

macnaught flow measurement



industrial flow meters

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The **M & MH** range from Macnaught are positive displacement oval gear flowmeters that are designed to cover a broad range of industrial fluid measurement applications. With versions covering **high temperature, high pressure**, as well as **hazardous locations**, there is a Macnaught Industrial flowmeter to fit virtually any industrial liquid measurement requirement.

Macnaught Industrial Flowmeters are constructed utilizing a **robust stainless steel body** suitable for use in the harshest environments. **Our bearing-less PTFE/PPS** rotors provide exceptionally **low pressure drop** and can even be used in **gravity fed applications**. This unique rotor design ensures minimal wear resulting in many **years of reliable service**. This approach has proven over time to

provide **consistently accurate flow measurement** that is not affected by variations in temperature, viscosity, or pressure.

Another benefit of our unique rotor design is simplicity of repair. With only **2 moving parts**, our meters are **simple to repair**, require minimal repair parts stock, and can even be repaired inline, resulting in **less downtime**.

Oval gear flowmeters are ideally suited to applications requiring **accurate dispense quantities**. Measurement of very **low flow rates, pulsating flow, small batch sizes, viscous products, and non-conductive liquids** are all ideal uses for oval gear meters. Because these meters don't require flow conditioning, **no straight piping runs** are required, so they can be used in installations where space is limited without effecting performance.

With **12 mechanical and digital display options** to choose from, Macnaught flowmeters are the perfect choice to suit virtually any application requirement.

Applications

- Chemical batching
- Additive Injection
- Hydraulic test stands
- High temperature chemical processes
- High pressure chemical processes
- Food and beverage batch processes
- Ethanol blending and production
- Pulp and Paper



Features

Designed and Manufactured in Australia

- Quality is controlled from concept to completion by Macnaught
- Shorter lead times and improved flexibility
- 2 years warranty

Mechanical Displays *(See Chart 1)*

- IP67 Versions for use in high pressure washdowns
- Low-cost version with plastic housing
- Enhanced Accuracy

Electronic Displays *(See Chart 1)*

- All displays have resettable and non-resettable totals
- 4-20mA and pulse output versions
- Batch controllers
- Meter mounted and remote displays
- Compact version for use with small meters or where space is limited
- Intrinsically safe for use in hazardous areas

Bearingless PPS Rotors *(Standard)*

- Minimize Wear
- Low Pressure Drop
- Quiet Operation
- Simple Repairs
- Reduced Friction

Modular End Connections *(See Chart 2)*

- Flexible Inventory for Faster Delivery
- Wide Variety of Connection Types
- Threaded Mounting Holes

316SS Body

- Robust Design
- Suitable for use in the harshest outdoor environments

Strainers and Air Eliminators Available *(See Chart 1&2)*

Meter Selection

Step 1 Verify Fluid Compatibility & Application Conditions

Determine if your fluid is compatible with the wetted parts of the meter. All wetted parts are made from: 316SS, FEP, and PPS. Also determine if the Pressure and Temperature are within the stated limits.

Tips: If the temperature is between 80-120C, use high temperature SS rotors (step 4). We also offer high pressure models if the operating pressure is beyond the limits of our standard Industrial meters.

Step 2 Choose the model based on your flow rate *(see Flow Range Chart)*

Tips: If possible, choose a meter model where your expected flow rates fall between 20-80% of the maximum flow range for optimum performance. If you are measuring a high viscosity fluid (over 1000cp), the maximum flow range will be lower. You should consult the factory if you are unsure which model you need.

Step 3 Choose your connection thread type

Tips: We also offer flange adaptor kits for all of our meters from M025 and larger (see step 6). We offer ANSI 150, DIN PN16, and JIS flange adaptors. Our adaptors can be fitted to any of our meters regardless of the threaded connection type. Flange adaptors are ordered separately in step 6. Please note that if you order a mechanical meter and want NPT threads with display in Litres, a type "3" connection should be specified. Also note that the F050 and larger meters do not include threaded connections. The adaptors must be ordered separately.

Step 4 Choose Rotor Type

Tips: Choose high viscosity rotors if the fluid is above 1000cp. If the fluid is between 100 and 1000cp and the flow rate is over 50% of the maximum rated flow of the meter, high viscosity rotors can be used if lower pressure drop is required. Choose High Temperature SS rotors if the process temperature will be between 80-120C.

Step 5 Choose Mechanical Display or Pulse Output options

Tips: Choose a pulse output if you want to use a digital display. The Digital displays are listed in the next step and can either be mounted on the meter or remotely. Our standard pulse output comes with both hall effect sensor and reed switch outputs. If you are installing the meter in a hazardous environment, you can choose option "2" which will give you 2 reed switches, which classifies the electrical output of the meter as a "simple device".

Step 6 Choose Accessories *(See Charts 1&2)*

Tips: All of our digital displays can be mounted either locally on the meter itself, remotely on a wall, on a panel, or nearby on the piping. Just choose the functions you need and the housing type you require. If you are looking for flanged end connections, you can also order the appropriate flange type here. Our strainers all come with the appropriate mesh size for the meter that they fit, so the connection size is the only choice you need to make.

Technical Specifications

Materials of construction

- Meter Body
 - Stainless Steel
- Rotor Materials
 - PPS/PTFE *(Models 012/025/040/050)*
 - Stainless Steel *(Models 006/009/075/100)*
- Seal Material
 - FEP/PTFE Encapsulated

Total Flow Range

- 0.008 – 1200 L/min
- 0.002 – 317 USG/minz

Temperature Range

- -40 – 80°C / -40 - 176 °F
(Applies to Models 012/025/040/050)

- -40 – 120°C / -40 - 248 °F
(Applies to standard Models 006/009/075/100.

**Note: For all other Models the "High Temp Rotor" option must be chosen*

Display Options

- 12mm LCD digital display
- 17mm LCD digital display
- Analogue Mechanical Display*
- 12mm Resettable Mechanical Totaliser*
- 17mm Resettable Mechanical Totaliser*

**Note: Please refer to 'part number' selection*

Outputs options

- 4-20mA (passive)
- Transistor
- Pulse Output
- Alarm

Compliance (as applicable)

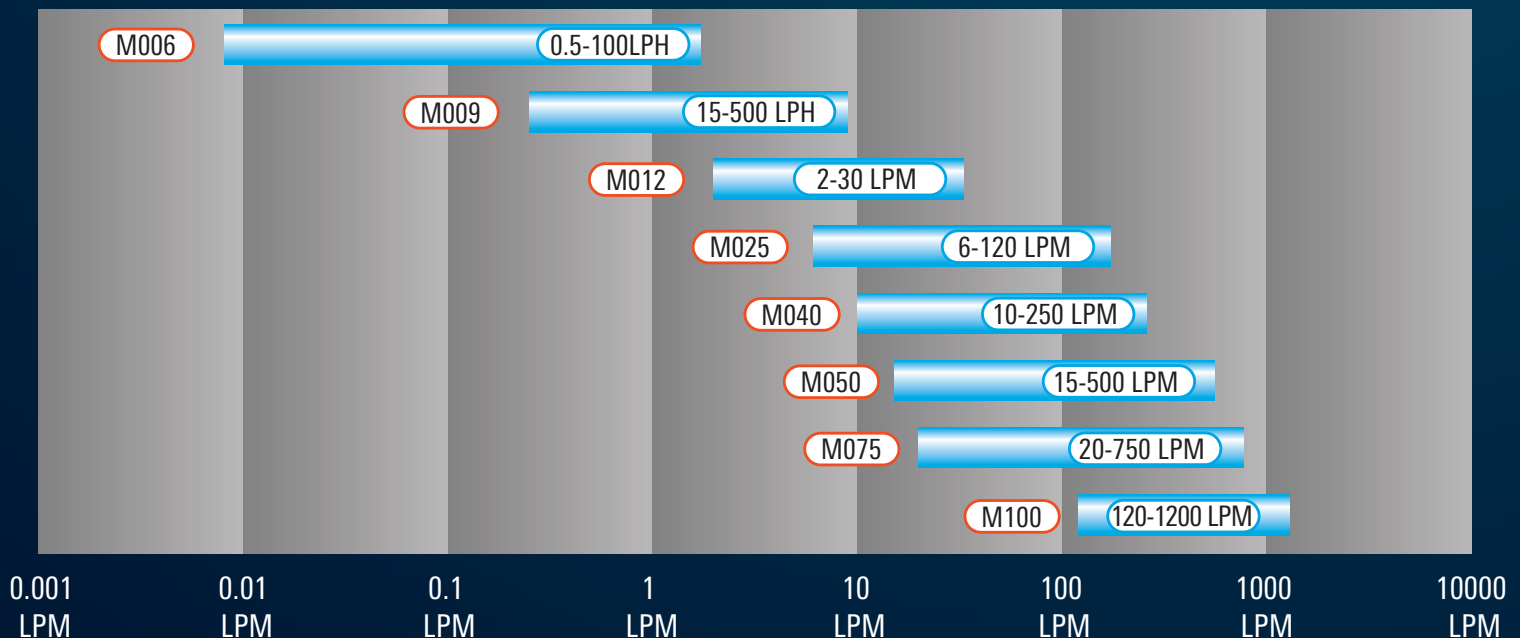
- Meters
 - CE (Certificate of Conformity)
- Displays
 - ATEX
 - IECEx

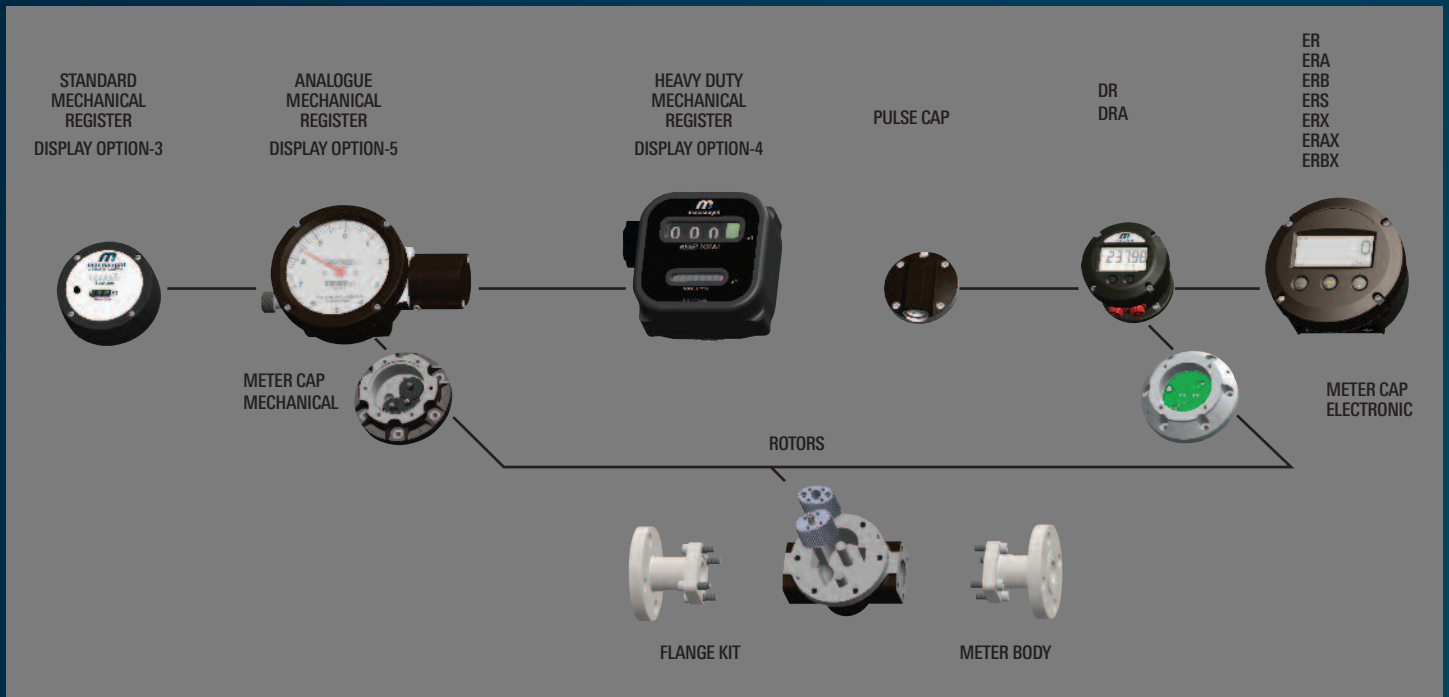
Part Number Selection

| | | | | |
|----|--|---------------------|----------------------------|--|
| M | Industrial Meters | | | |
| MH | High Pressure Industrial Meters (Models 006-012) | | | |
| | Model | Nominal Size | Flow Range | Max Pressure |
| | 006 | 1/4" | 0.5-100 lph/ 0.13-26.4 gph | 55 Bar/800 PSI (MH-550 Bar/8000 PSI) |
| | 009 | 1/4" | 15-500 lph/ 4-132 gph | 55 Bar/800 PSI (MH-550 Bar/8000 PSI) |
| | 012 | 1/2" | 2-30 lpm/ 0.5-8 gpm | 55 Bar/800 PSI (MH-200 Bar/3000 PSI) |
| | 025 | 1" | 6-120 lpm/ 1.6-32 gpm | 83 Bar/1200 PSI |
| | 040 | 1.5" | 10-250 lpm/ 2.64-66 gpm | 69 Bar/1000 PSI |
| | 050 | 2" | 15-500 lpm/ 4-130 gpm | 55 Bar/800 PSI |
| | 075 | 3" | 20-733 lpm/ 5-194 gpm | 12 Bar/175 PSI |
| | 100 | 4" | 120-1200 lpm/ 31.7-317 gpm | 12 Bar/175 PSI |
| | | Port Type | | |
| | | 1 | BSP (Rp) | (Port adaptors MUST be ordered separately on models 050 and larger) |
| | | 2 | NPT | (Port adaptors MUST be ordered separately on models 050 and larger) |
| | | 3 | NPT-Litre Calibration | (Port adaptors MUST be ordered separately on models 050 and larger) |
| | | | Rotor Type | |
| | | | S | Standard |
| | | | V | High Viscosity (M009 and Larger/Stainless Steel Rotors) |
| | | | T | High Temperature (Stainless Steel) |
| | | | | Display Type |
| | | | | 1 Electronic Pulse Meter- Reed Switch and Hall-Effect Outputs |
| | | | | 2 Reed Switch Only- for Hazardous Location Service |
| | | | | 3 Standard Duty Mechanical Register (models M012-M050 only, Max. Pressure 35 Bar/500PSI) |
| | | | | 4 Heavy Duty Mechanical Register (models M025 - M050 Max. Pressure 35 Bar/500PSI) |
| | | | | 5 Analogue Mechanical Register (models M025 - M050 Max. Pressure 35 Bar/500PSI) |
| M | 025- | 1 | S | 1 (example part number M025-1S1) |

Flow Range Chart

flow rate litres per minute





Accessories

(see specification sheets for part numbers)



Chart 1

| | Mechanical Registers | | | Digital Displays | | | | | | | | | |
|--------------------------------|----------------------|------|-----|------------------|------|------|------|------|------|------|------|------|--|
| Meter Mounted Displays | M | MR | MA | DR | DRA | ER | ERA | ERB | ERS | ERX | ERAX | ERBX | |
| Total | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |
| Resettable Total | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |
| Flow Rate Display | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |
| Pulse Output | | | | | ■ | | ■ | | ■ | | ■ | | |
| 4-20 mA Output (Passive) | | | | | ■ | | ■ | | ■ | | ■ | | |
| Alarm Output | | | | | ■ | | | | | | | | |
| Batch Control (Transistor Out) | | | | | | | | ■ | | | | ■ | |
| Net Use Function | | | | | | | | | ■ | | | | |
| Intrinsic Safety | | | | | | | | | | ■ | ■ | ■ | |
| Aluminium Housing IP67 | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |
| Plastic Housing | ■ | | | | | | | | | | | | |
| Digit Size (mm/ in.) | 5mm | 17mm | 5mm | 12mm | 12mm | 17mm | 17mm | 17mm | 17mm | 17mm | 17mm | 17mm | |

Chart 2

Strainers and Flange Adaptor Kits

*when flange adaptors are used, pressure rating reverts to flange rating

| | F006 | F009 | F012 | F019 | F025 | F040 | F050 | F075 | F100 |
|---------------|------|------|------|------|------|------|------|------|------|
| SS Y-Strainer | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | |
| ANSI | | | | | ■ | ■ | ■ | ■ | ■ |
| DIN | | | | | ■ | ■ | ■ | ■ | ■ |
| JIS | | | | | ■ | ■ | ■ | ■ | ■ |
| BSP (Rc) | | | | | ■ | ■ | ■ | ■ | ■ |
| NPT | | | | | | | ■ | ■ | ■ |

Trust Macnaught

Established in 1948, Macnaught has a 60 year tradition of excellence in manufacturing. Macnaught began marketing flowmeters in 1965 and has been manufacturing oval gear flowmeters since the early 1990's. Our decades of experience have resulted in a simple, robust, and highly accurate family of flowmeters that are optimized to suit a broad range of applications and markets. Macnaught offers optimized solutions for Fuel and Oil measurement, Bulk Fuel Custody Transfer, Corrosive Chemicals, Solvents, and a wide variety of other industrial liquids.

With full ISO 9001 and 14001 accreditation, you can be secure in the knowledge that quality and environmental responsibility are at the forefront of every decision at Macnaught.

Trust Macnaught to deliver the performance, value, and reliability required in today's most demanding environments. With distributors in over 60 countries and global sales support, Macnaught has become a global leader in fluid management solutions. Our focus on oval gear flow measurement reflects our commitment to excellence in providing optimized solutions for fluid management applications.

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