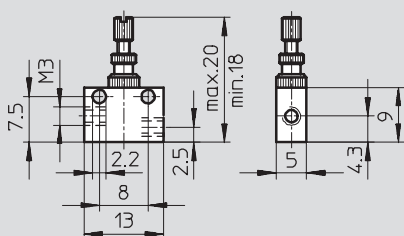
Sectional view



	Connecting thread	M3	M5	G½	G¼	G¾	G½	G¾
[1]	Regulating screw	Brass						Wrought aluminium alloy
[2]	Housing	Wrought aluminium alloy			Die-cast zinc			Wrought aluminium alloy
[3]	Seal	NBR						

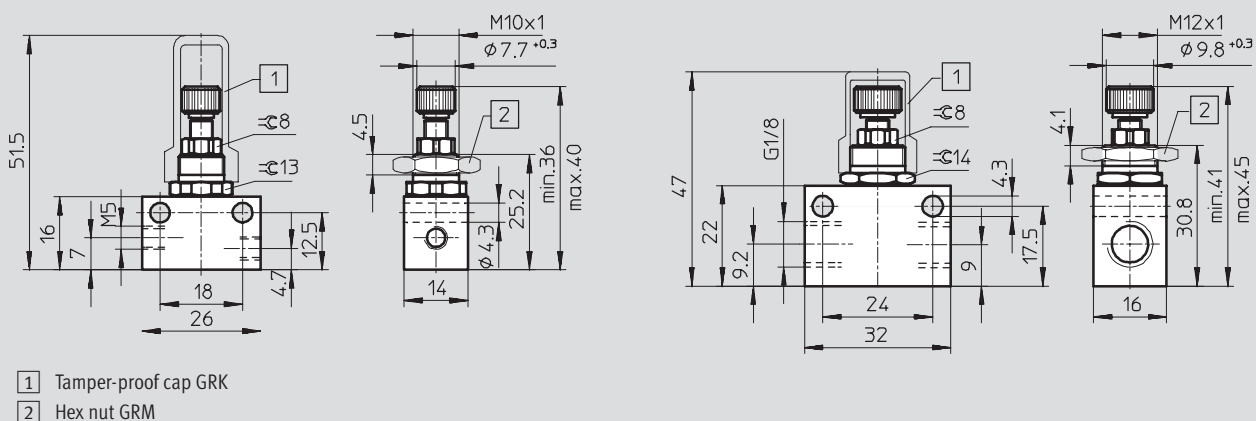
Dimensions

Connecting thread M3



Connecting thread M5

Connecting thread G¹/₈



Flow, non-return and regulating valves

5.6

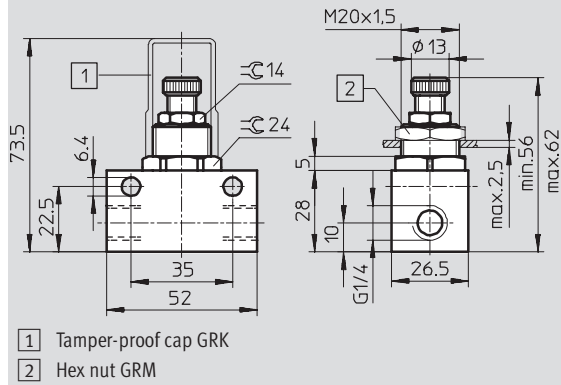
Flow control valves and one-way flow control valves

Technical data – Standard flow control valve with female thread

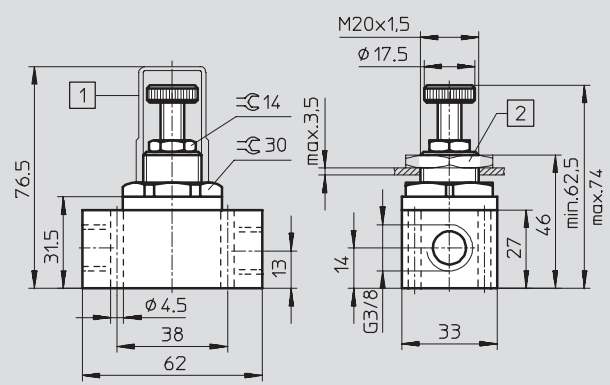
FESTO

Dimensions

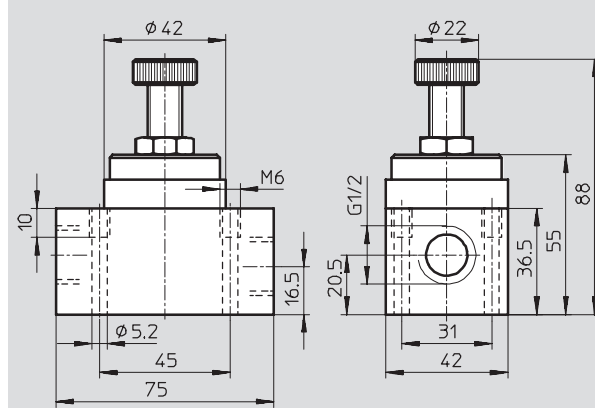
Connecting thread G1/4



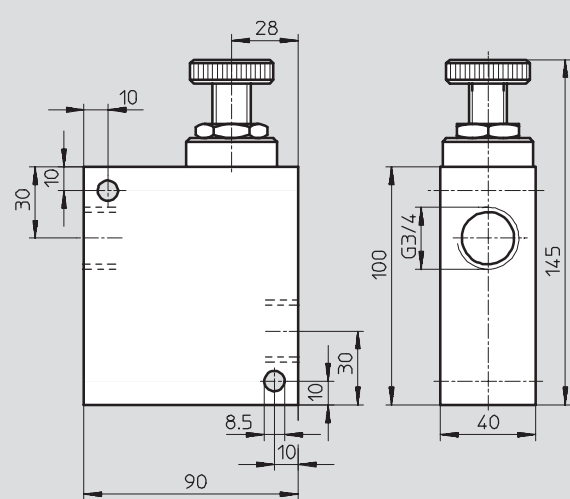
Connecting thread G3/8



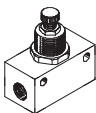
Connecting thread G1/2



Connecting thread G3/4



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

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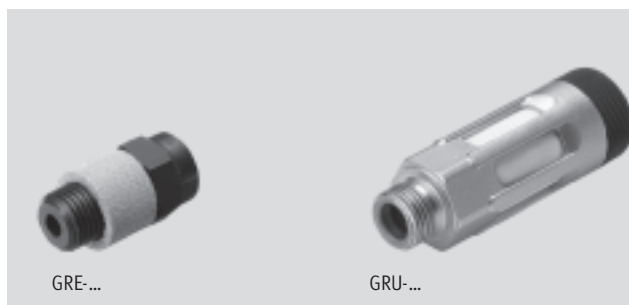
Technical data – Flow control/silencer combinations

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			G1/8	G1/4	G3/8	G1/2	G3/4
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			G1/8	G1/4	G3/8	G1/2	G3/4
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			G1/8	G1/4	G3/8	G1/2	G3/4
	GRE		15	25	50	75	–
	GRU		10	25	55	100	170

Standard flow rate qn [l/min] at 6 bar > 0 bar							
Female thread			G1/8	G1/4	G3/8	G1/2	G3/4
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

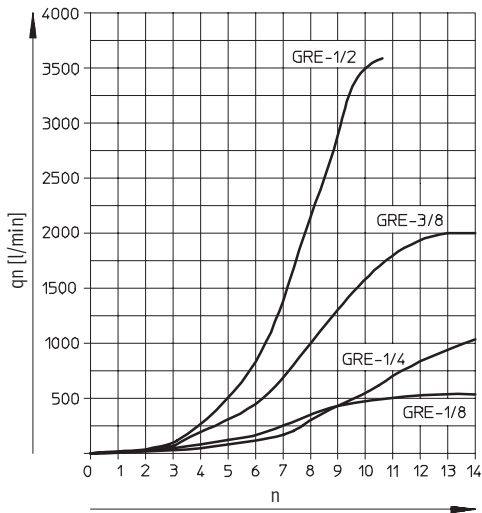
Flow control valves and one-way flow control valves

Technical data – Flow control/silencer combinations

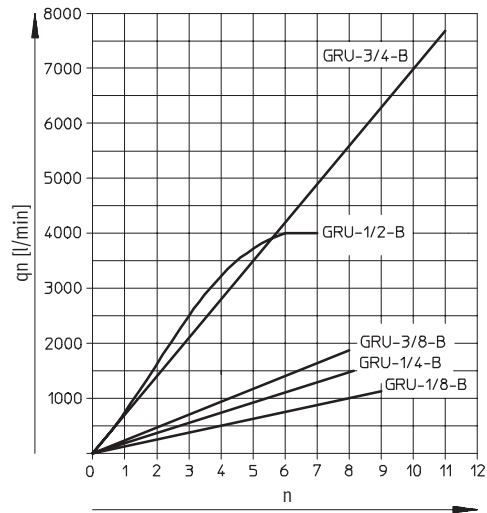
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Standard nominal flow rate q_n at 6 bar > 5 bar as a function of turns of the adjusting screw n

GRE

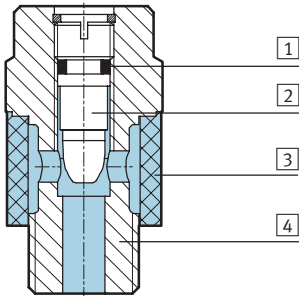


GRU

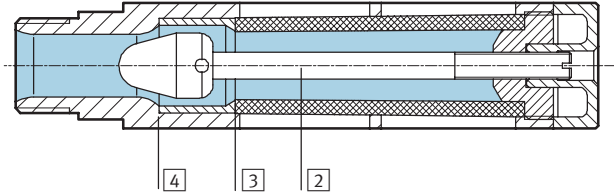


Materials

Sectional view GRE



Sectional view GRU

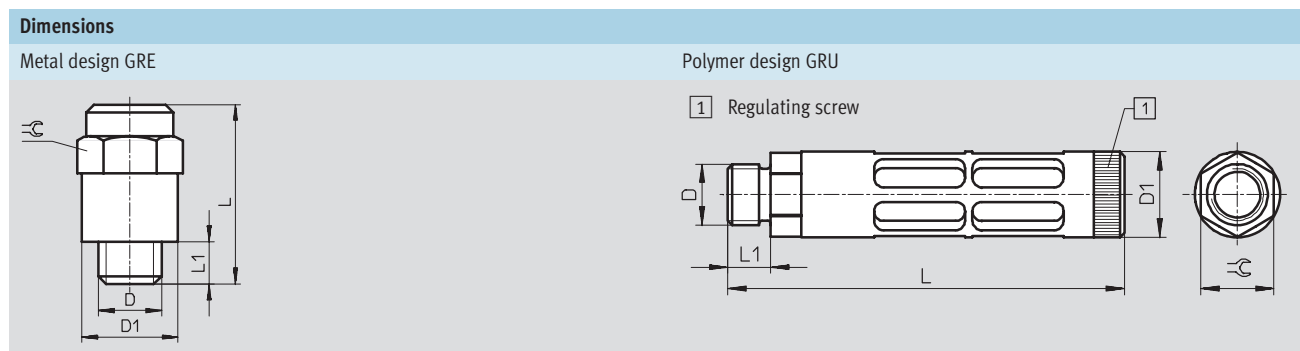


	Metal design GRE	Polymer design GRU
1 Seal	Nitrile rubber	–
2 Regulating screw	Brass	Polyacetal
3 Silencer	Bronze	Polyethylene
4 Housing	Wrought aluminium alloy	Die-cast aluminium

Flow control valves and one-way flow control valves

FESTO

Technical data – Flow control/silencer combinations



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

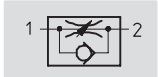
Ordering data										
Version	G1/8		G1/4		G3/8		G1/2		G3/4	
	Part No.	Type	Part No.	Type	Part No.	Type	Part No.	Type	Part No.	Type
Metal design										
	10 351	GRE-1/8	10 352	GRE-1/4	35 310	GRE-3/8	10 353	GRE-1/2	–	
Polymer design										
	9 516	GRU-1/8-B	9 517	GRU-1/4-B	9 518	GRU-3/8-B	9 519	GRU-1/2-B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

Flow control valves and one-way flow control valves

Technical data – Standard flow control valve for M5 compact system

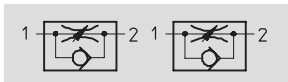
FESTO

Function

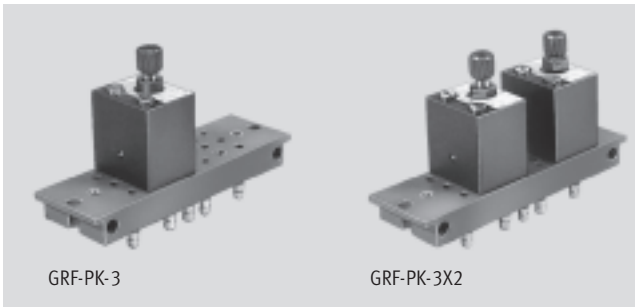


One-way flow control
GRF-PK

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



2 x one-way flow control valves
on one sub-base GRF-PK-3X2



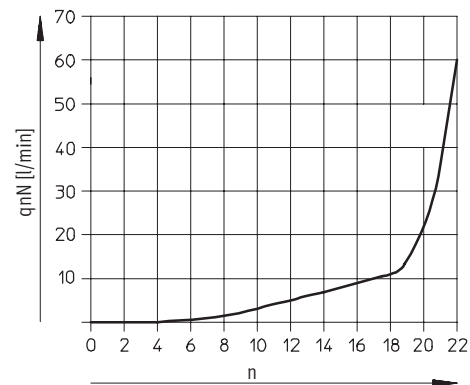
General technical data		
Type	GRF-PK-3	GRF-PK-3X2
Valve function	One-way flow control function	
Pneumatic connection	Barbed fitting PK-3	Barbed fitting PK-3
Setting component	Knurled screw	
Type of mounting	Via through-holes	
Mounting position	Any	
Max. tightening torque [Nm]	6	11

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_{nN} [l/min] at 6 bar > 5 bar		
Type	GRF-PK-3	GRF-PK-3X2
GRF	0 ... 45	0 ... 45

Standard nominal flow rate q_{nN} [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

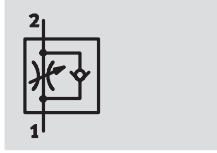
Ordering data					
Version	For tubing I.D. [mm]	One-way flow control valve		Two one-way flow control valves	
		Part No.	Type	Part No.	Type
	3	4 565	GRF-PK-3	4 566	GRF-PK-3X2

Flow control and one-way flow control valves

Technical data – Precision flow control valve on sub-base

FESTO

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	

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

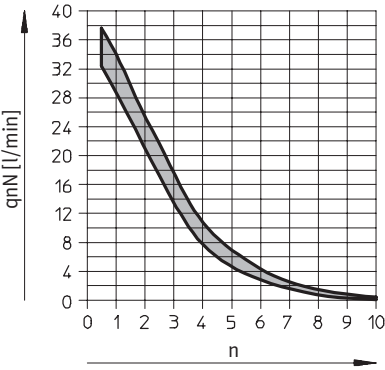
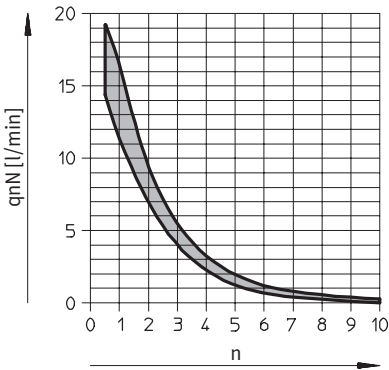
- 1) D: Flow control direction
2) R: Non-return direction

Flow control and one-way flow control valves

Technical data – Precision flow control valve

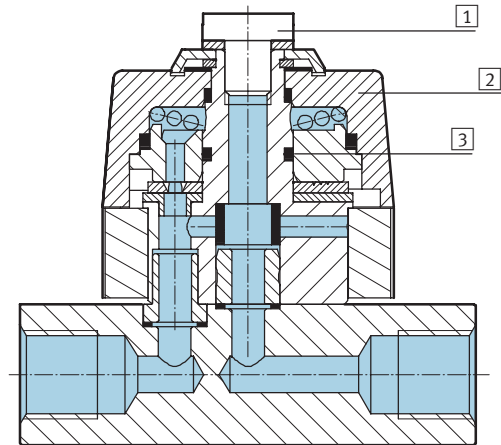


Standard flow rate q_n [l/min] 1 bar $\rightarrow$ 0 bar as a function of turns of the adjusting screw n	
GRP/GRPO-70-1/8-AL	GRP/GRPO-160-1/8-AL



Materials

Sectional view

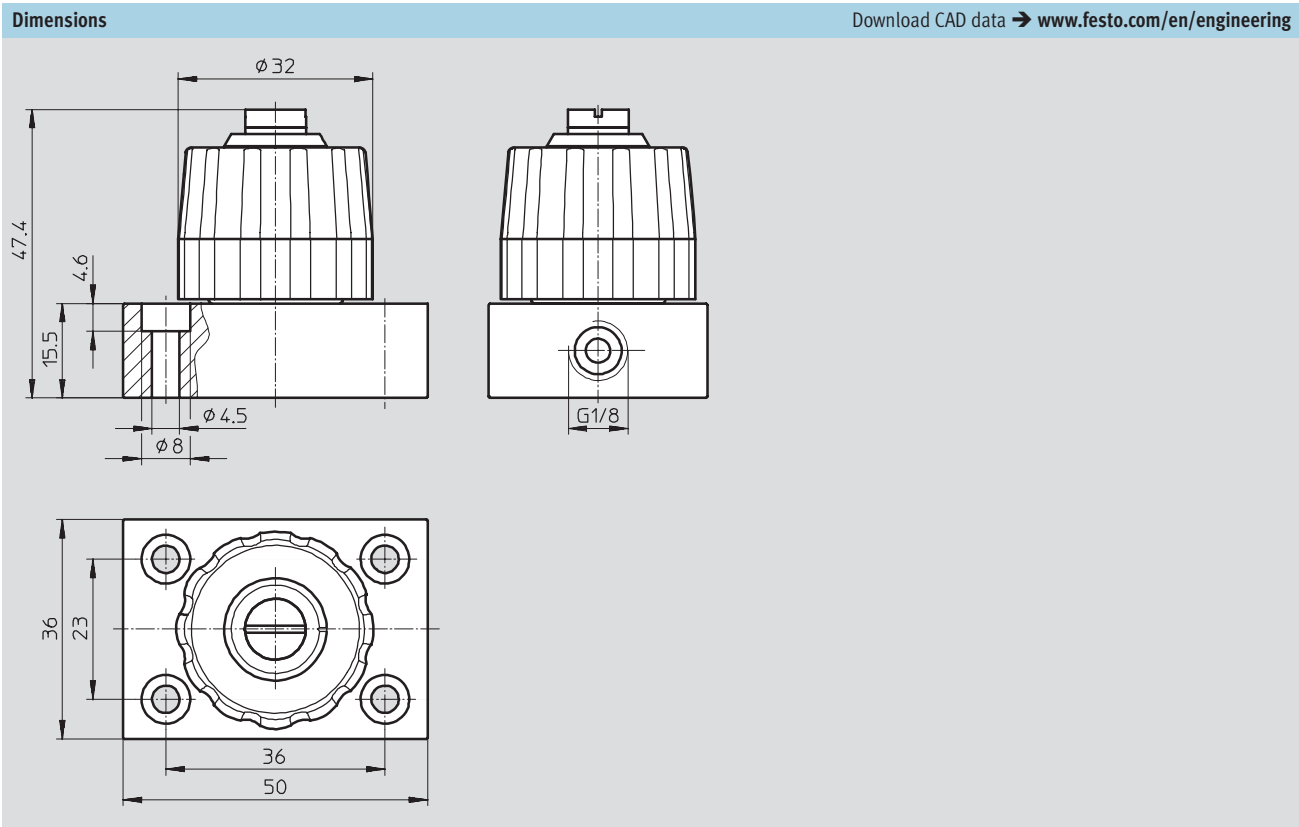


Flow control valve		
1	Locking screw	Brass
2	Rotary knob	Reinforced polyamide
3	Seals	Nitrile rubber

Flow control and one-way flow control valves

Technical data – Precision flow control valve

FESTO



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

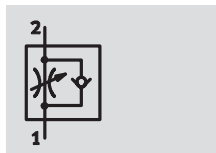
Flow, non-return and regulating valves
Flow control valves and one-way flow control valves

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



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-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 ... 19
	R ²⁾	15 ... 50	20 ... 60
GRPO	D ¹⁾	0 ... 1.7	0 ... 19
			0 ... 38

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

Flow control and one-way flow control valves

Technical data – Precision flow control valve

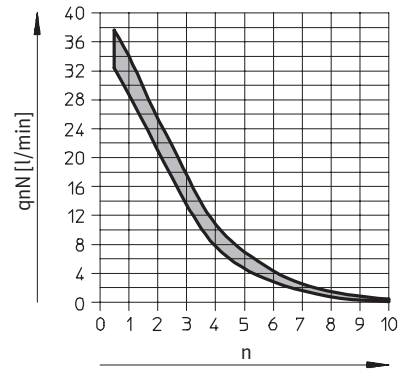
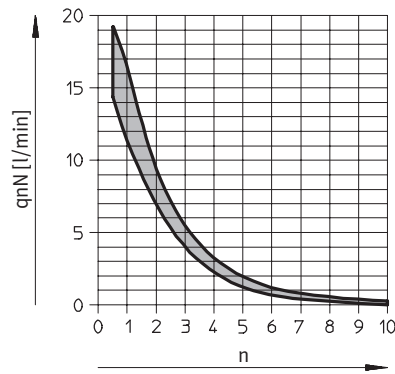
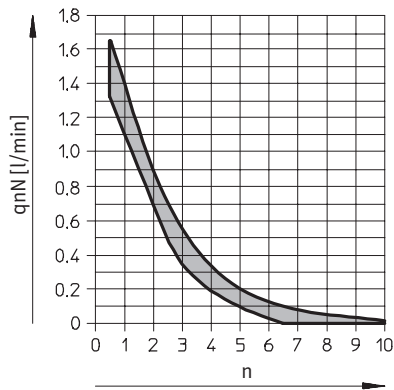
FESTO

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

GRP/GRPO-10-PK-3

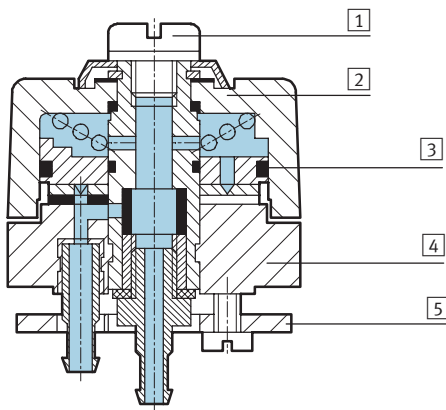
GRP/GRPO-70-PK-3

GRP/GRPO-160-PK-4



Materials

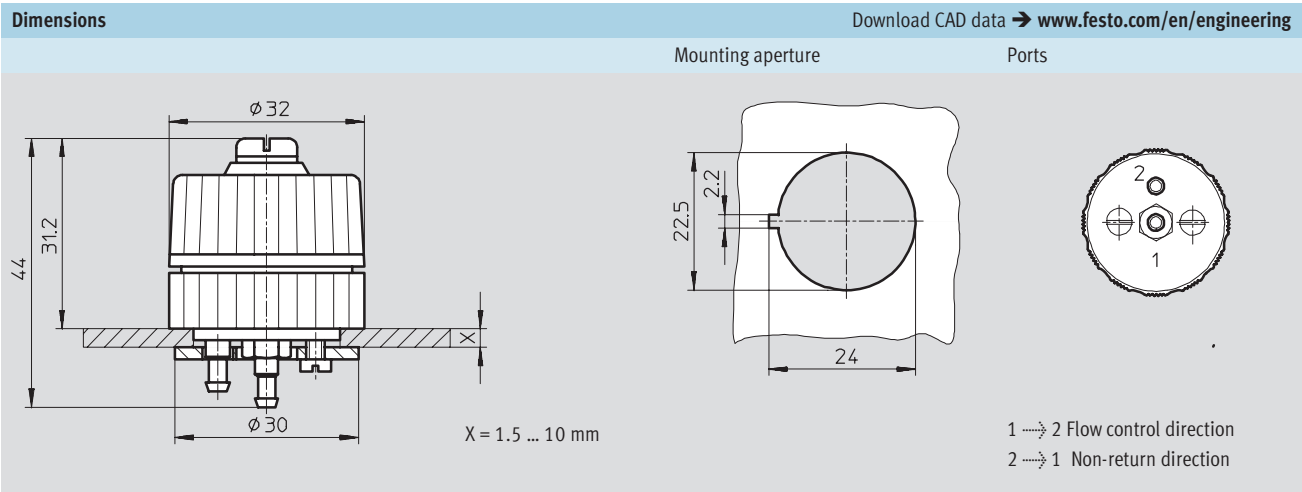
Sectional view



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



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

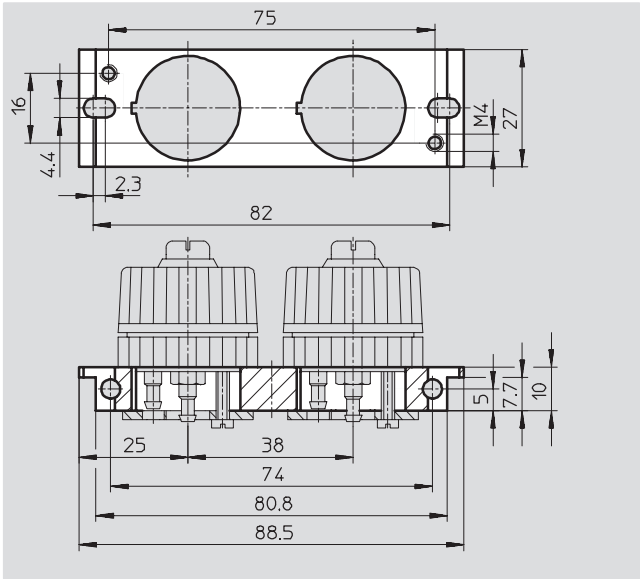
Flow control and one-way flow control valves

Accessories – Precision flow control valve

FESTO

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

Material:
Polyamide



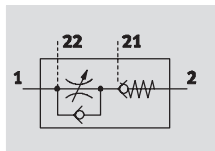
Ordering data					
	For no. of flow control valves	Hole Ø [mm]	Product weight [g]	Part No.	Type
	1	22.5	16	10 391	APL-2N-GRP
	2	2 x 22.5	22	10 392	APL-2N-GRP2

Functional combination GRXA-HG

Data sheet

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.

Functional combination

Data sheet

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 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

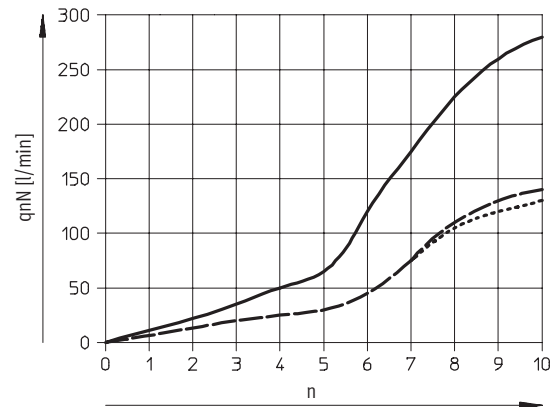
- 1) D: Flow control direction
 2) R: Non-return direction
 3) B: Non-return direction actuated

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 $\rightarrow$ 5 bar as a function of turns of the adjusting screw n

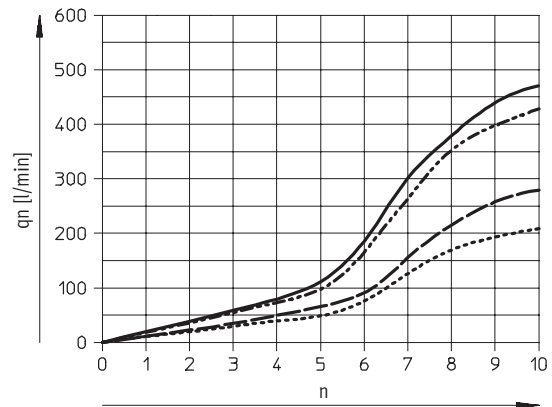
One-way flow control valve



- GRXA-HG-1/4-QS-8
 - - GRXA-HG-1/4-QS-6
 . . GRXA-HG-1/8-QS-6
 - . GRXA-HG-1/8-QS-4

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

One-way flow control valve



- GRXA-HG-1/4-QS-8
 - - GRXA-HG-1/4-QS-6
 . . GRXA-HG-1/8-QS-6
 - . GRXA-HG-1/8-QS-4

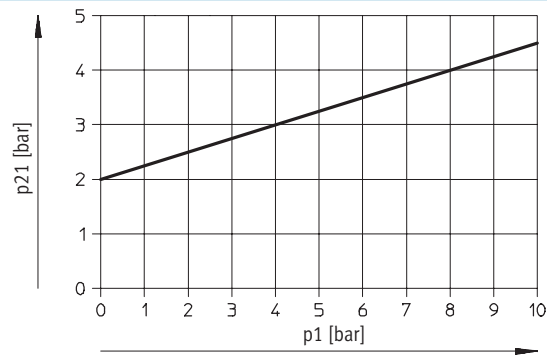
Functional combination

Data sheet

FESTO

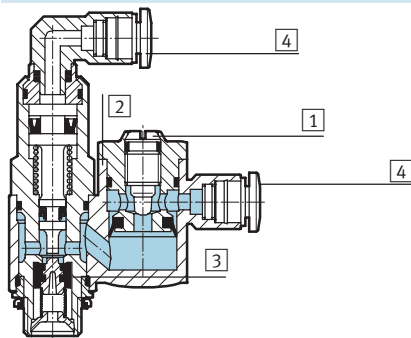
Minimum pilot pressure as a function of operating pressure

Non-return valve, piloted



Materials

Sectional view



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

Functional combination

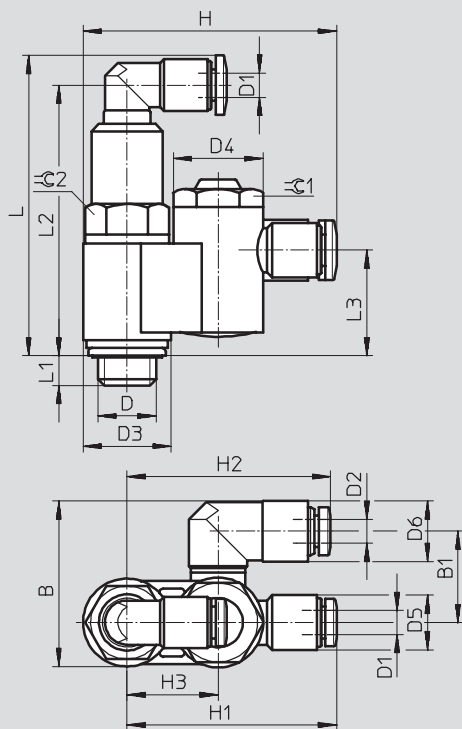
Data sheet

FESTO

Dimensions

Download CAD data → www.festo.com/en/engineering

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
G1/8	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			34.5							
G1/4	35.3	19.5	6	4	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			48.7							

Ordering data

Design	Screw-in thread	For tubing Outside [mm]	Part No.	Type
	G1/8	4	525 667	GRXA-HG-1/8-QS-4
		6	525 668	GRXA-HG-1/8-QS-6
	G1/4	6	525 669	GRXA-HG-1/4-QS-6
		8	525 670	GRXA-HG-1/4-QS-8