



Delta[®]

Commercial & Industrial Rotary Meter

Itron's Delta range of rotary gas meters comprises innovative and high quality products. Characterized by compact dimensions and easy maintenance, the Delta range is built on proven robust technology and provides reliable and accurate measurement and performance for commercial and industrial natural gas applications.

KEY BENEFITS

- » Excellent metrological stability attested by customers over the years
- » No influence of installation conditions nor stop-and-go flow rate on the metrology
- » Optimised pressure loss for low pressure network
- » Multi-position meter, changeable on the field
- » 360° rotating totalizer
- » Cyble technology

Operating Principle

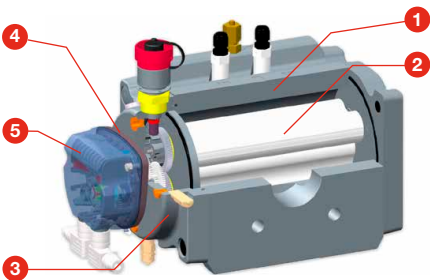
Delta meters are volumetric meters. The flow gas moves the pistons and each rotation traps and transfers a specific volume of gas. The movement is mechanically transmitted to the totaliser through the magnetic coupling.

Description

- A Delta meter is made of 5 main parts:
- » A measuring chamber that is limited by the body and the 2 base plates (1)
 - » 2 pistons, which are synchronised by 2 gears and which rotate in opposite directions (2)
 - » lubricant cover (3)
 - » A magnetic coupling to transmit the movement of the pistons to the totaliser (4)
 - » A totaliser to register the measured gas (5)

Technical Specifications

| | |
|---------------------------|--|
| Flow rate | From 0.25 m³/h to 1000 m³/h, G10 to G650 |
| Nominal Diameters | DN 25 to DN 150 (1" to 6") |
| Maximum Working Pressure | Up to 100 bar depending on the body material and flanging |
| Body Materials | Aluminium, ductile iron or steel. Compliant with the Pressure Equipment Directive 2014/68/EU |
| Temperature Range | ATEX/PED: -30° C to +60° C MID: -25° C to +55° C Storage temperature: -40° C to +70° C |
| Metrology | In accordance with MID and OIML, large rangeability up to 1:200. Compliant with the Measuring Instrument Directive 2014/32/EU |
| Intrinsic Safety Approval | L.C.I.E. 06 ATEX 6031 X - Compliant with the Directive 2014/34/EU |

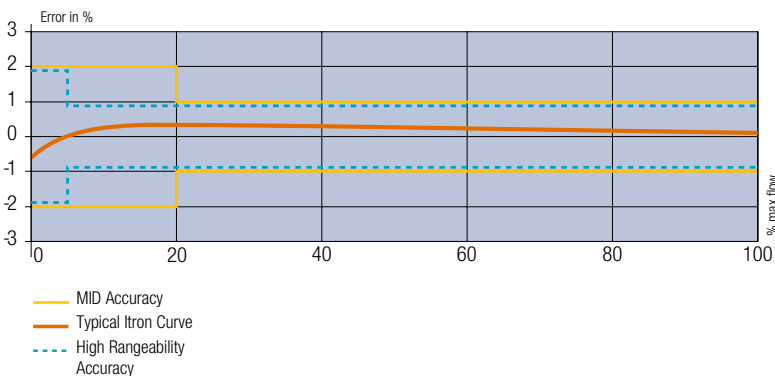


APPLICATIONS

Delta meters are designed to measure natural gas and various filtered, and non-corrosive gases. They are used when very accurate measurement is required, when the gas flow can be low or irregular.

Due to the volumetric principle of the Delta meter, its metrology is not influenced by installation conditions. Consequently, it can be used to build very compact stations without installing a straight pipe inlet before the meter.

Delta meters are approved for fiscal use.



Totaliser:

- » 9-digit index to register a larger volume
- » 45° orientation for an easy reading
- » 360° rotating totaliser
- » Equipped as standard with the cyble target: it allows the installation of the cyble sensor at any time
- » Equipped with 1 built-in silicagel cartridge; as an option, equipped with an external cartridge to enable easy maintenance even in extreme conditions
- » Integrated optical disc to facilitate the periodic calibration of the meter
- » Customised name plate (logo, bar-code, customer serial number...)
- » IP67 protection
- » UV resistant
- » Unit: m³

Interfaces:

- » Double Low Frequency fitted as standard on the whole range
- » Anti-tampering is supplied as standard
- » Medium Frequency is supplied as an option on the DN50 to DN150
- » High Frequency is supplied as an option on the whole range
- » Mechanical drive according to EN 12480 is supplied as an option
- » The cyble sensor can be delivered mounted onto the meter or installed afterwards at any time. It is a bounce-free transmitter. It allows also the counting of eventual back flows



Universal totaliser fitted as standard with the Cyble target



Cyble module ATEX

Low Frequency pulse transmitters (LF):

The LF transmitter consists of 2 dry Reed switches, normally open, and controlled by a magnet situated in the first drum of the totaliser. The LF connections are without polarity.

1) Internal Reed contacts

- » Hermetically sealed contacts
 - $U_i \leq 15 \text{ Volt}$
 - $I_i \leq 50 \text{ mA}$
 - $C_i = 0 \text{ F}$
 - $L_i = 0 \text{ H}$
 - $P_i \leq 120 \text{ mW}$
- » Ambient temperature
 $T_a = -30^\circ\text{C}$ to $+60^\circ\text{C}$
- » Minimum pulse time: 0.4 s

2) Cyble sensor

- » It conforms to CENELEC standard EN 60079-11 with:
 - $U_i \leq 14.3 \text{ Volt}$
 - $I_i \leq 50 \text{ mA}$
 - $C_i = 0 \text{ F}$
 - $L_i = 0 \text{ H}$
 - $P_i \leq 1 \text{ W}$

Inductive transmitters (HF and MF):

They are inductive sensors actuated by a toothed disc. The frequency is proportional to the instantaneous flow. The polarity of the connections is indicated on the name plate of the meter.

1) High Frequency transmitter

- » Proximity detectors conform to EN 60947-5-6 (NAMUR) standards.
- » They conform to CENELEC standards (EN 60079-0 and EN 60079-11) with:
 - $U_i \leq 15 \text{ Volt}$
 - $I_i \leq 50 \text{ mA}$
 - $C_i \leq 90 \text{ nF}$
 - $L_i \leq 100 \mu\text{H}$
 - $P_i \leq 120 \text{ mW}$
- » Ambient temperature
 $T_a = -30^\circ\text{C}$ to $+60^\circ\text{C}$

2) Medium Frequency transmitter

- » It conforms to CENELEC standards (EN 60079-0 and EN 60079-11) with:
 - $U_i \leq 16 \text{ Volt}$
 - $I_i \leq 52 \text{ mA}$
 - $C_i \leq 50 \text{ nF}$
 - $L_i \leq 250 \mu\text{H}$
 - $P_i \leq 64 \text{ mW}$



LF plug



HF plug



Mechanical drive according to EN 12480

Anti-tampering transmitter (AT):

This consists of one dry Reed switch, normally closed. Attempts at magnetic tampering will open the contact. The electrical characteristics are the same as those for the LF transmitter.

ALUMINIUM SERIES

DELTA SILVER EDITION

The Delta Silver Edition range combines Itron's proven Delta range with an eco-friendly design resulting in a lighter, smaller and easy to maintain product.



Delta Silver Edition range

Main Characteristics

- » Only the front cover must be filled with a lubricant.
- » Thermowells: supplied as an option, 2 tappings . 1/4" NPT allow an easy installation of thermowells.

- » Double Low Frequency transmitter connected on a Binder 6 pins plug. Anti-tampering is supplied as a standard.
- » MF is supplied as an option.
- » HF is supplied as an option, connected on a 3 pin binder. Possible to be retrofitted.

Technical Features

| | |
|------------------|-------------------------------------|
| Flow rate | 0.4 m³/h to 250 m³/h |
| G size | G16, G25, G40, G65 G100 and G160 |
| Rangeability | 1:20 to 1:200 |
| Nominal diameter | 50 and 80 (2" and 3") |
| Flanging | PN 10/16 and Class 150 (125) |
| Pressure range | 19.3 bar |

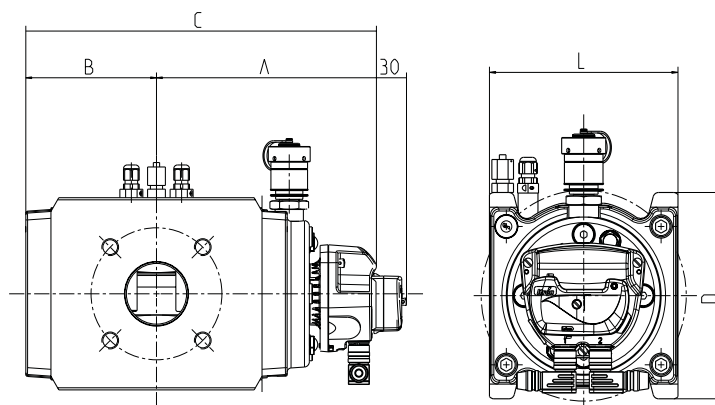
DN50/DN80:

| G size | Qmax (m³/h) | DN | Flange to flange distance Dim.: L | Rangeability | Starting flow (dm³/h) | Pressure loss Δpr ⁽¹⁾ (mbar) | 1 Imp LF& Cyble (m³/ Imp) | 1 Imp MF (dm³/ Imp) | Freq MF at Qmax (Hz) | 1 Imp HF (dm³/Imp) (Std. Gears 32/40) | Freq HF at Qmax (Hz) | A | B | C | D | Vc (dm³) | Weight (Kg) |
|--------|-------------|----|-----------------------------------|--------------|-----------------------|---|---------------------------|---------------------|----------------------|---------------------------------------|----------------------|-----|-----|-----|-----|----------|-------------|
| G16 | 25 | 50 | 171 | 20 to 50 | 50 | 0.13 | 0.1 | 2.72 | 2.55 | 0.0583 | 119 | 172 | 87 | 259 | 182 | 0.59 | 9 |
| G25 | 40 | 50 | 171 | 20 to 100 | 50 | 0.33 | 0.1 | 2.72 | 4.08 | 0.0583 | 191 | 172 | 87 | 259 | 182 | 0.59 | 9 |
| G40 | 65 | 50 | 171 | 20 to 160 | 50 | 0.88 | 0.1 | 2.72 | 6.64 | 0.0583 | 310 | 172 | 87 | 259 | 182 | 0.59 | 9 |
| G65 | 100 | 50 | 171 | 20 to 200 | 50 | 2.08 | 0.1 | 2.72 | 10.2 | 0.0583 | 476 | 172 | 87 | 259 | 182 | 0.59 | 9 |
| G65 | 100 | 80 | 171 | 20 to 200 | 70 | 0.69 | 0.1 | 4.36 | 6.36 | 0.0935 | 297 | 210 | 125 | 335 | 182 | 0.94 | 13 |
| G100 | 160 | 50 | 171 | 20 to 200 | 70 | 3.25 | 0.1 | 4.36 | 10.2 | 0.0935 | 475 | 210 | 125 | 335 | 182 | 0.94 | 13 |
| G100 | 160 | 80 | 171 | 20 to 200 | 70 | 1.73 | 0.1 | 4.36 | 10.2 | 0.0935 | 475 | 210 | 125 | 335 | 182 | 0.94 | 13 |
| G160 | 250 | 80 | 171 | 20 to 200 | 80 | 3.15 | 0.1 | 5.28 | 13.2 | 0.113 | 614 | 234 | 149 | 383 | 182 | 1.16 | 15 |

⁽¹⁾Δpr: Pressure loss (mbar) with $\rho = 0.83\text{Kg/m}^3$ and at Qmax



Delta Silver DN50 G40



DELTA COMPACT

The Itron meter is ideal for installation in extremely small cabinets.

Main Characteristics

- » Available in thread version (L=121mm) or flanged version (L=171mm).
- » Only the front cover has to be filled with lubricant.
- » Thermowell: supplied as an option, 1 tapping 1/4" NPT allows an easy installation of a thermowell.

- » Double Low Frequency transmitter connected on a Binder 6 pins plug. Anti-tampering is supplied as a standard.
- » HF is supplied as an option, connected on a Binder 6 pins plug.

Technical Features

| | |
|------------------|-----------------------|
| Flow rate | 0.25 m³/h to 65 m³/h |
| G size | G10, G16, G25 and G40 |
| Rangeability | 1:20 to 1:200 |
| Threaded version | DN40 1½" BSP or NPT |
| Flanged version | DN25, DN40 and DN50 |
| | (1", 1½", 2") |
| | ISO PN10/16 |
| | Class 150 (125) |
| Pressure range | Up to 19.3 bar |

Threaded version DN40 :

| G size | Qmax (m³/h) | DN | Flange to flange distance Dim.: L | Rangeability | Starting flow (dm³/h) | Pressure loss $\Delta p_r^{(1)}$ (mbar) | 1 Imp LF (m³/Imp) | 1 Imp HF (dm³/Imp) (Std. Gears 32/40) | Freq HF at Qmax (Hz) | A | B | C | D | Vc (dm³) | Weight (Kg) |
|--------|-------------|----|-----------------------------------|--------------|-----------------------|---|-------------------|---------------------------------------|----------------------|-----|----|-----|-----|----------|-------------|
| G10 | 16 | 40 | 121 | 20 to 50 | 25 | 0.3 | 0.01 | 0.218 | 20.4 | 126 | 46 | 172 | 126 | 0.19 | 4 |
| G16 | 25 | 40 | 121 | 20 to 100 | 25 | 0.8 | 0.01 | 0.218 | 31.8 | 126 | 46 | 172 | 126 | 0.19 | 4 |
| G25 | 40 | 40 | 121 | 20 to 160 | 25 | 1.8 | 0.01 | 0.218 | 50.9 | 126 | 46 | 172 | 126 | 0.19 | 4 |
| G40 | 65 | 40 | 121 | 20 to 200 | 25 | 4.8 | 0.01 | 0.218 | 82.8 | 126 | 46 | 172 | 126 | 0.19 | 4 |

Flanged version DN25/DN40/DN50 :

| G size | Qmax (m³/h) | DN | Flange to flange distance Dim.: L | Rangeability | Starting flow (dm³/h) | Pressure loss $\Delta p_r^{(1)}$ (mbar) | 1 Imp LF (m³/Imp) | 1 Imp HF (dm³/Imp) (Std. Gears 32/40) | Freq HF at Qmax (Hz) | A | B | C | D | Vc (dm³) | Weight (Kg) |
|--------|-------------|----|-----------------------------------|--------------|-----------------------|---|-------------------|---------------------------------------|----------------------|-----|----|-----|-----|----------|-------------|
| G10 | 16 | 25 | 171 | 20 to 50 | 25 | 0.4 | 0.01 | 0.218 | 20.4 | 126 | 60 | 186 | 126 | 0.19 | 6 |
| G10 | 16 | 40 | 171 | 20 to 50 | 25 | 0.3 | 0.01 | 0.218 | 20.4 | 126 | 60 | 186 | 126 | 0.19 | 6 |
| G10 | 16 | 50 | 171 | 20 to 50 | 25 | 0.3 | 0.01 | 0.218 | 20.4 | 126 | 60 | 186 | 126 | 0.19 | 6 |
| G16 | 25 | 25 | 171 | 20 to 100 | 25 | 0.8 | 0.01 | 0.218 | 31.8 | 126 | 60 | 186 | 126 | 0.19 | 6 |
| G16 | 25 | 40 | 171 | 20 to 100 | 25 | 0.7 | 0.01 | 0.218 | 31.8 | 126 | 60 | 186 | 126 | 0.19 | 6 |
| G16 | 25 | 50 | 171 | 20 to 100 | 25 | 0.6 | 0.01 | 0.218 | 31.8 | 126 | 60 | 186 | 126 | 0.19 | 6 |
| G25 | 40 | 40 | 171 | 20 to 160 | 25 | 1.8 | 0.01 | 0.218 | 50.9 | 126 | 60 | 186 | 126 | 0.19 | 6 |
| G25 | 40 | 50 | 171 | 20 to 160 | 25 | 1.6 | 0.01 | 0.218 | 50.9 | 126 | 60 | 186 | 126 | 0.19 | 6 |
| G40 | 65 | 40 | 171 | 20 to 200 | 25 | 4.5 | 0.01 | 0.218 | 82.8 | 126 | 60 | 186 | 126 | 0.19 | 6 |
| G40 | 65 | 50 | 171 | 20 to 200 | 25 | 4.2 | 0.01 | 0.218 | 82.8 | 126 | 60 | 186 | 126 | 0.19 | 6 |

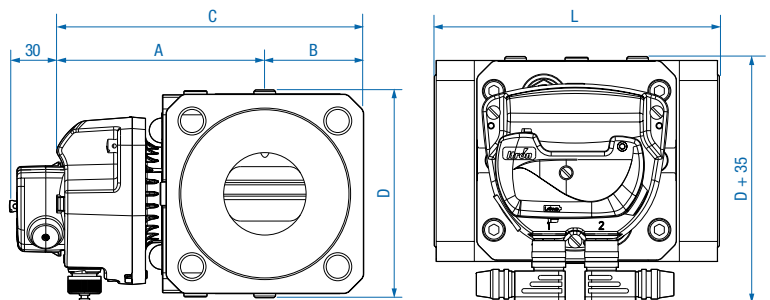
⁽¹⁾ Δp_r : Pressure loss (mbar) with $\rho = 0.83 \text{ Kg/m}^3$ and at Qmax



Delta DN40 G16



Delta DN50 G40 fitted with Cyble sensor



DELTA 2080/2100

Completing the whole aluminium series, this meter is design to measure big flow rates achieving a good compromise between that characteristic and its size.

Main Characteristics

- » Both front and rear covers must be filled with a lubricant.
- » Thermowells: supplied as an option, 2 tappings 1/4" NPT allow an easy installation of thermowells.

- » Double Low Frequency transmitter connected on a Binder 6 pins plug. Anti-tampering is supplied as a standard.
- » MF is supplied as an option.
- » HF is supplied as an option, connected on a 3 pin binder.

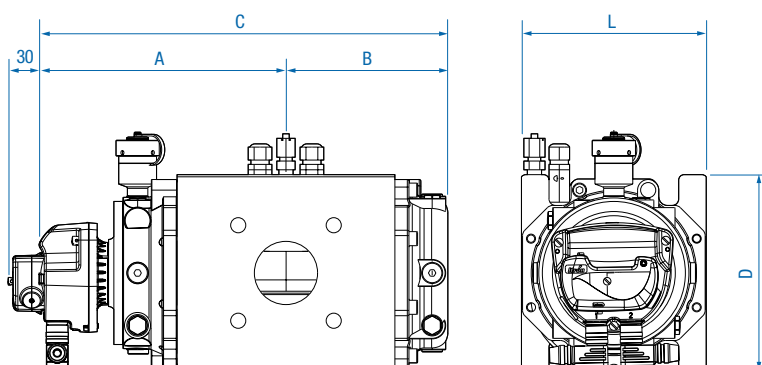
Technical Features

| | |
|------------------|------------------------------|
| Flow rate | 1.5 m³/h to 650 m³/h |
| G size | G160, G250 and G400 |
| Rangeability | 1:20 to 1:200 |
| Nominal diameter | 80 and 100 (3" and 4") |
| Flanging | PN 10/16 and Class 150 (125) |
| Pressure range | 16 bar (Option: 19.3 bar) |

DN80/DN100 :

| G size | Qmax (m³/h) | DN | Flange to flange distance Dim.: L | Rangeability | Starting flow (dm³/h) | Pressure loss Δpr ⁽¹⁾ (mbar) | 1 Imp LF & Cyble (m³/Imp) | 1 Imp MF (dm³/Imp) | Freq MF at Qmax (Hz) | 1 Imp HF (dm³/Imp) (Std. Gears 32/40) | Freq HF at Qmax (Hz) | A | B | C | D | Vc (dm³) | Weight (Kg) |
|--------|-------------|-----|-----------------------------------|--------------|-----------------------|---|---------------------------|--------------------|----------------------|---------------------------------------|----------------------|-----|-----|-----|-----|----------|-------------|
| G160 | 250 | 80 | 241 | 20 to 160 | 150 | 2.73 | 0.1 | 8.26 | 8.41 | 0.178 | 390 | 230 | 179 | 409 | 235 | 1.78 | 29 |
| G160 | 300 | 100 | 241 | 20 to 160 | 175 | 2.1 | 1 | 21.8 | 3.82 | 0.241 | 346 | 265 | 213 | 478 | 235 | 2.41 | 34 |
| G250 | 400 | 80 | 241 | 20 to 130 | 175 | 4.4 | 1 | 21.8 | 5.09 | 0.241 | 456 | 265 | 213 | 478 | 235 | 2.41 | 34 |
| G250 | 400 | 100 | 241 | 20 to 130 | 175 | 3.2 | 1 | 21.8 | 5.09 | 0.241 | 456 | 265 | 213 | 478 | 235 | 2.41 | 34 |
| G250 | 400 | 100 | 241 | 20 to 160 | 200 | 2.63 | 1 | 32.6 | 3.40 | 0.365 | 304 | 333 | 282 | 615 | 235 | 3.65 | 43 |
| G400 | 650 | 100 | 241 | 20 to 160 | 200 | 4.9 | 1 | 32.6 | 5.53 | 0.365 | 496 | 333 | 282 | 615 | 235 | 3.65 | 43 |

⁽¹⁾Δpr: Pressure loss (mbar) with ρ = 0.83Kg/m³ and at Qmax



Delta DN100 G250 equipped with HF and Cyble sensor

DELTA REFERENCE METER

In this meter, the classic pistons are replaced by 3-lobe and 60 °twisted pistons, eliminating the normal pulsations and resonance of the conventional rotary meter.

Developed to attend the highest requirements in terms of accuracy, stability and noise level, Delta reference meter is ideal for Metrology Institutes.

Main Characteristics

- » S-flow technology.
- » Front cover must be filled with lubricant.
- » Thermowells: supplied as an option.
- » Double Low Frequency transmitter connected on a Binder 6 pins plug and Anti-tampering are supplied as a standard.
- » MF is supplied as an option.
- » HF is supplied as an option, connected on a Binder 3 pin plug.

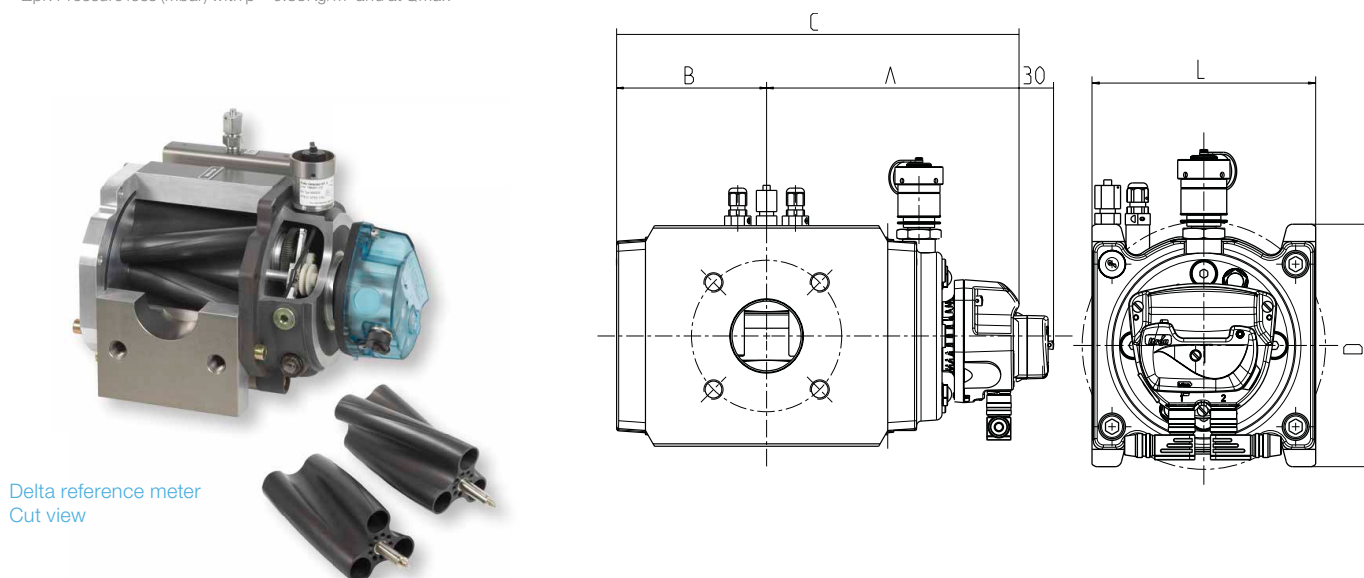
Technical Features

| | |
|------------------|--|
| Flow rate | 1 m ³ /h to 160 m ³ /h |
| G size | G16, G25, G40, G65 and G100 |
| Rangeability | 1:20 to 1:160 |
| Nominal diameter | 50 (2") |
| Flanging | PN 10/16 and Class 150 (125) |
| Pressure range | 16 bar |

DN50 :

| G size | Qmax (m ³ /h) | DN | Flange to flange distance Dim.: L | Rangeability | Starting flow (dm ³ /h) | Pressure loss Δpr ⁽¹⁾ (mbar) | 1 Imp LF & Cyble (m ³ /Imp) | 1 Imp MF (dm ³ /Imp) | Freq MF at Qmax (Hz) | 1 Imp HF (dm ³ /Imp) (Std. Gears 32/40) | Freq HF at Qmax (Hz) | A | B | C | D | Vc (dm ³) | Weight (Kg) |
|--------|--------------------------|----|-----------------------------------|--------------|------------------------------------|---|--|---------------------------------|----------------------|--|----------------------|-----|----|-----|-----|-----------------------|-------------|
| G16 | 25 | 50 | 171 | 20 to 30 | 50 | 0.09 | 0.1 | 2.31 | 3.01 | 0.0496 | 140 | 172 | 87 | 259 | 182 | 0.49 | 10 |
| G25 | 40 | 50 | 171 | 20 to 65 | 50 | 0.23 | 0.1 | 2.31 | 4.81 | 0.0496 | 224 | 172 | 87 | 259 | 182 | 0.49 | 10 |
| G40 | 65 | 50 | 171 | 20 to 100 | 50 | 0.6 | 0.1 | 2.31 | 7.82 | 0.0496 | 364 | 172 | 87 | 259 | 182 | 0.49 | 10 |
| G65 | 100 | 50 | 171 | 20 to 160 | 50 | 1.42 | 0.1 | 2.31 | 12.0 | 0.0496 | 560 | 172 | 87 | 259 | 182 | 0.49 | 10 |
| G100 | 160 | 50 | 171 | 20 to 200 | 50 | 3.64 | 0.1 | 2.31 | 19.3 | 0.0496 | 896 | 172 | 87 | 259 | 182 | 0.49 | 10 |

⁽¹⁾Δpr: Pressure loss (mbar) with ρ = 0.83Kg/m³ and at Qmax



Delta reference meter
Cut view

DUCTILE IRON SERIES

DELTA 2050/2080/2100 & S3-FLOW

The meters are designed to support high temperatures without impact on both safety and metrology. Due to the 3xDN flange to flange distance dimension, the replacement of turbine meters is possible without modifying the installation.

S3-FLOW is built up with s-flow technology to meet the highest requirements in accuracy measurement, being ideal to be used as a reference meter.

Main Characteristics

- » Both front and rear covers must be filled with a lubricant.
- » Thermowells: supplied as an option, 2 tapings 1/4" NPT allow an easy installation of thermowells.
- » Double Low Frequency transmitter connected on a Binder 6 pins plug. Anti-tampering is supplied as a standard.
- » MF is supplied as an option.
- » HF is supplied as an option.
- » High Temperature Loading: fire resistant PN5 is supplied as an option.

Technical Features

| | |
|------------------|---|
| Flow rate | 0.4 m³/h to 1000 m³/h |
| G size | G16, G25, G40, G65, G100, G160, G250, G400 and G650 |
| Rangeability | 1:20 to 1:200 |
| Nominal diameter | 50, 80, 100 and 150 (2", 3", 4" and 6") |
| Flanging | PN 10/16 and Class 150 (125) |
| Pressure range | 16 bar (Option: 19.3 bar) |

DN50/DN80/DN100/DN150 :

| G size | Qmax (m³/h) | DN | Flange to flange distance Dim.: L | Rangeability | Starting flow (dm³/h) | Pressure loss Δpr ⁽¹⁾ (mbar) | 1 Imp LF & Cyble (m³/Imp) | 1 Imp MF (dm³/Imp) | Freq MF at Qmax (Hz) | 1 Imp HF (dm³/Imp) (Std. Gears 32/40) | Freq HF at Qmax (Hz) | A | B | C | D | Vc (dm³) | Weight (Kg) |
|--------|-------------|--------------------|-----------------------------------|--------------|-----------------------|---|---------------------------|--------------------|----------------------|---------------------------------------|----------------------|-----|-----|-----|-----|----------|-------------|
| G16 | 25 | 50 | 150 | 20 to 50 | 70 | 0.1 | 0.1 | 4.36 | 1.59 | 0.0939 | 74 | 228 | 150 | 378 | 174 | 0.94 | 25 |
| G16 | 25 | 50 | 171 | 20 to 50 | 50 | 0.13 | 0.1 | 2.72 | 2.55 | 0.0585 | 119 | 190 | 112 | 302 | 174 | 0.59 | 19 |
| G25 | 40 | 50 | 150 | 20 to 100 | 70 | 0.21 | 0.1 | 4.36 | 2.55 | 0.0939 | 118 | 228 | 150 | 378 | 174 | 0.94 | 25 |
| G25 | 40 | 50 | 171 | 20 to 100 | 50 | 0.33 | 0.1 | 2.72 | 4.08 | 0.0585 | 190 | 190 | 112 | 302 | 174 | 0.59 | 19 |
| G40 | 65 | 50 | 150 | 20 to 160 | 70 | 0.55 | 0.1 | 4.36 | 4.14 | 0.0939 | 192 | 228 | 150 | 378 | 174 | 0.94 | 25 |
| G40 | 65 | 50 | 171 | 20 to 160 | 50 | 0.88 | 0.1 | 2.72 | 6.64 | 0.0585 | 309 | 190 | 112 | 302 | 174 | 0.59 | 19 |
| G65 | 100 | 50 | 150 | 20 to 200 | 70 | 1.3 | 0.1 | 4.36 | 6.36 | 0.0939 | 296 | 228 | 150 | 378 | 174 | 0.94 | 25 |
| G65 | 100 | 50 | 171 | 20 to 200 | 50 | 2.08 | 0.1 | 2.72 | 10.2 | 0.0585 | 475 | 190 | 112 | 302 | 174 | 0.59 | 19 |
| G65 | 100 | 80 | 171 | 20 to 200 | 70 | 0.69 | 0.1 | 4.36 | 6.36 | 0.0939 | 296 | 228 | 150 | 378 | 194 | 0.94 | 25 |
| G65 | 100 | 80 | 230 | 20 to 80 | 80 | 0.52 | 0.1 | 5.28 | 5.26 | 0.116 | 239 | 252 | 174 | 426 | 225 | 1.16 | 30 |
| G65 | 100 | 80 | 240 | 20 to 200 | 70 | 0.69 | 0.1 | 4.36 | 6.36 | 0.0939 | 296 | 228 | 150 | 378 | 194 | 0.94 | 27 |
| G100 | 160 | 50 | 150 | 20 to 200 | 70 | 3.25 | 0.1 | 4.36 | 10.2 | 0.0939 | 473 | 228 | 150 | 378 | 194 | 0.94 | 25 |
| G100 | 160 | 80 | 171 | 20 to 200 | 70 | 1.73 | 0.1 | 4.36 | 10.2 | 0.0939 | 473 | 228 | 150 | 378 | 194 | 0.94 | 25 |
| G100 | 160 | 80 | 230 | 20 to 130 | 80 | 1.32 | 0.1 | 5.28 | 8.42 | 0.116 | 383 | 252 | 174 | 426 | 225 | 1.16 | 30 |
| G100 | 160 | 80 | 240 | 20 to 200 | 70 | 1.73 | 0.1 | 4.36 | 10.2 | 0.0939 | 473 | 228 | 150 | 378 | 194 | 0.94 | 27 |
| G100 | 160 | 100 | 241 | 20 to 130 | 80 | 0.9 | 0.1 | 5.28 | 8.42 | 0.116 | 383 | 252 | 174 | 426 | 225 | 1.16 | 30 |
| G160 | 250 | 80 | 230 | 20 to 200 | 80 | 3.15 | 0.1 | 5.28 | 13.2 | 0.116 | 599 | 252 | 174 | 426 | 225 | 1.16 | 30 |
| G160 | 250 | 80 | 241 | 20 to 160 | 150 | 2.73 | 0.1 | 8.26 | 8.41 | 0.178 | 390 | 230 | 179 | 409 | 235 | 1.78 | 41 |
| G160 | 250 | 100 | 230 | 20 to 200 | 80 | 2.2 | 0.1 | 5.28 | 13.2 | 0.116 | 599 | 252 | 174 | 426 | 225 | 1.16 | 30 |
| G160 | 250 | 100 | 241 | 20 to 200 | 80 | 2.2 | 0.1 | 5.28 | 13.2 | 0.116 | 599 | 252 | 174 | 426 | 225 | 1.16 | 30 |
| G250 | 400 | 100 | 241 | 20 to 160 | 200 | 2.63 | 1 | 32.6 | 3.40 | 0.365 | 304 | 333 | 282 | 615 | 235 | 3.65 | 56 |
| G400 | 650 | 100 | 241 | 20 to 160 | 200 | 4.9 | 1 | 32.6 | 5.53 | 0.365 | 496 | 333 | 282 | 615 | 235 | 3.65 | 56 |
| G250 | 400 | 150 ⁽²⁾ | 450 | 20 to 100 | 400 | 0.77 | 1 | 48.0 | 2.31 | 0.595 | 187 | 343 | 267 | 610 | 365 | 5.4 | 120 |
| G400 | 650 | 150 ⁽²⁾ | 450 | 20 to 160 | 400 | 2.03 | 1 | 48.0 | 3.76 | 0.595 | 303 | 343 | 267 | 610 | 365 | 5.4 | 120 |
| G650 | 1000 | 150 ⁽²⁾ | 450 | 20 to 200 | 400 | 4.8 | 1 | 48.0 | 5.79 | 0.595 | 467 | 343 | 267 | 610 | 365 | 5.4 | 120 |

⁽¹⁾Δpr: Pressure loss (mbar) with ρ = 0.83Kg/m³ and at Qmax

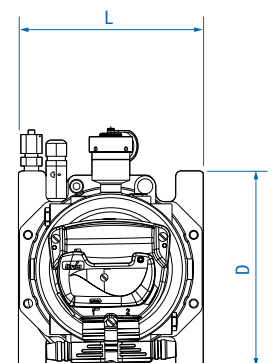
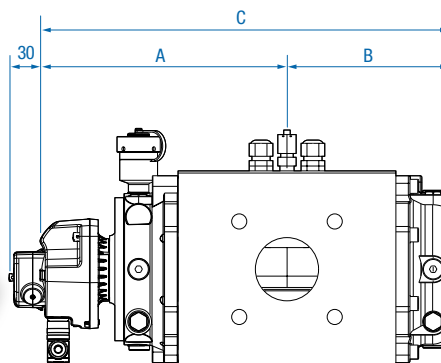
⁽²⁾S3-Flow meter



Delta DN150 G650 S3-Flow



Delta DN80 G100 3xDN
equipped with HF and Cyble sensor



STEEL SERIES

DELTA S1-FLOW

S1-Flow in steel is designed to meet the highest requirement, both in accurate measurement, due to s-flow technology, and high pressure conditions.

Main Characteristics

- » Only the front cover must be filled with a lubricant.
- » MF is supplied as an option.
- » 2 thermowells are supplied as option.

- » A by-pass can be installed as an option.
It enables the gas to flow even if the meter is blocked for any reason.
- » An alarm can be remotely sent requesting for maintenance.
- » Up to 2 HF are supplied as option.

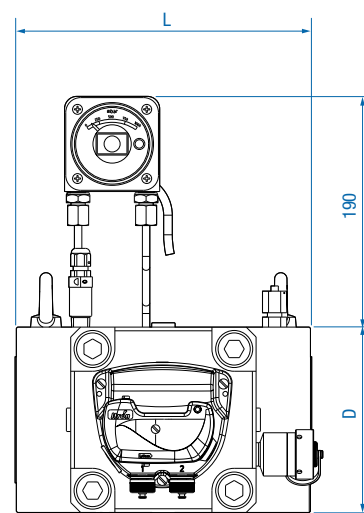
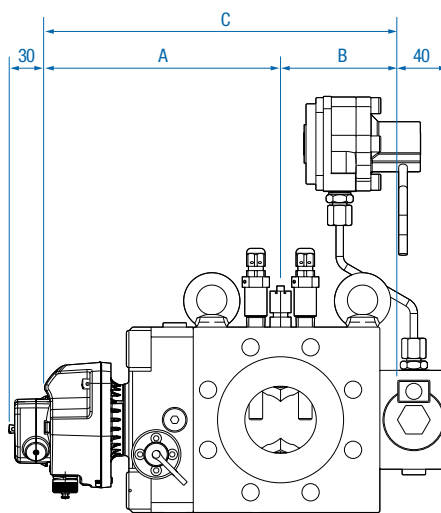
Technical Features

| | |
|------------------|---|
| Flow rate | 0.4 m³/h to 160 m³/h |
| G size | G16, G25, G40, G65 and G100 |
| Rangeability | 1:20 to 1:200 |
| Nominal diameter | 50 (2") |
| Flanging | PN 10/16 to PN40 Class 150 to Class 600 |
| Pressure range | 101.2 bar |

DN50 :

| G size | Qmax (m³/h) | DN | Flange to flange distance Dim.: L | Rangeability | Starting flow (dm³/h) | Pressure loss $\Delta p_r^{(1)}$ (mbar) | 1 Imp LF & Cyble (m³/Imp) | 1 Imp MF (dm³/Imp) | Freq MF at Qmax (Hz) | 1 Imp HF (dm³/Imp) (Std. Gears 32/40) | Freq HF at Qmax (Hz) | A | B | C | D | Vc (dm³) | Weight (Kg) |
|--------|-------------|----|-----------------------------------|--------------|-----------------------|---|---------------------------|--------------------|----------------------|---------------------------------------|----------------------|-----|-----|-----|-----|----------|-------------|
| G16 | 25 | 50 | 240 | 20 to 30 | 50 | 0.09 | 0.1 | 2.31 | 3.01 | 0.0496 | 140 | 190 | 100 | 290 | 150 | 0.49 | 34 |
| G25 | 40 | 50 | 240 | 20 to 65 | 50 | 0.23 | 0.1 | 2.31 | 4.81 | 0.0496 | 224 | 190 | 100 | 290 | 150 | 0.49 | 34 |
| G40 | 65 | 50 | 240 | 20 to 100 | 50 | 0.6 | 0.1 | 2.31 | 7.82 | 0.0496 | 364 | 190 | 100 | 290 | 150 | 0.49 | 34 |
| G65 | 100 | 50 | 240 | 20 to 160 | 50 | 1.42 | 0.1 | 2.31 | 12.0 | 0.0496 | 560 | 190 | 100 | 290 | 150 | 0.49 | 34 |
| G100 | 160 | 50 | 240 | 20 to 200 | 50 | 3.64 | 0.1 | 2.31 | 19.3 | 0.0496 | 896 | 190 | 100 | 290 | 150 | 0.49 | 34 |

⁽¹⁾ Δp_r : Pressure loss (mbar) with $\rho = 0.83 \text{ Kg/m}^3$ and at Qmax



Delta DN50 G100 S1 Flow in steel and equipped with by-pass, extension for the totalizer and cyble sensor

PRESSURE LOSS OF THE DELTA METERS

Calculation of pressure loss: $\Delta p = \Delta p_r \times \frac{\rho n}{0.83} \times (P_b + 1) \times \left[\frac{q}{Q_{max}} \right]^2 \times \left[\frac{273}{(273 + T_b)} \right]$

where:

- Δp : Pressure loss in the calculated conditions
- Δp_r : Pressure loss in the reference conditions
- ρn : Gas density (kg/m³) at 0° C and 1013 mbar
- P_b : Operating pressure (Bar gauge)
- q : Flow rate (m³/h)
- Q_{max} : Maximum flow rate (m³/h)
- T_b : Gas temperature (°C).

INSTALLATION

Each meter is delivered with binder plugs for the installed transmitters and oil for the lubrication. Please refer to the instruction manual supplied with the meter.

The advice given therein will ensure optimal use of the Delta meter over the years.



Flat gasket filters
from DN25 to DN150

ACCESSORIES / OPTIONS

Flat gasket-filter:

- » Flat gasket-filter, to be fit between flanges DN25 to DN150, High Temperature Resistant and with a level of filtration of 100.

External silicagel cartridge:

- » Accessory for maintenance on the installed external silicagel cartridge for extreme conditions.

Pete's plug®:

- » Ideal device for filling lubricant in the cover of the meter while equipment is in service. It must be fitted instead of the tap plug of the cover. Plugged on the pressure tapping, it can be used to measure the pressure and the temperature of the measured gas. Connection size: 1/4" NPT or 1/4" BSP. Maximum pressure of gas: 20 bar.

Thermowells:

- » These threaded 1/4" NPT thermowells, can be plugged onto the meter. They can be retrofitted on to the standard version (plugged onto the existing pressure tapping), or they can be installed on the versions equipped with extra-tapping. The internal diameter of the thermowell is 7 mm; it enables mounting of most standard temperature probes.

Extension for the totaliser:

- » This option allows the possibility to increase the distance between the body of the meter and the index, to facilitate the reading when the meter is covered with ice due to measurement at low temperatures.

By-pass:

- » It can be installed as an option on the steel version DN50. It enables the gas to flow even if the meter is blocked for any reason.

Bracket for mounting a volume converter:

- » This device permits the Itron Corus PTZ volume converter to be adapted directly onto the meter, or at the most convenient place to the meter to enable the converter index to be easily read.



Delta DN80 G100 with Corus PTZ



Thermowell fitted with sealing holes



Delta DN50 G65 S1-Flow equipped with
extension for the totaliser and by-pass



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ITRON GmbH

Hardeckstraße
D-76185 Karlsruhe
Germany

Phone: +49-721 5981 0

Fax: +49-721 5981 189