

4" Steel Model F4

Bulletin SS01012 Issue/Rev. 1.2 (10/17)

Smith Meter® PD Rotary Vane Meter

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



Model F4-S1

Features

- **Superior Accuracy** – The Smith Meter® 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 (slippage), to maximize accuracy.
- **Low Pressure Drop** – Streamlined flow path provides low pressure drop.
- **Positive and Accurate Registration** – High torque drive calibrator with adjustment in 0.05% increments ensures accurate registration.
- **Long Service Life** – Low friction ball bearings, fixed cam-type timing, and rugged construction give sustained accuracy and long service life.

Options

- **High Viscosity Meter Clearances** – To extend operation at maximum flow rate from 400 mPa•s to 2,000 mPa•s.
- **High Temperature Clearances** – To extend operating temperatures from 150°F to 200°F (65°C to 93°C).
- **All Iron Trim** – For operating temperatures above 200°F (93°C).
- **LPG Trim** – For low lubricity liquids such as LPG.
- **NACE Construction** – Special components available to meet requirements of NACE Standard MR-01-75

Operating Specifications

Maximum Flow Rate

	USGPM	L/min
Continuous Rating – Standard Trim	600	2,250
Intermittent Rating ¹ – Standard Trim	720	2,725
Continuous/Intermittent Rating – All Iron or LPG Trim	450	1,700

Minimum Flow Rate – Typical Performance

Linearity ²	Units	Viscosity (Centipoise – cP)					
		0.5	1	5	20	100	400
±0.15%	USGPM	100 ³	60	25	6	1.25	0.30
	L/min	375 ³	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

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

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

³ Linearity based on a maximum of 500 USGPM (1,875 L/min).

Repeatability

±0.02%

Viscosity

Standard: 400 mPa•s⁴ (2,000 SSU) maximum.

Optional: 2 Pa•s (10,000 SSU) maximum – 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 (e.g., at 4 Pa•s, derate Maximum Flow Rate to 50% of Normal Continuous Rating – 300 USGPM).

Temperature

Standard Meter Clearances With:

Buna N/PTFE⁵: -20°F to 150°F (-29°C to 65°C).

Viton: 10°F to 150°F (-12°C to 65°C).

High Temperature Meter Clearances With:

Buna N/PTFE⁵: -20°F to 200°F (-29°C to 93°C).

Viton: 10°F to 200°F (-12°C to 93°C).

All Iron Trim With:

Buna N: -20°F to 225°F (-29°C to 108°C).

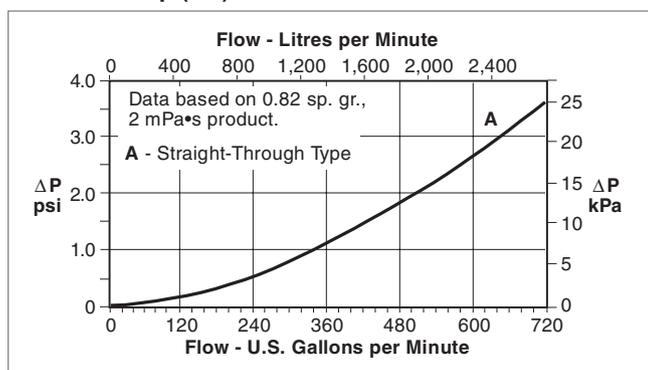
PTFE⁵: -20°F to 400°F (-29°C to 205°C).

Viton: 10°F to 400°F (-12°C to 205°C).

Meter Gearing

Five U.S. gallons or one dekalitre and one barrel or five dekalitres per revolution of meter calibrator output shaft.

Pressure Drop (ΔP)



Maximum Working Pressure

Model	Flange	PSI ^{6,9}	kPa ^{6,9}
F4-S1	150	150	1,034
F4-S3	150	285 ⁶	1,965 ⁶
F4-S5	300	300	2,068
F4-S6	300	740 ⁶	5,102 ⁶
F4-S7	600	1,480 ⁶	10,204 ⁶
F4-S8	900	2,220 ⁶	15,306 ⁶
F4-V3	150	285 ⁶	1,965 ⁶

Flange Class per ANSI B16.5 Raised Face Flange.

Materials of Construction

Trim	Housing	Internals	Seals ⁷
Standard	Steel	Iron, Steel, Stainless Steel, Aluminum	Buna N ⁸ , Viton or PTFE ⁵
LPG	Steel	Iron, Steel, Stainless Steel, Rulon and Nylon	Buna N ⁸ , Viton or PTFE ⁵
All Iron	Steel	Iron, Steel, Stainless Steel	Buna N ⁸ , Viton or PTFE ⁵

Installation

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

Approvals

INMETRO/DIMEL No. 0148

4 1,000 mPa•s = 1,000 cP = 1 Pa•s.

5 Polytetrafluoroethylene (PTFE).

6 Maximum W.P. at 100°F (38°C).

7 All S3 through S8 meters will have PTFE⁵ or Buna-N.

8 Standard.

9 See catalog code for more options.

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	F	4	S	1	G	B	S	0	0

Position 1: Code

K - Catalog Code

Positions 2 and 3: Model/Flange Size

F4 - 4" (F4)

Position 4: Flow Path

S - Straight
V - Vertical (V3 only)

Position 5: Pressure Class and End Connections

- Standard (Raised Face Flanges)
- 1 - Class 150, 150 psig/1,034 kPa
 - 3 - Class 150, 285 psig/1,965 kPa
 - 5 - Class 300, 300 psig/2,068 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)

- 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, 1,480 psig/10,204 kPa

All Flanges designed to ANSI B16.5, Pressure Ratings Maximum Working Pressure at 100° F

Position 6: Meter Gearing

- G - Gallons
- B - Barrels
- D - Dekaliters
- I - Imperial Gallons¹⁰
- P - Pound¹⁰

Position 7: Seals

- B - Buna-N
- V - Viton
- T - PTFE⁵

Position 8: Trim

- S - Standard
- A - All Iron
- L - LPG

Position 9: Temperature Compensation

- 0 - None
- A - ATC
- B - ATG

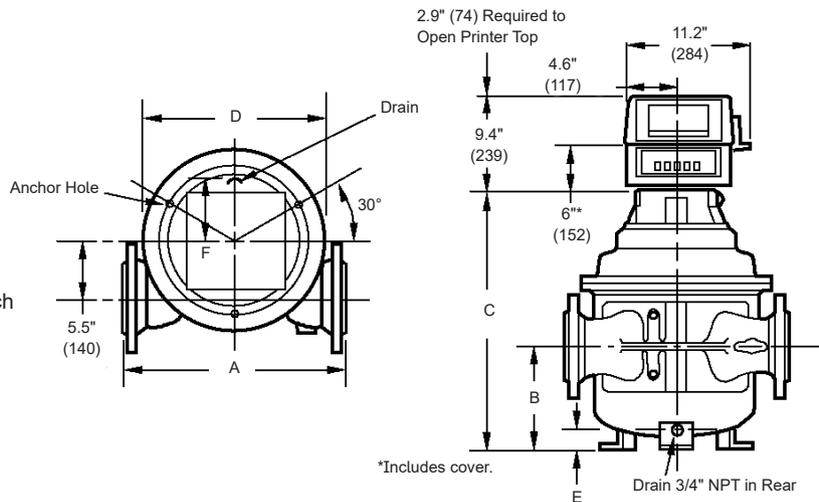
Position 10: Special Requirements¹¹

- 0 - Standard
- P - PED

Dimensions

Inches (mm)

Model F4-S1 through S7



Meter Anchor Bolt Holes
3 - 0.8" (20) Bolt Holes
on a 13.5" (343) Diameter Bolt
Circle

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

Model	A	B	C	D	E	F	Weight
F4-S1	20.0" (508)	9.3" (235)	23.4" (594)	17.8" (452)	1.3" (33)	5.4" (137)	295 lb (134 kg)
F4-S3	20.0" (508)	9.3" (235)	24.7" (627)	17.6" (447)	1.3" (33)	5.4" (137)	300 lb (136 kg)
F4-S5	21.1" (536)	9.3" (235)	24.7" (627)	17.6" (447)	1.3" (33)	5.4" (137)	340 lb (154 kg)
F4-S6	24.9" (632)	9.4" (239)	25.6" (650)	19.8" (503)	1.6" (41)	6.0" (152)	540 lb (245 kg)
F4-S7	26.6" (676)	9.8" (249)	27.8" (706)	21.0" (533)	1.7" (43)	6.3" (160)	830 lb (376 kg)
F4-S8	28.6" (726)	20.6" (523)	37.1" (942)	28.0" (711)	6.2" (157)	13.5" (342)	1,885 lb (942 kg)

5 Polytetrafluoroethylene (PTFE).

10 Consult factory for Model number when selecting Imperial or Pound Gearing.

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

Ordering Information

Application	Batching, Loading, Blending, Inventory, Process Control, etc.
Operating Conditions	Liquid – Name, Specific Gravity or API Gravity, Flow Range ¹² , Temperature Range ¹² , Viscosity Range ¹² , Maximum Working Pressure.
Seals	Buna N ¹³ , Viton, or PTFE ⁵ .
Units of Registration	Gallons, Barrels, Litres, Dekalitres, Pounds, Kilograms.
Direction of Flow	Left-to-right (as viewed above) is standard and will be supplied unless right-to-left flow is specified.
Style	Straight-through.
Options and Accessories	As required.

Accessories

Strainer

4" steel, R.F. flanged, 4 mesh or finer screen.

Mechanical Preset Valves

4" straight-through type, steel, flanged, 300 psi maximum working pressure.

Hydraulic Valves

4" globe-type, steel, R.F. flanged, 300 psi maximum working pressure.

Air Eliminator

4" steel, R.F. flanged, 300 psi maximum working pressure.

Counters

200 Series – Accumulative, 9-digit, non-reset type.

600 Series – 5 large digit reset, 8 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 optional.

Pulse Transmitters

UPT – Quad-channel, infrared, security pulse transmitter in an explosion-proof housing (up to 1,000 pulses/rev.).

Type E – SPDT Mercury Wetted Switch.

LNC Pulse Transmitter (adapts to 600 Series Counters).

Low-Resolution – 1 to 10 pulses¹⁴.

High-Resolution (HR) – 50 or 100 pulses¹⁴.

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.

5 Polytetrafluoroethylene (PTFE).

12 Specify: minimum / normal / maximum.

13 Standard seals supplied unless optional material specified.

14 Per revolution of LNC Right-Hand Wheel.

Revisions included in SS01012 Issue/Rev. 1.2 (10/17):

Page two: Corrected error on Materials of Construction table; revised footnote 7. F4-V3 added to Maximum Working Pressure table.

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.

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TechnipFMC
FMC Technologies
Measurement Solutions, Inc.
13460 Lockwood Road
Building S01
Houston, Texas 77044 USA
P:+1 281.591.4200

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

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