New
GRXA-HG

# One-way flow control, flow control and functional combinations

FESTO

- One-way flow control valves for exhaust and supply air flow control
- Flow control valves without non-return function
- For threads M3 ... G¾ and push-in fitting ∅ 3 ... 12 mm
- Functional combinations with one-way flow control valve and piloted non-return valve
- Polymer and metal designs
- Designs free of copper, PTFE and silicone
- Corrosion resistant designs

# Flow control valves and one-way flow control valves

Key features



## General information

### Standard nominal flow rate 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

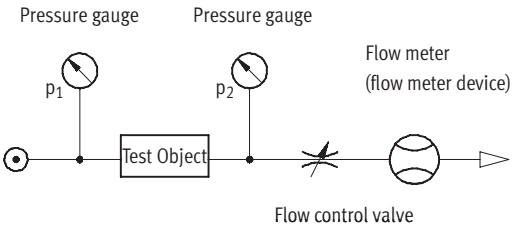
The standard flow rate is measured at an input pressure of p1 = 6 bar and an output pressure with respect to atmospheric pressure (p2 = 0 bar).

### Exhaust air flow control

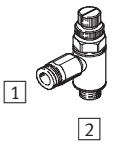

### Supply air flow control


### Flow control at both sides


### Flow measurement circuit



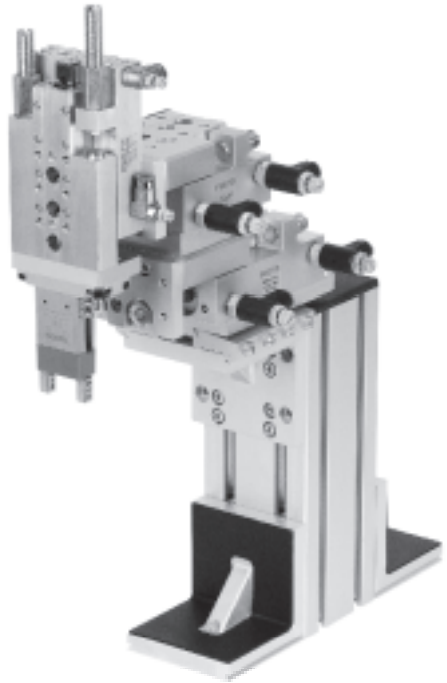

$p_1$ Input pressure
$p_2$ Output pressure




1 Compressed air connection
2 Working connection

## Typical applications

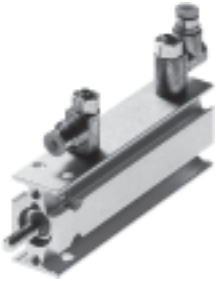
### Mini slide SLT with standard flow control valves



### Gripper HGW with mini flow control valves

### Flat cylinder DZF with mini flow control valves

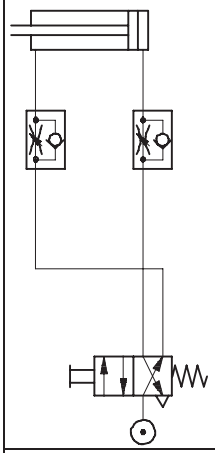
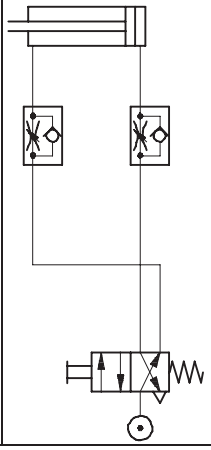
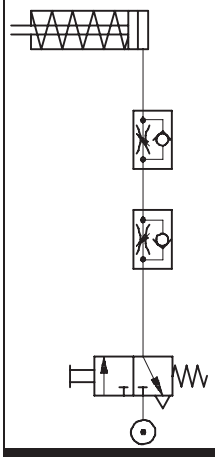
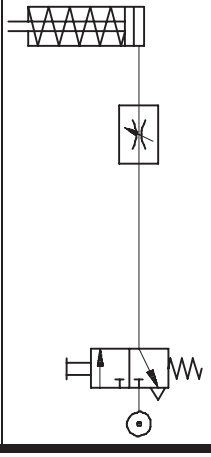
### Multimount cylinder DMM with mini flow control valves



# Flow control valves and one-way flow control valves

Key features

FESTO

| 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 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<br>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 joint rotatable 360°** | | | | | | |
| |  | GRXA-...-QS-...-D | Metal | Low flow | ■ | – | – |
| | | | | | ■ | – | – |
| | | | | | ■ | – | – |
| | **Adjustment via knurled screw** | | | | | | |
| |  | GRLA-...-QS-...-RS-B | Polymer | High flow | ■ | – | – |
| | | | | | ■ | – | – |
| | | | | | ■ | – | – |
| | **Adjustment via slotted head screw, push-in sleeve for QS push-in fittings** | | | | | | |
| |  | VFOC-E-... | Metal | Low flow | ■ | – | – |
| | | | | | ■ | – | – |

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

# Flow control and one-way flow control valves

Product range overview

FESTO

| Type | Pneumatic connection | | | | | | | | Free of copper, PTFE and silicone | → Page |
|---|---|---|---|---|---|---|---|---|---|---|
| | Thread | Tubing ∅ [mm] | | | | | | Tubing type[1] | | |
| | | 3 | 4 | 6 | 8 | 10 | 12 | | | |
| **Rotatable 360° around the screw-in axis after installation** | | | | | | | | | | |
| **Adjustment via slotted head screw** | | | | | | | | | | |
| GRLA-...-QS-...-D | M5 | ■ | ■ | ■ | – | – | – | PUN/PAN/PLN/PFAN (standard O.D.) | ■ | 2 / 5.6-13 |
| GRLZ-...-QS-...-D | G1/8 | ■ | ■ | ■ | ■ | – | – | | ■ | |
| | G1/4 | – | – | ■ | ■ | ■ | – | | ■ | |
| | G3/8 | – | – | ■ | ■ | ■ | – | | ■ | |
| | G1/2 | – | – | – | – | – | ■ | | ■ | |
| **Adjustment via slotted head screw** | | | | | | | | | | |
| GRLA-...-QS-...-MF-D | G1/8 | – | – | ■ | ■ | – | – | PUN/PAN/PLN/PFAN (standard O.D.) | ■ | 2 / 5.6-13 |
| **Adjustment via slotted head screw** | | | | | | | | | | |
| GRLA-F-...-QS-...--D | G1/8 | – | ■ | ■ | ■ | – | – | PUN/PAN/PLN/PFAN (standard O.D.) | ■ | 2 / 5.6-20 |
| | G1/4 | – | – | ■ | ■ | – | – | | ■ | |
| **Adjustment via knurled screw** | | | | | | | | | | |
| GRLA-...-QS-...-RS-D | M5 | ■ | ■ | ■ | – | – | – | PUN/PAN/PLN/PFAN (standard O.D.) | ■ | 2 / 5.6-13 |
| | G1/8 | ■ | ■ | ■ | ■ | – | – | | ■ | |
| | G1/4 | – | – | ■ | ■ | ■ | – | | ■ | |
| | G3/8 | – | – | ■ | ■ | ■ | – | | ■ | |
| | G1/2 | – | – | – | – | – | ■ | | ■ | |
| **Adjustment via knurled screw** | | | | | | | | | | |
| GRLA-...-QS-...-RS-MF-D | G1/8 | – | – | ■ | ■ | – | – | PUN/PAN/PLN/PFAN (standard O.D.) | ■ | 2 / 5.6-13 |
| **Adjustment via slotted head screw, swivel joint rotatable 360°** | | | | | | | | | | |
| GRXA-...-QS-...-D | M5 | ■ | ■ | ■ | – | – | – | PUN/PAN/PLN/PFAN (standard O.D.) | ■ | 2 / 5.6-13 |
| | G1/8 | ■ | ■ | ■ | ■ | – | – | | ■ | |
| | G1/4 | – | – | ■ | ■ | ■ | – | | ■ | |
| **Adjustment via knurled screw** | | | | | | | | | | |
| GRLA-...-QS-...-RS-B | G1/8 | – | – | ■ | ■ | – | – | PUN/PAN/PLN/PFAN (standard O.D.) | – | 2 / 5.6-20 |
| | G1/4 | – | – | ■ | ■ | – | – | | – | |
| | G3/8 | – | – | ■ | ■ | – | – | | – | |
| **Adjustment via slotted head screw, push-in sleeve for QS push-in fittings** | | | | | | | | | | |
| VFOC-E-... | – | – | ■ | – | – | – | – | PUN/PAN/PLN/PFAN (standard O.D.) | – | 2 / 5.6-79 |
| | – | – | – | ■ | | – | – | | – | |

1) Tubing → Volume 3

# Flow control and one-way flow control valves

Product range overview

FESTO

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

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

2) Only for tubing I.D. 3 mm

# Flow control and one-way flow control valves

Product range overview

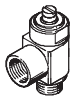
| Type | Pneumatic connection | | | | | | | | Free of copper, PTFE and silicone | ➔ Page |
|---|---|---|---|---|---|---|---|---|---|---|
| | Thread | Tubing ∅ [mm] | | | | | | Tubing type[1] | | |
| | | 3 | 4 | 6 | 8 | 10 | 12 | | | |
| **Adjustment via slotted head screw** | | | | | | | | | | |
| GRLA-...-B | M5 | Dependent on fitting | | | | | | | – | 2 / 5.6-34 |
| GRLZ-...-B | G1⁄8 | | | | | | | | – | |
| GRLO-...-B | G1⁄4 | | | | | | | | – | |
| | G3⁄8 | | | | | | | | – | |
| | G1⁄2 | | | | | | | | – | |
| | G3⁄4 | | | | | | | | – | |
| **Adjustment via knurled screw** | | | | | | | | | | |
| GRLA-...-RS-B | M5 | Dependent on fitting | | | | | | | – | 2 / 5.6-34 |
| GRLZ-...-RS-B | G1⁄8 | | | | | | | | – | |
| | G1⁄4 | | | | | | | | – | |
| **Adjustment via slotted head screw** | | | | | | | | | | |
| GRLA-...-PK-...-B | M5 | ■ | ■ | – | – | – | – | PU/PL/PP (standard I.D.) | – | 2 / 5.6-40 |
| GRLZ-...-PK-...-B | G1⁄8 | ■ | ■ | ■ | – | – | – | | – | |
| GRLO-...-PK-...-B | G1⁄4 | – | ■ | ■ | – | – | – | | – | |
| **Adjustment via knurled screw** | | | | | | | | | | |
| GRLA-...-PK-...-RS-B | M5 | ■ | – | – | – | – | – | PU/PL/PP (standard I.D.) | – | 2 / 5.6-40 |
| GRLZ-...-PK-...-RS-B | G1⁄8 | – | ■ | ■ | – | – | – | | – | |
| | G1⁄4 | – | ■ | ■ | – | – | – | | – | |

1) Tubing ➔ Volume 3

# Flow control and one-way flow control valves

Product range overview



| 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-...<br>GRLZ-...-QS-...<br>GRLO-...-QS-... | Metal | Low flow | ■ | ■ | ■ |
| | | GRLA-...-QS-...-LF-C<br>GRLZ-...-QS-...-LF-C<br>GRLO-...-QS-...-LF-C | | | ■ | ■ | ■ |
| |  | GRGA-...-QS-...<br>GRGZ-...-QS-...<br>GRGO-...-QS-... | Metal | Low flow | ■ | ■ | ■ |
| | | GRGA-...-QS-...LF-C<br>GRGZ-...-QS-...LF-C<br>GRGO-...-QS-...LF-C | | | ■ | ■ | ■ |
| **Mini flow control valve with female thread connection** | **Adjustment via slotted head screw** | | | | | | |
| |  | GRLA-...<br>GRLZ-...<br>GRLO-... | Metal | Low flow | ■ | ■ | ■ |
| |  | GRLA-...-LF-C<br>GRLZ-...-LF-C<br>GRLO-...-LF-C | | | ■ | ■ | ■ |
| **Mini flow control valve with barbed fitting connection PK** | **Adjustment via slotted head screw** | | | | | | |
| |  | GRLA-...-PK-...-LF-C<br>GRLZ-...-PK-...-LF-C<br>GRLO-...-PK-...-LF-C | Metal | Low flow | ■ | ■ | ■ |
| |  | GRGA-...-PK-...-LF-C<br>GRGZ-...-PK-...-LF-C<br>GRGO-...-PK-...-LF-C | | | ■ | ■ | ■ |
| **Corrosion resistant flow control valve with female thread connection** | **Adjustment via slotted head screw** | | | | | | |
| |  | CRGRLA-...-B | Stainless steel | Medium flow | ■ | – | – |
| | | | | | ■ | – | – |
| | | | | | ■ | – | – |
| | | | | | ■ | – | – |
| | | | | | ■ | – | – |

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

# Flow control and one-way flow control valves

Product range overview

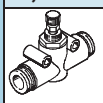
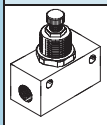
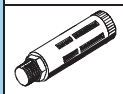
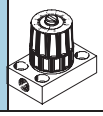
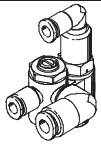
| Type | Pneumatic connection | | | | | | | | Free of copper, PTFE and silicone | → Page |
|---|---|---|---|---|---|---|---|---|---|---|
| | Thread | Tubing ∅ [mm] | | | | | | Tubing type[1] | | |
| | | 3 | 4 | 6 | 8 | 10 | 12 | | | |
| **Adjustment via slotted head screw** | | | | | | | | | | |
| GRLA-...-QS-...<br>GRLZ-...-QS-...<br>GRLO-...-QS-... | M3 | ■ | – | – | – | – | – | PUN/PAN/PLN/PFAN (standard O.D.) | – | 2 / 5.6-29 |
| GRLA-...-QS-...-LF-C<br>GRLZ-...-QS-...-LF-C<br>GRLO-...-QS-...-LF-C | M5 | ■ | ■ | – | – | – | – | | – | |
| GRGA-...-QS-...<br>GRGZ-...-QS-...<br>GRGO-...-QS-... | M3 | ■ | – | – | – | – | – | PUN/PAN/PLN/PFAN (standard O.D.) | – | |
| GRGA-...-QS-...LF-C<br>GRGZ-...-QS-...LF-C<br>GRGO-...-QS-...LF-C | M5 | ■ | ■ | – | – | – | – | | – | |
| **Adjustment via slotted head screw** | | | | | | | | | | |
| GRLA-...<br>GRLZ-...<br>GRLO-... | M3 | Dependent on fitting | | | | | | | – | 2 / 5.6-46 |
| GRLA-...-LF-C<br>GRLZ-...-LF-C<br>GRLO-...-LF-C | M5 | | | | | | | | – | |
| **Adjustment via slotted head screw** | | | | | | | | | | |
| GRLA-...-PK-...-LF-C<br>GRLZ-...-PK-...-LF-C<br>GRLO-...-PK-...-LF-C | M5 | ■ | – | – | – | – | – | PU/PL/PP (standard I.D.) | – | 2 / 5.6-49 |
| GRGA-...-PK-...-LF-C<br>GRGZ-...-PK-...-LF-C<br>GRGO-...-PK-...-LF-C | M5 | ■ | – | – | – | – | – | | – | |
| **Adjustment via slotted head screw** | | | | | | | | | | |
| CRGRLA-...-B | M5 | Dependent on fitting | | | | | | | – | 2 / 5.6-52 |
| | G1/8 | | | | | | | | – | |
| | G1/4 | | | | | | | | – | |
| | G3/8 | | | | | | | | – | |
| | G1/2 | | | | | | | | – | |

1) Tubing → Volume 3

# Flow control and one-way flow control valves

Product range overview

FESTO

| 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 thread 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-...<br>GRPO-...--PK-... | Polymer | Low flow | ■ | ■ | ■ |
| **Precision flow control valve on sub-base** |  | GRP-...-⅛-AL<br>GRPO-...-⅛-AL | Polymer | Low flow | ■ | ■ | ■ |
| **Functional combination with one-way flow control valve and piloted non-return valve** | **Adjustment via slotted head screw** | | | | | | |
| |  | GRXA-HG-...-QS-... | Metal | High flow | ■ | – | – |
| | | | | | ■ | – | – |
| **One-way flow control valve with 5 selectable flow control ranges** | **Precision adjustment via internal hex and setting of the ranges using a rotary 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 and one-way flow control valves

Product range overview

FESTO

| Type | Pneumatic connection | | | | | | | | Free of copper, PTFE and silicone | → Page |
|---|---|---|---|---|---|---|---|---|---|---|
| | Thread | Tubing ∅ [mm] | | | | | | Tubing type[1] | | |
| | | 3 | 4 | 6 | 8 | 10 | 12 | | | |
| **Adjustment via knurled screw** | | | | | | | | | | |
| GR-QS-... | – | ■ | ■ | ■ | ■ | – | – | PUN/PAN/PLN/PFAN (standard O.D.) | – | 2 / 5.6-55 |
| GR-QS-...-LF | – | – | ■ | ■ | – | – | – | | – | |
| GRO-QS-... | – | ■ | ■ | ■ | – | – | – | | – | |
| **Adjustment via knurled screw** | | | | | | | | | | |
| GR-...-B | M3 | Dependent on fitting | | | | | | | – | 2 / 5.6-59 |
| GRA-...-B | M5 | | | | | | | | – | |
| | G1⁄8 | | | | | | | | – | |
| | G1⁄4 | | | | | | | | – | |
| | G3⁄8 | | | | | | | | – | |
| | G1⁄2 | | | | | | | | – | |
| | G3⁄4 | | | | | | | | – | |
| **Adjustment via slotted head screw, directly screwed into valve** | | | | | | | | | | |
| GRE-... | G1⁄8 | – | – | – | – | – | – | – | – | 2 / 5.6-63 |
| | G1⁄4 | | | | | | | | – | |
| | G3⁄8 | | | | | | | | – | |
| | G1⁄2 | | | | | | | | – | |
| GRU-... | G1⁄8 | – | – | – | – | – | – | – | – | |
| | G1⁄4 | | | | | | | | – | |
| | G3⁄8 | | | | | | | | – | |
| | G1⁄2 | | | | | | | | – | |
| | G3⁄4 | | | | | | | | – | |
| **Adjustment via knurled screw** | | | | | | | | | | |
| GRF-PK-3-... | – | ■ | – | – | – | – | – | PU/PL/PP (standard I.D.) | – | 2 / 5.6-66 |
| **Adjustment via rotary knob** | | | | | | | | | | |
| GRP-...--PK-... GRPO-...--PK-... | – | ■ | ■ | – | – | – | – | PU/PL/PP (standard I.D.) | – | 2 / 5.6-72 |
| GRP-...-1⁄8-AL GRPO-...-1⁄8-AL | G1⁄8 | – | – | – | – | – | – | – | – | 2 / 5.6-68 |
| **Adjustment via slotted head screw** | | | | | | | | | | |
| GRXA-HG-...-QS-... | G1⁄8 | – | ■ | ■ | – | – | – | PUN/PAN/PLN/PFAN (standard O.D.) | – | 2 / 5.6-75 |
| | G1⁄4 | – | – | ■ | ■ | – | – | | | |
| **Precision adjustment via internal hex and setting of the ranges using a rotary switch** | | | | | | | | | | |
| GRLSA-1⁄8-QS-6 | G1⁄8 | – | – | ■ | – | – | – | PUN/PAN/PLN/PFAN (standard O.D.) | – | 2 / 5.6-79 |

1) Tubing → Volume 3

# Flow control valves and one-way flow control valves

Type codes



GRGA – M5 – QS – 3 – RS – LF – C –

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

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

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

| Setting component | |
|---|---|
| RS | Knurled screw |
| | Slotted head screw |

| Flow rate characteristic | |
|---|---|
| LF, MF | Low flow, medium flow |

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

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

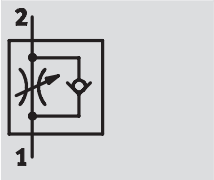
1) The series D is entirely free of copper and PTFE and thus does not have an additional CT note in the type code

# Flow control valves and one-way flow control valves

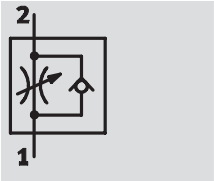
Technical data – Standard flow control valve with QS push-in connector, series D

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 | – | – | – |

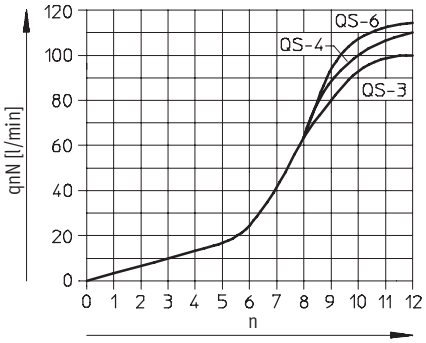
1) D: Flow control direction
2) R: Non-return direction

| 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 | – | – | – |

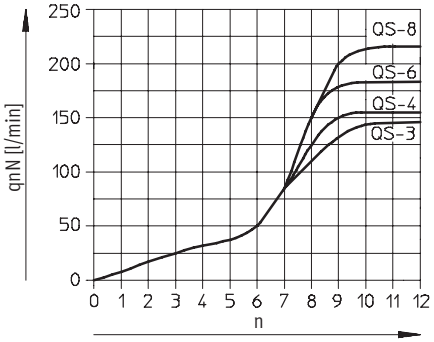
1) D: Flow control direction
2) R: Non-return direction

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

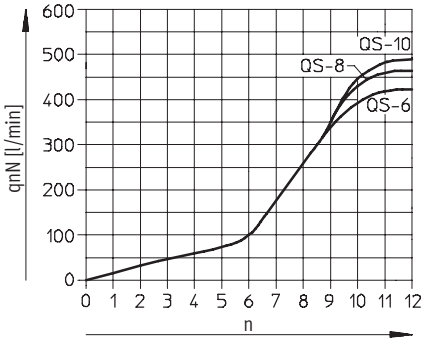
Screw-in thread M5



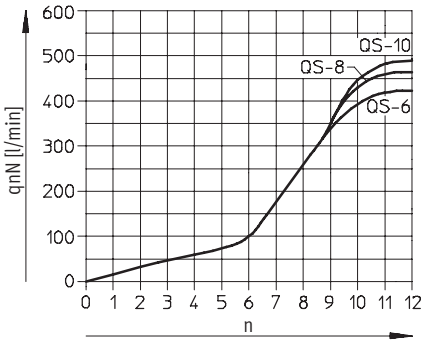

Screw-in thread G⅛




Screw-in thread G⅛ with flow rate MF

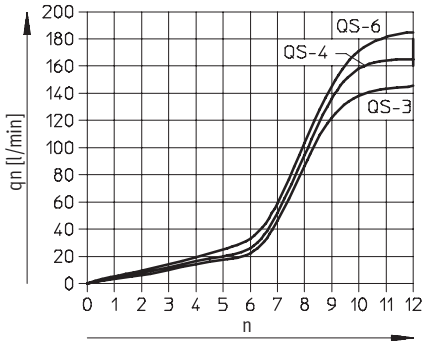



Screw-in thread G¼

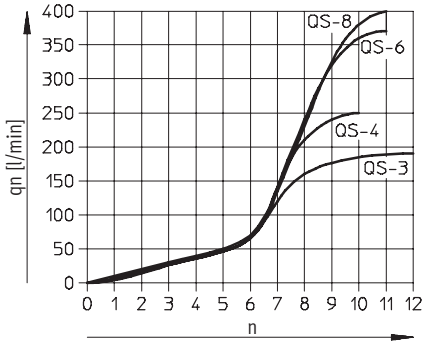



**Standard flow rate qn at 6 bar ⇢ 0 bar as a function of turns of the adjusting screw n**

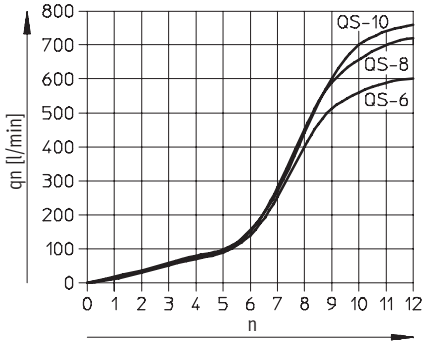
Screw-in thread M5



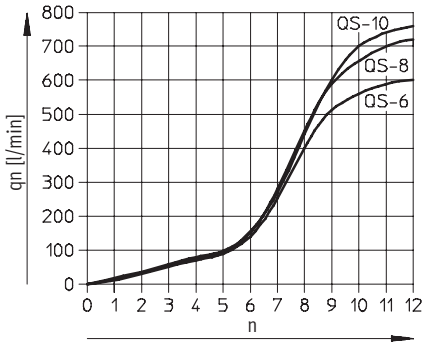

Screw-in thread G⅛




Screw-in thread G⅛ with flow rate MF




Screw-in thread G¼

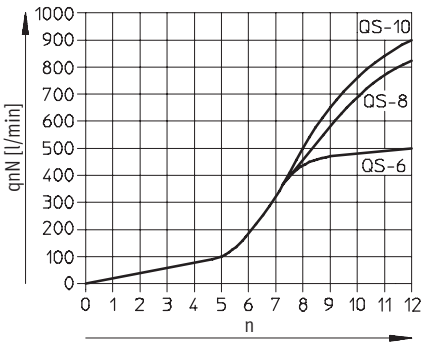


# Flow control valves and one-way flow control valves

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

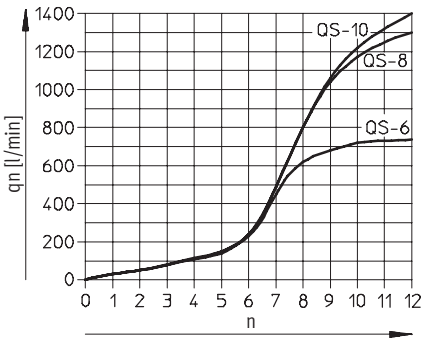
**Standard nominal flow rate qnN [l/min] at 6 bar ⇢ 5 bar as a function of turns of the adjusting screw n**

Screw-in thread G3⁄8

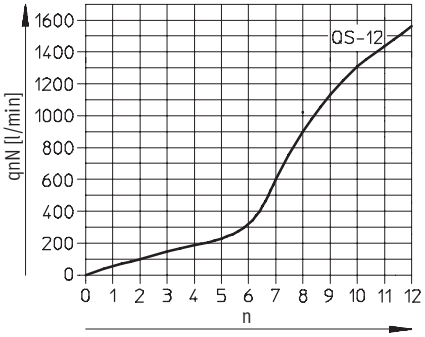



**Standard flow rate qn at 6 bar ⇢ 0 bar as a function of turns of the adjusting screw n**

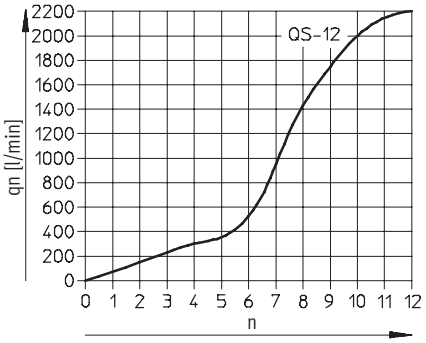
Screw-in thread G3⁄8




Screw-in thread G1⁄2

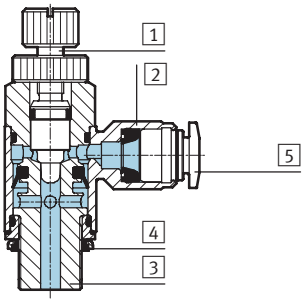



Screw-in thread G1⁄2




**Materials**

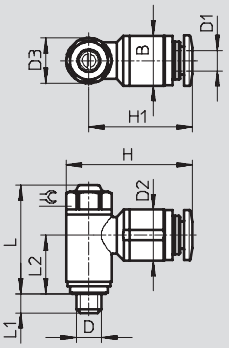
Sectional view



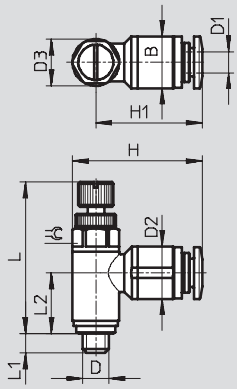

| Flow control valve | | |
|---|---|---|
| 1 | Regulating screw | Stainless steel |
| 2 | Swivel joint | Die-cast zinc |
| 3 | Threaded collar | Wrought aluminium alloy<br>(M5: nickel-plated brass) |
| 4 | Seal | Nitrile rubber |
| 5 | Release ring | Polyacetal |
| | Material note | Free of copper, PTFE and silicone |

**Dimensions** Download CAD data ➔ **www.festo.com/en/engineering**

Swivel joint, elbow outlet, slotted head screw



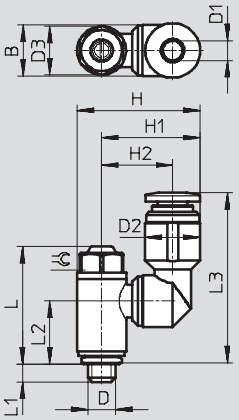

Swivel joint, elbow outlet, knurled screw




| Screw-in thread D | Tubing O.D. D1 | B | D2 ∅ | 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/en/engineering**

Swivel joint, outlet parallel and rotatable, slotted head screw

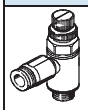
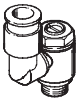



| Screw-in thread D | Tubing O.D. D1 | B | D2 ∅ +0.15/−0.1 | D3 ∅ | H | H1 | H2 | L | L1 | L2 | L3 | ⌀ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M5 | 3 | 8.9 | 8.2 | 8.9 ±0.07 | 20.7 | 16.25 | 12.15 | 21.4 | 3.6 | 11.5 | 29.6 | 8 |
| | 4 | 9.9 | 10 | | 22.4 | 17.95 | 12.95 | 21.4 | 3.6 | 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

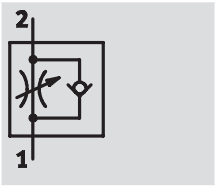
| Ordering data | | | | | |
|---|---|---|---|---|---|
| Design | Screw-in thread | For tubing O.D. [mm] | Flow | One-way flow control function for exhaust air<br>Part No. Type | One-way flow control function for supply air<br>Part No. Type |
| Swivel joint, elbow outlet, slotted head screw | | | | |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

# Flow control and one-way flow control valves

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

FESTO

Function




One-way flow control valve
GRLA-F

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

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

| General technical data | | | |
|---|---|---|---|
| Screw-in thread | | 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

FESTO

| 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 |

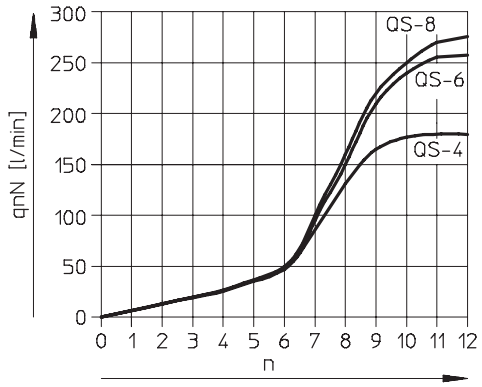
1) D: Flow control direction
2) R: Non-return direction

| 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 |

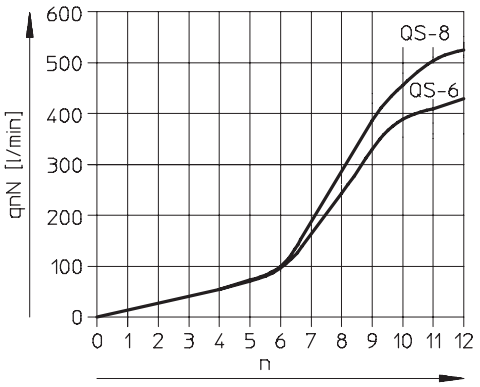
1) D: Flow control direction
2) R: Non-return direction

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

Screw-in thread G⅛

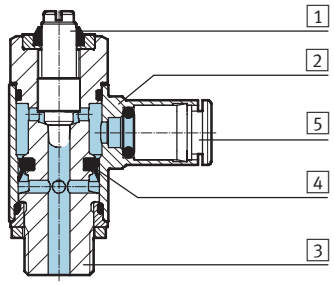



Screw-in thread G¼




**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 |

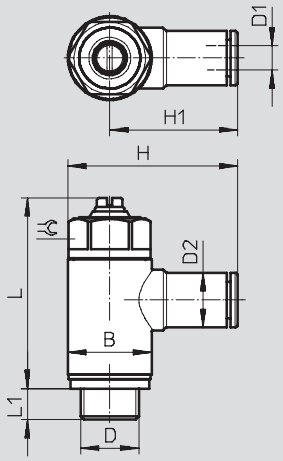
# Flow control and one-way flow control valves

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

FESTO

**Dimensions** Download CAD data ➔ **www.festo.com/en/engineering**

Swivel joint, elbow outlet, slotted head screw




| Screw-in thread D | Tubing outer ∅ D1 | D2 ∅ | B | H | H1 | L max. | L1 | ⫧ |
|---|---|---|---|---|---|---|---|---|
| G⅛ | 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 | | | |
| G¼ | 6 | 11 | 17.8 | 35.1 | 26.2 | 34.9 | 5.9 | 15 |
| | 8 | 13 | | 35.9 | 27.0 | | | |

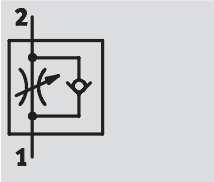
**Ordering data**

| 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 | | | | |
|  | G⅛ | 4 | **195 597** | **GRLA-F-⅛-QS-4-D** |
| | | 6 | **195 598** | **GRLA-F-⅛-QS-6-D** |
| | | 8 | **195 599** | **GRLA-F-⅛-QS-8-D** |
| | G¼ | 6 | **195 600** | **GRLA-F-¼-QS-6-D** |
| | | 8 | **195 601** | **GRLA-F-¼-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 |

# Flow control valves and one-way flow control valves

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

| 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 |

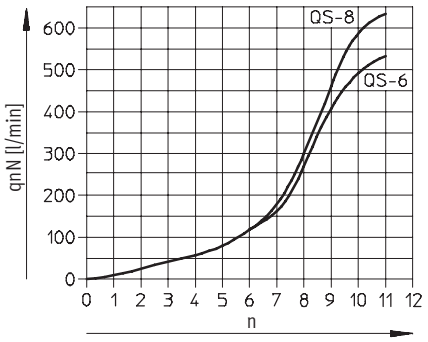
1) D: Flow control direction
2) R: Non-return direction

| 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

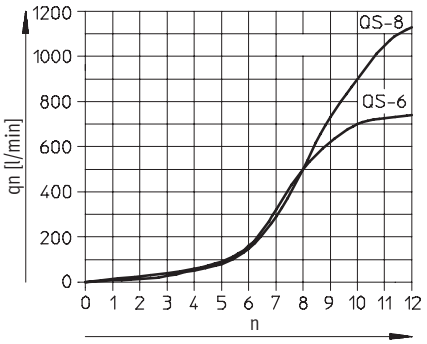
**Standard nominal flow rate qnN at 6 bar ⇢ 5 bar as a function of turns of the adjusting screw n**

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



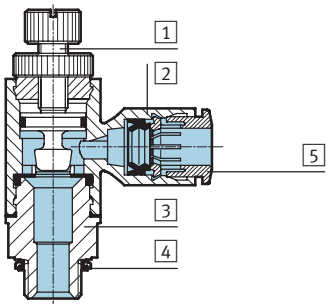

**Standard flow rate qn at 6 bar ⇢ 0 bar as a function of turns of the adjusting screw n**

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




**Materials**

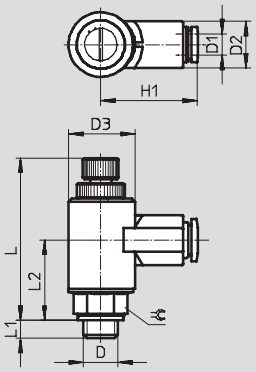
Sectional view




| 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 |

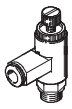
**Dimensions** Download CAD data ➔ **www.festo.com/en/engineering**

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 | | | | |

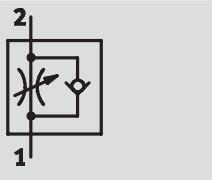
**Ordering data**

| 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** |

# 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 | | | G1/8 | G1/4 |
| One-way flow control function for exhaust air | | | | |
| GRLA | QS-6 | D[1] | 0 … 520 | – |
| | | R[2] | 400 … 550 | – |
| | QS-8 | D | 0 … 650 | 0 … 650 |
| | | R | 600 … 750 | 600 … 750 |

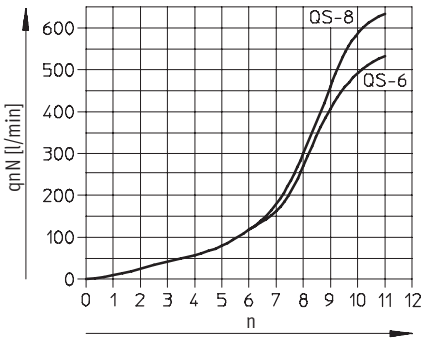
1) D: Flow control direction
2) R: Non-return direction

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

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

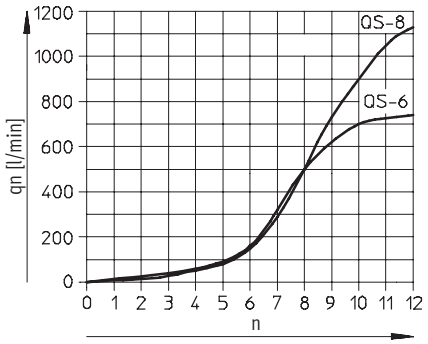
**Standard nominal flow rate qnN at 6 bar → 5 bar as a function of turns of the adjusting screw n**

Screw-in thread G1/8, G1/4



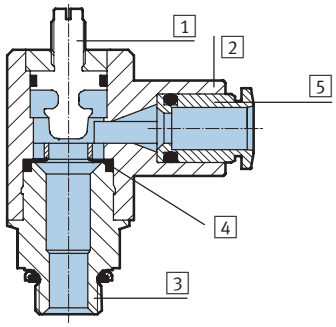

**Standard flow rate qn at 6 bar → 0 bar as a function of turns of the adjusting screw n**

Screw-in thread G1/8, G1/4




**Materials**

Sectional view



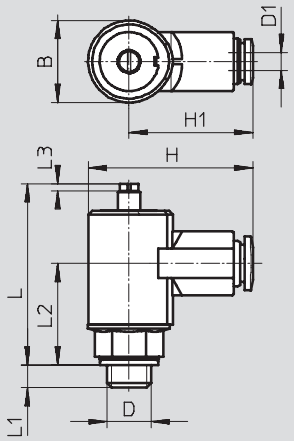

| Flow control valve | | |
|---|---|---|
| 1 | Regulating screw | Brass |
| 2 | Rotatable connection | Polybutylene terephthalate, reinforced |
| 3 | Threaded spigot | Wrought aluminium alloy |
| 4 | Seal | Nitrile rubber |
| 5 | Release ring | Polyacetate |

# Flow control and non-return valves

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

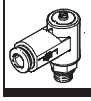
**Dimensions** Download CAD data ➔ **www.festo.com/en/engineering**

Rotatable connection, elbow outlet, slotted head screw




| Screw-in thread D | Tubing O.D. D1 | B ∅ –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 |

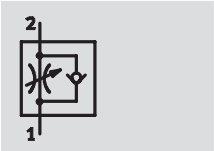
**Ordering data Bulk packs of 20**

| 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** |

# Flow control valves and one-way flow control valves

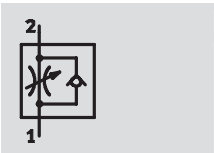
Technical data – Mini flow control valve with QS push-in connector

Function

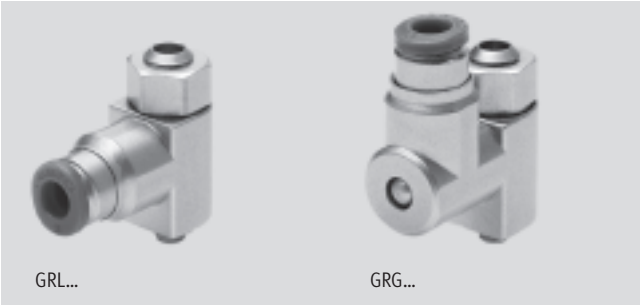



One-way flow control for exhaust air
GRLA/GRGA

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 |

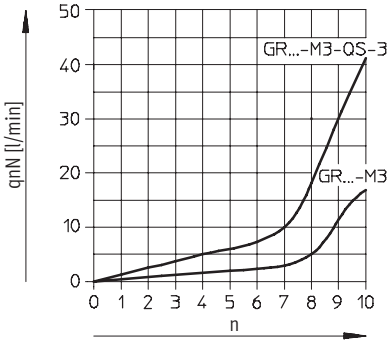
1) F: Flow control direction
2) N: Non-return direction

| 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 |

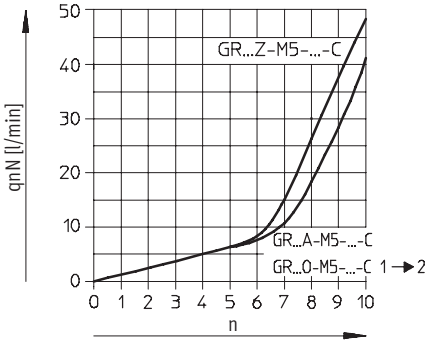
1) F: Flow control direction
2) N: Non-return direction

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

Screw-in thread M3

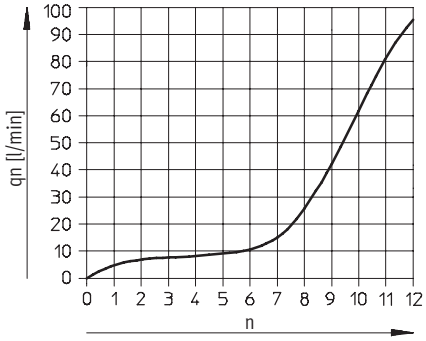



Screw-in thread M5

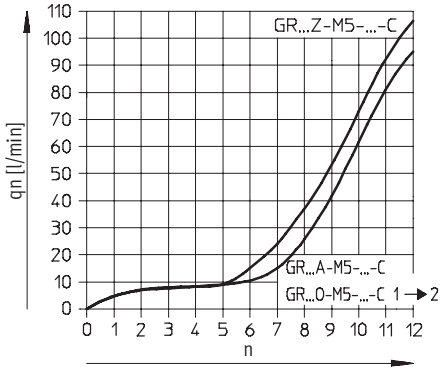



**Standard flow rate qn at 6 bar ⇢ 0 bar as a function of turns of the adjusting screw n**

Screw-in thread M3




Screw-in thread M5

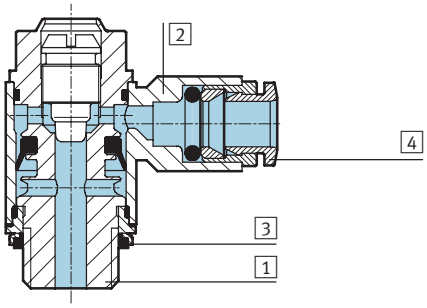


# Flow control valves and one-way flow control valves

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

## Materials

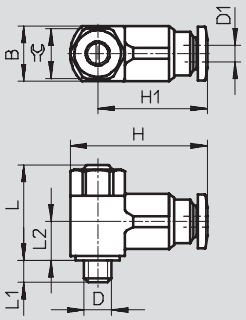
Sectional view




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

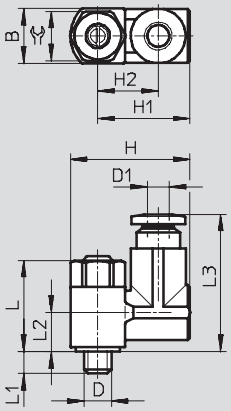
## Dimensions GRL...

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 |

| 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** |

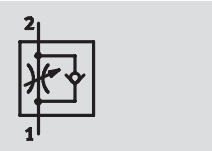
# Flow control valves and one-way flow control valves

Technical data – Standard flow control valve with female thread

FESTO

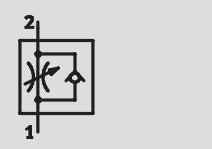


Function

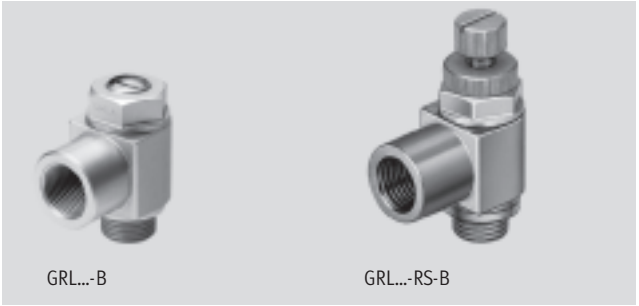



One-way flow control for exhaust air
GRLA

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 with the ISO 1179-1 standard and the ISO 228-1 standard.

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

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

# Flow control valves and one-way flow control valves

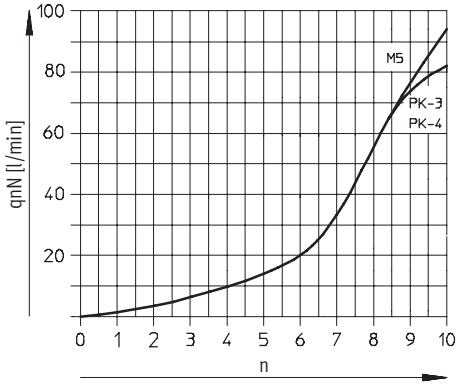
Technical data – Standard flow control valve with female thread

| Standard nominal flow rate 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 | – | – | – | – | – |

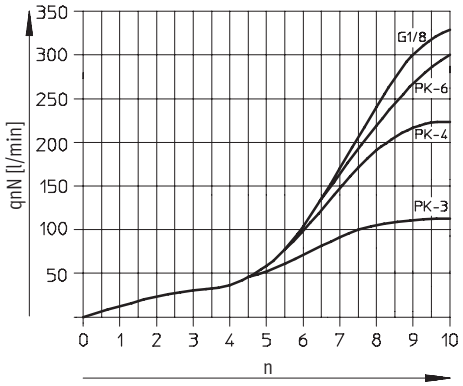
1) F: Flow control direction
2) N: Non-return direction

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

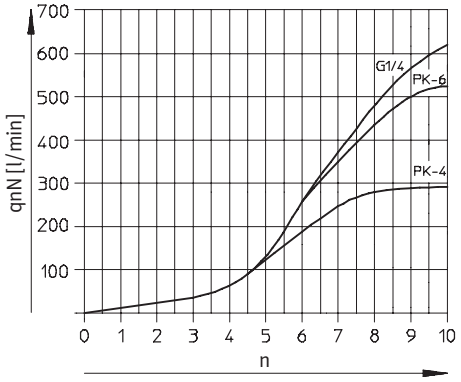
Screw-in thread M5




Screw-in thread G⅛

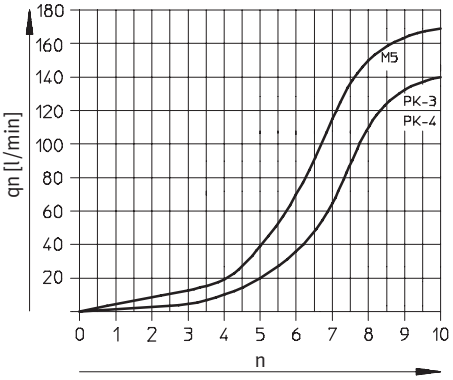



Screw-in thread G¼

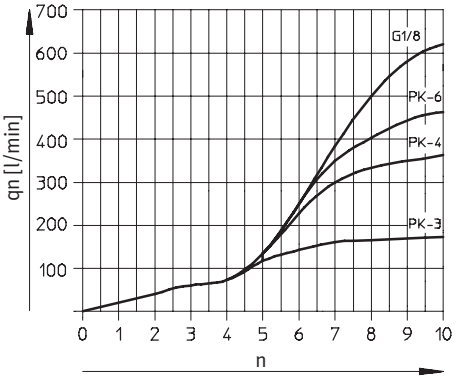



**Standard flow rate qn at 6 bar ⇢ 0 bar as a function of turns of the adjusting screw n**

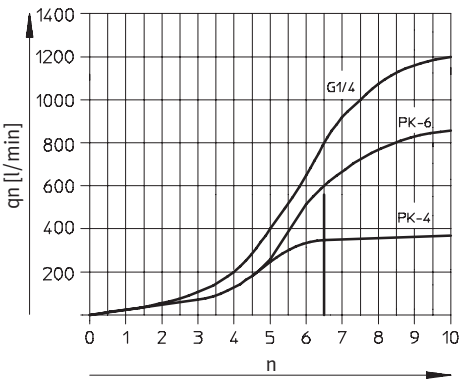
Screw-in thread M5




Screw-in thread G⅛

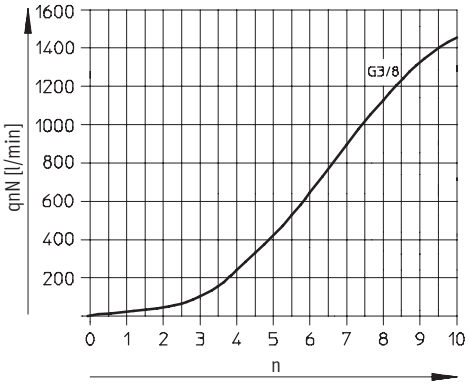



Screw-in thread G¼



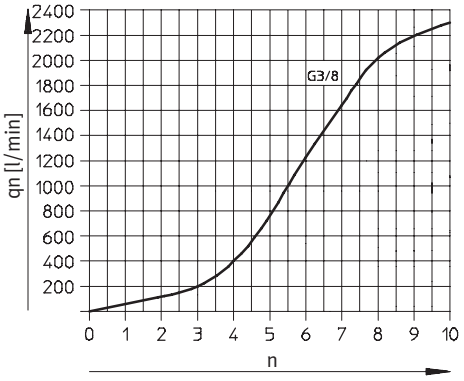
**Standard nominal flow rate qnN at 6 bar ⇢ 5 as a function of turns of the adjusting screw n**

Screw-in thread G3⁄8

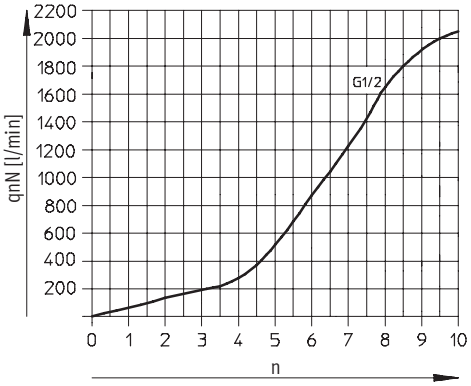



**Standard flow rate qn at 6 bar ⇢ 0 bar as a function of turns of the adjusting screw n**

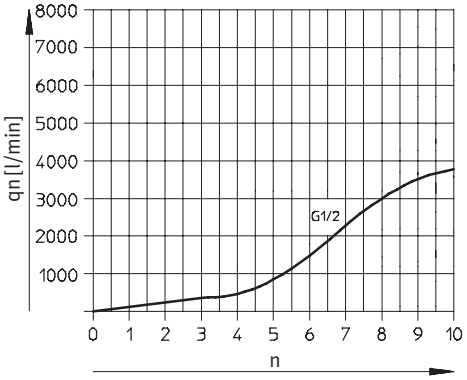
Screw-in thread G3⁄8



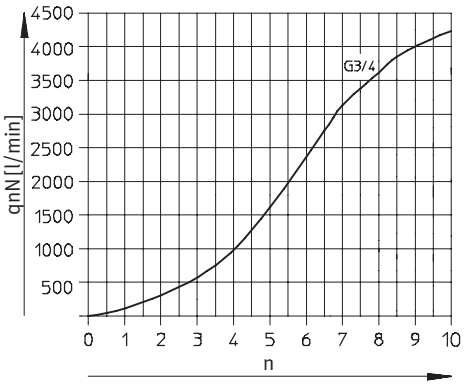

Screw-in thread G1⁄2



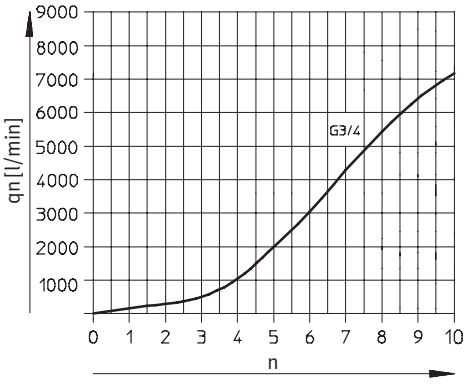

Screw-in thread G1⁄2




Screw-in thread G3⁄4




Screw-in thread G3⁄4

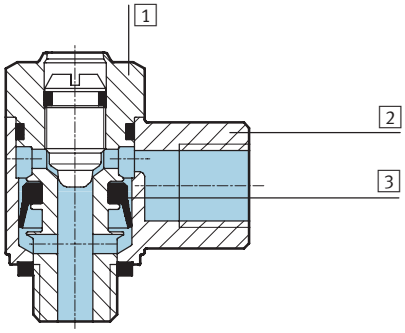


# Flow control valves and one-way flow control valves

Technical data – Standard flow control valve with female thread

## Materials

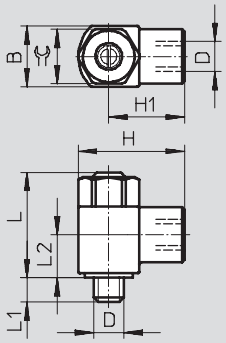
Sectional view



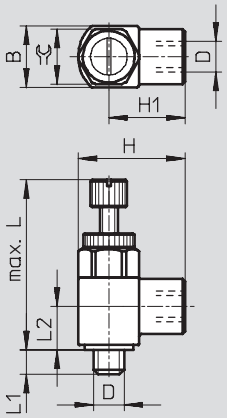

| Flow control valve | | |
|---|---|---|
| 1 | Threaded collar | Wrought aluminium alloy<br>(M5: brass, nickel-plated) |
| 2 | Swivel joint | Die-cast zinc |
| 3 | Seals | Nitrile rubber |
| | Note on material | Designs free of copper, PTFE and silicone<br>➔ Ordering data |

## 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 with the ISO 1179-1 standard and the ISO 228-1 standard.

# Flow control valves and one-way flow control valves

Technical data – Standard flow control valve with female thread

FESTO

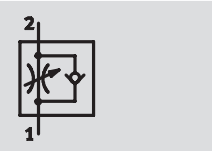
| Ordering data | | | | | |
|---|---|---|---|---|---|
| Design | Screw-in thread | Connecting thread | One-way flow control function for exhaust air<br>Part No. Type | One-way flow control function for supply air<br>Part No. Type | Flow control function, acting at both sides<br>Part No. Type |
| Female 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<br>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

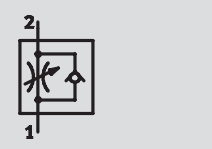
FESTO

Function

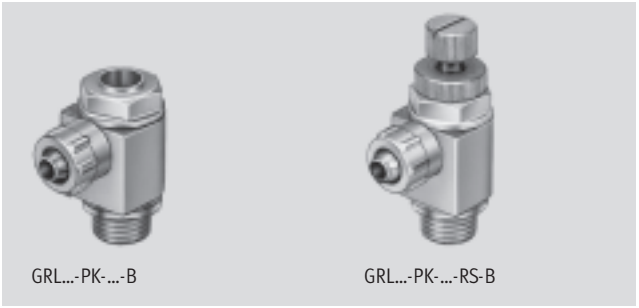



One-way flow control for exhaust air
GRLA

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 |

# Flow control valves and one-way flow control valves

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

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

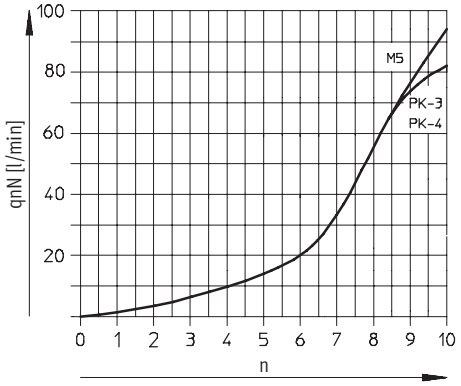
1) F: Flow control direction
2) N: Non-return direction

# Flow control valves and one-way flow control valves

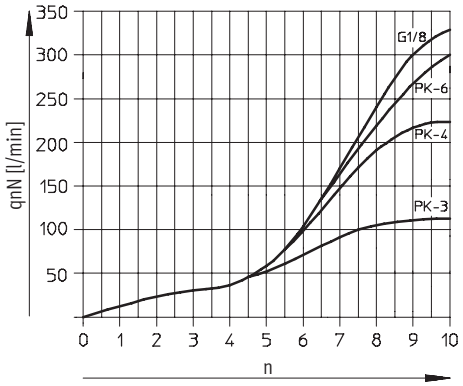
Technical data – Standard flow control valve with barbed fitting connection PK

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

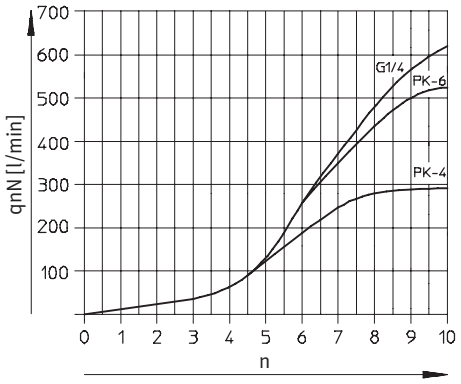
Screw-in thread M5




Screw-in thread G1⁄8

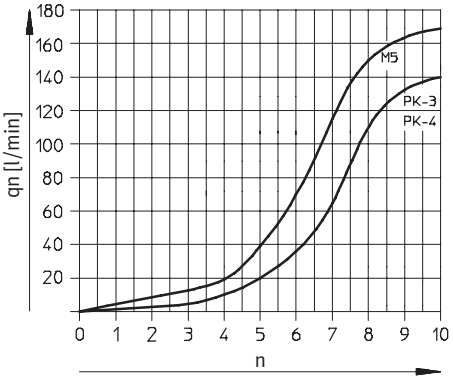



Screw-in thread G1⁄4

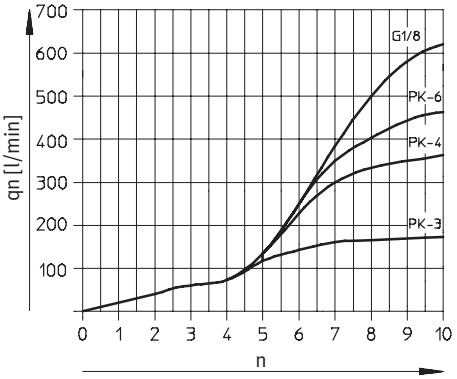



**Standard flow rate qn at 6 bar → 0 bar as a function of turns of the adjusting screw n**

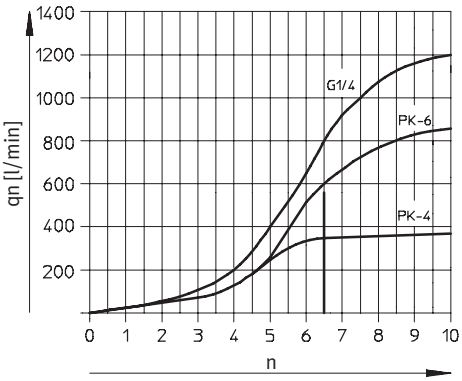
Screw-in thread M5




Screw-in thread G1⁄8




Screw-in thread G1⁄4



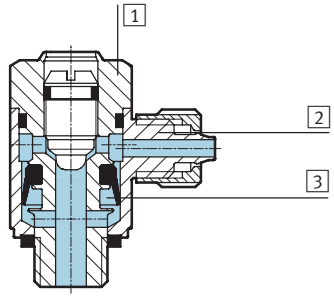
# Flow control valves and one-way flow control valves

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

FESTO

## Materials

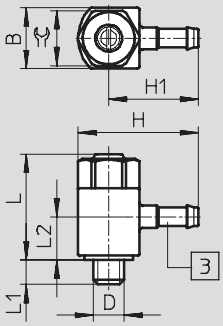
Sectional view




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

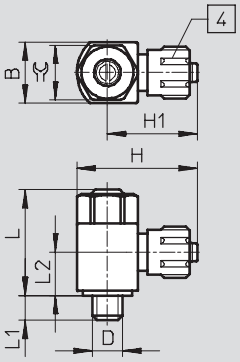
## Dimensions

Slotted head screw, screw-in thread M5




3 Barbed fitting

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

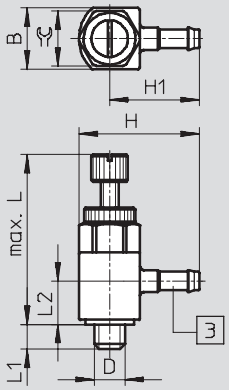



4 Union nut

| 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 |

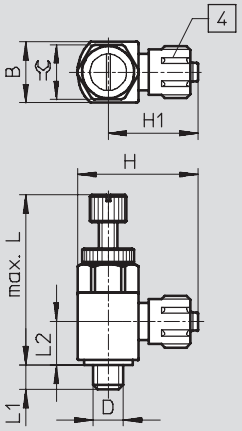
## Dimensions

Knurled screw, screw-in thread M5




3 Barbed fitting

Knurled screw, screw-in thread G1⁄8, G1⁄4




4 Union nut

| Screw-in thread D | Tubing I.D. | B | H | H1 | L max. | L1 | L2 | ⌀ |
|---|---|---|---|---|---|---|---|---|
| M5 | 3 | 10 –0.15 | 19.7 | 14.7 | 27.3 | 4 ±0.3 | 8.5 | 9 |
| G1⁄8 | 4 | 16 –0.15 | 30.2 | 22.2 | 38.6 | 5.3 +0.45/–0.35 | 13.4 | 14 |
| | 6 | 16 –0.15 | 30.3 | 22.3 | 38.6 | 5.3 +0.45/–0.35 | 12 | 14 |
| G1⁄4 | 4 | 20 –0.2 | 34.2 | 24.2 | 54.8 | 8.2 +0.45/–0.35 | 16.9 | 17 |
| | 6 | 20 –0.2 | 34.3 | 24.3 | 54.8 | 8.2 +0.45/–0.35 | 17.2 | 17 |

# Flow control valves and one-way flow control valves

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

| Ordering data | | | | | |
|---|---|---|---|---|---|
| Version[1] | Screw-in thread | For tubing I.D. [mm] | One-way flow control function for exhaust air<br>Part No. Type | One-way flow control function for supply air<br>Part No. Type | Flow control function acting at both sides<br>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<br>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

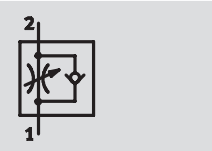
# Flow control valves and one-way flow control valves

Technical data – Mini flow control valve with female thread

FESTO

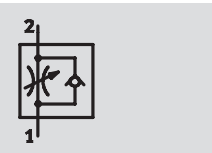


Function




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 | |

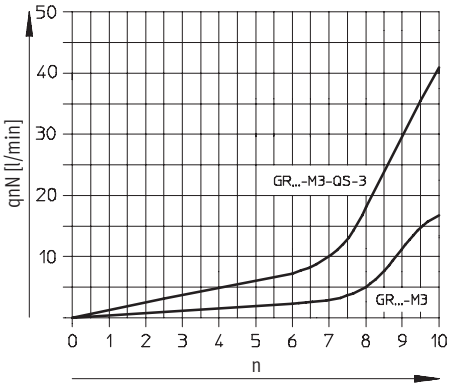
| Weights [g] | | | |
|---|---|---|---|
| Screw-in thread | | M3 | M5 |
| Product weight | [g] | 2 | 7 |

| 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 |

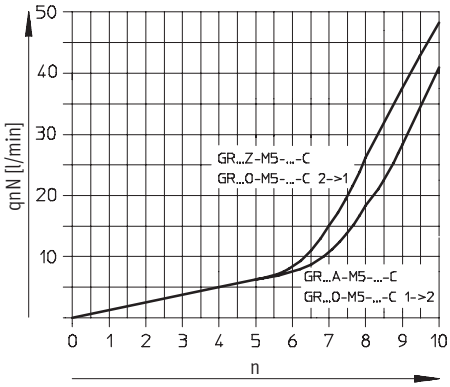
1) F: Flow control direction
2) N: Non-return direction

**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



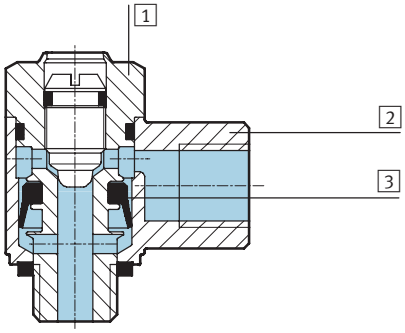
# Flow control valves and one-way flow control valves

Technical data – Mini flow control valve with female thread

FESTO

## Materials

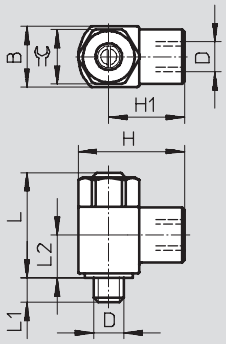
Sectional view




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

## Dimensions

Screw-in thread M3/M5




| Screw-in thread D | Connecting thread D | B | H | H1 | L | L1 | L2 | SW |
|---|---|---|---|---|---|---|---|---|
| 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 |

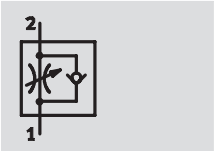
## Ordering data

| Version | Screw-in thread | Connecting thread | One-way flow control function for exhaust air<br>Part No. Type | One-way flow control function for supply air<br>Part No. Type | Flow control function acting at both sides<br>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

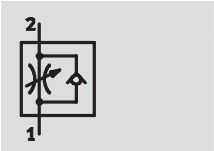
Technical data – Mini flow control valve with barbed fitting connection PK

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 |

# Flow control valves and one-way flow control valves

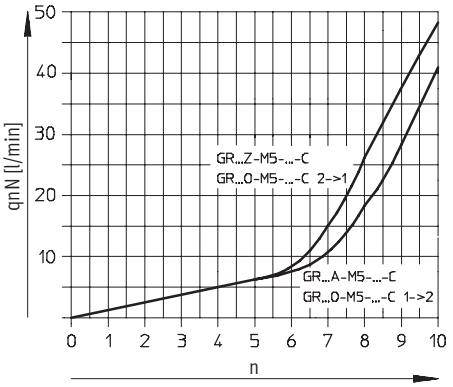
Technical data – Mini flow control valve with barbed fitting connection PK

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

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

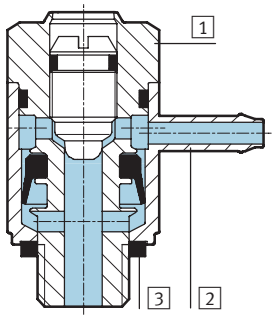
**Standard nominal flow rate qnN at 6 bar ⇢ 5 bar as a function of turns of the adjusting screw n**

Screw-in thread M5




**Materials**

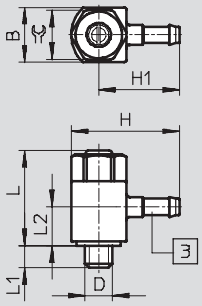
Sectional view




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

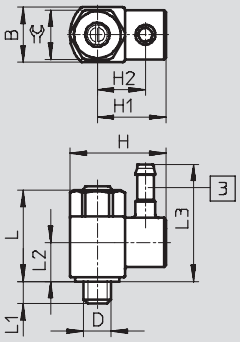
## Dimensions

Swivel joint, elbow outlet




3 Barbed fitting

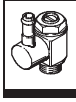
Swivel joint, parallel outlet




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

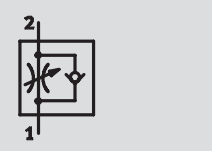
| Version | Screw-in thread | For tubing I.D. [mm] | One-way flow control function for exhaust air Part No. | Type | One-way flow control function for supply air Part No. | Type | Flow control function acting at both sides Part No. | Type |
|---|---|---|---|---|---|---|---|---|
| Barbed fitting, elbow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

FESTO

Function




One-way flow control for exhaust air
CRGRLA

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

CRGRLA-...-B

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

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

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

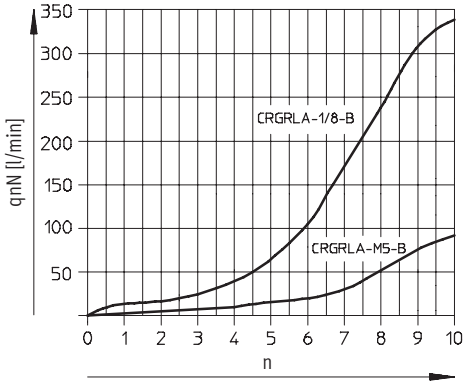
| Weights [g] | | | | | |
|---|---|---|---|---|---|
| Screw-in thread | M5 | G1/8 | G1/4 | G3/8 | G1/2 |
| | 14 | 44 | 83 | 150 | 315 |

| Standard nominal flow rate 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

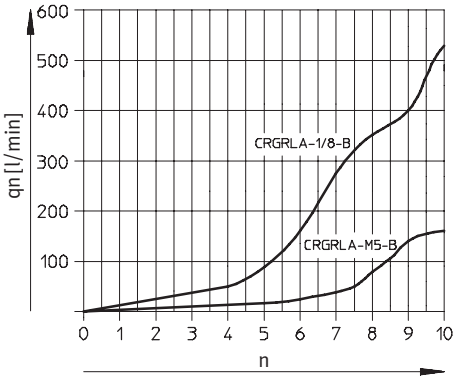
**Standard nominal flow rate qnN at 6 bar ⇢ 5 bar as a function of turns of the adjusting screw n**

Screw-in thread M5, G1⁄8

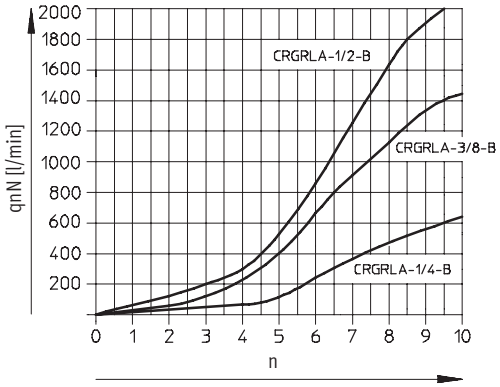



**Standard flow rate qn at 6 bar ⇢ 0 bar as a function of turns of the adjusting screw n**

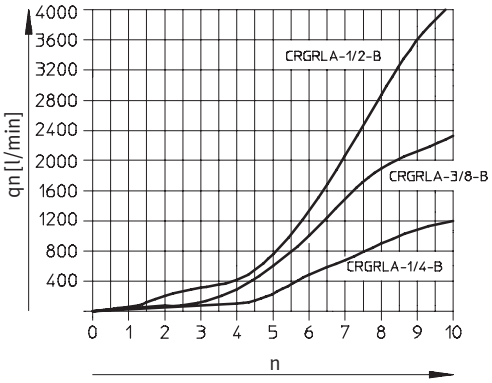
Screw-in thread M5, G1⁄8




Screw-in thread G1⁄4, G3⁄8, G1⁄2




Screw-in thread G1⁄4, G3⁄8, G1⁄2



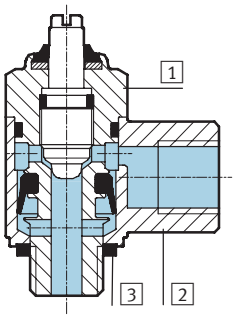
# Flow control valves and one-way flow control valves

Technical data – Corrosion resistant flow control valve with female thread

FESTO

## Materials

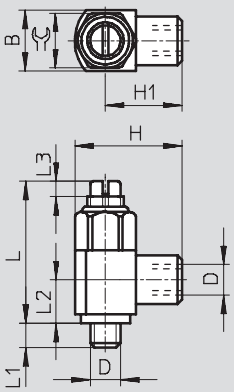
Sectional view



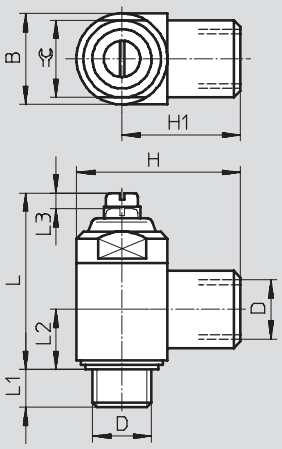

| Flow control valve | | |
|---|---|---|
| 1 | Threaded collar | High-alloy stainless steel |
| 2 | Swivel joint | High-alloy stainless steel |
| 3 | Seals | Fluorocaoutchouc, nitrile rubber |

## 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 | ⫧ |
|---|---|---|---|---|---|---|---|---|---|
| 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 with the ISO 1179-1 standard and the ISO 228-1 standard.

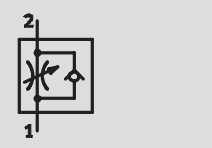
## Ordering data

| Version | Screw-in thread | Connecting thread | One-way flow control function for exhaust air<br>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 |

# Flow control valves and one-way flow control valves

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

| 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 | – |

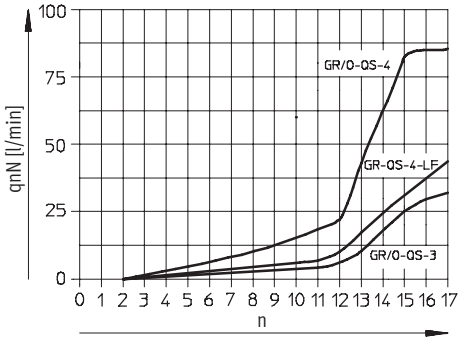
1) F: Flow control direction
2) N: Non-return direction

| 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

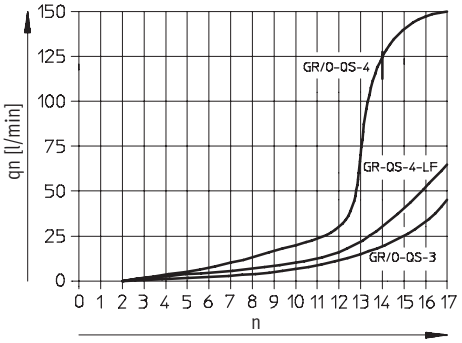
**Standard nominal flow rate qnN at 6 bar ⇢ 5 bar as a function of turns of the adjusting screw n**

Push-in connector QS-3/QS-4

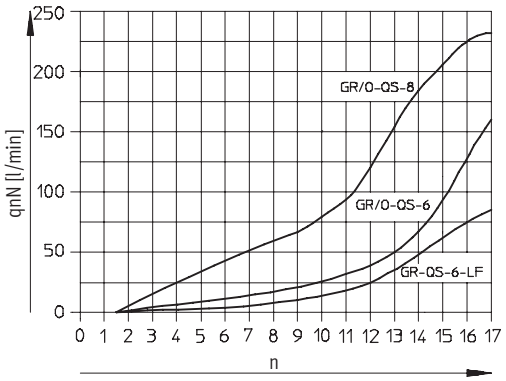



**Standard flow rate qn at 6 bar ⇢ 0 bar as a function of turns of the adjusting screw n**

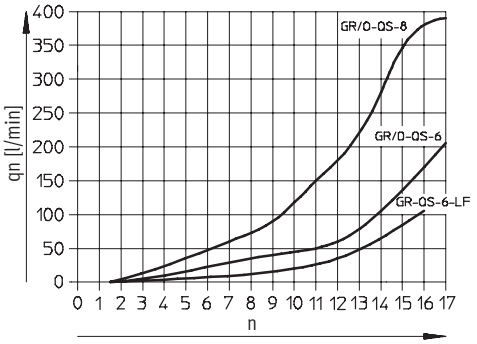
Push-in connector QS-3/QS-4




Push-in connector QS-6/QS-8

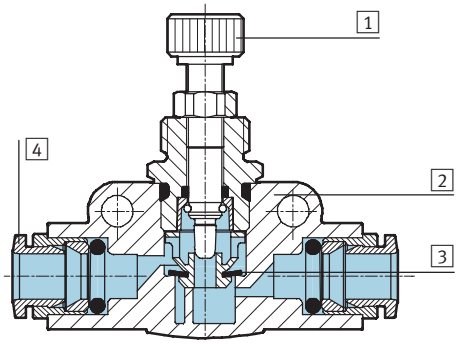



Push-in connector QS-6/QS-8



## Materials

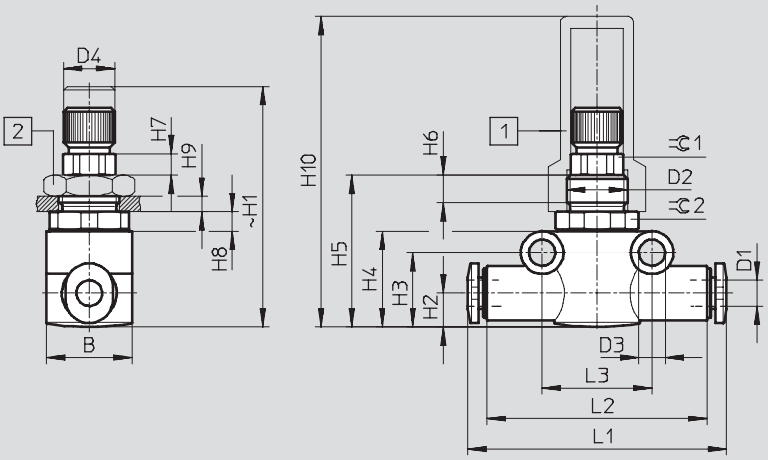
Sectional view




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

## Dimensions

Download CAD data ➔ **www.festo.com/en/engineering**




1 Tamper-proof cap GRK
2 Hex nut GRM

| Push-in connector | Tubing O.D. D1 | B | D2 | D3 ∅ ±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

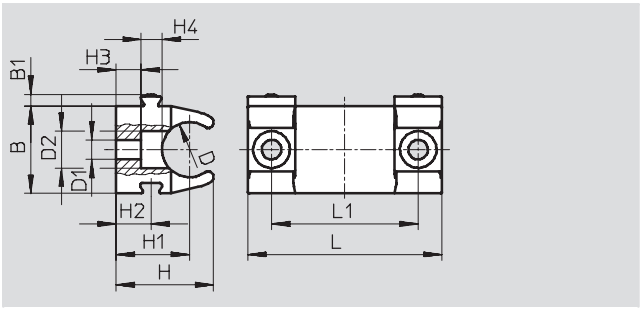
| Push-in connector | For tubing O.D. [mm] | Flow rate characteristic[1] | One-way flow control function Part No. | Type | Flow control function at both sides Part No. | Type |
|---|---|---|---|---|---|---|
| QS-3 | 3 | Mid flow | **193 965** | **GR-QS-3** | **193 971** | **GRO-QS-3** |
| QS-4 | 4 | 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** | – | |

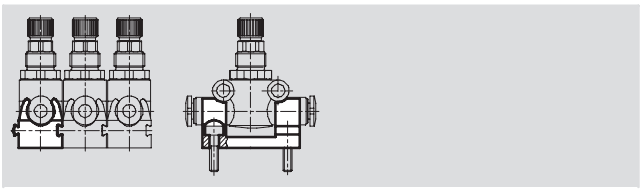
1) Low flow: Precision adjustment for low speed
Mid flow: Precision adjustment for average speed

**Retainer GR-H-QS**
for front panel mounting

Material: Polyacetal


GR-H-QS



**Dimensions and ordering data**

| For push-in fitting | B | B1 | D ∅ | D1 ∅ | D2 ∅ | H | H1 | H2 |
|---|---|---|---|---|---|---|---|---|
| QS-3/QS-4 | 14.3 | 1.9 | 9 | 3.2 | 6 | 16 | 12 | 5.7 |
| QS-6/QS-8 | 19,8 | 1.9 | 14.5 | 3.2 | 6 | 19.2 | 13 | 5.7 |

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

**Hex nut GRM**
for front panel mounting
Material: Steel

**Tamper-proof cap GRK**
Material: Polypropylene


GRM


GRK

**Ordering data**

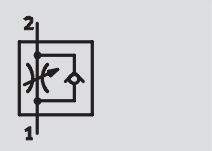
| For push-in fitting | Hex nut GRM | | Tamper-proof cap GRK | |
|---|---|---|---|---|
| | Part No. | Type | Part No. | Type |
| QS-3/QS-4 | **6 444** | **GRM-M5** | **6 436** | **GRK-M5** |
| QS-6/QS-8 | **2 107** | **GRM-⅛** | **2 105** | **GRK-⅛** |

# Flow control valves and one-way flow control valves

Technical data – Standard flow control valve with female thread

FESTO

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 with the ISO 1179-1 standard and the ISO 228-1 standard.

| 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 |

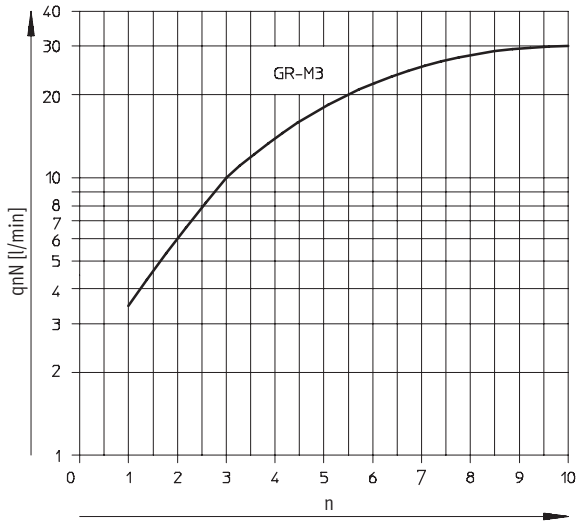
| Weights [g] | | | | | | | |
|---|---|---|---|---|---|---|---|
| Connecting thread | M3 | M5 | G⅛ | G¼ | G⅜ | G½ | G¾ |
| | 2.5 | 21 | 34 | 180 | 225 | 517 | 1 100 |

| 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 |

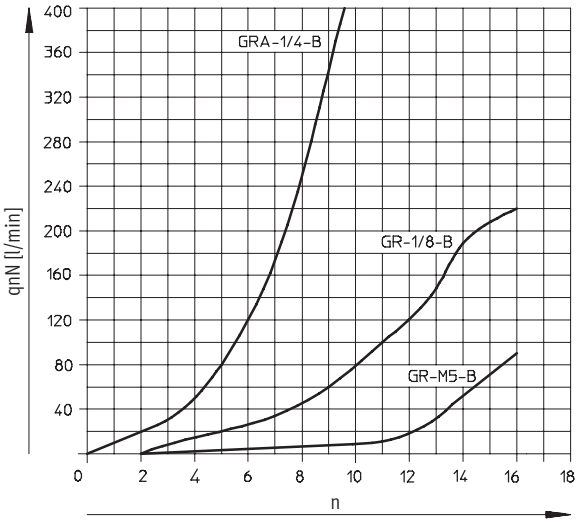
1) F: Flow control direction
2) N: Non-return direction

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

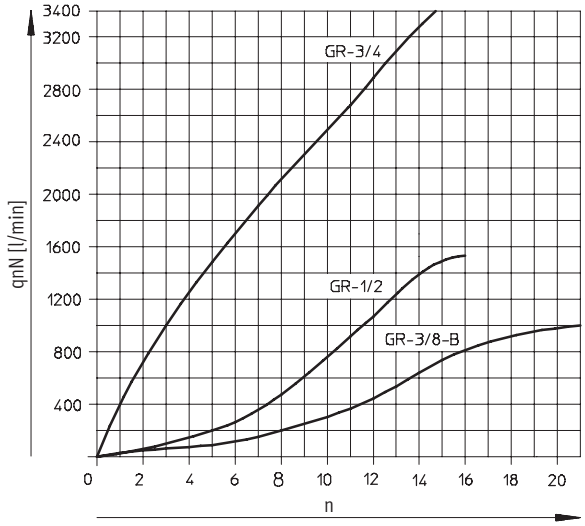
Connecting thread M3




Connecting thread M5, G1⁄8, G1⁄4




Connecting thread G3⁄8, G1⁄2, G3⁄4

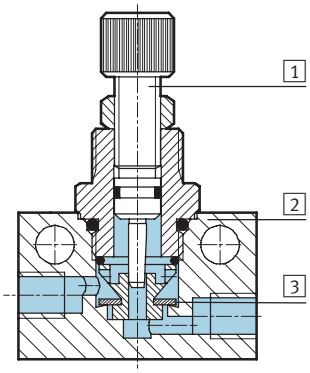


# Flow control valves and one-way flow control valves

Technical data – Standard flow control valve with female thread

## Materials

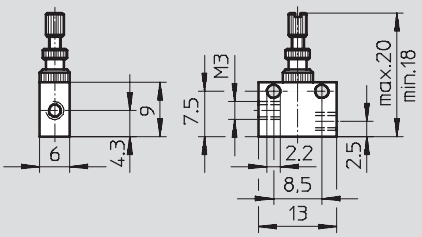
Sectional view



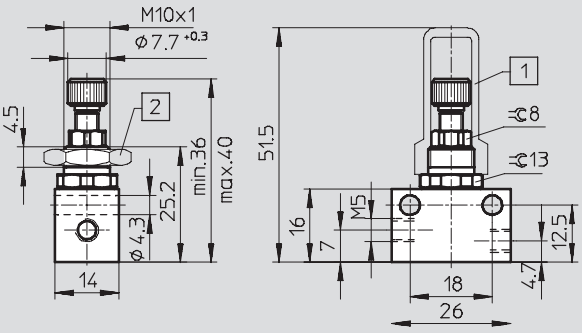

| Connecting thread | M3 | M5 | G1/8 | G1/4 | G3/8 | G1/2 | G3/4 |
|---|---|---|---|---|---|---|---|
| 1 Regulating screw | Brass | | | | | | Wrought aluminium alloy |
| 2 Housing | Wrought aluminium alloy | | | Die-cast zinc | | | Wrought aluminium alloy |
| 3 Seal | NBR | | | | | | |

## Dimensions

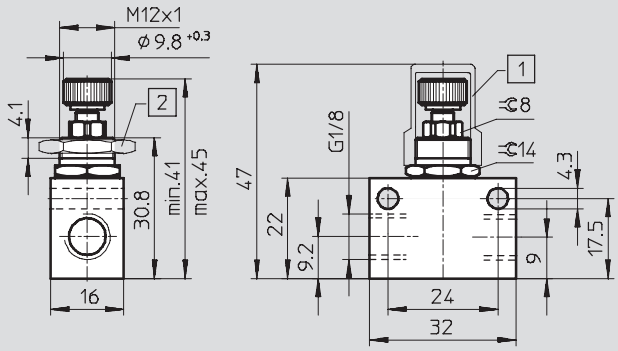
Connecting thread M3




Connecting thread M5




Connecting thread G1/8



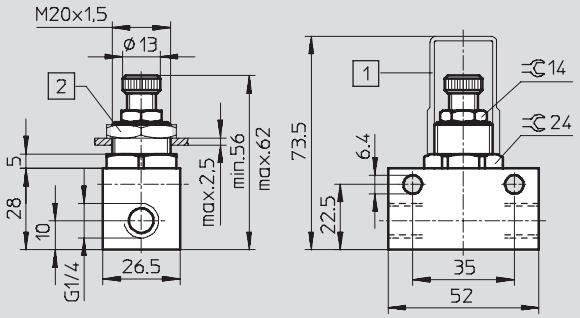

1 Tamper-proof cap GRK
2 Hex nut GRM

# Flow control valves and one-way flow control valves

Technical data – Standard flow control valve with female thread

## Dimensions

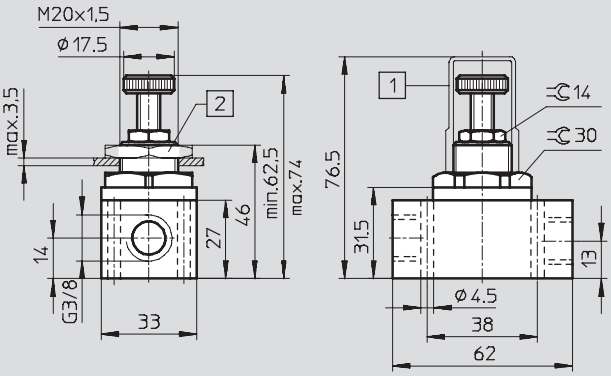
Connecting thread G¼




1 Tamper-proof cap GRK
2 Hex nut GRM

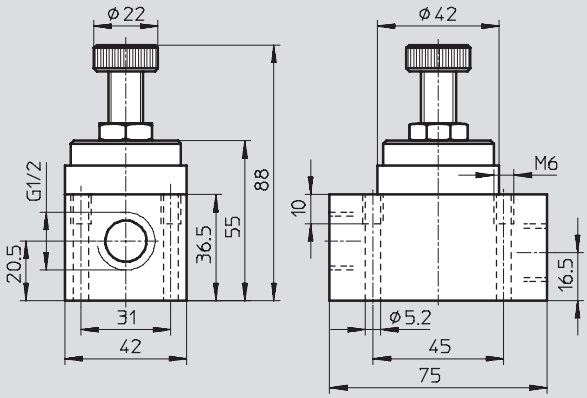
Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Connecting thread G⅜



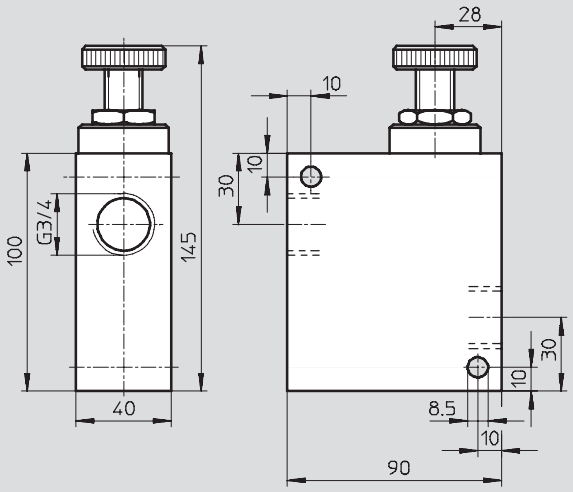

Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Connecting thread G½



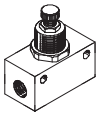

Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Connecting thread G¾




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

## Ordering data

| Version | Connecting thread | One-way flow control function | |
|---|---|---|---|
| | | Part No. | Type |
|  | M3 | **15 899** | **GR-M3** |
| | M5 | **151 213** | **GR-M5-B** |
| | 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** |

## Ordering data for accessories

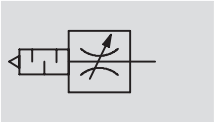
| | | For connecting thread M5 | | For connecting thread G⅛ | | For connecting thread G¼, G⅜ | |
|---|---|---|---|---|---|---|---|
| | | Part No. | Type | Part No. | Type | Part No. | Type |
|  | Hex nut | **6 444** | **GRM-M5** | **2 107** | **GRM-⅛** | **204 596** | **GRM-⅜** |
|  | Tamper-proof cap | **6 436** | **GRK-M5** | **2 105** | **GRK-⅛** | **6 309** | **GRK-⅜-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 |

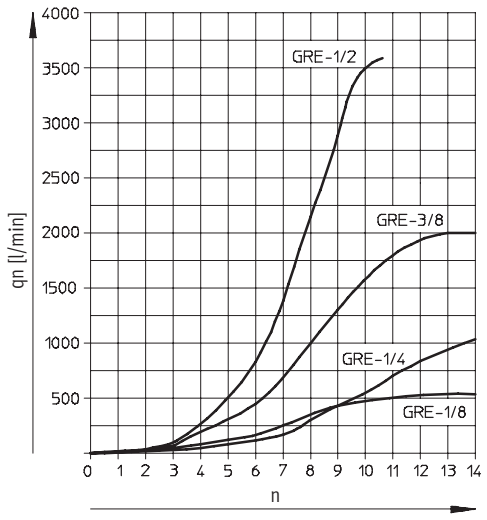
| Operating and environmental conditions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Screw-in thread | | | G1/8 | G1/4 | G3/8 | G1/2 | G3/4 |
| Operating medium | GRE | | Filtered compressed air, lubricated or unlubricated | | | | |
| | GRU | | Dried and filtered compressed air, lubricated or 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 |

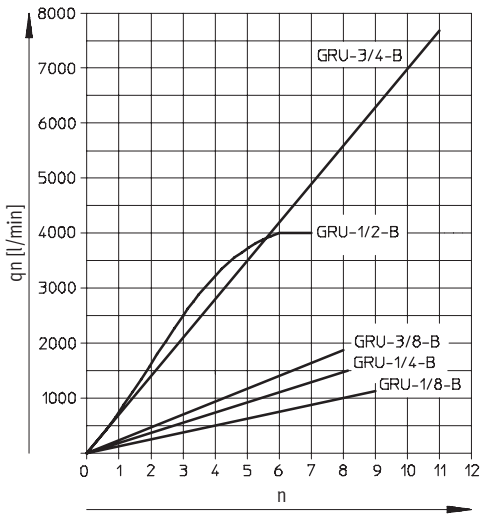
| Standard flow rate qn [l/min] at 6 bar ⇢ 0 bar | | | | | |
|---|---|---|---|---|---|
| Female thread | G1/8 | G1/4 | G3/8 | G1/2 | G3/4 |
| GRE | 2 ... 520 | 2 ... 996 | 3 ... 2 000 | 3 ... 3 600 | – |
| GRU | 0 ... 1000 | 0 ... 1 500 | 0 ... 1 700 | 0 ... 4 000 | 0 ... 8 000 |

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

GRE

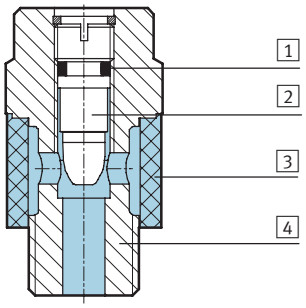



GRU

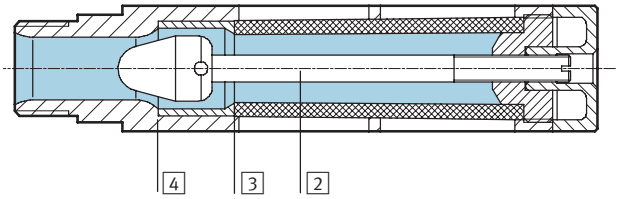



## Materials

Sectional view GRE



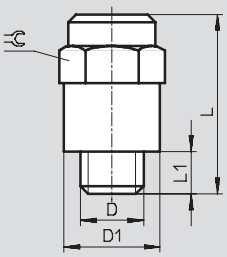

Sectional view GRU



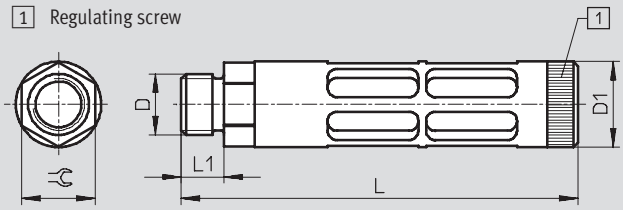

| | Metal design GRE | Polymer design GRU |
|---|---|---|
| 1 Seal | Nitrile rubber | – |
| 2 Regulating screw | Brass | Polyacetal |
| 3 Silencer | Bronze | Polyethylene |
| 4 Housing | Wrought aluminium alloy | Die-cast aluminium |

**Dimensions** Download CAD data ➔ **www.festo.com/en/engineering**

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**

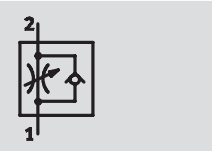
| Version | G1/8 Part No. | Type | G1/4 Part No. | Type | G3/8 Part No. | Type | G1/2 Part No. | Type | G3/4 Part No. | Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Metal design | | | | | | | | | | |
|  | **10 351** | **GRE-1/8** | **10 352** | **GRE-1/4** | **35 310** | **GRE-3/8** | **10 353** | **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

FESTO

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 |

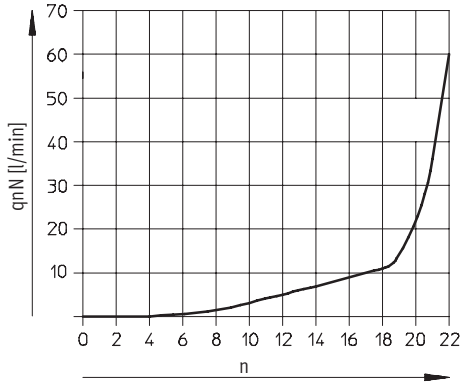
| Operating and environmental conditions | | | |
|---|---|---|---|
| Type | | GRF-PK-3 | GRF-PK-3X2 |
| Operating medium | | Filtered compressed air, lubricated or unlubricated | |
| Operating pressure | [bar] | 0.5 ... 8 | |
| Temperature of medium | [°C] | –10 ... 60 | |
| Ambient temperature | [°C]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

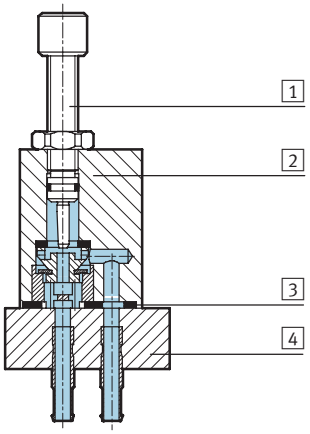
**Standard nominal flow rate qnN [l/min] at 6 bar ⇢ 5 bar as a function of turns of the adjusting screw n**

GRF



## Materials

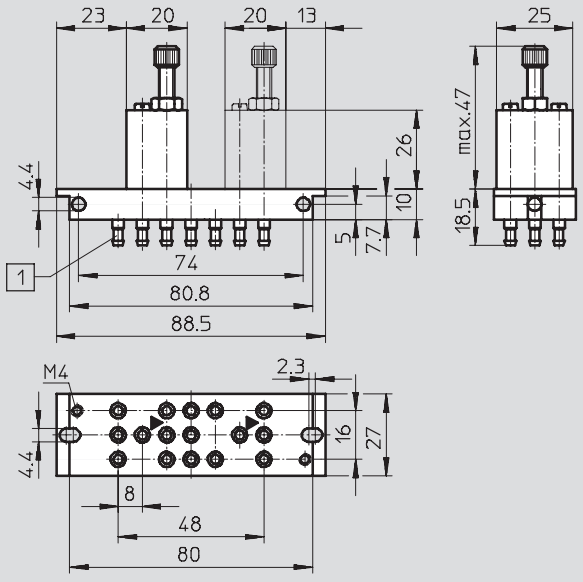
Sectional view




| 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

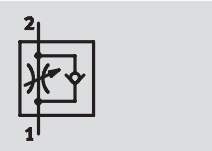
| Version | For tubing I.D. [mm] | One-way flow control valve Part No. | Type | Two one-way flow control valves Part No. | Type |
|---|---|---|---|---|---|
|  | 3 | **4 565** | **GRF-PK-3** | **4 566** | **GRF-PK-3X2** |

# Flow control and one-way flow control valves

Technical data – Precision flow control valve on sub-base

FESTO

Function




One-way flow control valve
GRP

Flow control valve, operative in both directions
GRPO

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


| General technical data | | | |
|---|---|---|---|
| Type | | GRP/GRPO-70-⅛-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 with the ISO 1179-1 standard and the ISO 228-1 standard.

| 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 | |

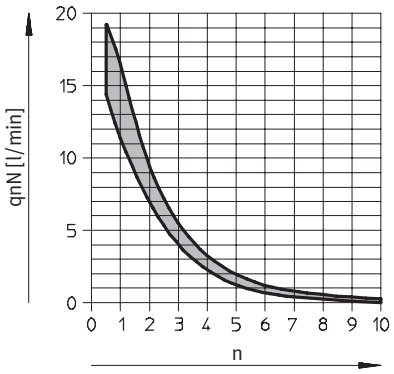
| Weight [g] | | |
|---|---|---|
| Type | GRP/GRPO-70-⅛-AL | GRP/GRPO-160-⅛-AL |
| | 110 | 110 |

| 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 |

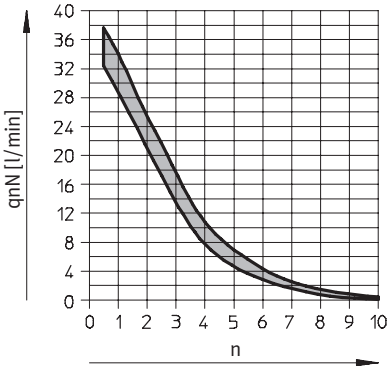
1) D: Flow control direction
2) R: Non-return direction

## 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

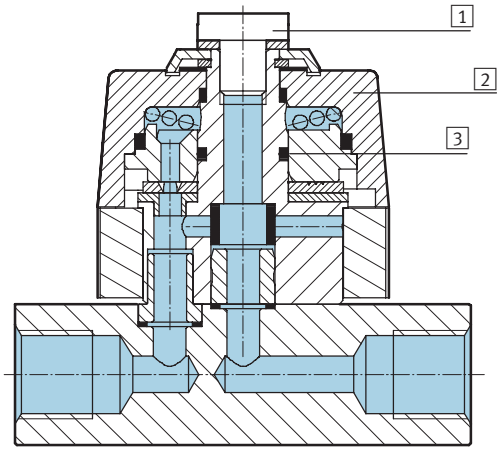



GRP/GRPO-160-⅛-AL




## Materials

Sectional view




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

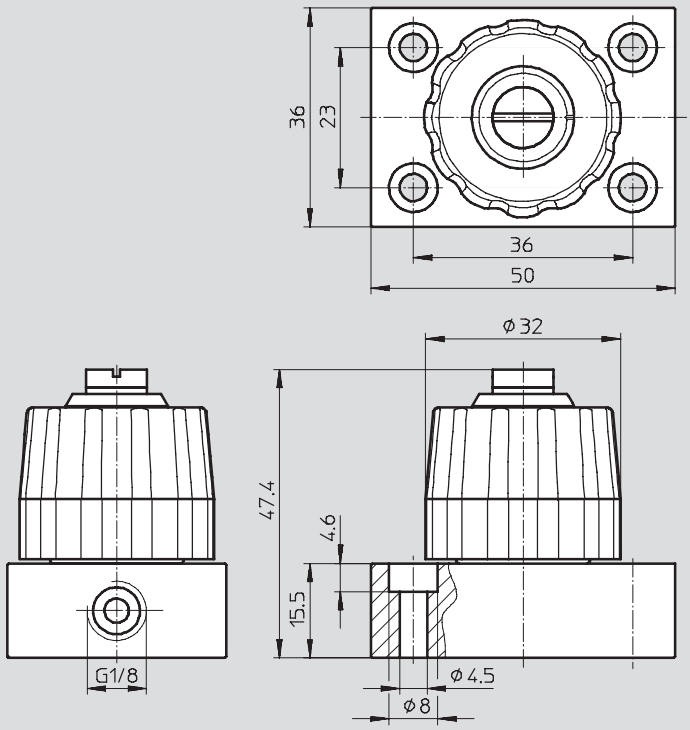
# Flow control and one-way flow control valves

Technical data – Precision flow control valve

FESTO

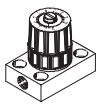
## Dimensions

Download CAD data ➔ **www.festo.com/en/engineering**




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

## Ordering data

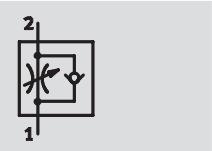
| Version | One-way flow control valve | | Bi-directional flow control valve | |
|---|---|---|---|---|
| | Part No. | Type | Part No. | Type |
|  | **542 022** | **GRP-70-⅛-AL** | **542 024** | **GRPO-70-⅛-AL** |
| | **542 023** | **GRP-160-⅛-AL** | **542 025** | **GRPO-160-⅛-AL** |

# Flow control and one-way flow control valves

Technical data – Precision flow control valve for front panel mounting

FESTO

Function




One-way flow control valve
GRP

Flow control valve, operative in both directions
GRPO

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

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 | | |

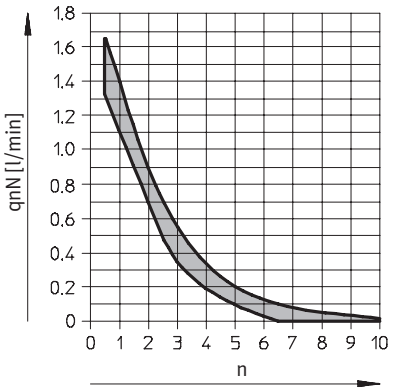
| Weight [g] | | | |
|---|---|---|---|
| Type | GRP/GRPO-10-PK-3 | GRP/GRPO-70-PK-3 | GRP/GRPO-160-PK-4 |
| | 48 | 48 | 48 |

| 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 |

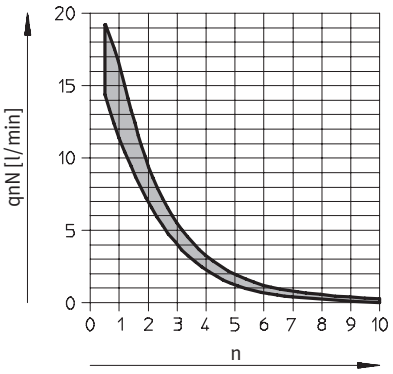
1) D: Flow control direction
2) R: Non-return direction

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

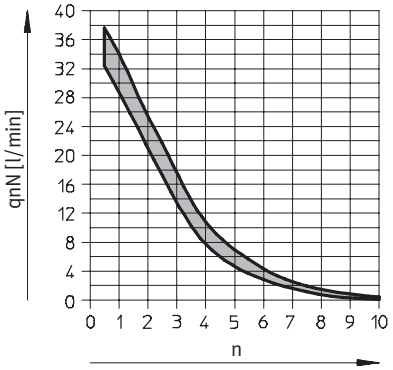
GRP/GRPO-10-PK-3




GRP/GRPO-70-PK-3

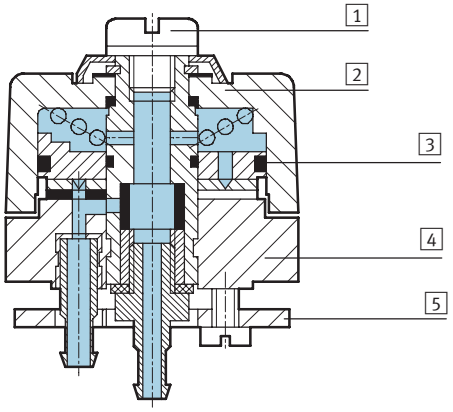



GRP/GRPO-160-PK-4




**Materials**

Sectional view



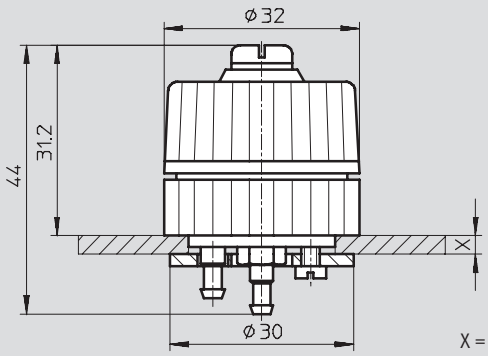

| Flow control valve | |
|---|---|
| 1 Locking screw | Brass |
| 2 Rotary knob | Reinforced polyamide |
| 3 Seals | Nitrile rubber |
| 4 Back plate | Wrought aluminium alloy |
| 5 Mounting plate | Wrought aluminium alloy |

# Flow control and one-way flow control valves

Technical data – Precision flow control valve

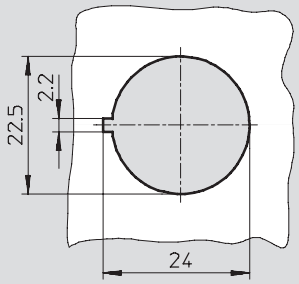
FESTO

**Dimensions** Download CAD data ➔ **www.festo.com/en/engineering**

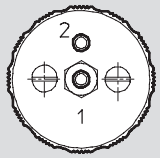



X = 1.5 ... 10 mm

Mounting aperture




Ports




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

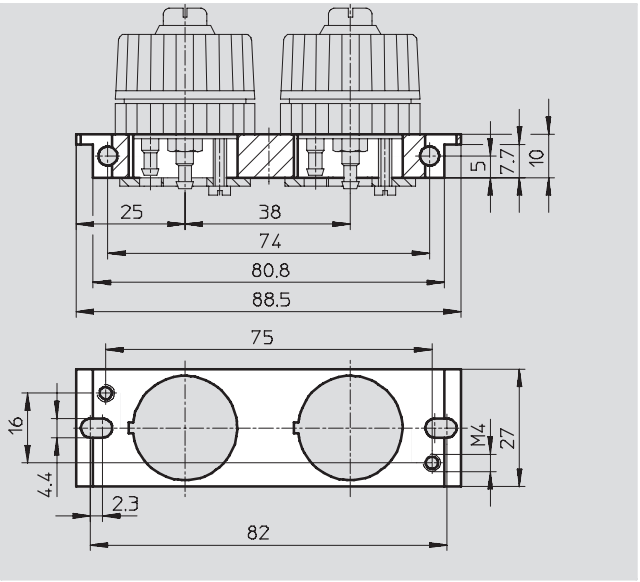
**Ordering data**

| 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** |

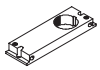
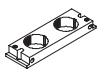
**Mounting plate APL-2N-GRP**
for precision flow control valves

Material:
Polyamide

APL-2N-GRPX2




**Ordering data**

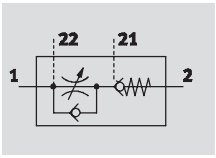
| | For no. of flow control valves | Hole ∅ [mm] | Product weight [g] | Part No. | Type |
|---|---|---|---|---|---|
|  | 1 | 22.5 | 16 | **10 391** | **APL-2N-GRP** |
|  | 2 | 2 x 22.5 | 22 | **10 392** | **APL-2N-GRPX2** |

# Functional combination GRXA-HG

Technical data

FESTO

Function




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

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

| General technical data | | | |
|---|---|---|---|
| Screw-in thread | | G⅛ | G¼ |
| 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 | | G⅛ | G¼ |
| 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 | | G⅛ | G¼ |
| | [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 |

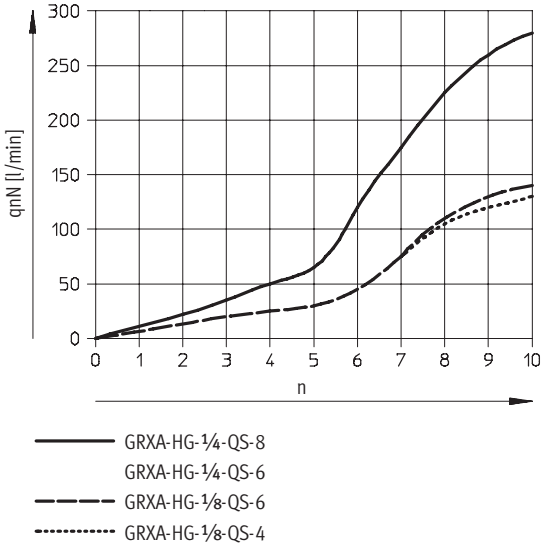
1) D: Flow control direction
2) R: Non-return direction
3) B: Non-return direction actuated

| 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

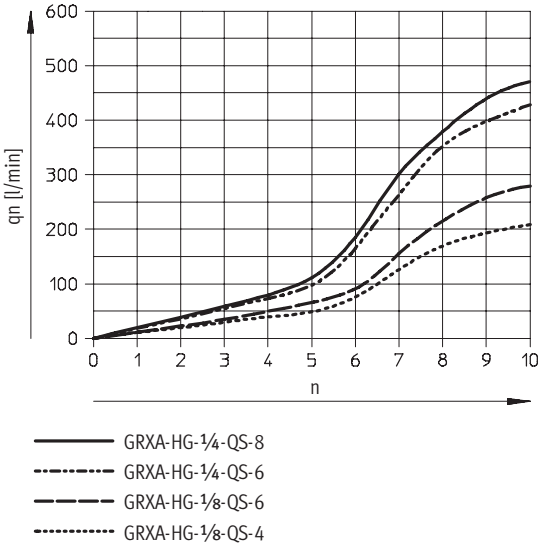
**Standard nominal flow rate qnN at 6 bar ⇢ 5 bar as a function of turns of the adjusting screw n**

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



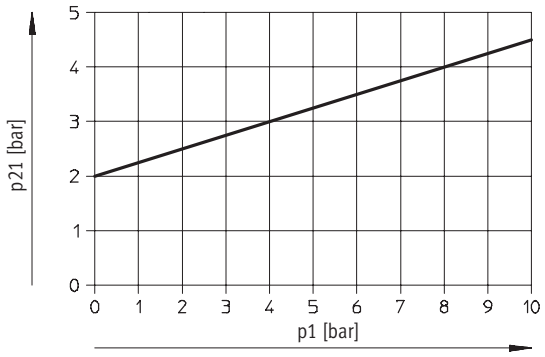
# Functional combination

Technical data

FESTO

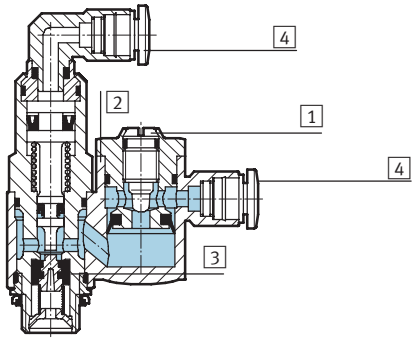
## Minimum pilot pressure as a function of operating pressure

Non-return valve, piloted




## Materials

Sectional view




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

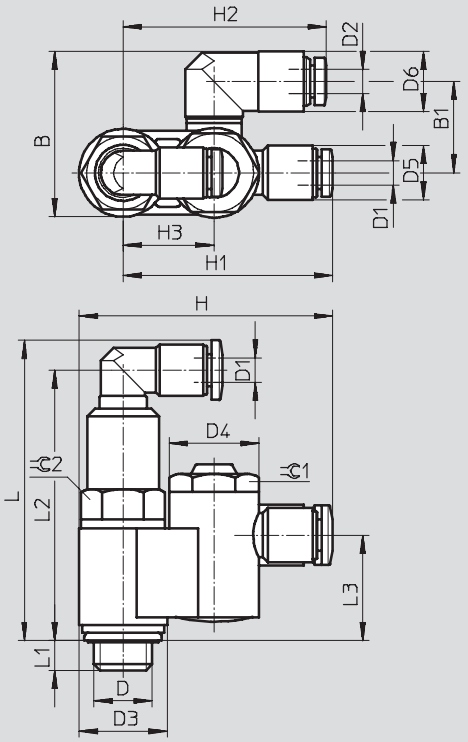
# Functional combination

Technical data



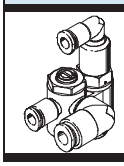
**Dimensions** Download CAD data ➔ **www.festo.com/en/engineering**

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 | ⌀1 | ⌀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**

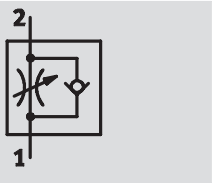
| Design | Screw-in thread | For tubing Outside [mm] | Part No. | Type |
|---|---|---|---|---|
|  | G⅛ | 4 | **525 667** | **GRXA-HG-⅛-QS-4** |
| | | 6 | **525 668** | **GRXA-HG-⅛-QS-6** |
| | G¼ | 6 | **525 669** | **GRXA-HG-¼-QS-6** |
| | | 8 | **525 670** | **GRXA-HG-¼-QS-8** |

# One-way flow control valves VFOC

Technical data

FESTO

Function




One-way flow control valve

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

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

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

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

| Standard nominal flow rate 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 |

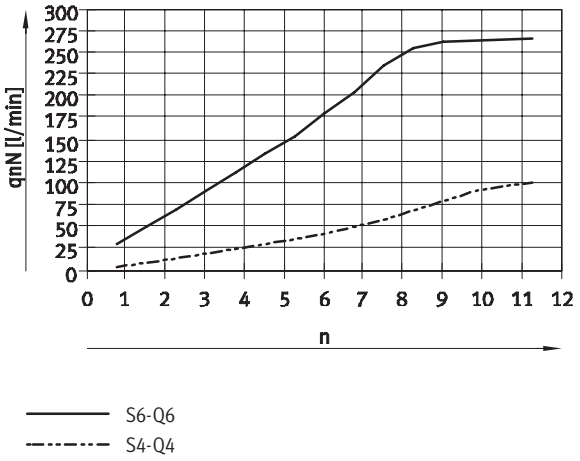
| Standard flow rate qn [l/min] at 6 bar ⇢ 0 bar | | |
|---|---|---|
| Push-in connector | QS-4 | QS-6 |
| Flow control direction | See graph | See graph |
| Non-return direction | 130 ... 160 | 330 ... 400 |

# One-way flow control valves VFOC

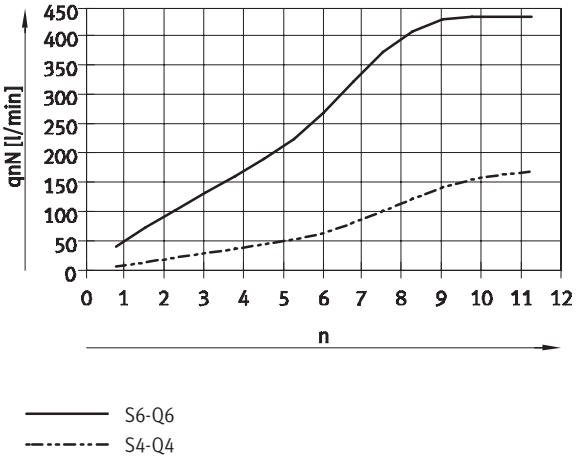
Technical data

FESTO

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

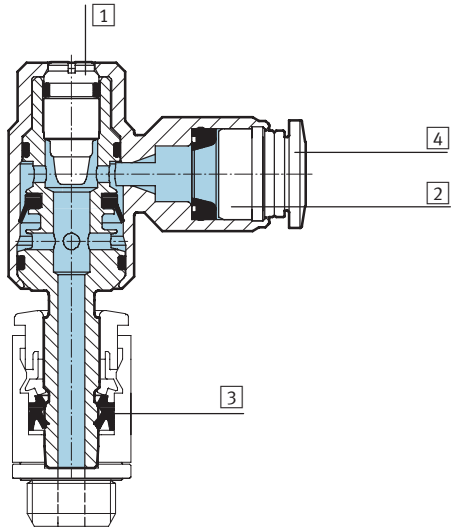



**Standard flow rate qn at 6 bar → 0 bar as a function of turns of the adjusting screw n**




**Materials**

Sectional view




| One-way flow control valve | | |
|---|---|---|
| 1 | Adjusting screw | Stainless steel |
| 2 | Rotatable connection | Die-cast zinc |
| 3 | Seal | Nitrile rubber |
| 4 | Release ring | Polyacetate |

Note

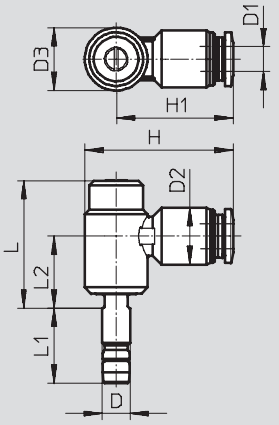
The push-in sleeves of the one-way flow control valves VFOC are exclusively matched to QS fittings from Festo,
➔ **www.festo.com/catalogue**
This combination alone guarantees a secure fit in the push-in fitting.

# One-way flow control valves VFOC

Technical data

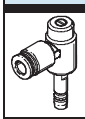
FESTO

**Dimensions** Download CAD data ➔ **www.festo.com/en/engineering**




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

**Ordering data**

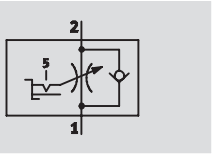
| Design | Push-in connector | For tubing O.D. [mm] | Part No. | Type |
|---|---|---|---|---|
|  | QS-4 | 4 | **540 362** | **VFOC-E-S4-Q4** |
| | QS-6 | 6 | **540 363** | **VFOC-E-S6-Q6** |

# One-way flow control valves GRLSA

Technical data

FESTO

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 |

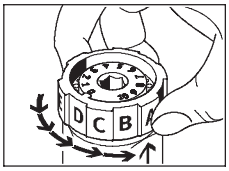
| Standard flow rate qn at 6 bar ⇢ 0 bar | | |
|---|---|---|
| Screw-in thread | | G1/8 |
| Flow control direction | [l/min] | 0 ... 410 |
| Non-return direction | [l/min] | 430 ... 540 |

# One-way flow control valves GRLSA

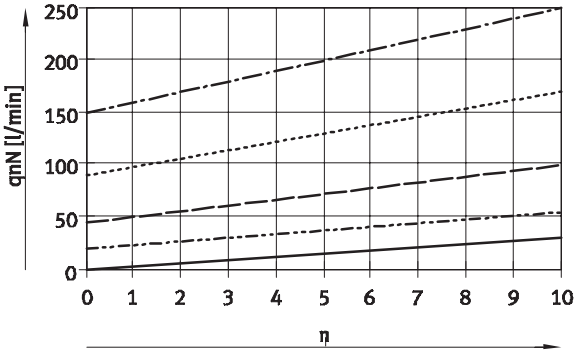
Technical data

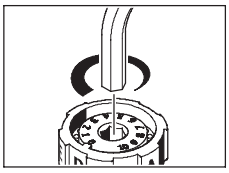
FESTO

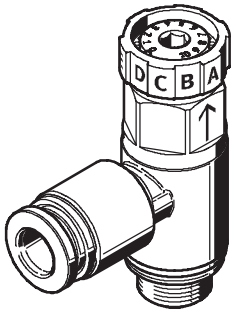
## Standard nominal flow rate qnN at 6 bar ⇢ 5 bar as a function of spindle swivel angle n = 300 degrees



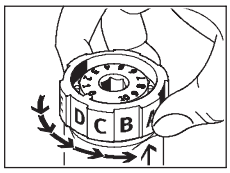

Setting: A
Setting: B
Setting: C
Setting: D
Setting: E



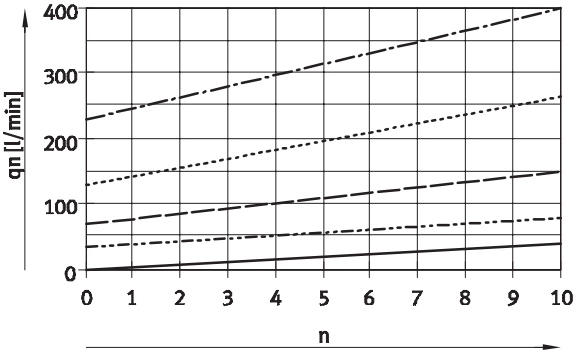



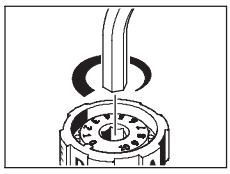


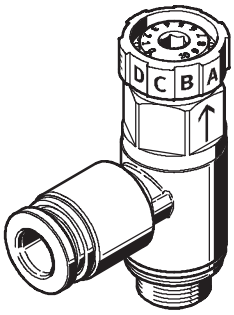

## Standard flow rate qn at 6 bar ⇢ 0 bar as a function of spindle swivel angle n = 300 degrees




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





# One-way flow control valves GRLSA

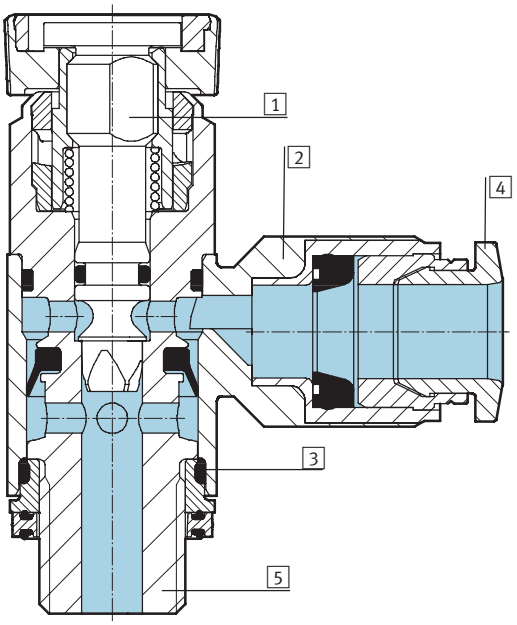
Technical data

FESTO



## Materials

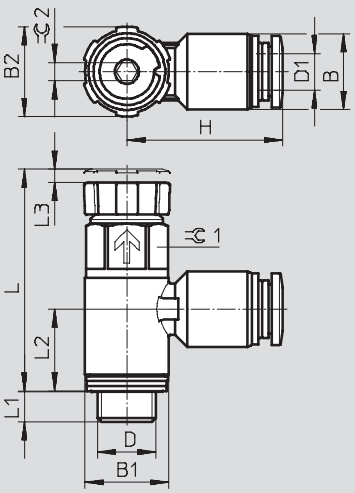
Sectional view




| 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

Download CAD data ➔ **www.festo.com/en/engineering**




| 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** |

# Product Range and Company Overview

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To meet this commitment, we strive to ensure a consistent, integrated, and systematic approach to management that will meet or exceed the requirements of the ISO 9001 standard for Quality Management and the ISO 14001 standard for Environmental Management.

9001: CERTCC5-16248-2006-AQ-ESN-TGA
ISO 9001
ISO 14001
DNV
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## United States

**Customer Resource Center**
502 Earth City Expy., Suite 125
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For ordering assistance, or to find
your nearest Festo Distributor,
**Call:** 1.800.99.FESTO
**Fax:** 1.800.96.FESTO
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**Call:** 1.866.GO.FESTO
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**Email:** product.support@us.festo.com

**Headquarters**
Festo Corporation
395 Moreland Road
P.O. Box 18023
Hauppauge, NY 11788
www.festo.com/us

### Sales Offices

**Appleton**
N. 922 Tower View Drive, Suite N
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**Boston**
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**Detroit -** Automotive Engineering Center
2601 Cambridge Court, Suite 320
Auburn Hills, MI 48326

**New York**
395 Moreland Road
Hauppauge, NY 11788

**Silicon Valley**
4935 Southfront Road, Suite F
Livermore, CA 94550

### Design and Manufacturing Operations


**East**: 395 Moreland Road, Hauppauge, NY 11788


**Central**: 1441 East Business Center Drive, Mt. Prospect, IL 60056


**West:** 4935 Southfront Road, Suite F, Livermore, CA 94550

## Mexico

**Headquarters**
Festo Pneumatic, S.A.
Av. Ceylán 3, Col. Tequesquinahuac
54020 Tlalnepantla, Edo. de México
Call: 011 52 [55] 53 21 66 00
Fax: 011 52 [55] 53 21 66 65
Email: festo.mexico@mx.festo.com
**www.festo.com/mx**


## Canada

**Headquarters**
Festo Inc.
5300 Explorer Drive
Mississauga, Ontario L4W 5G4
Call: 1.905.624.9000
Fax: 1.905.624.9001
Email: info.ca@ca.festo.com
**www.festo.com/ca**


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