

PRIME 4

Bulletin SS01096 Issue/Rev. 2.2 (12/19)

Smith Meter® PD Meters

The **Smith Meter® PRIME 4 Meter** is a 4-inch, 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 results in 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.



Operating temperature range

Standard: low temperature FKM seals -20° F to 200° F (-29° C to 93° C)

Nonstandard: consult factory

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

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

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 low temperature FKM seals are suitable for all loading rack fuels, blends, and additives. Consult factory regarding nonstandard seals.

² ANSI and DIN flanges are raised face.

³ PED required for all European countries. Equipment must be manufactured by Ellerbek, Germany facility.

Accuracy

Applicable to loading rack products from gasoline to fuel oil.

Repeatability:

Less than or equal to $\pm 0.02\%$.

Linearity⁴:

$\pm 0.15\%$ over the normal flow range.

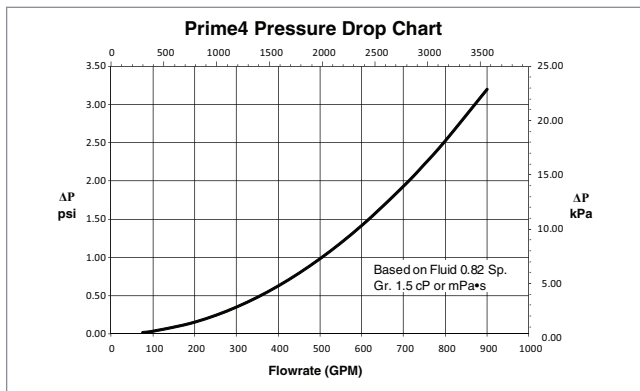
$\pm 0.25\%$ over the extended flow range.

Stability:

Better than $\pm 0.05\%$ 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.

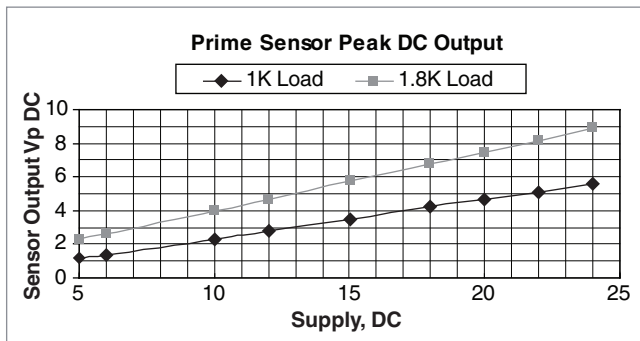
duty cycle: 70% on, 30% off to 30% on, 70% off.

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., 1.4 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

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

Weight

310 lbs (140 kg).

Electrical Safety Approvals

U.S. and Canada: UL/CUL Listed for use in Class I, Division 1, Groups C & D; Class I Zone 1 Group IIB, UNL-UL Enclosure 4X, CNL-CSA Enclosure 4; Tamb = -40°C to $+70^{\circ}\text{C}$

European: Ex db IIC T5...T6 Gb Tamb -50°C to $+70^{\circ}\text{C}$, IP 65 DEMKO 19 ATEX 2266X

Global: Ex db IIC T5...T6 Gb Tamb -50°C to $+70^{\circ}\text{C}$, IP 65 IECEx TUN 15.0029X

INMETRO (Brazil): Ex db IIC T6 Tamb = $-50^{\circ}\text{C} \leq \text{Tamb} \leq +70^{\circ}\text{C}$, IP 65 UL-BR 19.1164X

Weights & Measures Certifications

NTEP (US) CoC #96-099

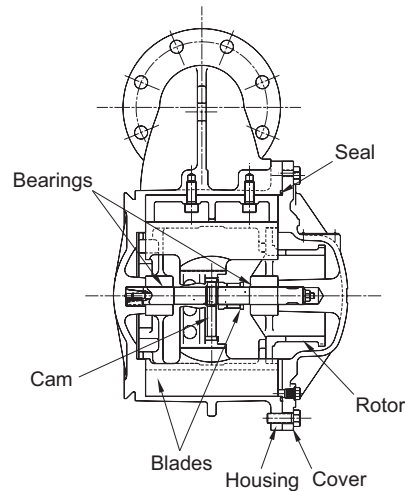
Measurement Canada (Canada) NOA AV-2323

OIML R117 test report issued by PTB (Germany)

PTB issued MID system certificates are available for the EU.

INMETRO (Brazil) DIMEL No. 0144.

Consult factory for others.

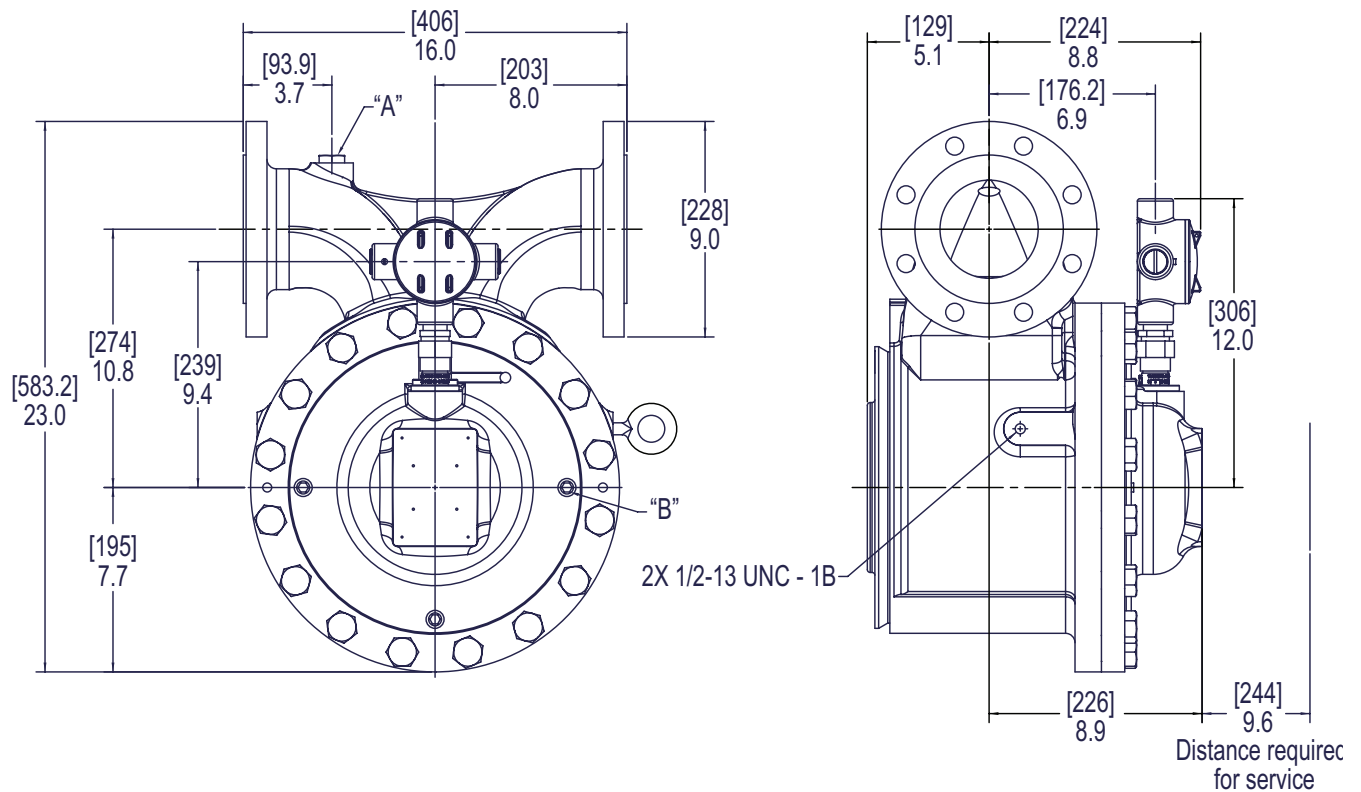


Housing and cover	Steel
Blades	Polyketone
Rotor	Cast iron
Cam	Hard surfaced steel
Bearings	Journal-type cast iron/hard surfaced steel
Seals	Low temperature FKM

+ Standard

Dimensions

Inches (mm)



Weight: 310 lbs (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.

Modeling Code

The following guide defines the correct PRIME 4 meter for a given application and the respective catalog code. This code is part of the ordering information and should be included on the purchase order.

PRIME 4	-	B	-	4	-	1	-	0	-	0	
Model Designation								Pressure Certification Requirement			
PRIME 4								0 – Not Required 1 – CRN Required 2 – PED Required ⁷			
End Connections and Working Pressure								Hazardous Locations Approval			
B – 4" AMSE Class 150, 285 psig (19 bar), Steel C – DN 100, PN 25, 25 bar, (362 psig), Steel E – DN 100, PN 16, 16 bar, (232 psig), Steel								0 – UL/CUL/ATEX/IECEX 1 – ATEX/IECEX 2 – UL Brazil			
Elastomers								Sensor Selection			
4 – Low Temperature FKM Seals								1 – Dual Output Signal			

⁷ If Pressure Certification Requirement option #2 (PED required) is selected then Hazardous Locations Approval is option #1 (ATEX/IECEX) is required.

Revisions included in SS01096 Issue/Rev. 2.2 (12/19):

Page 2: Electrical Safety Approvals updated. Page 4: Modeling code has been added to document.

The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.