

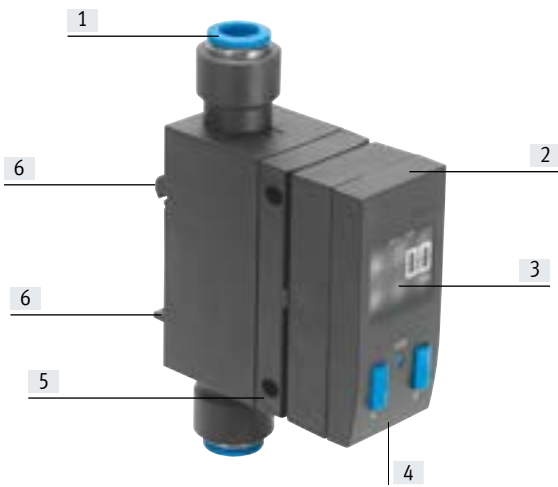
Flow sensors SFAB

FESTO



Key features

At a glance



- | | |
|---|--|
| [1] Quick and secure installation thanks to QS fitting | [4] Central electrical connection via an M12 plug |
| [2] Display can be rotated 270° | [5] Panel mounting of the sensor using retaining screws |
| [3] – High-contrast LCD display with blue background and white 9-segment display – Bar chart depicts current measured value – Switching point-dependent colour change | 5 measuring ranges from 0.1 ... 10 l/min to 10 ... 100 l/min |
| | [6] Manifold mounting of the sensor with H-rail or individually with adapter plate for wall mounting |

Impressive, straightforward, reliable

The flow sensors, featuring an attractive display and control concept, are very impressive when it comes to:

- Leakage detection in production
- Leak testing of end products
- Flow monitoring in parts feeding

The sensor provides:

- Absolute flow rate information
 - with threshold values and
 - convenient switching point adjustment via a display
- Cumulative air consumption measurement
- Patented – adjustable consumption-based switching pulse for cumulative air consumption measurement via the switching output

Flexible installation

This is made possible by the extremely compact design that dispenses with an upstream laminar flow inlet and outlet – the SFAB has an integrated flow steadying channel.

Systematically more reliable

The sensor can provide precise information even when flow conditions are fluctuating and unreliable thanks to the very large measuring range.

Easy to operate

- A large, illuminated LCD display increases the operational safety and makes the currently displayed flow rate or consumption values easy to read.
- Measured values outside the measuring range are visualised: flow rates are shown flashing.
- Values that fall below or exceed the threshold values can also be identified from a distance or if the sensor is in an inaccessible location by the display changing colour.
- Simple checking of the current sensor settings in SHOW mode
- Simple switching between consumption and flow rate indication

Convenient

- Clear and fast menu navigation
- Integrated QS fittings
- Fast teach-in
- Rotatable display
- Secure connections with extremely short assembly times
- Manual consumption measurement with start/stop and reset functionality

Advantages

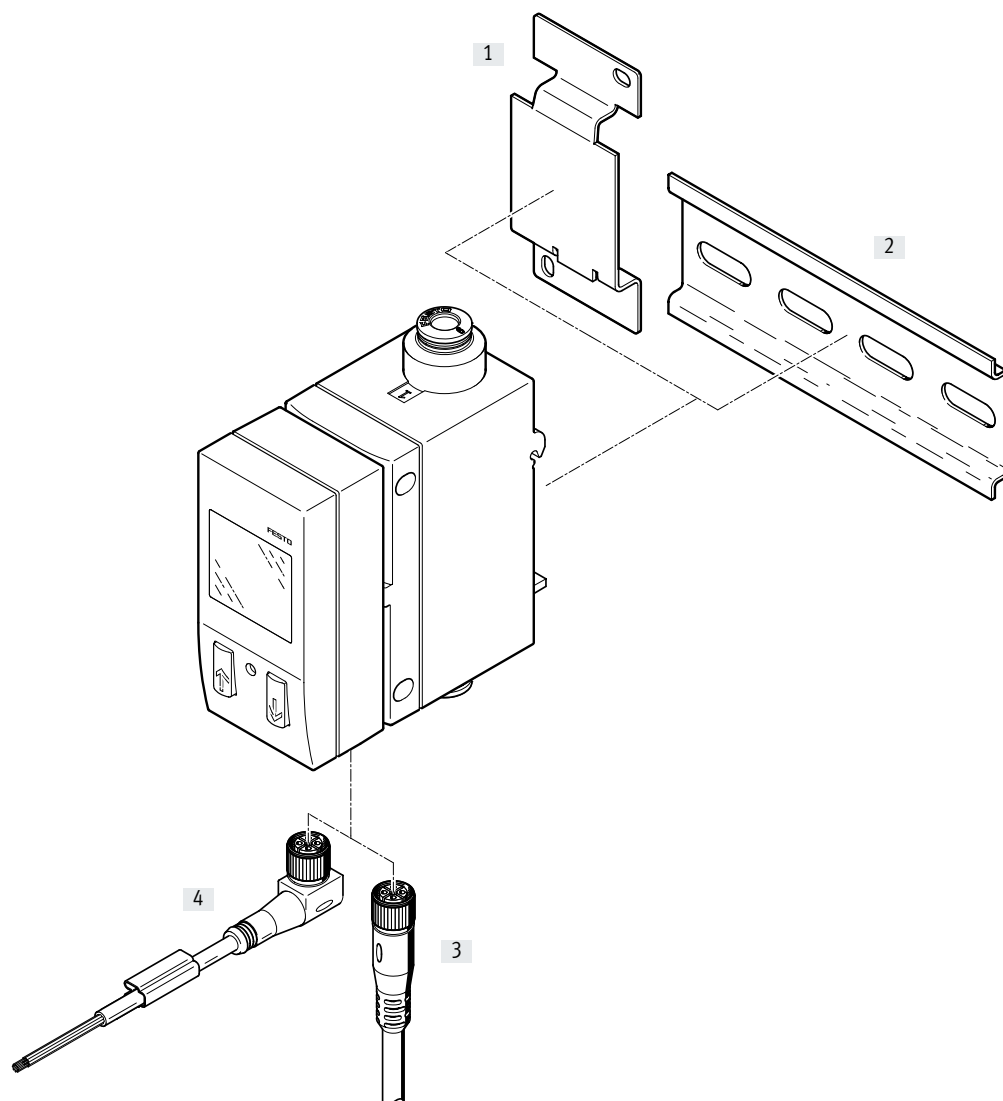
For the designer

- Owing to the high dynamic response of the measurement and large measuring range, a rough estimate of the system air consumption is sufficient to configure the sensor
- Festo plug and work solution
- The same device can be used for different applications
- The sensor covers a large measuring range with a specified accuracy thanks to its high dynamic response of 1:100
- NPN/PNP can be switched via the software
- Minimal assembly times
- Alternatively with 4 ... 20 mA or 0 ... 10 V analogue output
- Flexible installation without restrictions caused by laminar flow inlets, any mounting position
- Large choice of pneumatic connections is provided by the modular system
- Construction of more powerful machines

For the machine operator

- Precise information is available even with fluctuating pressure conditions
- Flow values can be read easily and reliably
- Visualisation of deviations (colour change, flashing value)
- Easy operation, no need for training
- Greater system reliability
- Values shown on the display:
 - can be shown for flow and consumption for different standard conditions
 - can be filtered/averaged independently of the analogue output in the case of high dynamic response of the measurement
- Fast commissioning thanks to easy-to-use, intuitive teach-in function

Peripherals overview



| Accessories | Brief description | → Page/Internet |
|-------------------------------------|--|-----------------|
| [1] Adapter plate SDE1-...-W-... | Included in the scope of delivery with SFAB-...-W... | 11 |
| [2] Mounting rail | To DIN EN 60715 | nrh |
| [3] Connecting cable NEBU-M12G5 | Straight socket | 11 |
| [4] Connecting cable NEBU-M12W5 | Angled socket | 11 |

Type codes

| | | |
|-------------|---------------|--|
| 001 | Series | |
| SFAB | Flow sensor | |

| | | |
|-------------|-----------------------------|--|
| 002 | Flow measuring range | |
| 10 | Max. 10 l/min | |
| 50 | Max. 50 l/min | |
| 200 | Max. 200 l/min | |
| 600 | Max. 600 l/min | |
| 1000 | Max. 1000 l/min | |

| | | |
|------------|------------------------|--|
| 003 | Flow rate input | |
| U | Unidirectional | |

| | | |
|------------|-------------------------|--|
| 004 | Type of mounting | |
| H | H-rail mounting | |
| W | Wall mounting | |

| | | |
|-------------|-----------------------------|--|
| 005 | Pneumatic connection | |
| Q6 | Push-in connector 6 mm | |
| Q8 | Push-in connector 8 mm | |
| Q10 | Push-in connector 10 mm | |
| Q12 | Push-in connector 12 mm | |
| T14 | Push-in connector 1/4" | |
| T38 | Push-in connector 3/8" | |
| T516 | Push-in connector 5/16" | |

| | | |
|------------|--|--|
| 006 | Electrical output 1 | |
| 2SA | 2x PNP or NPN, 1 analogue output 4 ... 20 mA | |
| 2SV | 2x PNP or NPN, 1 analogue output 0 ... 10 V | |

| | | |
|------------|------------------------------|--|
| 007 | Electrical connection | |
| M12 | Plug M12, A-coded | |

| | | |
|-------------|--|--|
| 008 | Connecting cable, M8, straight socket | |
| | None | |
| 2.5S | 2.5 m | |
| 5S | 5 m | |

| | | |
|-------------|---|--|
| 009 | Connecting cable, M8, angled plug socket | |
| | None | |
| 2.5A | 2.5 m | |
| 5A | 5 m | |

| | | |
|------------|-------------------------|--|
| 010 | EU certification | |
| | None | |
| EX2 | II 3GD | |

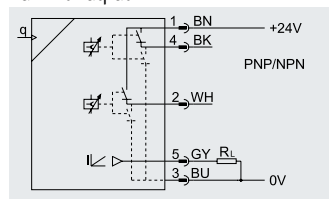
Additional variants can be ordered using the modular product system → 10

- Pneumatic connection
- Electrical accessories
- EU certification (ATEX)

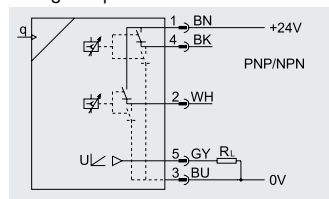
Data sheet

Function

Current output 2SA



Voltage output 2SV



- Analogue output 0 ... 10 V, adjustable switching outputs 2x PNP or 2x NPN
- Analogue output 4 ... 20 mA, adjustable switching outputs 2x PNP or 2x NPN
- Freely selectable pulse output for consumption measurement
- Analogue filter for setting the rise time
- Digital filter for smoothing the display values



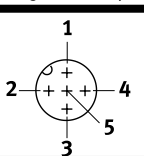
| General technical data | | -10U | -50U | -200U | -600U | -1000U |
|---|--|------------|------------|---|-----------|-------------|
| General | | | | | | |
| Certification | RCM compliance mark cUL us - Recognized (OL) | | | | | |
| KC mark | KC EMC | | | | | |
| Certificate issuing authority | UL E322346 | | | | | |
| CE marking (see declaration of conformity) | To EU EMC Directive To EU Explosion Protection Directive (ATEX) To EU RoHS Directive | | | | | |
| Note on materials | RoHS-compliant | | | | | |
| Input signal/measuring element | | | | | | |
| Measured variable | Flow rate, consumption | | | | | |
| Flow direction | Unidirectional P1 } P2 | | | | | |
| Measuring principle | Thermal | | | | | |
| Flow measuring range | [l/min] | 0.1 ... 10 | 0.5 ... 50 | 2 ... 200 | 6 ... 600 | 10 ... 1000 |
| Operating pressure | [bar] | 0 ... 10 | | | | |
| Nominal pressure | [bar] | 6 | | | | |
| Operating medium | Compressed air to ISO 8573-1:2010 [6:4:4] Nitrogen | | | Compressed air to ISO 8573-1:2010 [7:4:4] Nitrogen | | |
| Temperature of medium | [°C] | 0 ... 50 | | | | |
| Ambient temperature | [°C] | 0 ... 50 | | | | |
| Nominal temperature | [°C] | 23 | | | | |

Data sheet

| Electrical data | -10U | -50U | -200U | -600U | -1000U |
|---|--|----------|-----------|-----------|------------|
| Output, general^{1), 2)} | | | | | |
| Accuracy of flow rate | +/- (3% o.m.v. + 0.3% FS) | | | | |
| Repetition accuracy, zero point ±FS [%] | 0.2 | | | | |
| Repetition accuracy range ±FS [%] | 0.8 | | | | |
| Temperature coefficient range ±FS/K [%] | ≤0.1 | | | | |
| Pressure-dependent margin ±FS/bar [%] | 0.5 | | | | |
| Switching output | | | | | |
| Switching output | 2x PNP or 2x NPN, adjustable | | | | |
| Switching function | Window comparator or threshold value comparator, adjustable | | | | |
| Switching element function | N/C or N/O contact, adjustable | | | | |
| Switch-on time | Adjustable (factory setting: approx. 80 ms) | | | | |
| Switch-off time | Adjustable (factory setting: approx. 80 ms) | | | | |
| Max. output current [mA] | ≤100 | | | | |
| Voltage drop [V] | Max. 1.5 | | | | |
| Inductive protective circuit | Adapted to MZ, MY, ME coils | | | | |
| Analogue output | | | | | |
| Characteristic flow rate curve [l/min] | 0 ... 10 | 0 ... 50 | 0 ... 200 | 0 ... 600 | 0 ... 1000 |
| Output characteristic curve for current [mA] | 4 ... 20 | | | | |
| Output characteristic curve for voltage [V] | 0 ... 10 | | | | |
| Rise time [ms] | 15, 30, 60 (factory setting), 125, 250, 500, 999 possible settings | | | | |
| Max. load resistance at current output [ohm] | 500 | | | | |
| Min. load resistance of voltage output [kOhm] | 10 | | | | |
| Output, additional data | | | | | |
| Short circuit current rating | Yes | | | | |
| Overload protection | Provided | | | | |
| Electronics | | | | | |
| Operating voltage range DC [V] | 15 ... 30 | | | | |
| Reverse polarity protection | For all electrical connections | | | | |
| Electromechanics | | | | | |
| Electrical connection | Straight plug, M12x1, 5-pin | | | | |
| Max. connecting cable length [m] | <10 | | | | |

1) Accuracy with nominal conditions (6 bar, 23°C and horizontal mounting position)

2) % FS = % of the final value in the measuring range (full scale)

| Pin allocation | Pin | Meaning |
|--|-----|----------------------------|
|  | 1 | Operating voltage +24 V DC |
| | 2 | Binary output B |
| | 3 | 0 V |
| | 4 | Binary output A |
| | 5 | Analogue output C |

Data sheet

| Mechanics | | -10U | -50U | -200U | -600U | -1000U |
|-------------------------------------|-------|---------------|--------|--------|-------|--------|
| Mounting position | | Any | | | | |
| Pneumatic connection ¹⁾ | | QS6 | QS6 | – | – | – |
| | | QS8 | QS8 | QS8 | | |
| | | QS10 | QS10 | QS10 | QS10 | QS10 |
| | | QS12 | QS12 | QS12 | QS12 | QS12 |
| | | QS1/4 | QS1/4 | – | – | – |
| | | QS5/16 | QS5/16 | QS5/16 | – | – |
| | QS3/8 | QS3/8 | QS3/8 | QS3/8 | QS3/8 | |
| Product weight | [g] | 160 | | | | |
| Information about housing materials | | Reinforced PA | | | | |

| Display/operation | | -10U | -50U | -200U | -600U | -1000U |
|---|-------------------|---|----------------|-----------------|--------------------------------------|--------------|
| Display type | | Illuminated LCD, blue | | | | |
| Displayable units | | l/min, l/h, scfm, l, m ³ , scf | | | l/min, scfm, l, m ³ , scf | |
| Setting range for flow rate threshold value | | 1%FS ... 100% FS | | | | |
| Setting range for consumption impulse threshold value | [l] | 0.1 ... 1999.9 | 0.2 ... 1999.9 | 1 ... 1999.9 | 2 ... 1999.9 | 3 ... 1999.9 |
| | [m ³] | 0.01 ... 199.99 | | | 0.1 ... 1999.9 | 1 ... 19999 |
| | [scf] | 0.01 ... 199.99 | | 0.03 ... 199.99 | 0.1 ... 1999.9 | |
| Hysteresis setting range | | 0%FS ... 90% FS | | | | |

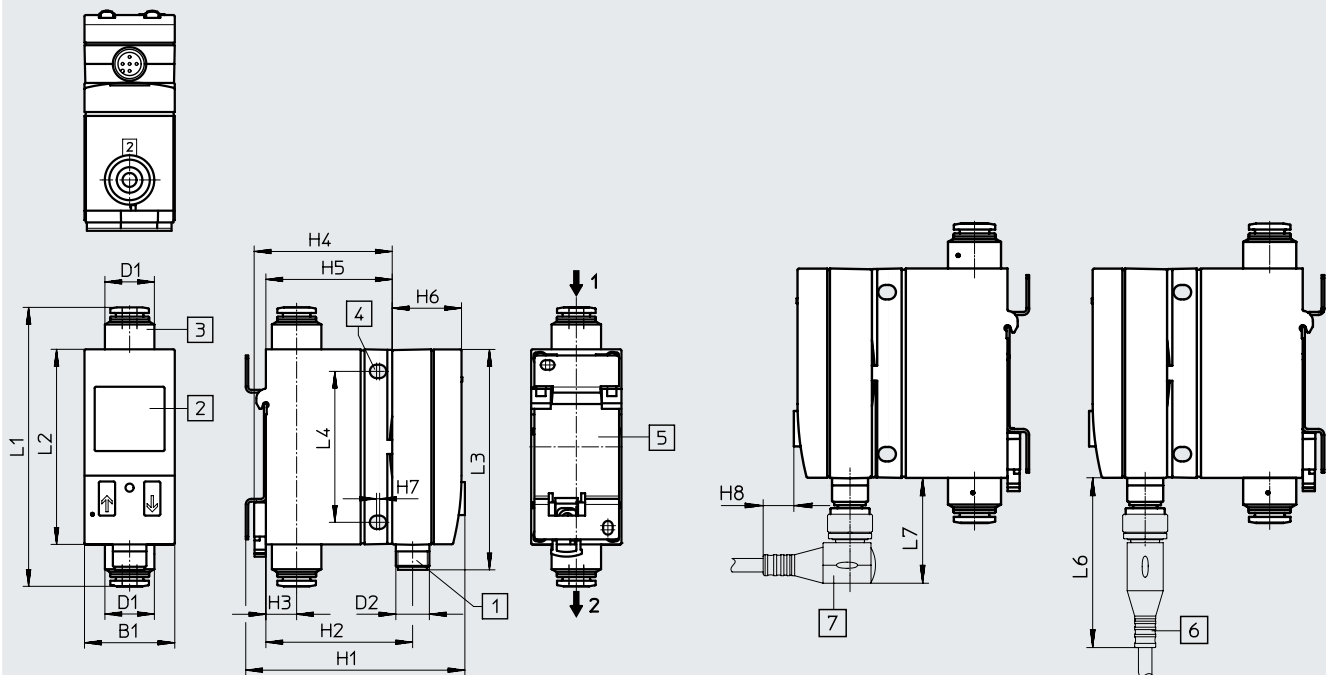
| Immissions/emissions | | -10U | -50U | -200U | -600U | -1000U |
|----------------------|--------|--|------|-------|-------|--------|
| Storage temperature | [°C] | –20 ... +80 (characteristic -D: –10 ... +60) | | | | |
| Degree of protection | | IP65 | | | | |
| Pressure drop | [mbar] | <100 | | | | |
| Protection class | | III | | | | |

Data sheet

Dimensions

Download CAD data → www.festo.com

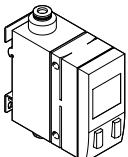
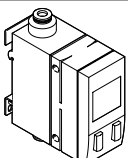
SFAB-...-H/-W



- [1] Plug M12x1 to EN 60947-5-2
- [2] LCD display
- [3] Pneumatic connection
- [4] Hole for retaining screw M4
- [5] Adapter plate for wall mounting
- [6] Connecting cable, straight socket
- [7] Connecting cable, angled plug socket

| Type | B1 | D1 | D2 | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | L1 | L2 | L3 | L4 | L6 | L7 |
|---------------|------|------|-------|----|------|----|------|------|------|-----|----|-------|------|------|----|----|----|
| SFAB-...-HQ6 | 32.3 | 17.7 | M12x1 | - | 51.6 | 11 | 48.5 | 44.3 | 24.4 | 1.1 | 12 | 95.6 | 69.8 | 78.9 | 54 | 56 | 35 |
| SFAB-...-HQ8 | | | | | | | | | | | | 99.8 | | | | | |
| SFAB-...-HQ10 | | | | | | | | | | | | 119.8 | | | | | |
| SFAB-...-HQ12 | | | | | | | | | | | | 124.4 | | | | | |
| SFAB-...-WQ6 | 32.3 | 17.7 | M12x1 | 79 | 51.6 | 11 | 48.5 | 44.3 | 24.4 | 1.1 | 12 | 95.6 | 69.8 | 78.9 | 54 | 56 | 35 |
| SFAB-...-WQ8 | | | | | | | | | | | | 99.8 | | | | | |
| SFAB-...-WQ10 | | | | | | | | | | | | 119.8 | | | | | |

Data sheet

| Ordering data | | | | | |
|---|---|---|------------|-------------------------|----------------------|
| Design | Electrical output | Flow measuring range [l/min] | Part no. | Type | |
| H-rail mounting | | | | | |
|  | 2x PNP or NPN, 1 analogue output 4 ... 20 mA | 0.1 ... 10 | 565385 | SFAB-10U-HQ6-2SA-M12 | |
| | | 0.5 ... 50 | 565389 | SFAB-50U-HQ6-2SA-M12 | |
| | | 2 ... 200 | 565393 | SFAB-200U-HQ8-2SA-M12 | |
| | | 2 ... 200 | 565397 | SFAB-200U-HQ10-2SA-M12 | |
| | | 6 ... 600 | 565401 | SFAB-600U-HQ10-2SA-M12 | |
| | | 10 ... 1000 | 565405 | SFAB-1000U-HQ10-2SA-M12 | |
| | 2x PNP or NPN, 1 analogue output 0 ... 10 V | 0.1 ... 10 | 565386 | SFAB-10U-HQ6-2SV-M12 | |
| | | 0.5 ... 50 | 565390 | SFAB-50U-HQ6-2SV-M12 | |
| | | 2 ... 200 | 565394 | SFAB-200U-HQ8-2SV-M12 | |
| | | 2 ... 200 | 565398 | SFAB-200U-HQ10-2SV-M12 | |
| | | 6 ... 600 | 565402 | SFAB-600U-HQ10-2SV-M12 | |
| | | 10 ... 1000 | 565406 | SFAB-1000U-HQ10-2SV-M12 | |
| | Wall or surface mounting | | | | |
| |  | 2x PNP or NPN, 1 analogue output 4 ... 20 mA | 0.1 ... 10 | 565387 | SFAB-10U-WQ6-2SA-M12 |
| 0.5 ... 50 | | | 565391 | SFAB-50U-WQ6-2SA-M12 | |
| 2 ... 200 | | | 565395 | SFAB-200U-WQ8-2SA-M12 | |
| 2 ... 200 | | | 565399 | SFAB-200U-WQ10-2SA-M12 | |
| 6 ... 600 | | | 565403 | SFAB-600U-WQ10-2SA-M12 | |
| 10 ... 1000 | | | 565407 | SFAB-1000U-WQ10-2SA-M12 | |
| 2x PNP or NPN, 1 analogue output 0 ... 10 V | | 0.1 ... 10 | 565388 | SFAB-10U-WQ6-2SV-M12 | |
| | | 0.5 ... 50 | 565392 | SFAB-50U-WQ6-2SV-M12 | |
| | | 2 ... 200 | 565396 | SFAB-200U-WQ8-2SV-M12 | |
| | | 2 ... 200 | 565400 | SFAB-200U-WQ10-2SV-M12 | |
| | | 6 ... 600 | 565404 | SFAB-600U-WQ10-2SV-M12 | |
| | | 10 ... 1000 | 565408 | SFAB-1000U-WQ10-2SV-M12 | |

Ordering data – Modular product system

| Ordering table | | Conditions | Code | Enter code |
|----------------------------|--|------------|--------------|------------|
| Module no. | 563795 | | | |
| Function | Flow sensor | | SFAB | -SFAB |
| Medium | Compressed air | | - | |
| Flow measuring range l/min | Max. 10 | | 10 | |
| | Max. 50 | | 50 | |
| | Max. 200 | | 200 | |
| | Max. 600 | | 600 | |
| | Max. 1000 | | 1000 | |
| Flow input | Unidirectional | | U | U |
| Type of mounting | H-rail mounting | | -H | |
| | Wall mounting | | -W | |
| Pneumatic connection | Push-in connector 6 mm | [1] | Q6 | |
| | Push-in connector 8 mm | [2] | Q8 | |
| | Push-in connector 10 mm | | Q10 | |
| | Push-in connector 12 mm | | Q12 | |
| | Push-in connector for 1/4 | [1] | T14 | |
| | Push-in connector for 5/16 | [2] | T516 | |
| Electrical output | 2x PNP or NPN, 1 analogue output 4 ... 20 mA | | -2SA | |
| | 2x PNP or NPN, 1 analogue output 0 ... 10 V | | -2SV | |
| Electrical connection | M12 plug, A-coded | | -M12 | M12 |
| Electrical accessories | n/a | | | |
| | Angled socket, cable 2.5 m | | -2.5A | |
| | Straight socket, cable 2.5 m | | -2.5S | |
| | Angled socket, cable 5 m | | -5 A | |
| | Straight socket, cable 5 m | | -5S | |
| EU certification | n/a | | | |
| | II 3GD | | -EX2 | |

[1] Q6, T14 Not with flow measuring range 200, 600, 1000

[2] Q8, T516 Not with flow measuring range 600, 1000

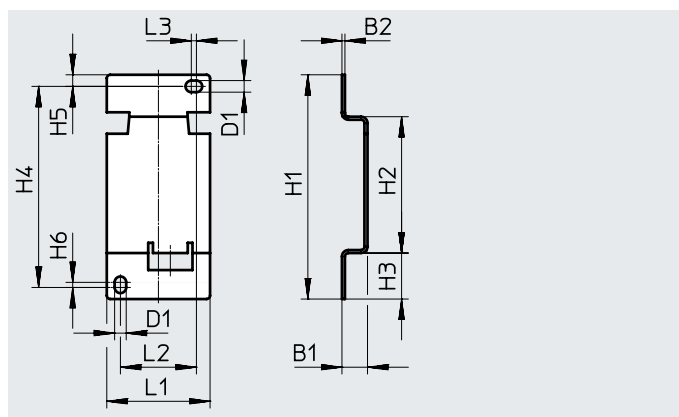
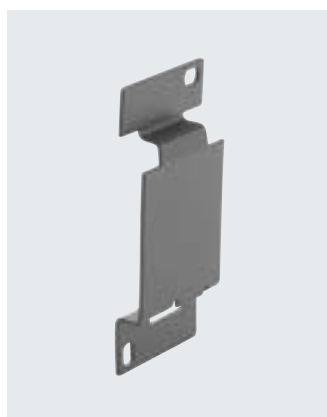
Accessories

Adapter plate SDE1-...-W...

For wall or surface mounting

Material:

Steel



Ordering data – Adapter plate¹⁾

| Type | B1 | B2 | D1 ∅ | H1 ±0.1 | H2 | H3 | H4 | H5 | H6 | L1 | L2 | L3 | Part no. | Type |
|---------------|-----|-----|---------|------------|----|------|----|-----|-----|------|------|-----|----------|---------------|
| SDE1-...-W... | 7.5 | 0.9 | 3.4 | 65.8 | 40 | 13.5 | 59 | 3.4 | 1.5 | 30.3 | 22.3 | 1.5 | 194297 | SDE1-...-W... |

1) Included in the scope of delivery with SFAB-...-W...

Ordering data – One-way flow control valve

Data sheets → Internet: grx-vfoi

| | Pneumatic connection | Suitable for SFAB ¹⁾ | Part no. | Type |
|--|----------------------|---------------------------------|----------|---------|
| | QS-4 | SFAB-10U | 193967 | GR-QS-4 |
| | QS-6 | SFAB-50U | 193969 | GR-QS-6 |
| | QS-8 | SFAB-200U | 193970 | GR-QS-8 |

1) Additional accessories may be required for adaptation to the pneumatic connection.

Ordering data – Connecting cables

Data sheets → Internet: nebu

| | Number of wires | Cable length [m] | Part no. | Type |
|-------------------------------|-----------------|------------------|----------|----------------------|
| M12x1, straight socket | | | | |
| | 5 | 2.5 | 541330 | NEBU-M12G5-K-2.5-LE5 |
| | | 5 | 541331 | NEBU-M12G5-K-5-LE5 |
| M12x1, angled socket | | | | |
| | 5 | 2.5 | 567843 | NEBU-M12W5-K-2.5-LE5 |
| | | 5 | 567844 | NEBU-M12W5-K-5-LE5 |