

## LTR Series

Turbine flow meters  
with built-in loading  
valve

To 800 lpm, 480 bar

The LTR range of turbine flow meters with built-in loading valves, provide a complete solution to the flow measurement of hydraulic systems on test stands, machine tools and other fixed or mobile applications. The flow meter can be installed anywhere in the hydraulic circuit for production testing, commissioning, development testing and control systems. The compact design allows the LTR series flow meters to be installed where space is limited.

The integral loading valve provides smooth progressive pressure control in both flow directions allowing components such as cylinders or motors to be tested without re-plumbing the test connections.

A wide range of readouts and signal converters are available which provide the instrumentation needed to analyse the performance of pumps, motors, valves and hydrostatic transmissions.

### Features

FLOW: 10 - 800 lpm

PRESSURE: Up to 480 bar (7000 psi)

ACCURACY:  $\pm 1\%$  of indicated reading over a wide range (depending on readout)

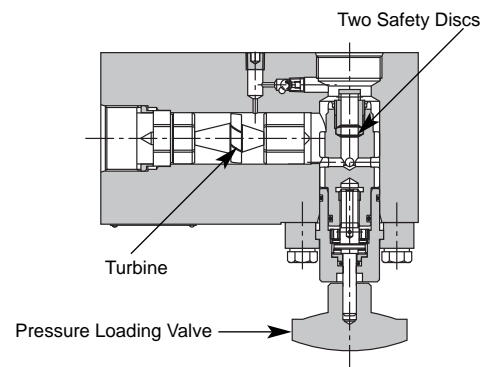
LOADING VALVE: with bi-directional flow and pressure loading capability\*

INTERPASS safety disc system, bypasses oil internally in the event of the valve being over pressurised

TEMPERATURE: sensor built-in

FLUIDS: Wide range of hydraulic, lubrication oil, and fuels

CALIBRATION: 21 cSt as standard. Special calibration possible



\*Greater flow reading accuracy is obtained in the forward direction.

*Another quality product from the Webster Range*

## Specifications

| Model Number | Accuracy & flow range when used with a Webster linearised readout |            |           |          |           |          | K factor (nominal pulses) | Max. cont. Pressure |
|--------------|---|------------|-----------|----------|-----------|----------|---------------------------|---------------------|
|              | Bottom range  |            | Mid range |          | Top range |          |                           |                     |
|              | lpm   | Accuracy   | lpm       | Accuracy | lpm       | Accuracy | Per litre                 | bar                 |
| LT250R       | 10 - 20   | ± 0.30 lpm | 20 - 250  | 1% IR    | 250 - 300 | 1% IR    | 135                       | 420                 |
| LT400R       | 10 - 20   | ± 0.50 lpm | 20 - 400  | 1% IR    | N/A       | N/A      | 135                       | 420                 |
| LT750R       | 20 - 40   | ± 0.40 lpm | 40 - 750  | 1% IR    | 750 - 800 | 1% IR    | 57                        | 210                 |
| LT750HPR     | 20 - 25   | ± 0.40 lpm | 40 - 750  | 1% IR    | 750 - 800 | 1% IR    | 57                        | 480                 |

## Measurement and indication

### Flow

Measured by the electronic count of an axial turbine that is designed to minimise the effects of variations in temperature and viscosity. A magnetic transducer monitors the speed of the turbine. Built-in flow straighteners reduce flow turbulence and allow flow measurement in both directions. To measure flows over 800 lpm see LTU bulletin for more details.

### Accuracy

All Webster flow meters have excellent repeatability giving accuracy of better than ±1% of the full-scale reading when used over their full flow range and within the viscosity band 10 - 30 cSt. Improved accuracy can be attained through special calibration for different viscosities and with frequency-flow linearisation that is offered with most Webster readouts. Depending on the readout used accuracy of 1% of the indicated reading can be obtained as shown in the table above. Please contact sales to discuss your application.

## Construction

### Flow block

High tensile aluminium block houses a six-blade turbine rotating on a stainless steel bearing and shaft. The flow straighteners and turbine design minimise the effects of turbulence and swirl, allowing the flowmeter to be connected with 90-degree bends on the inlet and outlet ports. The flowmeter block has 1/4" BSPF ports for pressure or temperature sensors. Optional loading valves, readouts and signal converters are available.

### Loading valve

The unique design of the pressure-balanced poppet ensures low handle effort throughout the flow and pressure ranges in addition to excellent tactile feedback, regardless of flow direction. In the event of overpressure, replaceable safety

### Duty cycle

LTR series flow meters can be run continuously within the bottom and mid flow ranges and intermittently in the top range. The 'HP' models have designed for heavy-duty applications with piston pumps, continuous pressure spikes or system pressures up to 480 bar.

### Temperature

Sensed by a thermistor housed in the transducer for fast response and simplified cable connection.

Resistance 30,000 ohms at 30 °C

Accuracy ± 1 °C over range 0 - 90 °C

Consult sales office for linear output temperature sensors.

discs (situated within the poppet) rupture, to internally by-pass the oil at low pressure. Safety discs with different pressure ranges up to 480 bar are available. Consult sales office for further information.

### Transducer

The self energised magnetic reluctance transducer has an output voltage of 80 mV RMS at minimum flow. The transducer output frequency is proportional to flow rate and is typically 20 - 1500 Hertz. Resistance 4300 ohms.

### Seals

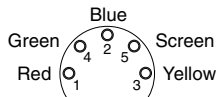
Viton seals compatible with oil, fuels, water glycol and water oil emulsions. EPDM seals for use with phosphate-ester are available. Consult sales office.

## Installation

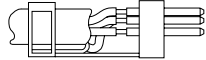
LTR turbines have built-in flow straighteners so the normal recommended length of 10Ø of straight tube can be reduced to 8 Ø where space is limited. 90-degree bends are permitted on the loading valve end of the block, but should always be of a similar bore size to that of the flowmeter to prevent venturi or constriction effects. The Webster range of flow meters can be used for intermittent or continuous testing of flow in either direction. Standard transducer output connection is 5 pin DIN. Cannon MS type connectors are available. Consult sales office for details.

## Connection Details

| Pin No. | Function   |
|---------|------------|
| 1 & 2   | Transducer |
| 3 & 4   | Thermistor |
| 5       | Ground     |



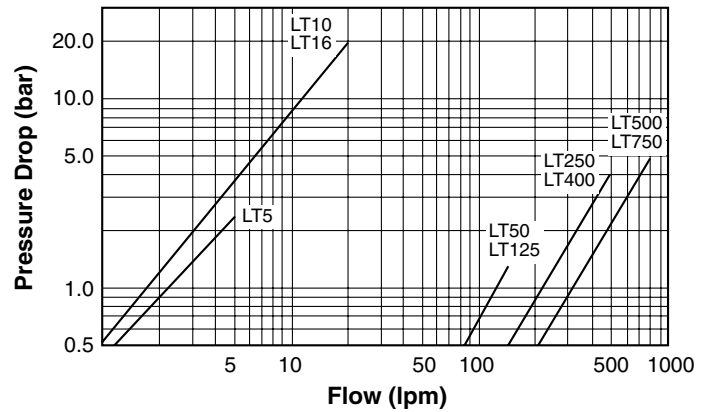
View from Solder Side



Solder screen and link wire to cable clamp as shown  
FT7884

## Pressure Drop Chart

Hydraulic Oil Viscosity 28 Centistokes



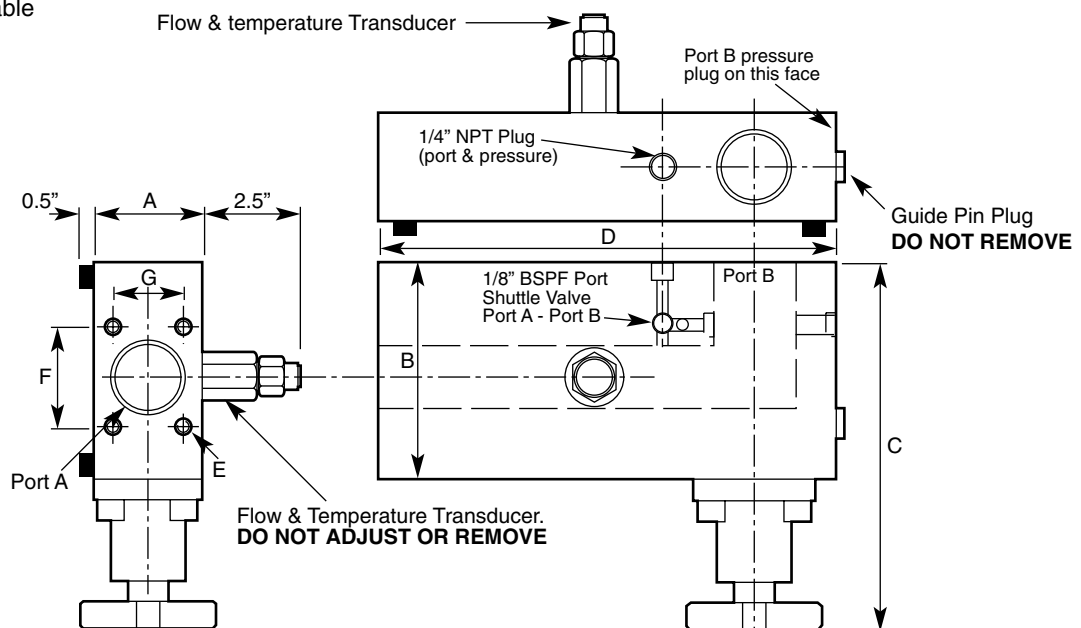
### Note

1 UK gallon = 4.546092 litres  
1 US gallon = 3.785412 litres

## LTR (Dimensions in Millimetres)

| Model No | Port Size     | A  | B   | C   | D   | E        | F  | G  |
|----------|---------------|----|-----|-----|-----|----------|----|----|
| LT250R   | 1" BSPF*      | 51 | 98  | 171 | 222 | -        | -  | -  |
| LT400R   | 1" BSPF*      | 51 | 98  | 171 | 222 | -        | -  | -  |
| LT750R   | 1 1/2" Flange | 76 | 117 | 184 | 254 | 1/2" UNC | 70 | 36 |
| LT750HPR | 1 7/8" UNF    | 76 | 117 | 216 | 235 | -        | -  | -  |

\* UNF ports available

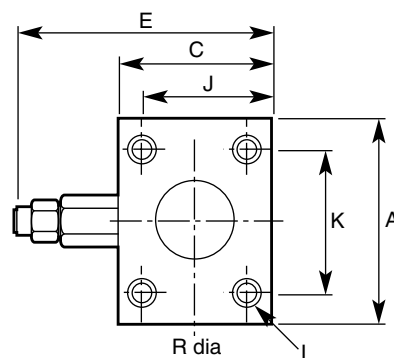
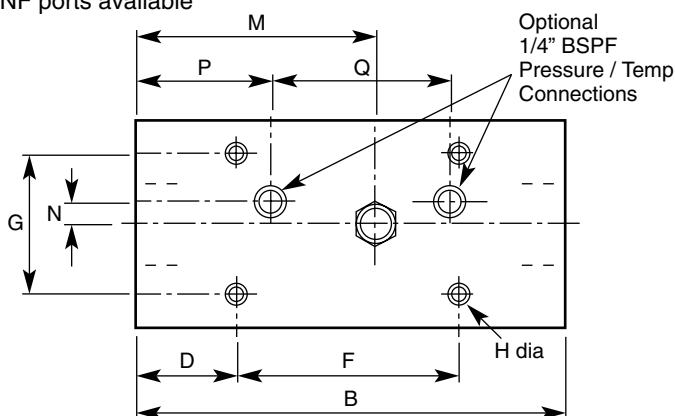


**See LT Bulletin**

**LT** (Dimensions in Millimetres)

| Model No | Port Size         | A   | B   | C  | D  | E   | F   | G  | H<br>UNC | J    | K    | L<br>UNC | M   | N   | P    | Q   | R  |
|----------|-------------------|-----|-----|----|----|-----|-----|----|----------|------|------|----------|-----|-----|------|-----|----|
| LT50     | 3/4" BSPF*        | 64  | 191 | 51 | 50 | 102 | 105 | 45 | 1/4"     | -    | -    | -        | 101 | 9.5 | 31.8 | 105 | -  |
| LT125    | 3/4" BSPF*        | 64  | 191 | 51 | 50 | 102 | 105 | 45 | 1/4"     | -    | -    | -        | 101 | 9.5 | 31.8 | 105 | -  |
| LT250    | 1" BSPF*          | 64  | 191 | 51 | 50 | 102 | 105 | 45 | 1/4"     | -    | -    | -        | 101 | 9.5 | 33.3 | 105 | -  |
| LT400    | 1" BSPF*          | 64  | 191 | 51 | 50 | 102 | 105 | 45 | 1/4"     | -    | -    | -        | 101 | 9.5 | 33.3 | 105 | -  |
| LT500    | 1 1/2" SAE Flange | 102 | 213 | 76 | 50 | 127 | 111 | 70 | 3/8"     | 35.7 | 69.8 | 1/2"     | 127 | 16  | 31.8 | 143 | 38 |
| LT750    | 1 1/2" SAE Flange | 102 | 213 | 76 | 50 | 127 | 111 | 70 | 3/8"     | 35.7 | 69.8 | 1/2"     | 127 | 19  | 31.8 | 143 | 38 |
| LT750HP  | 1 7/8" UNF        | 102 | 213 | 76 | 50 | 127 | 111 | 70 | 3/8"     | -    | -    | -        | 127 | 19  | 31.8 | 143 | -  |

\*UNF ports available

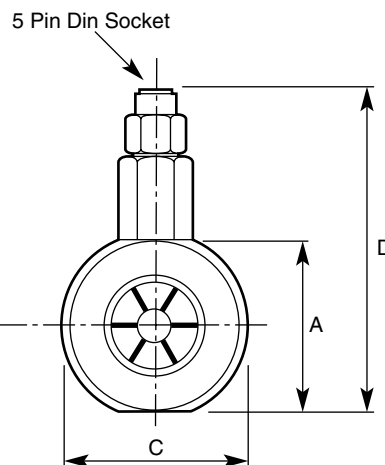
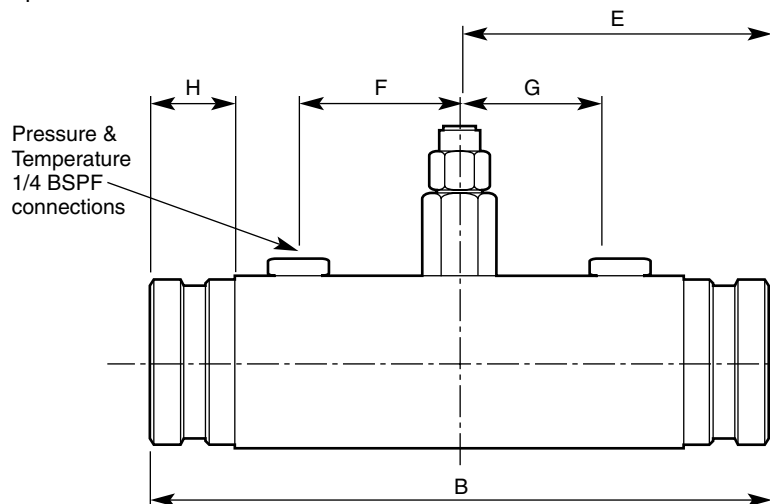


**See LTE Bulletin**

**LTE** (Dimensions in Millimetres)

| Model No | Port Size* | A    | B   | C       | D   | E    | F    | G    | H    |
|----------|------------|------|-----|---------|-----|------|------|------|------|
| LTE15    | 3/8" BSPF  | 42   | 136 | 50.8    | 102 | 68   | 42   | 42   | 23   |
| LTE30    | 3/4" BSPF  | 51   | 165 | 46 AF   | 101 | 79.4 | 44.5 | 35.5 | 28.5 |
| LTE50    | 3/4" BSPF  | 51   | 165 | 46 AF   | 101 | 79.4 | 44.5 | 35.5 | 28.5 |
| LTE125   | 3/4" BSPF  | 51   | 165 | 46 AF   | 101 | 79.4 | 44.5 | 35.5 | 28.5 |
| LTE250   | 1" BSPF    | 59.5 | 165 | 52.4 AF | 108 | 79.8 | 44.5 | 35.5 | 28.5 |
| LTE400   | 1" BSPF    | 59.5 | 165 | 52.4 AF | 108 | 79.8 | 44.5 | 35.5 | 28.5 |

\*UNF ports available



Certificate No.8242