



Oval Wheel Flowmeter

for low and high viscous liquids



measuring
•
monitoring
•
analysing

DON



- Measuring range:
0.5 ... 36 l/h und 150 ... 2500 l/min
- Viscosity range: up to 1000 cP
(higher on request)
- Accuracy: $\pm 0.2 \dots 1\%$ of reading
- Material: aluminium or stainless steel
- p_{\max} : 100 bar; t_{\max} : 150 °C
- Pulse output, LCD display, 4...20 mA,
alarms, mechanical register



S4

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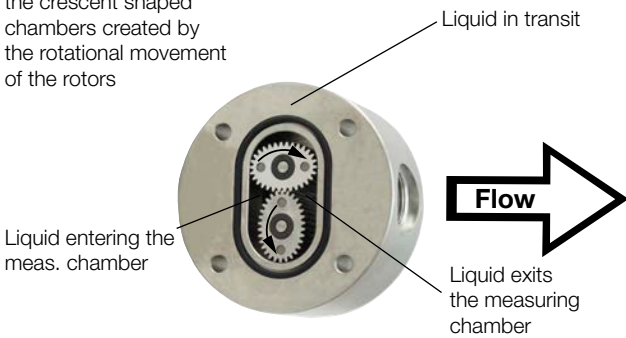
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Principle of Operation

Oval gear flowmeters are categorised as positive displacement flow technology. When liquid flows through this type of positive displacement flowmeter, two oval geared rotors measure a constant volume per rotation within a precisely machined measuring chamber. With each rotation, a constant volume of liquid is measured. The rotation of the oval gears is sensed via magnets embedded within the rotors. These magnets transmit a high resolution pulse output. The output signal can be process externally via a remote display controller or PLC or via a variety of output/display options available as accessories attached to the flowmeters.

Operation:

Liquid travels around the crescent shaped chambers created by the rotational movement of the rotors



The positive displacement flow technology allows for precise flow measurement of most clean liquids regardless of the media conductivity. Other liquid properties also have a minimal effect on the performance of this type of meter. Flow profile conditioning is not required as with alternative flow technology options making oval gear installations simple to install in tight spaces and at an economical price.

Areas of Application

For all viscous, non abrasive clean liquids like:

- Petroleum
- Oil
- Chemicals
- Grease
- Fuels
- Ink etc.
- Pastes

Stainless steel flowmeters are suited to most products and chemicals and aluminium meters are suitable for fuels, fuel oils & lubricating liquids.

Technical Details

Material

| | |
|-----------------------------|--|
| DON-1 | |
| Body: | aluminium |
| Oval wheels: | PPS GF30/PTFE |
| Axes: | stainless steel 1.4404 |
| DON-2 | |
| Body: | stainless steel 1.4404 DON-x05 ... DON-x15 (body cover DON-205 st. steel 1.4429) stainless steel 1.4404/1.3955 DON-x20 ... DON-x60 |
| Oval wheels: | stainless steel 1.4404 DON-x05 ... DON-x40 stainless steel 1.3955 DON-x45 ... DON-x60 |
| Bearing: | carbon graphite |
| Axes: | stainless steel 1.4404 |
| DON-8 | |
| Body: | stainless steel 1.4404 DON-x05 ... DON-x15 (body cover DON-805 st. steel 1.4429) stainl. steel 1.4404/1.3955 DON-x20 ... DON-x60 |
| Oval wheels: | PPS GF30/PTFE |
| Axes: | stainless steel 1.4404 |
| O-rings: | medium temperature FKM: -20 ... +150 °C NBR: -20 ... +100 °C FEP-O-seal: -15 ... +130 °C (FEP-O-seal, FEP encased, with solid core EPDM) |
| Cover for cable connection: | polyamide PA6 GF35 UL94 HB/VO stainless steel 1.4404 (optional) |



Material screws

For aluminium housing: stainless steel (standard)
steel, coated with GEOMET® 321 (DON-A25)

For stainless steel housing: stainless steel (standard)
steel, coated with GEOMET® 321 (optional) for higher pressure rating (see order details)

Accuracy (under reference conditions*): ± 1 % of reading (DON-x05...DON-x15)

SS-rotors: ± 0.5 % of reading (DON-x20...DON-x60)
± 0.2 % of reading (DON-x20...DON-x60; with optional Z3/E3-electronics based on linearisation function)

PPS-rotors: ± 1 % of reading (DON-x20...DON-x60)
± 0.5 % of reading (DON-x20...DON-x60; with optional Z3/E3-electronics based on linearisation function)
± 1 % of reading (option M) (better accuracy for higher viscosities on request)

Additional max. inaccuracy for analogue outputs 4-20 mA: +/-0.15% full scale

Repeatability: typ. ± 0.03 %

Protection class: IP 66/67 (IP 65 for M4)

Medium temp.: -20 °C... +80 °C for options Lx, Zx, M4, DON-1/DON-8
and -20 °C... +120 °C for DON-2 with pulse output and options Zx with cooling fins (+150 °C with option T0) for models with PPS-rotors, max. temp. is limited to +80 °C

Ambient temp.: -20 °C... +80 °C, option M4 0 °C... +60 °C

Cable entry: M20x1.5, 1/2" NPT adapter

ATEX-approval (option E1/E2/E3/E4/E5): II 2G Ex ia IIC T4 Gb (-20 °C ≤ Ta ≤ +60 °C)

(option HE, DE, BE, KE, GE, LE, RE): II 2G Ex db IIC T4/T6 Gb
 I M2 Ex db I Mb

IECEx-approval (option E1/E2/E3/E4/E5): Ex ia IIC T4 Gb

(option HE, DE, BE, KE, GE, LE, RE): Ex db IIC,
Ex db I Mb

* Reference conditions: x05...x20 (mineral oil 10 cSt, 20 °C, 5 bar);
x25...x60 (mineral oil 3 cSt, 20 °C, 1 bar).
Accuracy data is valid for given viscosities and higher.

Maximum Pressure (threaded version)

| Model | Maximum pressure (bar) | | | | |
|---------|------------------------|---------|---------------------|---------------------|----|
| | DON-1 | DON-2/8 | DON-1.. (Option-M4) | DON-2/8 (Option-M4) | |
| DON-x05 | 64 | 100 | - | - | |
| DON-x06 | | | - | - | |
| DON-x10 | | | - | - | |
| DON-x15 | | 100 | - | - | |
| DON-x20 | 40 | 70* | 40 | 40 | |
| DON-x25 | | 60* | | | |
| DON-x30 | | 50 | 16 | 16 | 16 |
| DON-x35 | | | | | |
| DON-x40 | 16 | 16 | 16 | 16 | |
| DON-x45 | | | | | |
| DON-x50 | | | | | |
| DON-x55 | | | | | |
| DON-x60 | | | | | |

With flanges, maximum pressure rating as above or as per flange rating, whichever is lower

* Max. pressure rating of 100 bar possible with steel screws (see order details)

Noise Level (in dB) at Full Scale

| Size | PPS-Oval Wheels | Stainless Steel-Oval Wheels |
|------|-----------------|-----------------------------|
| x25 | 83 | 91 |
| x30 | 84 | 93,1 |
| x35 | 83,5 | 95 |
| x40 | 85,4 | 96 |
| x45 | 87,5 | 98 |
| x50 | 86,1 | 99,4 |
| x55 | 86,1 | 98,1 |
| x60 | 85 | 99 |

Recommended Filter (for example model MFR-DO...)

DON-x05...DON-x15 < 75 µm micron (200 mesh)
DON-x20...DON-x35 < 150 µm micron (100 mesh)
DON-x40...DON-x60 < 350 µm micron (45 mesh)



Pulse Output

Reed switch pulse output (...R0/RE)

The reed switch output is a two wire normally open SPST voltage free contact ideal for installations without power or for use in hazardous area locations when Intrinsically Safe (I.S.) philosophy is adopted.

Note: when using the reed switch output the liquid temperature must not change at a rate greater than 10°C per minute.

Average switching life of reed contact (MTTF):

max. Load (100 V/10 mA) 5×10^5 switching cycles

min. Load (<5 V/10 mA) 5×10^8 switching cycles

Power supply: max. 30 V_{DC}, max. 200 mA

Hall sensor pulse output (...H0/HE)

In the electronics options H0/HE, a Hall Effect sensor is combined with an active push-pull output. The electrical connection is provided in 3-wire version. The output is actively switched either to +Vs or to ground. The external supply voltage is 8...30 V_{DC}. No additional external circuit is required (e.g pull up resistor). The high signal is approximately equal to the supply voltage +Vs and the low signal is approximately 0 V. The electrical load may optionally be connected to the supply voltage or to GND.

Maximum output current (current source or sink): 100 mA (short circuit protected).

In addition to Hall sensor, this option is equipped with a Reed switch which works the same as Option R0/RE.

Hall sensor pulse output (...HU)

Like option H0, however with following deviations:

- (i) no push-pull output - only NPN output
- (ii) supply voltage 5 - 30 V_{DC}

Hall sensor pulse output (...B0/BE)

Like options H0/HE, however with bipolar sensors and alternating polarised magnets. This option is used for pulsating flows, but it is not equipped with Reed switch and has halved K-factor as compared to H0/HE.

High-resolution Hall sensor pulse output, (...G0/GE, ...K0/KE)

Like options H0/HE; model DON-x05...DON-x10 can be supplied with four times the count of pulses per liter (...G0/GE) and models DON-x05...x20 with double amount of pulses (K0/KE) (see table «Output Pulse Resolution» on the following pages).

Quadrature hall effect pulse output (...D0/DE)

DON instrument with option D0/DE is provided with two independent Hall sensors. The two Hall effect sensors are arranged to give separate outputs out of phase with one another.

The QUAD output is mostly suitable for custody transfer with redundant signal or for detecting bidirectional flows (detection of flow direction).

Maximum output current per channel (current source or sink):

100 mA (short circuit protected).

Option L0/LE

The options L0 and LE (Ex) are available with loop powered 4-20 mA output. The loop is supplied with an external power supply 16...32 V_{DC}. The maximum resistance of the series loads (PLC analogue input/display electronics) depends on the magnitude of the supply voltage and can be calculated as:

$$\text{Max. load [Ohm]} = (+Vs - 9 V_{DC}) / 0.02 \text{ A } [\Omega]$$

$$\text{Example: } +Vs = 32 V_{DC} \Rightarrow \text{max. load} = 1150 \Omega$$

$$+Vs = 16 V_{DC} \Rightarrow \text{max. load} = 350 \Omega$$

The load can be inserted at any point in the current loop observing correct polarity.

Mechanical totaliser (...M4)

The flowmeters type DON-x20... up to DON-x60... are available with a 4-digit resettable mechanical totaliser and indication of accumulated total value. The motion of the rotors is transmitted to the mechanical register totaliser via an interfacing reduction gear train and dynamic seal assembly.

Option M4 is available for volume units litre and gallon.

Body material: enamelled die-cast aluminium, powder-coated

Protection: IP65

Ambient temp.: 0...+60°C

Medium temp.: -20...+80°C



Electronic with LCD Display

| Model | ..Z1 | ..Z2 | ..Z3 | ..ZE | ..ZB | ..E1 | ..E2 | ..E3 | ..E4 | ..E5 |
|--|---------------------------------|-------------------------|------------------------|------------------------|---------|--|-------------------------|--------------|--------------|-------------------------|
| Function | dual totaliser | dosing unit | rate/counter | | | dual totaliser | dosing unit | rate/counter | rate/counter | rate/counter |
| Power supply | | | | | | | | | | |
| External (also for backlighting) | 5 - 28 V _{DC} | 12 - 28 V _{DC} | 5 - 28 V _{DC} | 9 - 28 V _{DC} | - | U _i = 28 V I _i = 100 mA P _i = 0.7 W | | | | |
| Battery operation (output deactivated) ²⁾ | yes | no | yes | yes | yes | yes | no | yes | no | no |
| Battery included in shipment ³⁾ | yes | - | yes | no | yes | yes | - | yes | - | - |
| LCD display | | | | | | | | | | |
| Selectable units | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Decimal point | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Accumulative total | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Resettable total | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Linearisation | yes | no | yes | yes | yes | yes | no | yes | yes | yes |
| Rate display | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Backlighting | yes | yes | yes | yes | no | no | no | no | no | no |
| Input | | | | | | | | | | |
| Sensors | Hall sensor/ reed switch | | | | | reed switch | | | | |
| Outputs | | | | | | | | | | |
| 4-20 mA | no | no | yes | no | no | no | no | yes | yes (HART) | yes |
| Flow rate alarm min./max. | no | no | NPN/PNP/PP | no | no | no | no | no | no | with opto-coupler board |
| Batch end & control | no | yes | no | no | no | no | yes | no | no | no |
| Pulse outputs | no | no | PP | PP | no | no | no | no | no | with opto-coupler board |
| 2 x SPDT relays ¹⁾ | no | yes | option | no | no | no | with opto-coupler board | no | no | |
| Installation | | | | | | | | | | |
| IP65 | yes | yes | yes | IP66/67 | IP66/67 | yes | yes | yes | yes | yes |
| Cable entries | M20x1.5 / ½" NPT | | | | | | | | | |
| Medium temperature (Option: max. +120 °C) | -20...+80 °C | | | | | | | | | |
| Ambient temperature | -20 ... +80 °C | | | | | -20 ... +60 °C | | | | |
| Housing material | PA6 GF35 UL94 HB/VO/PC UL94 V-2 | | | | | | | | | |
| ATEX approval | no | | | | | yes | | | | |

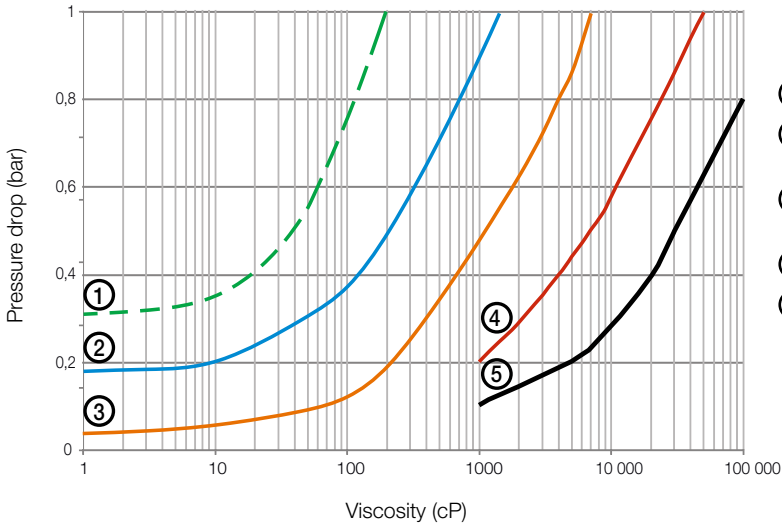
¹⁾ Replaces solid state outputs, for details see data sheet ZOK

²⁾ Battery operation only applicable with reed switch sensor »Rx«

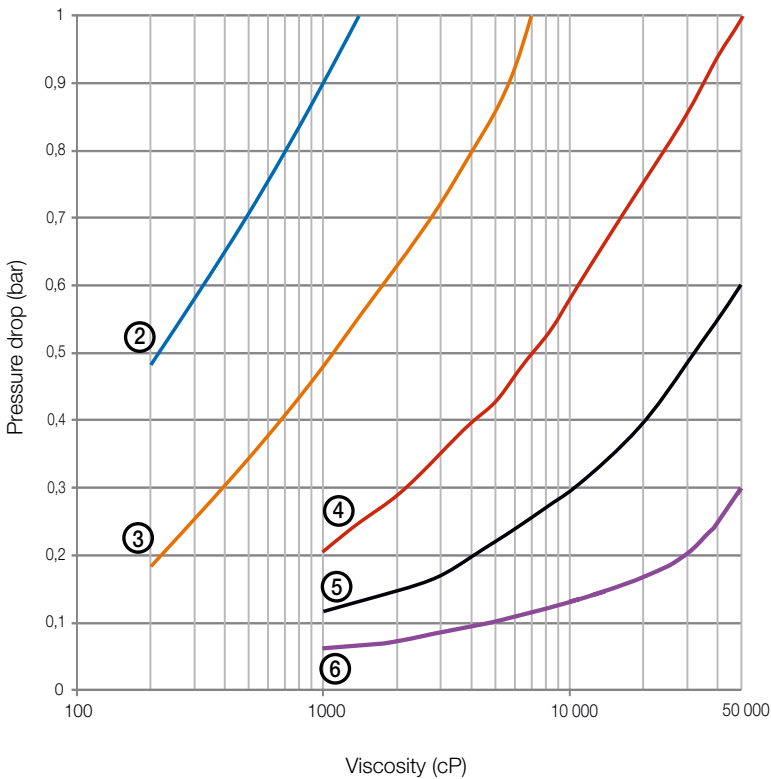
³⁾ Options Z6, Z7, Z8 and Z9 are shipped without batteries



DON Pressure Drop Curves versus Viscosity



- ① Standard rotors 100 % of full scale
- ② Standard rotors 50 % of full scale
special cut rotors 100 % of full scale
- ③ Standard rotors 25 % of full scale
special cut rotors 50 % of full scale
- ④ Special rotors 25 % of full scale
- ⑤ Special rotors 10 % of full scale



- ② Standard rotors 50 % of full scale
special cut rotors 100 % of full scale
- ③ Standard rotors 25 % of full scale
special cut rotors 50 % of full scale
- ④ Special cut rotors 25 % of full scale
- ⑤ Special cut rotors 10 % of full scale
- ⑥ Special cut rotors 5 % of full scale

Pressure drop limit versus flowrate

The curves above represent the pressure drop for standard cut oval rotors. Special cut rotors option «Y» have alternate tooth relieve which effectively reduces the pressure drop by

50%. When sizing a meter, be sure your selection falls **below the 1 bar maximum allowable pressure drop line on the graph.**



Maximum Flowrate Multiplier (for higher viscosities)

| Viscosities (cP) | Standard rotor | Special cut rotor |
|------------------|----------------|-------------------|
| ≤ 1000 | 1 | 1 |
| ≤ 2000 | 0.5 | 1 |
| ≤ 4000 | 0.42 | 0.84 |
| ≤ 6000 | 0.33 | 0.66 |
| ≤ 8000 | 0.25 | 0.5 |
| ≤ 30000 | 0.15 | 0.3 |
| ≤ 60000 | 0.12 | 0.25 |
| ≤ 150000 | 0.1 | 0.2 |
| ≤ 250000 | 0.05 | 0.1 |
| ≤ 1000000 | 0.025 | 0.05 |

Special cut rotors for higher viscosities

For viscosity > 1000 cP, special cut rotors option «Y» should be used to reduce pressure drop. This applies to DON-x15 and larger sizes. For higher viscosities, the flowmeter max. flowrate is de-rated according to the attached chart.

Example: DON-x25 measuring oil at 8000 cP, max. flow 150 l/min x 0.5 = 75 l/min new maximum flow rate.

Output Pulse Resolution

| Model | Measuring range [l/min] | Pulse/litre | | | | | |
|---------|-------------------------|----------------|----------------|----------------|-----------------------|---------------------------------|---------------------------------|
| | | Reed switch Rx | Hall sensor Hx | Hall sensor Bx | Quadr. hall sensor Dx | Hall sensor, high-resolution Gx | Hall sensor, high-resolution Kx |
| DON-x05 | 0.5 - 36 l/h | 2670 | 2670 | - | 2670 | 11320 | 5340 |
| DON-x06 | 2 - 36 l/h | 2670 | 2670 | - | - | - | - |
| DON-x10 | 2 - 100 l/h | 1062 | 1062 | - | 1062 | 4248 | 2124 |
| DON-x15 | 15 - 550 l/h | 351 | 702 | 351 | 702 | - | 1404 |
| DON-x20 | 1 - 40 | 82 | 163 | 82 | 163 | - | - |
| DON-x25 | 10 - 150 | 26 | 104 | 26 | 52 | - | - |
| DON-x30 | 15 - 250 | 13.5 | 55 | 13.5 | 27 | - | - |
| DON-x35 | 30 - 450 | 6.4 | 25.5 | 6.4 | 13.5 | - | - |
| DON-x40 | 50 - 580 | 4.9 | 19.6 | 4.9 | 9.8 | - | - |
| DON-x45 | 35 - 750 | 2.57 | 10.3 | 2.57 | 5.15 | - | - |
| DON-x50 | 50 - 1000 | 1.5 | 5.9 | 1.5 | 3 | - | - |
| DON-x55 | 75 - 1500 | 1.05 | 4.2 | 1.05 | 2.1 | - | - |
| DON-x60 | 150 - 2500 | 0.56 | 2.3 | 0.56 | 1.15 | - | - |

The values in above mentioned table are only approximate guidelines. The actual value for pulse rate can deviate from the values in this table and is mentioned in calibration certificate delivered with the flowmeter.



Oval Wheel Flowmeter Model DON

Order Details (Example: DON-105H R1 1 L0 M 0)

| Measuring range | Housing material ⁴⁾ | | | Connection | O-Ring Material | Electronics | Cable entry | Option |
|---------------------------|--------------------------------|-----------------|--------------------------|---|--------------------------------------|--|--|---|
| | Aluminium with PPS Rotor | Stainless steel | St. steel with PPS Rotor | | | | | |
| 0.5 - 36 l/h | DON-105H | DON-205H | DON-805H | R1 = G 1/8 N1 = 1/8" NPT | 1 = FKM 3 = FEP-O-ring 4 = NBR | R0 = Reed switch pulse output RE = Reed switch pulse output ATEX (Exd) H0 = Hall sensor (Push-Pull)/Reed switch, pulse output HE = H0 + ATEX HU = NPN pulse output (Hall/Reed), supply 5-30 V _{DC} B0 ⁹⁾ = for pulsating flow BE ⁹⁾ = B0 + ATEX (Exd) T0 ⁸⁾ = Hall sensor (Push-Pull), +150°C, pulse output K0 ⁹⁾ = high resolution (x2) Hall sensor (Push-Pull) KE ⁹⁾ = K0 + ATEX (Exd) G0 ²⁾ = high resolution (x4) Hall sensor (Push-Pull) GE ²⁾ = G0 + ATEX (Exd) D0 ¹¹⁾ = quad. Hall sensor 2 phased outputs (Push-Pull) DE ¹¹⁾ = as D0 + ATEX (Exd) L0 = 4...20 mA loop powered analogue output LE = L0 + ATEX (Exd) Z1 = dual LCD totaliser (ZOK-Z1) Z2 = dosing unit LCD (ZOK-Z2) Z3 = LCD totaliser, rate, outputs: 4-20 mA, alarm, pulse (ZOK-Z3) (impulses not for battery supply) Z6 = Z1 + B0 Z7 = Z3 + B0 Z8 = Z1 + D0 Z9 = Z3 + D0 ZE = LCD counter/flow (ZOE with external supply/with battery) ZB ¹²⁾ = LCD counter/flow (ZOE without external supply/with battery) E1 ¹²⁾ = Z1 + ATEX/IECEX (Exi) E2 ¹²⁾ = Z2 + ATEX/IECEX (Exi) E3 ¹²⁾ = Z3 + ATEX/IECEX (Exi) without switching or pulse outputs E4 ¹²⁾ = E3 + HART E5 ¹²⁾ = E3 + pulse or switching outputs + 4-20 mA M4 ⁶⁾ = mech. totaliser 4-digit | M = M20 N = 1/2" NPT S ⁷⁾ = M20 with cooling fin T ⁷⁾ = 1/2" NPT with cooling fin | O = without Y = special option (specify in clear text) e.g. Y = check valve (from DON-x30) Y ³⁾ = special cut rotors for higher viscosities |
| 2 - 36 l/h | | DON-206H | DON-806H | R1 = G 1/8 N1 = 1/8" NPT | | | | |
| 2 - 100 l/h | DON-110H | DON-210H | DON-810H | R2 = G 1/4 N2 = 1/4" NPT | | | | |
| 15 - 550 l/h | DON-115H | DON-215H | DON-815H | R3 = G 3/8 N3 = 3/8" NPT | | | | |
| 1 - 40 | DON-120H | DON-220H | DON-820H | R4 = G 1/2 N4 = 1/2" NPT H4 ⁵⁾ = G 1/2 (100 bar) P4 ⁵⁾ = 1/2" NPT (100 bar) | | | | |
| 10 - 150 | DON-125H | DON-225H | DON-825H | R6 = G 1 N6 = 1" NPT F6 = DIN flange, PN16/40 (DN25) A6 = ANSI flange, 150 lbs (1") B6 = ANSI flange, 300 lbs (1") H6 ⁵⁾ = G 1 (100 bar) P6 ⁵⁾ = 1" NPT (100 bar) | | | | |
| 15 - 250 | DON-130H | DON-230H | DON-830H | R8 = G 1 1/2 N8 = 1 1/2" NPT F8 = DIN flange, PN16/40 (DN40) A8 = ANSI flange, 150 lbs (1 1/2") B8 = ANSI flange, 300 lbs (1 1/2") | | | | |
| 30 - 450 | DON-135H | DON-235H | DON-835H | R9 = G 2 N9 = 2" NPT F9 = DIN flange, PN16 (DN50) C9 ⁸⁾ = DIN flange, PN40 (DN50) | | | | |
| 50 - 580 | DON-140H | DON-240H | DON-840H | A9 = ANSI flange, 150 lbs (2") B9 ¹⁾ = ANSI flange, 300 lbs (2") | | | | |
| 35 - 750 | DON-145H | DON-245H | DON-845H | RB = G 3 NB = 3" NPT FB = DIN flange, PN16 (DN80) | | | | |
| 50 - 1000 | DON-150H | DON-250H | DON-850H | AB = ANSI flange, 150 lbs (3") | | | | |
| 75 - 1500 | DON-155H | DON-255H | DON-855H | RC = G 4 NC = 4" NPT FC = DIN flange, PN16 (DN100) AC = ANSI flange, 150 lbs (4") | | | | |
| 150 - 2500 ¹⁰⁾ | DON-160H | DON-260H | DON-860H | | | | | |

¹⁾ Only for DON-x35 ²⁾ Only for DON-x05 and DON-x10 ³⁾ Not for DON-x05...DON-x10 ⁴⁾ Replace 'H' with 'G' to order GPH (GPM) ⁵⁾ With steel screws, only for DON-2... and DON-8... ⁶⁾ Only for DON-x20...DON-x60. Please specify the flow direction in clear text while ordering (possible flow directions «bottom to top» or «left to right» or «right to left» only). Standard flow direction is from bottom to top ⁷⁾ Only for electronic options -Zx/-Ex, not for DON-1... and DON-8... ⁸⁾ Only for DON-2... ⁹⁾ Only for DON-x05, -x10, -x15, without Reed switch ¹⁰⁾ Calibrated up to 2000 l/min. Higher flow rate calibration on request ¹¹⁾ Not for DON-x06 ¹²⁾ Without backlighting

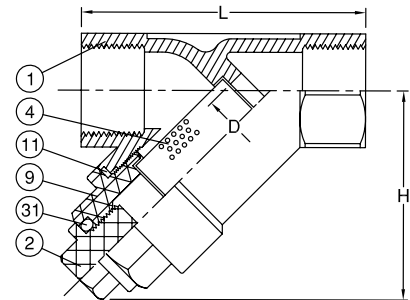
Technical Details MFR-DO (version stainless steel)

Design: two-part screwed body
 Connections: female thread G ¼ ... G 3
 DIN ISO 228-1
 Nominal pressure: PN 40
 Temperature range: -20 °C ... +180 °C
 Mesh size: 200 mesh/75 µm for G ¼, G ¾
 100 mesh/150 µm for G ½, G 1, G 1½
 40 mesh/400 µm for G 2, G 3
 Mounting position: cover toward bottom,
 note specified direction of flow

Materials

Body (1): stainless steel 1.4408, EN1503-1
 Plug (2): stainless steel 1.4408, EN1503-1
 Screen (4): stainless steel 316
 Bonnet (9): stainless steel 1.4408, EN1503-1
 Body seal (11): PTFE
 O-ring (31): FPM

MFR-DO



Dimensions and Order Details

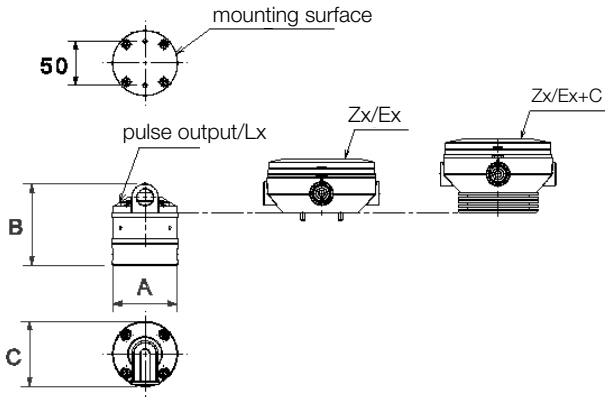
MFR-DO stainless steel version

(example: MFR-DOR15)

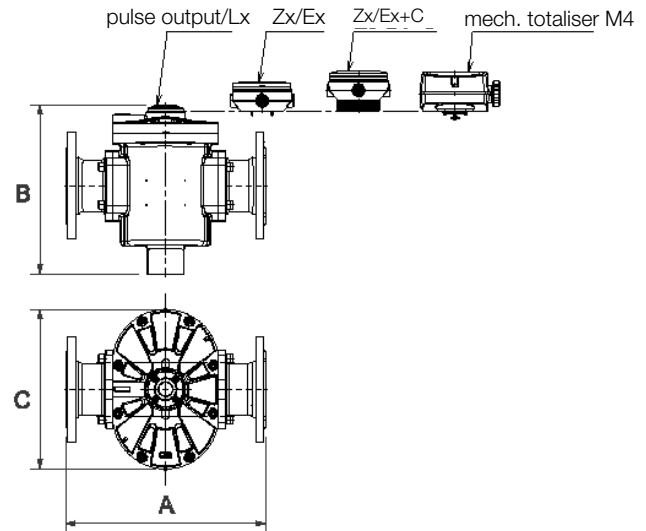
| Order no. | Size | | L | H | D |
|-----------|------|------|-------|-------|------|
| | | | [mm] | [mm] | [mm] |
| MFR-DOR08 | DN08 | G ¼ | 65.0 | 51.0 | 10.0 |
| MFR-DOR10 | DN10 | G ¾ | 65.0 | 51.0 | 12.0 |
| MFR-DOR15 | DN15 | G ½ | 65.0 | 51.0 | 15.0 |
| MFR-DOR25 | DN25 | G 1 | 90.0 | 72.0 | 25.0 |
| MFR-DOR40 | DN40 | G 1½ | 120.0 | 87.0 | 40.0 |
| MFR-DOR50 | DN50 | G 2 | 140.0 | 103.0 | 50.0 |
| MFR-DOR80 | DN80 | G 3 | 200.0 | 143.0 | 80.0 |

Dimensions DON-1(2/8)...

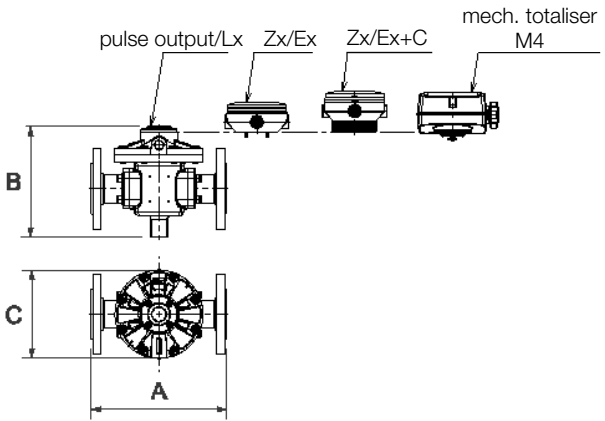
DON-x05 DON-x15



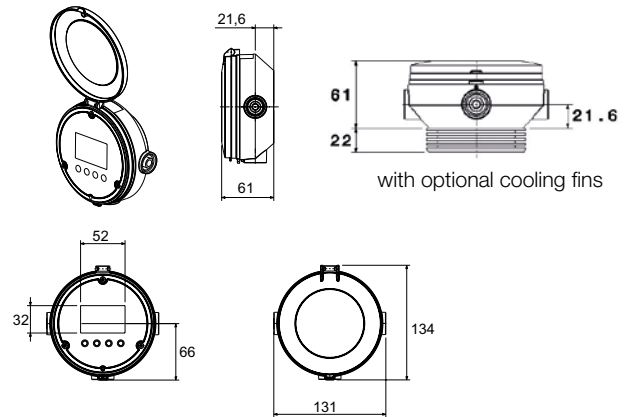
DON-x45 DON-x60



DON-x20 DON-x40



Electronic with LCD display / Zx/Ex



Dimensions DON-1(2/8).... (± 2 mm)

| Model | A [mm] | | B [mm] | | | C [mm] | | |
|---------|-------------------|-------------------|-----------------|-----------|-------------------------|-----------------|-------|-------------------------|
| | Thread connection | Flange connection | Pulse output/Lx | Zx/Ex | Mechanical totaliser M4 | Pulse output/Lx | Zx/Ex | Mechanical totaliser M4 |
| DON-x05 | 68 | - | 92 | 131 | - | 72 | 134 | - |
| DON-x06 | (68) | - | (92) | (131) | - | (72) | (134) | - |
| DON-x10 | 68 | - | 92 | 131 | - | 72 | 134 | - |
| DON-x15 | 68 | - | 99 | 138 | - | 72 | 134 | - |
| DON-x20 | 110 | - | 105 (101) | 134 (130) | 182 (178) | 112 | 134 | 165 |
| DON-x25 | 176 | 237 | 136 | 165 | 194 | 120 | 134 | 170 |
| DON-x30 | 188 | 252 | 166 | 195 | 223 | 163 | 163 | 200 |
| DON-x35 | 212 | 277 | 172 | 201 | 244 | 180 | 180 | 200 |
| DON-x40 | 212 | 277 | 246 | 275 | 299 | 180 | 180 | 200 |
| DON-x45 | 266 | 354 | 232 | 261 | 284 | 238 | 238 | 239 |
| DON-x50 | 294 | 382 | 229 | 258 | 302 | 290 | 290 | 290 |
| DON-x55 | 294 | 388 | 274 | 303 | 347 | 290 | 290 | 290 |
| DON-x60 | 320 | 414 | 351 | 380 | 424 | 331 | 331 | 331 |

Note: Dimensions for DON-2/8... are specified in () only when they are different from DON-1...