Smith Meter® PD Meters

3" Steel Model E3

*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.*

Model E3-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 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

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	.05	0.13
	L/min	150	95	38	10	2	0.5

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

FMC Technologies

Repeatability

±0.02%

Viscosity

Standard: 400 mPa•s[2] (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/PTFE[7]: -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/PTFE[7]: -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).
PTFE[7]: -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.

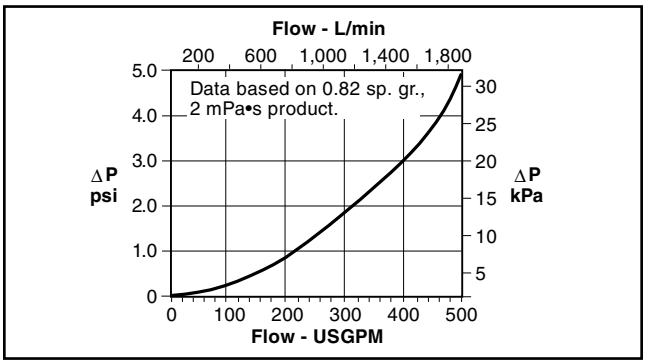
One barrel – special.

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	285[3]	1,965[3]
E3-S5	300	300	2,068
E3-S6	300	740[3]	5,102[3]
E3-S7	600	1,480[3]	10,204[3]
E3-S8	900	2,220[3]	15,306[3]

Flange Class per ANSI B16.5 Raised Face Flange.

Pressure Drop (∆P)



Materials of Construction

Trim	Housing	Internals	Seals[4]
Standard	Steel	Iron, Steel, Stainless Steel, Aluminum	Buna N[5], Viton, or PTFE[7]
LPG	Steel	Add Rulon and Nylon to Above	Buna N[5], Viton, or PTFE[7]
All Iron	Steel	Delete Aluminum From Standard	Buna N[5], Viton, or PTFE[7]

2 1,000 mPa•s = 1,000 cP = 1 Pa•s.
3 Maximum W.P. at 100°F (38°C).
4 All S3 through S8 meters with Viton trim have PTFE packing gland seals.
5 Standard.
6 See Catalog Code for more options.
7 Polytetrafluoroethylene (PTFE).

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, 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/1965 kPa
5 - Class 300, Not Available
6 - Class 300, 720 psig/4,964 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 S7)
D - Dekaliters (1:1 - S1) (5:1 - S3 through S7)
I - Imperial Gallons[8]
P - Pound[8]

Position 7: Seals

B - Buna-N
V - Viton
T - PTFE[7]

Position 8: Trim

S - Standard
A - All Iron
L - LPG

Position 9: Temperature Compensation

0 - None
A - ATC
B - ATG

Position 10: Special Requirements[9]

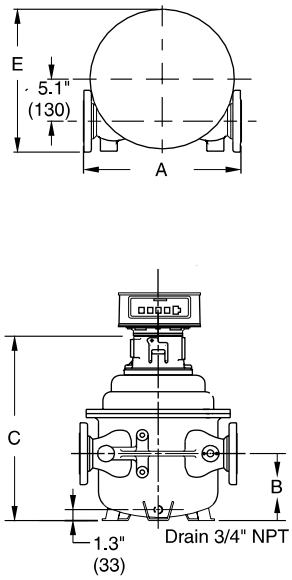
0 - Standard
P - PED (consult factory)
C - CRN

7 Polytetrafluoroethylene (PTFE).
8 Consult factory for Model number when selecting Imperial or Pound Gearing.
9 PED required for all European countries. The equipment must be manufactured by Ellerbek, Germany facility.

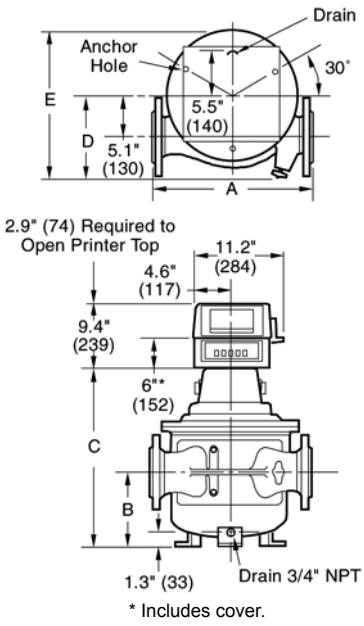
Dimensions

Inches (mm)

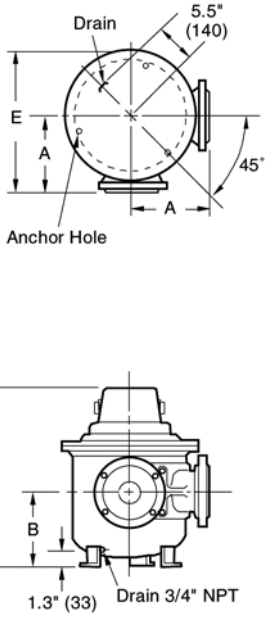
Model E3-S1 through S5



Model E3-S6 through S8

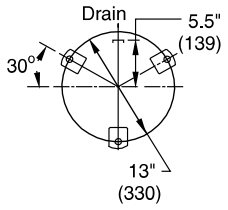


Model E3-A1 and A3



Meter Anchor Bolt Holes

3 - 0.8" (20) Bolt Holes on a
13" (330) 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	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	23.3" (592)	8.8" (224)	25.8" (655)	9.3" (236)	19.4" (492)	660 (299)
E3-S8	27.3" (691)	15.8" (400)	33.9" (860)	14.0" (355)	28.0" (711)	1,265 (573)
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, or PTFE[7].
Units of Registration	Gallons, Barrels, Litres, Dekalitres, Pounds, Kilograms, etc.
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 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.

Air Eliminator

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.

Pulse Transmitters

Type E – SPDT Mercury Wetted Switch.

LNC Pulse Transmitter (adapts to 600 Series Counters).

Low-Resolution – 1 to 10 pulses[12].
High-Resolution (HR) – 50 or 100 pulses[12].

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.

Model LEATC – Electronic, field-programmable for different products.

7 Polytetrafluoroethylene (PTFE).
10 Specify: minimum/normal/maximum.
11 Standard seals supplied unless optional material specified.
12 Per revolution of LNC Right-Hand Wheel.

Revisions included in SS01016 Issue/Rev. 1.0 (8/13):
- Optional material EPR removed.
- PED footnote added to Special Requirements.
- Page 3: Position 5 specs revised.
- Page 4: Dimensions for Model E3-S7, A – revised to 23.3" (592 mm).
- Footnote numbering revised throughout.

Editorial Change: 11/13: Seals - material reference changed to PTFE.

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