

3" Model ST-160-DI

Bulletin SS01064E Issue/Rev. 0.5 (4/18)

Smith Meter® PD Meters

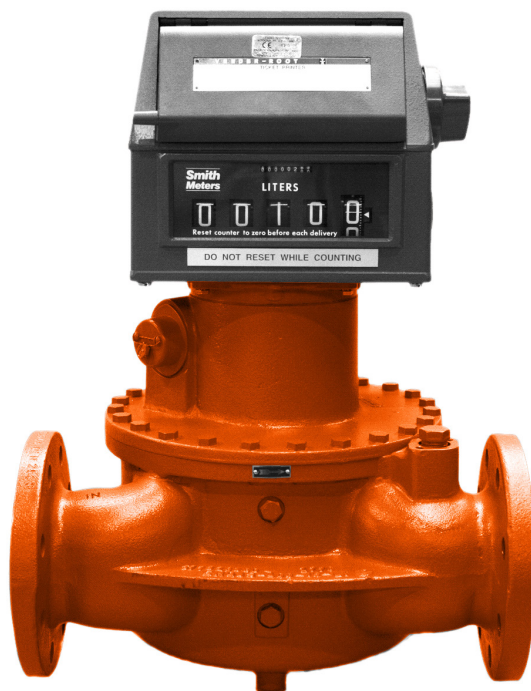
The **Smith Meter® Model ST-160** is a DN80 (3") single-case, straight-through, rotary vane positive displacement meter commonly used on tank trucks and as a line meter. Applications include: blending, batching, dispensing, inventory control and custody transfer of oils, solvents, chemicals, paints, fats, and fertilizers.

Features

- **Superior Accuracy** – The Smith Meter rotary vane meter principle and unique offset, inlet, and outlet nozzles combine to minimize pressure drop across the measuring chamber for reduced flow through the meter clearances for maximum accuracy.
- **Low Pressure Drop** – Streamlined flow path provides low pressure drop.
- **Positive and Accurate Registration** – High torque drive calibrator with adjustments in 0.05% increments ensures accurate registration.
- **Long Service Life** – Low friction ball bearings, fixed cam timing, and rugged construction give sustained accuracy and long life.
- **Ductile Iron Housing** – For a maximum working pressure of 16 bar.
- **PED¹** – Liquid compliant.

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 65°C (150°F) to 93°C (200°F).
- **Viton** – increase application flexibility.
- **All Iron Construction** – For operating temperatures above 93°C (150°F).
- **Load Rack Trim** – For low lubricity products.
- **End Connections** – Available with DIN or ANSI flanges.



Operating Specifications

Maximum Flow Rate

	USGPM	L/min
Continuous Rating – Standard Trim	320	1200
Intermittent Rating ² – Standard Trim	425	1600
Continuous/Intermittent Rating – All Iron Trim	245	925

Minimum Flow Rate Typical Performance

Linearity ³	Viscosity (mPa•s)						
	Units	0.5	1	5	20	100	400
±0.15%	USGPM	50	30	12	3.0	0.60	0.15
	L/min	190	113	45	11.3	2.30	0.57
±0.25%	USGPM	40	22	9	2.2	0.45	0.11
	L/min	150	83	34	8.3	1.70	0.42
±0.50%	USGPM	25	15	6	1.5	0.30	0.08
	L/min	95	57	23	5.7	1.10	0.30

- 1 PED required for all European countries. Equipment must be manufactured by Ellerbek, Germany facility.
- 2 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).
- 3 Linearity based on a maximum flow rate of 320 USGPM (1,200 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 - 600 L/min).

Temperature

Standard Meter Clearances, with –

-Buna-N: -20°C to 65°C (-4°F to 150°F)
-Viton seals: -12°C to 65°C (10°F to 150°F)

High Temperature Meter Clearances, with –

-Buna-N: -20°C to 93°C (-4°F to 200°F)
-Viton seals: -12°C to 93°C (10°F to 200°F)

All Iron Trim, with –

-Buna-N seals: -20°C to 108°C (-4°F to 225°F)
-Viton seals: -12°C to 150°C (10°F to 300°F)

Optional Low Temperature:

-29°C (-20°F) at reduced working pressure of 10 bar (1,000 kPa), with Buna-N Seals.
Special low temperature of -40°C (-40°F) on request.

Meter Gearing

One dekalitre per revolution of meter calibrator output shaft.

Installation

It is recommended that the meter be protected with a 40 mesh strainer.

Strainer Specifications

Type	End Connections	Housing Material	Pressure – bar (kPa)
E-30	Class 150 ANSI B16.5 raised face flanges	Cast Steel	19.7 (1,965)
	DIN EN PN16 raised face flanges		16 (1,600)

Meter Ordering Information

Application	Batching, Loading, Blending, Inventory, Process Control, etc.
Operating Conditions	Liquid – Name, Viscosity (Min./Max.), and Specific Gravity Flow Range – Min./Norm./Max. Temperature Range – Min./Max. Maximum Working Pressure
Units of Registration	Litres, Dekalitres, Gallons, Kilograms, or Pounds
Options	Seals – Buna or Viton Internal Construction – Iron/Aluminum, All Iron Clearances – Standard, High Viscosity, or High Temperature End Connections – ANSI or DIN
Accessories	As required, see next page.

End Connections and Maximum Working Pressure

End Connections	Housing Material	Pressure – bar (kPa)
Class 150 ANSI B16.42 raised face flanges DIN EN PN16 raised face flanges	Ductile Iron	16 (1,600)

Materials of Construction

Housing	Internals	Seals
Ductile Iron	Iron, Steel, Stainless Steel, Aluminum Optional: All Iron	Buna-N Optional: Viton

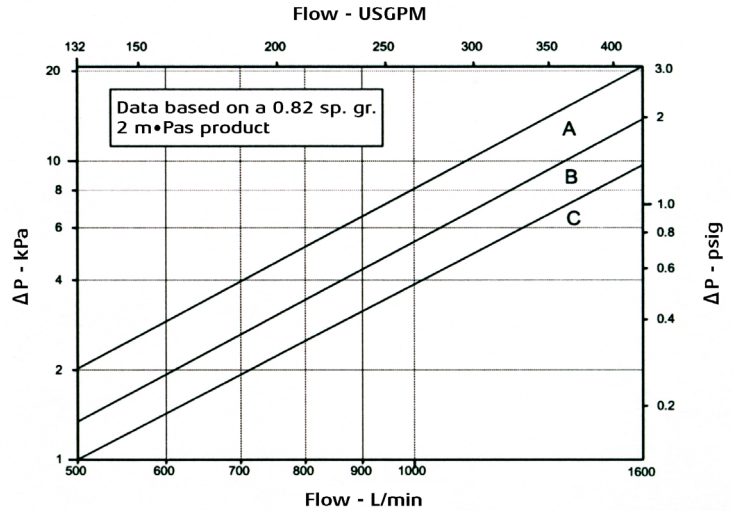
⁴ 1,000 mPa•s = 1,000 cP = 1 Pa•s.

Pressure Drop

A - Strainer - 40 Mesh
B - Meter
C - Preset Valve

To approximate pressure drop for strainers with other than 40 mesh baskets, multiply chart reading by the appropriate factor.

Mesh	Factor
4	.65
10	.75
20	.85
80	1.25



Accessories

Strainers

Housing Material – Ductile Iron.
Seals – Buna-N (standard) or Viton.
Liner – 40 (standard), 4, 10, 20, or 80 mesh.
Options – RB-Type Air Release Kit.

Deaerator

Type – Vertical or Horizontal.
Housing Material – Steel.
Seals – Buna-N (standard) or Viton.

Hydraulic Valves

Type – Globe-Type.
Housing Material – Cast Steel.

Mechanical Set Stop Valves

Type – Straight-through.
Housing Material – Steel.
Seals – Buna-N (standard) or Viton.

Automatic Temperature Compensation

Model ATC – Factory-set for a given product.
Model ATG – Field-adjustable for different products.

Counters

200 Series – Accumulative, nine-digit, non-reset type.
600 Series – Five large-digit reset, eight small-digit non-reset.

Printers

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

Preset Counters

300C Series – Five-digit mechanical pushbutton preset with valve linkage. Microswitch package for pump control or other interlock optional.

Pulse Transmitters

GPST-2 – Dual-channel, photoelectric transmitter to ATEX (EEx) d IIB T6. Output 100 pulses/revolution.

LNC Transmitter (Adapts to new-style 600 Series Counter)
– Low Resolution: 1 or 10 pulses/revolution of counter R.H. Wheel. ATEX approved (EEx) d IIA T6.
High Resolution (HR): 100 or 50 pulses/revolution of counter R.H. Wheel. ATEX approved (EEx) d IIA T6.

UPT – Universal Pulse Transmitter. ATEX approved (EEx) d IIB T6. Max output 1000 pulses/revolution

Flow Rate Indicators

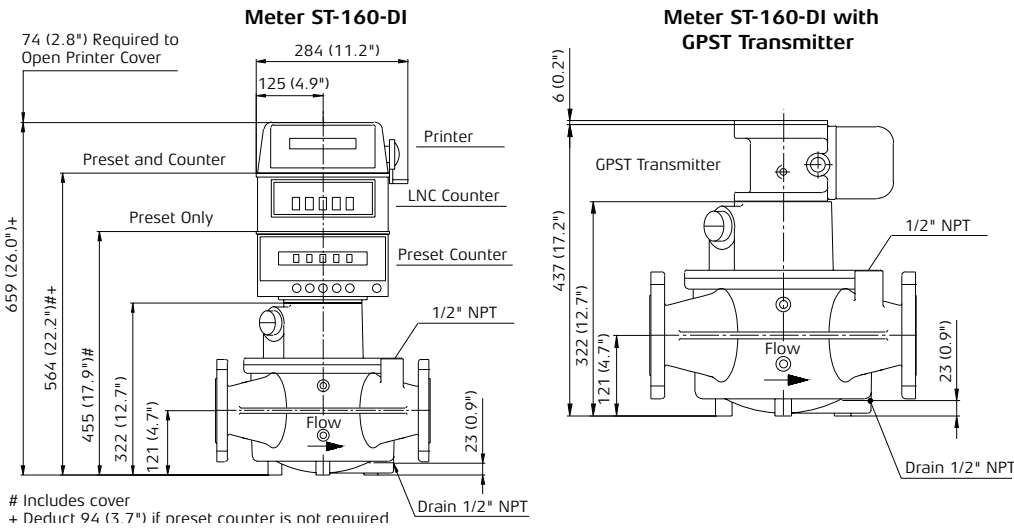
Direct mount mechanical.
Remote electronic.

Remote Registration

Electromechanical counters.
Electronic totalizers.
Load printer.

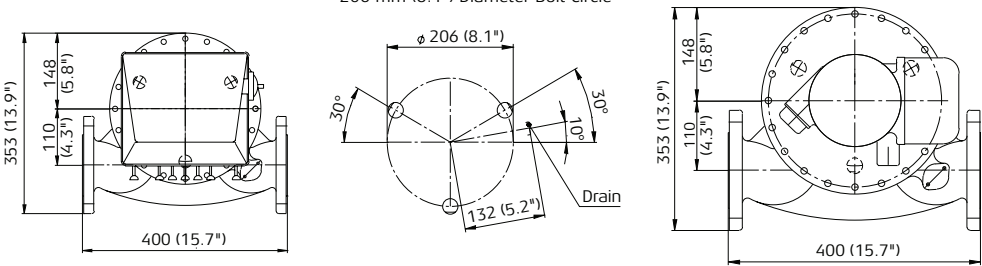
DIMENSIONS⁵
millimetres (inches)

Meter ST-160-DI with Accessories



Meter Mounting Bolt Holes

3-M10 Threaded Bolt Holes,
Equally Spaced on a
206 mm (8.1") Diameter Bolt Circle



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

Revisions included in SS0064E Issue/Rev. 0.5 (4/18):
New company branding.
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.