



EN



Serie C

Rotary Gas Meter



High accuracy
 High rangeability
 High performances
The Best !

Natural gas Companies worldwide use **Pietro Fiorentini** rotary meters in commercial and industrial natural gas measurement applications. Our rotary meters are also used in both high flow residential applications and low volume transmission applications. **Pietro Fiorentini** Series C rotary meters are used at the well head gathering line, compressor stations, gas distribution systems, and end users such as chemical and processing plants. Meters of standard construction are used in the measurement of a variety of filtered and dry non-corrosive gases, including specialty gases.

Pietro Fiorentini rotary meters are approved for custody transfer applications and used by natural gas transmission and gas distribution companies.

Some sizes of meters are available in the HTR version (High Temperature Resistance) according to EN12480 – Annex C

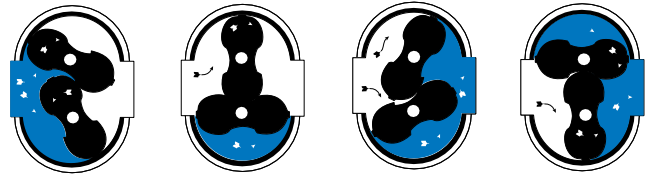
Serie C Rotary Meter Design Feature

- Compact size and lower weight
- High performance rotor (impeller) profile for increased rangeability
- Superior strength ensures reduced sensitivity to pipe stress
- Decreased susceptibility to damage from pressure shocks
- Simplified maintenance and repair
- Multi-functional index
- Low pressure drop
- Nominal pressure rating: ANSI150 or PN10/16
- Nominal Diameter: from DN40 to DN150 (from 1 ½ " to 6 ")
- Measuring Range: From 1:30 to 1:160 according to EN12480
- Flow rate: From 0,5 m³/h to 1000 m³/h
- Repeatability: Better than 0,1%
- Measuring Accuracy: According to EN12480
- Temperature Range: -25° C to +55° C
- Approval: EN12480, OIML R137 1&2, MID, ATEX, PED

Rotary Meters measurement principle

Pietro Fiorentini rotary meters are designed to measure the volume of gases and gas mixtures with a high degree of accuracy. The rotary type positive displacement operating principle assures permanent, non-adjustable accuracy by using two precision machined dual-lobed impellers encased within a rigid measuring chamber.

Unlike other meter types, measurement accuracy is not affected by changes in gas specific gravity, pressure, or fluctuating flow. Pietro Fiorentini rotary meters may be used from atmospheric pressure to 20 bar with highly accurate measurement over a wide operating range.



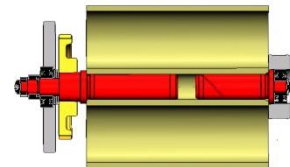
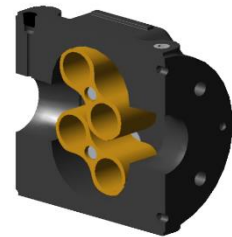
As shown in the picture, two contrarotating impellers of two-lobe shaped like an 8, are encased within a rigid measuring chamber, with the inlet and outlet connections on opposite sides. Precision machined timing gears keep the impellers in correct relative position. Optimal operating clearances between the impellers, cylinder and headplates provide a continuous, non-contacting seal.

Two precision machined dual-lobed impellers encased within a rigid measuring chamber.

Serie C Major Design Features

Rotors

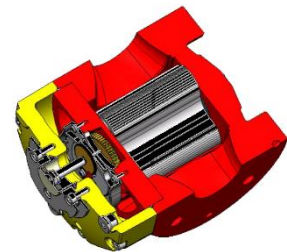
The precision machined high performance rotors are held in place with four main shaft bearings placed outside of the timing gears. This bearing placement strengthens the connection between the rotors and the timing gears. The sophisticated square profile impellers improve not only the accuracy, but also the rangeability of the meter by minimizing leakage between rotors and the body. This design also reduces the deflection of the rotor's main shafts at high flow rate and elevated pressure where dynamic loading is most prevalent. This feature makes the meter less vulnerable to damage during start up and operation.



Rugged Design

The Pietro Fiorentini Series C rotary meter's rugged design is less sensitive to stress from misaligned pipe or flanged connections. Our compact meter body, thick flange connections, and stainless steel bearing support rings facilitate easy installation, and robust performance in the most demanding installations. The square rotors with rigid main shafts are also less susceptible to damage from rapid pressurization of the meter.

Repair technicians can replace all major parts without special tools. This innovative Pietro Fiorentini measurement cartridge simplifies most maintenance and repair activities. Technicians can remove the complete measurement mechanism (rotors, timing gears, and bearings) from the meter body in one piece. Whether you just clean the cartridge and re-install it, or replace the cartridge, major repairs are fast and easy. When regulations permit, users can also install a new certified cartridge.



Multifunctional Index

The **Pietro Fiorentini** Series C rotary meters utilize a magnetically coupled index. A “drive” magnet couples to the “follower” magnet of the index, which in turn drives the odometer on the meter index.

The Series C index uses an 8 digit odometer and provides direct readings in cubic meters. The index is 100% sealed IP67 approved.

The index can be removed or installed with just “one twist and a click”.

The magnetic coupling allows for adjustable orientation of 355° or exchange without decommissioning the meter. A single index is adaptable to all Series C meter sizes due to the gear reduction internal to the meter body. The gear reduction is used to turn the drive magnet at an output ratio common to all Series C meters. By using a common index, the design enables standardization, reduces inventory and maximizes modular flexibility. The Series C index also contains a pocket that can hold different types of Low Frequency (LF) pulse devices, such as reed switches, or fraud detection/tamper indication devices,

For applications requiring serial communication, the Series C index is available with an encoder. The encoder uses three optical sensors to detect light passing through a specially designed slotted disc rotating within the index. The light detected passing through the disc is converted to a numeric value using Gray Code. The system offers high resolution and allows for instant flow calculation.



HTR Version

Some size **Pietro Fiorentini** Series C rotary meter are also available in the HTR version (High Temperature Resistance)

The HTR version is compliant with EN12480-Annex C
DVGW Test Report 17-134-4703-082

Body material : Cast Iron EN-GJS-400-15 or EN-GJS-400-18LT

Flange connection: PN10/16 Flat-face

Maximum Operating Pressure: 16 bar / 5 bar HTR

Surface treatment: Painted – Yellow RAL1004

Design Temperature range: -25° C to +55° C

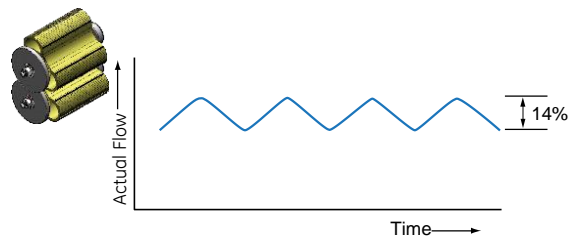
Operating Temperature range: -25° C to +55° C



Twin Versions

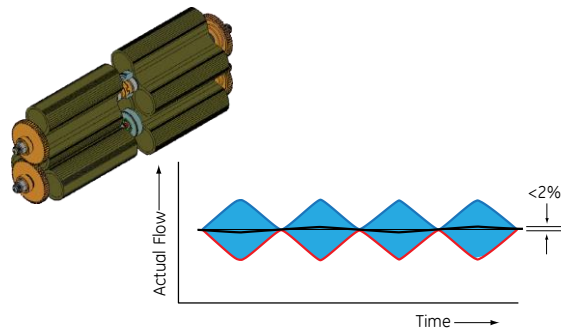
The twin impeller design reduces downstream pulsations and noise.

The figure-8 lobed impeller rotary meter design inherently creates pulsations as gas flows through the measurement chamber. This is a common and typical phenomenon with rotary meters. Resonance may affect the linearity of the calibration curve. The effect of such pulsations increases with pressure and the resultant resonance may affect components such as pressure regulators within the metering station. Harmonics, or the shift in frequency created by pulsations, can limit the achievable Qmax as the pressure in the measuring chamber varies.



Harmonics is simply a column of air being resonated at its fundamental or lowest frequency.

The small pulsation produced by the rotary meter occurs as the flow media quickly changes pressure as the measuring element (impellers) rotate. The amplitude of the pulsation from the measurement cavity is directly proportional to the pressure drop across the meter and the speed of the rotating device. These resonance flow points tend to show up as a higher than expected nominal value on the performance curve.



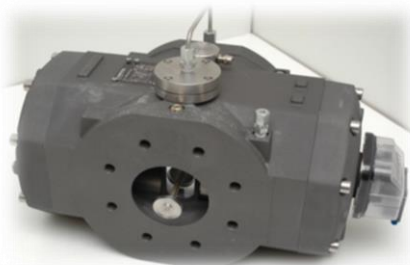
The Twin impeller principle, offered in the larger rotary meter sizes, divides the flow into two measuring chambers. The phase of each pair of impellers is shifted 45 degrees (180 degrees in terms of the sine wave) so that the pulsations are opposing and negligible, or eliminated. Pietro Fiorentini Twin rotary meters provide significantly improved accuracy over conventional rangeability make them ideal choices for reference or master meter applications. Reduced pulsations also significantly reduce ambient noise, making Twin rotary meters ideal for sound sensitive applications



The Twin version may have an internal by-pass as an additional functionality, to guarantee gas supply in case of an emergency when the rotors are blocked. The By-pass is automatically activated by exceeding a pressure drop value set in the factory. This desired pressure value must be communicated to us when ordering. The by-pass device gives a guarantee for the end user that gas is still available also in case the meter is damaged. This device cannot be activated by the user, but only by exceeding the set pressure drop. The by-pass device can be reset only by removing the instrument from the pipe and only after breaking the metrological seals.



By-pass Closed



By-pass Open

Serie C Rotary Meter Technical data

| | |
|-------------------------------|--|
| Materials: | Body & Rotors : Hard anodize Aluminum Alloy Shaft & Bearing: Stainless Steel Timing gears: High grade steel Bearing supports: AISI430 stainless steel |
| Nominal pressure rating: | ANSI150 & PN10/16 |
| Nominal Diameters: | from DN40 to DN150 (from 1 ½ " to 6 ") |
| Measuring Range: | From 1:30 to 1:160 according to EN12480 |
| Flow rates: | From 0,5 m ³ /h to 1000 m ³ /h |
| Repeatability: | Better than 0,1% |
| Measuring Accuracy: | According to EN12480 |
| Temperature Range: | -25° C to +55° C |
| Low frequency pulse: | 2x low frequency NO reed contact and 1 x anti fraude NC reed contact |
| High frequency pulse: | Optional on 171-241 size. Not available on 121 size. |
| Pressure & Temperature point: | ¼ " NPT female (others at request) |
| Approval: | EN12480 OIML R137 1&2 : 2012 2014/32/EU MID 2014/34/EU ATEX 2014/68/EU PED |

Our facility is ISO 9001 quality system certified by Lloyd's Register

The [Pietro Fiorentini](#) Series C meters are each supplied with a calibration certificate. The initial verification and calibration are carried out at the factory on an VSL approved Test-bench.

Available sizes / nominal operating conditions

| Model | Qmax | Qmin | Range | DN | Cyclic volume | Flange-Flange Distance | Weight Alum. / HTR | LF impulses | HTR version Availability |
|------------------|-------------------|-------------------|-------|---------------------|-----------------|------------------------|--------------------|----------------------|--------------------------|
| | m ³ /h | m ³ /h | max | metric (imperial) | dm ³ | mm | kg | Imp. /m ³ | Yes / No |
| G10 | 16 | 0.5 | 1:30 | 40 (G1½ or 1 ½ NPT) | 0.18 | 121 | 3.5 | 10 | ✗ |
| G16 | 25 | 0.5 | 1:50 | 40 (G1½ or 1 ½ NPT) | 0.18 | | 3.5 | 10 | ✗ |
| G25 | 40 | 0.65 | 1:65 | 40 (G1½ or 1 ½ NPT) | 0.26 | | 4 | 10 | ✗ |
| G16 | 25 | 0.50 | 1:50 | 40/50 (1½" / 2") | 0.69 | 171 | 10 / 23 | 10 | ✓ Only DN50 |
| G25 | 40 | 0.65 | 1:65 | 40/50 (1½" / 2") | 0.69 | | 10 / 23 | 10 | ✓ Only DN50 |
| G40 | 65 | 0.65 | 1:100 | 40/50 (1½" / 2") | 0.69 | | 10 / 23 | 10 | ✓ Only DN50 |
| G65 | 100 | 0.65 | 1:160 | 50 (2") | 0.69 | | 10 / 23 | 10 | ✓ |
| G100 | 160 | 1 | 1:160 | 50 (2") | 1.11 | | 12 / 30 | 1 | ✗ |
| G100 | 160 | 1 | 1:160 | 80 (3") | 1.11 | | 12 / 30 | 1 | ✓ |
| G100-Twin | 160 | 1.6 | 1:100 | 80 (3") | 1.73 | | 20.5 | 1 | ✗ |
| G160-Twin | 250 | 1.6 | 1:160 | 80 (3") | 1.73 | | 20.5 | 1 | ✗ |
| G100 | 160 | 1.6 | 1:100 | 80 (3") | 2.31 | 241 | 22.5 / 56 | 1 | ✓ |
| G160 | 250 | 1.6 | 1:160 | 80 (3") | 2.31 | | 22.5 / 56 | 1 | ✓ |
| G100 | 160 | 2.5 | 1:65 | 100 (4") | 2.98 | | 27.5 / 62 | 1 | ✓ |
| G160 | 250 | 1,6 | 1:160 | 100 (4") | 2.98 | | 27.5 / 62 | 1 | ✓ |
| G250 | 400 | 2.5 | 1:160 | 100 (4") | 2.98 | | 27.5 / 62 | 1 | ✓ |
| G250-Twin | 400 | 4.0 | 1:100 | 100 (4") | 3.88 | | 45 | 1 | ✗ |
| G400-Twin | 650 | 4.0 | 1:160 | 100 (4") | 3.88 | | 45 | 1 | ✗ |
| G400-Twin | 650 | 4.0 | 1:160 | 150 (6") | 3.88 | | 45 | 1 | ✗ |
| G400-Twin | 650 | 6.5 | 1:100 | 150 (6") | 5.97 | | 56 | 1 | ✗ |
| G650-Twin | 1000 | 6.5 | 1:160 | 150 (6") | 5.97 | | 56 | 1 | ✗ |

www.fiorentini.com

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