



Oscillation Flow Meter

for dry and wet gases



measuring
•
monitoring
•
analysing

DOG-4/-6



DOG-4



DOG-6



- Measuring ranges:
0.12 - 12 ... 60 - 6000 m³/h air
- p_{max}: 25 bar; t_{max}: 120 °C
- Connection:
flange DN 25 ... DN 200,
ANSI 1" ... 8"
- Material: stainless steel
- Accuracy:
±1.5 % of reading
- No moving parts
- Long-term stability
- Options: flow computer,
analogue and pulse outputs



SS

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KOBOLD Messring GmbH
Nordring 22-24
D-65719 Hofheim/Ts.
Head Office:
+49(0)6192 299-0
+49(0)6192 23398
info.de@kobold.com
www.kobold.com

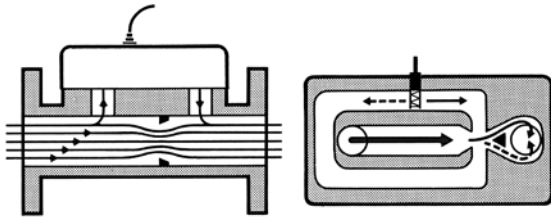
Description

The KOBOLD flow meters DOG-4/-6 are used for flow measurement of gases.

Primary use of DOG-4 is for dry gases.

The DOG-6 comes with a special sensor construction and an inclined measuring head. This inclination optimises the condensate drain specifically for applications involving wet gases, e.g. biogas.

The medium flows through an orifice in a tube. Bypass bores are located at the sides. The dynamic pressure at the orifice causes part of the gas volumetric flow to flow into the bypass. The division ratio remains constant over the whole measuring range.



The bypass channel contains the Oscillator – the Measuring cell itself. When the gas flows through the measuring cell, a gas column oscillates in a U-shaped channel mounted to the left and right. This oscillation frequency is proportional to the flow velocity and thus to the total volume flow. The oscillation frequency is sensed with a platinum sensor. An electrical alternating signal is generated that is displayed in the series connected electronics.

Application

The inner, connected flow channels are generously dimensioned. The constant changes of direction of the flow in the channels have a self-cleaning effect. The devices are therefore extremely dirt resistant and have no consumables. The mounting position can be chosen at will. When condensate forms in the gas, the horizontal mounting position with the sensing element pointing upwards is recommended. The gas flow velocity anywhere in the pipework upstream of the flow meter should not exceed the sound velocity. Pressure drops above critical and pulsating streams must be avoided.

The recommended inlet pipe section is 10x DN and the outlet pipe section 5x DN.

The version available with the bypass ball valves installed between the measuring head and the housing enables easy sensor replacement and/ or measuring head cleaning without flow interruption in main line/ flow meter. The bypass valves also serve for sensor protection against mechanical damage during start-up.

Areas of Application

- Compressed air
- Natural gas, biogas, fermentation gas
- Propane
- Hydrogen gas
- Nitrogen
- Argon

Technical Details

| | |
|----------------------|--|
| Measuring accuracy: | ±1.5% of reading (at $Q_t \leq MV \leq 100\%^*$) ±5 % of reading (at $1\% \leq MV < Q_t^*$) <i>*The lower limit Q_t depends on the density</i> |
| | $Q_t = 8\%$ at density 1 kg/m ³ $Q_t = 4\%$ at density 2 kg/m ³ $Q_t = 2\%$ at density 4 kg/m ³ $Q_t = 1\%$ at density ≥ 8 kg/m ³ |
| Repeatability: | 0.1% of reading |
| Media temperature: | -20 ... +120 °C (non ATEX version) -20 ... +60 °C (ATEX version) |
| Ambient temperature: | -20 ... +80 °C (non ATEX version) -20 ... +60 °C (ATEX version) |
| Operating pressure: | max. 25 bar |
| Span: | DOG-4: 1:100, DOG-6: max. 1:75 |
| Hot wire sensor: | platinum sensor |
| Protection: | IP 65 |

Materials (Sensor)

| | |
|------------------|-----------------------------|
| Housing: | stainless steel 1.4404/316L |
| Orifice: | stainless steel 1.4404/316L |
| Measuring head: | polyphenylene sulfide (PPS) |
| Hot wire sensor: | platinum/PEEK/ceramic |
| Gaskets: | NBR |
| Ball valves: | stainless steel |

Note:

Sponsored by the Federal Ministry of Economics and Technology on the basis of a resolution of the German Bundestag.

Electronic Options



Electronics DOG-...A/B/C/D/E/F/R
(Sensor with/without ATEX/IECEX certification)

Power supply:

- A: 230 V_{AC} ±10 %, 50 ... 60 Hz (with ATEX/IECEX)
- B: 230 V_{AC} ±10 %, 50 ... 60 Hz (without ATEX/IECEX)
- C: 110 V_{AC} ±10 %, 50 ... 60 Hz (without ATEX/IECEX)
- D: 110 V_{AC} ±10 %, 50 ... 60 Hz (with ATEX/IECEX)
- E: 24 V_{AC} ±10 %, 50 ... 60 Hz (without ATEX/IECEX)
- F: 24 V_{AC} ±10 %, 50 ... 60 Hz (with ATEX/IECEX)
- R: 24 V_{DC} ±20 %, (without ATEX/IECEX)

Input: platinum sensor (Allowed distance: max. 50 m to sensor)

Output: opto coupler, frequency linear to flow (see graph below)
V_{CE}: 12-24 V (recommended), max. 30 V
I_C: max. 50 mA
P_{tot}: 100 mW at 25 °C
derating: 0.91 mW/°C

Ambient temperature: -25 ... +60 °C

Protection: IP 20

Ex version (A/D/F):

- ATEX
- Transducer: II (1)G [Ex ia Ga] IIC
- Sensor: II 1 G Ex ia IIC T4 Ga
- IECEX
- Transducer: [Ex ia Ga] IIC
- Sensor: Ex ia IIC T4 Ga
- Transducer
- Mounting: DIN Rail
- Dimensions:
- Width: 45 mm
- Height: 105.6 mm
- Depth: 113.6 mm
- Weight: approx. 200 g

Electronics DOG-...G/H/I/K/L
(Sensor without/with ATEX/IECEX certification and Flow rate/Unit counter, with current/pulse output)

Display: alphanumeric LCD, UV-resistant with displayed functions:

Flow rate
(7 digits, 17 mm high)

Total
(7 digits, 17 mm high)
resettable

Accumulated total
(11 digits, 8 mm high)
not resettable

Units: **Flow:** m³, cf, scf, Nm³
time units: /sec, /min, /hr, /day
Total: m³
Accumulated total: m³

Decimal places: **Flow:** 0, 1, 2 or 3
Total: 0, 1, 2 or 3

Accumulated total: according to selection for total

Backlighting: yes

Signal input: **Flow:** sensor

Power supply:

- G: 230 V_{AC} ± 10 %, 50 ... 60 Hz (without ATEX/IECEX)
- H: 230 V_{AC} ± 10 %, 50 ... 60 Hz (with ATEX/IECEX)
- I: 110 V_{AC} ± 10 %, 50 ... 60 Hz (without ATEX/IECEX)
- K: 110 V_{AC} ± 10 %, 50 ... 60 Hz (with ATEX/IECEX)
- L: 24 V_{DC} ± 20 %, (without ATEX/IECEX)

Electrical connection: 4 x M16 x 1.5 cable gland

Housing material: ABS with PC cover

Weight: approx. 1800 g

Analogue output: 4 ... 20 mA (active), 10-Bit resolution, 3-wire

Pulse output: PNP, 24 V_{DC} active max. 50 mA, scaled according to linearised accumulated total (e. g. pulse every 12 litres)
pulse duration: user defined
0.008s ... 2s
max. frequency 64 Hz

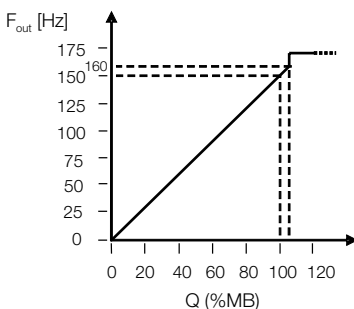
Protection: IP 65

Mounting: wall mounting

Data protection: EEPROM backup, backup of running totals every minute, data retention at least 10 years

Communication: Modbus RTU RS485 2-wire

Frequency/Flow Linearity





Elektronic Options (continuation)

(optional, other Modbus versions on request)

Ex version (K):

ATEX
 Transducer: II (1)G [Ex ia Ga] IIC
 Sensor: II 1 G Ex ia IIC T4 Ga
 IECEX
 Transducer: [Ex ia Ga] IIC
 Sensor: Ex ia IIC T4 Ga

Electronics DOG-...M/N/O/P
(Sensor without/with ATEX/IECEX certification and Flow computer)

Display: alphanumeric LCD, UV-resistant with displayed functions:
Compensated flow rate (7 digits, 17 mm high)
Compensated total (7 digits, 17 mm high) resettable
Accumulated total (11 digits, 8 mm high) not resettable
Actual line temperature (6 digits)
Actual line pressure (6 digits)

Units: **Flow:** m³, cf, scf, Nm³
 time units: /sec, /min, /hr, /day
Total: m³
 Accumulated total: m³
Temperature: °C, °F or K
Pressure: mbar, bar, PSI

Decimal places: **Flow:** 0, 1, 2 or 3
Total: 0, 1, 2 or 3
Accumulated total: according to selection for total
Temperature/Pressure: 1

Backlighting: yes

Signal input: **Flow:** sensor
Temperature: PT100, 2- or 3-wire
Pressure: 0(4) ... 20 mA (passive), 14-Bit resolution, 2- or 3-wire

Power supply:
 M: 230 V_{AC} ± 10%, 50 ... 60 Hz (without ATEX/IECEX)
 N: 230 V_{AC} ± 10%, 50 ... 60 Hz (with ATEX/IECEX)
 O: 110 V_{AC} ± 10%, 50 ... 60 Hz (without ATEX/IECEX)
 P: 110 V_{AC} ± 10%, 50 ... 60 Hz (with ATEX/IECEX)

Electrical Connection: 5 x M16 x 1.5 cable gland

Housing material: ABS with PC cover

Weight: approx. 1800 g

Analogue output: 4 ... 20 mA (active), 10-Bit resolution, 3-wire
 Pulse output: PNP, 24 V_{DC} active max. 50 mA, scaled according to linearised accumulated total (e. g. pulse every 12 litres)
 pulse duration: user defined
 0.001 s ... 10 s
 max. frequency 500 Hz

Protection: IP 65

Mounting: wall mounting

Data protection: EEPROM backup, backup of running totals every minute, data retention at least 10 years

Communication: Modbus RTU RS485 2-wire (optional, other Modbus versions on request)

Ex version (P):

ATEX
 Transducer: II (1)G [Ex ia Ga] IIC
 Sensor: II 1 G Ex ia IIC T4 Ga
 IECEX
 Transducer: [Ex ia Ga] IIC
 Sensor: Ex ia IIC T4 Ga

Display



Note: Temperature and pressure sensors are not included in scope of delivery.



Order Details for DOG-4 for dry gases (Example: DOG-42S0S50 0 A0 0)

| Measuring range | Model Material stainless steel | Pressure rating flanges* [PN] | Connection flange [size/type] | Ball valve | Electronics | Options |
|--------------------|--------------------------------------|--|----------------------------------|---|--|---|
| 0.12...12 m³/h Air | DOG-42S0S25.. | PN40 | DN25 | 0 = without ball valve 1 = with ball valve | B0 = frequency output, 230 V _{AC} A0 = as 'B0', with ATEX/IECEX C0 = frequency output, 110 V _{AC} D0 = as 'C0', with ATEX/IECEX E0 = frequency output, 24 V _{AC} F0 = as 'E0', with ATEX/IECEX R0 = frequency output, 24 V _{DC} G0 = unit counter, pulse output, analogue output, 230 V _{AC} H0 = as 'G0', with ATEX/IECEX I0 = unit counter, pulse output, analogue output, 110 V _{AC} K0 = as 'I0', with ATEX/IECEX L0 = unit counter, pulse output, analogue output, 24 V _{DC} M0 = flow computer, pulse output, analogue output, 230 V _{AC} N0 = as 'M0', with ATEX/IECEX O0 = flow computer, pulse output, analogue output, 110 V _{AC} P0 = as 'O0', with ATEX/IECEX Y0 = special (specify in clear text) | 0 = without Y = special option (specify in clear text) |
| 0.2...20 m³/h Air | DOG-4200S25.. | | | | | |
| 0.35...35 m³/h Air | DOG-4250S25.. | | | | | |
| 0.7...70 m³/h Air | DOG-42A0S25.. | | | | | |
| 0.07...7 CFM | DOG-42S1S25.. | | | | | |
| 0.12...12 CFM | DOG-4201S25.. | | | | | |
| 0.21...21 CFM | DOG-4251S25.. | | | | | |
| 0.41...41 CFM | DOG-42A1S25.. | Class 150 | ANSI 1" | | | |
| 0.12...12 m³/h Air | DOG-42S0A25.. | | | | | |
| 0.2...20 m³/h Air | DOG-4200A25.. | | | | | |
| 0.35...35 m³/h Air | DOG-4250A25.. | | | | | |
| 0.7...70 m³/h Air | DOG-42A0A25.. | | | | | |
| 0.07...7 CFM | DOG-42S1A25.. | | | | | |
| 0.12...12 CFM | DOG-4201A25.. | | | | | |
| 0.21...21 CFM | DOG-4251A25.. | | | | | |
| 0.41...41 CFM | DOG-42A1A25.. | Class 300 | | | | |
| 0.12...12 m³/h Air | DOG-42S0B25.. | | | | | |
| 0.2...20 m³/h Air | DOG-4200B25.. | | | | | |
| 0.35...35 m³/h Air | DOG-4250B25.. | | | | | |
| 0.7...70 m³/h Air | DOG-42A0B25.. | | | | | |
| 0.07...7 CFM | DOG-42S1B25.. | | | | | |
| 0.12...12 CFM | DOG-4201B25.. | | | | | |
| 0.21...21 CFM | DOG-4251B25.. | | | | | |
| 0.41...41 CFM | DOG-42A1B25.. | PN40 | DN 40 | | | |
| 0.12...12 m³/h Air | DOG-42S0S40.. | | | | | |
| 0.2...20 m³/h Air | DOG-4200S40.. | | | | | |
| 0.9...90 m³/h Air | DOG-42A5S40.. | | | | | |
| 2...200 m³/h Air | DOG-42C0S40.. | | | | | |
| 0.07...7 CFM | DOG-42S1S40.. | | | | | |
| 0.12...12 CFM | DOG-4201S40.. | | | | | |
| 0.53...53 CFM | DOG-42A6S40.. | | | | | |
| 1.2...120 CFM | DOG-42C1S40.. | Class 150 | ANSI 1½" | | | |
| 0.12...12 m³/h Air | DOG-42S0A40.. | | | | | |
| 0.2...20 m³/h Air | DOG-4200A40.. | | | | | |
| 0.9...90 m³/h Air | DOG-42A5A40.. | | | | | |
| 2...200 m³/h Air | DOG-42C0A40.. | | | | | |
| 0.07...7 CFM | DOG-42S1A40.. | | | | | |
| 0.12...12 CFM | DOG-4201A40.. | | | | | |
| 0.53...53 CFM | DOG-42A6A40.. | | | | | |
| 1.2...120 CFM | DOG-42C1A40.. | Class 300 | | | | |
| 0.12...12 m³/h Air | DOG-42S0B40.. | | | | | |
| 0.2...20 m³/h Air | DOG-4200B40.. | | | | | |
| 0.9...90 m³/h Air | DOG-42A5B40.. | | | | | |
| 2...200 m³/h Air | DOG-42C0B40.. | | | | | |
| 0.07...7 CFM | DOG-42S1B40.. | | | | | |
| 0.12...12 CFM | DOG-4201B40.. | | | | | |
| 0.53...53 CFM | DOG-42A6B40.. | | | | | |
| 1.2...120 CFM | DOG-42C1B40.. | PN40 | DN 50 | | | |
| 0.12...12 m³/h Air | DOG-42S0S50.. | | | | | |
| 0.2...20 m³/h Air | DOG-4200S50.. | | | | | |
| 1.1...110 m³/h Air | DOG-42B0S50.. | | | | | |
| 2.5...250 m³/h Air | DOG-42C5S50.. | | | | | |
| 0.07...7 CFM | DOG-42S1S50.. | | | | | |
| 0.12...12 CFM | DOG-4201S50.. | | | | | |
| 0.65...65 CFM | DOG-42B1S50.. | | | | | |
| 1.5...150 CFM | DOG-42C6S50.. | | | | | |

*Max. pressure rating limited to 25 bar.



Oscillation Flow Meter Model DOG-4/-6

Order Details for DOG-4 for dry gases (Example: DOG-42S0S50 0 A0 0) (continued)

| Measuring range | Model Material stainless steel | Pressure rating flanges* [PN] | Connection flange [size/type] | Ball valve | Electronics | Options |
|--------------------|--------------------------------------|-------------------------------------|-------------------------------------|---|--|---|
| 0.12...12 m³/h Air | DOG-42S0A50.. | Class 150 | ANSI 2" | 0 = without ball valve 1 = with ball valve | BO = frequency output, 230 V _{AC} AO = as 'BO', with ATEX/IECEX CO = frequency output, 110 V _{AC} DO = as 'CO', with ATEX/IECEX EO = frequency output, 24 V _{AC} FO = as 'EO', with ATEX/IECEX RO = frequency output, 24 V _{DC} GO = unit counter, pulse output, analogue output, 230 V _{AC} HO = as 'GO', with ATEX/IECEX IO = unit counter, pulse output, analogue output, 110 V _{AC} KO = as 'IO', with ATEX/IECEX LO = unit counter, pulse output, analogue output, 24 V _{DC} MO = flow computer, pulse output, analogue output, 230 V _{AC} NO = as 'MO', with ATEX/IECEX OO = flow computer, pulse output, analogue output, 110 V _{AC} PO = as 'OO', with ATEX/IECEX YO = special (specify in clear text) | 0 = without Y = special option (specify in clear text) |
| 0.2...20 m³/h Air | DOG-4200A50.. | | | | | |
| 1.1...110 m³/h Air | DOG-42B0A50.. | | | | | |
| 2.5...250 m³/h Air | DOG-42C5A50.. | | | | | |
| 0.07...7 CFM | DOG-42S1A50.. | | | | | |
| 0.12...12 CFM | DOG-4201A50.. | | | | | |
| 0.65...65 CFM | DOG-42B1A50.. | | | | | |
| 1.5...150 CFM | DOG-42C6A50.. | | | | | |
| 0.12...12 m³/h Air | DOG-42S0B50.. | Class 300 | ANSI 2" | | | |
| 0.2...20 m³/h Air | DOG-4200B50.. | | | | | |
| 1.1...110 m³/h Air | DOG-42B0B50.. | | | | | |
| 2.5...250 m³/h Air | DOG-42C5B50.. | | | | | |
| 0.07...7 CFM | DOG-42S1B50.. | | | | | |
| 0.12...12 CFM | DOG-4201B50.. | | | | | |
| 0.65...65 CFM | DOG-42B1B50.. | | | | | |
| 1.5...150 CFM | DOG-42C6B50.. | | | | | |
| 1.4...140 m³/h Air | DOG-42B5F80.. | PN16 | DN80 | | | |
| 4.5...450 m³/h Air | DOG-42D5F80.. | | | | | |
| 8.0...800 m³/h Air | DOG-42F0F80.. | | | | | |
| 0.82...82 CFM | DOG-42B6F80.. | | | | | |
| 2.7...270 CFM | DOG-42D6F80.. | PN40 | DN80 | | | |
| 4.7...470 CFM | DOG-42F1F80.. | | | | | |
| 1.4...140 m³/h Air | DOG-42B5S80.. | | | | | |
| 4.5...450 m³/h Air | DOG-42D5S80.. | | | | | |
| 8.0...800 m³/h Air | DOG-42F0S80.. | PN40 | DN80 | | | |
| 0.82...82 CFM | DOG-42B6S80.. | | | | | |
| 2.7...270 CFM | DOG-42D6S80.. | | | | | |
| 4.7...470 CFM | DOG-42F1S80.. | | | | | |
| 1.4...140 m³/h Air | DOG-42B5A80.. | Class 150 | ANSI 3" | | | |
| 4.5...450 m³/h Air | DOG-42D5A80.. | | | | | |
| 8.0...800 m³/h Air | DOG-42F0A80.. | | | | | |
| 0.82...82 CFM | DOG-42B6A80.. | | | | | |
| 2.7...270 CFM | DOG-42D6A80.. | | | | | |
| 4.7...470 CFM | DOG-42F1A80.. | Class 300 | | | | |
| 1.4...140 m³/h Air | DOG-42B5B80.. | | | | | |
| 4.5...450 m³/h Air | DOG-42D5B80.. | | | | | |
| 8.0...800 m³/h Air | DOG-42F0B80.. | | | | | |
| 0.82...82 CFM | DOG-42B6B80.. | | | | | |
| 2.7...270 CFM | DOG-42D6B80.. | PN16 | DN100 | | | |
| 4.7...470 CFM | DOG-42F1B80.. | | | | | |
| 2.7...270 m³/h Air | DOG-42D0F1H.. | | | | | |
| 6.5...650 m³/h Air | DOG-42E5F1H.. | | | | | |
| 10...1000 m³/h Air | DOG-42F5F1H.. | | | | | |
| 1.6...160 CFM | DOG-42D1F1H.. | PN40 | | | | |
| 3.8...380 CFM | DOG-42E6F1H.. | | | | | |
| 5.9...590 CFM | DOG-42F6F1H.. | | | | | |
| 2.7...270 m³/h Air | DOG-42D0S1H.. | | | | | |
| 6.5...650 m³/h Air | DOG-42E5S1H.. | | | | | |
| 10...1000 m³/h Air | DOG-42F5S1H.. | PN40 | | | | |
| 1.6...160 CFM | DOG-42D1S1H.. | | | | | |
| 3.8...380 CFM | DOG-42E6S1H.. | | | | | |
| 5.9...590 CFM | DOG-42F6S1H.. | | | | | |

*Max. pressure rating limited to 25 bar



Order Details for DOG-4 for dry gases (Example: DOG-42F0F80 0 A0 0) (continued)

| Measuring range | Model Material stainless steel | Pressure rating flanges ²⁾ [PN] | Connection flange [size/type] | Ball valve | Electronics | Options | | | | | |
|------------------------------------|--------------------------------------|---|-------------------------------------|---------------------|---|---|-----------|---------|---------------------|--|--|
| 2.7 ... 270 m³/h Air | DOG-42D0A1H.. | Class 150 | ANSI 4" | 1 = with ball valve | B0 = frequency output, 230 V _{AC} A0 = as 'B0', with ATEX/IECEX C0 = frequency output, 110 V _{AC} D0 = as 'C0', with ATEX/IECEX E0 = frequency output, 24 V _{AC} F0 = as 'E0', with ATEX/IECEX R0 = frequency output, 24 V _{DC} G0 = unit counter, pulse output, analogue output, 230 V _{AC} H0 = as 'G0', with ATEX/IECEX I0 = unit counter, pulse output, analogue output, 110 V _{AC} K0 = as 'I0', with ATEX/IECEX L0 = unit counter, pulse output, analogue output, 24 V _{DC} M0 = flow computer, pulse output, analogue output, 230 V _{AC} N0 = as 'M0', with ATEX/IECEX O0 = flow computer, pulse output, analogue output, 110 V _{AC} P0 = as 'O0', with ATEX/IECEX Y0 = special (specify in clear text) | 0 = without Y = special option (specify in clear text) | | | | | |
| 6.5 ... 650 m³/h Air | DOG-42E5A1H.. | | | | | | | | | | |
| 10 ... 1000 m³/h Air | DOG-42F5A1H.. | | | | | | | | | | |
| 1.6 ... 160 CFM | DOG-42D1A1H.. | | | | | | | | | | |
| 3.8 ... 380 CFM | DOG-42E6A1H.. | | | | | | | | | | |
| 5.9 ... 590 CFM | DOG-42F6A1H.. | | | | | | | | | | |
| 2.7 ... 270 m³/h Air | DOG-42D0B1H.. | | | | | | Class 300 | ANSI 4" | 1 = with ball valve | | |
| 6.5 ... 650 m³/h Air | DOG-42E5B1H.. | | | | | | | | | | |
| 10 ... 1000 m³/h Air | DOG-42F5B1H.. | | | | | | | | | | |
| 1.6 ... 160 CFM | DOG-42D1B1H.. | | | | | | | | | | |
| 3.8 ... 380 CFM | DOG-42E6B1H.. | | | | | | | | | | |
| 5.9 ... 590 CFM | DOG-42F6B1H.. | | | | | | | | | | |
| 6.0 ... 600 m³/h Air | DOG-42E0F1F.. | PN 16 | DN 150 | 1 = with ball valve | | | | | | | |
| 12 ... 1200 m³/h Air | DOG-42G0F1F.. | | | | | | | | | | |
| 30 ... 3000 m³/h Air | DOG-42H0F1F.. | | | | | | | | | | |
| 3.5 ... 350 CFM | DOG-42E1F1F.. | | | | | | | | | | |
| 7.1 ... 710 CFM | DOG-42G1F1F.. | | | | | | | | | | |
| 18 ... 1800 CFM | DOG-42H1F1F.. | | | | | | | | | | |
| 6.0 ... 600 m³/h Air | DOG-42E0A1F.. | Class 150 | ANSI 6" | 1 = with ball valve | | | | | | | |
| 12 ... 1200 m³/h Air | DOG-42G0A1F.. | | | | | | | | | | |
| 30 ... 3000 m³/h Air | DOG-42H0A1F.. | | | | | | | | | | |
| 3.5 ... 350 CFM | DOG-42E1A1F.. | | | | | | | | | | |
| 7.1 ... 710 CFM | DOG-42G1A1F.. | | | | | | | | | | |
| 18 ... 1800 CFM | DOG-42H1A1F.. | | | | | | | | | | |
| 12 ... 1200 m³/h Air | DOG-42G0E2H.. | | | | | | PN 10 | DN 200 | 1 = with ball valve | | |
| 25 ... 2500 m³/h Air | DOG-42G5E2H.. | | | | | | | | | | |
| 60 ... 6000 m³/h Air ¹⁾ | DOG-42H5E2H.. | | | | | | | | | | |
| 7.1 ... 710 CFM | DOG-42G1E2H.. | | | | | | | | | | |
| 15 ... 1500 CFM | DOG-42G6E2H.. | | | | | | | | | | |
| 35 ... 3500 CFM ¹⁾ | DOG-42H6E2H.. | | | | | | | | | | |
| 12 ... 1200 m³/h Air | DOG-42G0F2H.. | PN 16 | DN 200 | 1 = with ball valve | | | | | | | |
| 25 ... 2500 m³/h Air | DOG-42G5F2H.. | | | | | | | | | | |
| 60 ... 6000 m³/h Air ¹⁾ | DOG-42H5F2H.. | | | | | | | | | | |
| 7.1 ... 710 CFM | DOG-42G1F2H.. | | | | | | | | | | |
| 15 ... 1500 CFM | DOG-42G6F2H.. | | | | | | | | | | |
| 35 ... 3500 CFM ¹⁾ | DOG-42H6F2H.. | | | | | | | | | | |
| 12 ... 1200 m³/h Air | DOG-42G0A2H.. | Class 150 | ANSI 8" | 1 = with ball valve | | | | | | | |
| 25 ... 2500 m³/h Air | DOG-42G5A2H.. | | | | | | | | | | |
| 60 ... 6000 m³/h Air ¹⁾ | DOG-42H5A2H.. | | | | | | | | | | |
| 7.1 ... 710 CFM | DOG-42G1A2H.. | | | | | | | | | | |
| 15 ... 1500 CFM | DOG-42G6A2H.. | | | | | | | | | | |
| 35 ... 3500 CFM ¹⁾ | DOG-42H6A2H.. | | | | | | | | | | |
| Special | DOG-42YYYYY.. | Special | Special | | | | | | | | |

¹⁾ Calibrated up to 4000 m³/h. Higher flow rate calibration on request.

²⁾ Max. pressure rating limited to 25 bar. For DN150/DN200 (ANSI 6"/8") max. pressure rating limited to 16 bar.



Order Details for DOG-6 for wet gases (Example: DOG-62S0S50 0 B0 0)

| Measuring range | Model Material stainless steel | Pressure rating flanges* [PN] | Connection flange [size/type] | Ball valve | Electronics | Options |
|--------------------|--------------------------------------|--|-------------------------------------|---|--|---|
| 0.12...9 m³/h Air | DOG-62S0S25.. | PN40 | DN25 | 0 = without ball valve 1 = with ball valve | B0 = frequency output, 230 V _{AC} A0 = as 'B0', with ATEX/IECEX C0 = frequency output, 110 V _{AC} D0 = as 'C0', with ATEX/IECEX E0 = frequency output, 24 V _{AC} F0 = as 'E0', with ATEX/IECEX R0 = frequency output, 24 V _{DC} G0 = unit counter, pulse output, analogue output, 230 V _{AC} H0 = as 'G0', with ATEX/IECEX I0 = unit counter, pulse output, analogue output, 110 V _{AC} K0 = as 'I0', with ATEX/IECEX L0 = unit counter, pulse output, analogue output, 24 V _{DC} M0 = flow computer, pulse output, analogue output, 230 V _{AC} N0 = as 'M0', with ATEX/IECEX O0 = flow computer, pulse output, analogue output, 110 V _{AC} P0 = as 'O0', with ATEX/IECEX Y0 = special (specify in clear text) | 0 = without Y = special option (specify in clear text) |
| 0.2...15 m³/h Air | DOG-6200S25.. | | | | | |
| 0.35...27 m³/h Air | DOG-6250S25.. | | | | | |
| 0.7...55 m³/h Air | DOG-62A0S25.. | | | | | |
| 0.07...5 CFM | DOG-62S1S25.. | | | | | |
| 0.12...9 CFM | DOG-6201S25.. | | | | | |
| 0.21...16 CFM | DOG-6251S25.. | | | | | |
| 0.41...32 CFM | DOG-62A1S25.. | | | | | |
| 0.12...9 m³/h Air | DOG-62S0A25.. | Class 150 | ANSI 1" | | | |
| 0.2...15 m³/h Air | DOG-6200A25.. | | | | | |
| 0.35...27 m³/h Air | DOG-6250A25.. | | | | | |
| 0.7...55 m³/h Air | DOG-62A0A25.. | | | | | |
| 0.07...5 CFM | DOG-62S1A25.. | | | | | |
| 0.12...9 CFM | DOG-6201A25.. | | | | | |
| 0.21...16 CFM | DOG-6251A25.. | | | | | |
| 0.41...32 CFM | DOG-62A1A25.. | | | | | |
| 0.12...9 m³/h Air | DOG-62S0B25.. | Class 300 | | | | |
| 0.2...15 m³/h Air | DOG-6200B25.. | | | | | |
| 0.35...27 m³/h Air | DOG-6250B25.. | | | | | |
| 0.7...55 m³/h Air | DOG-62A0B25.. | | | | | |
| 0.12...9 m³/h Air | DOG-62S0S40.. | PN40 | DN40 | | | |
| 0.2...15 m³/h Air | DOG-6200S40.. | | | | | |
| 0.9...70 m³/h Air | DOG-62A5S40.. | | | | | |
| 2...150 m³/h Air | DOG-62C0S40.. | | | | | |
| 0.07...5 CFM | DOG-62S1S40.. | | | | | |
| 0.12...9 CFM | DOG-6201S40.. | | | | | |
| 0.53...41 CFM | DOG-62A6S40.. | | | | | |
| 1.2...88 CFM | DOG-62C1S40.. | | | | | |
| 0.12...9 m³/h Air | DOG-62S0A40.. | Class 150 | ANSI 1½" | | | |
| 0.2...15 m³/h Air | DOG-6200A40.. | | | | | |
| 0.9...70 m³/h Air | DOG-62A5A40.. | | | | | |
| 2...150 m³/h Air | DOG-62C0A40.. | | | | | |
| 0.07...5 CFM | DOG-62S1A40.. | | | | | |
| 0.12...9 CFM | DOG-6201A40.. | | | | | |
| 0.53...41 CFM | DOG-62A6A40.. | | | | | |
| 1.2...88 CFM | DOG-62C1A40.. | | | | | |
| 0.12...9 m³/h Air | DOG-62S0B40.. | Class 300 | | | | |
| 0.2...15 m³/h Air | DOG-6200B40.. | | | | | |
| 0.9...70 m³/h Air | DOG-62A5B40.. | | | | | |
| 2...150 m³/h Air | DOG-62C0B40.. | | | | | |
| 0.12...9 m³/h Air | DOG-62S0S50.. | PN40 | DN50 | | | |
| 0.2...15 m³/h Air | DOG-6200S50.. | | | | | |
| 1.1...85 m³/h Air | DOG-62B0S50.. | | | | | |
| 2.5...190 m³/h Air | DOG-62C5S50.. | | | | | |
| 0.07...5 CFM | DOG-62S1S50.. | | | | | |
| 0.12...9 CFM | DOG-6201S50.. | | | | | |
| 0.65...50 CFM | DOG-62B1S50.. | | | | | |
| 1.5...110 CFM | DOG-62C6S50.. | | | | | |
| 0.12...9 m³/h Air | DOG-62S0A50.. | Class 150 | ANSI 2" | | | |
| 0.2...15 m³/h Air | DOG-6200A50.. | | | | | |
| 1.1...85 m³/h Air | DOG-62B0A50.. | | | | | |
| 2.5...190 m³/h Air | DOG-62C5A50.. | | | | | |
| 0.12...9 CFM | DOG-6201A50.. | | | | | |
| 0.21...16 CFM | DOG-6251A50.. | | | | | |
| 0.65...50 CFM | DOG-62B1A50.. | | | | | |
| 1.5...110 CFM | DOG-62C6A50.. | | | | | |
| 0.12...9 m³/h Air | DOG-62S0B50.. | Class 300 | | | | |
| 0.2...15 m³/h Air | DOG-6200B50.. | | | | | |
| 1.1...85 m³/h Air | DOG-62B0B50.. | | | | | |
| 2.5...190 m³/h Air | DOG-62C5B50.. | | | | | |

*Max. pressure rating limited to 25 bar



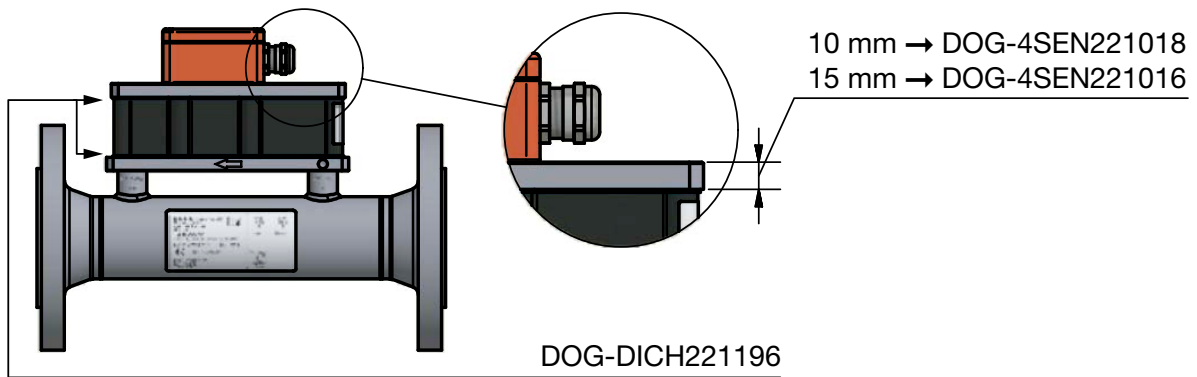
Order Details for DOG-6 for wet gases (Example: DOG-62S0S50 0 B0 0) (continued)

| Measuring range | Model Material stainless steel | Pressure rating flanges ¹⁾ [PN] | Connection flange [size/type] | Ball valve | Electronics | Options | | | |
|----------------------|--------------------------------------|---|-------------------------------------|---|-------------|---------|---------------------|--|--|
| 1.4 ... 105 m³/h Air | DOG-62B5F80.. | PN 16 | DN80 | 0 = without ball valve 1 = with ball valve | | | | | |
| 4.5 ... 340 m³/h Air | DOG-62D5F80.. | | | | | | | | |
| 8.0 ... 600 m³/h Air | DOG-62F0F80.. | | | | | | | | |
| 0.82 ... 62 CFM | DOG-62B6F80.. | | | | | | | | |
| 2.7 ... 200 CFM | DOG-62D6F80.. | | | | | | | | |
| 4.7 ... 350 CFM | DOG-62F1F80.. | | | | | | | | |
| 1.4 ... 105 m³/h Air | DOG-62B5A80.. | Class 150 | ANSI 3" | | | | | | |
| 4.5 ... 340 m³/h Air | DOG-62D5A80.. | | | | | | | | |
| 8.0 ... 600 m³/h Air | DOG-62F0A80.. | | | | | | | | |
| 0.82 ... 62 CFM | DOG-62B6A80.. | | | | | | | | |
| 2.7 ... 200 CFM | DOG-62D6A80.. | | | | | | | | |
| 4.7 ... 350 CFM | DOG-62F1A80.. | | | | | | | | |
| 1.4 ... 105 m³/h Air | DOG-62S0B80.. | Class 300 | | | | | | | |
| 4.5 ... 340 m³/h Air | DOG-62D5B80.. | | | | | | | | |
| 8.0 ... 600 m³/h Air | DOG-62F0B80.. | | | | | | | | |
| 2.7 ... 205 m³/h Air | DOG-62D0F1H.. | PN 16 | DN100 | | | | | | |
| 6.5 ... 490 m³/h Air | DOG-62E5F1H.. | | | | | | | | |
| 10 ... 750 m³/h Air | DOG-62F5F1H.. | | | | | | | | |
| 1.6 ... 120 CFM | DOG-62D1F1H.. | | | | | | | | |
| 3.8 ... 290 CFM | DOG-62E6F1H.. | | | | | | | | |
| 5.9 ... 440 CFM | DOG-62F6F1H.. | | | | | | | | |
| 2.7 ... 205 m³/h Air | DOG-62D0A1H.. | Class 150 | ANSI 4" | | | | | | |
| 6.5 ... 490 m³/h Air | DOG-62E5A1H.. | | | | | | | | |
| 10 ... 750 m³/h Air | DOG-62F5A1H.. | | | | | | | | |
| 1.6 ... 120 CFM | DOG-62D1A1H.. | | | | | | | | |
| 3.8 ... 290 CFM | DOG-62E6A1H.. | | | | | | | | |
| 5.9 ... 440 CFM | DOG-62F6A1H.. | | | | | | | | |
| 2.7 ... 205 m³/h Air | DOG-62S0B1H.. | Class 300 | | | | | | | |
| 6.5 ... 490 m³/h Air | DOG-6200B1H.. | | | | | | | | |
| 10 ... 750 m³/h Air | DOG-6250B1H.. | | | | | | | | |
| 6.0 ... 450 m³/h Air | DOG-62E0F1F.. | PN 16 | DN150 | | | | | | |
| 12 ... 900 m³/h Air | DOG-62G0F1F.. | | | | | | | | |
| 30 ... 2250 m³/h Air | DOG-62H0F1F.. | | | | | | | | |
| 3.5 ... 270 CFM | DOG-62E1F1F.. | | | | | | | | |
| 7.1 ... 530 CFM | DOG-62G1F1F.. | | | | | | | | |
| 18 ... 1300 CFM | DOG-62H1F1F.. | | | | | | | | |
| 6.0 ... 450 m³/h Air | DOG-62E0A1F.. | Class 150 | ANSI 6" | | | | 1 = with ball valve | | |
| 12 ... 900 m³/h Air | DOG-62G0A1F.. | | | | | | | | |
| 30 ... 2250 m³/h Air | DOG-62H0A1F.. | | | | | | | | |
| 3.5 ... 270 CFM | DOG-62E1A1F.. | | | | | | | | |
| 7.1 ... 530 CFM | DOG-62G1A1F.. | | | | | | | | |
| 18 ... 1300 CFM | DOG-62H1A1F.. | | | | | | | | |
| 12 ... 900 m³/h Air | DOG-62G0E2H.. | PN 10 | | | | | | | |
| 25 ... 1900 m³/h Air | DOG-62G5E2H.. | | | | | | | | |
| 60 ... 4000 m³/h Air | DOG-62H5E2H.. | | | | | | | | |
| 12 ... 900 m³/h Air | DOG-62G0F2H.. | PN 16 | DN200 | | | | | | |
| 25 ... 1900 m³/h Air | DOG-62G5F2H.. | | | | | | | | |
| 60 ... 4000 m³/h Air | DOG-62H5F2H.. | | | | | | | | |
| 7.1 ... 530 CFM | DOG-62G1F2H.. | | | | | | | | |
| 15 ... 1100 CFM | DOG-62G6F2H.. | | | | | | | | |
| 35 ... 2400 CFM | DOG-62H6F2H.. | | | | | | | | |
| 12 ... 900 m³/h Air | DOG-62G0A2H.. | Class 150 | ANSI 8" | | | | | | |
| 25 ... 1900 m³/h Air | DOG-62G5A2H.. | | | | | | | | |
| 60 ... 4000 m³/h Air | DOG-62H5A2H.. | | | | | | | | |
| 7.1 ... 530 CFM | DOG-62G1A2H.. | | | | | | | | |
| 15 ... 1100 CFM | DOG-62G6A2H.. | | | | | | | | |
| 35 ... 2400 CFM | DOG-62H6A2H.. | | | | | | | | |
| Special | DOG-62YYYY.. | Special | Special | | | | | | |

¹⁾ Max. pressure rating limited to 25 bar. For DN150/DN200 (ANSI 6"/8") max. pressure rating limited to 16 bar.

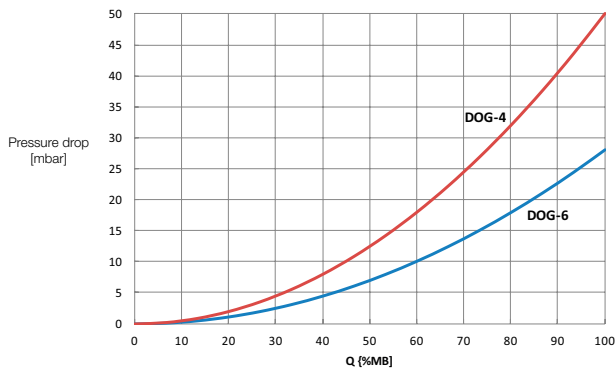
Order Details Accessories/Spare parts for DOG-4/-6

| Order Code | Description | Image |
|----------------|---|-------|
| DOG-4SEN221018 | DOG-4 spare sensor with transport sleeve, 10 mm plate | |
| DOG-4SEN221016 | DOG-4 spare sensor with transport sleeve, 15 mm plate | |
| DOG-6SEN221195 | DOG-6 spare sensor with transport sleeve | |
| DOG-4KAL01 | DOG-4/-6 calibration software with PC interface with USB connection | |
| DOG-DICH221196 | DOG-4/-6 sealing set for oscillator | |





Pressure Loss/Flow



The diagram applies for gases with a density of air at NPT (0°C and 1013.25 mbar). The pressure loss is always proportional to the density of the gas. For example, the pressure loss doubles at 100% higher operating pressure.

Calculating the Actual Density

The actual density can be calculated with the following formula:

$$D = \frac{D_0 \cdot P \cdot T_0}{T}$$

D_0 = density at 1 bar abs. and 0°C (= 273 K)

T = temperature in K

(= °C + 273 for example 20°C = 273 + 20 = 293 K)

T_0 = 273 K

P = operating pressure in bar (absolute pressure)

Calculating the Norm Flow

$$Q_N = Q \cdot \frac{P \cdot 273}{1.013 \cdot T}$$

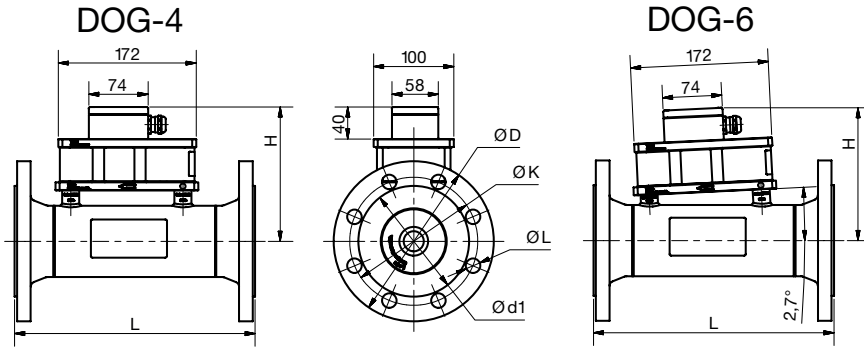
Q_N = norm flow at 1.013 bar abs. and 0°C

Q = operating flow

P = operating pressure in bar (absolute pressure)

T = operating temperature in K

Dimensions and Weights DOG-4/-6 (without ball valve)

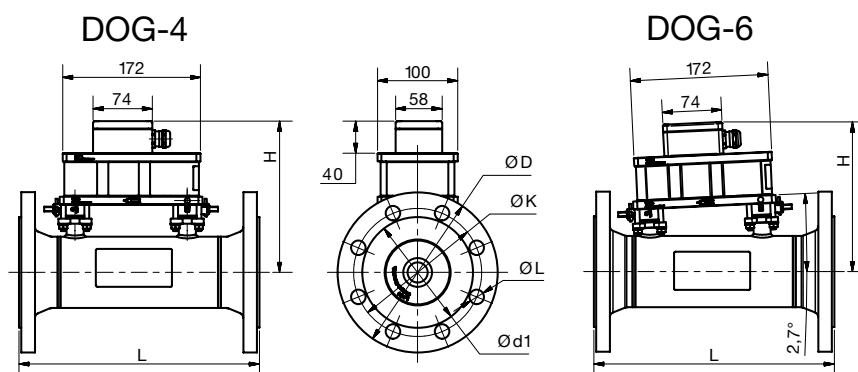


| Dimensional details without ball valve, EN-flanges | | | | | | | | | |
|--|-----------------------|-----------------------|-------------------------|------------------------------|------------------------|------------------------------------|------------------|------------|----------------|
| DN... PN... [mm... bar...] | L (length) [mm] | H (height) [mm] | ØD (outer Ø) [mm] | ØK (pitch circle) [mm] | ØL (hole Ø) [mm] | Ød1 (sealing surface Ø) [mm] | No. of screws | Screw size | Weight [kg] |
| DN25 PN40 | 300 | 145 | 115 | 85 | 14 | 68 | 4 | M12 | 6.9 |
| DN40 PN40 | 300 | 153 | 150 | 110 | 18 | 88 | 4 | M16 | 8.8 |
| DN50 PN40 | 300 | 159 | 165 | 125 | 18 | 102 | 4 | M16 | 10.4 |
| DN80 PN16 | 300 | 173 | 200 | 160 | 18 | 138 | 8 | M16 | 13.2 |
| DN80 PN40 | 300 | 173 | 200 | 160 | 18 | 138 | 8 | M16 | 14.8 |

| Dimensional details without ball valve, ASME-flanges Class 150 | | | | | | | | | |
|--|-----------------------|-----------------------|-------------------------|------------------------------|------------------------|------------------------------------|------------------|------------|----------------|
| NPS | L (length) [mm] | H (height) [mm] | ØD (outer Ø) [mm] | ØK (pitch circle) [mm] | ØL (hole Ø) [mm] | Ød1 (sealing surface Ø) [mm] | No. of screws | Screw size | Weight [kg] |
| 1 | 317.5 ≈ 12.5" | 140 | 110 | 79.4 | 15.9 | 50.8 | 4 | M14 | 6.3 |
| 1½ | 317.5 ≈ 12.5" | 148 | 125 | 98.4 | 15.9 | 73 | 4 | M14 | 8.1 |
| 2 | 317.5 ≈ 12.5" | 154 | 150 | 120.7 | 19.1 | 92 | 4 | M16 | 10.2 |
| 3 | 355.7 ≈ 14" | 168 | 190 | 152.4 | 19.1 | 127 | 4 | M16 | 15.4 |

| Dimensional details without ball valve, ASME-flanges Class 300 | | | | | | | | | |
|--|-----------------------|-----------------------|-------------------------|------------------------------|------------------------|------------------------------------|------------------|------------|----------------|
| NPS | L (length) [mm] | H (height) [mm] | ØD (outer Ø) [mm] | ØK (pitch circle) [mm] | ØL (hole Ø) [mm] | Ød1 (sealing surface Ø) [mm] | No. of screws | Screw size | Weight [kg] |
| 1 | 317.5 ≈ 12.5" | 140 | 124 | 88.9 | 19.1 | 50.8 | 4 | M16 | 7.3 |
| 1½ | 317.5 ≈ 12.5" | 148 | 155 | 114.3 | 22.2 | 73 | 4 | M20 | 10.2 |
| 2 | 317.5 ≈ 12.5" | 154 | 165 | 127 | 19.1 | 92 | 8 | M16 | 11.5 |
| 3 | 355.7 ≈ 14" | 168 | 210 | 168.3 | 22.2 | 127 | 8 | M20 | 18.9 |

Dimensions and Weights DOG-4/-6 (with ball valve)

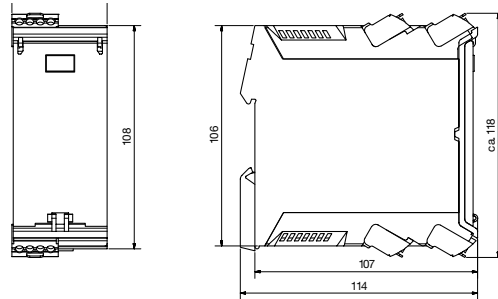


| Dimensional details with ball valve, EN-flanges | | | | | | | | | |
|---|-----------------------|-----------------------|-------------------------|------------------------------|------------------------|------------------------------------|------------------|------------|----------------|
| DN... PN... [mm... bar...] | L (length) [mm] | H (height) [mm] | ØD (outer Ø) [mm] | ØK (pitch circle) [mm] | ØL (hole Ø) [mm] | Ød1 (sealing surface Ø) [mm] | No. of screws | Screw size | Weight [kg] |
| DN25 PN40 | 300 | 166 | 115 | 85 | 14 | 68 | 4 | M12 | 7.2 |
| DN40 PN40 | 300 | 174 | 150 | 110 | 18 | 88 | 4 | M16 | 9.3 |
| DN50 PN40 | 300 | 180 | 165 | 125 | 18 | 102 | 4 | M16 | 10.8 |
| DN80 PN16 | 300 | 194 | 200 | 160 | 18 | 138 | 8 | M16 | 13.6 |
| DN80 PN40 | 300 | 194 | 200 | 160 | 18 | 138 | 8 | M16 | 15.1 |
| DN100 PN16 | 320 | 207 | 220 | 180 | 18 | 158 | 8 | M16 | 15.7 |
| DN100 PN40 | 320 | 207 | 235 | 190 | 22 | 162 | 8 | M20 | 19.2 |
| DN150 PN16 | 320 | 234 | 285 | 240 | 22 | 212 | 8 | M20 | 24.3 |
| DN200 PN10 | 320 | 260 | 340 | 295 | 22 | 268 | 8 | M20 | 35.6 |
| DN200 PN16 | 320 | 260 | 340 | 295 | 22 | 268 | 12 | M20 | 35.2 |

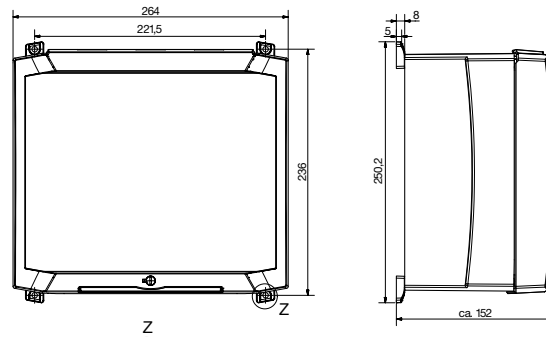
| Dimensional details with ball valve, ASME-flanges Class 150 | | | | | | | | | |
|---|-----------------------|-----------------------|-------------------------|------------------------------|------------------------|------------------------------------|------------------|------------|----------------|
| NPS | L (length) [mm] | H (height) [mm] | ØD (outer Ø) [mm] | ØK (pitch circle) [mm] | ØL (hole Ø) [mm] | Ød1 (sealing surface Ø) [mm] | No. of screws | Screw size | Weight [kg] |
| 1 | 317.5 ≈ 12.5" | 166 | 110 | 79.4 | 15.9 | 50.8 | 4 | M14 | 6.7 |
| 1½ | 317.5 ≈ 12.5" | 174 | 125 | 98.4 | 15.9 | 73 | 4 | M14 | 8.5 |
| 2 | 317.5 ≈ 12.5" | 180 | 150 | 120.7 | 19.1 | 92 | 4 | M16 | 10.5 |
| 3 | 355.7 ≈ 14" | 194 | 190 | 152.4 | 19.1 | 127 | 4 | M16 | 15.7 |
| 4 | 355.7 ≈ 14" | 207 | 230 | 190.5 | 19.1 | 157.2 | 8 | M16 | 20.5 |
| 6 | 381 ≈ 15" | 234 | 280 | 241.3 | 22.2 | 216 | 8 | M20 | 30 |
| 8 | 381 ≈ 15" | 260 | 345 | 298.5 | 22.2 | 270 | 8 | M20 | 48 |

| Dimensional details with ball valve, ASME-flanges Class 300 | | | | | | | | | |
|---|-----------------------|-----------------------|-------------------------|------------------------------|------------------------|------------------------------------|------------------|------------|----------------|
| NPS | L (length) [mm] | H (height) [mm] | ØD (outer Ø) [mm] | ØK (pitch circle) [mm] | ØL (hole Ø) [mm] | Ød1 (sealing surface Ø) [mm] | No. of screws | Screw size | Weight [kg] |
| 1 | 317.5 ≈ 12.5" | 166 | 124 | 88.9 | 19.1 | 50.8 | 4 | M16 | 7.7 |
| 1½ | 317.5 ≈ 12.5" | 174 | 155 | 114.3 | 22.2 | 73 | 4 | M20 | 10.6 |
| 2 | 317.5 ≈ 12.5" | 180 | 165 | 127 | 19.1 | 92 | 8 | M16 | 11.9 |
| 3 | 355.7 ≈ 14" | 194 | 210 | 168.3 | 22.2 | 127 | 8 | M20 | 19.3 |
| 4 | 355.7 ≈ 14" | 207 | 255 | 200 | 22.2 | 157.2 | 8 | M20 | 28.8 |

Dimensions Electronics DOG-...A/B/C/E/R



Dimensions Electronics DOG-...G/H/I/L/M/N/O



Accessories (optional)

- Replacement sensor
- Sealing for oscillator
- Recalibration tool for transmitter