

The **Smith Meter™ Model ST-40** is a DN50 (2") 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 at 16 bar.
- **PED** - 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 Meter Clearances** - to extend operating temperatures from 65°C to 93°C.
- **Viton** - for increased application flexibility.
- **All Iron Construction** - for operating temperatures above 93°C.
- **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                   | 85    | 320   |
| Intermittent Rating <sup>1</sup> - Standard Trim    | 105   | 400   |
| Continuous/Intermittent Rating All Iron or LPG Trim | 75    | 285   |



Model ST-40-DI

### Minimum Flow Rate - Typical Performance

| Linearity <sup>2</sup> | Units | Viscosity (mPa•s) |    |    |     |     |      |
|------------------------|-------|-------------------|----|----|-----|-----|------|
|                        |       | 0.5               | 1  | 5  | 20  | 100 | 400  |
| ±0.15%                 | USGPM | 30                | 20 | 8  | 2.0 | 0.4 | 0.10 |
|                        | L/min | 113               | 75 | 30 | 7.6 | 1.5 | 0.38 |
| ±0.25%                 | USGPM | 20                | 15 | 6  | 1.5 | 0.3 | 0.08 |
|                        | L/min | 77                | 57 | 22 | 5.7 | 1.1 | 0.30 |
| ±0.50%                 | USGPM | 15                | 10 | 4  | 1.0 | 0.2 | 0.05 |
|                        | L/min | 57                | 38 | 15 | 3.8 | 0.8 | 0.19 |

### Repeatability

± 0.02%

### Viscosity

Standard: 400 mPa•s<sup>3</sup> (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 - 160 L/min).

### Notes:

<sup>1</sup> 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).

<sup>2</sup> Linearity based on a maximum flow rate of 85 USGPM (320 L/min).

<sup>3</sup> 1,000 mPa•s = 1,000 cP = 1 Pa•s

## 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.

## End Connections and Maximum Working Pressure

| End Connections   | Housing Material | Pressure - bar (kPa) |
|---|------------------|----------------------|
| Class 150 ANSI B16.42 raised face flanges<br>DIN EN PN16 raised face flange | Ductile Iron     | 16 (1,600)           |

## Materials of Construction

| Housing      | Internals   | Seals                              |
|--------------|---|------------------------------------|
| Ductile Iron | Iron, Steel, Stainless Steel, Aluminum<br><br><b>Optional:</b> All Iron | Buna<br><br><b>Optional:</b> Viton |

## Installation

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

## Strainer Specifications

| Type   | End Connections  | Housing Material | Pressure - bar (kPa) |
|--------|--|------------------|----------------------|
| 50-E16 | Class 150 ANSI B16.42 raised face flanges<br><br>DIN EN PN16 raised face flanges | Ductile Iron     | 16 (1,600)           |

## Meter Ordering Information

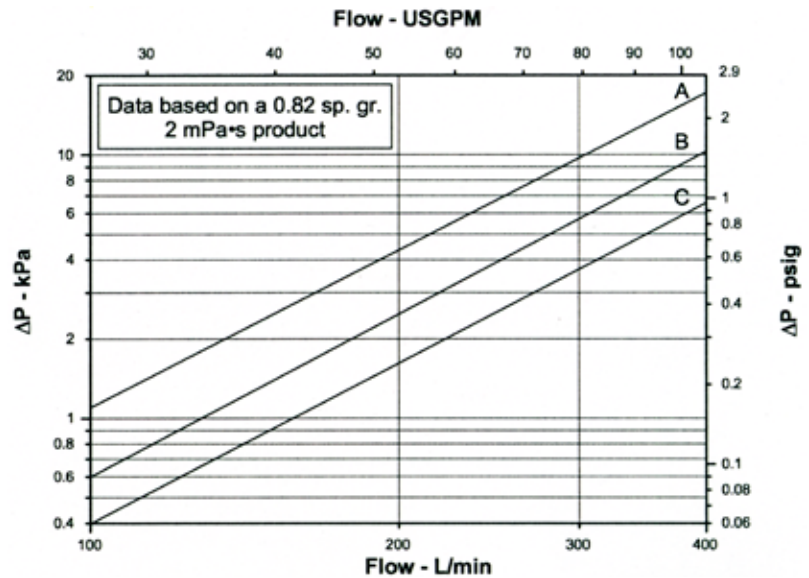
|                              |  |
|------------------------------|--|
| <b>Application</b>           | Batching, Loading, Blending, Inventory, Process Control, etc.  |
| <b>Operating Conditions</b>  | <b>Liquid</b> - Name, Viscosity (Min./Max.), and Specific Gravity<br><b>Flow Range</b> - Min./Norm./Max.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

## 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 (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), 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 pre-set with valve linkage. Microswitch package for pump control or other interlock optional.

### Pulse Transmitters

**GPST** - Dual-channel, photoelectric transmitter to ATEX (EEx)d IIB T6. Maximum output 500 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.

**PE-P Portable Photoelectric Transmitter** - General purpose enclosure. Requires Right-Angle-Drive on meter.

**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.

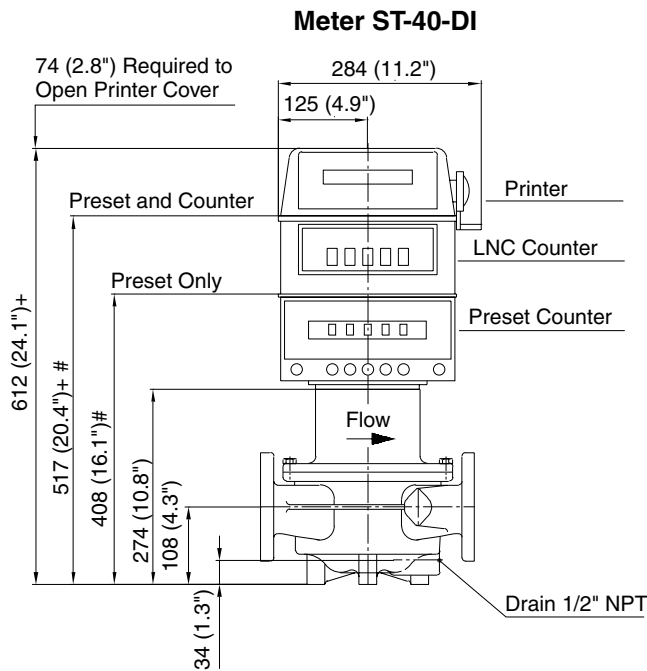
Electronic totalizers.

Load printer.

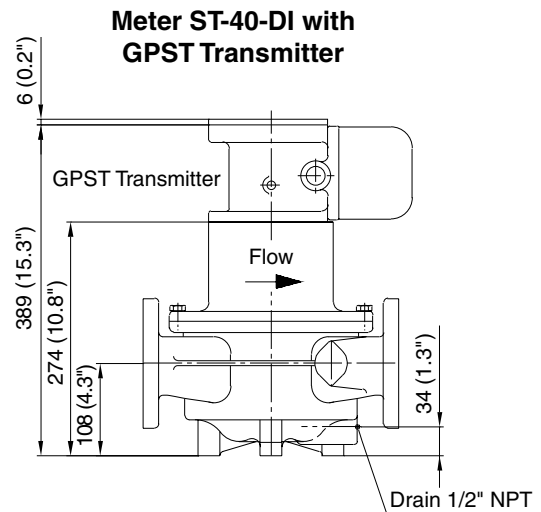
## Dimensions<sup>5</sup>

Millimetres (Inches)

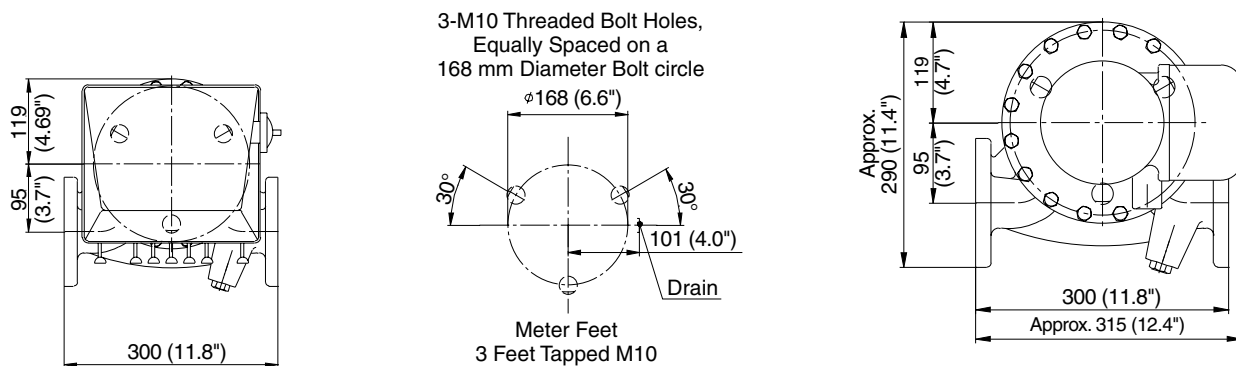
### Meter ST-40-DI with Accessories



# Includes cover  
+ Deduct 94 (3.7") if preset counter is not required



### Meter Mounting Bolt Holes



### Notes:

<sup>5</sup> Dimensions - Millimetres to the nearest whole mm (inches to the nearest tenth), each independently dimensioned from respective engineering drawings.

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.

#### Headquarters:

1803 Gears Road, Houston, TX 77067 USA, Phone: 281/260-2190, Fax: 281/260-2191

#### Gas Measurement Products:

Houston, TX USA Phone 281/260-2190  
Theftford, England Phone (44) 1842-82-2900  
Kongsberg, Norway Phone (47) 32/286-700  
Buenos Aires, Argentina Phone 54 (11) 4312-4736

#### Integrated Measurement Systems:

Corpus Christi, TX USA Phone 361/289-3400  
Kongsberg, Norway Phone (47) 32/286-700  
San Juan, Puerto Rico Phone 787/274-3760  
United Arab Emirates, Dubai Phone 971 +4/331-3646

#### Liquid Measurement Products:

Erie, PA USA Phone 814/898-5000  
Los Angeles, CA USA Phone 661/702-8660  
Slough, England Phone (44) 1753-57-1515  
Ellerbek, Germany Phone (49) 4101-3040  
Barcelona, Spain Phone (34) 93/201-0989  
Moscow, Russia Phone (7) 495/564-8705  
Melbourne, Australia Phone (61) 3/9807-2818

Beijing, China Phone (86) 10/6500-2251  
Singapore Phone (65) 6861-3011  
Chennai, India Phone (91) 44/450-4400

Visit our website at [www.fmctechnologies.com](http://www.fmctechnologies.com)