2" Steel Model C2

Bulletin SS01010 Issue/Rev. 0.9 (10/21)

Smith Meter® PD Meters

The Smith Meter model C2 meter is a 2", double-case, straight-through (S1 through S7), rotary-vane type, positive displacement meter. Applications for the C2 include blending, batching, dispensing, inventory control, and custody transfer of oils, solvents, chemicals, paints, fats, and fertilizers.

Features

- Superior accuracy—Smith Meter's rotary-vane meter principle, combined with the meter's uniquely designed (offset) inlet and outlet nozzles, maximizes accuracy by minimizing pressure drop across the measuring chamber reducing slippage (flow through meter clearances).
- Low pressure drop—Streamlined flow path provides low pressure drop.
- Positive and accurate registration—High-torque drive calibrator with adjustment in 0.05 percent (%) increments ensures accurate registration.
- Long service life—Low friction ball bearings, fixed cam-type timing, and rugged construction provide sustained accuracy and long service life.

Options

- High-viscosity meter clearances extend operation at maximum flow rate from 400 to 2,000 millipascal-second (mPa•s).
- High-temperature clearances extend operating temperatures from 150 to 200 degrees Fahrenheit (°F) (65 to 93 degrees Celsius (°C)).
- All iron trim option for operating temperatures above 200 °F (93 °C).
- Liquefied petroleum gas (LPG) trim option for low-lubricity liquids, such as LPG.
- Compliant with NACE standard MR0175.
- ASME Section VIII vessel construction is available for model C2-S3.

Generic Illustration

Operating Specifications

Maximum Flow Rate		
	USGPM	L/min
Continuous rating	125	475
Intermittent rating[1]	150	570
Continuous/intermittent rating with all iron and LPG construction	100	375

Minimum Flow Rates Typical Performance							
Linearity[2]	Units	Viscosity (Centipoise—mPa•s)					
		.5	1	5	20	100	400
±0.15%	USGPM	25	15	6	1.5	0.30	0.08
	L/min	95	57	23	6.0	1.00	0.30
±0.25%	USGPM	17	10	4	1.0	0.20	0.05
	L/min	65	38	15	4.0	0.75	0.20
±0.50%	USGPM	13	8	3	0.8	0.16	0.04
	L/min	50	30	11	3.0	0.60	0.15

1 Intermittent rating applies to service on clean, refined products where continuous operation is not required (for example, truck loading, rail loading, and other batching applications).

2 Linearity based on a maximum flow rate of 125 US gallons per minute (USGPM) (475 liters per minute (L/min)).

Repeatability

±0.02%

Viscosity

Standard: 400 mPa•s[3] (2,000 Seconds Saybolt Universal (SSU)) maximum

Optional: 2 pascal-seconds (Pa•s) (10,000 SSU) maximum and specify “High Viscosity Meter Clearances”

Over 2 Pa•s: Specify “High Viscosity Meter Clearances” and derate maximum flow rate in direct proportion to viscosity over 2 Pa•s. For example, at 4 Pa•s, derate maximum flow rate to 50% of normal continuous rating 63 USGPM.

Temperature

Standard meter clearances with:

Buna-N/PTFE[7]:	-20 °F to 150 °F (-29 °C to 65 °C)
FKM[8]:	10 °F to 150 °F (-12 °C to 65 °C)
Low temp. FKM[8,9]:	-50 °F to 150 °F (-46 °C to 65 °C)

High temperature meter clearances with:

Buna-N//PTFE[7]:	-20 °F to 200 °F (-29 °C to 93 °C)
FKM[8]:	10 °F to 200 °F (-12 °C to 93 °C)
Low temp. FKM[8,9]:	-50 °F to 200 °F (-46 °C to 93 °C)

All iron trim with:

Buna-N:	-20 °F to 225 °F (-29 °C to 108 °C)
PTFE[7]:	-20 °F to 400 °F (-29 °C to 205 °C)
FKM[8]:	10 °F to 400 °F (-12 °C to 205 °C)
Low temp. FKM[8,9]:	-50 °F to 400 °F (-46 °C to 205 °C)

Meter Gearing

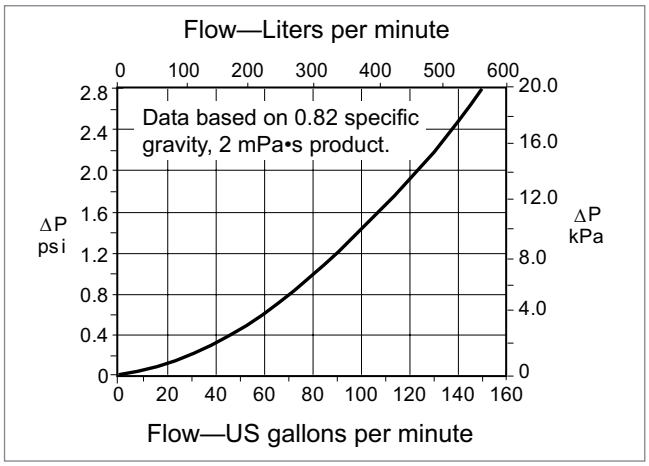
Five US gallons or 1 dekaliter per revolution of meter calibrator output shaft (standard).

Maximum Working Pressure

Model	Flange	PSI	kPa
C2-S1	150	150	1,034
C2-S3	150	285[4]	1,965[4]
C2-S5	300	300	2,068
C2-S6	300	740[4]	5,102[4]
C2-S7	600	1,480[4]	10,204[4]

Note: Flange class per ANSI B16.5 raised-face flange.

Pressure Drop (ΔP)



Materials of Construction

Trim	Housing	Internals	Seals
Standard	Steel	Iron, steel, stainless steel, aluminum	Buna-N[6], PTFE[7], FKM[5,8], EPR, or low temp. FKM[8,9]
LPG	Steel	Iron, steel, stainless steel, rulon, nylon	Buna-N[6], PTFE[7], FKM[5,8], EPR, or low temp. FKM[8,9]
Iron	Steel	Iron, steel, stainless steel	Buna-N[6], PTFE[7], FKM[5,8], EPR, or low temp. FKM[8,9]

Installation

It is recommended that the meter be protected with a suitable mesh strainer.

Weights and Measures Approvals

United States—NTEP CC 95-054
Canada—NOA S.WA-0615
Australia—5-6B-55B
PTB Issued OIML R117-1 Test Report
PTB Issued MID certificate
Brazil—INMETRO
Russia—GOST

For other certifications, consult factory.

Pressure Safety

Canadian CRN

3 1,000 mPa•s = 1,000 cP = 1 Pa•s.
4 Maximum working pressure at 100 °F (38° C).
5 All S3 through S7 meters with FKM[8] adder will have Polytetrafluoroethylene (PTFE) packing gland seals.
6 Standard.
7 Polytetrafluoroethylene (PTFE.
8 Fluoroelastomers (FKM).
9 Only available for C2-S3 with low temperature material and ASME Section VIII design. Low temperature FKM is the standard sealing material for meters with the ASME Section VIII design.

Catalog Code

The following guide defines the correct PD 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.

1	2	3	4	5	6	7	8	9	10
K	C	2	S	3	G	B	S	0	0

Position 1: Code

K—Catalog Code

Positions 2 and 3: Model/Flange Size

C2—2"

Position 4: Flow Path

S—Straight

Position 5: Pressure Class and End Connections

Standard (Raised-Face Flanges)

3—Class 150, 285 psig/1,965 kPa
6—Class 300, 740 psig/5,102 kPa
7—Class 600, 1,480 psig/10,204 kPa

PED (Raised-Face Flanges)

1—Class 150, not available
3—Class 150, 285 psig/1,965 kPa
5—Class 300, not available
6—Class 300, 740 psig/5,102 kPa
7—Class 600, consult factory

All Flanges designed to ANSI B16.5, pressure ratings maximum working pressure at 100 °F.

Position 6: Meter Gearing

G—Gallons (5:1 - S1)
B—Barrels (1:1 - S3 through S8)
D—Dekaliters (1:1 - S1 through S8)
I—Imperial Gallons[10]
P—Pound[10]

Position 7: Seals

B—Buna-N
V—FKM[8]
T—PTFE[7]
L—Low temperature FKM[8,9]

Position 8: Trim

S—Standard
A—All Iron
L—LPG

Position 9: Temperature Compensation

0—None
A—ATC
B—ATG

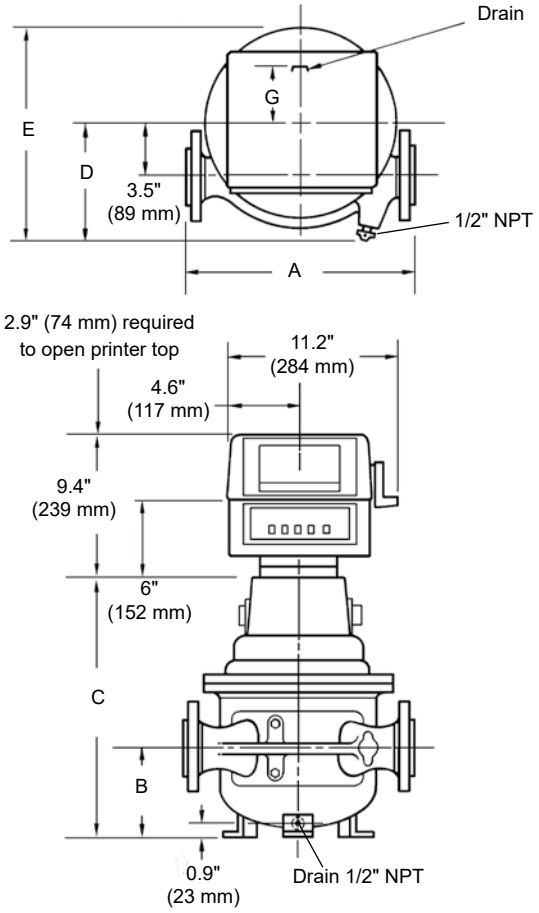
Position 10: Special Requirements[11]

0—Standard
P—PED (consult factory for availability)
C—CRN and low temperature material[9]
L—Low temperature material[9]

7 Polytetrafluoroethylene (PTFE).
8 Fluoroelastomers (FKM).
9 Only available for C2-S3 with low temperature material and ASME Section VIII design—Low temperature FKM[8] is the standard sealing material for meters with the ASME Section VIII design.
10 Consult factory for model number when selecting imperial or pound gearing.
11 PED required for all European countries. The equipment must be manufactured by Ellerbek, Germany facility.

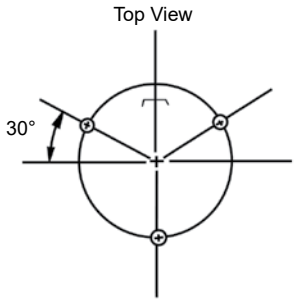
Dimensions

Inches (mm)



Meter
Anchor Bolt Holes

Three-0.6" (15 mm) bolt holes on a "F" diameter bolt circle.



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

Model	A	B	C	D	E	F	G	Weight—lb (kg)
C2-S1	14.0" (356)	5.6" (142)	15.8" (400)	7.4" (188)	13.4" (340)	8.5" (216)	3.8" (97)	95 (43)
C2-S3	14.0" (356)	5.6" (142)	18.6" (472)	7.4" (188)	13.4" (340)	8.5" (216)	3.8" (97)	110 (50)
C2-S3 Low Temperature Material	14.0" (356)	5.6" (142)	17.7" (450)	7.4" (188)	13.4" (340)	8.5" (216)	3.8" (97)	175 (79)
C2-S5	14.6" (371)	5.6" (142)	18.6" (472)	7.4" (188)	13.4" (340)	8.5" (216)	3.8" (97)	115 (52)
C2-S6	18.0" (457)	5.8" (147)	21.0" (533)	7.8" (198)	14.8" (375)	9.1" (232)	4.3" (109)	170 (77)
C2-S7	18.8" (476)	6.4" (162)	21.6" (548)	7.8" (198)	15.1" (385)	9.1" (232)	4.3" (109)	255 (116)

Ordering Information	
Application	Batching, loading, blending, inventory, process control, etc.
Operating Conditions	Liquid—Name and specific gravity or API gravity, flow range[12], temperature range[12], viscosity range[12], maximum working pressure, C of E.
Seals	Buna-N[13], FKM[8], or PTFE[7].
Units of Registration	Gallons, liters, pounds, and kilograms
Direction of Flow[14]	Left to right flow (as viewed above) is standard and will be supplied unless right to left flow is specified.
Options and Accessories	As required.

7 Polytetrafluoroethylene (PTFE).
8 Fluoroelastomers (FKM).
12 Specify minimum, normal, or maximum.
13 Standard seals supplied unless optional material specified.
14 For right-to-left flow on C2-S1 meters, add reversing gear kit.

Accessories

Strainer
2" steel, raised-face (RF) flanged, 4 mesh or finer screen

Mechanical Preset Valves
2" offset or straight through type, steel, flanged, 150 pound per square inch (psi) and 300 psi (300 psi straight through only) maximum working pressure respectively

Hydraulic Valves
2" globe type, steel, RF flanged, 300 psi maximum working pressure

Air Eliminator
2" steel, RF flanged

Counters
- 200 Series—Accumulative, nine-digit, non-reset type
- 600 Series—Five large digit reset, eight small digit non-reset

Printer
- Seven-digit accumulative
- Optional six-digit zero start

Preset Counter
- 300C Series—four-digit (five-digit optional) mechanical pushbutton preset with valve linkage
- Optional microswitch package for hydraulic valve, pump control, or other interlock

Pulse Transmitters
- LNC Pulse Transmitter (adapts to 600 Series Counters).
  - Low-Resolution—1 or 10 pulses[15].
  - High-Resolution (HR)—50 or 100 pulses[15].
- UPT—Quad-channel, infrared, security pulse transmitter in an explosion-proof housing (up to 1,000 pulses/rev.).

Flow Rate Indicator
Direct mount mechanical

Remote Electronic
- Remote registration
- Electro-mechanical counters
- Electronic totalizers

Automatic Temperature Compensation
- Model ATC—Factory-set for a given product
- Model ATG—Field-adjustable for different products

15 Per revolution of LNC right-hand wheel.

Revisions included in SS01010 Issue/Rev. 0.9 (10/21):
C2-S3 ASME Section VIII low temperature material information added.

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