PRIME 4

Bulletin SS01096 Issue/Rev. 1.8 (11/14)

FMC Technologies

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SMITH METER® PD METERS

The Smith Meter® PRIME 4 Meter is a 4", single-case, positive displacement meter designed for maximum accuracy and reliability. The PRIME 4 is ideal for loading rack service and custody transfer of petroleum products. Applications include gasolines and oxygenates, ethanol, kerosene, diesel fuel, jet fuels, and fuel oils.

FEATURES

- **Superior Accuracy** – Minimal slippage for outstanding linearity and maximum accuracy.
- **Low Pressure Drop** – A unique flow pattern minimizes pressure drop to less than 3.2 psi at extended maximum flow.
- **Superb Reliability** – Unique design with only three moving parts means low initial cost and minimum maintenance. Direct pulse output eliminates the mechanical drive train resulting in fewer parts to fail and no need for a packing gland.
- **Long Service Life** – Horizontal rotor and specially designed journal bearings minimize wear.
- **Long-Term Stability** – Polyketone blades show decreased wear over time keeping the meter stable between proving intervals and resulting in time and cost savings.

OPTIONS

Quadrature (Dual Output Signal) – Two discrete pulse channels are generated 90 electrical degrees out-of-phase with each other. By monitoring these signals with a pulse sequence comparator, the integrity of the system can be checked for pulse transmission errors (noise), loss of transmitter power, malfunctioning transmitter, and faulty transmission cable.

1 The Standard Buna seals are suitable for all loading rack fuels, blends, and additives. Viton seals are offered for those users who prefer these seals.
2 ANSI and DIN flanges are raised face.
3 PED required for all European countries. Equipment must be manufactured by Ellerbek, Germany facility.

SPECIFICATIONS

Flow Range

Units	Extended Min.	Normal Flow Range		Extended Max.
		Min.	Max.	
GPM	45	75	750	900
L/min	190	285	2,850	3,400

Operating Temperature Range

Standard: (Buna-N) Seals -20°F to 150°F (-29°C to 65°C).
Optional: Viton[1] Seals 10°F to 200°F (-12°C to 93°C).
Optional: Low Swell Buna Seals -20°F to 150°F (-29°C to 65°C).

End Connections[2]	Housing/ Cover Material	Maximum Working Pressure @ 100°F			
		psig	kPa	bar	Pressure Code[3]
4" ANSI 150	Steel	285	1,965	19	B31.3
DN 100, PN 16	Steel	232	1,600	16	PED
DN 100, PN 25	Steel	362	2,500	25	PED

Accuracy

Applicable to loading rack products from gasoline to fuel oil.

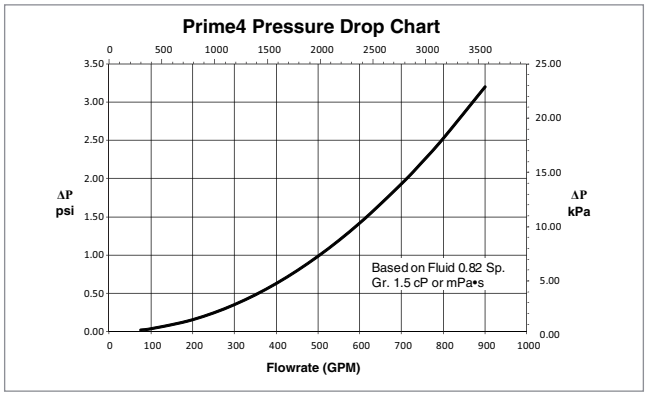
Repeatability:
Less than or equal to ±0.02%.

Linearity[4]:
±0.15% over the normal flow range.
±0.25% over the extended flow range.

Stability:
Better than ±0.05% per 10 million gallons (38 million liters).

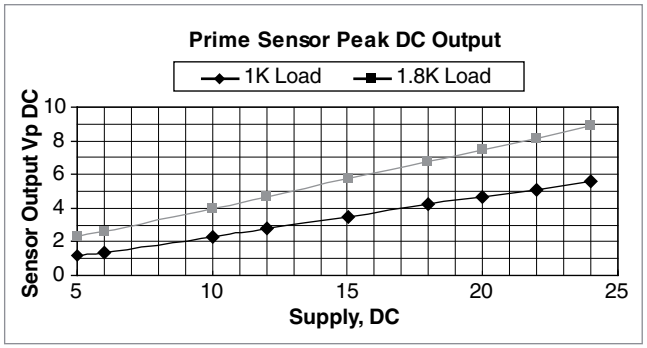
Maximum Viscosity

Up to 100 mPa·s.



Pulse Pick-Up Sensor

Type: Square wave/current sinking.
Input: 6-28 Vdc, 30 mA max., 20 mA typical.
Output Signal:
Voltage High: (See chart below)
Voltage Low: 0.8 Vdc @ 20 mA sink current.
Duty Cycle: 70% on, 30% off to 30% on, 70% off.
Quadrature:
Separation for dual output signal is 90 ±40 electrical degrees.
Pulse Resolution:
50 pulses per gallon (13 pulses per litre).



4 Based on Kerosene (0.82 sp. gr., 1.5 mPa·s) (1.5 cP).
5 Cable loop resistance must be limited to 50 Ω maximum. Cable loop resistance = 2 x cable length (ft) x cable resistance (Ω/ft).

Signal Cable

Three-wire shielded for single-channel transmission.
Four-wire shielded for dual-channel transmission.

Size	Distance
#20 AWG	Up to 2,000 ft. (610 m)[5]
#18 AWG	Up to 3,000 ft. (915 m)[5]
#16 AWG	Up to 5,000 ft. (1,525 m)[5]

Wiring Connections

Red	6-28 Vdc
Black	Common
White	Signal A
Yellow	Signal B (Optional)

Weight

310 lb (140 kg.).

APPROVALS

Electrical

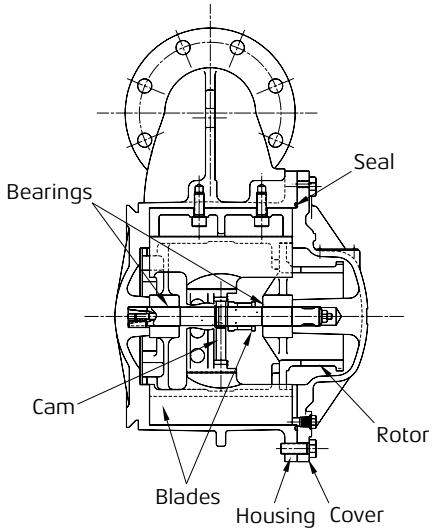
UL/CUL Listed (U.S. and Canada) for use in Class I, Groups C and D, Division 1 and 2 hazardous locations NEMA 4.

Class II, Groups E, F, and G, Division 1 and 2 hazardous locations.

European/ATEX – Ex d IIB T6, PTB 03 ATEX 032.

Weights & Measures

NTEP (US), Measurement Canada (Canada), PTB (Germany), GOST (Russia), PTB issued MID system certificates are available for the EU and others. INMETRO/DIMEL No. 0144. Consult factory for other.



Housing and Cover	Steel
Blades	Polyketone
Rotor	Cast Iron
Cam	Hard Surfaced Steel
Bearings	Journal Type Cast Iron/Hard Surfaced Steel
Seals	Buna-N+, Viton, or Low Swell Buna

+ Standard

MODELING CODES

PRIME 4 — B — 0 — 1 — 2 — 0

Model Designation

PRIME 4

End Connections and Working Pressure

B – 4" ANSI Class 150, 285 psig (19 bar), Steel
C – DN 100, PN25, 25 bar, (363 psig), Steel
E – DN 100, PN16, 16 bar (Steel)

Elastomers

0 – Buna-N (Standard-Supplied Unless Otherwise Specified)
1 – Viton
2 – Low Swell Buna

Sensor Type

0 – Single Output Signal (Standard)
1 – Dual Output Signal

Arrangement (See Below)

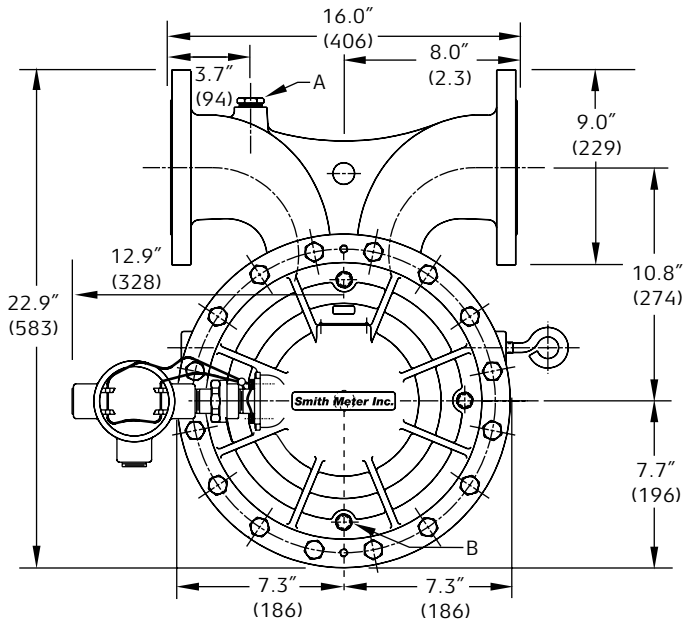
0 – Horizontal Flow (Standard)
1 – Vertical Flow, Nozzles Right
2 – Vertical Flow, Nozzles Left

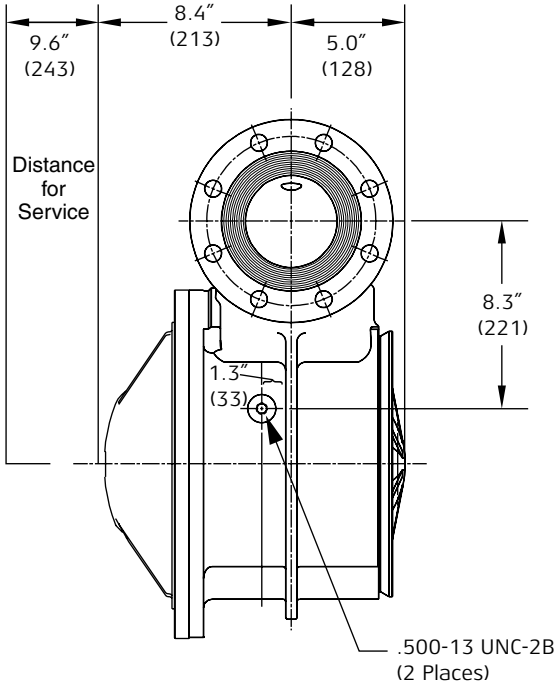
Approval

0 – UL/CUL
1 – ATEX/PED[6]

DIMENSIONS

Inches (mm)





Weight: 310 lb (140 kg).

(A) 3/4" NPT Thermal Well
(B) 1/4" NPT Drain/Vent Plug (3 places)

Note: Dimensions – Inches to the nearest tenth (millimeters to the nearest whole mm), each independently dimensioned from respective engineering drawings.

6 PED required for all European countries. Equipment must be manufactured by Ellerbek, Germany facility.

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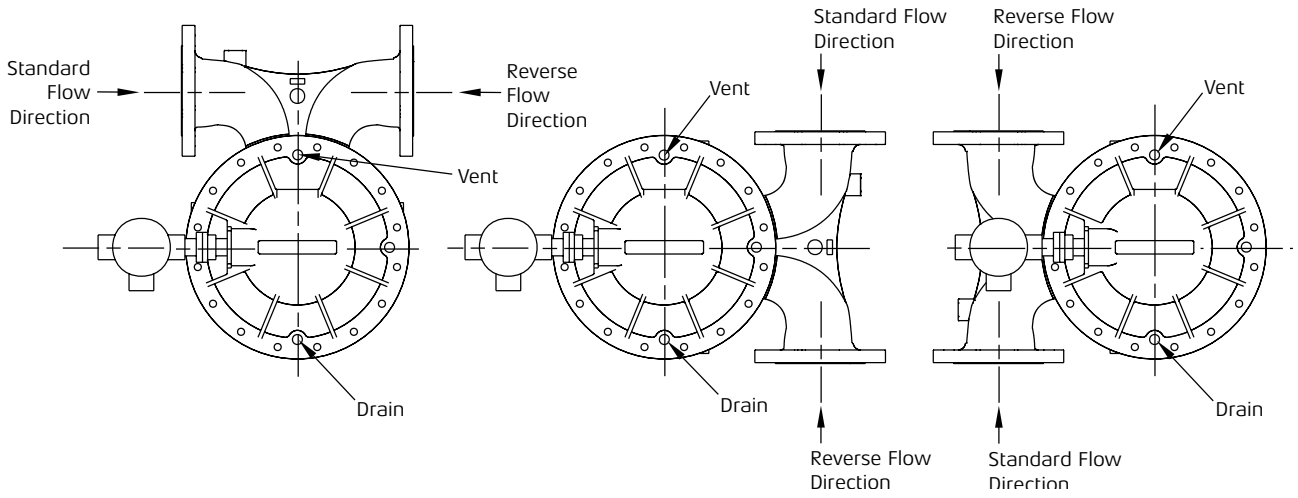
ARRANGEMENT



Horizontal Flow[7]
Standard and Reverse Flow

Vertical Flow, Nozzles
Right Reverse Flow

Vertical Flow, Nozzles
Left Standard Flow

Note: Drain must always be in down position as shown. Vent source should always be the highest vertical point of the meter. The cover vent may not always be at this point and an alternate vent source should be used.

7 Horizontal flow with nozzles down is an alternate arrangement. However, it is not preferred because external drain plugs in the piping are required. If this arrangement is used, the cover should be rotated to place the drain in the down position.

Revisions included in SS01096 Issue/Rev. 1.8 (11/14):

Page 2: Reference to SS01096A1 removed; Repeatability incorrectly changed from ±0.02% to ±0.01%. Page 3: Reference SS01096A2 removed. INMETRO/DIMEL No. 0144 approval added to page 2.

USA Operation
1602 Wagner Avenue
Erie, Pennsylvania 16510 USA
P:+1 814.898.5000

FMC Technologies
Measurement Solutions, Inc.
500 North Sam Houston Parkway West,
Suite 100
Houston, Texas 77067 USA
P:+1 281.260.2190

Germany Operation
Smith Meter GmbH
Regentstrasse 1
25474 Ellerbek, Germany
P:+49 4101 304.0

www.fmctechnologies.com/measurementsolutions

