

# Systems & Products

# Metering runs and Metering skids for liquids and gases



**P E T R O L**  
**Metering Systems**

**Via delle Valli, 25 - 04011 Aprilia (LT)**  
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Final destination:  
**El-Feel Lybia**

**SKID**



**Liquid**

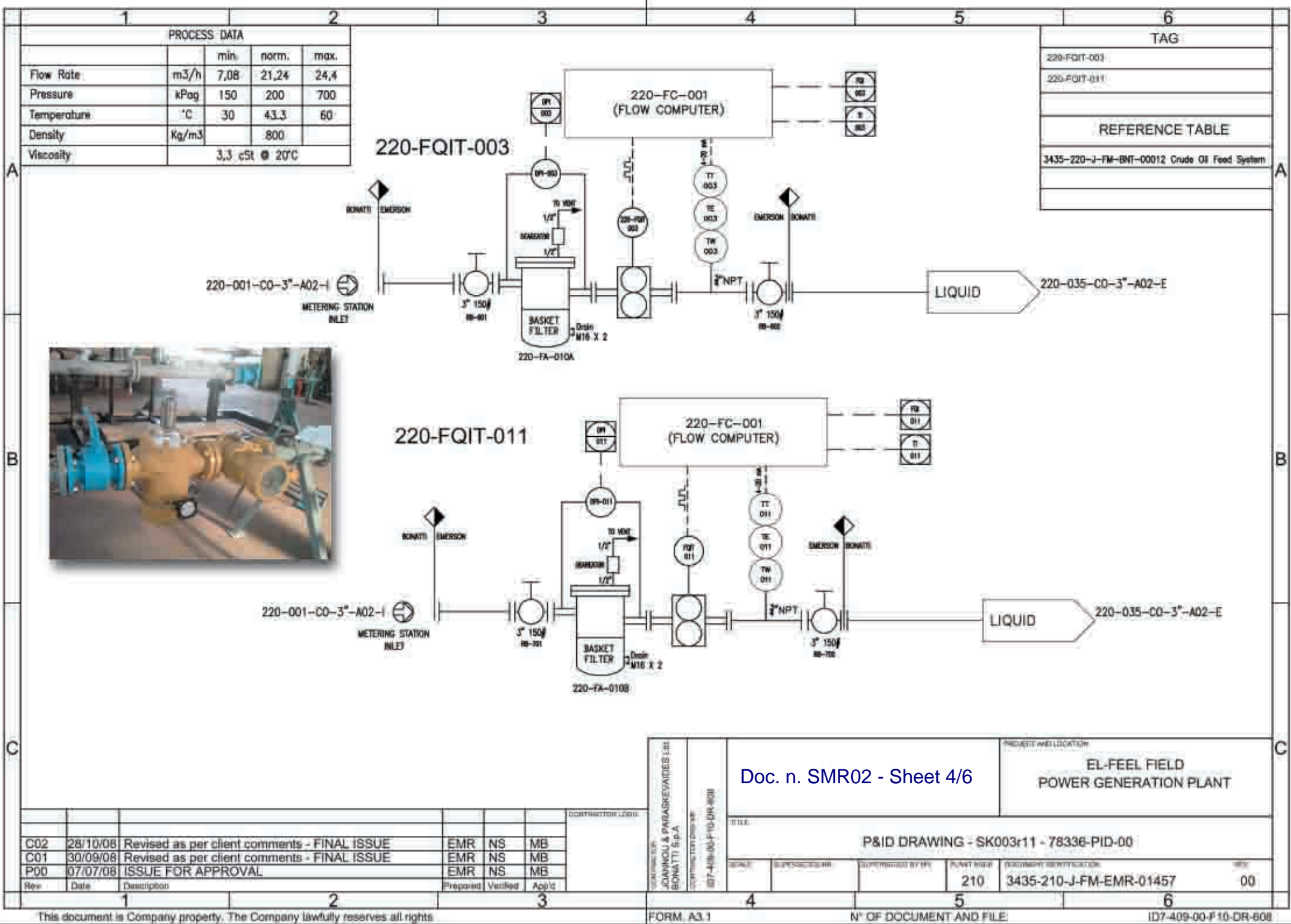


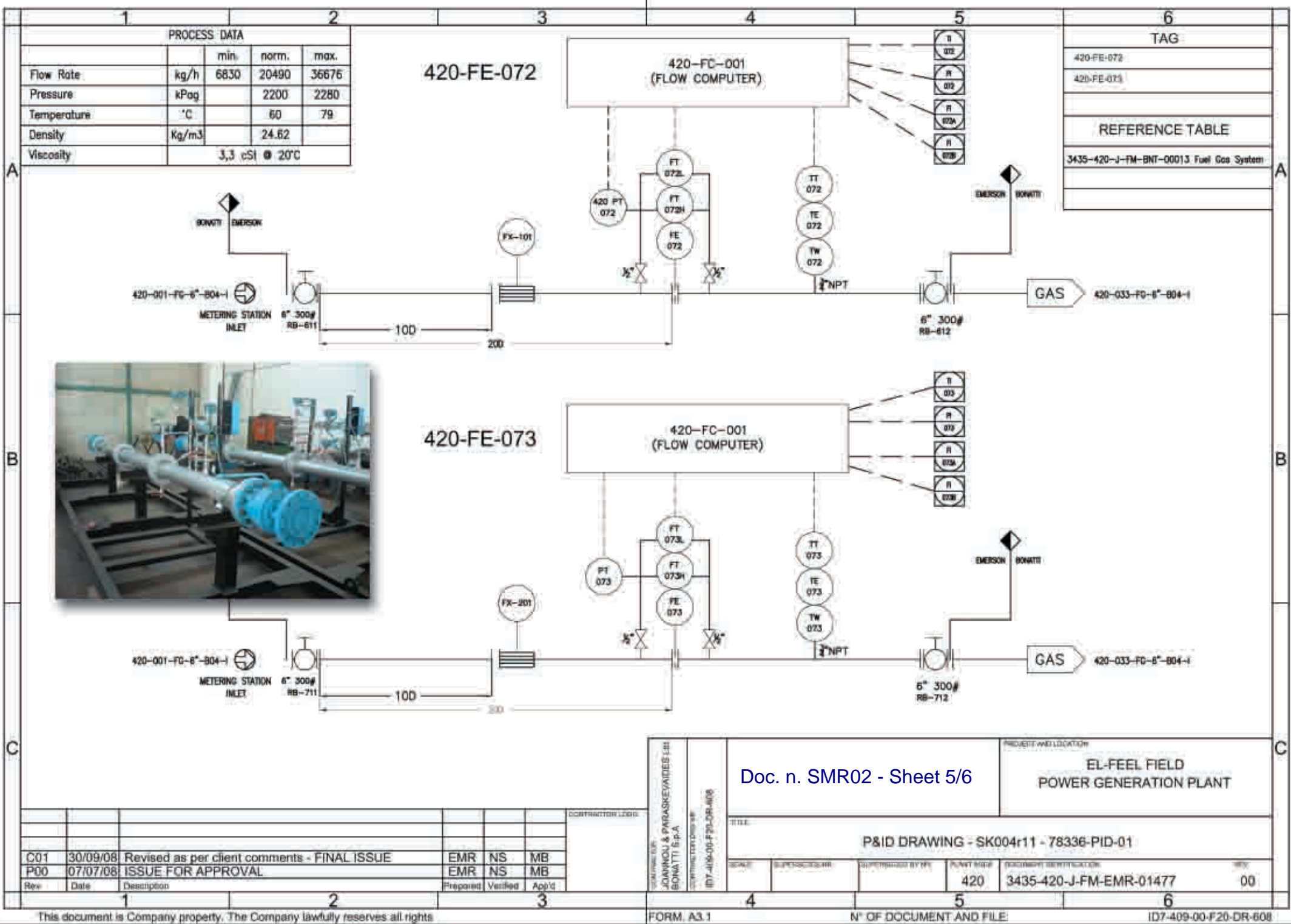




SKID  
GAS











**DIESEL OIL METERING SKID**



**GAS METERING SKID**



# Truck loading facilities

Top & bottom loading  
Gravity un-loading

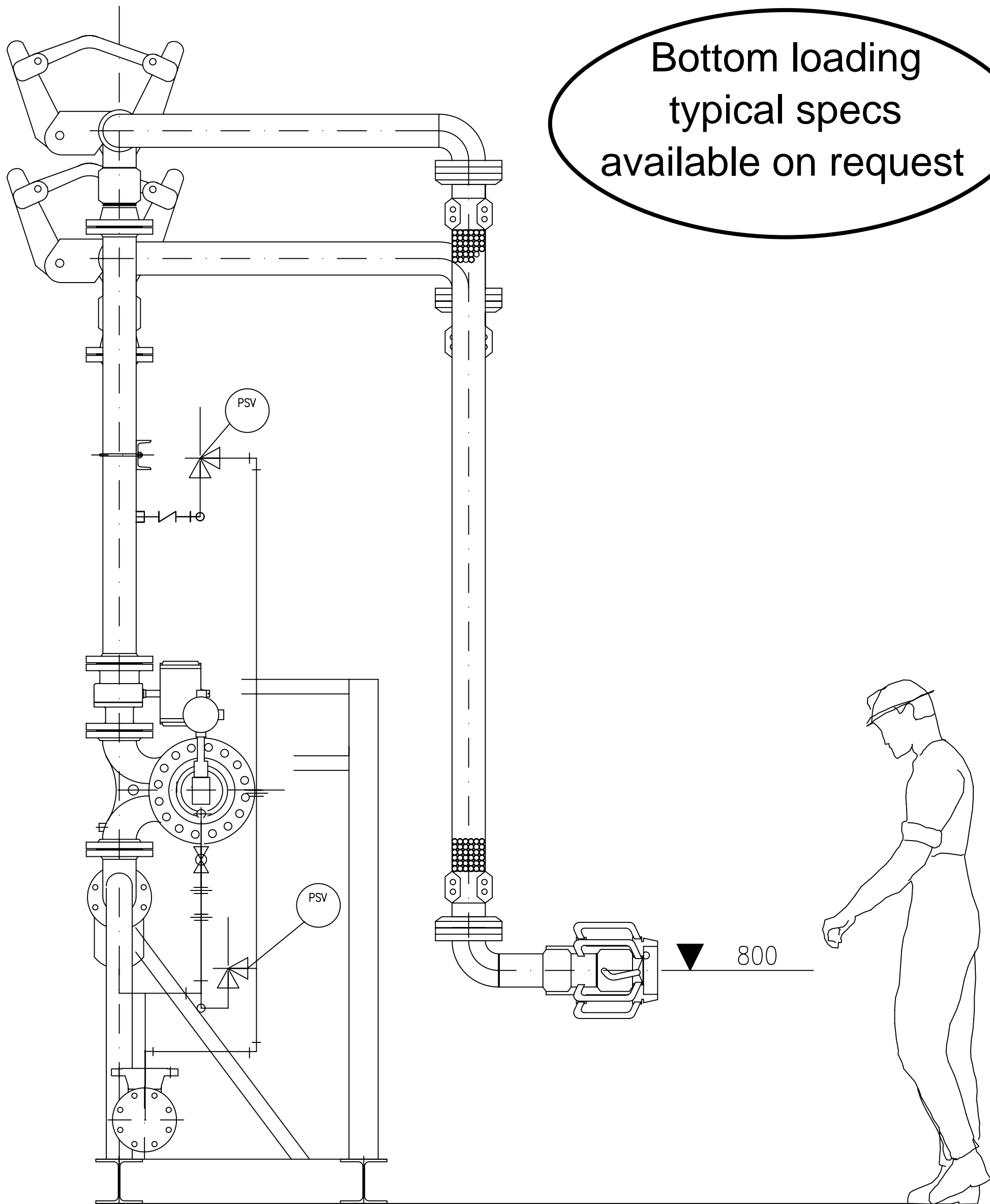


**P E T R O L**  
Metering *Systems*

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Bottom loading  
typical specs  
available on request

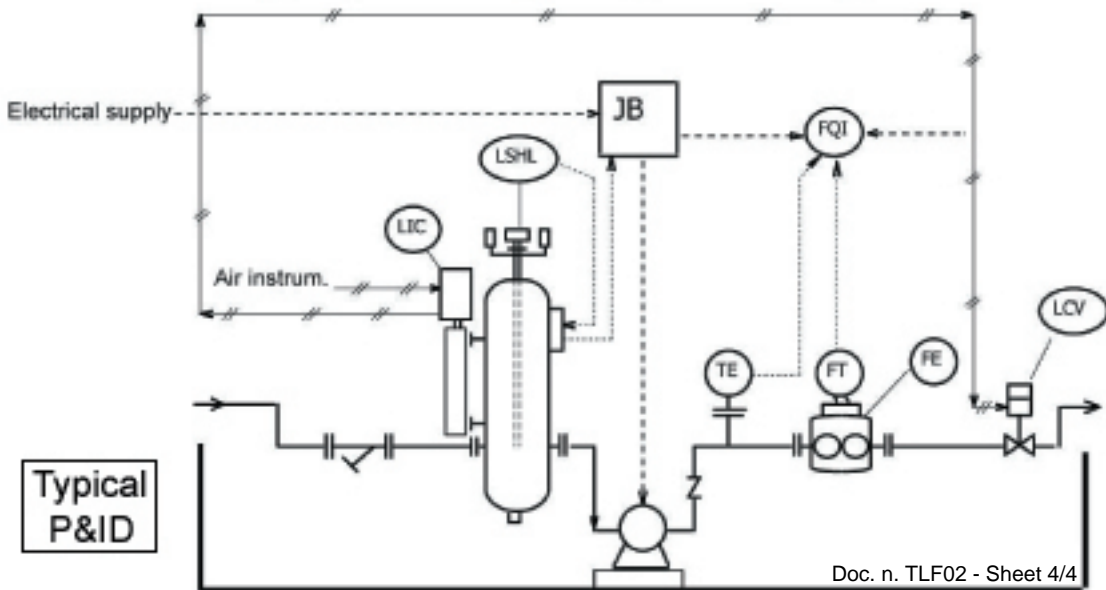




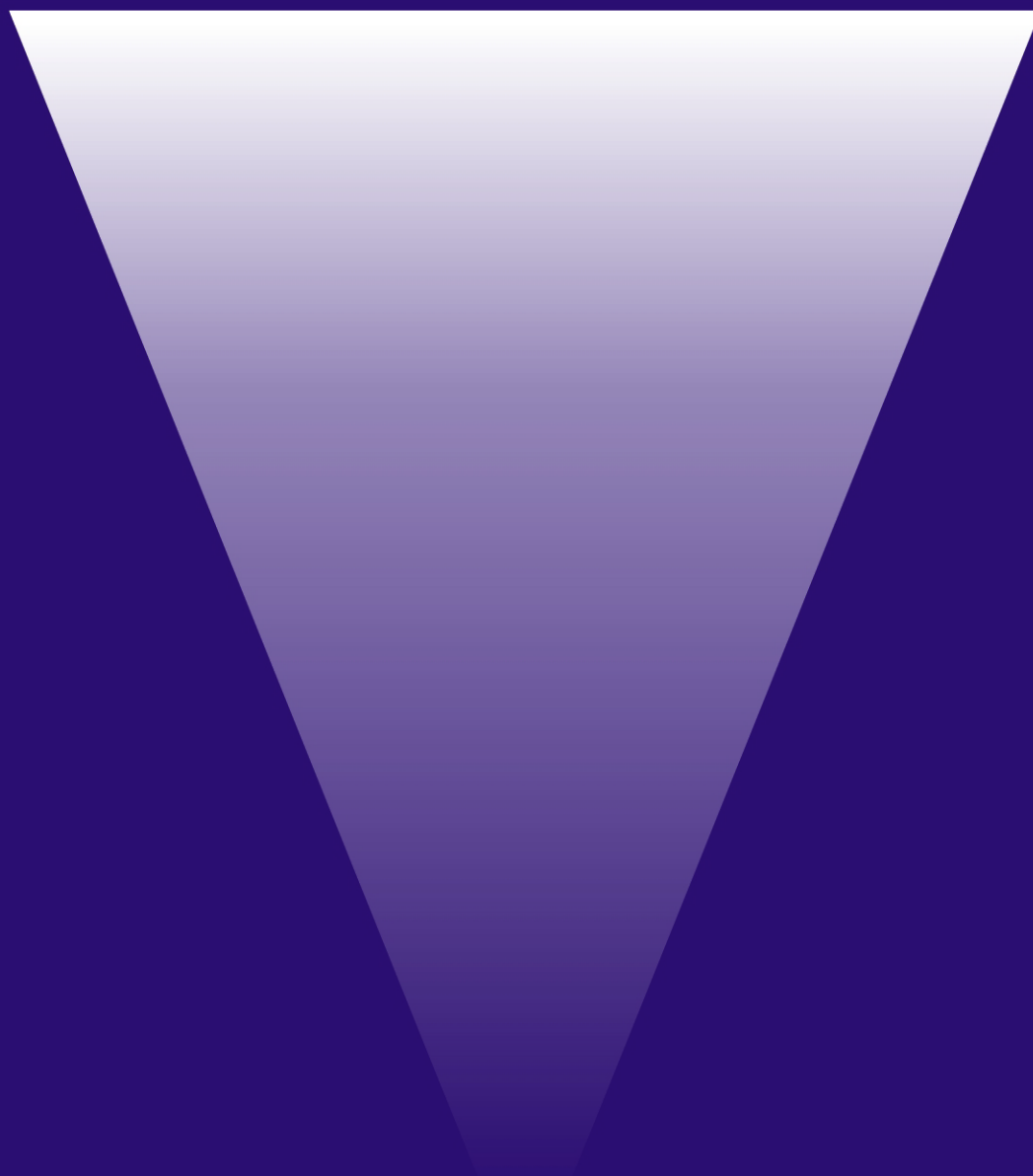
H<sub>2</sub>O



# Light products gravity un-loading



# Blending & Additive injection system



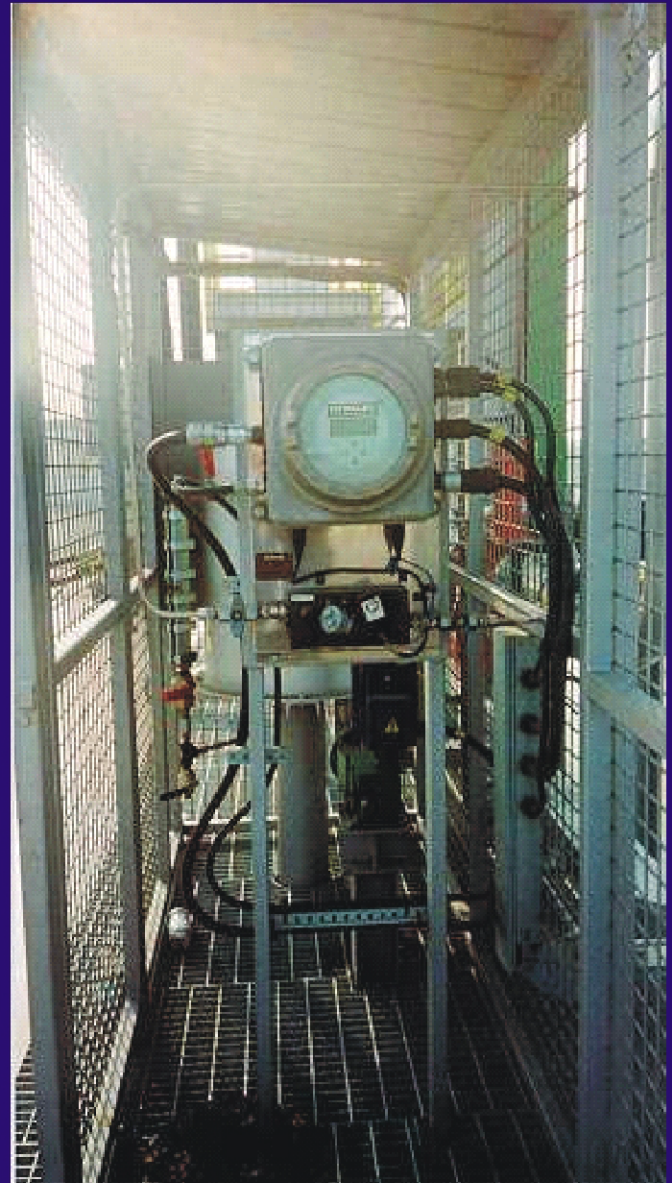
Produzione Misuratori Volumetrici

**P E T R O L**  
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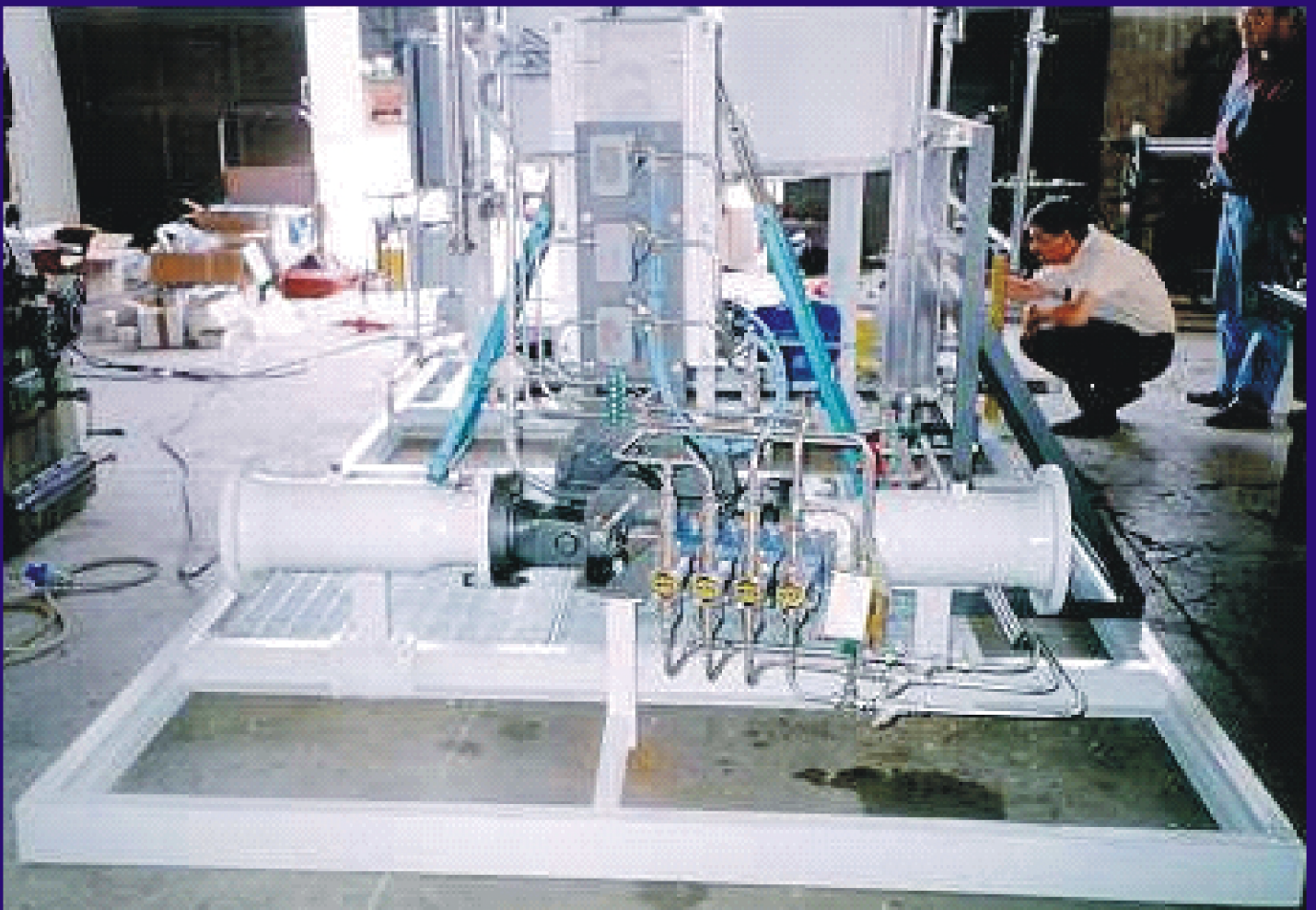


Plant: on line Automatic Loading & Coloring System for Diesel  
Supply: Bottom Loading Metering System, on Line Diesel  
Coloring System, Remote Automation System  
Flow Rate:  $4 \times 120 \text{ M}^3/\text{h}$   
Working Pressure: 10 Bar  
Working Temperature: Ambient





Supply: on line Additivition System  
(Corrosive, Frost and Electrostatic Protection)  
Flow Rate: 250 m<sup>3</sup>/h  
Working Pressure: 10 Bar  
Working Temperature: Ambient



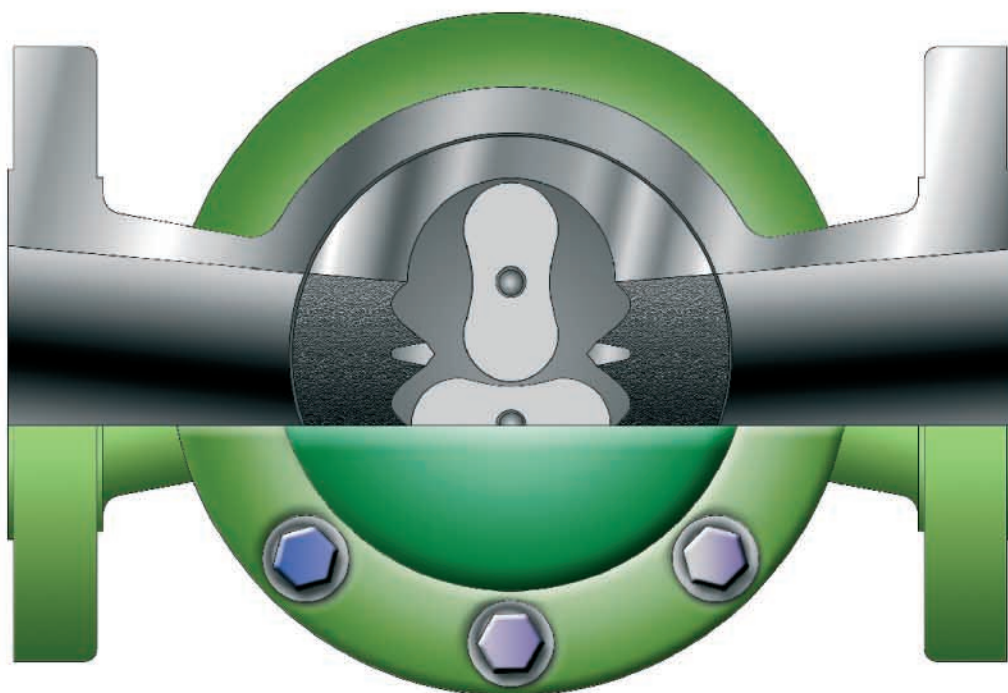




Produzione Misuratori Volumetrici

PETROL  
Metering *Systems*

# ***PD meters*** *For liquids*



*Bi-rotor Mechanism*

*Horizontal Design*



[www.petrolms.it](http://www.petrolms.it)

Doc. n. BRB01



# Production line

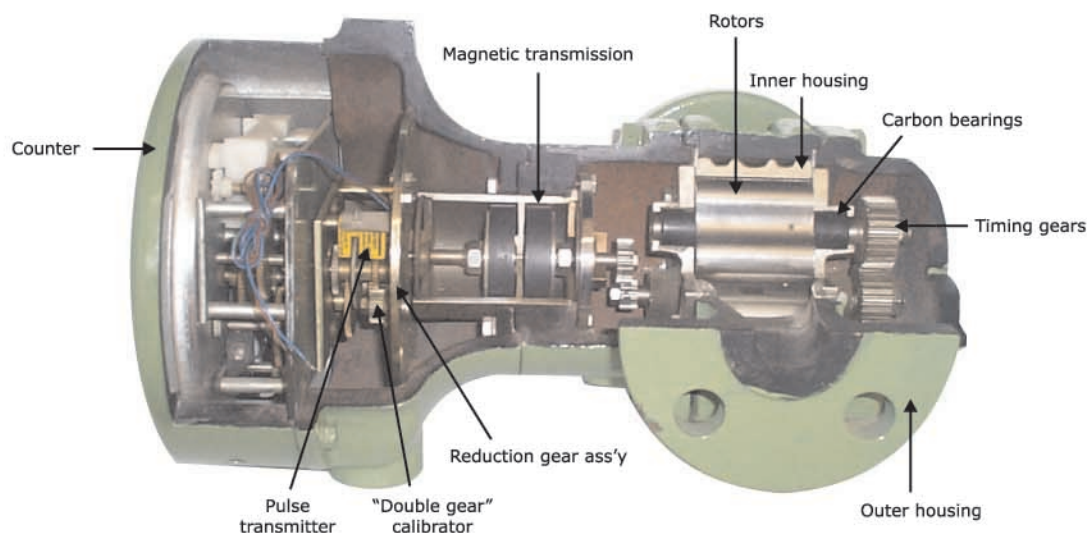
**P.M.S. Petrol Metering Systems S.r.l.** is producing PD meters for liquids on the basis of the manufacturing technology and experiences accumulated since the year 1970 from its employees and managers. The production started just after the year 1970 as a result of the technical agreement with a Japanese company who was already producing this type of PD meters since the year 1945.

After the year 1980 the former Petrol S.r.l. now **P.M.S. Petrol Metering Systems S.r.l.** became a completely free PD meters manufacturer operating with an own technology all over the world from the own factory of Aprilia (Lt). The PD meters work on "Roots" principle, known since the beginning of the last century and in this case specialized to obtain an extremely precise and reliable volumetric measure of liquids flowing through pipes. In other cases the same principle has been specialized to produce pumps, low pressure compressors and other industrial devices. Since their commercial debut in the European markets "Petrol" PD meters have contributed to the automation and modernization of the industrial processes for their reliability and exceptional operating characteristics coupled with a very high manufacturing technique. "Petrol" PD meters are to-day available for the measure for almost all the liquid industrially utilized in a range of models so wide to cover flow rate ranges from few hundred of litres/hour to 1.800 m<sup>3</sup>/h with nominal sizes from 1" to 16". Furthermore they can meet even contemporary either in the standard version either in the jacketed version operating specifications as severe as max. operating pressure till 15 MPa and max. operating temperatures over 230°C. Up to PD meters model 112 (10" nominal size) their design is horizontal, i.e. the rotors shafts work in horizontal position while from model 212 (12" nominal size and over) their design is vertical, i.e. the rotors shafts work in vertical position. In addition up to PD meters model 28 (8" nominal size) their metering mechanism is composed of two (2) rotors keyed on two (2) shafts while from model 110 (10" nominal size and over) their metering mechanism is composed of four (4) rotors always keyed on two (2) shafts but shifted of 45° (tetra-rotor mechanism).

The PD meters 10" size and over (tetra-rotor mechanism) are duly described in the specific bulletin available on request.

## Sectional view (mod. FA11-22-C8)

Scale 1:3



## Main features

**DETAILED DESCRIPTION IN THE GENERAL CATALOGUE AVAILABLE ON REQUEST**

*Double case construction*

*Floating rotors*

*Magnetic transmission*

*Carbon bearings*

*Change gear calibrator (auto-check)*

*Construction materials*

*High pressure / temperature*

*Capability of metering viscous liquids*

*"Tailored" versions*

*Excellent accuracy and repeatability*

*Reduced maintenance*

*Extended production line*

*Wide range of ancillary equipment*

*Horizontal and vertical design*



## "PETROL" PD meters



**Approved by Industry and Commerce Ministry, Weight and Measure Dept. with D.M. 28/7/1970, n.347828 for Italy and D.M. 10/9/1989 n.99.03.01.002 for European Countries.**

"Petrol" PD meters are typical volumetric instruments which directly measure the quantity of liquid flowing through pipes by means of a couple of rotors. These instruments, totally manufactured in our factory since more than 30 years, allow an accurate measure either of the flow rate either of volumes transferred (integrated flow rate) of practically all the liquids industrially utilized. They may be used for custody transfer purposes, operating controls and for the many other needs of the petroleum, chemical, pharmaceutical, crude oil extractions, ships and steel making industries, power plants, etc.

## Operating principle

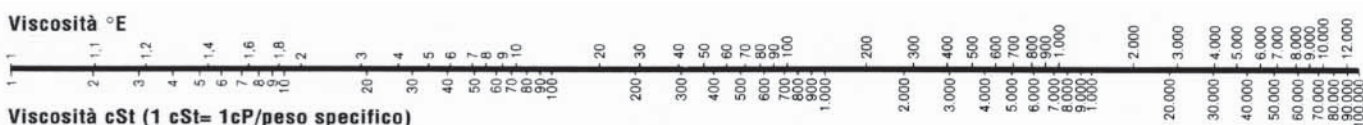
The two rotors, manufactured in such a way that they never touch each other nor they touch the other components of the "base volume", are alternatively driven by the timing gears coupled on rotor's shafts just outside the rear cover of the inner housing.

As shown in the operating scheme, the liquid entering the PD meter pushes the bottom rotor, which is in condition of unbalanced pressure, to rotate counterclockwise. Contemporarily the top rotor, being driven by the timing gears, rotates clockwise.

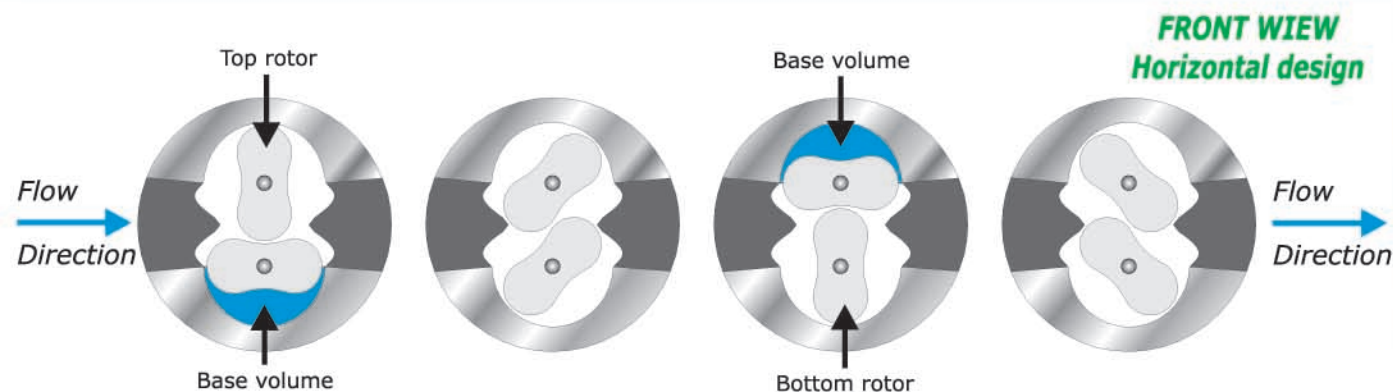
After a 90 degrees rotation, the rotors are in a reciprocal position in respect to the initial one and therefore it is the top rotor (pushed from the liquid to rotate clockwise) which drives the bottom rotor, through the timing gears, to rotate counterclockwise. During a complete cycle, i.e. a 360° rotors' rotation four (4) "base volumes" are generated. By transmitting the number of rotors' rotations to the counter the volume passed through the PD meter is displayed.

**To select a PD meter the viscosity of the liquid to be metered is the most important characteristic to be known. PD meter size an relevant flow-rate range directly depends from its value.**

**For this reason hereinafter is printed a viscosity conversion diagram.**

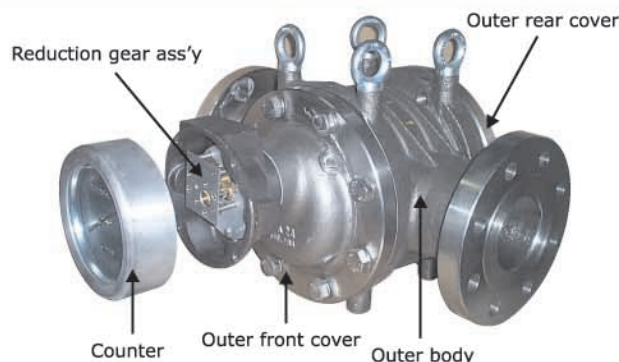


## Operating scheme (Bi-rotor mechanism)



**Horizontal design means that the rotors' shafts MUST WORK IN HORIZONTAL POSITION (as in above sequence)**

## Outer housing (Body + front cover + rear cover)

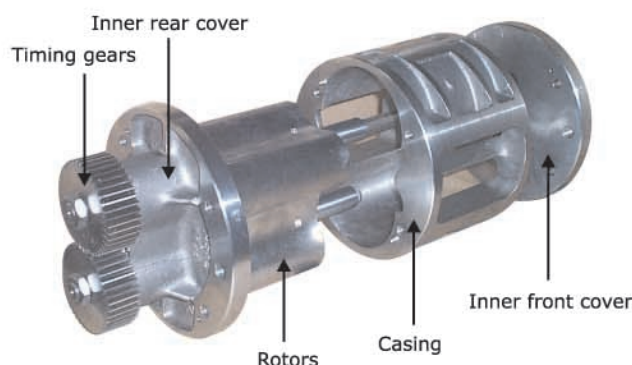


## Outer housing materials

CODE	Body/Covers	Gaskets
<b>A</b>	Cast iron	Universal SA
<b>B</b>	Bronze	Universal SA
<b>C</b>	Cast steel	Universal SA
<b>D</b>	Ductile iron	Universal SA
<b>E</b>	AISI 304	Teflon
<b>F</b>	AISI 316	Teflon
<b>G</b>	AISI 316 L	Teflon

Magnetic transmission to drive the counter (standard)

## Inner housing (Casing + front cover + rear cover + rotors)

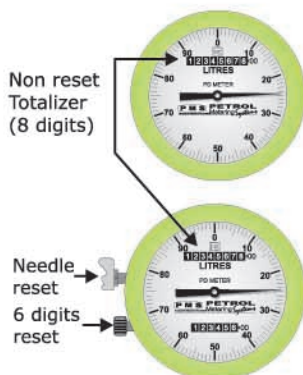


## Inner housing materials

CODE	Casing/Covers	Rotors
<b>1</b>	Bronze	Bronze
<b>2</b>	Bronze	Allum. Alloy
<b>3</b>	Cast iron	Allum. Alloy
<b>5</b>	Cast iron	Cast iron
<b>7</b>	AISI 304	AISI 304
<b>8</b>	AISI 316	AISI 316
<b>9</b>	AISI 316 L	AISI 316 L

Impregnated carbon bearings to support rotors' shafts (standard)

## Counter models



### MOD. 12

10 figures non reset type totalizer (8 on digits + 2 on dial)

For electronic counters, explosion proof or control room version, see general catalogue.

### MOD. 22

8 figures reset type counter (6 on digits + 2 on dial) plus 8 digits non reset totalizer.

The needle scope is to increase the counter resolution.  
One needle revolution = one (1) unit of the totalizer.

## Identification code

**F A 53 - 12 - F 8**

<b>F</b>	PD meter type
<b>A</b>	Max pressure
<b>53</b>	PD meter model
<b>12</b>	Counter model
<b>F</b>	Outer housing materials
<b>8</b>	Inner housing materials

Standard flanges according to ANSI or UNI codes.  
Special flanges according to other codes on request

## How to select

### PD meter type

**F** standard **FJ** jacketed

### Max Pressure

(See table)

### PD meter model

From the table "flow rate ranges" select the PD meter model more suitable for the specific needs with reference to the type/viscosity of liquid to be metered.

### Accessories

Transmitters code are:

**P** for electric pulses

**N** for pneumatic pulses

Insert above codes after the first number of the counter model, ex. -1P2- or/and -2N2-.

For temperatures above 80°C use mod. AK-5 fin-cooler.

To read from the top use mod. AM-6 angle adaptor.

### Construction materials

From the relevant "tables" select the construction materials more suitable for the specific needs for what concerns both the outer housing and the inner housing. For diluted HCl and diluted H2SO4 are available PD meters completely realized in "Moplen". For other construction materials consult the factory.

## Max pressure

CODE	Mpa
<b>A</b>	1
<b>L</b>	2
<b>M</b>	6,2
<b>H</b>	11
<b>X</b>	>11



# Flow-rate ranges (m³/h)

PD meter model	Flanges size (DN)	Viscosity in mPa.s							Water
		> 0.5	2	10	50	150	500	2000	
51	25	0,6÷3	0,55÷3,5	0,4÷4	0,35÷4	0,25÷4	0,18÷3,5	0,005÷2,8	0,5÷2,8
11	25	1÷5,5	0,9÷6	0,65÷6,5	0,55÷6,5	0,4÷6,5	0,3÷6	0,1÷5	0,9÷5
12	50	2,2÷12	2÷13	1,4÷14	1,2÷14	0,9÷14	0,65÷13	0,2÷10	1,8÷10,5
22	50	3,5÷18	3÷20	2,2÷22	1,8÷22	1,5÷22	1÷20	0,3÷16	2,5÷16,5
53	80	6÷34	5,5÷36	3,8÷38	3,2÷38	2,5÷38	1,8÷36	0,6÷30	4,5÷28
13	80	9,5÷52	8,5÷54	5,6÷56	4,5÷56	3,8÷56	2,8÷54	0,9÷45	7÷42
14	100	15÷85	14÷90	10÷100	8,5÷100	6,5÷100	4,5÷90	1,5÷75	12÷75
24	100	22÷120	20÷130	14÷140	12÷140	9,5÷140	6,5÷130	2÷100	16÷100
16	150	27÷150	25÷160	17÷170	14÷170	11,5÷170	8÷160	2,5÷130	20÷125
18	200	36÷200	34÷220	24÷240	20÷240	17÷240	11÷220	3,5÷170	30÷175
28	200	48÷260	45÷280	30÷300	25÷300	20÷300	14÷280	4,5÷220	35÷225

PD meters may be supplied with the underdetailed alternative flanges size without changing the above flow ranges.

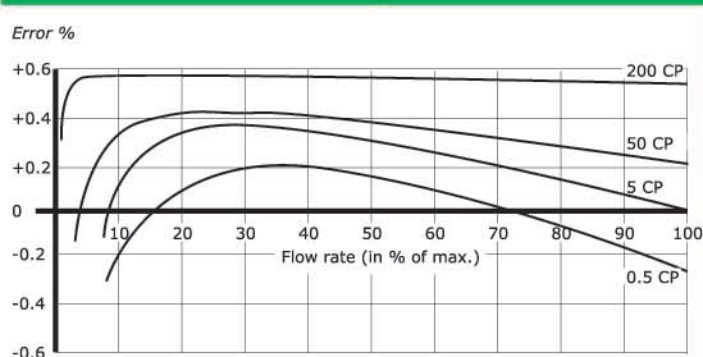
## Alternative flanges size

PD meter model	Flanges size (DN)	Flow-rate range m³/h
51AB	40	<p>See above table</p> <p>Same model number Same flow-rate range</p>
11AB	40	
12AB	40	
22BC	65	
53B	50	
13B	50	
14C	80	
24C	80	
16D	100	
18F	150	
28F	150	

## Notes on flow-rate ranges

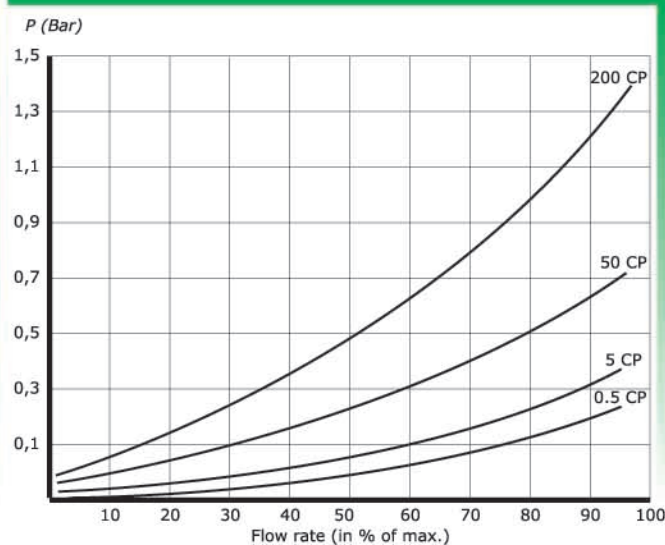
Flow rate ranges shown in the table are referred to intermittent service. For continuous service (8/24 hours of operation per day), as well as for service on lines operated with reciprocating or volumetric pumps its recommended to reduce the max. flow rate of about the 30 % or to consult the factory. The table has been prepared very conservatively to allow anybody to ask for a quotation or to select a "Petrol" PD meter, provided operating temperature is below 80 °C. It is possible to use "Petrol" PD meters for flow rates and viscosities outside mentioned ranges but in such cases it is necessary to consult the factory. The max allowed flow rate is about 20% higher than that shown in the table. PD meters accuracy is in accordance with the official approvals issued by Italian Ministry for installation in Italy and in European Countries.

## Accuracy curves



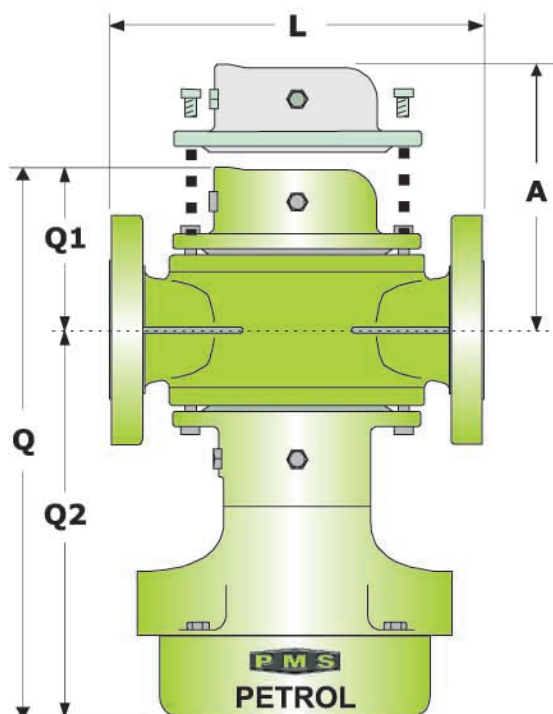
The graph shows only the trend of the accuracy curve for liquids of different viscosity. Curves may then be shifted up and down along the Error % axis with the calibrator.

## Pressure drop





## PD meters outline dimensions



The inner housing is removed from the rear. The dimension A shows the minimum space to be left for its removal.

## Dimensions table

MOD	L	Q	Q1	Q2	A
51	200	311	78	233	110
11	200	329	86	243	130
12	250	375	110	265	180
22	250	425	135	290	230
53	320	432	148	284	230
13	320	492	178	314	290
14	385	565	210	355	360
24	450	655	255	400	450
16	610	695	240	455	520
18	610	795	288	507	600
28	625	889	335	554	700

Dimensions valid for PD meters flanged  
ANSI 150 RF and UNI PN 10/16

## Tests

- All the outer housings are tested at a pressure 1,5 times the max. operating pressure printed in the PD meter name-plate;
- Performance tests are carried out with water as liquid medium and with calibrated tanks (see picture at the right showing a 5 KI calibrated tank) sealed by Italian Weight and Measure Dept., as reference volume.



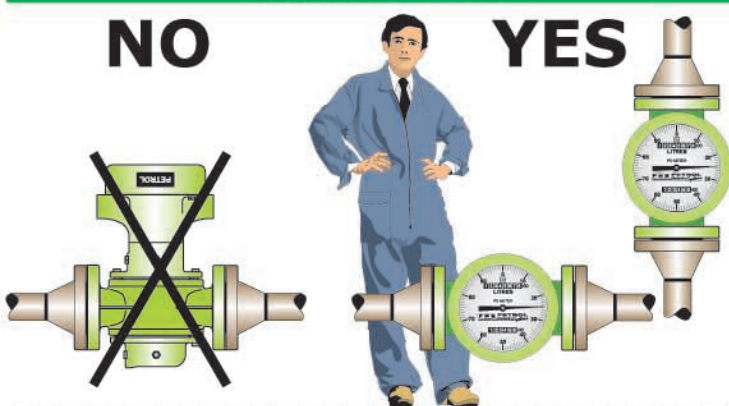
## Precautions

- The majority of PD meters troubles is caused by solid particles which entering the metering mechanism, block the rotors. Remove the flanges' protections just before PD meter installation and be sure that the PD meter inlet line has been properly cleaned before the start-up
- Use the PD meter within the flow rate range, pressure and temperature values printed in the name-plate and be sure that the flow direction agrees with the arrow stamped on equipment body.
- The use of a protection strainer mounted just upstream the PD meter or directly coupled on the PD meter inlet flange is strongly recommended. More-over install the PD meter if possible on a by-pass.
- PD meters over 3" size shall be duly anchored on a strong foundation.
- PD meter flow direction may be: left-right, right-left, down-up, up down. However **the rotors' shafts must compulsory work in horizontal**

## Installations

**NO**

**YES**



# Specialists

During the years "Petrol" has accumulated a very strong experience in the production of PD meters suitable for the heaviest operating conditions in the more different industrial fields such as the measurement of blood, of phthalic and of maleic anhydride, of crude oil on well-heads, of heavy oils at high temperatures, of sea water etc. Such a technical background and the investments yearly destined to the research in the field of the volumetric measurement of liquids have till now satisfied any particular need of the customers. Hereinafter are listed the most significant references for crude oil extraction industry, for power plants and for marine terminals.

## Users and application

### Chemical industry

acetic acid, alcohol, caustic soda, demi water, formaldehyde, methanol, naphthalene, nitric acid, paintings, saline solutions, solvents, sulphuric acid.

### Crude oil extraction and marine terminals

Crude-oil, fuel-oils, refined products.

### Food industry

alcohol, alcoholic beverages, fats (animal and vegetal), fatty acids, saline solutions, vegetal oils, water.

### Petrochemical industry

Acetaldehyde, acetone, acrylonitrile (AN), benzene, butanol, ethanol, ethylene, LPG, maleic anhydride, phthalic anhydride, propylene, styrene, toluene, xylene.

### Petroleum industry

asphalt, bitumen, crude-oil, gasoline, heavy oils, jp4, light-oil, LPG, lubricants, kerosene, naphta, paraffines, tar.

### Pharmaceutical industry

Acid solutions, caustic soda, demi water, HCL diluted, H<sub>2</sub>SO<sub>4</sub> diluted and concentrated, phosphoric acid.

### Power plants industry

bunker C, crude-oil, demi water, heavy oil, naphta.

### Ships and steel making industry

bunker C, diathermic-oil, heavy-oil, light-oil, turbine-oil, sweet water, sea water.

## Marine terminals

### ITALY

#### Costiero Gas Livorno

LPG ships unloading max flow-rate

600/1200 m<sup>3</sup>/h

### ABROAD

#### Sudan

#### Marsa Bashayer Marine Terminal

Crude oil loading max flow-rate

8000m<sup>3</sup>/h

#### Lebanon

#### Zaharani marine terminal

Gasoil unloading max flow-rate

1800 m<sup>3</sup>/h

#### Beddawi Marine terminal

Gasoil unloading max flow-rate

1800 m<sup>3</sup>/h

See specific reports in the General Catalog

## Power plants

**ITALY:** Acea Montemartini, ASM Brescia, ASM Ponti sul Mincio, Bastardo, Brindisi Nord, Brindisi Sud, Borgo Trento, Fiume Santo, Isab Priolo, La Spezia, Melilli, Monfalcone, Montalto di Castro, Napoli Levante, Ostiglia, Pietrafitta, Piombino, Porto Tolle, Rosignano Solvay, S. Barbara, San Filippo del Mela, S. Gilla, Sermide, Sulcis, Tavazzano, Termini Imerese, Torrevaldaliga Nord, Torrevaldaliga Sud, Trino Vercellese, Vado Ligure.

**ABROAD:** Algeria, Arabia Saudita, Argentina, Cambogia, Chile, China, Egypt, Ethiopia, Ghana, Jordan, Greece, Indonesia, Ivory Coast, Irak, Lebanon, Jamaica, Malaysia, Malta, Morocco, Pakistan, Syria, Sud Africa, Tunisia, Turkey, U.A.E., Uruguay, Venezuela, Yemen.

## Crude oil

### Platforms:

#### (Off-shore)

**ITALY:** Agostino, Amelia, Angela / Angelina, Annalisa, Aquila, Barbara, Cervia, Daria, Emilio, Emma, Fratello, Garibaldi, Giovanna, Hera Lacinia, Luna, Nilde, Pennina, Perla, Prezioso, Regina, Squalo, Vega.

**ABROAD:** Brasil, China, Croazia, Congo, India, Libya, Nigeria, Vietnam.

### Extraction fields:

#### (On shore)

**ITALY:** Cavone, Gaggiano, Gela, Monte Alpi, Pisticci, Torrente Baganza, Torrente Tona, Trecate, Val D'Agri, Villa Fortuna.

**ABROAD:** Austria, Egypt, Libya, Nigeria.

## Metering Systems

"PETROL" PD meters are also used as the main component of metering systems for custody transfer purposes and for calibration and/or control of other flow sensor devices.



Skidded 16" size PD meters  
(ships loading/unloading)



Master metering system  
(Check of flow sensors)





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<b>Phone</b>	:	++39.06.92727658
<b>Fax</b>	:	++39.06.92860025
<b>I. V. A. code</b>	:	IT02068390596
<b>Fiscal code</b>	:	06381091005
<b>Total ground</b>	:	2.500 m <sup>2</sup>
<b>Covered area</b>	:	1.000 m <sup>2</sup>
<b>URL web site</b>	:	<a href="http://www.petrolms.it">http://www.petrolms.it</a>
<b>E-mail:</b>		
<b>General Info</b>	:	<a href="mailto:petrolms@petrolms.it">petrolms@petrolms.it</a>
<b>Dott. Ing. Mario Romiti</b>	:	<a href="mailto:mario.romiti@petrolms.it">mario.romiti@petrolms.it</a>
<b>Dott.ssa Silvia Romiti</b>	:	<a href="mailto:silvia.romiti@petrolms.it">silvia.romiti@petrolms.it</a>
<b>Bank references</b>	:	Monte Dei Paschi Di Siena - Aprilia (LT)
<b>Account n.</b>	:	9650.06
<b>ABI code</b>	:	01030
<b>CAB code</b>	:	73920
<b>SWIFT code</b>	:	PASCITMMAPR

***...Thanks for having selected our company.***



Produzione Misuratori Volumetrici

# PETROL

## Metering Systems

**Petrol Metering Systems Srl - Via delle Valli, 25 - 04011 Aprilia (LT) Italy**  
**Tel.: ++39.06.92727658 - Fax: ++39.06.92860025**  
**Web: [www.petrolms.it](http://www.petrolms.it) - E-mail: [petrolms@petrolms.it](mailto:petrolms@petrolms.it)**

## "PETROL" TETRA-ROTORS PD METERS

### Vertical design



Doc. n. TRB01

Models 212, 612 and 114 are double case PD meters basically using the Roots operating principle but with two (2) rotors shifted at 45° keyed on each shaft to nullify vibrations and pressure pulsation.

Inner housing may be manufactured in cast iron or in the various grades of stainless steel up to Aisi 316L while the outer housing may be manufactured in cast steel or in stainless steel thus permitting their use in almost any liquid industrially used.

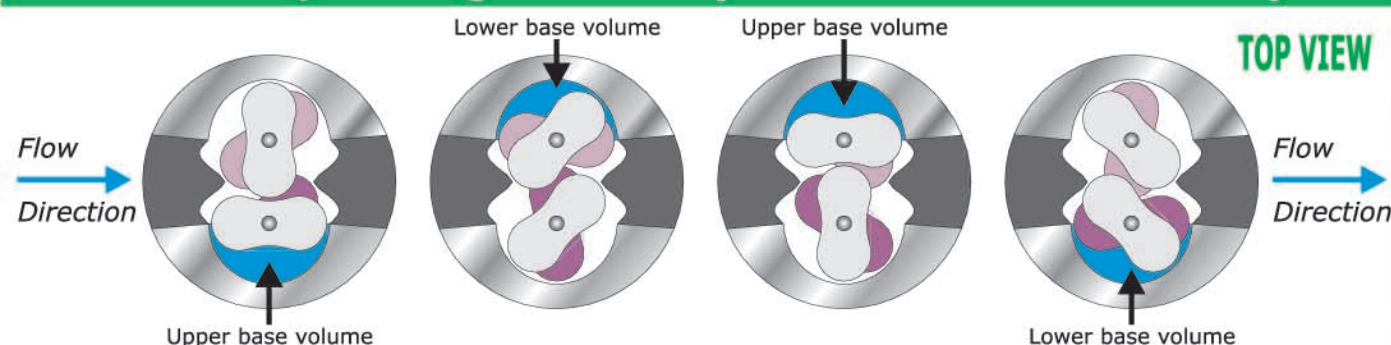
**These PD meters are specially designed for installations in pipelines, in marine terminals for ships loading and unloading and as main components of skidded metering systems where a very high repeatability is required together with a very easy and reduced maintenance.**

### Models 212 - 114



For PD meters main features see back page - For references see general catalogue (on request) - For materials/identification code see inner pages

## Operating scheme (Tetra-rotors mechanism)



## Flow-rate ranges (m³/h)

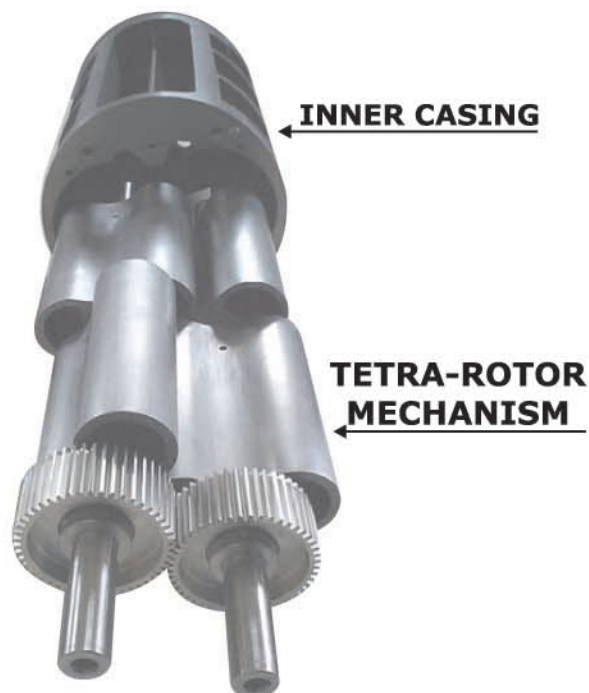
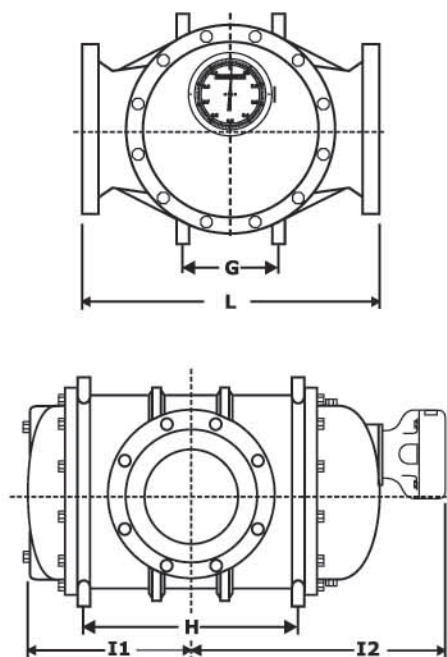
PD meter model	Flanges size (DN)	Viscosity in mPa.s				
		> 0.5	2	10	150	500
212L	250	150÷850	130÷850	90÷900	60÷900	40÷800
212	300	150÷750	130÷750	90÷800	60÷800	40÷700
612	300	200÷1000	180÷1000	130÷1100	85÷1100	55÷900
612P	350	200÷1200	180÷1200	130÷1300	85÷1300	55÷1100
114	350	250÷1350	230÷1350	160÷1500	100÷1500	70÷1250
114R	400	250÷1500	230÷1500	160÷1600	100÷1600	70÷1400

Flow rate ranges shown in the table at the left are referred to continuous service ( 8/24 hours of operation per day ). For intermittent service the max flow rate may be increased by 15%. The table has been prepared very conservatively to allow anybody to ask for a quotation or to select a "Petrol" PD meter, provided operating temperature is below 80 °C. It is possible to use "Petrol" PD meters for flow rates and viscosities outside mentioned ranges but in such cases it is necessary to consult the factory. The max allowed flow rate is about 25% higher than that shown in the table. PD meters accuracy is in accordance with the official approvals issued by Italian Ministry for installation in Italy and in European Countries.



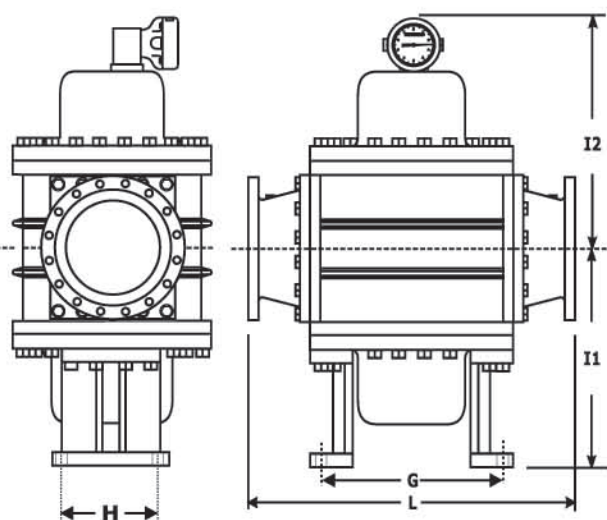
## Mod. 110-112

### Horizontal design



## Mod. 212-612-114

### Vertical design



## Tests

- All the outer housings are tested at a pressure 1,5 times the max. operating pressure printed in the PD meter name-plate;
- Performance tests are carried out with water as liquid medium and with a 25 KI calibrated tank (see picture at the right) sealed by Italian Weight and Measure Dept., as reference volume.



## Precautions

- The majority of PD meters troubles is caused by solid particles which entering the metering mechanism, block the rotors. Remove the flanges' protections just before PD meter installation and be sure that the PD meter inlet line has been properly cleaned before the start-up
- The use of a protection strainer mounted just upstream the PD meter or directly coupled on the PD meter inlet flange is strongly recommendly.
- Use the PD meter within the flow rate range, pressure and temperature values printed in the name-plate and be sure that the flow direction agrees with the arrow stamped on equipment body.

## Outline dimensions

Mod.	L	I1	I2	G	H
110	625	335	554	202	405
112	650	395	615	250	524
212	1200	678	750	662	350
612	1300	778	845	662	350
114	1400	825	890	662	350

Dimensions valid for PD meters flanged  
ANSI 150 RF and UNI PN 10/16

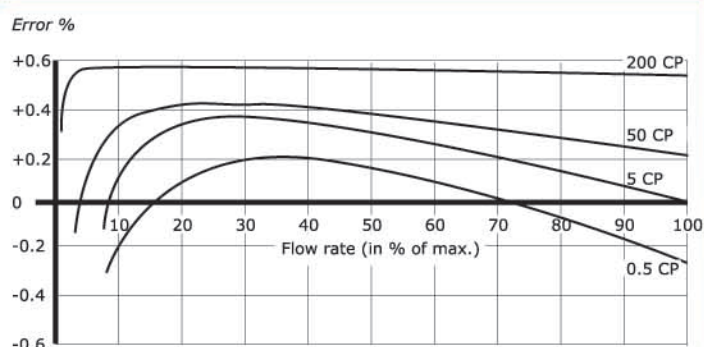
## Outer housing materials

CODE	Body/Covers	Gaskets
<b>C</b>	Cast steel	Universal SA
<b>E</b>	AISI 304	Teflon
<b>F</b>	AISI 316	Teflon
Magnetic transmission to drive the counter (standard)		

## Inner housing materials

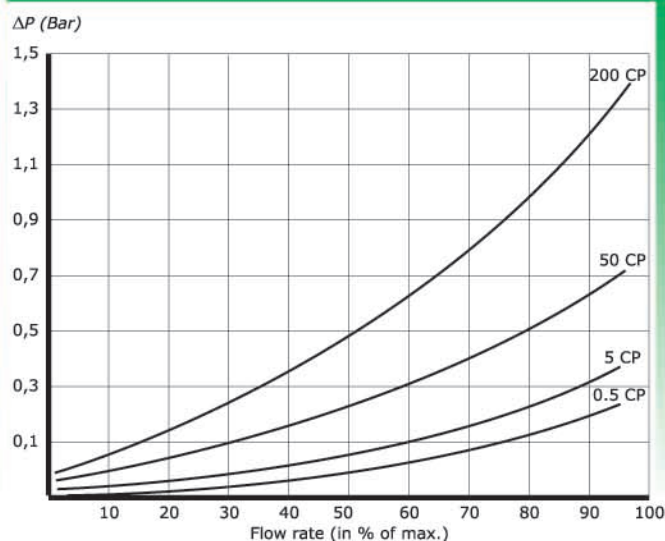
CODE	Casing/Covers	Rotors
<b>5</b>	Cast iron	Cast iron
<b>7</b>	AISI 304	AISI 304
<b>8</b>	AISI 316	AISI 316
Impregnated carbon bearings to support rotors' shafts (standard)		

## Accuracy curves

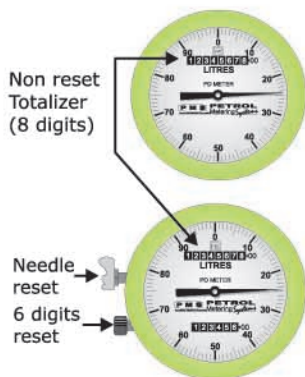


The graph shows only the trend of the accuracy curve for liquids of different viscosity. Curves may then be shifted up and down along the *Error %* axis with the calibrator.

## Pressure drop



## Counter models



### MOD. 12

10 figures non reset type totalizer (8 on digits + 2 on dial)

For electronic counters, explosion proof or control room version, see general catalogue.

### MOD. 22

8 figures reset type counter (6 on digits + 2 on dial) plus 8 digits non reset totalizer.

The needle scope is to increase the counter resolution.  
One needle revolution = one (1) unit of the totalizer.

## Identification code

### F A 212 - 12 - F 8

- F** PD meter type
- A** Max pressure
- 212** PD meter model
- 12** Counter model
- F** Outer housing materials
- 8** Inner housing materials

Standard flanges according to ANSI or UNI codes.  
Special flanges according to other codes on request

## How to select

- **PD meter type**  
**F** standard **FJ** jacketed
- **Max Pressure**  
(See table)
- **PD meter model**  
From the table "flow rate ranges" select the PD meter model more suitable for the specific needs with reference to the type/viscosity of liquid to be metered.

### ➤ Accessories

**P** for electric pulses  
Insert above codes after the first number of the counter model, ex. -1P2- or/and -2P2-.  
For temperatures above 80°C use mod. AK-5 fin-cooler.  
To read from the top use mod. AM-6 angle adaptor. for all the horizontally designed PD meters  
Vertically designed PD meters are always equipped with mod. AM-6 angle adaptor.

### ➤ Construction materials

From the relevant "tables" select the construction materials more suitable for the specific needs for what concerns both the outer housing and the inner housing.  
For other construction materials consult the factory.

## Max pressure

CODE	Mpa
<b>A</b>	1
<b>L</b>	2
<b>M</b>	6,2
<b>H</b>	11
<b>X</b>	>11



## "PETROL" TETRA-ROTORS PD METERS

*Horizontal design*



### Main features

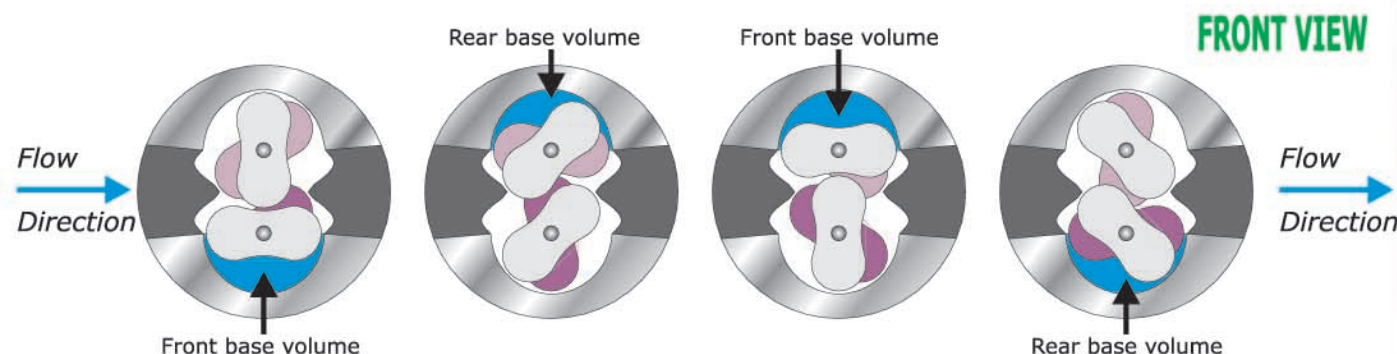
*Detailed description in the general catalogue available on request*

- Double case construction
- Floating rotors
- Magnetic transmission
- Carbon bearings
- Change gear calibrator (auto check)
- Construction materials
- Max operating pressure up to 15 MPa
- Max operating temperature up to 230°C
- Capability of metering viscous liquids
- Excellent accuracy and repeatability
- Reduced maintenance

### Models 110 - 112



### Operating scheme (Tetra-rotors mechanism)



### Flow-rate ranges ( $m^3/h$ )

PD meter model	Flanges size (DN)	Viscosity in mPa.s				
		> 0.5	2	10	150	500
110H	200	70÷400	60÷400	45÷450	30÷450	20÷360
110	250	70÷400	60÷400	45÷450	30÷450	20÷360
112L	250	100÷550	85÷550	55÷550	35÷550	25÷500
112	300	100÷550	85÷550	55÷550	35÷550	25÷500

To select a PD meter the viscosity of the liquid to be metered is the most important characteristic to be known. PD meter size and relevant flow-rate range directly depends from its value.

For notes on flow-rate ranges see front page  
For references see general catalogue (on request)  
For materials/identification code see inner pages