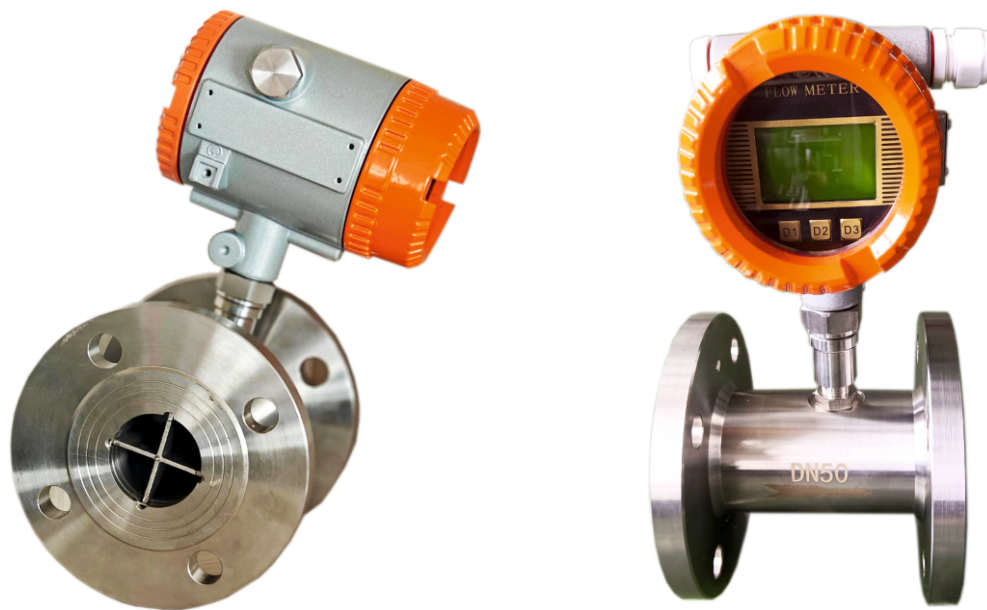


## APPLICATION

- Oil Recovery market
- Bio-pharmaceuticals
- Water Flood Secondary Recovery
- Nuclear
- Aerospace
- Well water
- Glycerin
- Chemicals ( Low conductive)
- Potable/Demineralized water
- Process Control Batching
- Chemical Feed Lines
- Food & Beverage
- Irrigation
- Pharmaceuticals
- Filling Process
- Measurement of fuel consumption
- Crude Oil
- Benzene
- Dosing systems
- Gasoline/Kerosene
- Solvents
- Metering liquid fertilizer
- Hydraulic & gear oils
- Refined products
- Coolants
- Ethylene Glycol & Alcohol
- Petroleum Products



## SPECIAL FEATURES

- Accurate & repeatable measurement
- SS construction for good corrosion resistance
- Fast response time & high resolution
- Wide temperature Range up to 150°C
- High turndown ratio with extendable flow range
- Easy installation & a variety of end connections
- Minimum maintenance required
- Long service life, even in severe applications
- Inbuilt tubular flow straightener reduces internal turbulence & gives good accuracy. Requires less space in the flow line, lowering costs & providing easy, one-man installation.
- Low to medium viscosity design for single or multi- viscosity metering applications.
- Long bearing life. Bearing replacement & clean-up are fast & easy, since all internal parts are easily accessible by removing end dome nuts.
- TFM have a low mass impeller design which allows rapid dynamic response, so they can be used in pulsating flow applications.
- Multiple communication protocol.

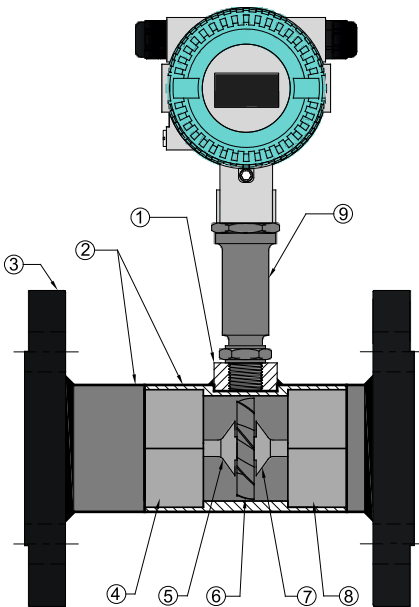
**TECHNICAL SPECIFICATIONS**

| <b>Accuracy</b>   | : $\pm 0.65\%$ of span ( 5 points )  |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
|---|--|---------------------------|--|--|-----|------|--------------------|----|---------|-------|------|---------|-----|----|---------|------|----|---------|-----|
| <b>Repeatability</b>  | : $\pm 0.2\%$ or better  |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Turn down ratio</b>  | : 10:01  |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Response time</b>  | : 4S (2~32)  |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Frequency</b>  | : 1- 3000Hz  |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Flow velocity</b>  | : 1 to 5 m/s ( for calibration )<br>: 1 to 10 m/s ( working range )  |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Temperature</b>  | : Ambient - 20 to $+55^{\circ}\text{C}$   Process- 20 to $+150^{\circ}\text{C}$  |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Viscosity</b>  | : Maximum 20000cp  |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Ambient humidity</b>   | : 5~90%RH  |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Operating pressure</b>   | : 10 to 15 Bar   |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Meter size</b>   | : DN25 to DN80   |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Process connection</b>   | : Standard - Flange Type   Optional - Threaded & Tri-Clamp Type  |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Flow meter body MOC</b>  | : Standard - SS316/ SS316L   Ss304, SS304L   |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Flow output</b>  | : 4-20A, isolated  |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Load resistance (Transmitter)</b>  | : 600 Ohm  |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Communication</b>  | : a) RS485/ Modbus RTU b) HART   |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Measured parameters</b>  | : Flow, Velocity, Totalizer  |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Filtration requirement</b><br>(Note: For safe operation of the flow meter, we suggest Filtration Requirement in order to avoid damages due to contamination) | <table border="1" data-bbox="566 1361 954 1574"> <thead> <tr> <th colspan="3">Recommended Strainer Size</th> </tr> <tr> <th>TFM</th> <th>Mesh</th> <th>Particle Max. (mm)</th> </tr> </thead> <tbody> <tr> <td>1"</td> <td>40 x 40</td> <td>0.425</td> </tr> <tr> <td>1.5"</td> <td>35 x 35</td> <td>0.5</td> </tr> <tr> <td>2"</td> <td>20 x 20</td> <td>0.55</td> </tr> <tr> <td>3"</td> <td>14 x 14</td> <td>1.4</td> </tr> </tbody> </table> | Recommended Strainer Size |  |  | TFM | Mesh | Particle Max. (mm) | 1" | 40 x 40 | 0.425 | 1.5" | 35 x 35 | 0.5 | 2" | 20 x 20 | 0.55 | 3" | 14 x 14 | 1.4 |
| Recommended Strainer Size   |  |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| TFM   | Mesh   | Particle Max. (mm)        |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| 1"  | 40 x 40  | 0.425                     |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| 1.5"  | 35 x 35  | 0.5                       |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| 2"  | 20 x 20  | 0.55                      |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| 3"  | 14 x 14  | 1.4                       |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Storage temperature</b>  | : $-20^{\circ}\text{C}$ to $+70^{\circ}\text{C}$   |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Transmitter enclosure</b>  | : IP 65  |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Transmitter housing</b>  | : Standard Polyurethane coated die cast aluminum   |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Transmitter type</b>   | : a) Integral<br>b) Remote ( Optional )  |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Transmitter Weight</b>   | : 1.470 Kg approx ( integral version )<br>( Total weight of the flowmeter will depends on the size & process connection )  |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Supply</b>   | : 24V DC   |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |
| <b>Power consumption</b>  | : 0.2W   |                           |  |  |     |      |                    |    |         |       |      |         |     |    |         |      |    |         |     |

### TURBINE FLOW METER SIZING

| Type   | Nominal Diameter |        | Standard Flow Range Water |               |               |               |
|--------|------------------|--------|---------------------------|---------------|---------------|---------------|
|        | (mm)             | (inch) | (m <sup>3</sup> /hr)      |               | (LPM)         |               |
|        |                  |        | Min @ 1 m/sec             | Max @ 5 m/sec | Min @ 1 m/sec | Max @ 5 m/sec |
| TFM 25 | 25               | 1"     | 1.76                      | 8.83          | 29.45         | 147.26        |
| TFM 40 | 40               | 1.5"   | 4.52                      | 22.61         | 75.39         | 376.99        |
| TFM 50 | 50               | 2"     | 7.06                      | 35.34         | 117.81        | 589.05        |
| TFM 80 | 80               | 3"     | 18.09                     | 90.478        | 301.59        | 1508.00       |

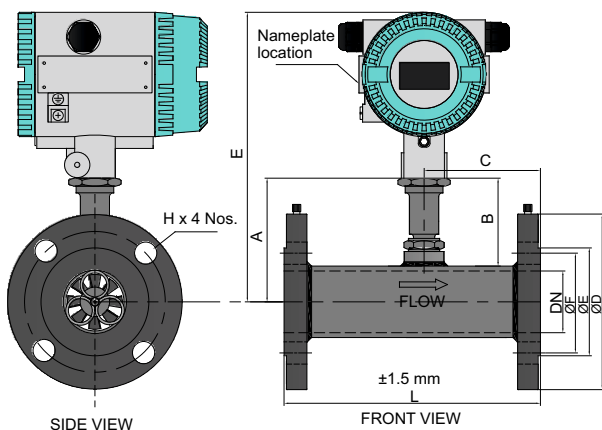
### WORKING PRINCIPLE



1. Pickup Boss
2. Flow Measuring pipe
3. Flange
4. Upstream Flow Straightner Tube
5. Upstream Diffuser
6. Impeller (Turbine Blades)
7. Downstream Diffuser
8. Downstream Flow Straightner Tube
9. Magnetic Pickup Sensor

### DIMENSION

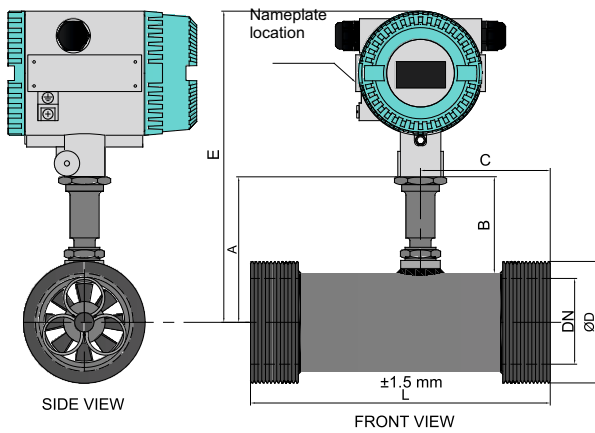
Fig 1 Flanged process connection



| Nominal Dimensions For Flowmeter With Flange #150 |            |       |      |       |      |                   |            |       |                |      |             |
|---|------------|-------|------|-------|------|-------------------|------------|-------|----------------|------|-------------|
| Meter Size  | DN<br>Inch | A     | B    | C     | ØD   | ØE (Raised Faced) | ØF (P.C.D) | G     | H(Dia of hole) | L    | Weight (Kg) |
|   |            | (mm)  | (mm) | (mm)  | (mm) | (mm)              | (mm)       | (mm)  | (mm)           | (mm) |             |
| 25  | 1"         | 94.5  | 78   | 58    | 110  | 50.8              | 79.4       | 225.5 | 16             | 150  | 3.65        |
| 40  | 1.5"       | 103   | 78.5 | 76.5  | 125  | 73.0              | 98.4       | 234   | 16             | 178  | 4.96        |
| 50  | 2"         | 108   | 77   | 80.0  | 150  | 92.0              | 120.7      | 239   | 19             | 185  | 6.58        |
| 80  | 3"         | 122.5 | 78   | 114.5 | 190  | 127               | 152.4      | 253.5 | 19             | 254  | 11.78       |

DIMENSION

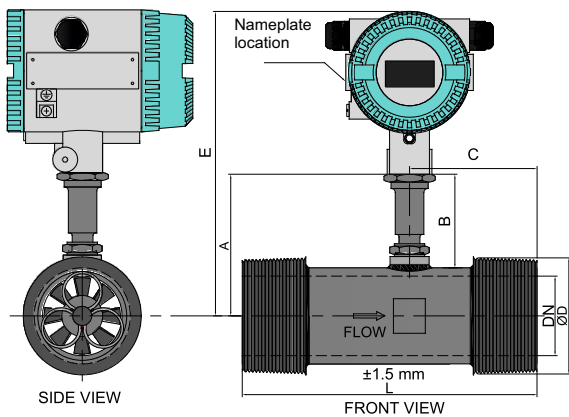
Fig 2 Threaded Type (BSPP)



**Nominal Dimensions For Flowmeter With Threaded End Connection (BSPP)**

| Meter Size |      | A (mm) | B (mm) | C (mm) | Process Connection ØD (mm) | E (mm) | L (mm) | Weight (Kg) (approx) |
|------------|------|--------|--------|--------|----------------------------|--------|--------|----------------------|
| DN         | Inch |        |        |        |                            |        |        |                      |
| 25         | 1"   | 94.5   | 78     | 58     | G1 1/4                     | 225.5  | 150    | 2.23                 |
| 40         | 1.5" | 103    | 78.5   | 76.5   | G2                         | 234    | 178    | 2.88                 |
| 50         | 2"   | 108    | 77     | 80.0   | G2 1/2                     | 239    | 185    | 3.48                 |

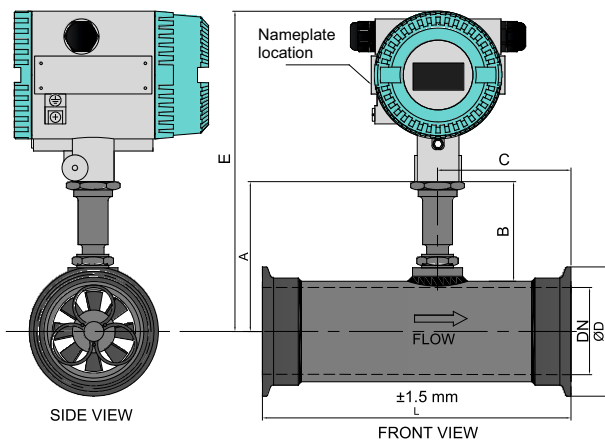
Fig 3 Threaded Type (NPT)



**Nominal Dimensions For Flowmeter With Threaded End Connection (NPT)**

| Meter Size |      | A (mm) | B (mm) | C (mm) | Process Connection ØD (mm) | E (mm) | L (mm) | Weight (Kg) (approx) |
|------------|------|--------|--------|--------|----------------------------|--------|--------|----------------------|
| DN         | Inch |        |        |        |                            |        |        |                      |
| 25         | 1"   | 94.5   | 78     | 58     | 1 1/4"                     | 225.5  | 150    | 2.26                 |
| 40         | 1.5" | 103    | 78.5   | 76.5   | 2"                         | 234    | 178    | 2.92                 |
| 50         | 2"   | 108    | 77     | 80.0   | 2 1/2"                     | 239    | 185    | 3.67                 |

Fig 4 Tri-Clover Type



**Nominal Dimensions For Flowmeter With Tri-Clover End Connection**

| Meter Size |      | A (mm) | B (mm) | C (mm) | ØD (mm) | E (mm) | L (mm) | Weight (Kg) (approx) |
|------------|------|--------|--------|--------|---------|--------|--------|----------------------|
| DN         | Inch |        |        |        |         |        |        |                      |
| 25         | 1"   | 94.5   | 78     | 58     | 50.5    | 225.5  | 150    | 2.42                 |
| 40         | 1.5" | 103    | 78.5   | 76.5   | 64      | 234    | 178    | 2.94                 |
| 50         | 2"   | 108    | 77     | 80.0   | 77.5    | 239    | 185    | 3.33                 |

**ORDERING CODES**
**1. PRODUCT CODE**
**2818**
**2818**
**2. NORMAL SIZE**

- 1A** DN 25 ( 1inch )
- 1** DN 40 ( 1.5 inch )
- 2** DN 50 ( 2 inch )
- 3** DN 80 ( 3 inch )

**1A**
**3. END CONNECTION**

- 2A** #150 Flanged Type
- B** #300 Flanged Type
- C** Threaded Type
- D** Sanitary Type ( Triclover )

**2A**
**4. FLOW METER BODY**

- SS 304/304L Stainless Steel
- SS 316/316L Stainless Steel

**1**
**5. ACCURACY**

- A** 0.5% of rate

**A**
**6. CONVERTER**

- A** No display : 24V DC: Pulse Output
- B** No display : 24VDC: 4~20mA
- C** Local display : Lithium Battery Power, No output
- D** Local display : 24VDC Power ; 4~20mA Output
- E** Local display : 24VDC Power ; 4~20mA Output : Modbus Rs485 Communication
- F** Local display : 24VDC Power ; 4~20mA Output : HART Rs485 Communication

**A**
**6. FLUID TEMPERATURE**

- 4** -20...+80°C
- 5** -20...+120°C
- 6** -20...+150°C

**4**
**ORDERING EXAMPLE : NI-TMF-2818-1A-2A-1-A-A-4**