

4" Steel Model F4

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Smith Meter PD Meter

The Smith Meter Model F4 is a 4", steel, double-case, straight-through (S3 through S8), rotary-vane, positive displacement meter. Applications for the F4 include blending, batching, dispensing, inventory control, and custody transfer of oils, solvents, chemicals, paints, fats, and fertilizers.

Features

- The rotary vane meter principle, combined with the meter's uniquely designed (offset) inlet and outlet nozzles, minimizes pressure drop across the measuring chamber, which reduces flow through meter clearances to maximize accuracy.
- Streamlined flow path provides low pressure drop.
- High torque drive calibrator with adjustment in 0.05 percent (%) increments ensures accurate registration.
- Low-friction ball bearings, fixed cam-type timing, and rugged construction for sustained accuracy and long service life.

Options

- High viscosity meter clearances to extend operation at maximum flow rate from 400 millipascal-second (mPa•s) to 2,000 mPa•s.
- High-temperature clearances extend operating temperatures from 150 degree Fahrenheit (°F) to 200 °F (65 degree Celsius ((°C) to 93°C).
- All iron trim for operating temperatures above 200 °F (93 °C).
- Liquefied petroleum gas (LPG) trim option for low-lubricity liquids, such as LPG.
- Compliant with National Mechanical Engineers (NACE) International standard MR0175.
- ASME Section VIII vessel construction is available for model F4-S3.

Operating Specifications

US gallons per minute (USGPM) and liters per minute (L/min).

Maximum Flow Rate

	USGPM	L/min
Continuous rating with standard trim	600	2,250
Intermittent rating extended with standard trim	750	2,725
Continuous and Intermittent rating with all iron and LPG trim	450	1,700

NOTE: Intermittent rating applies to limited service at maximum flow rate on clean, refined products where continuous operation is not required and these include truck loading, rail loading, and other batching applications.

Minimum Flow Rates (Typical Performance)

Linearity	Units	Viscosity (Centipoise—mPa•s)					
		.5	1	5	20	100	400
±0.15%	USGPM	100*	60	25	6	1.25	0.30
	L/min	375*	227	95	23	4.75	1.14
±0.25%	USGPM	75	45	18	4	1.00	0.25
	L/min	284	170	68	15	3.80	0.95
±0.50%	USGPM	50	30	12	3	0.60	0.15
	L/min	190	114	45	11	2.25	0.57

NOTE: Linearity based on a maximum flow rate of 600 USGPM (2,250 L/min) unless otherwise stated.

NOTE: *Linearity based on a maximum of 500 USGPM (1,875 L/min).

Repeatability

±0.02%

Viscosity

Viscosity is 1,000 mPa•s = 1,000 cP = 1 Pa•s.

- Standard viscosity is 400 mPa•s (2,000 seconds, Saybolt universal (SSU)) maximum.
- Optional viscosity is two pascal seconds (Pa•s) (10,000 SSU) maximum. Specify high viscosity meter clearances.
- For viscosity over two Pa•s, specify high viscosity meter clearances and derate maximum flow rate in direct proportion to viscosity over two Pa•s. For example, at four Pa•s, derate maximum flow rate to 50% of normal continuous rating 300 USGPM.

Temperature Ranges

Standard meter clearances with:

- Buna-N and polytetrafluoroethylene (PTFE) is -20 to 150 °F (-29 to 65 °C).
- Fluoroelastomer (FKM) is 10 to 150 °F (-12 to 65 °C).
- Low temperature FKM is -50 to 150 °F (-46 to 65 °C)

High temperature meter clearances with:

- Buna-N and PTFE is -20 to 200 °F (-29 to 93 °C).
- FKM is 10 to 200 °F (-12 to 93 °C).
- Low temperature FKM (standard) is -50 to 200 °F (-46 to 93 °C).

NOTE: Only available for F4-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.

All iron trim with:

- Buna-N is -20 to 225 °F (-29 to 108 °C).
- PTFE is -20 to 400 °F (-29 to 205 °C).
- FKM is 10 to 400 °F (-12 to 205 °C).
- Low temperature FKM (standard) is -50 to 400 °F (-46 to 205 °C).

NOTE: Only available for F4-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.

Meter Gearing

Five US gallons or one dekaliter and one barrel or five dekaliters per revolution of meter calibrator output shaft.

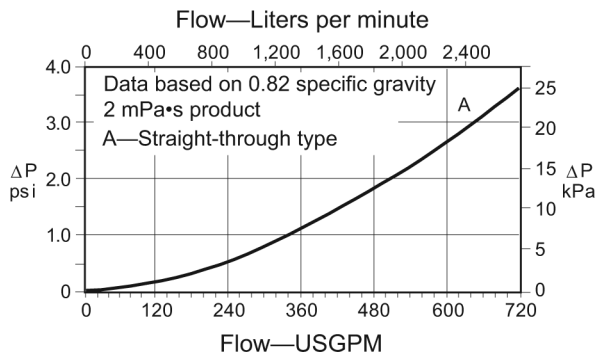
Maximum Working Pressure

Model	Flange	PSI	kPa
F4-S3	150	285	1,965
F4-S6	300	740	5,102
F4-S7	600	1,480	10,204
F4-S8	900	2,220	15,306

Flange class per ANSI B16.5 raised-face (RF) flange.

NOTE: PSI and kPa maximum working pressure is 100 °F (38 °C). See catalog code for more options.

Pressure Drop (ΔP)



Materials of Construction

Trim	Housing	Internals	Seals
Standard	Steel	Iron, steel, stainless steel, and aluminum	Standard is Buna-N.
LPG	Steel	Iron, steel, stainless steel, aluminum, rulon, and nylon	Optional is FKM and PTFE.
All iron	Steel	Iron, steel, and stainless steel	

NOTE: Buna-N is standard for seals.

NOTE: Low temperature FKM is only available for F4-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.

Installation

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

Weights and Measures Approvals

NTEP Certificate of Conformance 95-054

Canadian Notice of Approvals (NOA) S.WA-0615

Australia NMI 5-6B-55B

Brazil INMETRO Dimel No. 0148

EU PTB Issued MID (Measuring Instrument Directive)

PTB Issued OIML R117 Test report

Russia GOST

For other, consult the factory.

Pressure Safety Approvals

PED Pressure Equipment Directive (EU)

CRN Canadian Registration Number

For other, consult the factory.

Catalog Code

The following guide defines the correct PD meter for a given application and its 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	F	4	S	1	G	B	S	0	0

Position 1: Code

K—Catalog code

Position 2 and 3: Model/Flange Size

F4—4"

Positions 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

8—Class 900, 2,220 psig/15,306 kPa

PED (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

NOTE: All flanges are designed to ANSI B16.5 with pressure ratings at maximum working pressure of 100 °F.

Position 6: Meter Gearing

G—Gallons

B—Barrels

D—Dekaliters

I—Imperial gallons

P—Pounds

NOTE: Consult the factory for the model number when selecting imperial or pound gearing.

Position 7: Seals

B—Buna-N

V—FKM

T—PTFE

L—Low temperature FKM

NOTE: Low temperature FKM is only available for F4-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.

Position 8: Trim

S—Standard

A—All iron

L—LPG

Position 9: Temperature Compensation

0—None

A—ATC

B—ATG

Position 10: Special Requirements

S—Standard

P—European Pressure Equipment Directive (PED)

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

C—CRN and low temperature material

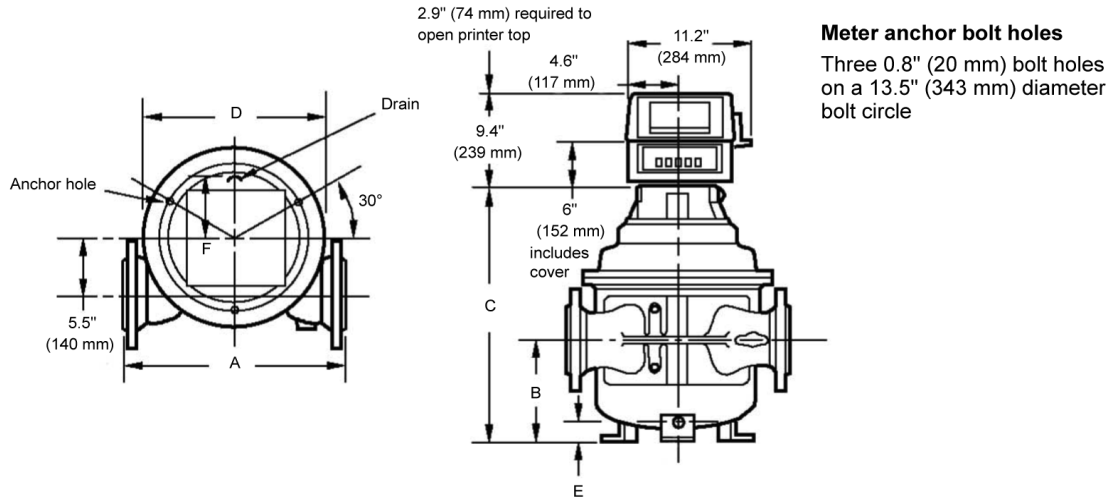
L—Low temperature material

NOTE: Only available for F4-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.

Dimensions and Weight

The dimensions are in inches (") to the nearest tenth (millimeters (mm) to the nearest whole millimeter), each independently dimensioned from respective engineering drawings.

Model F4-S3 through S8



Meter anchor bolt holes
Three 0.8" (20 mm) bolt holes on a 13.5" (343 mm) diameter bolt circle

Model	A	B	C	D	E	F	Weight lb (kg)
F4-S3	20.0" (508)	9.3" (235)	24.7" (627)	17.6" (447)	1.3" (33)	5.4" (137)	300 (136)
F4-S3 Low Temperature Material	20.0" (508)	9.3" (235)	25.1" (638)	18.5" (470)	1.2" (31)	5.4" (137)	450 (205)
F4-S6	24.9" (632)	9.4" (239)	25.6" (650)	19.8" (503)	1.6" (41)	6.0" (152)	540 (245)
F4-S7	26.6" (676)	9.8" (249)	27.8" (706)	21.0" (533)	1.7" (43)	6.3" (160)	830 (376)
F4-S8	28.6" (726)	20.6" (523)	37.1" (942)	28.0" (711)	6.2" (157)	13.5" (342)	1,885 (942)

Ordering Information

- Application: Batching, loading, blending, inventory, process control, etc.
- Operating conditions: Liquid name, specific gravity or API gravity, flow range, temperature range, viscosity range, and maximum working pressure

NOTE: Specify minimum, normal, and maximum for flow range, temperature range, and viscosity range.

- Seals: Buna-N, FKM, PTFE, or low temperature FKM

NOTE: Standard seals (Buna-N) supplied unless optional material specified.

NOTE: Low temperature material FKM is only available for F4-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.

- Units of registration: Gallons, barrels, liters, dekaliters, pounds, and kilograms
- Direction of flow: Left-to-right is standard unless right-to-left flow is specified
- Style: Straight-through
- Options and accessories: As required

Accessories

Strainer

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

Mechanical Preset Valves

4" straight-through type, steel, flanged, 300 pounds per square inch (psi) maximum working pressure

Hydraulic Valves

4" globe-type, steel, RF flanged, 300 psi maximum working pressure

Air Eliminator

4" steel, RF flanged, 300 psi maximum working pressure

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
- Microswitch package for hydraulic valve, pump control, or other interlock is optional

Pulse Transmitters

- Universal pulse transmitter (UPT)—Quad-channel, infrared, security pulse transmitter in an explosion-proof housing (up to 1,000 pulses/revolution)
- Large number counters (LNC) pulse transmitter (adapts to 600 Series counters)
 - Low-resolution—1 to 10 pulses
 - High-resolution—50 or 100 pulses

NOTE: Pulses per revolution of LNC right-hand heel.

Flow Rate Indicator

- Direct-mount mechanical
- Remote electronic

Remote Registration

- Electro-mechanical counters
- Electronic totalizers

Automatic Temperature Compensation Models

- Automatic temperature compensator (ATC)—Factory-set for a given product
- Automatic temperature gravity (ATG)—Field-adjustable for different products

The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacture 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.