One-way flow control, flow control and functional combinations

FESTO

Flow control valves and one-way flow control valves

Key features

General information

Standard nominal flow rate qnN

The standard nominal flow rate qnN is the flow rate based on standard conditions at an input pressure of p1 = 6 bar and an output pressure of p2 = 5 bar, measured at room temperature t = 20 °C.

Standard flow rate qn

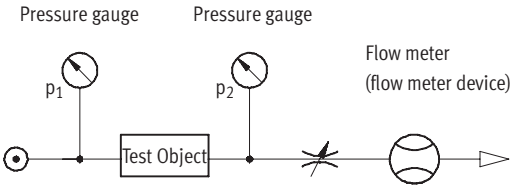
The standard flow rate is measured at an input pressure of p1 = 6 bar and an output pressure with respect to atmospheric pressure (p2 = 0 bar).

Exhaust air flow control

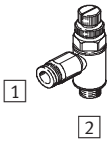
Supply air flow control

Flow control at both sides

Flow measurement circuit



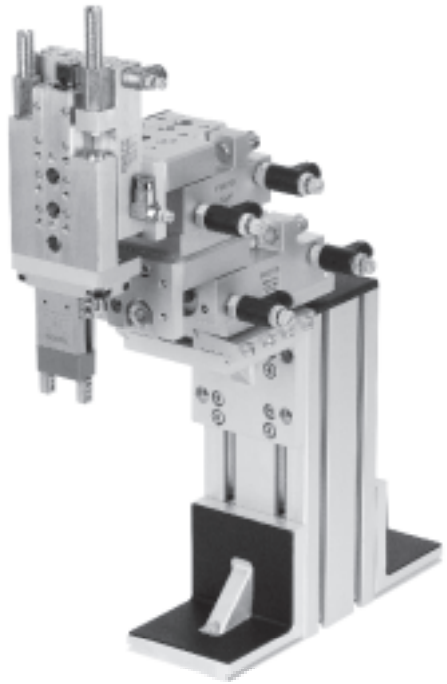
p_1 Input pressure
p_2 Output pressure



1 Compressed air connection
2 Working connection

Typical applications

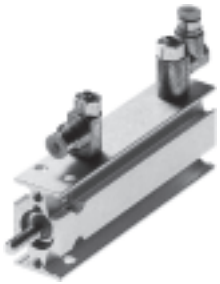
Mini slide SLT with standard flow control valves



Gripper HGW with mini flow control valves

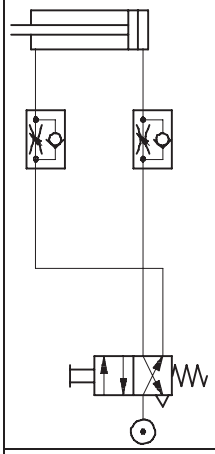
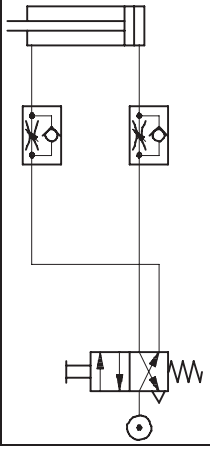
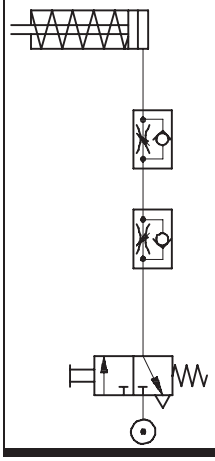
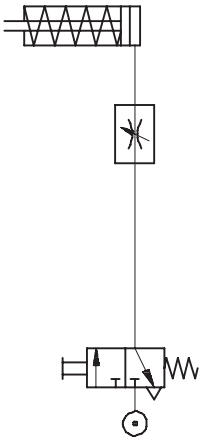
Flat cylinder DZF with mini flow control valves

Multimount cylinder DMM with mini flow control valves



Flow control valves and one-way flow control valves

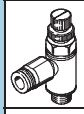
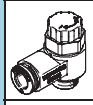
Key features

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

Flow control valves and one-way flow control valves

Product range overview

FESTO

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

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

Flow control valves and one-way flow control valves

Product range overview

FESTO

Type	Pneumatic connection								Free of copper and PTFE	→ Page/Internet
	Thread	Tubing ∅ [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	■	13
GRLZ-...-QS-...-D	G1⁄8	■	■	■	■	–	–	(standard O.D.)	■	
	G1⁄4	–	–	■	■	■	–		■	
	G3⁄8	–	–	■	■	■	–		■	
	G1⁄2	–	–	–	–	–	■		■	
Adjustment via slotted head screw										
GRLA-...-QS-...-MF-D	G1⁄8	–	–	■	■	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	■	13
Adjustment via slotted head screw										
GRLA-F-...-QS-...--D	G1⁄8	–	■	■	■	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	■	20
	G1⁄4	–	–	■	■	–	–		■	
Adjustment via knurled screw										
GRLA-...-QS-...-RS-D	M5	■	■	■	–	–	–	PUN/PAN/PLN/PFAN	■	13
	G1⁄8	■	■	■	■	–	–	(standard O.D.)	■	
	G1⁄4	–	–	■	■	■	–		■	
	G3⁄8	–	–	■	■	■	–		■	
	G1⁄2	–	–	–	–	–	■		■	
Adjustment via knurled screw										
GRLA-...-QS-...-RS-MF-D	G1⁄8	–	–	■	■	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	■	13
Adjustment via slotted head screw, swivel connection rotatable 360°										
GRXA-...-QS-...-D	M5	■	■	■	–	–	–	PUN/PAN/PLN/PFAN	■	13
	G1⁄8	■	■	■	■	–	–	(standard O.D.)	■	
	G1⁄4	–	–	■	■	■	–		■	
Adjustment via knurled screw										
GRLA-...-QS-...-RS-B	G1⁄8	–	–	■	■	–	–	PUN/PAN/PLN/PFAN	–	20
	G1⁄4	–	–	■	■	–	–	(standard O.D.)	–	
	G3⁄8	–	–	■	■	–	–		–	
Adjustment via rotary knob										
VFOV-LE...	G1⁄8	–	■	■	■	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	■	26
Adjustment via slotted head screw, push-in sleeve for QS push-in fittings										
VFOC-E-...	–	–	■	–	–	–	–	PUN/PAN/PLN/PFAN	–	29
VFOC-S-...	–	–	–	■		–	–	(standard O.D.)	–	

1) Tubing → Internet: tubing

Flow control valves and one-way flow control valves

Product range overview

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

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

2) Only for tubing I.D. 3 mm

Flow control valves and one-way flow control valves

Product range overview

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

1) Tubing ➔ Internet: tubing

Flow control valves and one-way flow control valves

Product range overview

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

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

Flow control valves and one-way flow control valves

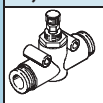
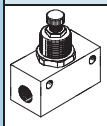
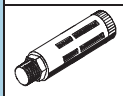
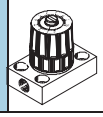
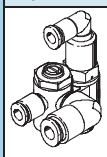
Product range overview

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

1) Tubing → Internet: tubing

Flow control valves and one-way flow control valves

Product range overview

Function	Version	Type	Material	Flow rate characteristic[1]	Flow control direction		
					Exhaust air	Supply air	Both
					A	Z	O
Inline flow control valve with QS push-in fitting	**Adjustment via knurled screw**						
		GR-QS-...	Polymer	Medium flow	■	■	–
		GR-QS-...-LF		Low flow	■	■	–
		GRO-QS-...		Medium flow	–	–	■
Inline flow control valve with female threaded connection	**Adjustment via knurled screw**						
		GR-...-B	Metal	Medium flow	■	■	–
		GRA-...-B			■	■	–
					■	■	–
					■	■	–
					■	■	–
					■	■	–
					■	■	–
Flow control/silencer combinations, threaded design	**Adjustment via slotted head screw, directly screwed into valve**						
		GRE-...	Metal	Medium flow	■	–	–
					■	–	–
					■	–	–
					■	–	–
		GRU-...	Polymer	High flow	■	–	–
					■	–	–
					■	–	–
					■	–	–
					■	–	–
Standard flow control valve with barbed fitting connection PK, frame assembly	**Adjustment via knurled screw**						
		GRF-PK-3-...	Metal	Low flow	■	■	–
Precision flow control valve with barbed fitting connection PK	**Adjustment via rotary knob**						
		GRP-...--PK-...	Polymer	Low flow	■	■	■
		GRPO-...--PK-...					
Precision flow control valve on sub-base		GRP-...-⅛-AL	Polymer	Low flow	■	■	■
		GRPO-...-⅛-AL					
Functional combination with one-way flow control valve and piloted non-return valve	**Adjustment via slotted head screw**						
		GRXA-HG-...-QS-...	Metal	High flow	■	–	–
					■	–	–
One-way flow control valve with 5 selectable flow control ranges	**Precision adjustment via internal hex and setting of the ranges using a selector switch**						
		GRLSA-⅛-QS-6	Metal	Low flow	■	–	–

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

Flow control valves and one-way flow control valves

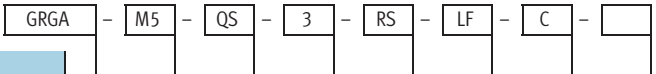
Product range overview

Type	Pneumatic connection								Free of copper and PTFE	➔ Page/Internet
	Thread	Tubing ∅ [mm]						Tubing type[1]		
		3	4	6	8	10	12			
Adjustment via knurled screw										
GR-QS-...	–	■	■	■	■	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	–	68
GR-QS-...-LF	–	–	■	■	–	–	–		–	
GRO-QS-...	–	■	■	■	–	–	–		–	
Adjustment via knurled screw										
GR-...-B	M3	Dependent on fitting							–	72
GRA-...-B	M5								–	
	G1⁄8								–	
	G1⁄4								–	
	G3⁄8								–	
	G1⁄2								–	
	G3⁄4								–	
Adjustment via slotted head screw, directly screwed into valve										
GRE-...	G1⁄8	–	–	–	–	–	–	–	–	77
	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.)	–	80
Adjustment via rotary knob										
GRP-...--PK-... GRPO-...--PK-...	–	■	■	–	–	–	–	PU/PL/PP (standard I.D.)	–	86
GRP-...-1⁄8-AL GRPO-...-1⁄8-AL	G1⁄8	–	–	–	–	–	–	–	–	82
Adjustment via slotted head screw										
GRXA-HG-...-QS-...	G1⁄8	–	■	■	–	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	–	38
	G1⁄4	–	–	■	■	–	–			
Precision adjustment via internal hex and setting of the ranges using a selector switch										
GRLSA-1⁄8-QS-6	G1⁄8	–	–	■	–	–	–	PUN/PAN/PLN/PFAN (standard O.D.)	–	29

1) Tubing ➔ Internet: tubing

Flow control valves and one-way flow control valves

Type codes



Type	
Swivel joint, elbow outlet	
GRLA	One-way flow control valve for exhaust air
CRGRLA	One-way flow control valve for exhaust air, corrosion-resistant
GRLZ	One-way flow control valve for supply air
GRLO	Flow control valve without non-return function
Swivel joint, parallel	
GRGA	One-way flow control valve for exhaust air
GRGZ	One-way flow control valve for supply air
GRGO	Flow control valve without non-return function
Swivel joint, freely rotatable	
GRXA	One-way flow control valve for exhaust air
Front panel and inline mounting	
GR	One-way flow control valve
GRA	One-way flow control valve
GRO	Flow control valve without non-return function

Screw-in and connecting thread	
M3	Metric thread M3
M5	Metric thread M5
1/8	Pipe thread G1/8
1/4	Pipe thread G1/4
3/8	Pipe thread G3/8
1/2	Pipe thread G1/2
3/4	Pipe thread G3/4

Tubing connection	
Type of connection	
QS	Push-in connector for standard O.D. tubing
PK	Barbed fitting connector for standard I.D. tubing
For tubing O.D. or tubing I.D.	
3	3 mm
4	4 mm
6	6 mm
8	8 mm
10	10 mm

Setting component	
RS	Knurled screw
	Slotted head screw

Flow rate characteristic	
LF, MF	Low flow, medium flow

Generation	
	Series A
B	Series B
C	Series C
D[1)]	Series D

Material note	
CT[1)]	Free of copper, PTFE and silicone

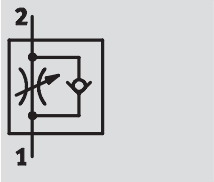
1) The series D is entirely free of copper and PTFE and thus does not have an additional CT note in the type code

Flow control valves and one-way flow control valves

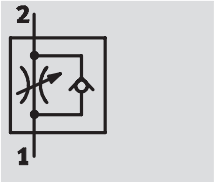
Technical data – Standard flow control valve with QS push-in connector, series D

FESTO

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

Operating and environmental conditions							
Screw-in thread			M5	G1⁄8	G1⁄4	G3⁄8	G1⁄2
Operating medium			Dried air, lubricated or unlubricated, grade of filtration 40µm				
Operating pressure		[bar]	0.2 ... 10				
Storage temperature		[°C]	–10 ... +40				
Ambient temperature		[°C]	–10 ... +60				
Temperature of medium		[°C]	–10 ... +60				

Weights [g]						
Screw-in thread		M5	G1⁄8	G1⁄4	G3⁄8	G1⁄2
	GRL...-D	13	22	42	60	106
	GRXA-...-D	–	16	26	47	–
	GRLA-...-MF-D	–	32	–	–	–
	GRLA-...-RS-D	14	23	30	40	–
	GRLA-...-RS-QS...D	–	24	50	72	124
	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

Standard nominal flow rate qnN [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	–	–	–

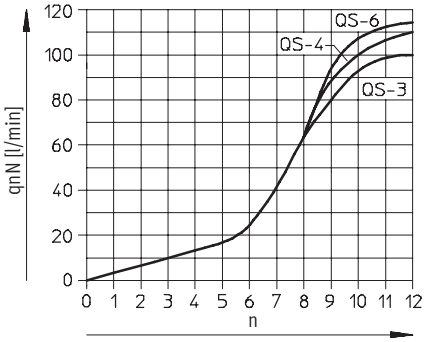
1) D: Flow control direction
2) R: Non-return direction

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	–	–	–

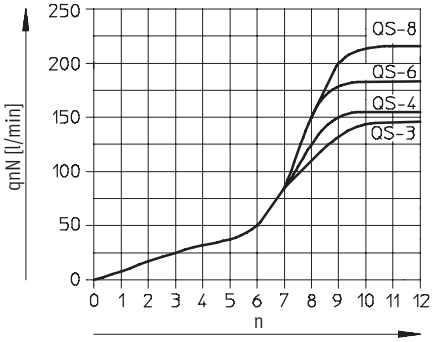
1) D: Flow control direction
2) R: Non-return direction

Standard nominal flow rate qnN [l/min] at 6 bar ⇢ 5 bar as a function of turns of the adjusting screw n

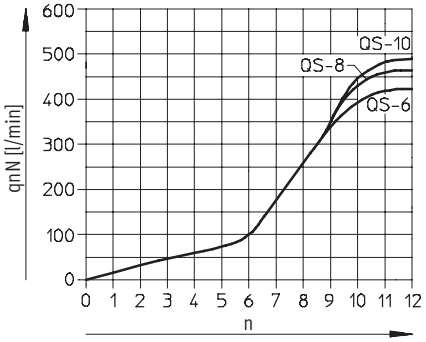
Screw-in thread M5



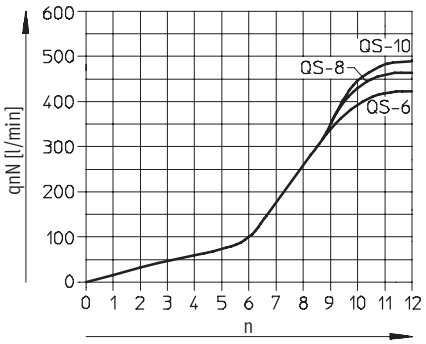
Screw-in thread G⅛



Screw-in thread G⅛ with flow rate MF

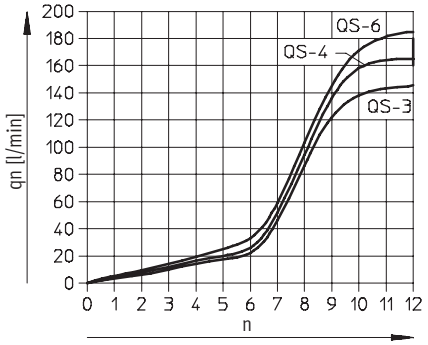


Screw-in thread G¼

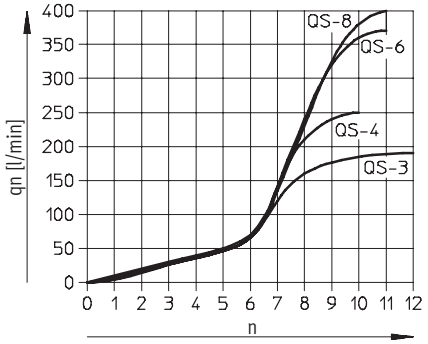


Standard flow rate qn at 6 bar ⇢ 0 bar as a function of turns of the adjusting screw n

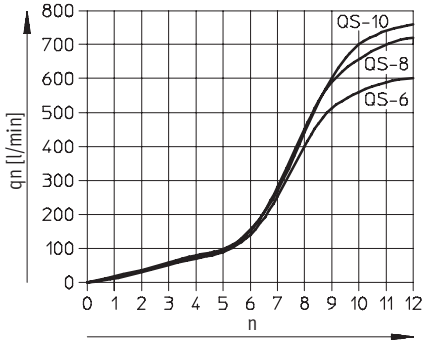
Screw-in thread M5



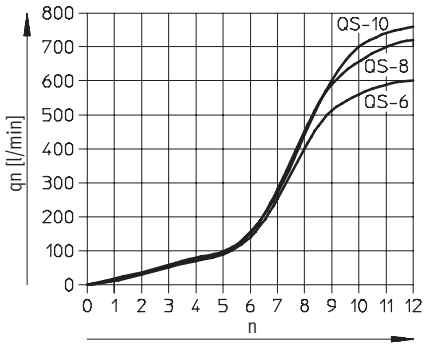
Screw-in thread G⅛



Screw-in thread G⅛ with flow rate MF

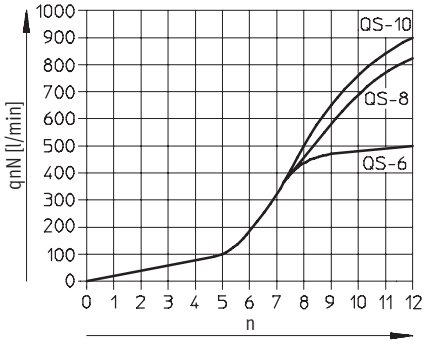


Screw-in thread G¼



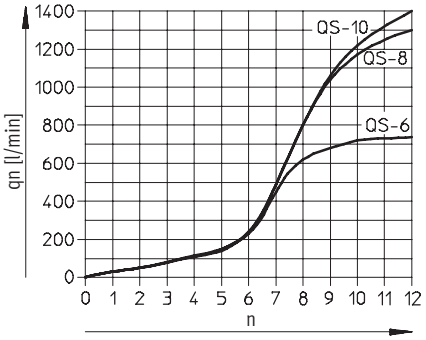
Standard nominal flow rate qnN [l/min] at 6 bar ⇢ 5 bar as a function of turns of the adjusting screw n

Screw-in thread G3/8

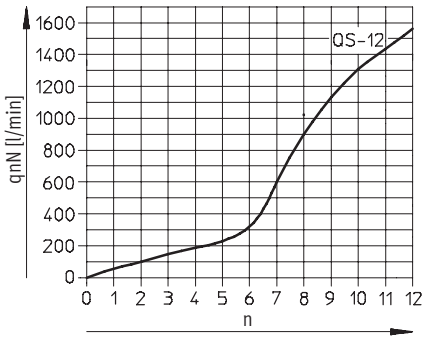


Standard flow rate qn at 6 bar ⇢ 0 bar as a function of turns of the adjusting screw n

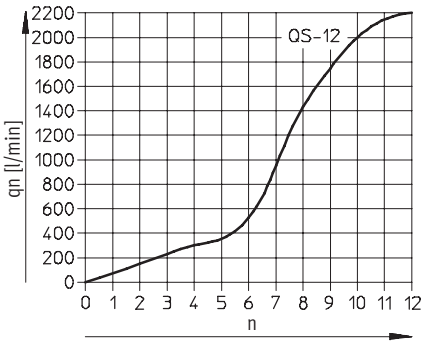
Screw-in thread G3/8



Screw-in thread G1/2

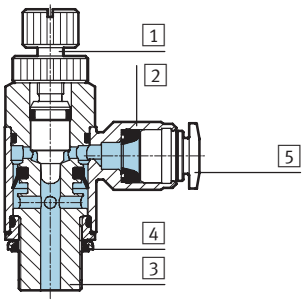


Screw-in thread G1/2



Materials

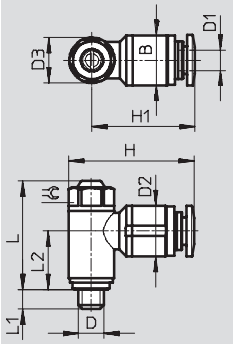
Sectional view



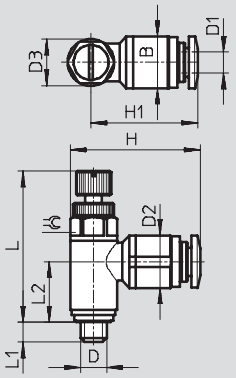
Flow control valve		
1	Regulating screw	Slotted head screw: Brass
		Knurled screw: Stainless steel
2	Swivel joint	Die-cast zinc
3	Threaded collar	Wrought aluminium alloy (M5: nickel-plated brass)
4	Seal	Nitrile rubber
5	Release ring	Polyacetal
	Material note	Designs free of copper, PTFE and silicone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

Dimensions Download CAD Data ➔ **www.festo.com/us/cad**

Swivel joint, elbow outlet, slotted head screw



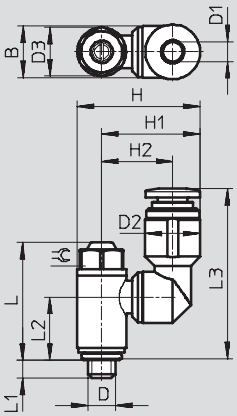
Swivel joint, elbow outlet, knurled screw



Screw-in thread D	Tubing O.D. D1	B	D2 ∅	D3 ∅	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				
	6	12	12.0 ±0.2		26.5	22			10.65	
G1/8	3	13.8	10.2 ±0.2	13.8 ±0.07	31.9	25	26.9	5.1 +0.17/–0.25	14.4	12
	4				29.4	22.5				
	6		12.5 ±0.2		32.6	25.7			13.7	
	8		14.5 ±0.2		35.6	28.7				
G1/8 (MF)	6		12.5 ±0.2	17.8 ±0.15	36.6	27.7	31.5		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		5.9 +0.17/–0.25		
	8		14.5 ±0.2			30.7				
	10		17.5 ±0.2		42.0	33.1			16.1	
G3/8	6	22.4	12.5 ±0.2	22.4 ±0.15	39.8	28.6	36.0	6.95 +0.15/–0.3	20.3	19
	8		14.5 ±0.2		44.1	32.9			19.3	
	10		17.5 ±0.2		46.7	35.5				
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		
	8		14.5 ±0.2			30.7				
	10		17.5 ±0.2		42.0	33.1			16.1	
G3/8	6	22.4	12.5 ±0.2	22.4 ±0.15	39.8	28.6	55.3	6.95 +0.15/–0.3	20.3	19
	8		14.5 ±0.2		44.1	32.9			19.3	
	10		17.5 ±0.2		46.7	35.5				
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

Dimensions Download CAD Data ➔ **www.festo.com/us/cad**

Swivel joint, outlet parallel and rotatable, slotted head screw

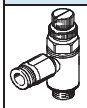
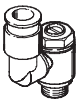


Screw-in thread D	Tubing O.D. D1	B	D2 ∅ +0.15/–0.1	D3 ∅	H	H1	H2	L	L1	L2	L3	⌀
M5	3	8.9	8.2	8.9 ±0.07	20.7	16.25	12.15	21.4	3.6	11.5	29.6	8
	4	9.9	10		22.4	17.95	12.95	21.4	3.6	11.5	31.3	8
	6	12	12.2		24.7	20.25	14.15	21.4	3.6	11.5	33	8
G1/8	3	13.8	10.2	13.8 ±0.07	27.6	20.7	15.6	26.9	4.9	14.1	37	12
	4		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
G1/4	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

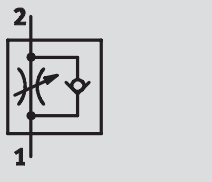
FESTO

Ordering data					
Design	Screw-in thread	For tubing O.D. [mm]	Flow	One-way flow control function for exhaust air Part No. Type	One-way flow control function for supply air 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 Free of copper, PTFE and silicone					
	M5	3	LF	**197 576 GRLA-M5-QS-3-RS-D**	–
		4	LF	**197 577 GRLA-M5-QS-4-RS-D**	–
		6	LF	**197 578 GRLA-M5-QS-6-RS-D**	–
	G1/8	3	LF	**197 579 GRLA-1/8-QS-3-RS-D**	–
		4	LF	**197 580 GRLA-1/8-QS-4-RS-D**	–
		6	LF	**197 581 GRLA-1/8-QS-6-RS-D**	–
		6	MF	**537 072 GRLA-1/8-QS-6-RS-MF-D**	–
		8	LF	**534 337 GRLA-1/8-QS-8-RS-D**	–
		8	MF	**537 073 GRLA-1/8-QS-8-RS-MF-D**	–
	G1/4	6	LF	**534 338 GRLA-1/4-QS-6-RS-D**	–
		8	LF	**534 339 GRLA-1/4-QS-8-RS-D**	–
		10	LF	**534 340 GRLA-1/4-QS-10-RS-D**	–
	G3/8	6	LF	**534 341 GRLA-3/8-QS-6-RS-D**	–
		8	LF	**534 342 GRLA-3/8-QS-8-RS-D**	–
		10	LF	**534 343 GRLA-3/8-QS-10-RS-D**	–
	G1/2	12	LF	**534 344 GRLA-3/8-QS-12-RS-D**	–
Swivel joint, outlet parallel and rotatable, slotted head screw					
	M5	3	LF	**195 806 GRXA-M5-QS-3-D**	–
		4	LF	**195 807 GRXA-M5-QS-4-D**	–
		6	LF	**195 808 GRXA-M5-QS-6-D**	–
	G1/8	3	LF	**195 809 GRXA-1/8-QS-3-D**	–
		4	LF	**195 810 GRXA-1/8-QS-4-D**	–
		6	LF	**195 811 GRXA-1/8-QS-6-D**	–
		8	LF	**195 812 GRXA-1/8-QS-8-D**	–
	G1/4	6	LF	**195 813 GRXA-1/4-QS-6-D**	–
		8	LF	**195 814 GRXA-1/4-QS-8-D**	–
		10	LF	**195 815 GRXA-1/4-QS-10-D**	–

Flow control and one-way flow control valves

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

Function



One-way flow control valve
GRLA-F

D series:

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

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

General technical data			
Screw-in thread		G⅛	G¼
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		G⅛	G¼
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	G⅛/4	G⅛/6	G⅛/8	G¼/6	G¼/8
GRLA-F	25	25	25	37	37

Flow control and one-way flow control valves

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

Standard nominal flow rate qnN [l/min] at 6 bar → 5 bar				
Screw-in thread			G⅛	G¼
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

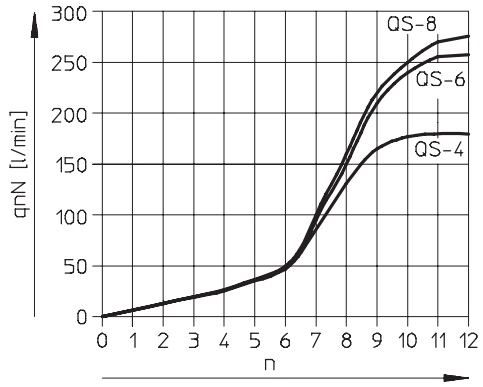
1) D: Flow control direction
2) R: Non-return direction

Standard flow rate qn [l/min] at 6 bar → 0 bar				
Screw-in thread			G⅛	G¼
One-way flow control function for exhaust air				
GRLA-F-... -D	QS-4	D[1]	250	–
		R[2]	270 ... 300	–
	QS-6	D	370	600
		R	330 ... 390	570 ... 680
	QS-8	D	400	720
		R	330 ... 410	610 ... 760

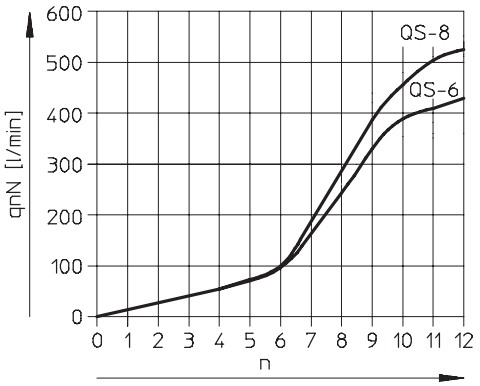
1) D: Flow control direction
2) R: Non-return direction

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

Screw-in thread G⅛

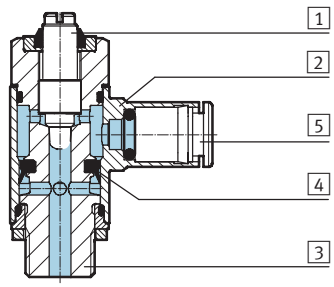


Screw-in thread G¼



Materials

Sectional view



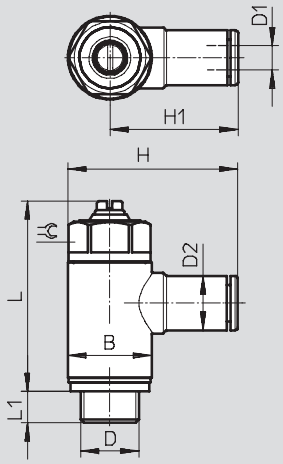
One-way flow control valve		
1	Regulating screw	High-alloy stainless steel
2	Swivel joint	Nickel and chrome plated brass
3	Hollow bolt	Wrought aluminium alloy
4	Seal	Fluorocarbon rubber
5	Release ring	Nickel and chrome plated brass
–		Free of copper and PTFE

Flow control and one-way flow control valves

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

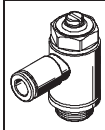
Dimensions Download CAD Data ➔ **www.festo.com/us/cad**

Swivel joint, elbow outlet, slotted head screw



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

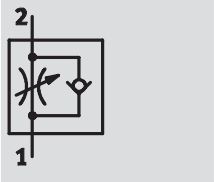
Ordering data

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

Flow control valves and one-way flow control valves

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

GRLA-...-QS-...-RS-B

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

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

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

Standard nominal flow rate qnN [l/min] at 6 bar ⇢ 5 bar					
Screw-in thread			G1/8	G1/4	G3/8
One-way flow control function for exhaust air					
GRLA	QS-6	D[1]	0 … 520	0 … 520	0 … 530
		R[2]	400 … 550	400 … 550	400 … 550
	QS-8	D	0 … 650	0 … 650	0 … 650
		R	600 … 750	600 … 750	600 … 750

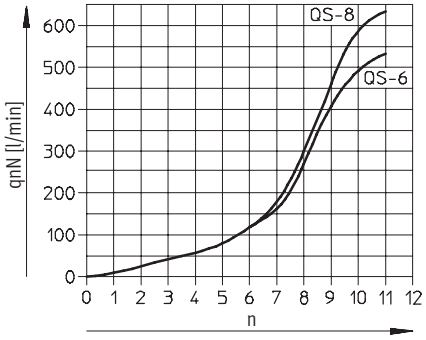
1) D: Flow control direction
2) R: Non-return direction

Standard flow rate qn [l/min] at 6 bar ⇢ 0 bar					
Screw-in thread			G1/8	G1/4	G3/8
One-way flow control function for exhaust air					
GRLA	QS-6	D[1]	0 … 720	0 … 740	0 … 740
		R[2]	600 … 750	620 … 760	620 … 760
	QS-8	D	0 … 1,080	0 … 1,130	0 … 1,130
		R	800 … 1,250	900 … 1,260	900 … 1,260

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

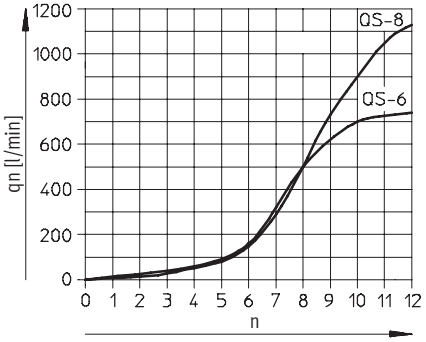
Standard nominal flow rate qnN at 6 bar ⇢ 5 bar as a function of turns of the adjusting screw n

Screw-in thread G1/8, G1/4, G3/8



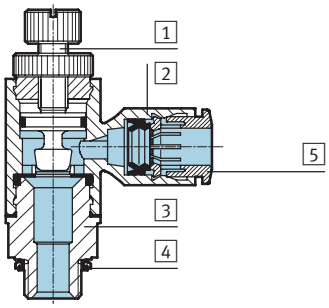
Standard flow rate qn at 6 bar ⇢ 0 bar as a function of turns of the adjusting screw n

Screw-in thread G1/8, G1/4, G3/8



Materials

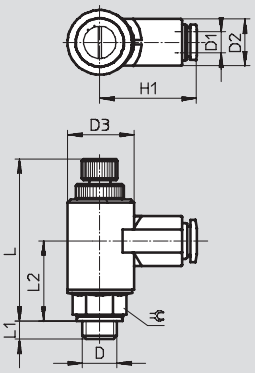
Sectional view



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

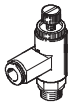
Dimensions Download CAD Data ➔ **www.festo.com/us/cad**

Swivel joint, elbow outlet, knurled screw

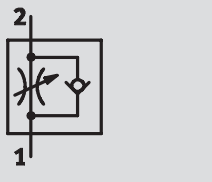


Screw-in thread D	Tubing O.D. D1	D2 ∅	D3 ∅ –0.1	H1	L max.	L1	L2	⌀
G1/8	6	13	17.9	27.2	53	4.7	22.8	13
	8	17		35.4				
G1/4	6	13	17.9	27.2	53.6	5.8	22.3	17
	8	17		35.4				
G3/8	6	13	17.9	27.2	54.6	6	23.1	19
	8	17		35.4				

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**

Function



One-way flow control valve

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

General technical data				
Screw-in thread 2		G⅛		
QS push-in fitting 1	[mm]	4	6	8
Valve function		One-way flow control function for exhaust air		
Actuation type		Manual		
Means of setting		Rotary knob		
Type of mounting		Screw-in		
Mounting position		Any		
Special features		Freely rotatable around the screw-in axis after installation		
Max. tightening torque	[Nm]	3		

Operating and environmental conditions		
Screw-in thread		G⅛
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

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

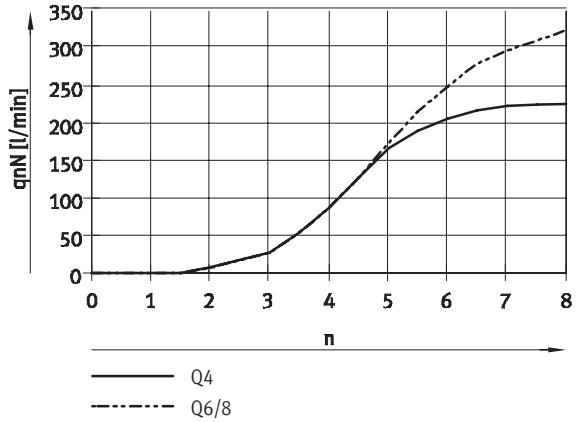
1) D: Flow control direction
2) R: Non-return direction

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

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

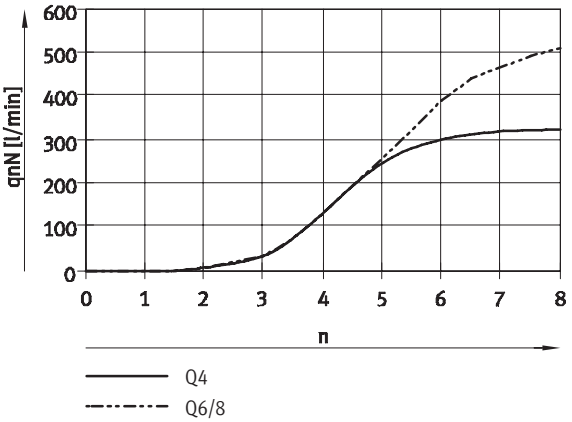
Standard nominal flow rate qnN at 6 bar ⇢ 5 bar as a function of the turns of the adjusting screw n

Screw-in thread G1/8



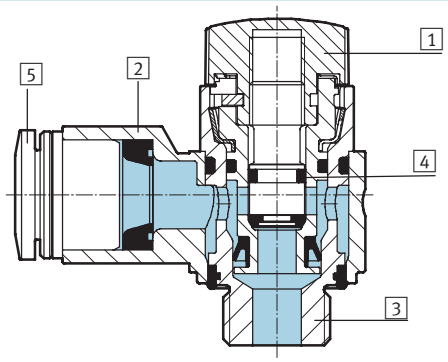
Standard flow rate qn at 6 bar ⇢ 0 bar as a function of the turns of the adjusting screw n

Screw-in thread G1/8



Materials

Sectional view



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

Dimensions

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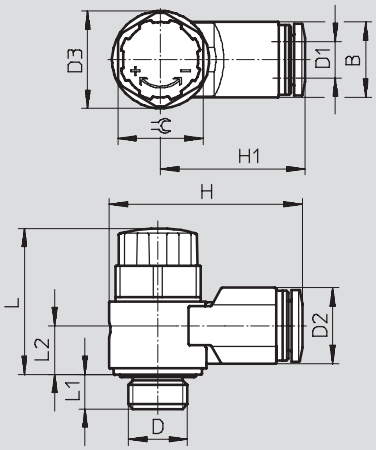
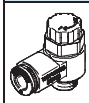
Swivel connection, elbow outlet



Type	Screw-in thread D	Tubing O.D. D1	B	D2	D3	H	H1	L	L1	L2	⫧
VFOV-LE-G18-Q4	G⅛	4	10.8	10.4	16	30.1	22.1	24.2	5.5	7.2	14
VFOV-LE-G18-Q6		6	12.8	12.5		31.8	23.8			8.3	
VFOV-LE-G18-Q8		8	14.8	14.4		36.2	28.2			9.4	

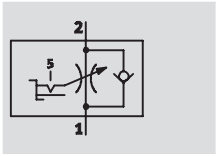
Ordering data

Constructional design	Screw-in thread	QS push-in fitting	Weight [g]	Part No.	Type
Swivel connection, elbow outlet					
	G⅛	4	10	**549 155**	**VFOV-LE-G18-Q4**
		6	10	**549 156**	**VFOV-LE-G18-Q6**
		8	12	**549 157**	**VFOV-LE-G18-Q8**
Cover cap					
				**549 159**	**VAMC-F4-18-C**

One-way flow control valves GRLSA

Technical data

Function



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

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

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

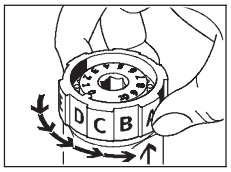
Operating and environmental conditions		
Screw-in thread		G1/8
Operating/control medium		Dried air, lubricated or unlubricated, grade of filtration 40 µm
Operating pressure	[bar]	0.2 ... 10
Storage temperature	[°C]	–10 ... +40
Ambient temperature	[°C]	–10 ... +60
Temperature of medium	[°C]	–10 ... +60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

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

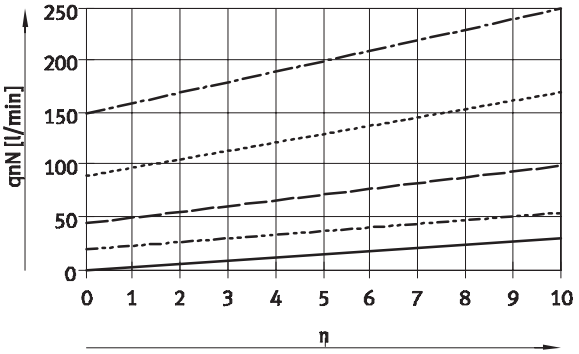
Standard nominal flow rate qnN at 6 bar ⇢ 5 bar		
Screw-in thread		G1/8
Flow control direction	[l/min]	0 ... 250
Non-return direction	[l/min]	180 ... 310

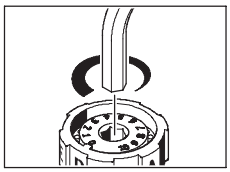
Standard flow rate qn at 6 bar ⇢ 0 bar		
Screw-in thread		G1/8
Flow control direction	[l/min]	0 ... 410
Non-return direction	[l/min]	430 ... 540

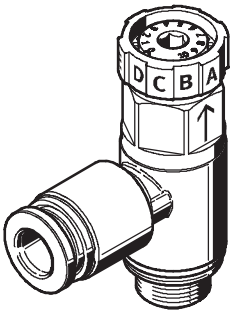
Standard nominal flow rate qnN at 6 bar ⇢ 5 bar as a function of spindle swivel angle n = 300 degrees



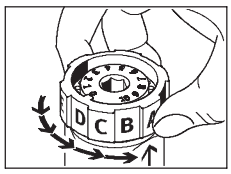
Setting: A
Setting: B
Setting: C
Setting: D
Setting: E



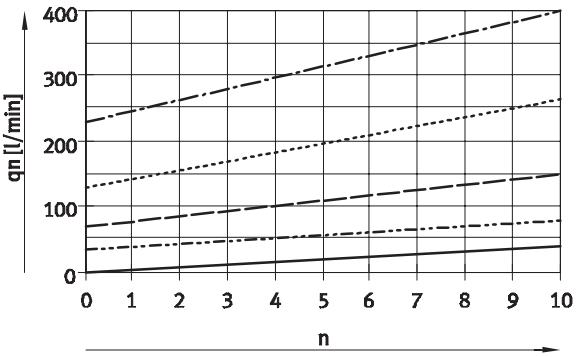


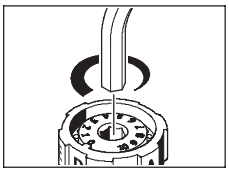


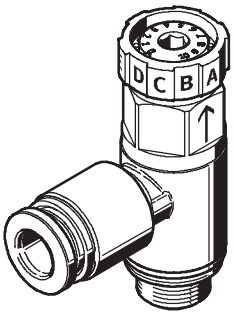
Standard flow rate qn at 6 bar ⇢ 0 bar as a function of spindle swivel angle n = 300 degrees



Setting: A
Setting: B
Setting: C
Setting: D
Setting: E







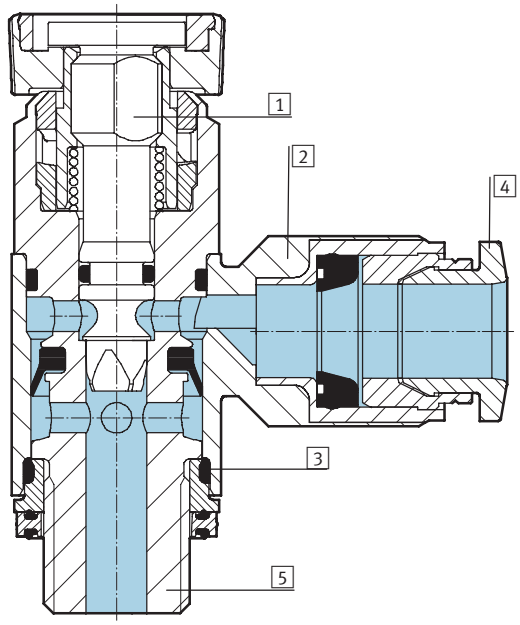
One-way flow control valves GRLSA

Technical data

FESTO

Materials

Sectional view



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

Dimensions

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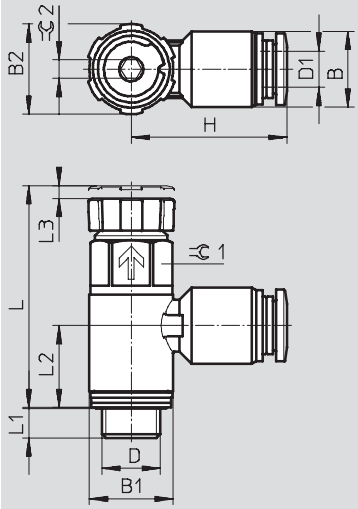
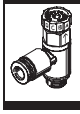


Type	D	D1	B	B1	B2	H	L	L1	L2	L3	⌀1	⌀2
GRLSA-⅛-QS-6	G⅛	6	12.5	13.8	15	25.7	36.6	5.1	13.6	2	12	3

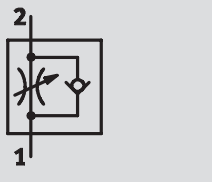
Ordering data

Design	Screw-in thread	QS [mm]	Part No.	Type
	G⅛	6	**540 661**	**GRLSA-⅛-QS-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

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		G⅛	G¼
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		G⅛	G¼
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 qnN [l/min] at 6 bar ⇢ 5 bar				
Screw-in thread			G⅛	G¼
One-way flow control function for exhaust air				
GRLA	QS-6	D[1]	0 … 520	–
		R[2]	400 … 550	–
	QS-8	D	0 … 650	0 … 650
		R	600 … 750	600 … 750

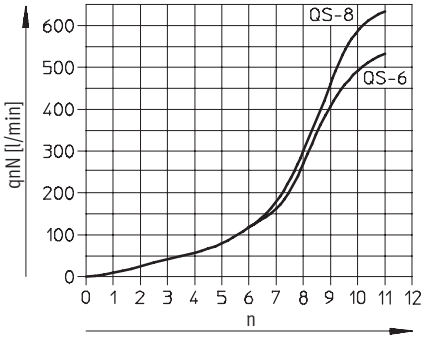
1) D: Flow control direction
2) R: Non-return direction

Standard flow rate qn [l/min] at 6 bar ⇢ 0 bar				
Screw-in thread			G⅛	G¼
One-way flow control function for exhaust air				
GRLA	QS-6	D[1]	0 … 720	–
		R[2]	600 … 750	–
	QS-8	D	0 … 1,080	0 … 1,130
		R	800 … 1,250	900 … 1,260

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

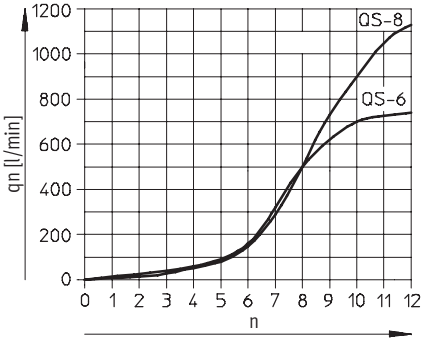
Standard nominal flow rate qnN at 6 bar ⇢ 5 bar as a function of turns of the adjusting screw n

Screw-in thread G⅛, G¼



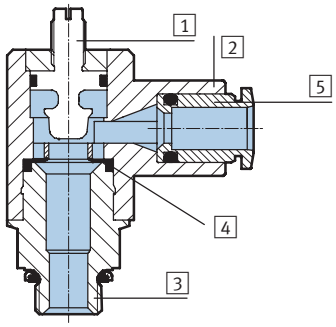
Standard flow rate qn at 6 bar ⇢ 0 bar as a function of turns of the adjusting screw n

Screw-in thread G⅛, G¼



Materials

Sectional view



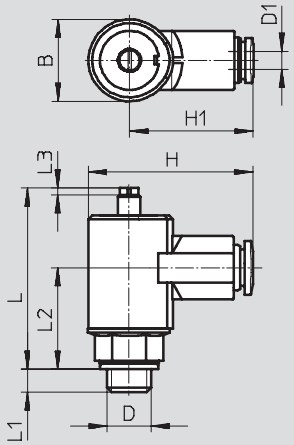
Flow control valve		
1	Regulating screw	Brass
2	Rotatable connection	Polybutylene terephthalate, reinforced
3	Threaded spigot	Wrought aluminium alloy
4	Seal	Nitrile rubber
5	Release ring	Polyacetate

Flow control and non-return valves

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

Dimensions Download CAD Data ➔ **www.festo.com/us/cad**

Rotatable connection, elbow outlet, slotted head screw



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

Ordering data Bulk packs of 20

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

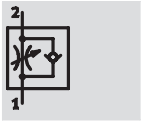
One-way flow control valves VFOC

Technical data

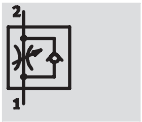
FESTO

Function

One-way flow control valve



Exhaust air



Supply air

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

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

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

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

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

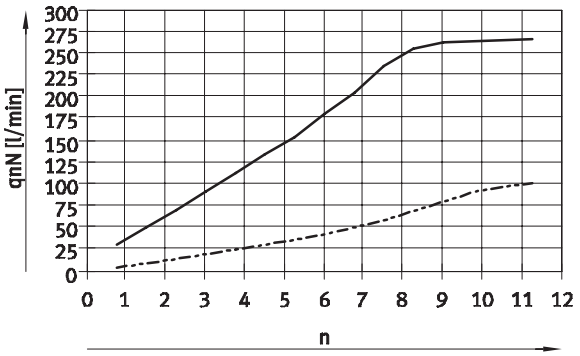
Standard flow rate qn [l/min] at 6 bar ⇢ 0 bar		
Push-in connector	QS-4	QS-6
Flow control direction	See graph	See graph
Non-return direction	130 ... 160	330 ... 400

One-way flow control valves VFOC

Technical data

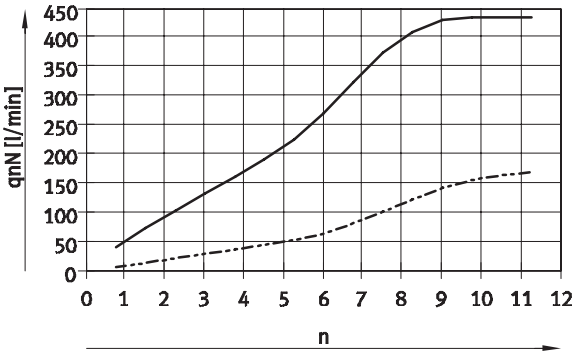
FESTO

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



S6-Q6
S4-Q4

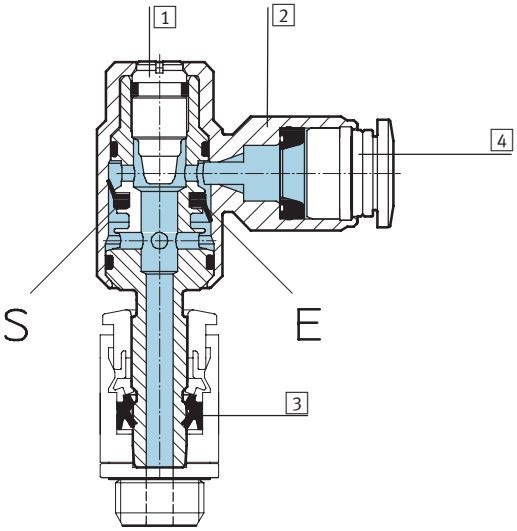
Standard flow rate qn at 6 bar → 0 bar as a function of turns of the adjusting screw n



S6-Q6
S4-Q4

Materials

Sectional view



One-way flow control valve		
1	Adjusting screw	Stainless steel
2	Swivel connection	Die-cast zinc
3	Seal	Nitrile rubber
4	Release ring	Polyacetal
E	Arrangement of non-return valve for exhaust air flow control (colourless anodised push-in sleeve)	
S	Arrangement of non-return valve for supply air flow control (blue anodised push-in sleeve)	

Note

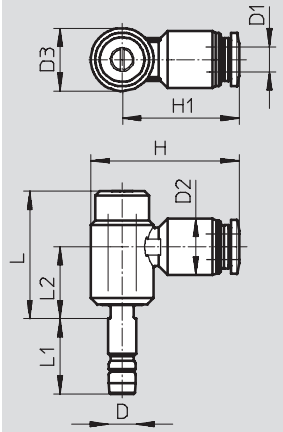
The push-in sleeves of the one-way flow control valves VFOC are exclusively matched to QS fittings from Festo → **www.festo.com/catalogue**.
This combination alone guarantees a secure grip in the push-in fitting.

One-way flow control valves VFOC

Technical data

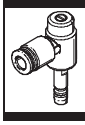
FESTO

Dimensions Download CAD Data ➔ **www.festo.com/us/cad**



Type	D	D1	D2 ∅	D3 ∅	H	H1	L	L1	L2
VFOC-...-S4-Q4	S4	QS-4	10	8.9	24.7	20.3	23.2	14.8	13.2
VFOC-...-S6-Q6	S6	QS-6	12.5	13.8	32.6	25.7	28	16.5	15.8

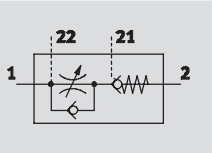
Ordering data

Design	Push-in connector	For tubing O.D.	One-way flow control valve for exhaust air		One-way flow control valve for supply air	
		[mm]	Part No.	Type	Part No.	Type
	QS-4	4	**540 362**	**VFOC-E-S4-Q4**	**559 723**	**VFOC-S-S4-Q4**
	QS-6	6	**540 363**	**VFOC-E-S6-Q6**	**559 724**	**VFOC-S-S6-Q6**

Functional combination GRXA-HG

Technical data

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

Technical data

Standard nominal flow rate qnN [l/min] at 6 bar ⇢ 5 bar				
Screw-in thread			G⅛	G¼
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

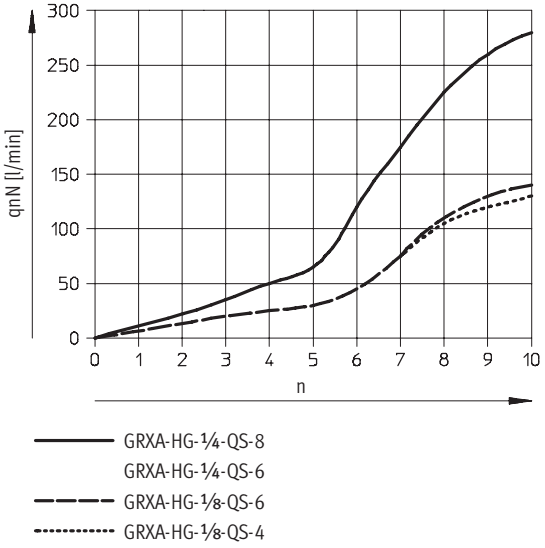
1) D: Flow control direction
2) R: Non-return direction
3) B: Non-return direction actuated

Standard flow rate qn [l/min] at 6 bar ⇢ 0 bar				
Screw-in thread			G⅛	G¼
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

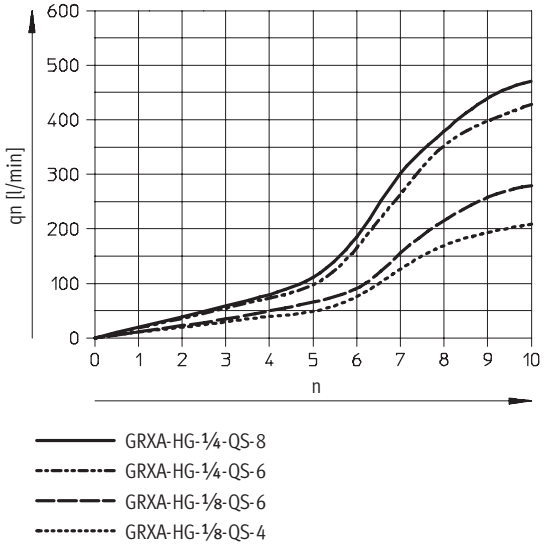
Standard nominal flow rate qnN at 6 bar ⇢ 5 bar as a function of turns of the adjusting screw n

One-way flow control valve



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

One-way flow control valve

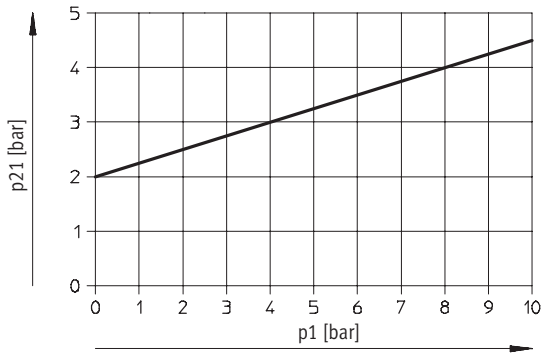


Functional combination

Technical data

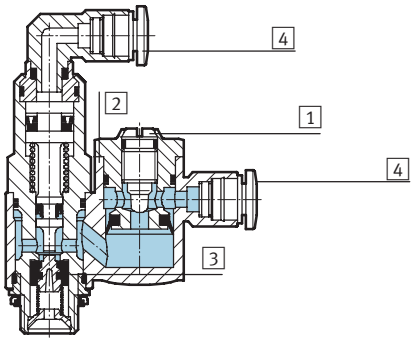
Minimum pilot pressure as a function of operating pressure

Non-return valve, piloted



Materials

Sectional view



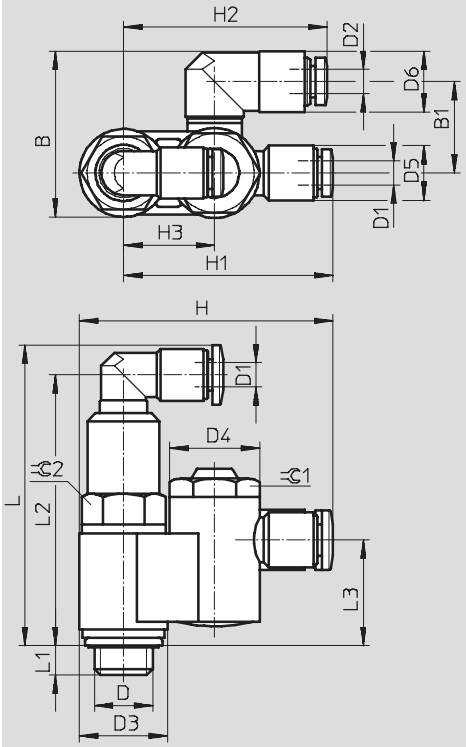
Functional combination		
1	Adjusting screw	Brass
2	Rotatable connection	Die-cast zinc
3	Seal	Nitrile rubber
4	Release ring	Polyacetate

Functional combination

Technical data

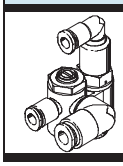
Dimensions Download CAD Data ➔ **www.festo.com/us/cad**

Rotatable connection, elbow outlet, slotted head screw



Pneumatic connection D	B	B1	D1 ∅	D2 ∅	D3	D4 ∅	D5 ∅	D6	H	H1	H2	H3	L	L1	L2	L3	⌀C 1	⌀C 2
G⅛	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							
G¼	35.3	19.5	4	6	19	19	9	12.5	52.2	42.7	40.5	21	56.3	5.6	51.4	21.1	17	16
	39.5	21.5		8				17	58.2		48.7							

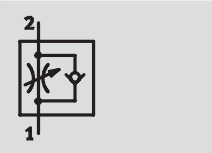
Ordering data

Design	Screw-in thread	For tubing Outside [mm]	Part No.	Type
	G⅛	4	**525 667**	**GRXA-HG-⅛-QS-4**
		6	**525 668**	**GRXA-HG-⅛-QS-6**
	G¼	6	**525 669**	**GRXA-HG-¼-QS-6**
		8	**525 670**	**GRXA-HG-¼-QS-8**

Flow control valves and one-way flow control valves

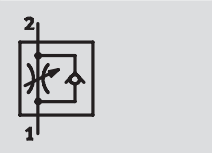
Technical data – Mini flow control valve with QS push-in connector

Function

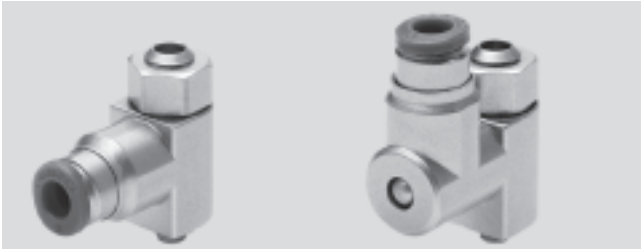


One-way flow control for exhaust air
GRLA/GRGA

Flow control acting at both sides
GRLO/GRGO



One-way flow control for supply air
GRLZ/GRGZ



GRL... GRG...

- 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

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

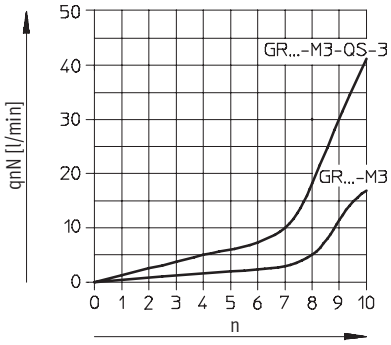
1) F: Flow control direction
2) N: Non-return direction

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

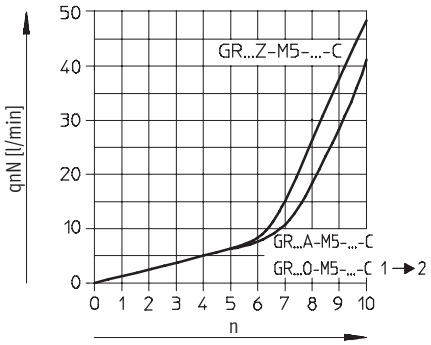
1) F: Flow control direction
2) N: Non-return direction

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

Screw-in thread M3

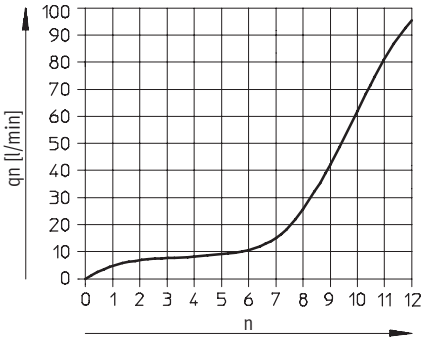


Screw-in thread M5

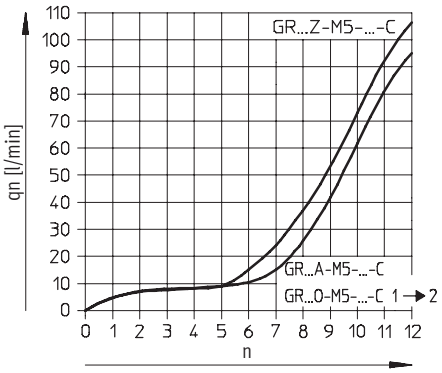


Standard flow rate qn at 6 bar ⇢ 0 bar as a function of turns of the adjusting screw n

Screw-in thread M3

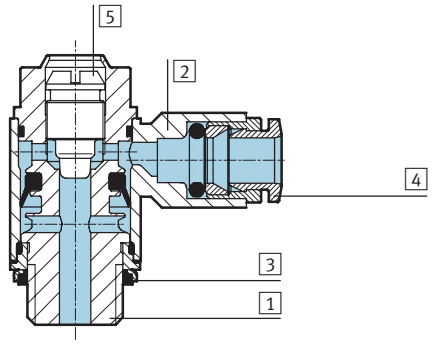


Screw-in thread M5



Materials

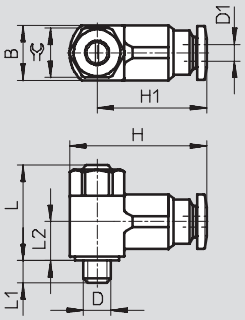
Sectional view



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

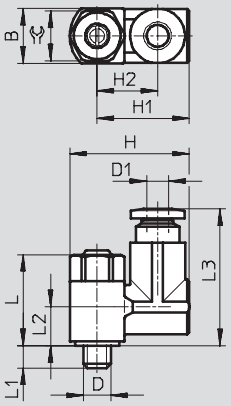
Dimensions GRL...

Swivel joint, elbow outlet, slotted head screw



Dimensions GRG...

Swivel joint, parallel outlet, slotted head screw



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

Flow control valves and one-way flow control valves

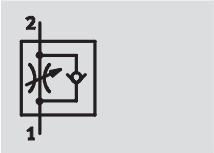
Technical data – Mini flow control valve with QS push-in connector

Ordering data									
Design	Screw-in thread	For tubing O.D. [mm]	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
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

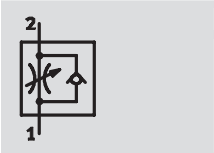
Technical data – Standard flow control valve with female thread

Function

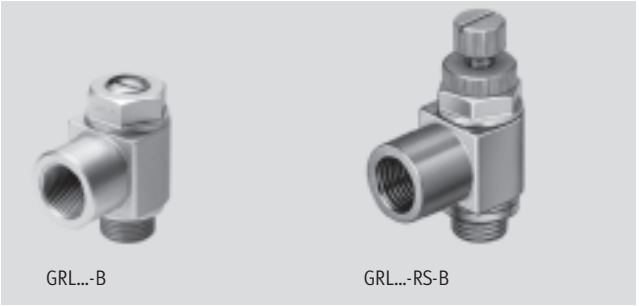


One-way flow control for exhaust air
GRLA

Flow control acting at both sides
GRLO



One-way flow control for supply air
GRLZ



GRL...-B GRL...-RS-B

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

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

Note: This product conforms to ISO 1179-1 and to ISO 228-1

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

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

Flow control valves and one-way flow control valves

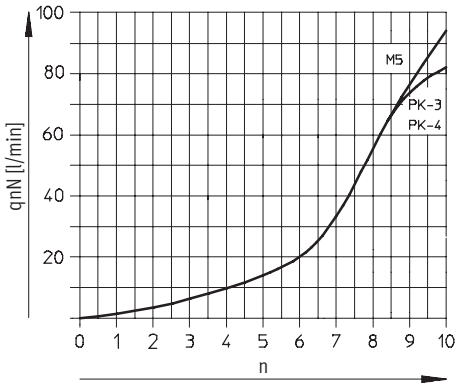
Technical data – Standard flow control valve with female thread

Standard nominal flow rate qnN [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	–	–	–	–	–

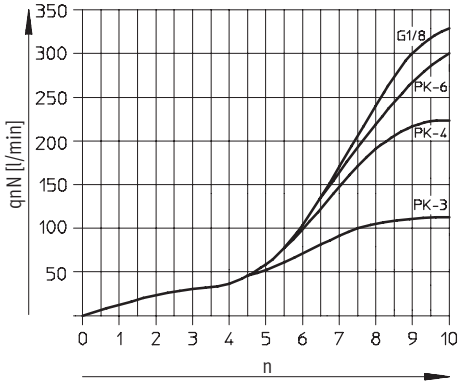
1) F: Flow control direction
2) N: Non-return direction

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

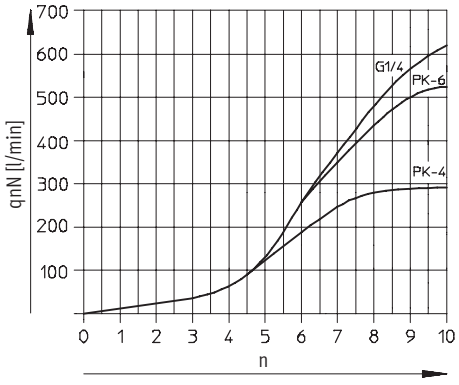
Screw-in thread M5



Screw-in thread G⅛

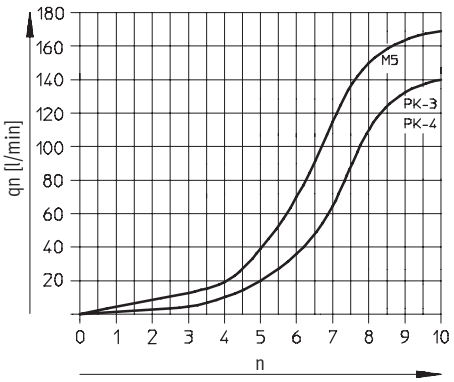


Screw-in thread G¼

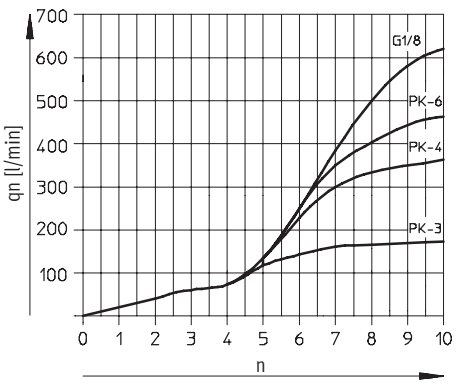


Standard flow rate qn at 6 bar ⇢ 0 bar
as a function of turns of the adjusting screw n

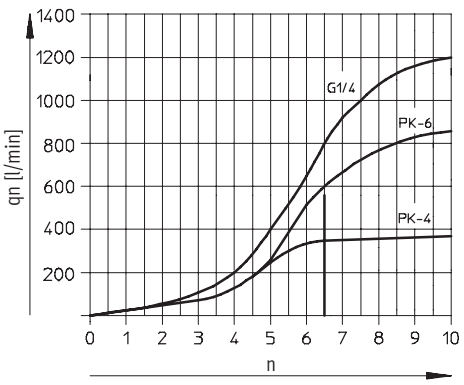
Screw-in thread M5



Screw-in thread G⅛

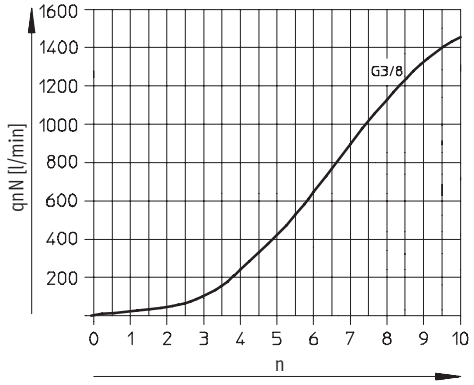


Screw-in thread G¼

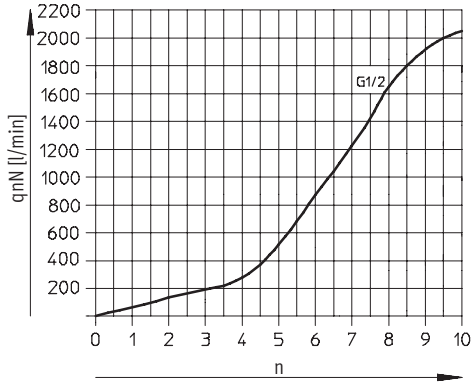


Standard nominal flow rate qnN at 6 bar → 5
as a function of turns of the adjusting screw n

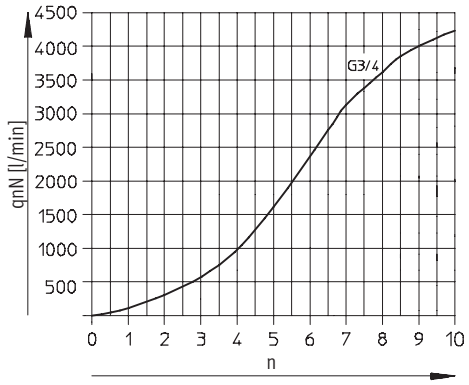
Screw-in thread G3⁄8



Screw-in thread G1⁄2

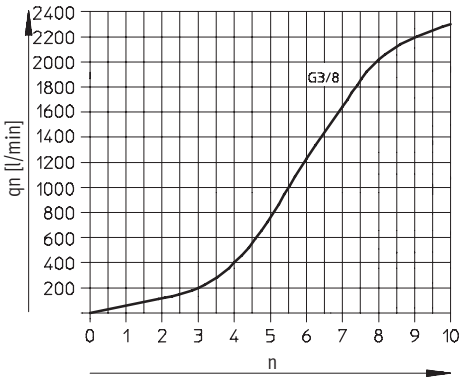


Screw-in thread G3⁄4

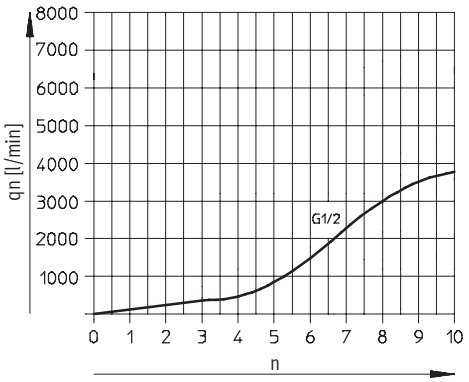


Standard flow rate qn at 6 bar → 0 bar
as a function of turns of the adjusting screw n

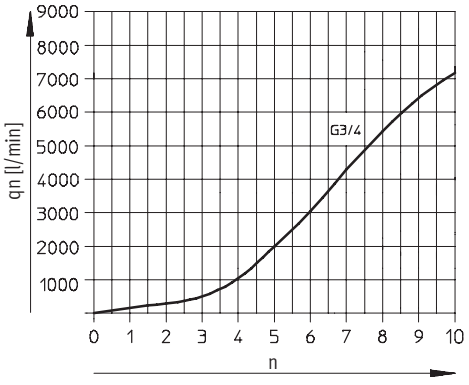
Screw-in thread G3⁄8



Screw-in thread G1⁄2

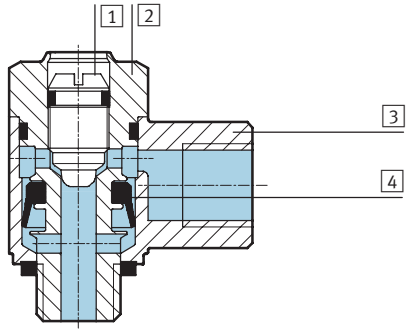


Screw-in thread G3⁄4



Materials

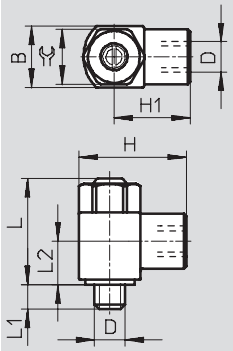
Sectional view



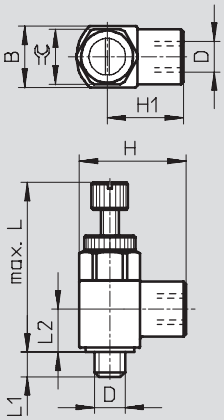
Flow control valve		
1	Regulating screw	Brass
		Designs free of copper, PTFE and silicone : wrought aluminium alloy
2	Threaded collar	G thread: wrought aluminium alloy
		M5: brass, nickel-plated
3	Swivel joint	Die-cast zinc
4	Seals	Nitrile rubber
	Note on material	Designs free of copper, PTFE and silicone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

Dimensions

Slotted head screw



Knurled screw



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

Note: This product conforms to ISO 1179-1 and to ISO 228-1

Type discontinued GRLA-...-CT
Available up until 2011

Flow control valves and one-way flow control valves

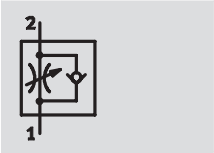
Technical data – Standard flow control valve with female thread

Ordering data					
Design	Screw-in thread	Connecting thread	One-way flow control function for exhaust air Part No. Type	One-way flow control function for supply air Part No. Type	Flow control function, acting at both sides Part No. Type
Female thread, elbow outlet, slotted head screw					
	M5	M5	**151 160 GRLA-M5-B**	**151 183 GRLZ-M5-B**	**151 181 GRLO-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

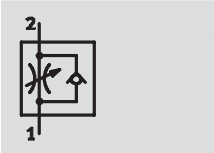
Technical data – Standard flow control valve with barbed fitting connection PK

Function

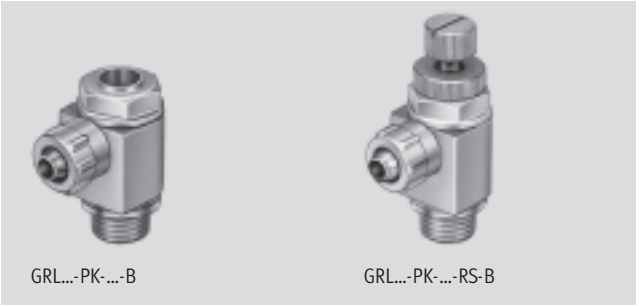


One-way flow control for exhaust air
GRLA

Flow control acting at both sides
GRLO



One-way flow control for supply air
GRLZ



GRL...-PK-...-B

GRL...-PK-...-RS-B

Series B:

- Mid flow:
  Precision adjustment for average speed
- Adjustment with slotted head screw
- Adjustment with knurled screw
- With screw-in thread G⅛ and G¼ with union nut

General technical data					
Screw-in thread			M5	G⅛	G¼
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	G⅛	G¼
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		

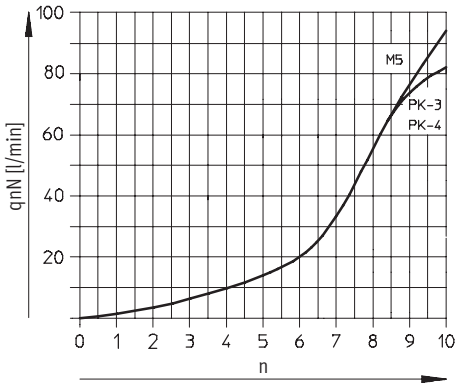
Weights [g]					
Screw-in thread			M5	G⅛	G¼
	GRL...-B	[g]	10	25	44
	GRL...-RS-B	[g]	11	26	45

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

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

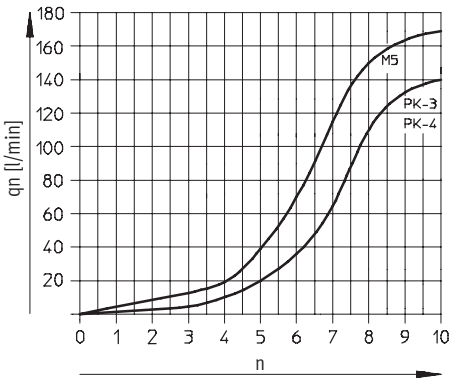
Standard nominal flow rate qnN at 6 bar → 5 as a function of turns of the adjusting screw n

Screw-in thread M5

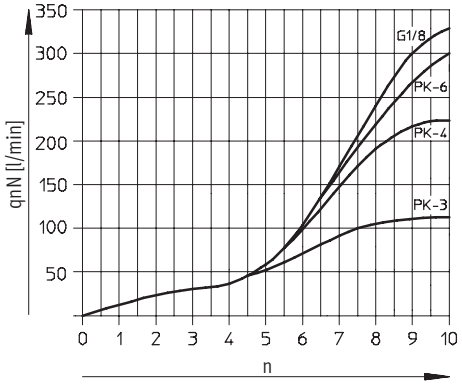


Standard flow rate qn at 6 bar → 0 bar as a function of turns of the adjusting screw n

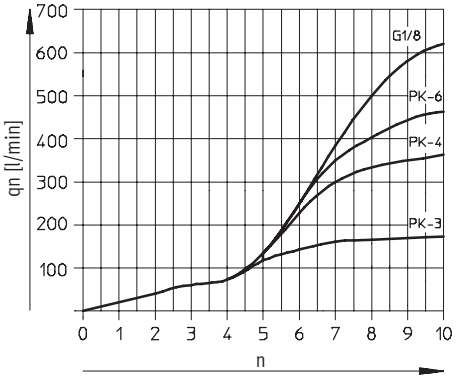
Screw-in thread M5



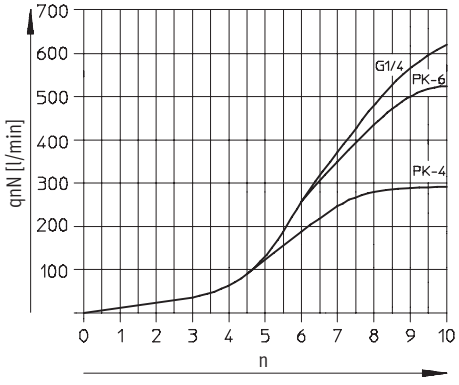
Screw-in thread G⅛



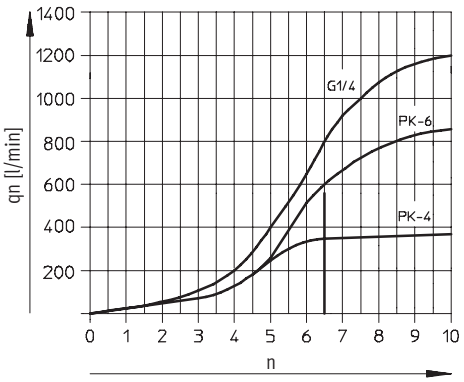
Screw-in thread G⅛



Screw-in thread G¼

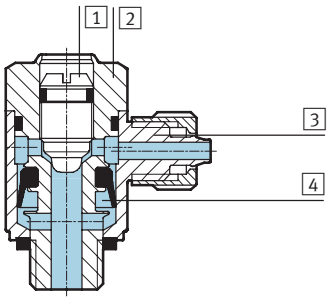


Screw-in thread G¼



Materials

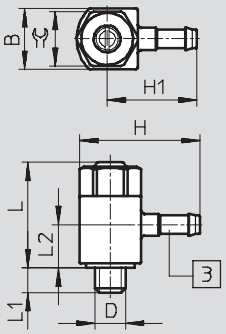
Sectional view



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

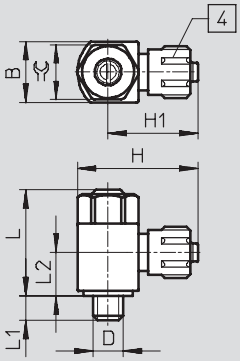
Dimensions

Slotted head screw, screw-in thread M5



3 Barbed fitting

Slotted head screw, screw-in thread G1⁄8, G1⁄4

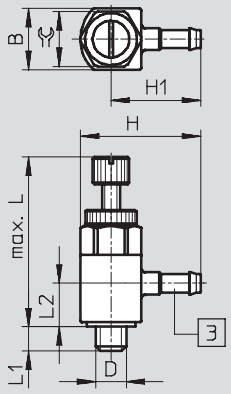


4 Union nut

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
G1⁄8	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
G1⁄4	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

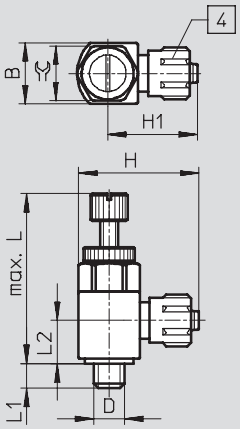
Dimensions

Knurled screw, screw-in thread M5



3 Barbed fitting

Knurled screw, screw-in thread G⅛, G¼



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
G⅛	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
G¼	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

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

FESTO

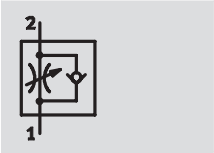
Ordering data					
Version[1]	Screw-in thread	For tubing I.D. [mm]	One-way flow control function for exhaust air Part No. Type	One-way flow control function for supply air Part No. Type	Flow control function acting at both sides Part No. Type
Barbed fitting, elbow outlet, slotted head screw					
	M5	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

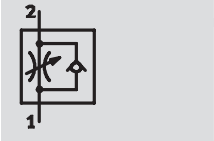
Technical data – Mini flow control valve with female thread

Function



One-way flow control for exhaust air
GRLA

Flow control acting at both sides
GRLO



One-way flow control for supply air
GRLZ

GRL...-M3

GRL...-M5-LF-C

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

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

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

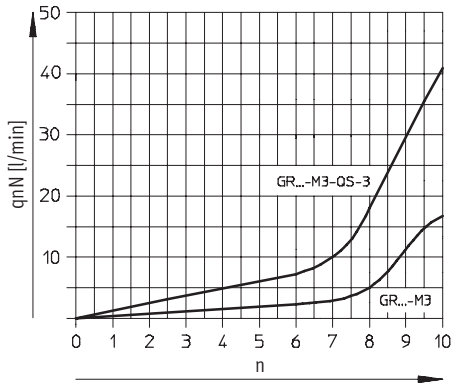
Weights [g]			
Screw-in thread		M3	M5
Product weight	[g]	2	7

Standard nominal flow rate qnN [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

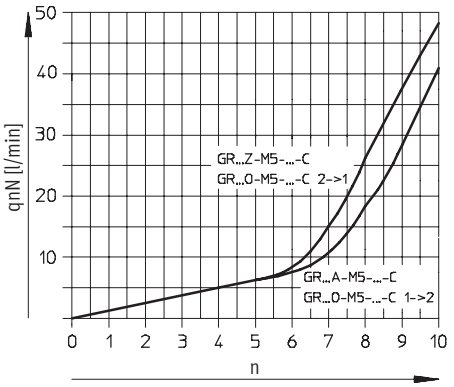
1) F: Flow control direction
2) N: Non-return direction

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

Screw-in thread M3

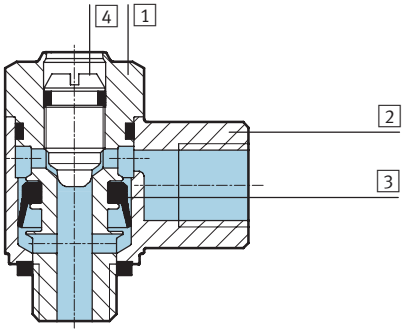


Screw-in thread M5



Materials

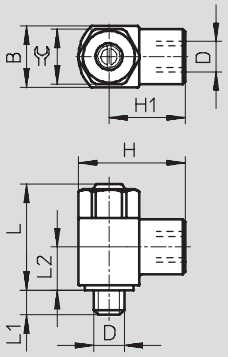
Sectional view



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

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

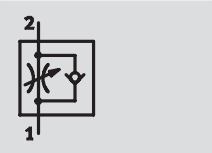
Ordering data

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

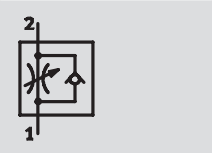
Technical data – Mini flow control valve with barbed fitting connection PK

Function



One-way flow control for exhaust air
GRLA

Flow control acting at both sides
GRLO



One-way flow control for supply air
GRLZ

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

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

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

Variants:
- Swivel joint, elbow outlet
- Swivel joint, parallel outlet

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

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

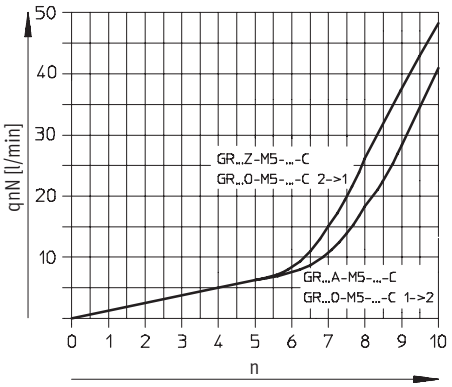
Weights [g]		
Screw-in thread		M5
Product weight	[g]	7

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

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

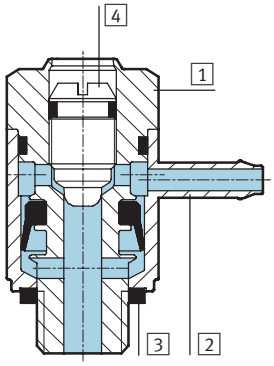
Standard nominal flow rate qnN at 6 bar ⇢ 5 bar as a function of turns of the adjusting screw n

Screw-in thread M5



Materials

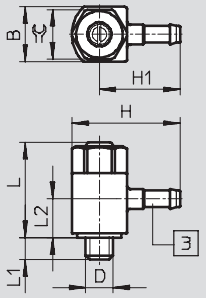
Sectional view



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

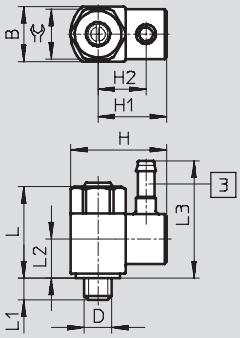
Dimensions

Swivel joint, elbow outlet



3 Barbed fitting

Swivel joint, parallel outlet



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

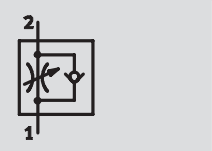
Ordering data

Version	Screw-in thread	For tubing I.D. [mm]	One-way flow control function for exhaust air Part No. Type	One-way flow control function for supply air Part No. Type	Flow control function acting at both sides 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

Function



One-way flow control for exhaust air
CRGRLA

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

CRGRLA-...-B

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

Note: This product conforms to ISO 1179-1 and to ISO 228-1

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

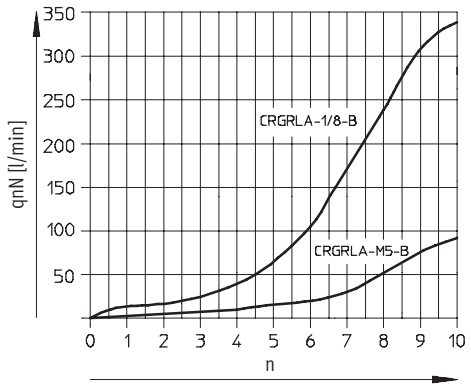
Weights [g]						
Screw-in thread		M5	G1/8	G1/4	G3/8	G1/2
		14	44	83	150	315

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

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

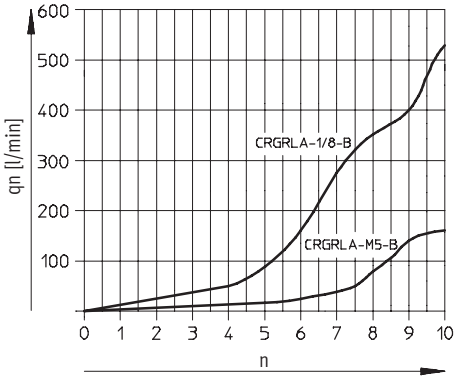
Standard nominal flow rate qnN at 6 bar ⇢ 5 bar as a function of turns of the adjusting screw n

Screw-in thread M5, G1⁄8

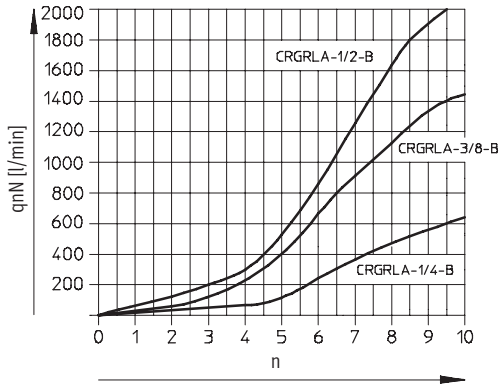


Standard flow rate qn at 6 bar ⇢ 0 bar as a function of turns of the adjusting screw n

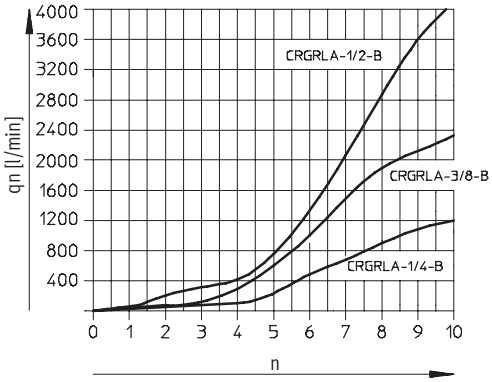
Screw-in thread M5, G1⁄8



Screw-in thread G1⁄4, G3⁄8, G1⁄2



Screw-in thread G1⁄4, G3⁄8, G1⁄2

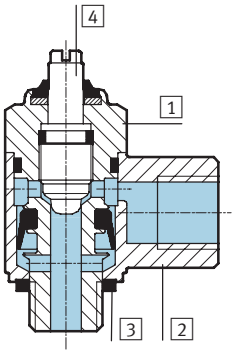


Flow control valves and one-way flow control valves

Technical data – Corrosion resistant flow control valve with female thread

Materials

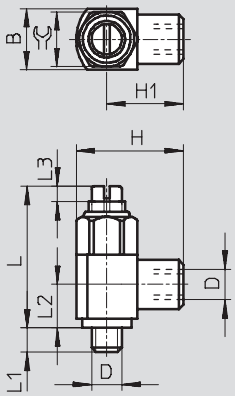
Sectional view



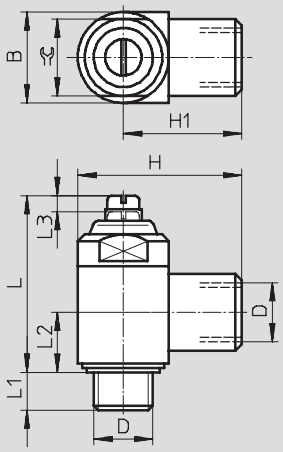
Flow control valve		
1	Threaded collar	High-alloy stainless steel
2	Swivel joint	High-alloy stainless steel
3	Seals	Fluorocaoutchouc, nitrile rubber
4	Regulating screw	High-alloy stainless steel

Dimensions

Screw-in thread M5



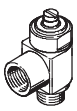
Screw-in thread G1/8, G1/4, G3/8, G1/2



Screw-in thread D	Connecting thread D	B	H	H1	L	L1	L2	L3	SW
M5	M5	10 –0.25	17.5 ±0.3	12.5	23.2	4	7.1	2.5	9
G1/8	G1/8	16 –0.4	28 +0.4/–0.3	20	33.7	5.5	10.3	3.5	14
G1/4	G1/4	20 –0.3	36 +0.4/–0.2	26	38.8	6.5	13.2	3.5	17
G3/8	G3/8	25 –0.3	41 +0.4/–0.2	28.5	48.5	7.5	15.4	5	22
G1/2	G1/2	32 –0.4	53 ±0.5	37	62.2	9	18.9	7.5	27

Note: This product conforms to ISO 1179-1 and to ISO 228-1

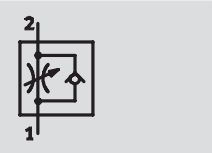
Ordering data

Version	Screw-in thread	Connecting thread	One-way flow control function for exhaust air Part No. Type
	M5	M5	**161 403 CRGRLA-M5-B**
	G1/8	G1/8	**161 404 CRGRLA-1/8-B**
	G1/4	G1/4	**161 405 CRGRLA-1/4-B**
	G3/8	G3/8	**161 406 CRGRLA-3/8-B**
	G1/2	G1/2	**161 407 CRGRLA-1/2-B**

Flow control valves and one-way flow control valves

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

GR-QS-...
GRO-QS-...

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

1) For standard O.D. tubing

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

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

Standard nominal flow rate qnN [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	–

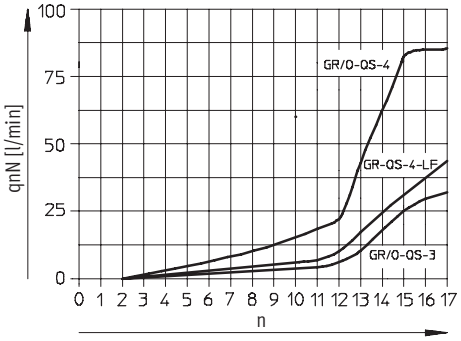
1) F: Flow control direction
2) N: Non-return direction

Standard flow rate qn [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

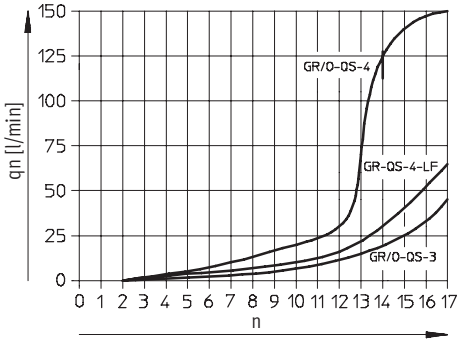
Standard nominal flow rate qnN at 6 bar ⇢ 5 bar as a function of turns of the adjusting screw n

Push-in connector QS-3/QS-4

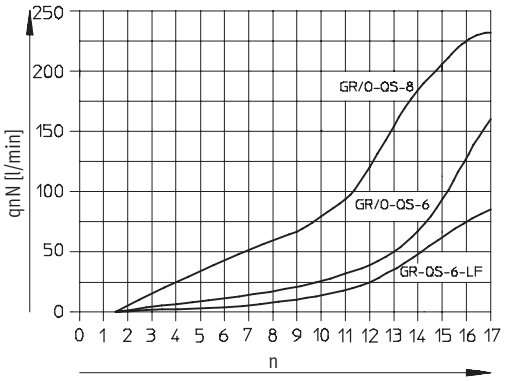


Standard flow rate qn at 6 bar ⇢ 0 bar as a function of turns of the adjusting screw n

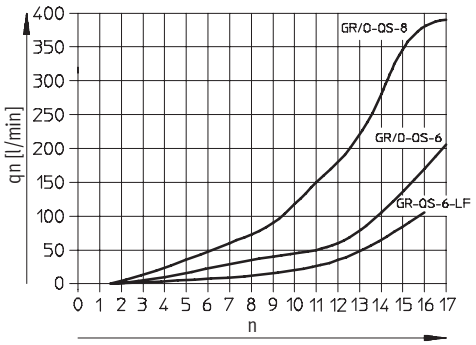
Push-in connector QS-3/QS-4



Push-in connector QS-6/QS-8



Push-in connector QS-6/QS-8

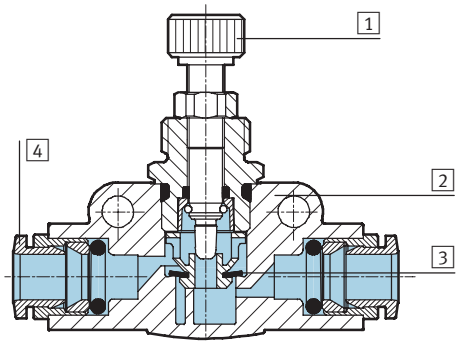


Flow control valves and one-way flow control valves

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

Materials

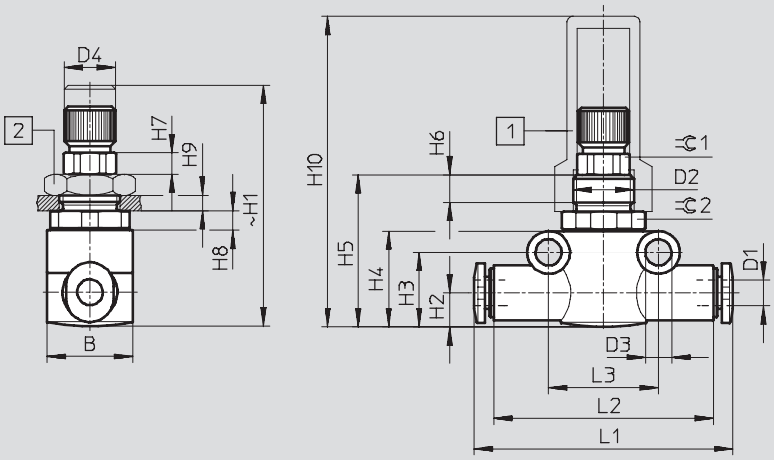
Sectional view



Flow control valve		
1	Regulating screw	Brass, nickel-plated
2	Housing	Reinforced PA
3	Seals	Nitrile rubber
4	Release ring	Polyacetal

Dimensions

Download CAD Data ➔ **www.festo.com/us/cad**



1 Cover cap GRK
2 Hex nut GRM

Push-in connector	Tubing O.D. D1	B	D2	D3 ∅ ±0.1	D4 ∅ –0.3	H1 min.	H1 max.	H2	H3	H4
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	⫧1	⫧2
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 Part No.	Type	Flow control function at both sides 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**	–	

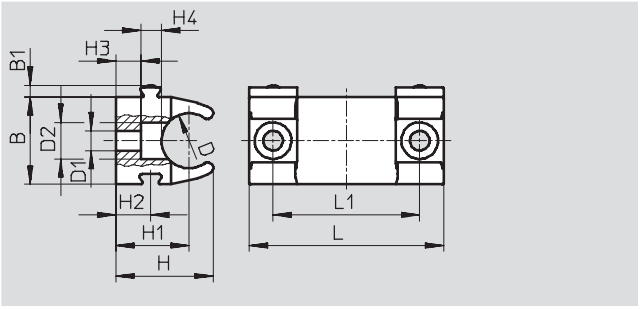
1) Low flow: Precision adjustment for low speed
Mid flow: Precision adjustment for average speed

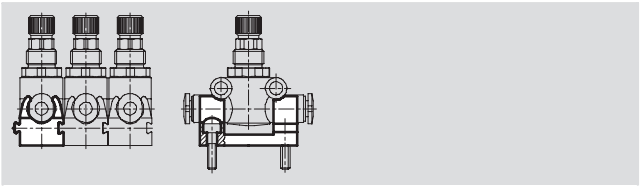
Retainer GR-H-QS

for front panel mounting

Materials: Polyacetal

GR-H-QS





Dimensions and ordering data								
For one-way flow control valve	B	B1	D ∅	D1 ∅	D2 ∅	H	H1	H2
Pneumatic connection QS-3/QS-4	14.3	1.9	9	3.2	6	16	12	5.7
Pneumatic connection QS-6/QS-8	19.8	1.9	14.5	3.2	6	19.2	13	5.7

For one-way flow control valve	H3	H4	L	L1	Product weight [g]	Part No.	Type
Pneumatic connection QS-3/QS-4	4.1	3.4	31.8	24	4	**195 495**	**GR-H-QS-3-4**
Pneumatic connection 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

Materials: Steel

GRM

Ordering data			
For one-way flow control valve	Brief description	Part No.	Type
Pneumatic connection QS-3/QS-4	Hex nut M10x1	**6 444**	**GRM-M5**
Pneumatic connection QS-6/QS-8	Hex nut M12x1	**2 107**	**GRM-⅛**

Cover cap GRK

Materials: Polypropylene

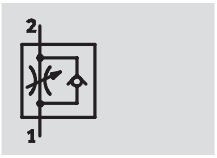
GRK

Ordering data			
For one-way flow control valve	Brief description	Part No.	Type
Pneumatic connection QS-3/QS-4	Cover cap	**6 436**	**GRK-M5**
Pneumatic connection QS-6/QS-8		**2 105**	**GRK-⅛**

Flow control valves and one-way flow control valves

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-¼-B

General technical data								
Connecting thread		M3	M5	G⅛	G¼	G⅜	G½	G¾
Valve function		One-way flow control function						
Setting component		Knurled screw						
Type of mounting		Through-hole						
		–	Front panel mounting					
Mounting position		Any						
Max. tightening torque	[Nm]	0.15	0.9	0.9	0.8	1	1.2	2

Note: This product conforms to ISO 1179-1 and to ISO 228-1

Operating and environmental conditions								
Connecting thread		M3	M5	G⅛	G¼	G⅜	G½	G¾
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

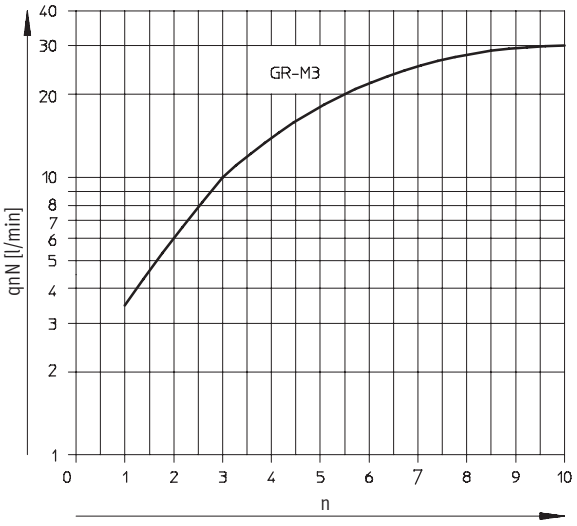
Weights [g]								
Connecting thread		M3	M5	G⅛	G¼	G⅜	G½	G¾
		2.5	21	34	180	225	517	1 100

Standard nominal flow rate qnN [l/min] at 6 bar ⇢ 5 bar								
Connecting thread		M3	M5	G⅛	G¼	G⅜	G½	G¾
	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

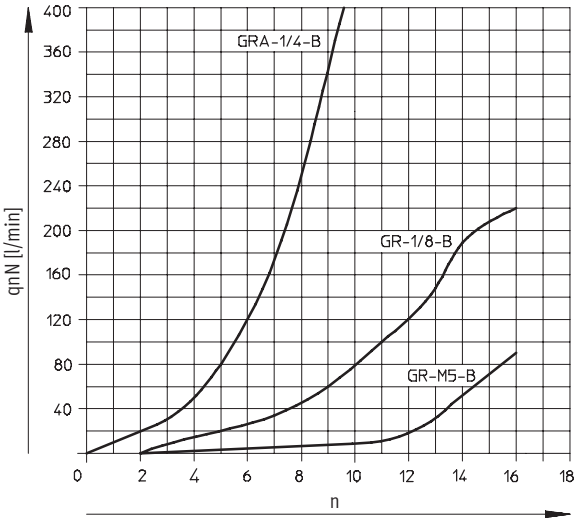
1) F: Flow control direction
2) N: Non-return direction

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

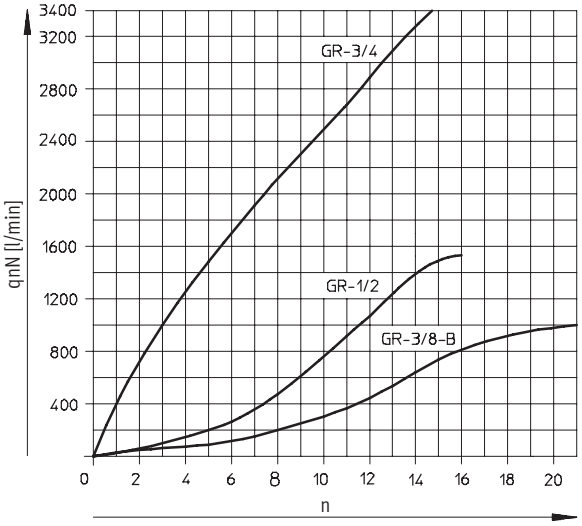
Connecting thread M3



Connecting thread M5, G1⁄8, G1⁄4

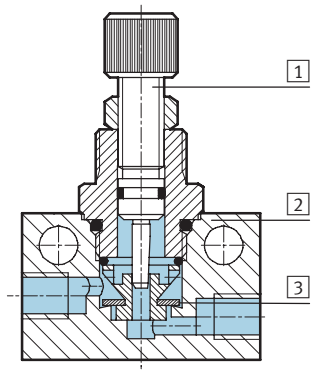


Connecting thread G3⁄8, G1⁄2, G3⁄4



Materials

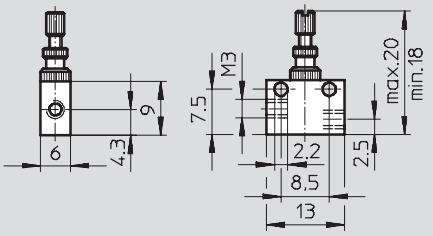
Sectional view



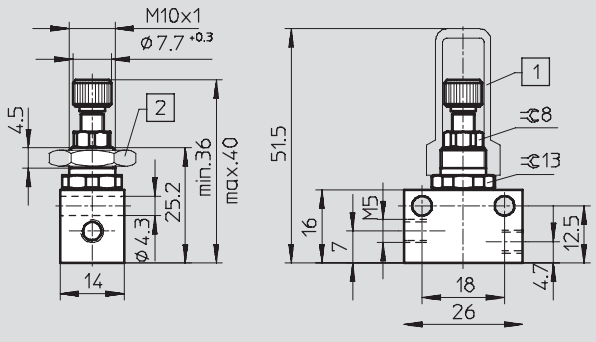
Connecting thread	M3	M5	G1⁄8	G1⁄4	G3⁄8	G1⁄2	G3⁄4
1 Regulating screw	Brass						
2 Housing	Wrought aluminium alloy			Die-cast zinc			Wrought aluminium alloy
3 Seal	NBR						

Dimensions

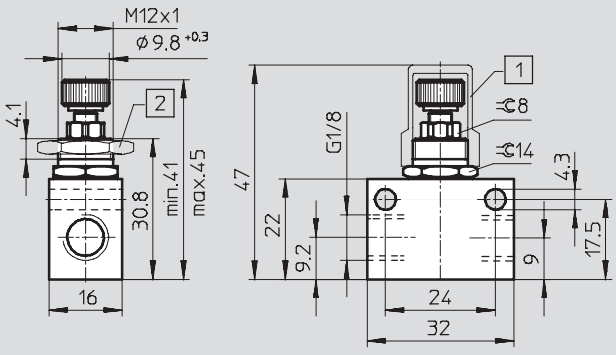
Connecting thread M3



Connecting thread M5



Connecting thread G1⁄8



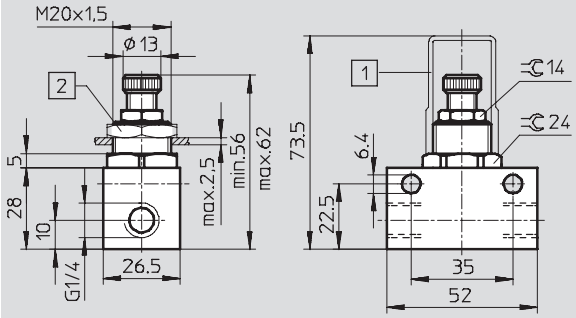
1 Cover cap GRK
2 Hex nut GRM

Flow control valves and one-way flow control valves

Technical data – Standard flow control valve with female thread

Dimensions

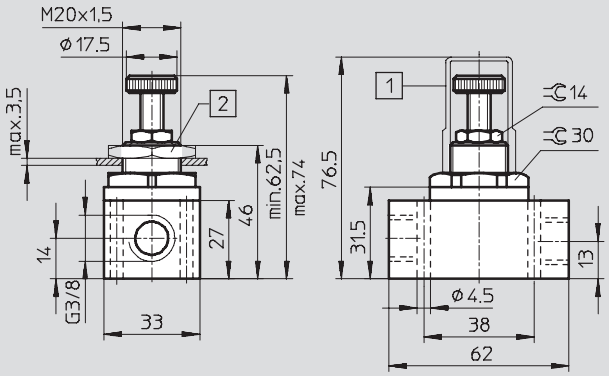
Connecting thread G¼



1 Cover cap GRK
2 Hex nut GRM

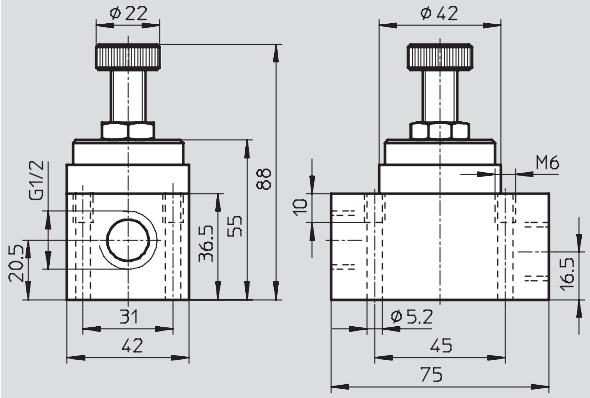
Note: This product conforms to ISO 1179-1 and to ISO 228-1

Connecting thread G⅜



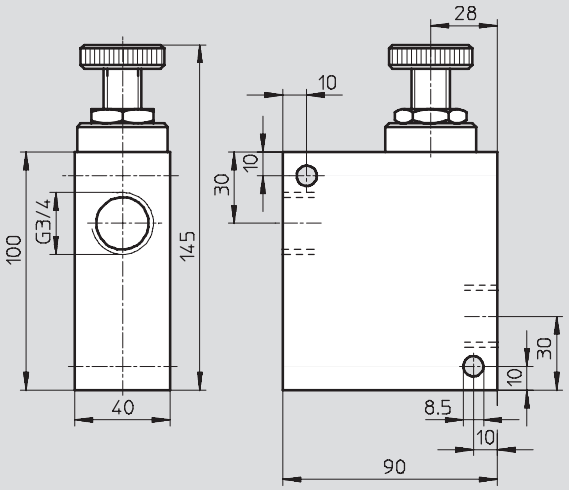
Note: This product conforms to ISO 1179-1 and to ISO 228-1

Connecting thread G½



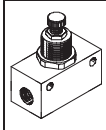
Note: This product conforms to ISO 1179-1 and to ISO 228-1

Connecting thread G¾



Note: This product conforms to ISO 1179-1 and to ISO 228-1

Ordering data

Version	Connecting thread	One-way flow control function	
		Part No.	Type
	M3	**15 899**	**GR-M3**
	M5	**151 213**	**GR-M5-B**
	G⅛	**151 215**	**GR-⅛-B**
	G¼	**6 509**	**GRA-¼-B**
	G⅜	**6 308**	**GR-⅜-B**
	G½	**3 720**	**GR-½**
	G¾	**2 103**	**GR-¾**

Hex nut GRM
for front panel mounting

Materials: Steel


GRM

Ordering data			
For one-way flow control valve	Brief description	Part No.	Type
Pneumatic connection M5	Hex nut M10x1	**6 444**	**GRM-M5**
Pneumatic connection G1⁄8	Hex nut M12x1	**2 107**	**GRM-1⁄8**
Pneumatic connection G1⁄4, G3⁄8	Hex nut M20x1.5	**204 596**	**GRM-3⁄8**

Cover cap GRK
Materials: Polypropylene


GRK

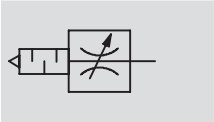
Ordering data			
For one-way flow control valve	Brief description	Part No.	Type
Pneumatic connection M5	Cover cap	**6 436**	**GRK-M5**
Pneumatic connection G1⁄8		**2 105**	**GRK-1⁄8**
Pneumatic connection G1⁄4, G3⁄8		**6 309**	**GRK-3⁄8-B**

Flow control valves and one-way flow control valves

Technical data – Flow control/silencer combinations

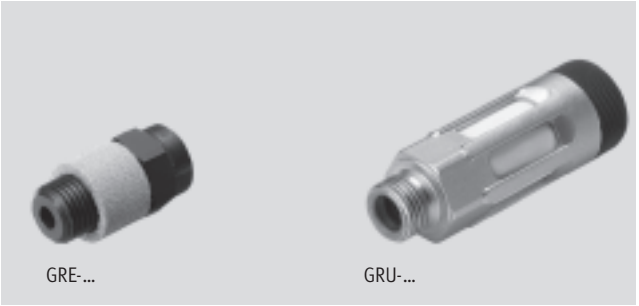
FESTO

Function



Flow control/silencer
GRE, GRU

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



GRE-...

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

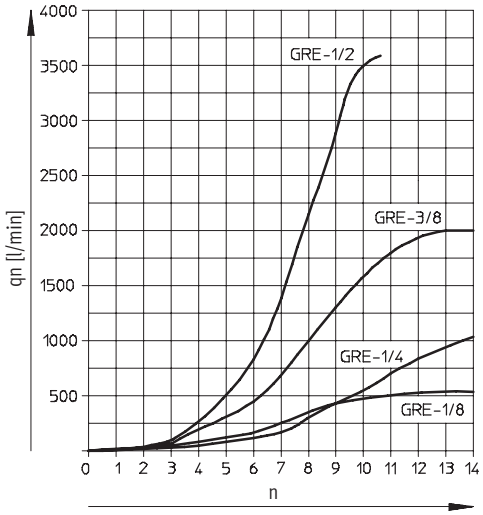
Operating and environmental conditions							
Screw-in thread			G1/8	G1/4	G3/8	G1/2	G3/4
Operating medium	GRE		Filtered compressed air, lubricated or unlubricated				
	GRU		Dried and filtered compressed air, lubricated or unlubricated				
Operating pressure		[bar]	0 ... 10				
Temperature of medium		[°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

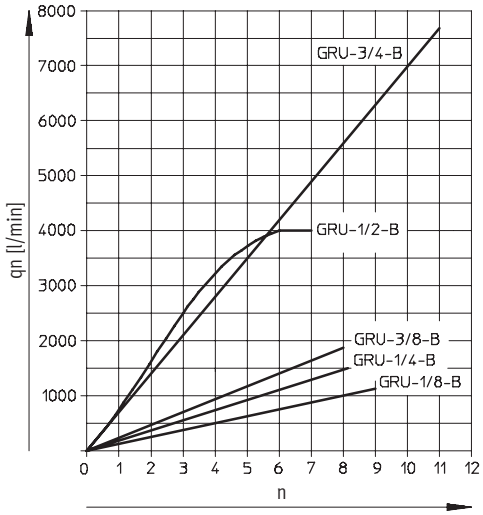
Standard flow rate qn [l/min] at 6 bar ⇢ 0 bar					
Female thread	G1/8	G1/4	G3/8	G1/2	G3/4
GRE	2 ... 520	2 ... 996	3 ... 2 000	3 ... 3 600	–
GRU	0 ... 1000	0 ... 1 500	0 ... 1 700	0 ... 4 000	0 ... 8 000

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

GRE

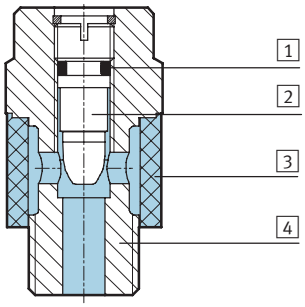


GRU

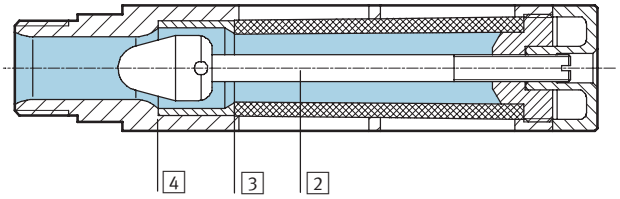


Materials

Sectional view GRE



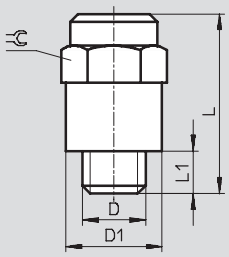
Sectional view GRU



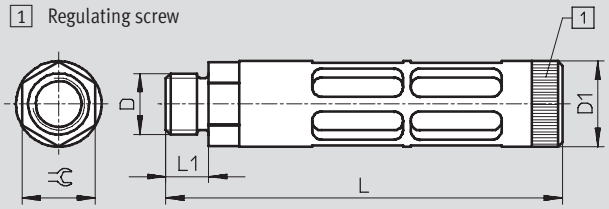
	Metal design GRE	Polymer design GRU
1 Seal	Nitrile rubber	–
2 Regulating screw	Brass	Polyacetal
3 Silencer	Bronze	Polyethylene
4 Housing	Wrought aluminium alloy	Die-cast aluminium
Note on materials	GRE-3/8: RoHS-compliant	–

Dimensions Download CAD Data ➔ **www.festo.com/us/cad**

Metal design GRE



Polymer design GRU



Screw-in thread D	D1 ∅	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

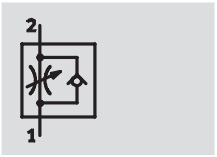
Ordering data

Version	G1/8 Part No.	Type	G1/4 Part No.	Type	G3/8 Part No.	Type	G1/2 Part No.	Type	G3/4 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

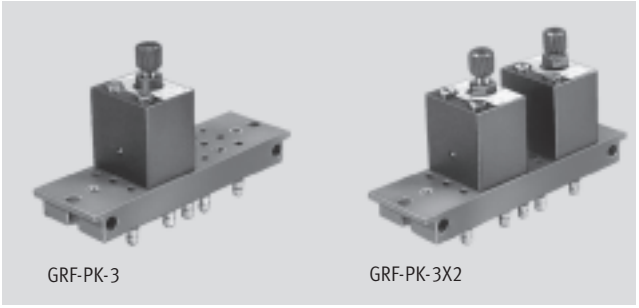
Technical data – Standard flow control valve for M5 compact system

Function



One-way flow control
GRF-PK

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



GRF-PK-3 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

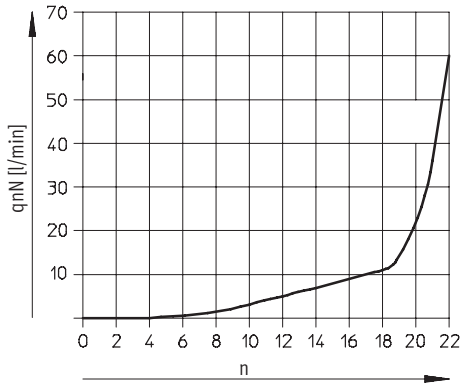
Operating and environmental conditions			
Type		GRF-PK-3	GRF-PK-3X2
Operating medium		Filtered compressed air, lubricated or unlubricated	
Operating pressure	[bar]	0.5 ... 8	
Temperature of medium	[°C]	–10 ... 60	
Ambient temperature	[°C]	–10 ... 60	

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

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

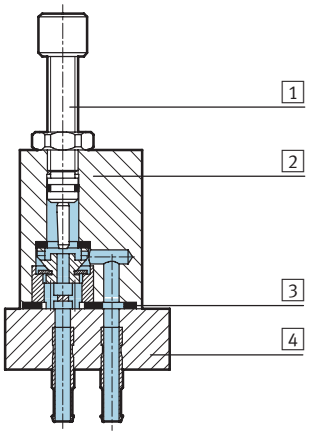
Standard nominal flow rate qnN [l/min] at 6 bar ⇢ 5 bar as a function of turns of the adjusting screw n

GRF



Materials

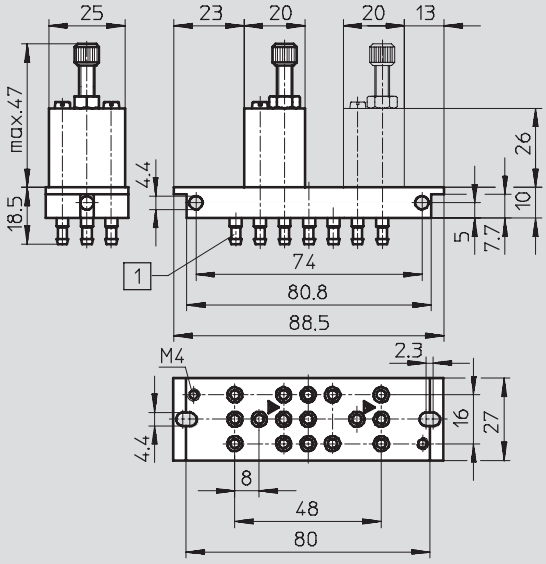
Sectional view



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

Dimensions

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



1 Barbed fitting PK-3

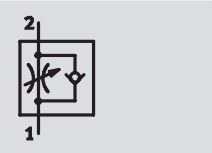
Ordering data

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

Flow control and one-way flow control valves

Technical data – Precision flow control valve on sub-base

Function



One-way flow control valve
GRP

Flow control valve, operative in both directions
GRPO

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

General technical data			
Type		GRP/GRPO-70-⅛-AL	GRP/GRPO-160-⅛-AL
Valve function	GRP	One-way flow control function	
	GRPO	Bi-directional flow control function	
Pneumatic connection		G⅛	
Means of setting		Rotary knob	
Type of mounting		On sub-base	
Installation position		Any	
Type of actuation		Manual	

Note: This product conforms to ISO 1179-1 and to ISO 228-1

Operating and environmental conditions			
Type		GRP/GRPO-70-⅛-AL	GRP/GRPO-160-⅛-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	

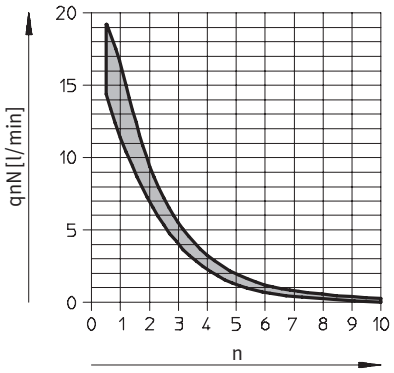
Weight [g]		
Type	GRP/GRPO-70-⅛-AL	GRP/GRPO-160-⅛-AL
	110	110

Standard flow rate qn [l/min] 1 bar ⇢ 0 bar			
Type		GRP/GRPO-70-⅛-AL	GRP/GRPO-160-⅛-AL
GRP	D[1)]	0 ... 19	0 ... 38
	R[2)]	20 ... 60	25 ... 90
GRPO	D[1)]	0 ... 19	0 ... 38

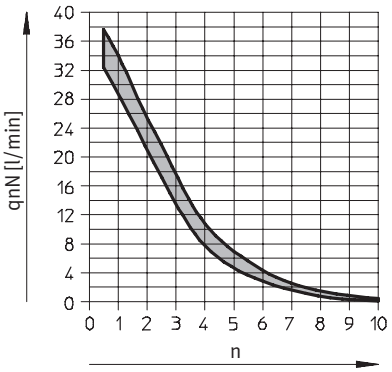
1) D: Flow control direction
2) R: Non-return direction

Standard flow rate qn [l/min] 1 bar → 0 bar as a function of turns of the adjusting screw n

GRP/GRPO-70-⅛-AL

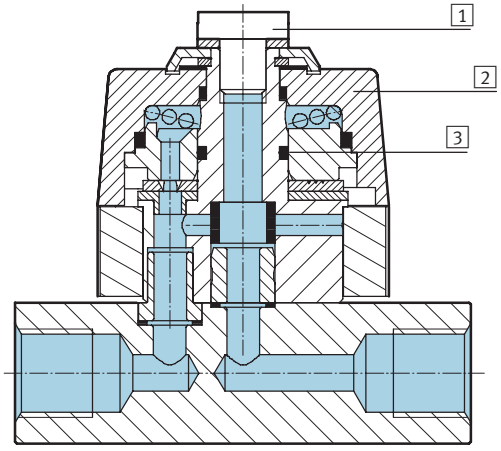


GRP/GRPO-160-⅛-AL



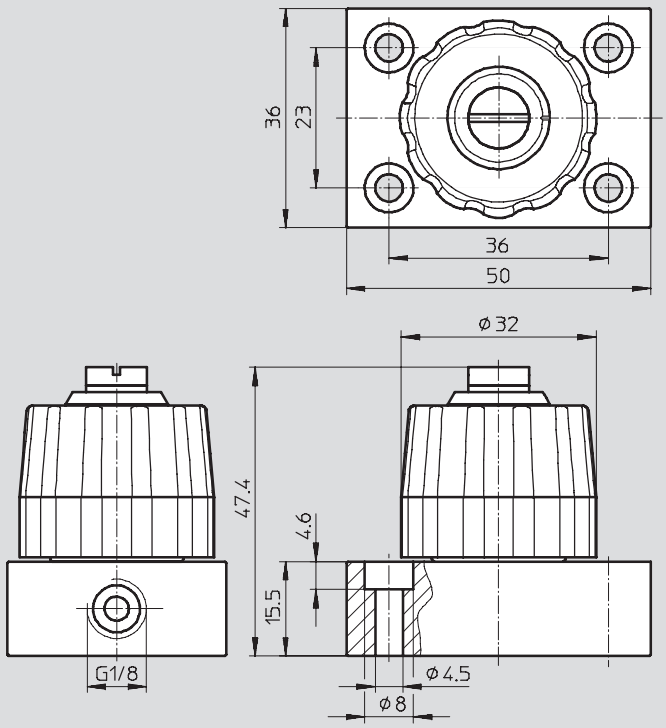
Materials

Sectional view



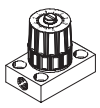
Flow control valve		
1	Locking screw	Brass
2	Rotary knob	Reinforced polyamide
3	Seals	Nitrile rubber

Dimensions Download CAD Data ➔ **www.festo.com/us/cad**



Note: This product conforms to ISO 1179-1 and to ISO 228-1

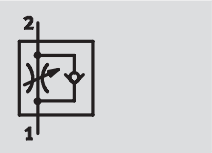
Ordering data

Version	One-way flow control valve		Bi-directional flow control valve	
	Part No.	Type	Part No.	Type
	**542 022**	**GRP-70-⅛-AL**	**542 024**	**GRPO-70-⅛-AL**
	542 023	**GRP-160-⅛-AL**	**542 025**	**GRPO-160-⅛-AL**

Flow control and one-way flow control valves

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

GRP/GRPO...

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

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

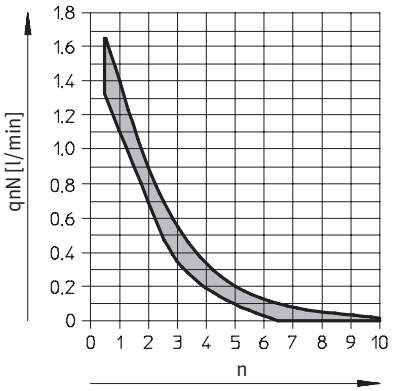
Weight [g]			
Type	GRP/GRPO-10-PK-3	GRP/GRPO-70-PK-3	GRP/GRPO-160-PK-4
	48	48	48

Standard flow rate qn [l/min] 1 bar ⇢ 0 bar				
Type		GRP/GRPO-10-PK-3	GRP/GRPO-70-PK-3	GRP/GRPO-160-PK-4
GRP	D[1)]	0 ... 1.7	0 ... 19	0 ... 38
	R[2)]	15 ... 50	20 ... 60	25 ... 90
GRPO	D[1)]	0 ... 1.7	0 ... 19	0 ... 38

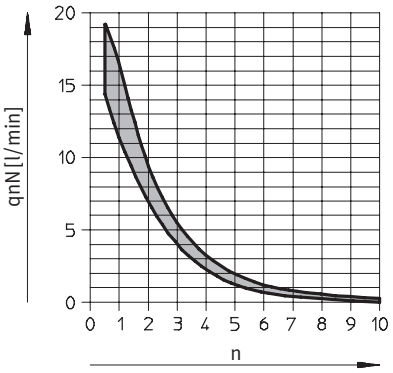
1) D: Flow control direction
2) R: Non-return direction

Standard flow rate qn [l/min] 1 bar ⇢ 0 bar as a function of turns of the adjusting screw n

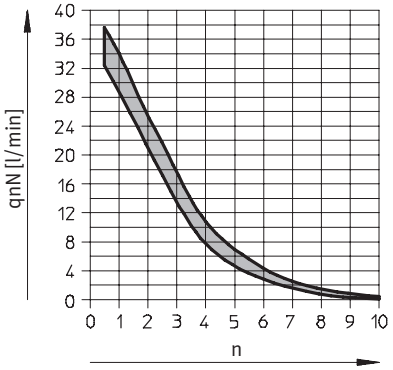
GRP/GRPO-10-PK-3



GRP/GRPO-70-PK-3

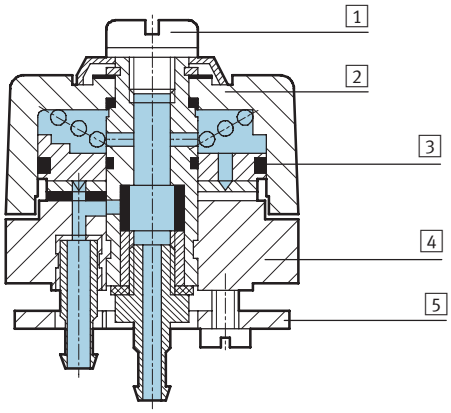


GRP/GRPO-160-PK-4



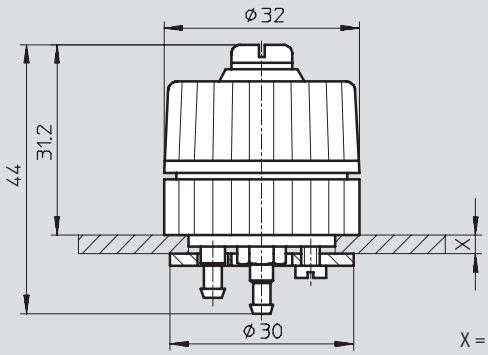
Materials

Sectional view



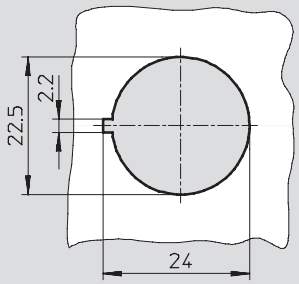
Flow control valve	
1 Locking screw	Brass
2 Rotary knob	Reinforced polyamide
3 Seals	Nitrile rubber
4 Back plate	Wrought aluminium alloy
5 Mounting plate	Wrought aluminium alloy

Dimensions Download CAD Data ➔ **www.festo.com/us/cad**

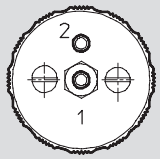


X = 1.5 ... 10 mm

Mounting aperture



Ports



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

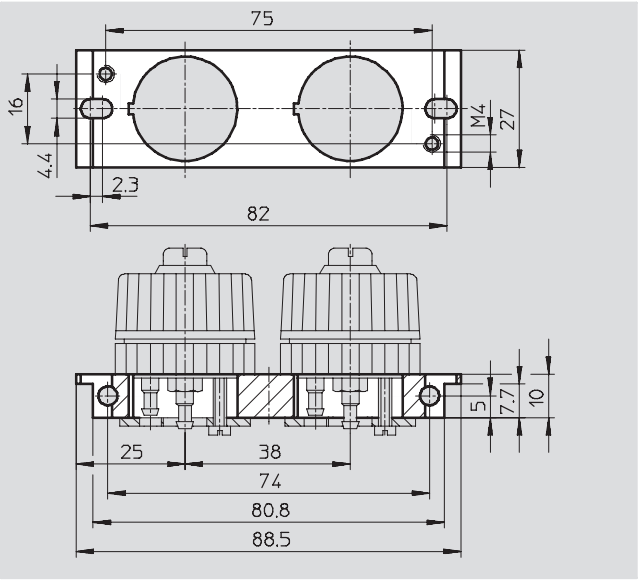
Ordering data

Version	For tubing I.D. [mm]	One-way flow control function Part No.	Type	Bi-directional flow control function 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**

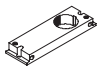
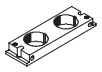
Mounting plate APL-2N-GRP
for precision flow control valves

Material:
Polyamide

APL-2N-GRPX2



Ordering data

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

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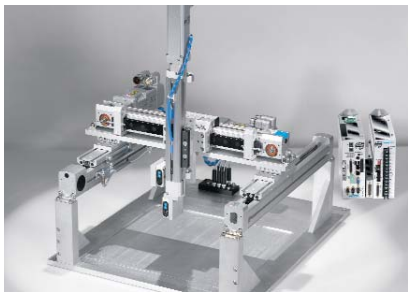

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