

PETROL INSTRUMENTS S.r.l. - ITALY

P D F L O W M E T E R S

C O M P A N Y C A R D

Our Company has become specialized in the manufacturing of **“rotor type” double case and single case PD (Positive Displacement) flow meters** for the measurement, within the limits of the legal accuracy, of the volume of liquids flowing through pipes.

We wish to point out that our company is 100% Italian and is one of the few manufacturers in the world of double case PD flow meters all in stainless steel or with only the metering mechanism (inner housing ass'y) in stainless steel.

Furthermore Petrol Instruments manufactures **tank provers** of various capacities, from 50 litres to 10.000 litres, approved by the Italian Metric Office and since 2004 is also manufacturing **master meters** with higher accuracy and repeatability to test other flowmeters measuring liquids different from water as alternative to tank provers of special capacity.

Our technology is derived from a technical agreement expired in 1980 with TOKICO, a Company belonging to the Hitachi group.

Our Quality System has been certified in accordance with **ISO 9001: 2000** and our Products in conformity with **PED** and **ATEX** directives as well as other **International Standards**.

The Approval n. 347828 dated 28/07/70, issued by the Italian Weight and Measure Department, allowed since many years the installation of our PD flow meters in **Custody Transfer applications** either in Italy and abroad with high satisfaction of our Customers.

Our PD flow meters have contributed to the automation and modernization of many industrial processes for their reliability and their operating characteristics coupled with a **very high manufacturing technique**.

Having increased in these years our experience in the field of flow measurement, **we can offer instruments that allow to meet, even contemporary, the most severe operating conditions**.

The **reliability** of our PD flow meters, engineered and manufactured to maintain **excellent performances during the years and to reduce their maintenance to a minimum**, is clearly demonstrated by the references for supplies either in Italy either abroad listed in detail in our general catalogue.

We produce almost 100% of our PD flow meters components in Aprilia factory - Italy, therefore we have been able to reduce practically to zero the spare parts storehouse of our customers by guaranteeing the delivery of the few urgent spares eventually needed in a very short period of time (max 48 hours).

Please find below our **Production line**:

A. Double case PD Flowmeters

- A.1. Sizes from 1" to 16", permitting the accurate measurement of liquid flow-streams from few hundreds of litres up to 2000 m³/h.
- A.2. Max. operating pressure over 200 bar and max. operating temperatures over 250 degree C.

B. Single case PD Flowmeters

- B.1. Sizes from 1" to 4", permitting the accurate measurement of liquid flow-streams from few hundreds of litres per hour up to 150 m³/h.
- B.2. Max. operating pressure over 10 bar and max. operating temperatures over 100 degree C.

C. Master Meters

- C.1. Sizes from 1" to 16", permitting the accurate measurement of liquid flow-streams from few hundreds of litres up to 2000 m³/h.

D. Protection Strainers

- D.1. Sizes from 1" to 16", protecting the PD flow meters and master meters allowing their proper functioning and durability.
- D.2. Max. operating pressure over 200 bar and max. operating temperatures over 250 degree C.

E. Tank Provers

- E.1. 50, 100, 200, 500, 1.000, 2.000, 5.000, 10.000 litres capacities available

The main characteristics of our PD flow meters and Master Meters may be summarized as follows:

A. Excellent Accuracy and Repeatability

Accuracy : $\pm 0,1\%$ for master meters, $\pm 0,15\%$ for fiscal applications and $\pm 0,5\%$ for general purpose.

Repeatability: $\pm 0,02\%$.

B. Double case construction

In this type of construction the metering mechanism, called hereinafter inner housing ass'y (inner casing plus rotors, shafts and gears), is a sub-ass'y operating, testable and replaceable in any moment.

During the line flushing or the "start-up" operations the inner housing ass'y can be therefore removed from the outer housing flanged to the piping without removing the entire PD flowmeter from the line and consequently avoiding any damage to the metering mechanism during such operations.

In addition there is a drastic reduction of the time required for the PD flowmeter maintenance being normally enough to remove and maintain only the inner housing ass'y, without the need of removing the entire PD flowmeter from the line.

Furthermore PD flow meters may be manufactured with different construction materials either for the outer housing either for the inner housing ass'y (inner casing plus rotors shafts and gears) in accordance to customer's specific needs.

C. Floating type rotors

The rotors never touch each other nor they touch the other parts composing the "base volume" but are synchronized by a couple of timing gears mounted outside the inner casing. The rotors are not therefore subject to wear which means that the PD flowmeter does not need any re-calibration with the time due to the wear of the parts composing the "base volume".

D. Reduced maintenance

The adoption on a standard basis of the magnetic transmission to drive the counter (which means a static seal between the wetted parts and the dry parts of the PD flowmeter) and of carbon bearings instead of ball bearings to support the rotor shafts, as well as the double case construction and the floating type rotors, reduce the maintenance of our PD flow meters to a real minimum.

E. Capability of metering viscous liquids

Due to our PD flow meters operating principle and manufacturing procedures there are no problems for the measure of viscous liquids. In facts the rotor profile of the PD flow meters is worked out with constant profile cutters.

It is therefore very easy to produce PD flow meters with different "clearances" and consequently also suitable for the measurement of very viscous liquids (50.000 mPa.s and over).

F. Low Pressure Drop

The straight-through path and floating rotor design create a very low pressure drop at maximum flow.

G. Certifications/Homologations

1. Approval Certificate n. 347828 dated 28/07/70, issued by Italian Weight and Measure Department, for legal and custody transfer applications in Italy.
2. Approval Certificate n. 341976 dated 17/05/1991, issued by Italian Weight and Measure Department, for the legal application in Italy of the "Tank Provers Petrol Instruments".
3. Approval Certificate n. 10596 dated 10/09/2004, issued by Italian Weight and Measure Department, for the legal application in Italy of the "Master Meters Petrol Instruments".
4. Approval Certificate n. 23679 dated 25/04/2006 issued by the Russian Authority, for the legal use in Russia.
5. Compliance with OIML R117.
6. Approval Certificate n. 1115 dated 03/08/2006 issued by Pascal, attesting the conformity of our products to the PED directive n. 97/23/EC.
7. CEE Approval Certificate for model of measuring instruments n. 06.03.01.011 dated 18/10/06, issued by Italian Weight and Measure Department, for the legal use in European Common Market (CEE) Countries.
8. EC Declaration of Conformity (ATEX, PED).
9. MIGAS Approval dated 22/02/2007 issued by the Indonesian Authority for legal use in Indonesia.
10. DPR Approval dated 09/09/2008 issued by Department of Petroleum Resources for the legal use in Nigeria.
11. Pattern Approval Certificate (PAC) issued by AQSIC for legal use in China.
12. ISO 9001:2000 Certificate of Conformity n. IT229954 dated 31/07/2008 issued by Bureau Veritas Italia.
13. ISO 14001:2004 Certificate of Conformity n. AT-00975/0 dated 18/12/2008 issued by IQNet.

H. Different construction materials

Availability of all the construction materials industrially used from cast iron to cast steel and to the various grades of stainless steel up to AISI 316 L, in relation to the chemical properties of metered liquids.

"All resin" version ("moplen") with hastelloy B shafts and screws is available for the measure of diluted hydrochloric acid and diluted sulphuric acid.

I. Wide range of accessories

1. Local indication of metered volumes with mechanical non reset counter or reset counter
2. Ticket printer, zero-start or accumulative type.
3. Local preset counters with mechanic, electric or pneumatic operation of the shut-off valve, once delivered the preset liquid volumes.
4. Electronic counters with preset and temperature compensation functions
5. Remote electric/electronic set-stop systems realized by means of an intrinsically safe or explosion proof pulse transmitter and an electro-mechanic/electronic panel type preset counter with an electric output signal, once delivered the preset liquid volumes.
6. Remote pneumatic set-stop systems realized by means of a pneumatic pulse transmitter and a pneumatic panel type preset counter, with a pneumatic output signal once delivered the preset liquid volumes.
7. Remote transmission of metered volumes by means of intrinsically safe/ explosion proof transmitters and remote analogue or digital pulses processing.

The Aprilia (LT) factory, on a ground of 5.500 m², shows a covered surface of 2000 m² and an high production capability either as number of PD flow meters produced either as production line completion.

In our factory, totally dedicated to the construction of our Products and the relevant accessories, are available a series of test stations, equipped with calibrated tanks of various capacity, sealed by Italian Metric Office, for the performance tests and the calibration of all the PD flow meters produced.

From a commercial stand-point our company can rely on a sales network through agents and representative companies, both in Italy and abroad, to promptly furnish all the assistance required by our customers.

The Industrial Sectors of major use and the relevant main customers can be summarized as follows:

- **Automation:** Chemint S.p.A.; Elsag Bailey Hartmann & Braun Italia S.p.A.
- **Chemical/
Petrochemical:** Chemi S.p.A.; Agrolinz Melamin Italia S.r.l.; Dibra S.p.A.; Eni Group; Exxon Chemical S.p.A.; Montedison Group; Montell Italia S.p.A.; Lonza S.p.A. (ex Alusuisse Group); Nuova Sardamag S.p.A.; Rohm & Haas Italia S.p.A.; Solvay & C. ie S.A.; Solvay Portugal S.A. (Portugal).
- **Crude-oil/
derivate
treatment:** Italfluid Geoenergy S.r.l.; Premabergo Italiana S.p.A.; Siirtec S.p.A.
- **Crude-oil
extraction :** Agip S.p.A.; Agip Nigeria and N.R.S.A. (Nigeria); Agip Recherches Congo S.A. (Congo); Edison Oil S.p.A.; Oil & Natural Gas Corporation LTD, (India).
- **Engineering:** ABB Combustion Engineering S.p.A.; ABB Industri S.A. (Norway); Ansaldo Energia S.p.A.; Brown & Root (UK.); Ctip S.p.A.; Engineering India Limited LTD (India); Fisher & Porter (U.K.); Fluor Daniel Argentina Inc.; Jantesa (Venezuela); Mannesmann Aktiengesellschaft (Austria); Snamprogetti S.p.A.; Snia Engineering S.p.A.; Techint S.p.A.; Techint Italimpianti S.p.A.; Technip Italy S.p.A.
- **Food Plants:** C.M.B. S.p.A.
- **Military Plants:** Bonatti S.p.A.; Sigeco S.p.A.
- **Petroleum:** Agip Lubrindo Pratama (Indonesia); Agip Petroli S.p.A.; Api S.p.A.; Costiero Gas Livorno S.p.A.; Elf Idrocarburi Italiana S.p.A.; Friulana Gas S.p.A.; I.E.S. S.p.A.; Indeni Petroleum Ltd. (Zambia); Indian Oil Co. Ltd. (India); Liquigas S.p.A.; OMV Aktiengesellschaft (Austria); Raffineria di Roma S.p.A.; Saras S.p.A.; Umm-Al Jawaby Oil Service (England).
- **Pharmaceutical:** Abbott S.p.A.; A.C.R.A.F. S.p.A.; Antibioticos S.p.A.; Biosint S.p.A.; Bristol Myers Squibb S.p.A.; Johnson & Johnson S.p.A.; Recordati S.p.A.; Zambon Group S.p.A.
- **Power
Generation:** Abb Sae Sadelmi S.p.A.; Ansaldo Energia S.p.A.; Enel S.p.A.; Enel Power S.p.A.
- **Ship-Makers** Fincantieri S.p.A.
- **Steel Making:** Ilva Laminati Piani S.p.A.
- ◆ **Markets:** 40% Italy, 60% foreign countries directly and through Italian industrial groups.
- ◆ **References:** as per attached lists.



The list of Countries where our PD flow meters are presently installed can be summarized as follows:

LIST OF FINAL DESTINATION COUNTRIES

- | | |
|---------------|-------------------|
| ALGERIA | LUXEMBURG |
| ARGENTINA | MALAYSIA |
| AUSTRIA | MEXICO |
| BAHRAIN | MOROCCO |
| BANGLADESH | NEPAL |
| BULGARIA | NIGERIA |
| CAMBOGIA | NORWAY |
| CANADA | OMAN |
| CEKA REPUBLIC | PAKISTAN |
| CHILE | PHILIPPINES |
| CHINA | POLAND |
| COLOMBIA | PORTUGAL |
| CONGO | QATAR |
| CROAZIA | ROMANIA |
| CUBA | RUSSIA |
| EGYPT | SAUDI ARABIA |
| ENGLAND | S.DOMINGO |
| ETHIOPIA | SINGAPORE |
| FRANCE | SLOVAKIA |
| GERMANY | SOMALIA |
| GUAM | SOUTH AFRICA |
| HAITI | SPAIN |
| INDIA | SYRIA |
| INDONESIA | TANZANIA |
| IRAN | TUNISIA |
| IRAQ | TURKEY |
| JAMAICA | UCRAINA |
| JORDAN | UNITED ARAB EMIR. |
| JUGOSLAVIA | UNITED STATES |
| KENYA | URUGUAY |
| KOREA | VENEZUELA |
| KUWAIT | VIETNAM |
| LEBANON | YEMEN |
| LYBIA | ZAMBIA |

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