

Introduction

Tri-gear Flowmeters are precise, reliable and rugged instruments for the volumetric flow of liquids in general industrial, petroleum and chemical applications that require high degrees of accuracy and repeatability. They operate on the Positive Displacement principle using advanced gear technology and offer a competitive alternative to their Oval Gear, Sliding Vane and Bi-Rotor alternatives.

Principal of operation

Liquid Passes into the single case measuring chamber and displaces two Tri-gears. Each rotation of a Tri-gear is proportional to a discrete unit of volume, in turn, the speed at which the gears rotate is directly proportional to flowrate. Reed and Hall Effect sensors mounted outside the pressure boundary detect the movement of the Tri-gears, thus allowing local or remote instruments to display flow total, rate of flow or facilitate batching applications.

Meters can be fitted with additional sensors to provide in phase or out of phase signals for applications such as bi-directional flow.

The Tri-Gear based flowmeter outperforms its competitors when it comes to the accurate metering of the majority of clean liquids including Solvents, Alcohols, Fuels, Oils, additives, chemicals, food bases, paints and viscous emulsions whether pumped or gravity fed. Additionally it is an excellent, higher accuracy replacement for transmitting variable area (Rotameter) flowmeters.

Benefits

- High Resolution Digital Output
- Wide Rangeability
- Bi-directional flow capability
- Digital or Analogue Outputs available.
- HART Output option.
- Less slippage than oval gear meters.
- Smoother and quieter than Oval Gear Meters.
- Dual Output standard (reed and hall effect)
- Low Mass Tri-gears facilitate fast response time to step changes in flowrate.



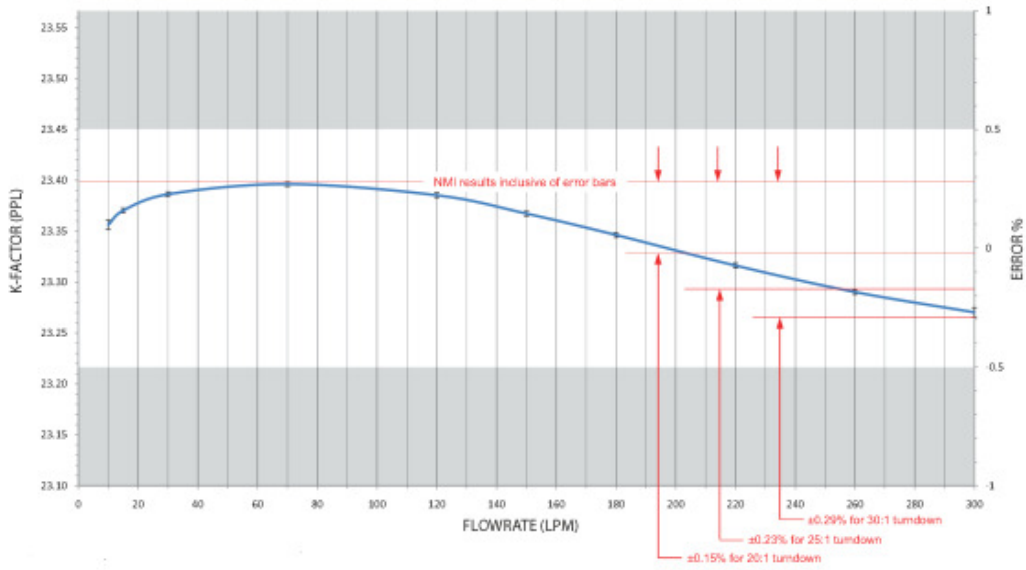
Performance and Specifications

| Model prefix: | TG008 | TG015 | TG020 | TG025 | TG040 | TG050 |
|---|--|--|--------------------|---------------------|----------------------|---------------------|
| Capacity group: | small capacity | medium capacity | | | | |
| Nominal size (inches) | 8mm (3/8") | 15mm (1/2") | 20mm (3/4") | 25mm (1") | 40mm (1.5") | 50mm (2") |
| *Flow range – litres/min – US gal/min | 0.25 ~ 9.2 0.07 ~ 2.4 | 2 ~ 50 0.6 ~ 13 | 2 ~ 50 0.6 ~ 13 | 5 ~ 150 1.3 ~ 40 | 10 ~ 250 2.6 ~ 66 | 20 ~ 500 5 ~ 132 |
| **Accuracy @ 3cp | ± 0.5% of reading | ± 0.25% of reading (15:1 turndown), ± 0.5% of reading (25:1 turndown) | | | | |
| Repeatability | typically ± 0.01% of reading | | | | | |
| Temperature range | -20°C ~ +120°C (-4°F ~ +250°F), refer factory for lower & higher temperatures | | | | | |
| Maximum pressure (threaded meters) | | | bar (PSI) | | | |
| Aluminium meters | 15 (220) | | | | | |
| 316 Stainless Steel meters | 34 (495) | 30 (440) | | | | |
| High Pressure models | refer factory | | | | | |
| Electrical – for pulse meters (see below for optional outputs) | | | | | | |
| Output pulse resolution | Pulses/litre (pulses/US gallon) – nominal | | | | | |
| Reed Switch and Hall Effect | 670 (2546) | 77 (292.6) | 77 (292.6) | 33.5 (125.4) | 11.5 (43.7) | 6.5 (24.7) |
| High Resolution Hall / Quadrature | 1340 (5092) | 154 (585.2) | 154 (585.2) | 67 (254.6) | 23 (87.4) | 13 (49.4) |
| Reed Switch output | 30Vdc x 200mA max. (maximum thermal shock 10°C (50°F)/minute) | | | | | |
| Hall Effect output (NPN) | 3 wire open collector, 5 ~ 24Vdc max., 20mA max. | | | | | |
| Optional outputs | 4 ~ 20mA, scaled pulse, quadrature pulse, flow alarms or two stage batch control | | | | | |
| Physical | | | | | | |
| Protection class | IP66/67 (NEMA4X), integral ancillaries can be supplied Intrinsically Safe | | | | | |
| Noise generation @ maximum flow | - | 75db | | | | |
| Dimensions | refer data sheet | | | | | |
| Pressure drop chart | refer data sheet | | | | | |
| Min. filtration – microns (mesh) | 75 microns (200 mesh) | 150 microns (100 mesh) | | | | |
| Approximate shipping weights (basic threaded meter) | | | kg | | | |
| Stainless Steel | 2.2 | 3.0 | 3.0 | 4.0 | 9.0 | 12.0 |
| Aluminium | 1.0 | 1.5 | 1.5 | 2.0 | 4.0 | 6.0 |

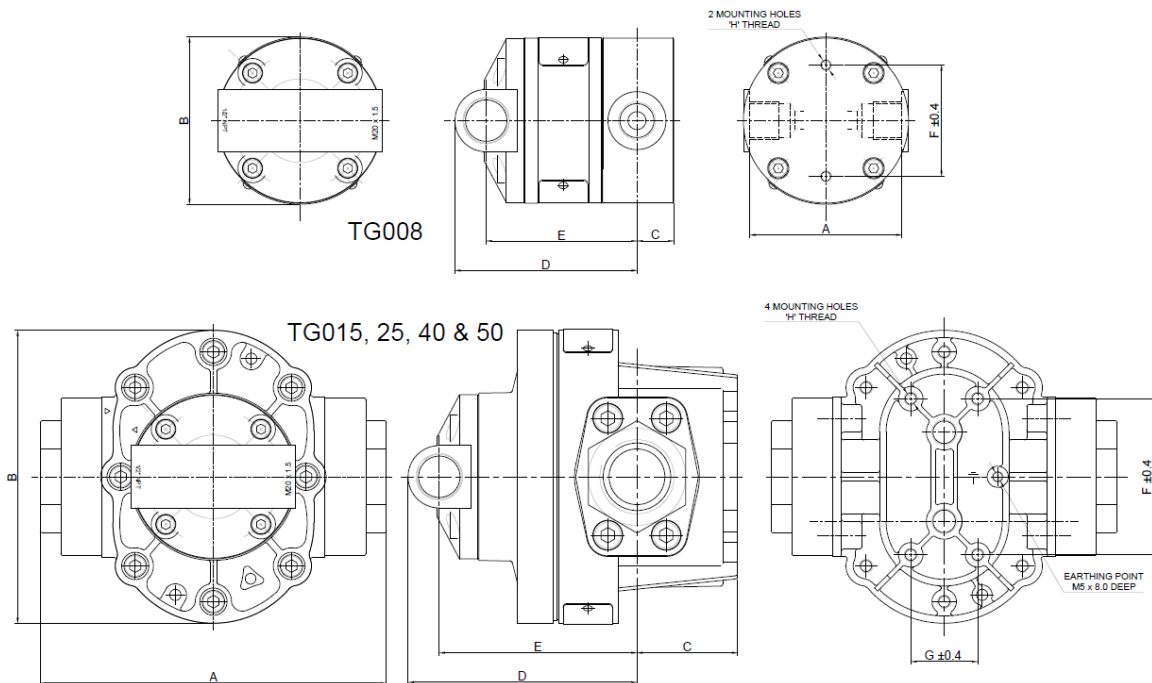
* Maximum flow is to be reduced as viscosity increases, see flow de-rating guide.

Max. allowable pressure drop is 140Kpa (20psi).

TG040A - Accuracy vs. Flowrate

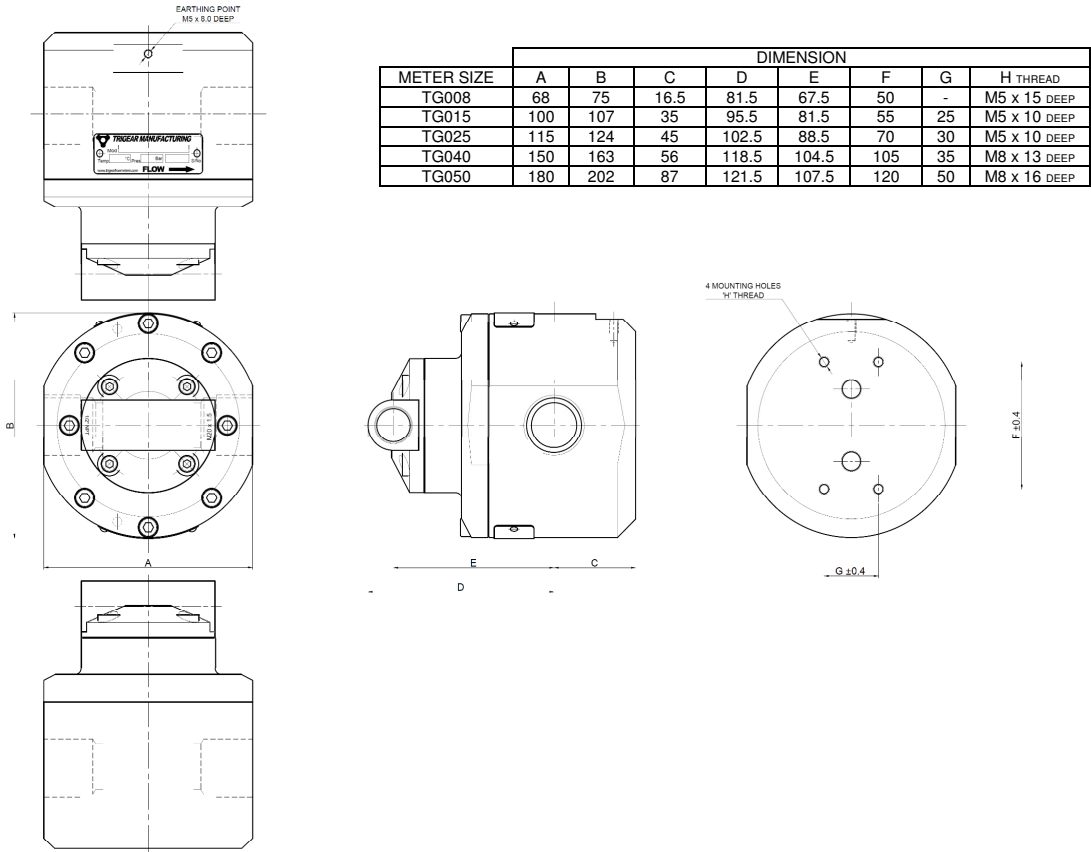


Stainless Steel Threaded Meter

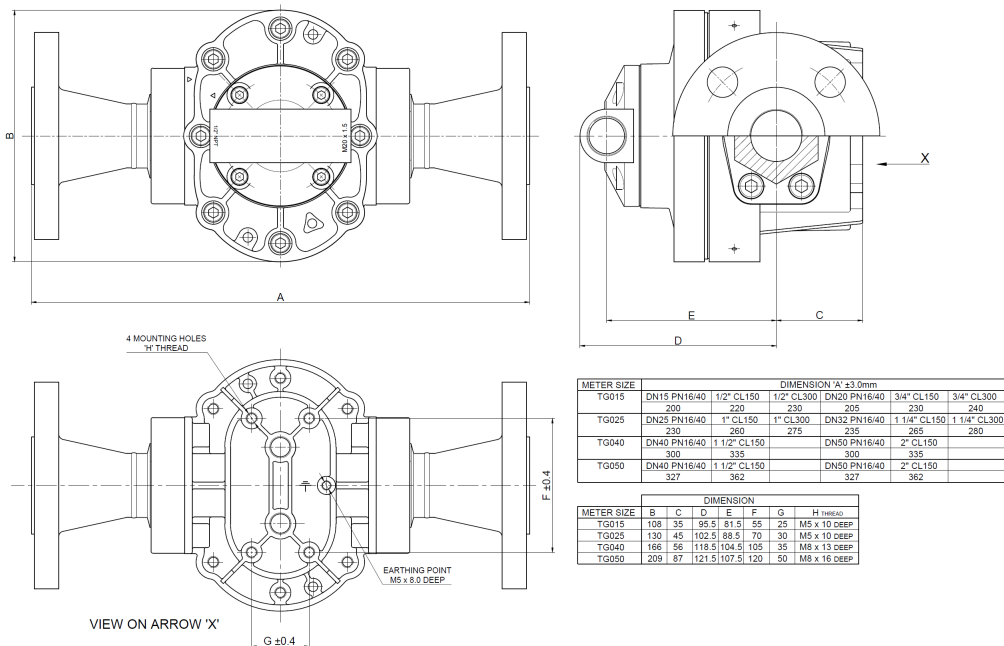


| METER SIZE | DIMENSION | | | | | | |
|------------|-----------|-----|------|-------|-------|-----|----|
| | A | B | C | D | E | F | G |
| TG008 | 68 | 75 | 16.5 | 81.5 | 67.5 | 50 | - |
| TG015 | 130 | 108 | 35 | 95.5 | 81.5 | 55 | 25 |
| TG025 | 155 | 130 | 45 | 102.5 | 88.5 | 70 | 30 |
| TG040 | 215 | 188 | 58 | 118.5 | 104.5 | 105 | 35 |
| TG050 | 242 | 209 | 87 | 121.5 | 107.5 | 120 | 50 |

Aluminium Threaded Meters



Flanged Meters



Model Designation

| Size | | | |
|---------------------|---|--------|-------------------------------------|
| TG | 008 | 3/8" | (8mm) aluminium or stainless steel |
| TG | 015 | 1/2" | (15mm) aluminium or stainless steel |
| TG | 020 | 3/4" | (20mm) aluminium or stainless steel |
| TG | 025 | 1" | (25mm) aluminium or stainless steel |
| TG | 040 | 1 1/2" | (40mm) aluminium or stainless steel |
| TG | 050 | 2" | (50mm) aluminium or stainless steel |
| Body material | | | |
| S | 316L Stainless Steel | | |
| A | Aluminium | | |
| Tri-gear material | | | |
| 1 | PPS (Ryton) | | |
| 6 | Keishi cut PPS (Ryton) - for high viscosity liquids | | |
| Bearing type | | | |
| 1 | PPS (Ryton) | | |
| O-ring material | | | |
| 1 | Viton (standard) | | |
| 2 | EPR - (Ethylene Propylene Rubber) | | |
| 3 | Teflon encapsulated viton | | |
| 4 | Buna-N (Nitrile) 100 °C (212 °F) max. | | |
| Temperature limits | | | |
| 1 | 80°C (180°F) - TG008 only | | |
| 2 | 120°C (250°F) - see note 1 | | |
| 5 | 120°C (250°F) - see note 2 | | |
| Process connections | | | |
| 1 | BSP female threaded | | |
| 2 | NPT female threaded | | |
| 4 | ANSI-150 RF flanges | | |
| 5 | ANSI-300 RF flanges | | |
| 6 | PN 16 DIN flanges | | |
| 9 | Customer nominated | | |
| Cable entries | | | |
| 1 | M20 x 15mm | | |
| 2 | 1/2" NPT | | |
| Integral options | | | |
| HR | High Resolution Hall Effect output | | |
| 420 | Analog output - Loop powered 4-20mA output option | | |
| ExH | Explosion proof - Exd I/IB T4/T6 (Hall Effect) | | |
| ISH | Intrinsically safe (I.S.) Hall Effect output | | |
| RS | Reed Switch only | | |
| 102 | Contrec 102 Rate Totaliser | | |
| 202 | Contrec 202DI ATEX I.S. Flowrate Totaliser | | |
| F112 | Fluidwell F112 ATEX I.S. Flowrate Totaliser with 4-20mA o/p and linearization | | |
| F018 | Fluidwell F018 ATEX I.S. Flowrate Totaliser with 4-20mA o/p and HART | | |
| SB | Specific build requirement | | |

Model No. Example

TG 025 A 1 1 1 - 1 2 1 HR

Notes:

1) 120°C (250°F) rating for the pulse meter, 80°C (180°F) rating with PPS Rotor and/or totalisers.

See temperature code 5 for higher temperature with totalisers.

2) Cooling fin is fitted with LCD instruments for operation between 80~120°C (180~250°F)

DSTG – 1705

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