

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

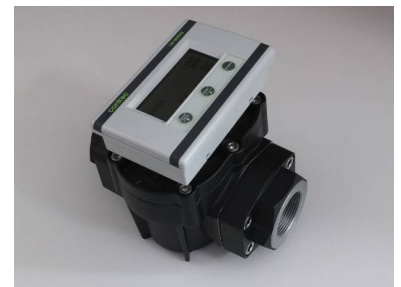
Liquid Passes into the single case measuring chamber and displaces two Tri-gears. Each rotation of a Tri-gear is proportional to a discrete unit of volume, in turn, the speed at which the gears rotate is directly proportional to flowrate. Reed and Hall Effect sensors mounted outside the pressure boundary 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.

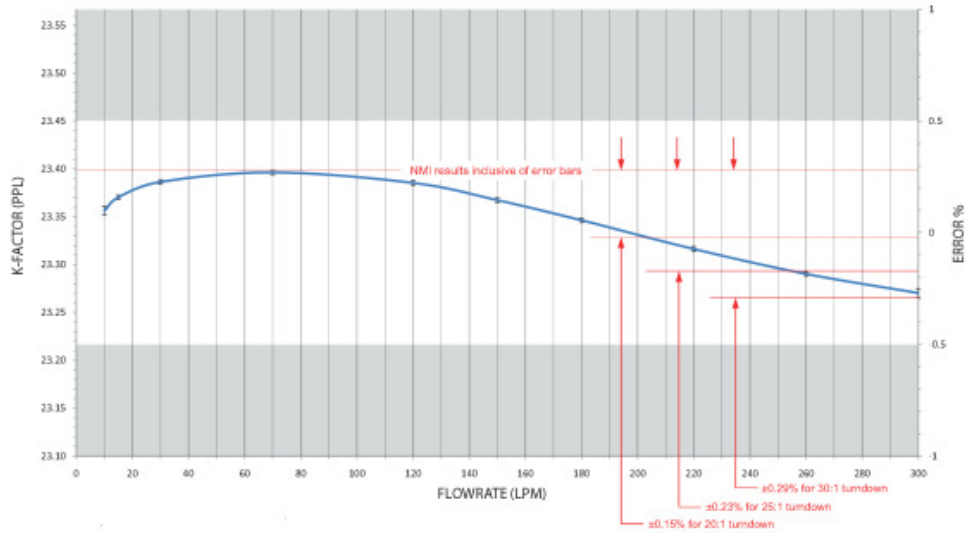


Performance and Specifications

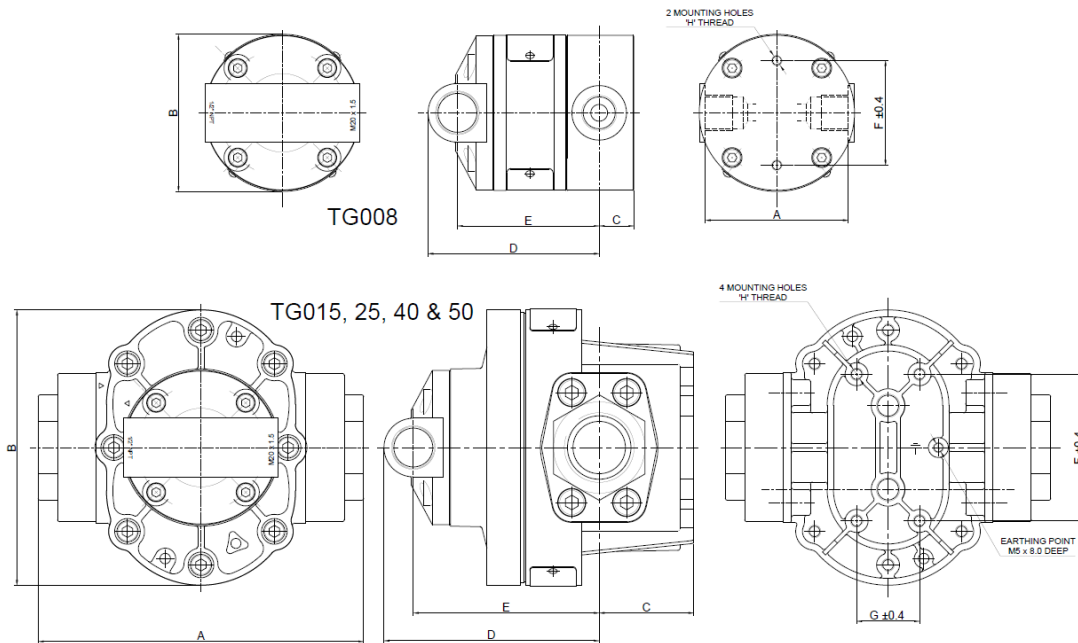
Model prefix:	TG008	TG015	TG020	TG025	TG040	TG050
Capacity group:	small capacity	medium capacity				
Nominal size (inches)	8mm (3/8")	15mm (1/2")	20mm (3/4")	25mm (1")	40mm (1.5")	50mm (2")
*Flow range – litres/min – US gal/min	0.25 ~ 9.2 0.07 ~ 2.4	1-40 0.3 ~ 10.5	2 ~ 50 0.6 ~ 13	5 ~ 150 1.3 ~ 40	10 ~ 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	30 (440)					
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

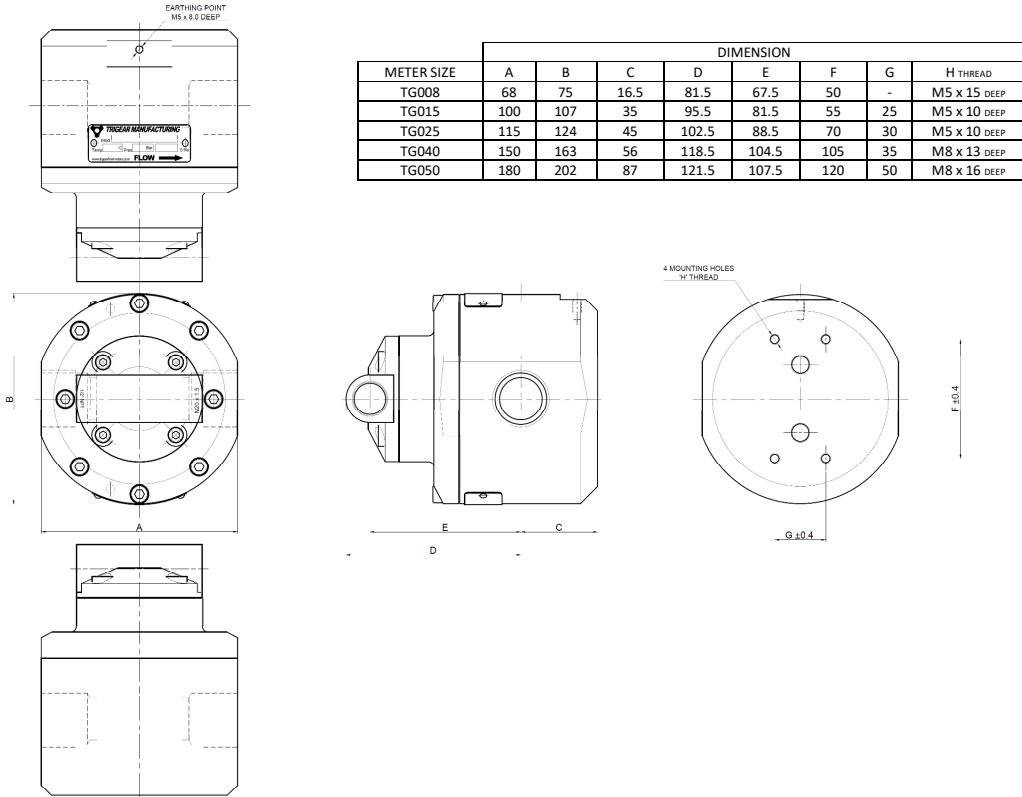


Stainless Steel Threaded Meter

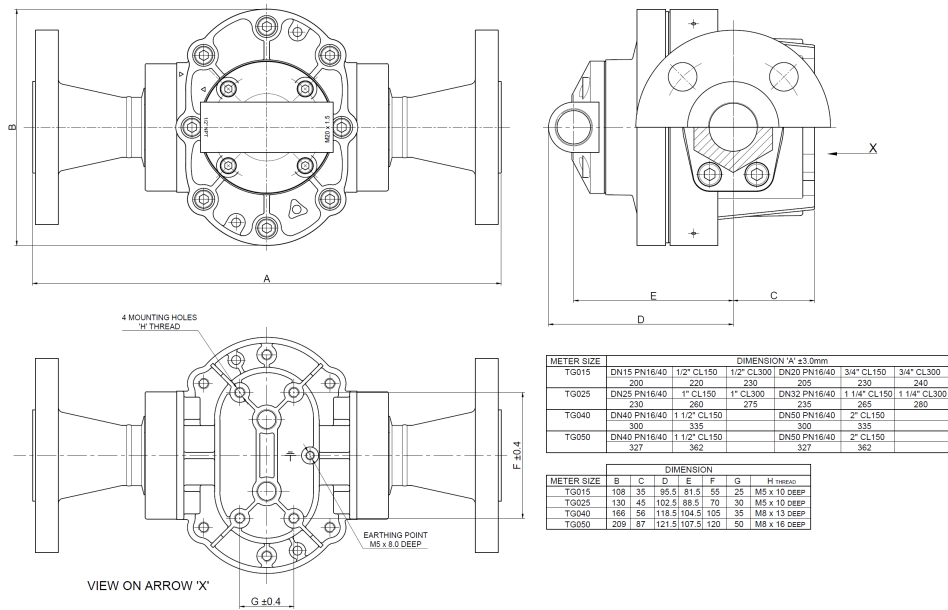


METER SIZE	DIMENSION							H mm±0.05
	A	B	C	D	E	F	G	
TG008	66	75	16.5	81.5	67.5	50	-	M5 x 12 DEEP
TG015	130	108	35	95.5	81.5	55	25	M5 x 10 DEEP
TG025	155	130	45	102.5	88.5	70	30	M5 x 10 DEEP
TG040	215	166	56	118.5	104.5	105	35	M6 x 13 DEEP
TG050	242	209	87	121.5	107.5	120	50	M8 x 16 DEEP

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)			
2	PEEK (FDA Approved Material)			
6	Keishi cut PPS (Ryton) - for high viscosity liquids			
8	Keishi cut PEEK - for high viscosity liquids			
Bearing type				
1	PPS (Ryton)			
2	PEEK (FDA Approved Material)			
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) No Heat Insulation - maximum for meter mounted readout.			
2	120°C (250°F) - Use Heat Insulator (Option 5) if meter mounted readout.			
5	120°C (250°F) - Heat Insulator fitted for meter mounted readout			
Process connections				
1	BSP female threaded			
2	NPT female threaded			
4	ANSI-150 RF flanges			
5	ANSI-300 RF flanges			
6	PN16 DIN flanges			
9	Customer nominated			
Cable entries				
0	M16 x 15mm (exclusive to FRT Rate Totaliser)			
1	M20 x 15mm			
2	1 1/2" NPT			
Integral options				
HR	High Resolution Hall Effect output			
420	Analog output - 4 wire, 4 ~20mA output option			
ExH	Explosion proof ~ Exd IIB T4/T6 (Hall Effect)			
ISH	Intrinsically safe (I.S.) Hall Effect output			
RS	Reed Switch only			
F1	FRT-00 Flow Rate Totaliser - No output - display only			
F2	FRT-AP Flow Rate Totaliser - 4-20mA output proportional to flowrate & scaled pulse output			
F3	FRT-ALP Flow Rate Totaliser - Alarm and/or scaled pulse output			
F4	FRT-BC Flow Rate Totaliser - 2 stage batch control			
102	Contrec 102 Rate Totaliser			
202	Contrec 202DI ATEX I.S. Flowrate Totaliser			
SB	Specific build requirement			

DSTG – 1921

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