One-way flow control valves

FESTO

One-way flow control valves

Key features

Function

Flow control or one-way flow control valves regulate the piston speed of pneumatic drives during advance and return strokes. This is done through suitable restriction of the flow rate of compressed air in exhaust air or supply air direction. With the one-way flow control valve GRLA or GRLZ, the flow control function works in one direction only (exhaust air or supply air); the non-return function works in the opposite direction. With the flow control valve GRLO, the flow control function is active in both directions.

The flow control function creates an adjustable annular gap inside the valve. This gap can be increased or decreased by turning the knurled screw or slotted head screw. The required restriction can be set with the help of this adjustment component.

Note

The documentation for the flow control valves can be found at
➔ www.festo.com/catalogue

General information

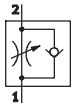
Standard nominal flow rate qnN

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

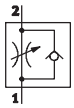
Standard flow rate qn

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

Exhaust air one-way flow control function

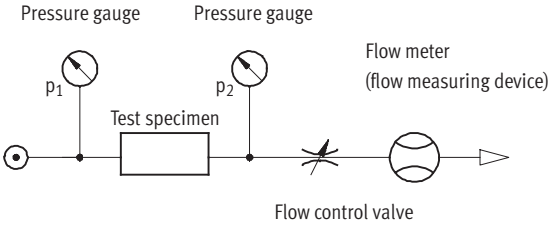


Supply air one-way flow control function

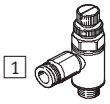


Flow control function in both directions

Flow measurement circuit



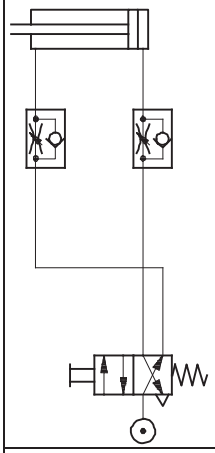
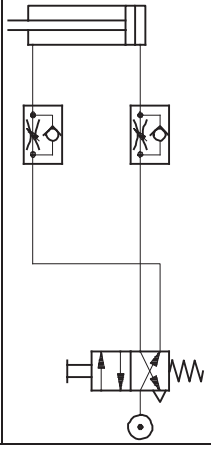
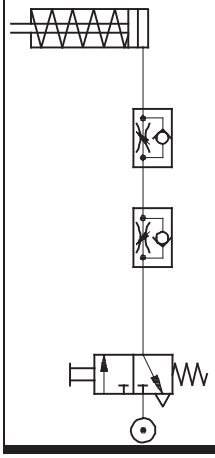
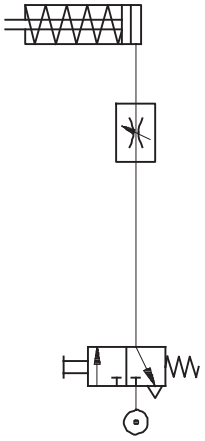
p_1 Operating pressure
p_2 Output pressure

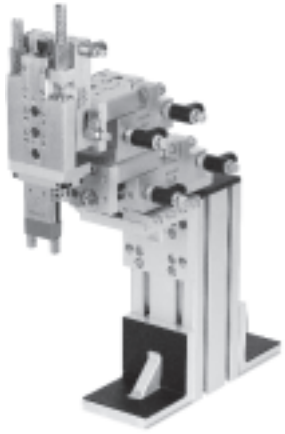
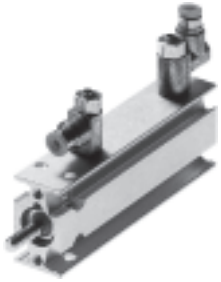


1 Supply port (pneumatic connection 1)
2 Working line (pneumatic connection 2)

One-way flow control valves

Key features

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

Application examples		
Mini slide SLT with one-way flow control valve, standard	Flat cylinder DZF with one-way flow control valve, mini	Multimount cylinder DMM with one-way flow control valve, mini
		

One-way flow control valves

Product range overview

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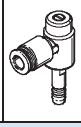
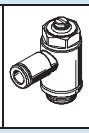
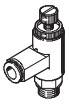
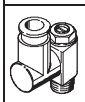
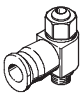
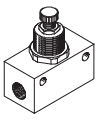
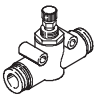
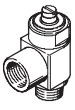
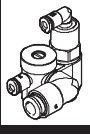
Version	Valve function	Version	Type	Connection direction	Pneumatic connection 1	Pneumatic connection 2	qnN[1] [l/min]	Adjustment component	➔ Page/ Internet
Standard	**Metal**								
	Exhaust air one-way flow control function		GRLA	Elbow outlet	QS-3, QS-4, QS-6, QS-8, QS-10, QS-12	M5, G1⁄8, G1⁄4, G3⁄8, G1⁄2	100 ... 1,580	Slotted head screw Knurled screw	8
					M5, G1⁄8, G1⁄4, G3⁄8, G1⁄2, G3⁄4	M5, G1⁄8, G1⁄4, G3⁄8, G1⁄2, G3⁄4	95 ... 4,320	Slotted head screw	16
					M5, G1⁄8, G1⁄4	M5, G1⁄8, G1⁄4	95 ... 610	Knurled screw	
					PK-3, PK-4, PK-6	M5, G1⁄8, G1⁄4	83 ... 540	Slotted head screw	16
			GRLSA	Elbow outlet	QS-6, QS-8	G1⁄8, G1⁄4	0 ... 450	Rotary knob with scale, internal hex	24
	Supply air one-way flow control function		GRLZ	Elbow outlet	QS-3, QS-4, QS-6, QS-8	M5, G1⁄8	100 ... 215	Slotted head screw	8
					M5, G1⁄8, G1⁄4	M5, G1⁄8, G1⁄4	95 ... 610	Slotted head screw Knurled screw	16
					PK-3, PK-4, PK-6	M5, G1⁄8, G1⁄4	83 ... 540	Slotted head screw	16
			VFOC-S	Elbow outlet	QS-4, QS-6	Push-in sleeve[2] QS-4, QS-6	100 ... 270	Slotted head screw	27
	Chromed metal								
	Exhaust air one-way flow control function		GRLA-F	Elbow outlet	QS-4, QS-6, QS-8	G1⁄8, G1⁄4	180 ... 530	Slotted head screw	29
	Polymer								
	Exhaust air one-way flow control function		GRLA	Elbow outlet	QS-6, QS-8	G1⁄8, G1⁄4, G3⁄8	520 ... 650	Knurled screw	32

1) Standard nominal flow rate in direction of flow control.
2) Only suitable for push-in connector QS.

One-way flow control valves

Product range overview

Version	Valve function	Version	Type	Connection direction	Pneumatic connection 1	Pneumatic connection 2	qnN[1)] [l/min]	Adjustment component	→ Page/ Internet
Mini	**Metal**								
	Exhaust air one-way flow control function		GRLA	Elbow outlet	QS-3, QS-4	M3, M5	40 ... 41	Slotted head screw	35
					M3	M3	0 ... 18	Slotted head screw	39
			GRGA	Parallel outlet	QS-3	M3	0 ... 41	Slotted head screw	35
	Supply air one-way flow control function		GRLZ	Elbow outlet	QS-3, QS-4	M3, M5	41 ... 48	Slotted head screw	35
					M3	M3	0 ... 18	Slotted head screw	39
			GRGZ	Parallel outlet	QS-3	M3	0 ... 41	Slotted head screw	35
In-line installation	**Metal**								
	One-way flow control function		GR/GRA	Inline	M3, M5, G1⁄8, G1⁄4, G3⁄8, G1⁄2, G3⁄4	M3, M5, G1⁄8, G1⁄4, G3⁄8, G1⁄2, G3⁄4	29.5 ... 3,300	Knurled screw	gr
	Polymer								
	One-way flow control function		GR	Inline	QS-3, QS-4, QS-6, QS-8	QS-3, QS-4, QS-6, QS-8	25 ... 225	Knurled screw	gr
Corrosion-resistant	**Stainless steel**								
	Exhaust air one-way flow control function		CRGRLA	Elbow outlet	M5, G1⁄8, G1⁄4, G3⁄8, G1⁄2	M5, G1⁄8, G1⁄4, G3⁄8, G1⁄2	95 ... 2,100	Slotted head screw	43
Function combination	**Metal**								
	Exhaust air one-way flow control function		GRXA	–	QS-4, QS-6, QS-8	G1⁄8, G1⁄4	130 ... 280	Slotted head screw	47

1) Standard nominal flow rate in direction of flow control.

One-way flow control valves

Type codes

GRLA/GRLSA/GRLA-F/GRGA/CRGRLA/GRLZ/GRGZ

GRLA – ⅛ – QS – 6 – [ ] – [ ] – D

Type	
Exhaust air one-way flow control function	
GRLA	One-way flow control valve, elbow outlet
GRLSA	One-way flow control valve, elbow outlet with rotary knob
GRLA-F	One-way flow control valve, elbow outlet, chromed metal
GRGA	One-way flow control valve, parallel outlet
CRGRLA	One-way flow control valve, elbow outlet, corrosion-resistant
GRXA-HG	One-way flow control valve, function combination
Supply air one-way flow control function	
GRLZ	One-way flow control valve, elbow outlet
GRGZ	One-way flow control valve, parallel outlet

Pneumatic connection 2	
M3, M5, ⅛, ¼, ⅜, ½, ¾	Male thread

Pneumatic connection 1	
Connection type	
–	Female thread (connection size as for connection 2)
QS	Push-in connector QS
PK	Barbed connector
Tubing O.D. or tubing I.D.	
3, 4, 6, 8, 10, 12	Tubing O.D. with push-in connector QS
3, 4, 6	Tubing I.D. with barbed connector PK

Adjustment component	
–	Slotted head screw
RS	Knurled screw

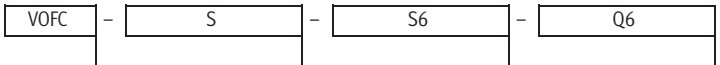
Flow rate characteristic	
LF	Low flow
MF	Medium flow

Generation	
B	B series
C	C series
D	D series

One-way flow control valves

Type codes

VOFC



Type	
VOFC	One-way flow control valve, elbow outlet

Valve function	
S	Supply air one-way flow control function

Pneumatic connection 2	
S4	Push-in sleeve QS-4
S6	Push-in sleeve QS-6

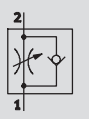
Pneumatic connection 1	
Q4	Push-in connector QS-4
Q6	Push-in connector QS-6

One-way flow control valves GRLA/GRLZ, standard

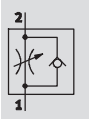
Technical data – Push-in connector QS, metal

One-way flow control function

Exhaust air



Supply air



Flow rate

100 ... 1,580 l/min

Temperature range

–10 ... +60 °C

Pressure

0.2 ... 10 bar

- Can be swivelled 360° around the screw-in axis after mounting

GRLA/GRLZ GRLA-...-RS

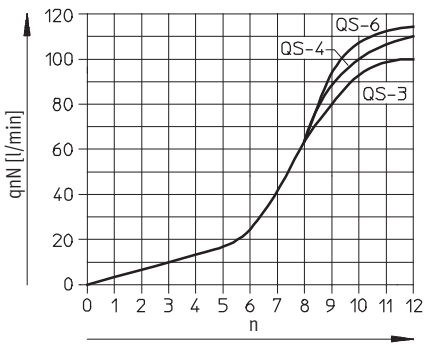
General technical data – GRLA						
Valve function		Exhaust air one-way flow control function				
Pneumatic connection 2		M5	G1⁄8	G1⁄4	G3⁄8	G1⁄2
Pneumatic connection 1		QS-3, QS-4, QS-6	QS-3, QS-4, QS-6, QS-8	QS-6, QS-8, QS-10	QS-6, QS-8, QS-10	QS-12
Adjustment component		Slotted head screw				
		Knurled screw				
Type of mounting		Screw-in, via male thread				
Mounting position		Any				
Max. tightening torque	[Nm]	1.5	5	11	15	18

General technical data – GRLZ			
Valve function		Supply air one-way flow control function	
Pneumatic connection 2		M5	G1⁄8
Pneumatic connection 1		QS-3, QS-4, QS-6	QS-3, QS-4, QS-6, QS-8
Adjustment component		Slotted head screw	
Type of mounting		Screw-in, via male thread	
Mounting position		Any	
Max. tightening torque	[Nm]	1.5	5

Operating and environmental conditions		
Operating pressure	[bar]	0.2 ... 10
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Operation with lubricated medium possible (in which case lubricated operation will always be required)
Ambient temperature	[°C]	–10 ... +60
Temperature of medium	[°C]	–10 ... +60
Storage temperature	[°C]	–10 ... +40
Certification		Germanischer Lloyd

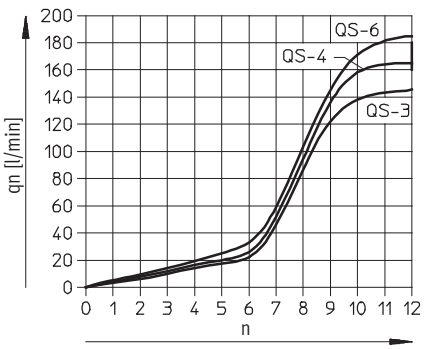
Standard nominal flow rate qnN at 6 → 5 bar as a function of turns of the adjusting screw n

GRLA/GRLZ-M5



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

GRLA/GRLZ-M5

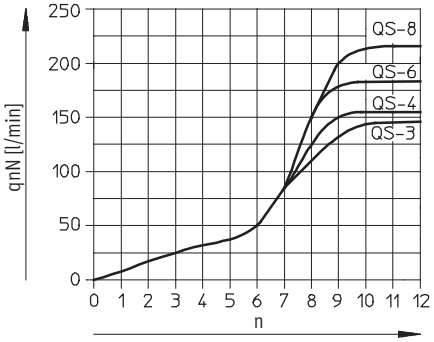


One-way flow control valves GRLA/GRLZ, standard

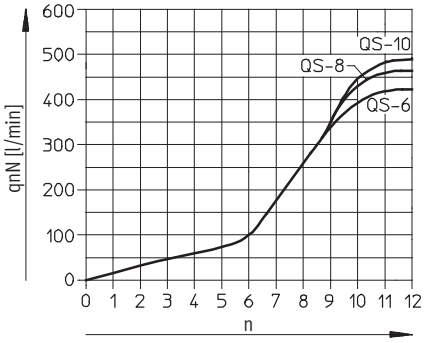
Technical data – Push-in connector QS, metal

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

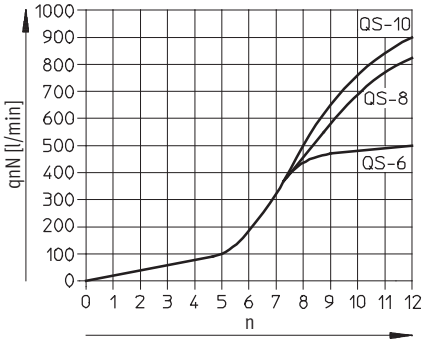
GRLA/GRLZ-1/8



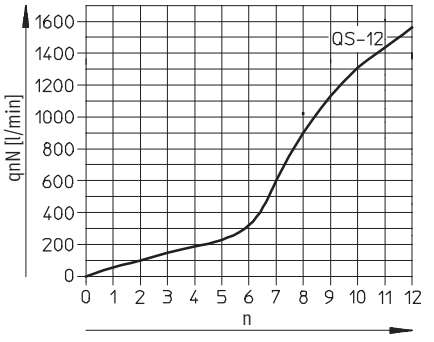
GRLA-1/8-...-MF/GRLA-1/4



GRLA-3/8

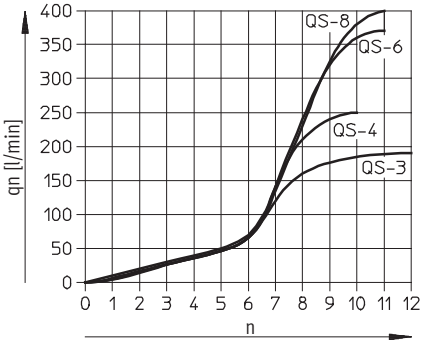


GRLA-1/2

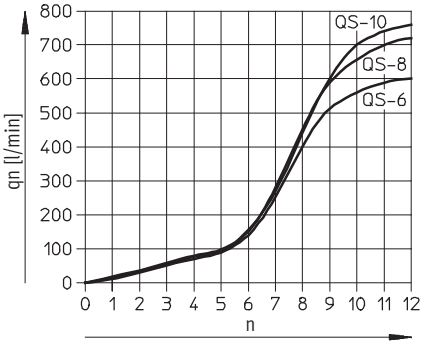


Standard flow rate qn at 6 → 0 bar as a function of turns of the adjusting screw n

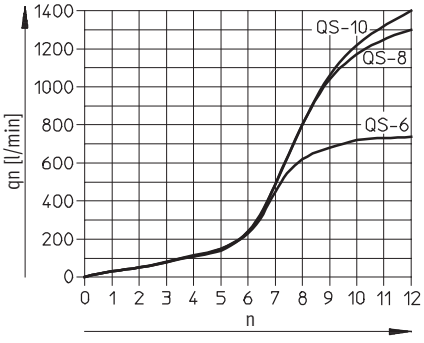
GRLA/GRLZ-1/8



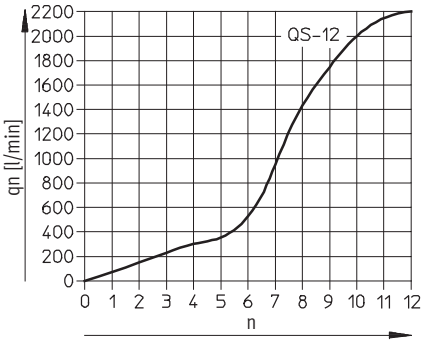
GRLA-1/8-...-MF/GRLA-1/4



GRLA-3/8



GRLA-1/2

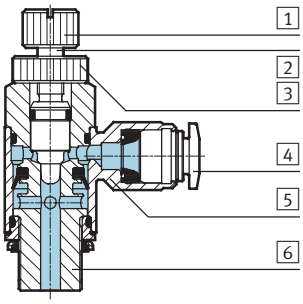


One-way flow control valves GRLA/GRLZ, standard

Technical data – Push-in connector QS, metal

Materials

Sectional view

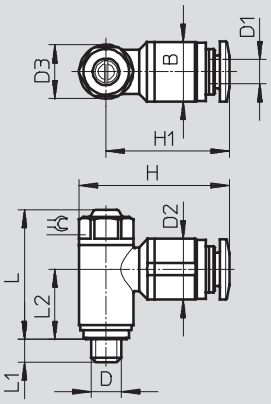


One-way flow control valve		
1	Knurled head (only GRLA-...-RS)	Anodised wrought aluminium alloy
2	Adjusting screw	Brass
3	Hollow bolt (only GRLA-...-RS)	Anodised wrought aluminium alloy
4	Releasing ring	POM
5	Swivel connection	Die-cast zinc, chromed
6	Threaded plug	Wrought aluminium alloy GRLA/GRLZ-M5: Brass
–	Seals	NBR
Note on materials		RoHS-compliant

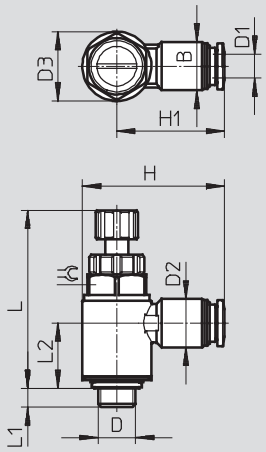
Dimensions

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

Slotted head screw



Knurled screw



Type	Connection D	Tubing O.D. D1	B	D2 ∅	D3 ∅	H	H1	Lmax. Slotted head screw	Lmax. Knurled screw	L1	L2	⫷
GRL...-M5	M5	3	8.9	8.2 +0.15	8.9 ±0.07	22.4	18	21.4	31.3	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	
GRL...-⅛	G⅛	3	13.8	10.2 ±0.2	13.8 ±0.07	31.9	25	26.9	40.4	5.1 +0.17/–0.25	14.4	12
		4		10.2 ±0.2		29.4	22.5					
		6		12.5 ±0.2		32.6	25.7				13.7	
		8		14.5 ±0.2		35.6	28.7					12
GRLA-⅛-...-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					
GRLA-¼	G¼	6	17.8	12.5 ±0.2	17.8 ±0.15	36.6	27.7	31.5	48.3	5.9 +0.17/–0.25	17.2	15
		8		14.5 ±0.2			30.7					
		10		17.5 ±0.2		42.0	33.1				16.1	
GRLA-⅜	G⅜	6	22.4	12.5 ±0.2	22.4 ±0.15	39.8	28.6	36.0	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					
GRLA-½	G½	12	27.8	20.5 ±0.15	27.8 ±0.15	55.3	41.4	42.3	65.7	8.15 +0.15/–0.3	23.0	24

One-way flow control valves GRLA/GRLZ, standard

Technical data – Push-in connector QS, metal

Ordering data – Exhaust air one-way flow control function

	Pneumatic connection		Standard nominal flow rate qnN at 6 → 5 bar		Standard flow rate qn at 6 → 0 bar		Weight	Part No.	Type
			in direction of flow control	in non-return direction	in direction of flow control	in non-return direction			
	2	1	[l/min]	[l/min]	[l/min]	[l/min]	[g]		
Slotted head screw									
	M5	QS-3	100	60 … 100	145	150 … 170	13	**193137**	**GRLA-M5-QS-3-D**
		QS-4	110	65 … 110	165	140 … 160		**193138**	**GRLA-M5-QS-4-D**
		QS-6	115	70 … 110	185	145 … 170		**193139**	**GRLA-M5-QS-6-D**
	G1/8	QS-3	130	100 … 130	180	200 … 220	22	**193142**	**GRLA-1/8-QS-3-D**
		QS-4	160	120 … 190	250	270 … 300		**193143**	**GRLA-1/8-QS-4-D**
		QS-6	185	160 … 240	370	330 … 390		**193144**	**GRLA-1/8-QS-6-D**
			400	290 … 420	600	570 … 680	32	**537075**	**GRLA-1/8-QS-6-MF-D**
		QS-8	215	175 … 250	400	330 … 410	22	**193145**	**GRLA-1/8-QS-8-D**
			475	325 … 500	720	610 … 760	32	**537076**	**GRLA-1/8-QS-8-MF-D**
	G1/4	QS-6	400	290 … 420	600	570 … 680	42	**193146**	**GRLA-1/4-QS-6-D**
		QS-8	475	325 … 500	720	610 … 760		**193147**	**GRLA-1/4-QS-8-D**
		QS-10	480	345 … 500	760	630 … 790		**193148**	**GRLA-1/4-QS-10-D**
	G3/8	QS-6	495	320 … 495	740	840 … 890	60	**193149**	**GRLA-3/8-QS-6-D**
		QS-8	820	450 … 850	1,300	1,080 … 1,420		**193150**	**GRLA-3/8-QS-8-D**
		QS-10	900	540 … 975	1,400	1,160 … 1,620		**193151**	**GRLA-3/8-QS-10-D**
	G1/2	QS-12	1,580	925 … 1,605	2,220	1,910 … 2,500	106	**193152**	**GRLA-1/2-QS-12-D**
Knurled screw									
	M5	QS-3	100	60 … 100	145	150 … 170	14	**197576**	**GRLA-M5-QS-3-RS-D**
		QS-4	110	65 … 110	165	140 … 160		**197577**	**GRLA-M5-QS-4-RS-D**
		QS-6	115	70 … 110	185	145 … 170		**197578**	**GRLA-M5-QS-6-RS-D**
	G1/8	QS-3	130	100 … 130	180	200 … 220	23	**197579**	**GRLA-1/8-QS-3-RS-D**
		QS-4	160	120 … 190	250	270 … 300		**197580**	**GRLA-1/8-QS-4-RS-D**
		QS-6	185	160 … 240	370	330 … 390		**197581**	**GRLA-1/8-QS-6-RS-D**
		QS-8	215	175 … 250	400	330 … 410	24	**534337**	**GRLA-1/8-QS-8-RS-D**
	G1/4	QS-6	400	290 … 420	600	570 … 680	50	**534338**	**GRLA-1/4-QS-6-RS-D**
		QS-8	475	325 … 500	720	610 … 760		**534339**	**GRLA-1/4-QS-8-RS-D**
		QS-10	480	345 … 500	760	630 … 790		**534340**	**GRLA-1/4-QS-10-RS-D**
	G3/8	QS-6	495	320 … 495	740	840 … 890	72	**534341**	**GRLA-3/8-QS-6-RS-D**
		QS-8	820	450 … 850	1,300	1,080 … 1,420		**534342**	**GRLA-3/8-QS-8-RS-D**
		QS-10	900	540 … 975	1,400	1,160 … 1,620		**534343**	**GRLA-3/8-QS-10-RS-D**
	G1/2	QS-12	1,580	925 … 1,605	2,220	1,910 … 2,500	124	**534344**	**GRLA-1/2-QS-12-RS-D**

Ordering data – Supply air one-way flow control function

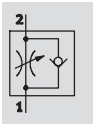
	Pneumatic connection		Standard nominal flow rate qnN at 6 → 5 bar		Standard flow rate qn at 6 → 0 bar		Weight	Part No.	Type
			in direction of flow control	in non-return direction	in direction of flow control	in non-return direction			
	2	1	[l/min]	[l/min]	[l/min]	[l/min]	[g]		
Slotted head screw									
	M5	QS-3	100	60 … 100	135	130 … 160	13	**193153**	**GRLZ-M5-QS-3-D**
		QS-4	110	65 … 110	160	150 … 180		**193154**	**GRLZ-M5-QS-4-D**
		QS-6	115	70 … 110	170	160 … 200		**193155**	**GRLZ-M5-QS-6-D**
	G1/8	QS-3	130	100 … 130	200	180 … 200	22	**193156**	**GRLZ-1/8-QS-3-D**
		QS-4	160	120 … 190	300	260 … 290		**193157**	**GRLZ-1/8-QS-4-D**
		QS-6	185	160 … 240	340	390 … 460		**193158**	**GRLZ-1/8-QS-6-D**
		QS-8	215	175 … 250	370	390 … 470		**193159**	**GRLZ-1/8-QS-8-D**

One-way flow control valves GRLA/GRLZ, standard

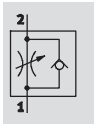
Technical data – Female thread/barbed connector, metal

One-way flow control function

Exhaust air



Supply air



Flow rate

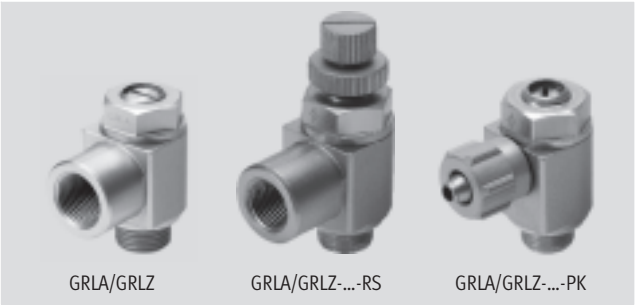
83 … 4,320 l/min

Temperature range

–10 … +60 °C

Pressure

0.2 … 10 bar



GRLA/GRLZ GRLA/GRLZ-...-RS GRLA/GRLZ-...-PK

General technical data – GRLA										
Valve function		Exhaust air one-way flow control function								
Connection type		Female thread						Barbed connector		
Pneumatic connection 2		M5	G1⁄8	G1⁄4	G3⁄8	G1⁄2	G3⁄4	M5	G1⁄8	G1⁄4
Pneumatic connection 1		M5[1)]	G1⁄8[1)]	G1⁄4[1)]	G3⁄8[1)]	G1⁄2[1)]	G3⁄4[1)]	PK-3, PK-4	PK-3, PK-4, PK-6	PK-4, PK-6
Adjustment component		Slotted head screw								
		Knurled screw			–					
Type of mounting		Screw-in								
Mounting position		Any								
Max. tightening torque	[Nm]	1.5	6	11	20	40	60	1.5	6	11

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

General technical data – GRLZ							
Valve function		Supply air one-way flow control function					
Connection type		Female thread			Barbed connector		
Pneumatic connection 2		M5	G1⁄8	G1⁄4	M5	G1⁄8	G1⁄4
Pneumatic connection 1		M5[1)]	G1⁄8[1)]	G1⁄4[1)]	PK-3, PK-4	PK-3, PK-4, PK-6	PK-4, PK-6
Adjustment component		Slotted head screw					
		Knurled screw			–		
Type of mounting		Screw-in					
Mounting position		Any					
Max. tightening torque	[Nm]	1.5	6	11	1.5	6	11

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

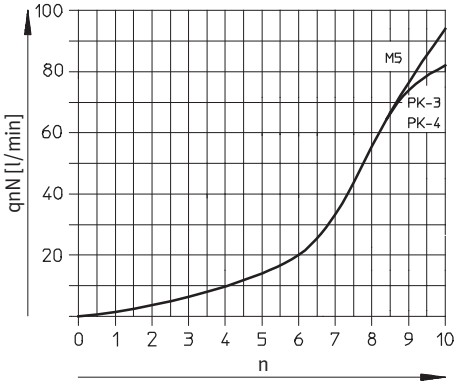
Operating and environmental conditions							
Pneumatic connection 2		M5	G1⁄8	G1⁄4	G3⁄8	G1⁄2	G3⁄4
Operating pressure	[bar]	0.2 … 10	0.3 … 10				
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]					
Note on operating/pilot medium		Operation with lubricated medium possible (in which case lubricated operation will always be required)					
Ambient temperature	[°C]	–10 … +60					
Temperature of medium	[°C]	–10 … +60					
Storage temperature	[°C]	–10 … +40					
Certification		GRLA: Germanischer Lloyd					

One-way flow control valves GRLA/GRLZ, standard

Technical data – Female thread/barbed connector, metal

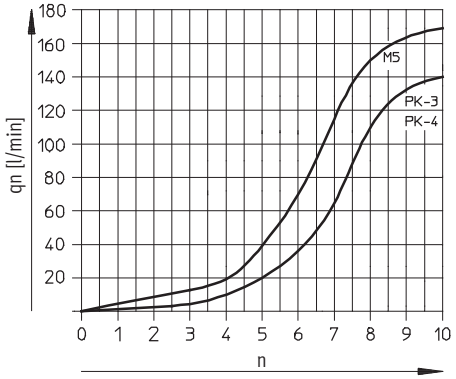
Standard nominal flow rate qnN at 6 ⇢ 5 bar as a function of turns of the adjusting screw n

GRLA/GRLZ-M5

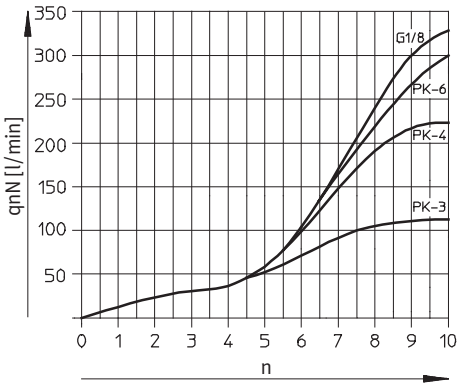


Standard flow rate qn at 6 ⇢ 0 bar as a function of turns of the adjusting screw n

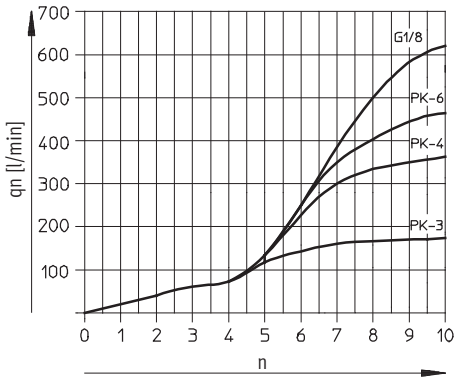
GRLA/GRLZ-M5



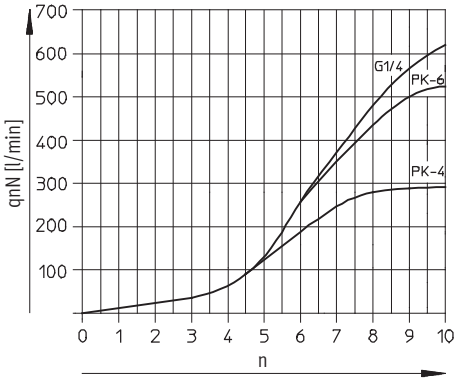
GRLA/GRLZ-⅛



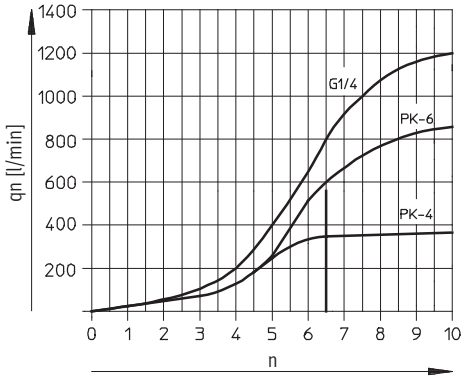
GRLA/GRLZ-⅛



GRLA/GRLZ-¼



GRLA/GRLZ-¼

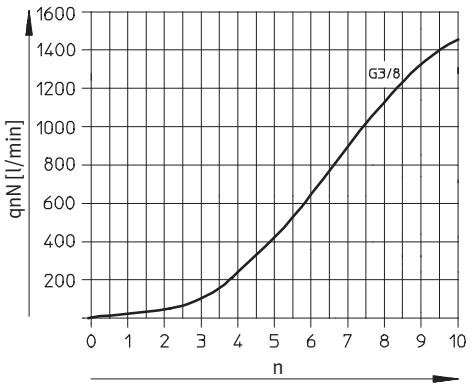


One-way flow control valves GRLA/GRLZ, standard

Technical data – Female thread/barbed connector, metal

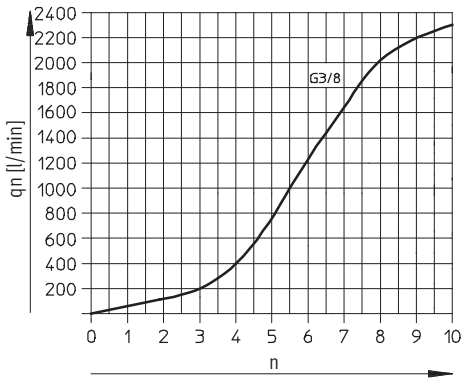
Standard nominal flow rate qnN at 6 → 5 bar as a function of turns of the adjusting screw n

GRLA-3/8

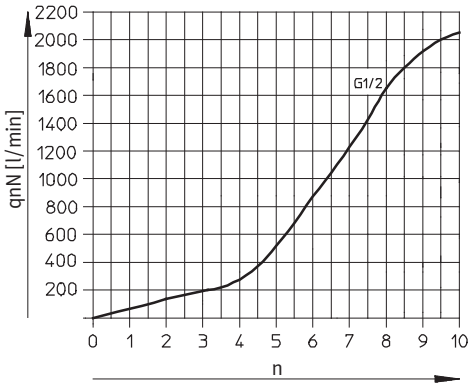


Standard flow rate qn at 6 → 0 bar as a function of turns of the adjusting screw n

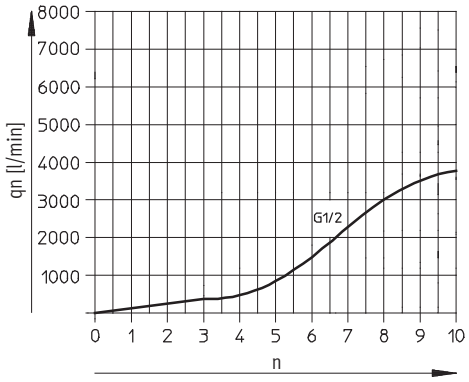
GRLA-3/8



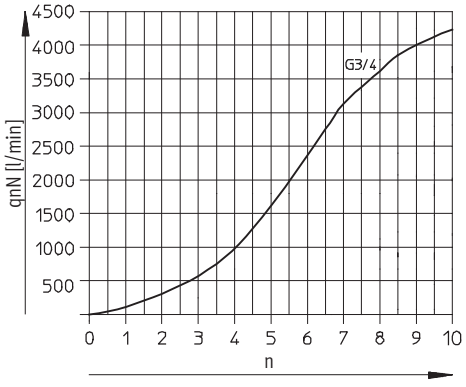
GRLA-1/2



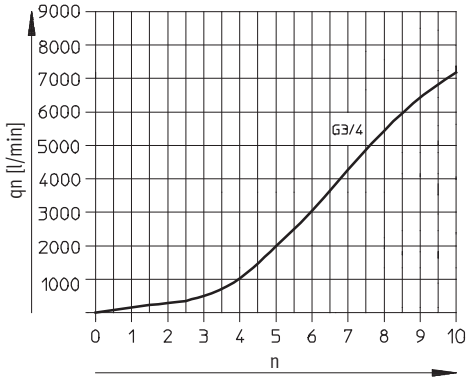
GRLA-1/2



GRLA-3/4

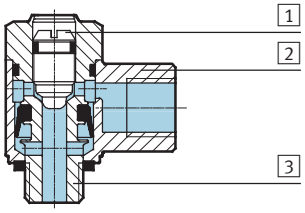


GRLA-3/4



Materials

Sectional view



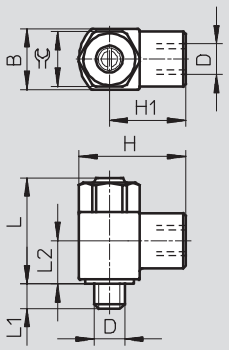
One-way flow control valve		
1	Adjusting screw	Brass
2	Swivel connection	Die-cast zinc
3	Threaded plug	Wrought aluminium alloy GRLA/GRLZ-M5: Nickel-plated brass
–	Seals	NBR
Note on materials		RoHS-compliant

One-way flow control valves GRLA/GRLZ, standard

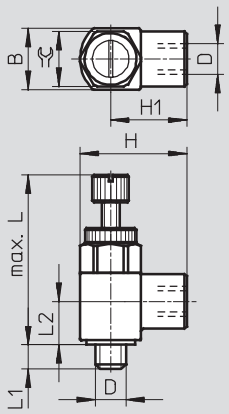
Technical data – Female thread/barbed connector, metal

Dimensions – Female thread connection type Download CAD Data ➔ **www.festo.com/us/cad**

Slotted head screw



Knurled screw



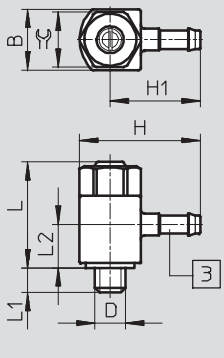
Type	Connection D	Nominal size [mm]	B	H	H1	Lmax.		L1	L2	⫷
						Slotted head screw	Knurled screw			
GRL...-M5	M5	2	10 –0.15	17.5	12.5	17.6	27.3	4.0 ±0.3	7.1	9
GRL...-⅛	G⅛	4	16 –0.15	28	20	25.2	38.6	5.3 +0.45/–0.35	10.3	14
GRL...-¼	G¼	6	20 –0.2	36	26	30.8	54.8	8.2 +0.45/–0.35	13.2	17
GRLA-⅜	G⅜	8.5	25 –0.2	41	28.5	37.2	–	8.8 +0.45/–0.35	15.5	22
GRLA-½	G½	10.6	32 –0.2	53	37	48.6	–	12.8 ±0.45	18.9	27
GRLA-¾	G¾	14	41 –0.3	64	43.5	60.2	–	13.5 ±0.5	24.5	36

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

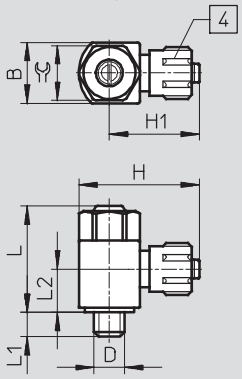
Dimensions – Barbed connector connection type Download CAD Data ➔ **www.festo.com/us/cad**

Slotted head screw

GRL...-M5



GRL...-⅛/GRL...-¼



3 Barbed connector

4 Union nut

Type	Connection D	Nominal size [mm]	B	H	H1	L max.	L1	L2	⫷
GRL...-M5-PK-3	M5	2	10 –0.15	19.7	14.7	17.6	4.0 ±0.3	8.5	9
GRL...-M5-PK-4			10 –0.15	21.7	16.7	17.6	4.0 ±0.3	8.5	9
GRL...-⅛-PK-3	G⅛	4	16 –0.15	27.1	19.1	25.2	5.3 +0.45/–0.35	13.4	14
GRL...-⅛-PK-4			16 –0.15	30.2	22.2	25.2	5.3 +0.45/–0.35	13.4	14
GRL...-⅛-PK-6			16 –0.15	30.3	22.3	25.2	5.3 +0.45/–0.35	12.0	14
GRL...-¼-PK-4	G¼	6	20 –0.2	34.2	24.2	30.8	8.2 +0.45/–0.35	16.9	17
GRL...-¼-PK-6			20 –0.2	34.3	24.3	30.8	8.2 +0.45/–0.35	17.2	17

One-way flow control valves GRLA/GRLZ, standard

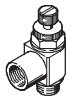
Technical data – Female thread/barbed connector, metal

Ordering data – Exhaust air one-way flow control function

	Pneumatic connection		Standard nominal flow rate qnN at 6 → 5 bar		Standard flow rate qn at 6 → 0 bar		Weight	Part No.	Type
			in direction of flow control	in non-return direction	in direction of flow control	in non-return direction			
	2	1	[l/min]	[l/min]	[l/min]	[l/min]	[g]		
Slotted head screw									
	M5	M5	95	76 … 95	169	135 … 170	11	**151160**	**GRLA-M5-B**
	G⅛	G⅛	340	260 … 420	615	470 … 760	28	**151165**	**GRLA-⅛-B**
	G¼	G¼	610	450 … 820	1,200	885 … 1,615	59	**151172**	**GRLA-¼-B**
	G⅜	G⅜	1,450	970 … 1,600	2,300	1,540 … 2,540	97	**151178**	**GRLA-⅜-B**
	G½	G½	2,100	1,550 … 2,200	4,000	2,950 … 4,190	204	**151179**	**GRLA-½-B**
	G¾	G¾	4,320	3,220 … 4,720	7,300	5,440 … 7,300	377	**151180**	**GRLA-¾-B**
	M5	PK-3	83	72 … 83	140	120 … 140	10	**151161**	**GRLA-M5-PK-3-B**
		PK-4	83	76 … 88	140	128 … 148	10	**151162**	**GRLA-M5-PK-4-B**
	G⅛	PK-3[1)]	110	100 … 110	162	145 … 165	22	**151166**	**GRLA-⅛-PK-3-B**
		PK-4[1)]	230	190 … 240	360	295 … 375	25	**151167**	**GRLA-⅛-PK-4-B**
		PK-6[1)]	300	210 … 290	455	320 … 440	26	**151168**	**GRLA-⅛-PK-6-B**
	G¼	PK-4[1)]	260	220 … 260	370	315 … 370	44	**151173**	**GRLA-¼-PK-4-B**
		PK-6[1)]	540	410 … 585	840	635 … 910	45	**151174**	**GRLA-¼-PK-6-B**
Knurled screw									
	M5	M5	95	76 … 95	169	135 … 170	12	**151163**	**GRLA-M5-RS-B**
	G⅛	G⅛	340	260 … 420	615	470 … 760	30	**151169**	**GRLA-⅛-RS-B**
	G¼	G¼	610	450 … 820	1,200	885 … 1,615	59	**151175**	**GRLA-¼-RS-B**

1) Via union nut

Ordering data – Supply air one-way flow control function

	Pneumatic connection		Standard nominal flow rate qnN at 6 → 5 bar		Standard flow rate qn at 6 → 0 bar		Weight	Part No.	Type
			in direction of flow control	in non-return direction	in direction of flow control	in non-return direction			
	2	1	[l/min]	[l/min]	[l/min]	[l/min]	[g]		
Slotted head screw									
	M5	M5	95	76 … 95	169	135 … 170	11	**151183**	**GRLZ-M5-B**
	G⅛	G⅛	340	260 … 420	615	470 … 760	28	**151188**	**GRLZ-⅛-B**
	G¼	G¼	610	450 … 820	1,200	885 … 1,615	59	**151195**	**GRLZ-¼-B**
	M5	PK-3	83	72 … 83	140	120 … 140	10	**151184**	**GRLZ-M5-PK-3-B**
		PK-4	83	76 … 88	140	125 … 150	10	**151185**	**GRLZ-M5-PK-4-B**
	G⅛	PK-3[1)]	110	100 … 110	162	145 … 165	22	**151189**	**GRLZ-⅛-PK-3-B**
		PK-4[1)]	230	190 … 240	360	295 … 375	25	**151190**	**GRLZ-⅛-PK-4-B**
		PK-6[1)]	300	210 … 290	455	320 … 440	26	**151191**	**GRLZ-⅛-PK-6-B**
	G¼	PK-4[1)]	260	220 … 260	370	315 … 370	44	**151196**	**GRLZ-¼-PK-4-B**
		PK-6[1)]	540	410 … 585	840	635 … 910	45	**151197**	**GRLZ-¼-PK-6-B**
Knurled screw									
	M5	M5	95	76 … 95	169	135 … 170	12	**151186**	**GRLZ-M5-RS-B**
	G⅛	G⅛	340	260 … 420	615	470 … 760	30	**151192**	**GRLZ-⅛-RS-B**
	G¼	G¼	610	450 … 820	1,200	885 … 1,615	59	**151198**	**GRLZ-¼-RS-B**

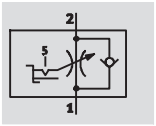
1) Via union nut

One-way flow control valves GRLSA, standard

FESTO

Technical data – Push-in connector QS, metal

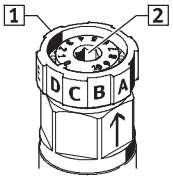
One-way flow control function
Exhaust air



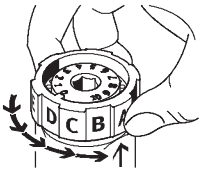
Flow rate
0 ... 450 l/min
Temperature range
–10 ... +60 °C
Pressure
0.2 ... 10 bar

This one-way flow control valve offers the ideal conditions for optimum and easy setting of the flow rate in a unique design.

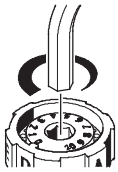
There are two setting options:



1 Gradual for preselection of the flow range in 5 stages via rotary switch: A, B, C, D, E



2 Infinitely variable for precision adjustment using internal hex via a scale marked from 0 to 10



General technical data			
Valve function		Exhaust air one-way flow control function	
Pneumatic connection 2		G⅛	G¼
Pneumatic connection 1		QS-6	QS-8
Adjustment component		Rotary knob with scale and internal hex	
Actuation type		Manual	
Type of mounting		Screw-in	
Mounting position		Any	
Max. tightening torque	[Nm]	5.5	11

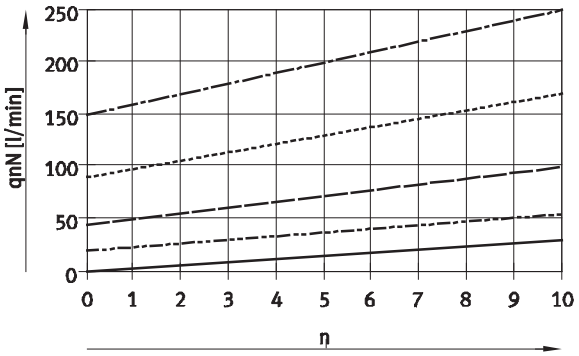
Operating and environmental conditions		
Operating pressure	[bar]	0.2 ... 10
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Operation with lubricated medium possible (in which case lubricated operation will always be required)
Ambient temperature	[°C]	–10 ... +60
Temperature of medium	[°C]	–10 ... +60
Storage temperature	[°C]	–10 ... +40

One-way flow control valves GRLSA, standard

Technical data – Push-in connector QS, metal

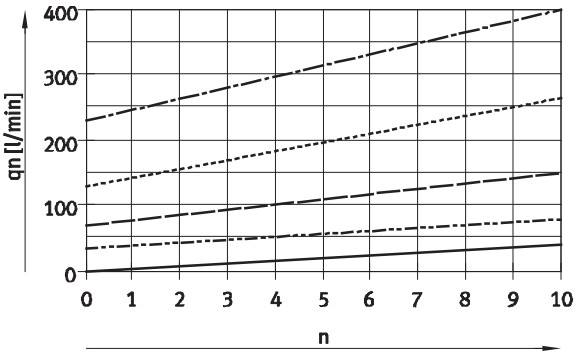
Standard nominal flow rate qnN at 6 → 5 bar
as a function of the position of the flow control screw (scale) n

GRLSA-⅛

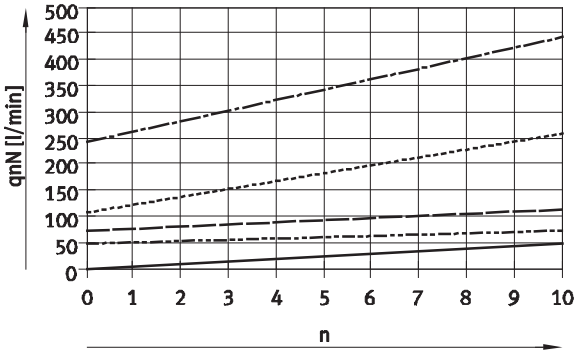


Standard flow rate qn at 6 → 0 bar
as a function of the position of the flow control screw (scale) n

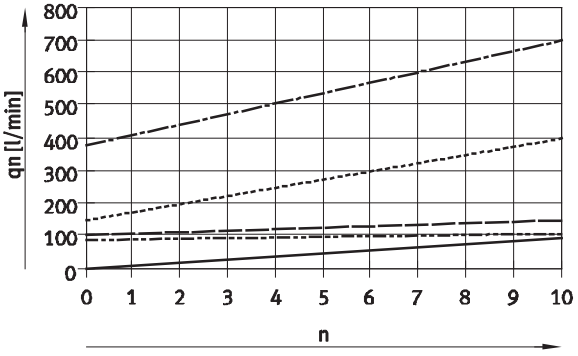
GRLSA-⅛



GRLSA-¼



GRLSA-¼

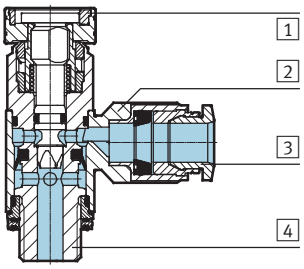


Stage: A
Stage: B
Stage: C
Stage: D
Stage: E

Flow rate value tolerance: ±20%

Materials

Sectional view



One-way flow control valve		
1	Adjusting screw	PA, reinforced
2	Swivel connection	Die-cast zinc
3	Releasing ring	POM
4	Hollow bolt	Anodised wrought aluminium alloy
–	Seals	NBR
Note on materials		RoHS-compliant
		Free of copper and PTFE

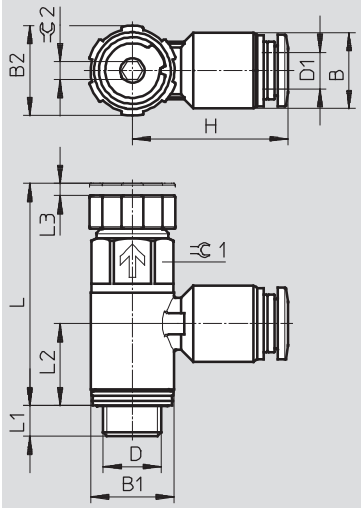
One-way flow control valves GRLSA, standard

FESTO

Technical data – Push-in connector QS, metal

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

Rotary knob with scale and internal hex



Type	Connection D	Tubing O.D. D1	B	B1	B2	H	L max.	L1	L2	L3	SW1	SW2
GRLSA-⅛	G⅛	6	12.5	13.8	15	25.7	36.6	5.1	13.5	2	12	3
GRLSA-¼	G¼	8	14.5	17.8	18.8	30.75	46.5	7	17.2	3	15	3

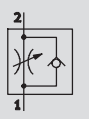
Ordering data – Exhaust air one-way flow control function

	Pneumatic connection		Standard nominal flow rate qnN at 6 ⇢ 5 bar		Standard flow rate qn at 6 ⇢ 0 bar		Weight	Part No.	Type
			in direction of flow control	in non-return direction	in direction of flow control	in non-return direction			
	2	1	[l/min]	[l/min]	[l/min]	[l/min]	[g]		
Rotary knob with scale and internal hex									
	G⅛	QS-6	0 ... 250	180 ... 310	0 ... 410	430 ... 540	19.5	**540661**	**GRLSA-⅛-QS-6**
	G¼	QS-8	0 ... 450	390 ... 570	0 ... 700	820 ... 930	34.8	**540662**	**GRLSA-¼-QS-8**

One-way flow control valves VFOC, standard

Technical data – Push-in connector QS, metal

One-way flow control function
Supply air

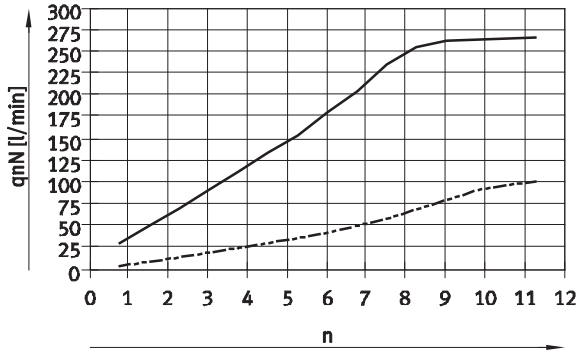


Flow rate
0 ... 270 l/min
Temperature range
–10 ... +60 °C
Pressure
0.2 ... 10 bar

General technical data		
Valve function	Supply air one-way flow control function	
Pneumatic connection 2	Push-in sleeve QS-4	Push-in sleeve QS-6
Pneumatic connection 1	QS-4	QS-6
Note on the pneumatic connection 2	Only suitable for push-in connector QS from Festo	
Adjustment component	Slotted head screw	
Actuation type	Manual	
Type of mounting	Plug-in, with push-in sleeve	
Mounting position	Any	

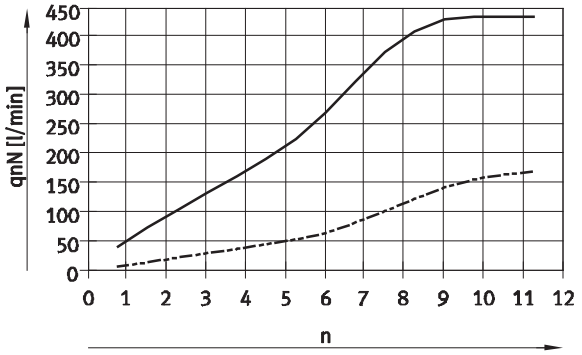
Operating and environmental conditions		
Operating pressure	[bar]	0.2 ... 10
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Operation with lubricated medium possible (in which case lubricated operation will always be required)
Ambient temperature	[°C]	–10 ... +60
Temperature of medium	[°C]	–10 ... +60
Storage temperature	[°C]	–10 ... +40

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



QS-6
QS-4

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



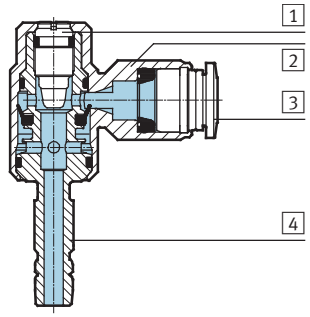
QS-6
QS-4

One-way flow control valves VFOC, standard

Technical data – Push-in connector QS, metal

Materials

Sectional view



One-way flow control valve		
1	Adjusting screw	High-alloy stainless steel
2	Swivel connection	Die-cast zinc
3	Releasing ring	POM
4	Hollow bolt	Black anodised wrought aluminium alloy
–	Seals	NBR
Note on materials		Free of copper and PTFE

Dimensions

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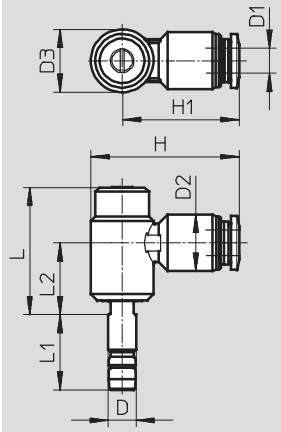
Slotted head screw



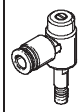
Note

The push-in sleeves of the one-way flow control valves VFOC are exclusively matched to push-in fittings QS from Festo

➔ **www.festo.com/catalogue.**
This combination alone guarantees a secure grip in the push-in fitting.

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

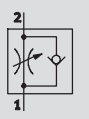
Ordering data – Supply air one-way flow control function

	Pneumatic connection		Standard nominal flow rate qnN at 6 ⇢ 5 bar		Standard flow rate qn at 6 ⇢ 0 bar		Weight	Part No.	Type
			in direction of flow control	in non-return direction	in direction of flow control	in non-return direction			
	2	1	[l/min]	[l/min]	[l/min]	[l/min]	[g]		
Slotted head screw									
	Push-in sleeve QS-4	QS-4	0 … 100	60 … 100	0 … 170	130 … 160	9.2	**559723**	**VFOC-S-S4-Q4**
	Push-in sleeve QS-6	QS-6	0 … 270	170 … 260	0 … 430	330 … 400	21.6	**559724**	**VFOC-S-S6-Q6**

One-way flow control valves GRLA-F, standard

Technical data – Push-in connector QS, chromed metal

One-way flow control function
Exhaust air



- Can be swivelled 360° around the screw-in axis after mounting

Flow rate
100 ... 530 l/min
Temperature range
0 ... +150 °C
Pressure
0.2 ... 10 bar

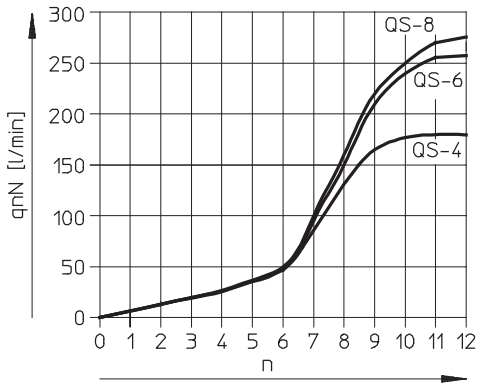
General technical data			
Valve function		Exhaust air one-way flow control function	
Pneumatic connection 2		G1/8	G1/4
Pneumatic connection 1		QS-4, QS-6, QS-8	QS-6, QS-8
Adjustment component		Slotted head screw	
Actuation type		Manual	
Type of mounting		Screw-in	
Mounting position		Any	
Max. tightening torque	[Nm]	5.5	11

Operating and environmental conditions		
Operating pressure	[bar]	0.2 ... 10
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Operation with lubricated medium possible (in which case lubricated operation will always be required)
Ambient temperature	[°C]	0 ... +150
Temperature of medium	[°C]	0 ... +150
Storage temperature	[°C]	–10 ... +150
Corrosion resistance class CRC[1)]		3

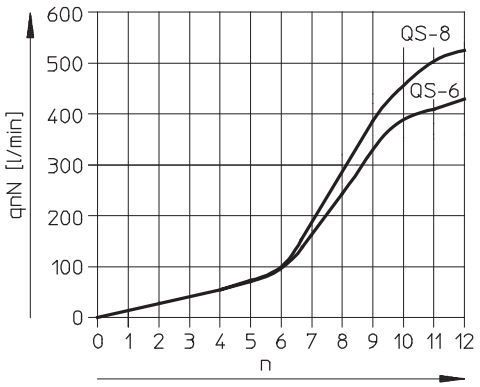
1) Corrosion resistance class 3 according to Festo standard 940 070
Components subject to high corrosion stress. External visible parts in direct contact with industrial atmospheres or media such as solvents and cleaning agents, with a predominantly functional requirement for the surface.

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

GRLA-F-1/8



GRLA-F-1/4



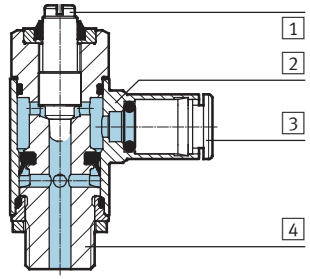
One-way flow control valves GRLA-F, standard

Technical data – Push-in connector QS, chromed metal

FESTO

Materials

Sectional view

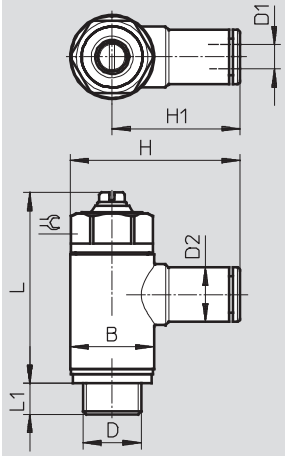


One-way flow control valve		
1	Adjusting screw	High-alloy stainless steel
2	Swivel connection	Nickel and chrome-plated brass
3	Releasing ring	Nickel and chrome-plated brass
4	Hollow bolt	Wrought aluminium alloy
–	Seals	FPM
Note on materials		RoHS-compliant
		Free of copper and PTFE

Dimensions

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

Slotted head screw



Type	Connection D	Tubing O.D. D1	B	D2 ∅	H	H1	L max.	L1	⌀
GRLA-F-⅛	G⅛	4	13.8	9	28.0	21.1	31.6	5.2	12
		6		11	31.0	24.1			
		8		13	31.9	25.0			
GRLA-F-¼	G¼	6	17.8	11	35.1	26.2	34.9	5.9	15
		8		13	35.9	27.0			

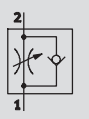
Ordering data – Exhaust air one-way flow control function

	Pneumatic connection		Standard nominal flow rate qnN at 6 ⇢ 5 bar		Standard flow rate qn at 6 ⇢ 0 bar		Weight	Part No.	Type
			in direction of flow control	in non-return direction	in direction of flow control	in non-return direction			
	2	1	[l/min]	[l/min]	[l/min]	[l/min]	[g]		
Slotted head screw									
	G⅛	QS-4	180	103 ... 188	250	270 ... 300	25	**195597**	**GRLA-F-⅛-QS-4-D**
		QS-6	255	111 ... 280	370	330 ... 390		**195598**	**GRLA-F-⅛-QS-6-D**
		QS-8	275	132 ... 307	400	330 ... 410		**195599**	**GRLA-F-⅛-QS-8-D**
	G¼	QS-6	430	384 ... 478	600	570 ... 680	37	**195600**	**GRLA-F-¼-QS-6-D**
		QS-8	530	402 ... 578	720	610 ... 760		**195601**	**GRLA-F-¼-QS-8-D**

One-way flow control valves GRLA, standard

Technical data – Push-in connector QS, polymer

One-way flow control function
Exhaust air



- Can be swivelled 360° around the screw-in axis after mounting

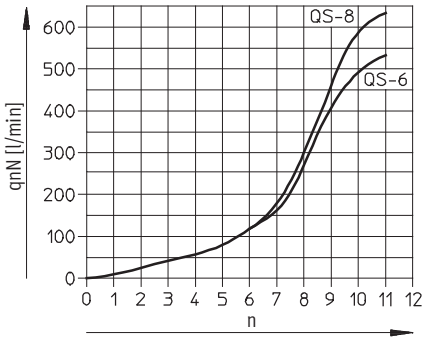
Flow rate
520 … 650 l/min
Temperature range
–10 … +60 °C
Pressure
0.2 … 10 bar

General technical data				
Valve function		Exhaust air one-way flow control function		
Pneumatic connection 2		G1/8	G1/4	G3/8
Pneumatic connection 1		QS-6, QS-8	QS-6, QS-8	QS-6, QS-8
Adjustment component		Knurled screw		
Actuation type		Manual		
Type of mounting		Screw-in		
Mounting position		Any		
Max. tightening torque	[Nm]	4	11	40
Perm. actuation torque for regulating screw	[Nm]	0.4		

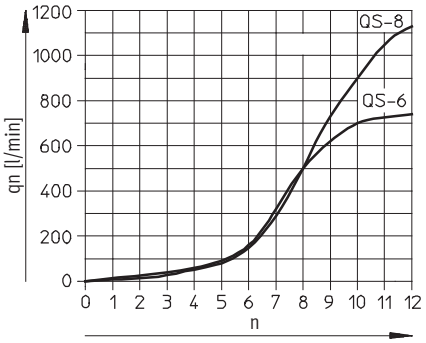
Operating and environmental conditions		
Operating pressure	[bar]	0.2 … 10
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Operation with lubricated medium possible (in which case lubricated operation will always be required)
Ambient temperature	[°C]	–10 … +60
Temperature of medium	[°C]	–10 … +60
Storage temperature	[°C]	–10 … +40
Corrosion resistance class CRC[1)]		2

1) Corrosion resistance class 2 according to Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

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



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



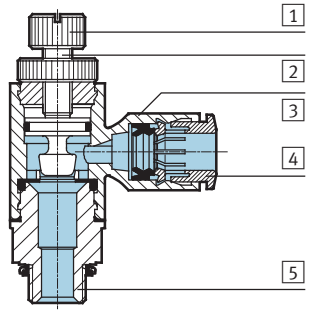
One-way flow control valves GRLA, standard

Technical data – Push-in connector QS, polymer

FESTO

Materials

Sectional view



One-way flow control valve		
1	Knurled head	Wrought aluminium alloy
2	Regulating screw	Brass
3	Swivel connection	PBT, reinforced
4	Releasing ring	POM
5	Threaded plug	Wrought aluminium alloy
–	Seals	TPE-U(PU)
		NBR
Note on materials		RoHS-compliant

Dimensions

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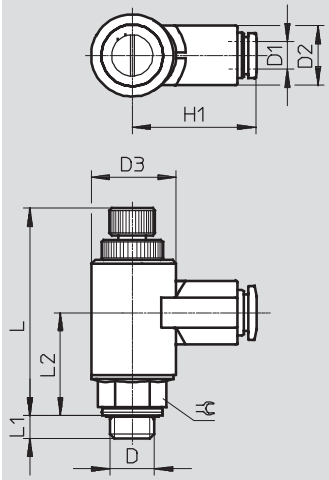
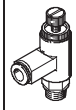
Knurled screw



Type	Connection D	Tubing O.D. D1	D2 ∅	D3	H1	L max.	L1	L2	⇔
GRLA-1/8	G1/8	6	13.0 ±0.25	17.9 –0.1	27.2	48	4.9	22.6	13
		8	16.8 ±0.4		35.4				
GRLA-1/4	G1/4	6	13.0 ±0.25	17.9 –0.1	27.2	48	5.8	22.3	17
		8	16.8 ±0.4		35.4				
GRLA-3/8	G3/8	6	13.0 ±0.25	17.9 –0.1	27.2	48	6.8	22.3	19
		8	16.8 ±0.4		35.4				

Ordering data – Exhaust air one-way flow control function

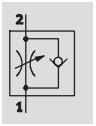
	Pneumatic connection		Standard nominal flow rate qnN at 6 ⇢ 5 bar		Standard flow rate qn at 6 ⇢ 0 bar		Weight	Part No.	Type
			in direction of flow control	in non-return direction	in direction of flow control	in non-return direction			
	2	1	[l/min]	[l/min]	[l/min]	[l/min]	[g]		
Knurled screw									
	G1/8	QS-6	520	400 ... 550	720	600 ... 750	25	**162965**	**GRLA-1/8-QS-6-RS-B**
		QS-8	650	600 ... 750	1,080	800 ... 1,250		**162966**	**GRLA-1/8-QS-8-RS-B**
	G1/4	QS-6	520	400 ... 550	720	600 ... 750	30	**162967**	**GRLA-1/4-QS-6-RS-B**
		QS-8	650	600 ... 750	1,130	800 ... 1,250		**162968**	**GRLA-1/4-QS-8-RS-B**
	G3/8	QS-6	530	400 ... 550	720	600 ... 750	40	**162969**	**GRLA-3/8-QS-6-RS-B**
		QS-8	650	600 ... 750	1,130	900 ... 1,250		**162970**	**GRLA-3/8-QS-8-RS-B**

One-way flow control valves GRLA/GRLZ/GRGA/GRGZ, mini

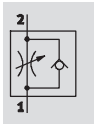
Technical data – Push-in connector QS, metal

One-way flow control function

Exhaust air



Supply air



Flow rate

40 ... 48 l/min

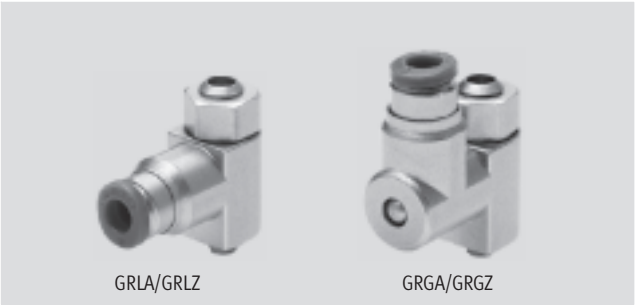
Temperature range

–10 ... +60 °C

Pressure

0.2 ... 10 bar

- Low flow: precision adjustment for low speed



GRLA/GRLZ GRGA/GRGZ

General technical data – GRLA/GRGA			
Valve function		Exhaust air one-way flow control function	
Pneumatic connection 2		M3	M5
Pneumatic connection 1		QS-3	QS-3, QS-4
Adjustment component		Slotted head screw	
Type of mounting		Screw-in	
Mounting position		Any	
Max. tightening torque	[Nm]	0.3	1.5

General technical data – GRLZ/GRGZ			
Valve function		Supply air one-way flow control function	
Pneumatic connection 2		M3	M5
Pneumatic connection 1		QS-3	QS-3, QS-4
Adjustment component		Slotted head screw	
Type of mounting		Screw-in	
Mounting position		Any	
Max. tightening torque	[Nm]	0.3	1.5

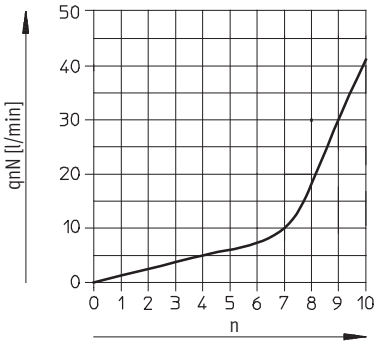
Operating and environmental conditions		
Operating pressure	[bar]	0.2 ... 10
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Operation with lubricated medium possible (in which case lubricated operation will always be required)
Ambient temperature	[°C]	–10 ... +60
Temperature of medium	[°C]	–10 ... +60
Storage temperature	[°C]	–10 ... +40
Certification		GRLA: Germanischer Lloyd

One-way flow control valves GRLA/GRLZ/GRGA/GRGZ, mini

Technical data – Push-in connector QS, metal

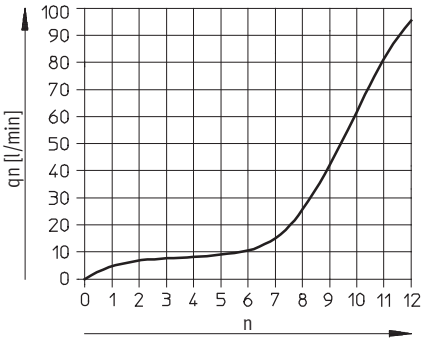
Standard nominal flow rate qnN at 6 → 5 bar as a function of turns of the adjusting screw n

GRLA/GRLZ/GRGA/GRGZ-M3

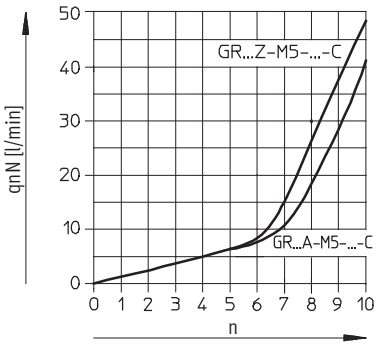


Standard flow rate qn at 6 → 0 bar as a function of turns of the adjusting screw n

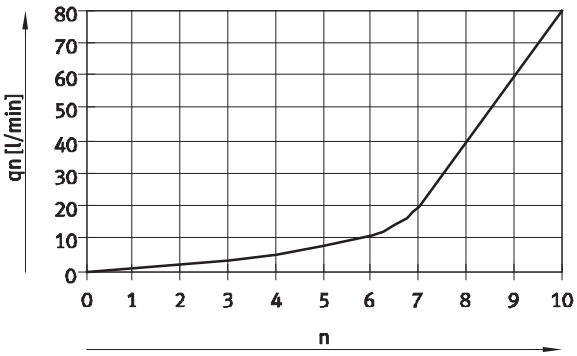
GRLA/GRLZ/GRGA/GRGZ-M3



GRLA/GRLZ-M5

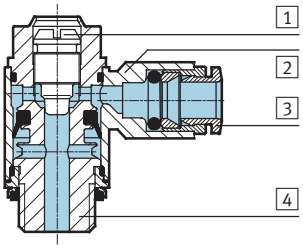


GRLA/GRLZ-M5



Materials

Sectional view



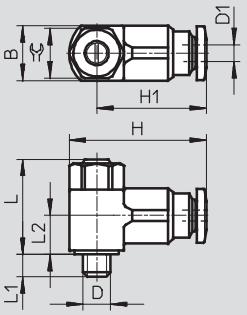
One-way flow control valve		
1	Adjusting screw	Brass
2	Swivel connection	Die-cast zinc
3	Releasing ring	POM
4	Threaded plug	Nickel-plated brass
–	Seals	NBR
Note on materials		RoHS-compliant

One-way flow control valves GRLA/GRLZ/GRGA/GRGZ, mini

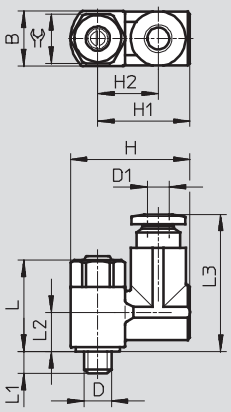
Technical data – Push-in connector QS, metal

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

GRLA/GRLZ, elbow outlet

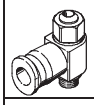


GRGA/GRGZ, parallel outlet

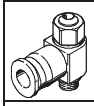


Type	Connection D	Nominal size [mm]	Tubing O.D. D1	B	H	H1	H2	L max.	L1	L2	L3	SW
GRLA/GRLZ	M3	1.4	3	8 –0.15	20	15.8	–	16.6	2.3 +0.15/–0.3	7	–	7
	M5	1.4	3	9.8 –0.15	22.4	18.4		17.7	3.1 +0.15/–0.35	7.3		
		1.4	4	9.8 –0.15	22.2	18.2		17.7	3.1 +0.15/–0.35	7.3		
GRGA/GRGZ	M3	1.4	3	8 –0.15	18	14	9.25	16.6	2.3 +0.15/–0.3	7.5	22	7

Ordering data – Exhaust air one-way flow control function

	Pneumatic connection		Standard nominal flow rate qnN at 6 ⇢ 5 bar		Standard flow rate qn at 6 ⇢ 0 bar		Weight	Part No.	Type
			in direction of flow control	in non-return direction	in direction of flow control	in non-return direction			
	2	1	[l/min]	[l/min]	[l/min]	[l/min]	[g]		
Slotted head screw									
	M3	QS-3	41	27 … 50	95	75 … 110	7	**175041**	**GRLA-M3-QS-3**
	M5	QS-3	40	46 … 70	80	90 … 140	9	**175053**	**GRLA-M5-QS-3-LF-C**
		QS-4	40	50 … 75	80	100 … 150	9	**175056**	**GRLA-M5-QS-4-LF-C**
	M3	QS-3	41	27 … 50	95	75 … 110	14	**175044**	**GRGA-M3-QS-3**

Ordering data – Supply air one-way flow control function

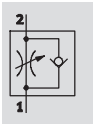
	Pneumatic connection		Standard nominal flow rate qnN at 6 ⇢ 5 bar		Standard flow rate qn at 6 ⇢ 0 bar		Weight	Part No.	Type
			in direction of flow control	in non-return direction	in direction of flow control	in non-return direction			
	2	1	[l/min]	[l/min]	[l/min]	[l/min]	[g]		
Slotted head screw									
	M3	QS-3	41	27 … 44	95	75 … 100	7	**175043**	**GRLZ-M3-QS-3**
	M5	QS-3	48	36 … 52	80	60 … 90	9	**175055**	**GRLZ-M5-QS-3-LF-C**
		QS-4	48	40 … 65	80	65 … 110	9	**175058**	**GRLZ-M5-QS-4-LF-C**
	M3	QS-3	41	27 … 44	95	75 … 100	14	**175046**	**GRGZ-M3-QS-3**

One-way flow control valves GRLA/GRLZ, mini

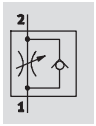
Technical data – Female thread, metal

One-way flow control function

Exhaust air



Supply air



Flow rate

0 ... 18 l/min

Temperature range

–10 ... +60 °C

Pressure

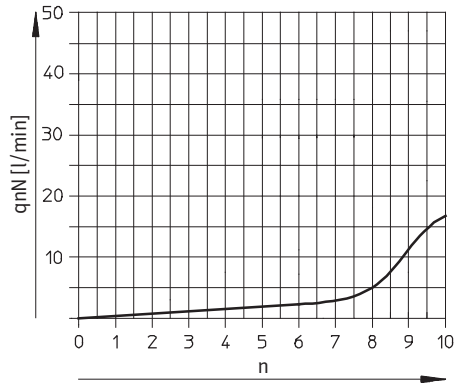
0.2 ... 10 bar

General technical data – GRLA		
Valve function		Exhaust air one-way flow control function
Pneumatic connection 2		M3
Pneumatic connection 1		M3
Adjustment component		Slotted head screw
Type of mounting		Screw-in
Mounting position		Any
Max. tightening torque	[Nm]	0.3

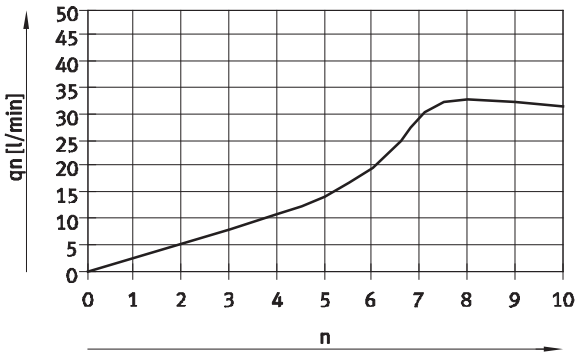
General technical data – GRLZ		
Valve function		Supply air one-way flow control function
Pneumatic connection 2		M3
Pneumatic connection 1		M3
Adjustment component		Slotted head screw
Type of mounting		Screw-in
Mounting position		Any
Max. tightening torque	[Nm]	0.3

Operating and environmental conditions		
Operating pressure	[bar]	0.2 ... 10
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Operation with lubricated medium possible (in which case lubricated operation will always be required)
Ambient temperature	[°C]	–10 ... +60
Temperature of medium	[°C]	–10 ... +60
Storage temperature	[°C]	–10 ... +40
Certification		GRLA: Germanischer Lloyd

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



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

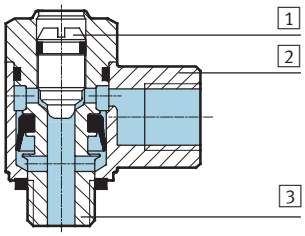


One-way flow control valves GRLA/GRLZ, mini

Technical data – Female thread, metal

Materials

Sectional view



One-way flow control valve	
1 Adjusting screw	Brass
2 Swivel connection	Die-cast zinc
3 Threaded plug	Nickel-plated brass
– Seals	NBR
Note on materials	RoHS-compliant

Dimensions

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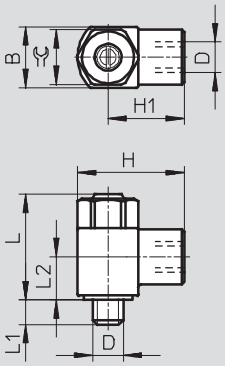
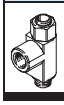
Slotted head screw

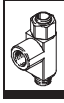


Type	Connection D	Nominal size [mm]	B	H	H1	L max.	L1	L2	⌀
GRLA/GRLZ	M3	0.8	5 –0.1	9	6.5	13.3	2.5 +0.15/–0.3	6.4	4.5

Ordering data – Exhaust air one-way flow control function

	Pneumatic connection		Standard nominal flow rate qnN at 6 ⇢ 5 bar		Standard flow rate qn at 6 ⇢ 0 bar		Weight	Part No.	Type
			in direction of flow control	in non-return direction	in direction of flow control	in non-return direction			
	2	1	[l/min]	[l/min]	[l/min]	[l/min]	[g]		
Slotted head screw									
	M3	M3	18	18 … 20	33	33 … 37	2	**175038**	**GRLA-M3**

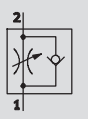
Ordering data – Supply air one-way flow control function

	Pneumatic connection		Standard nominal flow rate qnN at 6 ⇢ 5 bar		Standard flow rate qn at 6 ⇢ 0 bar		Weight	Part No.	Type
			in direction of flow control	in non-return direction	in direction of flow control	in non-return direction			
	2	1	[l/min]	[l/min]	[l/min]	[l/min]	[g]		
Slotted head screw									
	M3	M3	18	18 … 20	33	33 … 37	2	**175040**	**GRLZ-M3**

One-way flow control valves CRGRLA, corrosion-resistant

Technical data – Female thread, stainless steel

One-way flow control function
Exhaust air



Flow rate
95 ... 2,100 l/min
Temperature range
–20 ... +80 °C
Pressure
0.2 ... 10 bar

General technical data						
Valve function		Exhaust air one-way flow control function				
Pneumatic connection 2		M5	G⅛	G¼	G⅜	G½
Pneumatic connection 1		M5	G⅛	G¼	G⅜	G½
Adjustment component		Slotted head screw				
Type of mounting		Screw-in				
Mounting position		Any				
Max. tightening torque	[Nm]	1.5	6	11	20	40
Perm. actuation torque for regulating screw	[Nm]	0.2	0.5	1.5	2	3

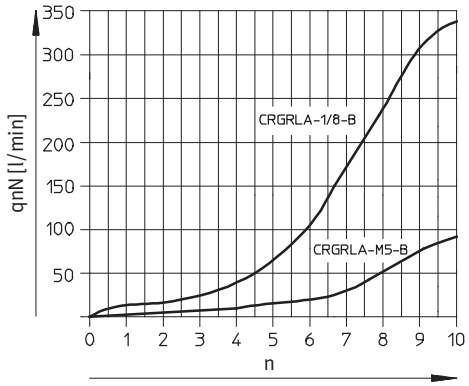
Note: This product conforms to ISO 1179-1 and ISO 228-1

Operating and environmental conditions						
Pneumatic connection 2		M5	G⅛	G¼	G⅜	G½
Operating pressure	[bar]	0.2 ... 10	0.3 ... 10			
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]				
Note on operating/pilot medium		Operation with lubricated medium possible (in which case lubricated operation will always be required)				
Ambient temperature	[°C]	–20 ... +80				
Temperature of medium	[°C]	–10 ... +60				
Storage temperature	[°C]	–10 ... +40				
Corrosion resistance class CRC[1]		3				
Certification		Germanischer Lloyd				

1) Corrosion resistance class 3 according to Festo standard 940 070
Components subject to high corrosion stress. 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.

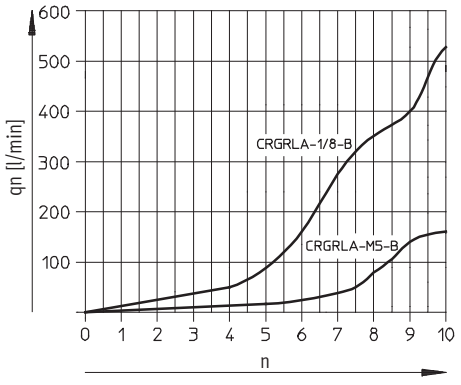
Standard nominal flow rate qnN at 6 ⇢ 5 bar as a function of turns of the adjusting screw n

CRGRLA-M5, CRGRLA-⅛



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

CRGRLA-M5, CRGRLA-⅛

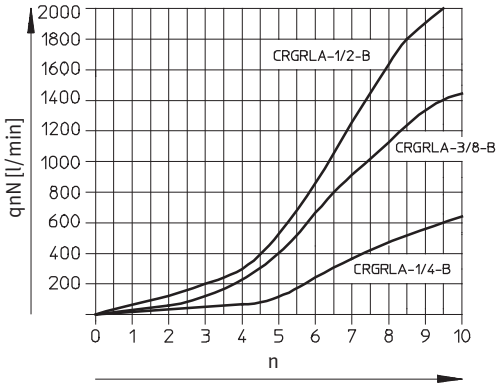


One-way flow control valves CRGRLA, corrosion-resistant

Technical data – Female thread, stainless steel

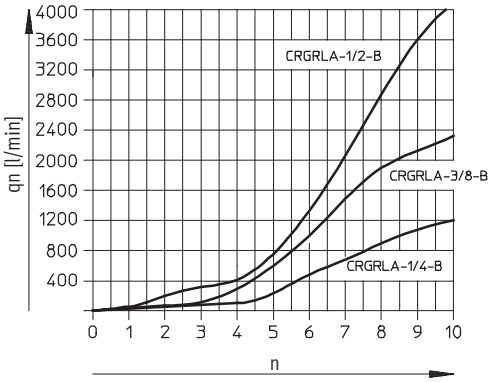
Standard nominal flow rate qnN at 6 → 5 bar as a function of turns of the adjusting screw n

CRGRLA-¼, CRGRLA-⅜, CRGRLA-½



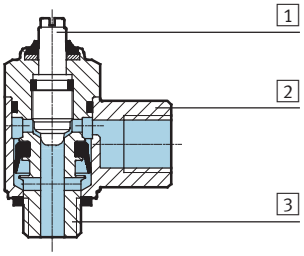
Standard flow rate qn at 6 → 0 bar as a function of turns of the adjusting screw n

CRGRLA-¼, CRGRLA-⅜, CRGRLA-½



Materials

Sectional view



One-way flow control valve	
1 Regulating screw	High-alloy stainless steel
2 Swivel connection	High-alloy stainless steel
3 Hollow bolt	High-alloy steel
– Seals	FPM, PVC
Note on materials	RoHS-compliant

Dimensions

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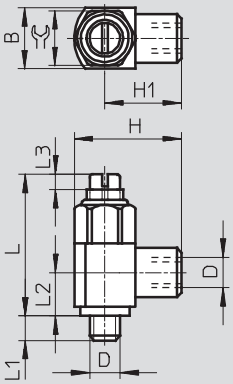
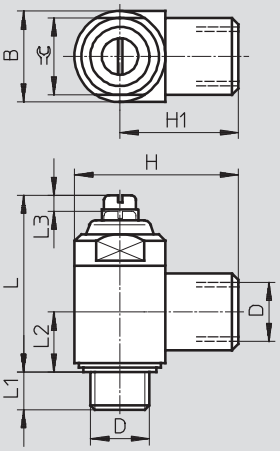
CRGRLA-M5



CRGRLA-⅛, CRGRLA-¼, CRGRLA-⅜, CRGRLA-½

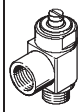


Type	Connection D	Nominal size [mm]	B	H	H1	L	L1	L2	L3	⌀
CRGRLA-M5	M5	2	10 –0.25	17.5 ±0.3	12.5	23.2	4	7.1	2.5	9
CRGRLA-⅛	G⅛	4	16 –0.4	28 +0.4/–0.3	20	33.7	5.5	10.3	3.5	14
CRGRLA-¼	G¼	6	20 –0.3	36 +0.4/–0.2	26	38.8	6.5	13.2	3.5	17
CRGRLA-⅜	G⅜	8.5	25 –0.3	41 +0.4/–0.2	28.5	48.5	7.5	15.4	5	22
CRGRLA-½	G½	10.6	32 –0.4	53 ±0.5	37	62.2	9	18.9	7.5	27

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

One-way flow control valves CRGRLA, corrosion-resistant

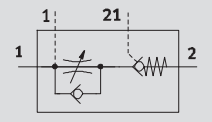
Technical data – Female thread, stainless steel

Ordering data – Exhaust air one-way flow control function									
	Pneumatic connection		Standard nominal flow rate qnN at 6 → 5 bar		Standard flow rate qn at 6 → 0 bar		Weight	Part No.	Type
			in direction of flow control	in non-return direction	in direction of flow control	in non-return direction			
	2	1	[l/min]	[l/min]	[l/min]	[l/min]	[g]		
Slotted head screw									
	M5	M5	95	77 ... 95	165	140 ... 150	10.2	**161403**	**CRGRLA-M5-B**
	G1/8	G1/8	340	260 ... 420	580	530 ... 590	37.8	**161404**	**CRGRLA-1/8-B**
	G1/4	G1/4	610	450 ... 820	1,265	1,030 ... 1,345	71.6	**161405**	**CRGRLA-1/4-B**
	G3/8	G3/8	1,450	970 ... 1,600	2,515	2,095 ... 2,665	126.9	**161406**	**CRGRLA-3/8-B**
	G1/2	G1/2	2,100	1,550 ... 2,200	4,265	3,550 ... 4,325	262.3	**161407**	**CRGRLA-1/2-B**

One-way flow control valves GRXA, function combination

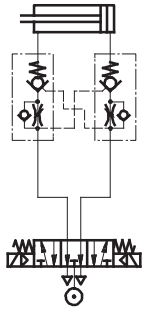
Technical data – Push-in connector QS, metal

One-way flow control function
Exhaust air



Flow rate
130 … 280 l/min
Temperature range
–10 … +60 °C
Pressure
0.5 … 10 bar

Function example:



The function combination consists of a one-way flow control valve and a piloted non-return valve.
Exhaust air flow control is active as long as a pilot signal from pneumatic connection 21 is applied. If no pilot signal is applied, the valve shuts off the exhaust air. The compressed air flows unthrottled through the non-return valve in the supply air direction.

- Stop function and speed setting in one housing
- Swivel pilot connection 21 perpendicular to screw-in direction
- Additional pilot connection 1 for crossover interconnection, e.g. for stop function with pressure failure
  ➔ Function example

General technical data				
Valve function			Exhaust air one-way flow control function	
Pneumatic connection 2			G⅛	G¼
Pneumatic connection 1			QS-4, QS-6	QS-6, QS-8
Pneumatic connection 21/additional pilot connection 1			QS-4	QS-4
Adjustment component			Slotted head screw	
Actuation type			Pneumatic	
Type of mounting			Screw-in, via male thread	
Mounting position			Any	
Switching time	Off	[ms]	44	
	On	[ms]	6	
Max. tightening torque		[Nm]	5	12

Operating and environmental conditions		
Operating pressure p1	[bar]	0.5 … 10
Pilot pressure p21	[bar]	2 … 10
Operating/pilot medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Operation with lubricated medium possible (in which case lubricated operation will always be required)
Ambient temperature	[°C]	–10 … +60
Temperature of medium	[°C]	–10 … +60
Storage temperature	[°C]	–10 … +40

Note

Additional measures are required for use in safety-related applications; in Europe, for example, the standards listed under the EC Machinery Directive must be observed.

Without additional measures in accordance with statutory minimum requirements, the product is not suitable for use in safety-related sections of control systems.

One-way flow control valves GRXA, function combination

Technical data – Push-in connector QS, metal

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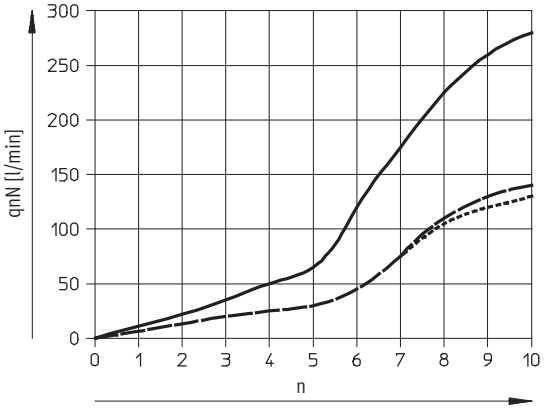
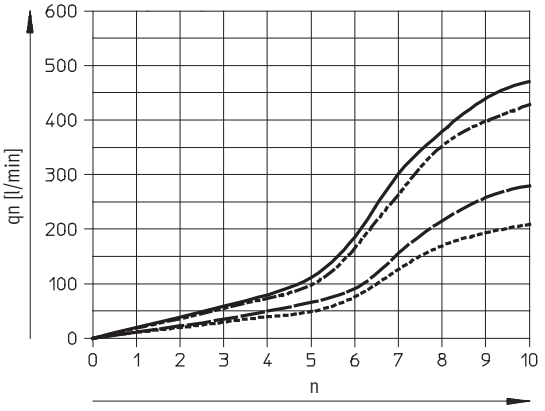
Standard nominal flow rate qnN at 6 ⇢ 5 bar as a function of turns of the adjusting screw n



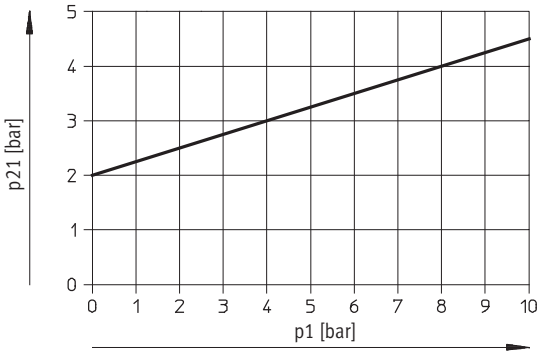
GRXA-HG-¼-QS-8, GRXA-HG-¼-QS-6
GRXA-HG-⅛-QS-6
GRXA-HG-⅛-QS-4

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



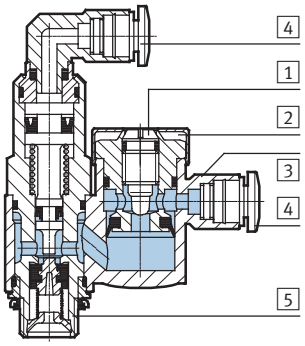
GRXA-HG-¼-QS-8
GRXA-HG-¼-QS-6
GRXA-HG-⅛-QS-6
GRXA-HG-⅛-QS-4

Minimum pilot pressure p21 as a function of operating pressure p1



Materials

Sectional view



One-way flow control valve		
1	Adjusting screw	Brass
2	Cap	Anodised wrought aluminium alloy
3	Swivel connection	POM
4	Releasing ring	POM
5	Hollow bolt	Anodised wrought aluminium alloy
–	Seals	NBR
Note on materials		RoHS-compliant

One-way flow control valves GRXA, function combination

Technical data – Push-in connector QS, metal

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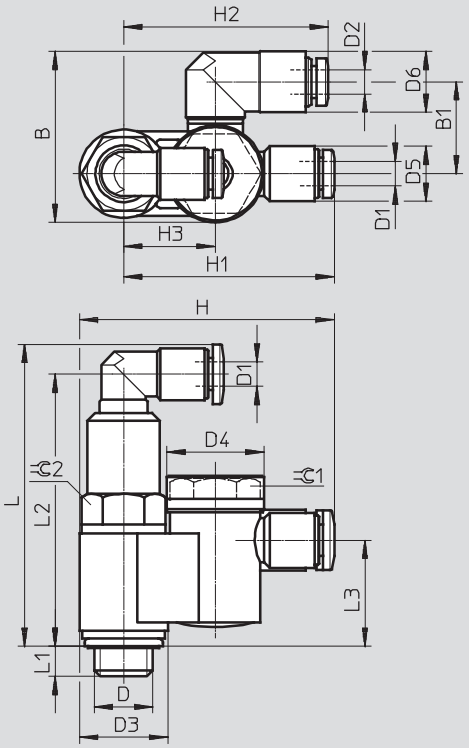
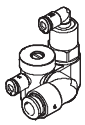
Dimensions Download CAD Data ➔ **www.festo.com/us/cad**

Slotted head screw



Type	Connection D	Tubing O.D. D1	Tubing O.D. D2	B	B1	D3 ∅	D4 ∅	D5 ∅	D6 ∅	H	H1	H2	H3	L	L1	L2	L3	⌀1	⌀2
GRXA-HG-⅛	G⅛	4	4	28	15	14.5	15.9	9	10	41.8	34.5	33.5	15	49.5	4.9	44.6	17.4	13	12
		4	6	31.5	17.3				12.5	41.8		34.5							
GRXA-HG-¼	G¼	4	6	36.1	19.5	19	20.6	9	12.5	52.2	42.7	40.5	21	56.3	5.6	51.4	21.1	17	16
		4	8	40.3	21.5				17	58.2		48.7							

Ordering data – Exhaust air one-way flow control function

	Pneumatic connection 2	Pneumatic connection 1	Standard nominal flow rate qnN at 6 ⇢ 5 bar: in direction of flow control [l/min]	Standard nominal flow rate qnN at 6 ⇢ 5 bar: in non-return direction [l/min]	Standard flow rate qn at 6 ⇢ 0 bar: in direction of flow control [l/min]	Standard flow rate qn at 6 ⇢ 0 bar: in non-return direction [l/min]	Weight [g]	Part No.	Type
Slotted head screw									
	G⅛	QS-4	130	100 … 140 100 … 140[1)]	210	220 … 250 230 … 260[1)]	28.2	**525667**	**GRXA-HG-⅛-QS-4**
		QS-6	140	120 … 160 115 … 165[1)]	280	260 … 300 270 … 300[1)]	28.2	**525668**	**GRXA-HG-⅛-QS-6**
	G¼	QS-6	280	180 … 260 200 … 270[1)]	430	410 … 470 430 … 490[1)]	58.8	**525669**	**GRXA-HG-¼-QS-6**
		QS-8	280	190 … 260 200 … 280[1)]	470	440 … 500 460 … 520[1)]	58.8	**525670**	**GRXA-HG-¼-QS-8**

1) Unactuated

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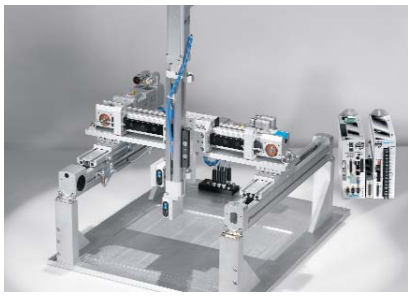

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