

The **Smith Meter™ Model E3** is a 3", double-case, straight-through (S1 through S7) or angle-type (A1 and A3), rotary vane, positive displacement meter. Applications include: blending, batching, dispensing, inventory control, and custody transfer of oils, solvents, chemicals, paints, fats, and fertilizers.

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 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	420	1,600
Intermittent Rating - (S1 and A1 Only) Standard Trim	500	1,900
Continuous/Intermittent Rating - All Iron or LPG Trim	315	1,200



Model E3-S1

Minimum Flow Rate — Typical Performance

Linearity ¹	Units	Viscosity (mPa•s)					
		0.5	1	5	20	100	400
±0.15%	USGPM	80	50	20	5	1	0.25
	L/min	303	190	75	19	4	1
±0.25%	USGPM	50	35	15	4	0.8	0.20
	L/min	190	132	57	15	3	0.8
±0.50%	USGPM	40	25	10	2.4	0.5	0.13
	L/min	150	95	38	10	2	0.5

Repeatability

±0.02%

Viscosity

Standard: 400 mPa•s² (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 - 210 USGPM).

Temperature

Standard Meter Clearances With:

Buna N/Teflon: -20°F to 150°F (-29°C to 65°C).
 Viton: 10°F to 150°F (-12°C to 65°C).

¹ Linearity based on a maximum flow rate of 420 USGPM (1,600 L/min) unless otherwise stated.

² 1,000 mPa•s = 1,000 cP = 1 Pa•s.

High Temperature Meter Clearances With:
 Buna N/EPR/Teflon: -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).
 EPR: -20°F to 300°F (-29°C to 149°C).
 Teflon: -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 per revolution of meter calibrator output shaft.

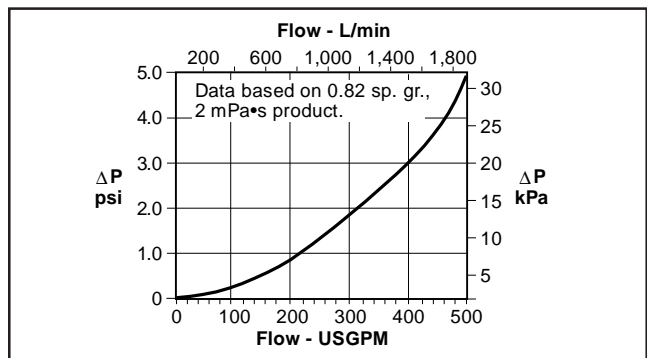
One barrel - special.

Maximum Working Pressure

Model	Flange	PSI ⁶	kPa ⁶
E3-S1, A1	150	150	1,034
E3-S3	150	285 ³	1,965 ³
E3-A3	150	275 ³	1,896 ³
E3-S5	300	300	2,069
E3-S6	300	720 ³	4,964 ³
E3-S7	600	1,440 ³	9,929 ³

Flange Class per ANSI B16.5 Raised Face Flange.

Pressure Drop (ΔP)



Materials of Construction

Trim	Housing	Internals	Seals ⁴
Standard	Steel	Iron, Steel, Stainless Steel, Aluminum	Buna N ⁵ , Viton, Teflon
LPG	Steel	Add Rulon and Nylon to Above	Buna N ⁵ , Viton, Teflon
All Iron	Steel	Delete Aluminum From Standard	Buna N ⁵ , Viton, Teflon

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	E	3	S	1	G	B	S	0	0

Position 1: Code

K - Catalog Code

Positions 2 and 3: Model/Flange Size

E3 - 3" (E3)

Position 4: Flow Path

S - Straight
 A - 90° Angle
 V - Vertical

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, 720 psig/4,964 kPa
- 7 - Class 600, 1,480 psig/9,928 kPa

PED (Raised Face Flanges)

- 1 - Class 150, Not Available
- 3 - Class 150, 285 psig/1965 kPa
- 5 - Class 300, Not Available
- 6 - Class 300, Consult Factory
- 7 - Class 600, Consult Factory

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

³ Maximum W.P. at 100°F (38°C).
⁴ All S3 through S7 meters with Viton trim have Teflon packing gland seals.
⁵ Standard.
⁶ See Catalog Code for more options.
⁷ Consult factory for Model number when selecting Imperial or Pound Gearing.

Position 6: Meter Gearing

- G - Gallons (5:1 - S1)
- B - Barrels (1:1 - S3 through S7)
- D - Dekaliters (1:1 - S1) (5:1 - S3 through S7)
- I - Imperial Gallons⁷
- P - Pound⁷

Position 7: Seals

- B - Buna-N
- V - Viton
- T - Teflon

Position 8: Trim

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

Position 9: Temperature Compensation

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

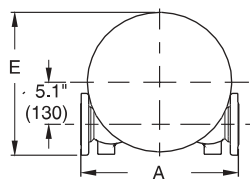
Position 10: Special Requirements

- 0 - Standard
- P - PED

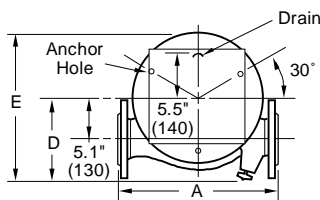
Dimensions

Inches (mm)

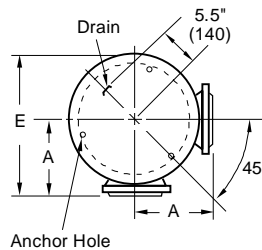
Model E3-S1 through S5



Model E3-S6 and S7
Model E3-S1 through S7

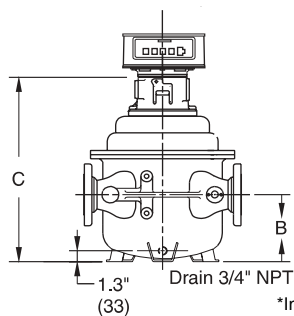
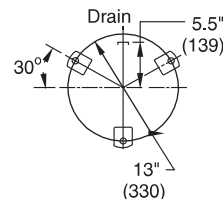


Model E3-A1 and A3
Model E3-A1 and A3

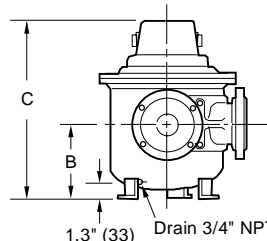
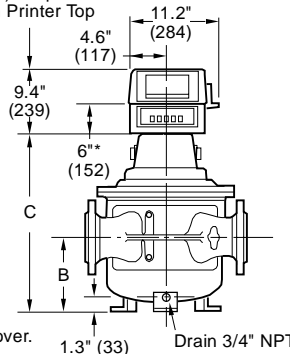


Meter Anchor Bolt Holes

3 - 0.8" (20) Bolt Holes on a 13" (330) Diameter Bolt Circle



2.9" (74) Required to Open Printer Top



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	Weight - lb (kg)
E3-S1	18.5" (470)	8.1" (206)	21.3" (540)	8.9" (226)	17.8" (451)	265 (120)
E3-S3	18.5" (470)	8.1" (206)	22.5" (572)	8.9" (226)	17.8" (451)	270 (122)
E3-S5	19.5" (495)	8.1" (206)	22.5" (572)	9.3" (236)	17.8" (451)	285 (129)
E3-S6	23.0" (584)	8.5" (216)	25.0" (635)	9.3" (236)	18.7" (475)	435 (197)
E3-S7	23.7" (602)	8.8" (224)	25.8" (655)	9.3" (236)	19.4" (492)	660 (299)
E3-A1	10.0" (254)	8.1" (206)	21.3" (540)	—	18.5" (470)	265 (120)
E3-A3	10.0" (254)	8.1" (206)	22.5" (572)	—	18.5" (470)	270 (122)

Ordering Information

Application	Batching, Loading, Blending, Inventory Process Control, etc.
Operating Conditions	Liquid — Name, Specific Gravity, or API Gravity, Flow Range ¹⁰ , Temperature Range ¹⁰ , Viscosity Range ¹⁰ , Maximum Working Pressure
Seals	Buna N ¹¹ , Viton, Teflon, or EPR.
Units of Registration	Gallons, Litres, Pounds, Kilograms, Dekalitres, Barrels, Tons, etc.
Direction of Flow	Left to right - standard. Specify right to left if desired.
Style	Straight through or angle type.
Options and Accessories	As required.

Accessories

Strainer

3" steel, R.F. flanged.

Mechanical Preset Valves

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

Deaerator

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

Hydraulic Valves

3" globe-type, steel, R.F. 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 optional.

¹⁰ Specify: minimum/normal/maximum.

¹¹ Standard seals supplied unless optional material specified.

Pulse Transmitters

Type E - SPDT Mercury Wetted Switch.
LNC Pulse Transmitter (adapts to 600 Series Counters).

Low-Resolution - 1 to 10 pulses¹².
High-Resolution (HR) - 50 or 100 pulses¹².

PEXP - Photo-electric pulse generator in an explosion-proof case (up to 1,000 pulses/rev.).

PPS - Dual-channel, photo-electric, 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.
Model LEATC - Electronic, field-programmable for different products.

¹² Per revolution of LNC Right-Hand Wheel.

Revisions included in SS01016 Issue/Rev. 0.8 (7/06):
Updated materials of construction (removed EPR) pg 2.
Updated weight of model E3-S1 to 17.8" per MOL-2597.

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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