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PD Flowmeters since 1970

REF. PRODL-02/E

TO WHOM IT MAY CONCERN

Subject: Production line presentation

With this letter we are very pleased to introduce you our Company which 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 **digital control valves, tank provers** with a capacity from 50 litres to 10.000 litres approved by the Italian Metric Office and **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 9001:2015** and our Products are in conformity with **PED** and **ATEX** directives as well as other **International Standards for custody transfer applications.**

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 250 bar, max operating temperatures over 250 °C and max viscosity of 50000 cP and over.

Sheet 1 of 6



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 °C.

C. Protection Strainers

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

D. Control Valves

- D.1. Sizes from 2" to 4", used when an high precision flowrate and batch control is needed.
- D.2. Max operating pressure over 40 bar and max operating temperatures over 140 °C.

E. Master Meters

- E.1. Sizes from 1" to 16", permitting the accurate measurement of liquid flow-streams from few hundreds of litres up to 2000 m³/h.
- E.2. Max operating pressure over 250 bar, max operating temperatures over 250 °C and max viscosity of 50000 cP and over.

F. Tank Provers

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

Main characteristics:

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. Low Pressure Drop

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

C. 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.

D. 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".

E. Magnetic transmission

Sealing between the wetted parts and the dry parts of the PD flowmeter is of static type, and this fully guarantees against any leakage of the flowing liquid.

F. Wide range of accessories

- F.1. Local indication of metered volumes with mechanical non reset counter or reset counter
- F.2. Mechanical Ticket printer, zero-start or accumulative type.
- F.3. Local mechanical preset counters with mechanic, electric or pneumatic operation of the shut-off valve, once delivered the preset liquid volumes.
- F.4. Electronic counters with preset and temperature compensation functions for fiscal applications
- F.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.
- F.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.
- F.7. Remote transmission of metered volumes by means of intrinsically safe/ explosion proof transmitters and remote analogue or digital pulses processing.
- F.8. Intrinsically safe or Explosion proof Flowrate/Totalizer with optional pulse output, 4-20 mA output and Hart protocol

G. Certifications/Homologations

- G.1. Approval Certificate n. 347828 dated 28/07/1970, issued by Italian Weight and Measure Department, for legal and custody transfer applications in Italy.
- G.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".
- G.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".
- G.4. Approval Certificate n. 57385 dated 30/12/2014 issued by the Russian Authority, for the legal use in Russia.
- G.5. Compliance with OIML R117.
- G.6. Approval Certificate n. 00227PED12002A2 Rev.0 dated 10/12/2018 issued by Pascal, attesting the conformity of our products to the PED directive n. 2014/68/EU.
- G.7. CEE Approval Certificate for model of measuring instruments n. 06.03.01.011 dated 18/10/2006, issued by Italian Weight and Measure Department, for the legal use in European Common Market (CEE) Countries.
- G.8. EC Declaration of Conformity (ATEX, PED).
- G.9. DPR Approval dated 09/09/2008 issued by Department of Petroleum Resources for the legal use in Nigeria.
- G.10. Pattern Approval Certificate (PAC) issued by AQSIC for the legal use in China.
- G.11. ISO 14001:2004 Certificate of Conformity n. AT-00975/0 dated 18/12/2008 issued by IQNet.
- G.12. MIGAS Approval dated 08/08/2016 issued by the Indonesian Authority, for the legal use in Indonesia.
- G.13. ISO 9001:2015 Certificate of Conformity n. IT229954-1 dated 28/07/2020 issued by Bureau Veritas Italia.
- G.14. Hellenic Metrology Approval dated 11/05/2012 issued by the Hellenic Authority, for the legal use in Greece.
- G.15. MID Evaluation Certificate n. MID 127_EC_01 rev.0 for Petrol Instruments PD Meters dated 29/09/2017 issued by KIWA
- G.16. MID EU-Type Examination Certificate Module B n. MID 127_B_1 rev.0 for Petrol Instruments PD Meters dated 16/12/2019 issued by KIWA
- G.17. LR Type Approval Certificate n. LR2004671TA rev.0 for Petrol Instruments PD Meters dated 15/06/2020 issued by Lloyd's Register
- G.18. Certificate of Qualification in Achilles Joint Qualification System (JQS) for suppliers to the Oil Industry in Norway and Denmark dated 30/05/2018 issued by Achilles
- G.19. Certificate of Registration in Achilles First Point Assessment (FPAL) for suppliers to the Oil & Gas Industry dated 14/03/2017 issued by Achilles
- G.20. Certificate of Registration in JSRS (Joint Supplier Registration System) for suppliers to the Oman Oil & Gas Industry dated 10/02/2016 issued by Ministry of Oil & Gas
- G.21. NMIM/SIRIM Pattern Type Approval dated 03/01/2018 issued by the NMIM (National Metrology Institute of Malaysia), for the legal use in Malaysia.
- G.22. Kazakhstan Approval for the legal use in Kazakhstan

Main benefits:

A. Compact Design

No upstream or downstream pipe lengths are necessary.

B. Long Service Life

The rotors never touch each other nor they touch the other parts composing the "base volume" therefore they are not subject to wear. Plus the magnetic transmission of the rotors movement eliminates the maintenance and product leakage associated with a mechanical linkage method.

C. 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.

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. Highest Performance on Viscous Products

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).

Recommended for Crude Oil Custody Transfer Applications.

F. Possibility to use it without power supply

Suitable for any application.

G. Direct reading of the volume

Excellent accuracy and repeatability.

H. Flexibility to customer needs

Customized solutions

I. No Special Tools and No Skilled Person Required

Easier Maintenance.

J. Not subject to air hammer effect and slug damages

Longer life.

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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.

In this respect please find hereto enclosed our document n° FDC-02/E relevant to the list of countries where our PD flow meters are presently installed.

We hope that our Products meet your interest and that we will have the opportunity to co-operate with your Company in the near future, making you available all our experience, product reliability and competitive prices.

We invite you to contact us again if you need any further assistance.

Kind regards

Paola Romiti (CEO)
PETROL INSTRUMENTS S.r.l.

ATT./ Doc. n. FDC-03/E

Aprilia 10/2020.



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DOC. FDC-03/E

PETROL INSTRUMENTS S.R.L. - ITALY

PD FLOW METERS

LIST OF FINAL DESTINATION COUNTRIES

ALGERIA	KUWAIT
ALBANIA	LEBANON
ANGOLA	LITHUANIA
ARGENTINA	LYBIA
AUSTRALIA	LUXEMBURG
AUSTRIA	MALAYSIA
AZERBAIJAN	MALTA
BAHRAIN	MAURITIUS
BANGLADESH	MALDIVE
BELARUS	MEXICO
BELGIUM	MOROCCO
BRASIL	NETHERLANDS
BULGARIA	NIGERIA
CAMBOGIA	NORWAY
CANADA	OMAN
CEKA REPUBLIC	PANAMA
CHILE	PAKISTAN
CHINA	PHILIPPINES
COLOMBIA	POLAND
CONGO	PORTUGAL
CROAZIA	QATAR
CUBA	ROMANIA
CYPRUS	RUSSIA
DENMARK	SAN MARINO
ECUADOR	SAUDI ARABIA
EGYPT	SINGAPORE
ESTONIA	SLOVAKIA
FINLAND	SOUTH AFRICA
FRANCE	SPAIN
GEORGIA	SRI LANKA
GERMANY	SUDAN
GREECE	SWEDEN
GUATEMALA	SWITZERLAND
HAITI	SYRIA
HONG KONG	TAIWAN
HUNGARY	TANZANIA
ICELAND	THAILAND
INDIA	TUNISIA
INDONESIA	TURKEY
IRAN	TURKMENISTAN
IRAQ	UNITED ARAB EMIR.
ISRAEL	UNITED KINGDOM
ITALY	UNITED STATES
JAMAICA	URUGUAY
JAPAN	VENEZUELA
JORDAN	VIETNAM
KAZAKHSTAN	YEMEN
KOREA	ZAMBIA

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Aprilia 10/2018.

Sheet 6 of 6

