# Piston Positive Displacement Flowmeter

**Rotary piston flowmeters** provide high levels of accuracy & repeatability for flowrate measurement or totalising for dispensing & batching. These meters suit a wide range of liquids including extremely viscous lubricants, chemicals & food bases to non-conductive low viscosity solvents, either pumped or gravity fed.

## Features / Benefits

- Flow: 0.2 ~ 140 litres/min
  *(0.05 ~ 37 US gal/min)*
- Size: 15mm *(1/2")*, 25mm *(1")*, 40mm *(1 1/2") female threaded, ANSI or DIN flanged*
- High accuracy & repeatability, direct reading flowmeter
- No requirement for flow conditioning *(straight pipe runs etc.)*
- Simple to install, Easy to service *(low number of parts)*
- Measures high & low viscosity liquids
- Measures conductive & non-conductive clean liquids

## Applications include:

chemicals, additives, resins, acids, alcohols, essences, edible oils, flavourings, food bases, insecticides, adhesives, latex, emulsions, paints, inks, oils, fuels, grease, solvents, lubricants

## Meter selection

Meters are selected based on flow range, pressure, temperature, material compatibility and functionality.

- ***Aluminium*** flowmeters are ideal for lubricants including oils and grease, fuels and fuel oils.

- ***Stainless steel*** flowmeters are suited for chemicals, water based products and the food, cosmetic and pharmaceutical industries.

- ***Pulse meters*** have two pulse outputs which can be interfaced to most electronic instrumentation. The reed switch is ideal for rate measurement and does not require external power. The open collector Hall Effect output produces high resolution pulses ideal for precise dispensing and preset batch control.

- ***Meters*** available with integral or remote totalisers, flow rate totalisers and preset batch controllers.

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## Specification

| Model prefix | CM84A | CM84S | CM01A | CM01S | CM46A | CM46S |
|---|---|---|---|---|---|---|
| Nominal size (inches) | 15mm (1/2") | | 25mm (1") | | 40mm (1 1/2") | |
| Flow range | 0.2 ~ 10 litres / min | | 2 ~ 50 litres / min | | 4 ~ 140 litres / min | |
| | (0.05 ~ 2.7 US gal / min) | | (0.5 ~ 13.2 US gal / min) | | (1.1 ~ 37.0 US gal / min) | |
| * Maximum flow (fuels) | - | | 55 litres / min | | - | |
| | - | | (14.5 gal / min) | | - | |
| Accuracy @ 3cp | ± 1.0% of rate (± 0.2% with optional RT12) | | ± 0.5% of rate (± 0.2% with optional RT12) | | | |
| Repeatability | typically ± 0.03% | | | | | |
| Temperature range | -10ºC ~ +120ºC (-14ºF ~ +250ºF) | | | | | |
| Maximum pressure | 30 bar (435 psi) | 100 bar (1450 psi) | 60 bar (870 psi) | 100 bar (1450 psi) | 30 bar (435 psi) | 100 bar (1450 psi) |
| **Materials** | | | | | | |
| Body materials | Aluminium | 316 stainless steel | Aluminium | 316 stainless steel | Aluminium | 316 stainless steel |
| Piston materials | PEEK | | | | | |
| O-ring materials | viton, nitrile (Buna-N), EPR or teflon encapsulated viton | | | | | |
| **Electrical** | | | | | | |
| Output pulse resolution | pulses / litre (pulses / US gallon) - nominal | | | | | |
| Reed Switch | 200 (760) | | 20 (75) | | 7.3 (28) | |
| Hall Effect | 400 (1520) | | 100 (380) | | 44 (167) | |
| **Reed Switch output | 30Vdc x 200mA max. (max. temp. shock 10ºC (50ºF) / min) | | | | | |
| **Hall Effect output | 3 wire NPN open collector, 5~24Vdc max., 20mA max. | | | | | |
| Electrical connection | M20 x 1.5mm pitch | | | | | |
| **Physical** | | | | | | |
| Process connections | 1/2"BSPP female threaded | | 1"BSPP female threaded | | 1 1/2"BSPP female threaded | |
| Protection class | IP66/67 (NEMA4X), optional Explosionproof | | | | IP66/67 (NEMA4X) | |
| Dimensions | refer <www.trimec-europe.com> | | | | | |
| Pressure drop chart | refer <www.trimec-europe.com> | | | | | |
| Chemical resistance chart | refer <www.trimec-europe.com> | | | | | |
| Recommended filtering | 150 micron (100 mesh) | | | | | |

* Maximum flow on fuels may be maintained for intermittent periods of refuelling.
* Maximum flow is to be reduced as viscosity increases, max. pressure drop 100Kpa.

## Optional functions *(with FRT instruments):*

*Flow rate display* : 7 digits, programmable engineering units
*Resettable total* : 7 digits, programmable eng. units
*Accumulated total* : 7 digits, programmable eng. units
*Preset batching* : 7 digits, programmable eng. units

## Optional outputs *(with FRT instruments):*

*Analog* : 4~20mA programmable zero & span
*Scaled pulse* : programmable (e.g. 1 pulse/litre, /10 gal etc)
*Flow rate alarms* : programmable high & low flow rate alarms

## Ordering Information

**Meter size**

| | | |
|---|---|---|
| CM84 | 1/2" | (15mm) |
| CM01 | 1" | (25mm) |
| CM46 | 1 1/2" | (40mm) |

**Body material**

| | |
|---|---|
| A | Aluminium |
| S | 316L Stainless Steel |

**Piston material**

| | |
|---|---|
| 2 | PEEK |
| 9 | Special purpose materials, e.g. for 200°C |

**Partition material**

| | |
|---|---|
| 2 | Stainless Steel |

**O-ring material**

| | |
|---|---|
| 1 | Viton *(standard - 204ºC max.)* |
| 2 | Ethylene Propylene Rubber to 150ºC |
| 3 | Teflon encapsulated viton to 150ºC |
| 4 | Buna-N *(Nitrile - 100ºC max.)* |

**Temperature limits**

| | |
|---|---|
| 1 | 60ºC (140ºF) |
| 2 | 120ºC (250ºF) (see note 1) |
| 3 | 150ºC max. (Peek piston & NPN Hall Effect output) |
| 5 | 120ºC *(see note 2)* |
| 6 | 200ºC max. (S/S meter, aluminum piston, coil output) |

**Process connections**

| | |
|---|---|
| 1 | BSP (RP) female threaded |
| 2 | NPT female threaded |
| 3 | 1 1/2" Triclamp Ferrule |
| 4 | ANSI150-RF Flanges |
| 5 | ANSI300-RF Flanges |
| 6 | DIN PN16 Flanges |
| 9 | Customer nominated |

**Cable entries**

| | |
|---|---|
| 0 | M16x1.5 (exclusive to FRT Rate Totaliser) |
| 1 | M20 x 1.5mm |
| 2 | 1/2" NPT |

Model No. Example

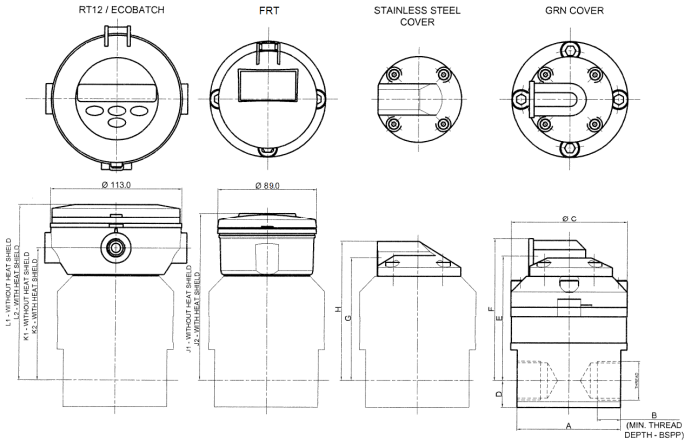
CM01 S 2 2 1 - 5 1 1 R2

**Integral options**

| | | |
|---|---|---|
| Glass reinforced nylon | 00 | GRN terminal cover |
| | SS | Stainless terminal cover |
| No output - display only | F1 | FRT-00 Flow Rate Totaliser |
| 4-20mA output proportional to flowrate & scaled pulse output | F2 | FRT-AP Flow Rate Totaliser |
| Alarm and/or scaled pulse output | F3 | FRT-ALP Flow Rate Totaliser |
| 2 stage batch control | F4 | FRT-BC Flow Rate Totaliser |
| Alarms & 4~20mA | R2 | RT12 flowrate totaliser |
| | R3 | Intrinsically Safe RT12 |
| Scaled pulse output | R4 | RT40 large LCD flowrate totaliser |
| Ecobatch | E0 | EB10 batch controller |
| Consult factory | SB | Specific build requirement |

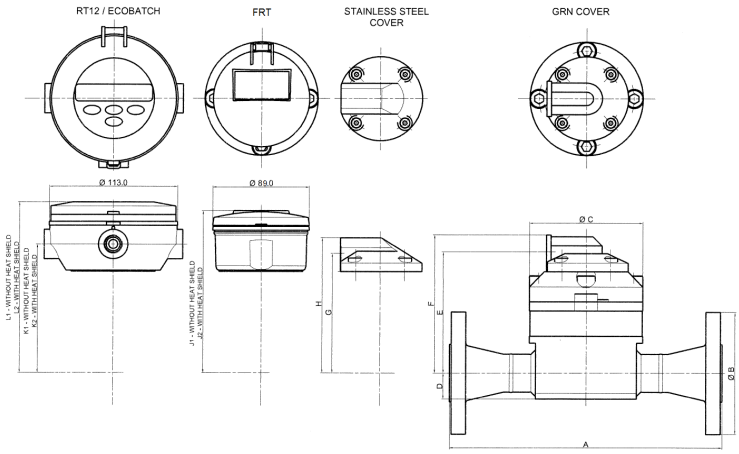
(1) 120ºC (250ºF) rating of the pulse meter, 80ºC (180ºF) rating with RT, FRT & EB integral options.
See temperature code 5 for higher temperature (with RT, FRT & EB).
(2) Cooling fin is fitted with FRT, RT or EB integral options for operation between 80~120ºC (180~250ºF).

## Threaded Meter Dimensions




| Meter | Thread | A | B | Ø C | D | E | F | G | H | J1 | J2 | K1 | K2 | L1 | L2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CM84 | 1/2" BSPP or NPT | 68 | 16 | 80 | 15 | 82.9 | 97.9 | 81.4 | 95.4 | 119.9 | 138.9 | 89.4 | 108.4 | 127.4 | 146.4 |
| CM01 | 1" BSPP or NPT | 89 | 20 | 100 | 23 | 107 | 122 | 105.5 | 119.5 | 144 | 163 | 113.5 | 132.5 | 151.5 | 170.5 |
| CM46 | 1 1/2" BSPP or NPT | 114 | 25 | 130 | 34 | 131.1 | 146.1 | 129.6 | 143.6 | 168.1 | 187.1 | 137.6 | 156.6 | 175.6 | 194.6 |

## Flanged Meter Dimensions




| Meter | Thread | A | Ø B | Ø C | D | E | F | G | H | J1 | J2 | K1 | K2 | L1 | L2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CM84 | 1/2" CL150 | 200 | 89 | 80 | 15 | 82.9 | 97.9 | 81.4 | 95.4 | 119.9 | 138.9 | 89.4 | 108.4 | 127.4 | 146.4 |
| | 1/2" CL300 | 210 | 95 | | | | | | | | | | | | |
| | DN15 PN16/40 | 180 | 95 | | | | | | | | | | | | |
| CM01 | 1" CL150 | 240 | 108 | 100 | 23 | 107 | 122 | 105.5 | 119.5 | 144 | 163 | 113.5 | 132.5 | 151.5 | 170.5 |
| | 1" CL300 | 250 | 124 | | | | | | | | | | | | |
| | DN25 PN16/40 | 210 | 115 | | | | | | | | | | | | |
| CM46 | 1 1/2" CL150 | 300 | 127 | 130 | 34 | 131.1 | 146.1 | 129.6 | 143.6 | 168.1 | 187.1 | 137.6 | 156.6 | 175.6 | 194.6 |
| | 1 1/2" CL300 | 310 | 156 | | | | | | | | | | | | |
| | DN40 PN16/40 | 265 | 150 | | | | | | | | | | | | |



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