

# ICM

## In-line Contamination Monitor



- Low Cost & Compact
- Water & Dust Resistant
- Real time system analysis
- Easy integration to control systems
- Simple installation & operation
- Available in ATEX version



## Applications

*When it comes to condition monitoring, MP Filtri Ltd provide the expertise & response required by a fast moving global hydraulic industry.*

*A continual focus on quality & business improvements means that we can provide the best solution and service for our customers.*

- Diesel Systems
- Test Rigs
- Lubrication
- Mining/Heavy Engineering
- Renewable Energy
- Motorsport
- Harbour systems
- Off-shore
- Aviation Systems
- Emerging technologies



# ICM

## In-line Contamination Monitor

The ICM automatically measures and displays particulate contamination, moisture and temperature levels in various hydraulic fluids. It is designed specifically to be mounted directly to systems, where ongoing measurement or analysis is required, and where space and costs are limited.

- 8 channel contamination measurement & display
- Measures and displays ISO 4406:1999, NAS 1638, AS 4059E and ISO 11218
- Moisture and temperature sensing
- Data logging and 4000 test result memory
- Manual, automatic and remote control functionality
- Multicolour LED and remote alarm signaling
- Robust die cast aluminium construction
- LPA View software (included)



### Specification

|                                 |  |
|---------------------------------|--|
| <b>Technology</b>               | LED Based Light Extinction Automatic Optical Particle Counter  |
| <b>Particle Sizing</b>          | >4,6,14,21,25,38,50,70 µm(c) to ISO 4406 1999 Standard   |
| <b>Analysis Range \ Formats</b> | ISO 4406: 1999 Code 0 to 25<br>NAS 1638 Class 00 to 12<br>AS4059 Rev.E. Table 1&2 Sizes A-F: 000 to 12 ISO 11218 00-12<br>(Lower Limits are Test Time dependent) |
| <b>Accuracy</b>                 | ± ½ code for 4, 6 14µm(c).<br>± 1 code for larger sizes.   |
| <b>Calibration</b>              | Each unit individually calibrated with ISO Medium Test Dust (MTD) based on ISO 11171 (1999), on equipment certified by IFTS.                                     |
| <b>Operating Flow Rate</b>      | 20 - 400 ml/minute   |
| <b>Viscosity Range</b>          | ≤ 1000 cSt   |
| <b>Fluid Temperature</b>        | -25 to +80 °C *Pressure limited  |
| <b>Pressure Max</b>             | 400 barg. *Temperature limited<br>* For high frequency pressure pulse applications contact MP Filtri Ltd   |
| <b>Test Time</b>                | Adjustable 10 - 3600 seconds. Factory set to 120 seconds   |
| <b>Moisture Sensing</b>         | % RH (Relative Humidity) ±3%   |

|                                    |   |
|------------------------------------|---|
| <b>Temperature Measurement</b>     | ±3°C  |
| <b>Flow rate measurement</b>       | Indication only   |
| <b>Data Storage</b>                | 4000 tests.   |
| <b>Comms Port</b>                  | RS485, RS232, MODBUS, CANBUS  |
| <b>Ambient Temperature min/max</b> | -25°C to 80°C non K version<br>-25°C to 55°C K version  |
| <b>Environmental Protection</b>    | IP 65/67 versatile<br>IK04 Impact Protection  |
| <b>Weight</b>                      | 1.15kg  |
| <b>Electrical Supply</b>           | Voltage 9-36V DC  |
| <b>Supply Current</b>              | 12V      24V      36V<br>Basic Unit      70mA      40mA      30mA<br>With -K (Keypad)      150mA      80mA      60mA  |
| <b>Power Consumption</b>           | <2.2W   |
| <b>Outer Casing Finishes</b>       | Anodised Aluminium (dark grey)<br>Polyester Vinyl Paint (light grey)  |
| <b>Wetted parts</b>                | M - C46400 Cu alloy, 316 stainless steel, viton, FR4, sapphire.<br>N - 316 stainless steel, viton, sapphire.<br>S - 316 stainless steel, perfluoro elastomer, sapphire, EPDM. |

## W Water and Temperature Sensing



The ICM “W” option indicates water content as a percentage of saturation and oil temperature in degrees centigrade. 100% RH corresponds to the point at which free water can exist in the fluid. i.e. the fluid is no longer able to hold the water in a dissolved solution.

The sensor can help provide early indication of

costly failure due to free water, including but not exclusive to;

- Corrosion
- Metal surface fatigue e.g. bearing failure
- Reduced lubrication & load carrying characteristics

## M N S Fluid Compatibility

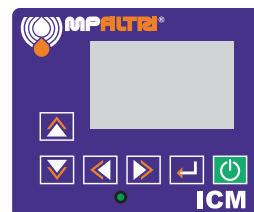
The ICM can operate across a number of fluid types meeting the needs of most major hydraulic markets.

|           | Wetted parts                                    | Typical fluids                               |
|-----------|---|--|
| <b>M</b>  | Brass, Viton & FR4                              | Synthetic, diesel, petroleum & mineral based |
| <b>N*</b> | Austenitic Stainless Steel & Viton              | Off-shore & water based fluids               |
| <b>S*</b> | Austenitic Stainless Steel & Perfluoroelastomer | Phosphate Ester & Aggressive**               |

\*Please note: the N & S versions are supplied with an anodised aluminium case and are not available with water sensor option. M versions are available with polyester vinyl paint finish or anodised finish. Where anodised finish is required, please specify at time of order. See specification table for more details \*\*Consult MP Filtri. Visit [mpfiltri.co.uk](http://mpfiltri.co.uk) for detailed fluid specification compatibility.

## K Keypad Option

Keypad – Adds 6 key keypad and 128 x 64 pixel back-lit graphical display.



K version



Non K version  
(OEM Product)

## R Relays



The ICM “R” option displays & operates over 8 channels comprehensively covering all of the applied standard formats. It allows fully customisable alarm settings and indicates these via a multicolour LED and/or remote customer control systems.

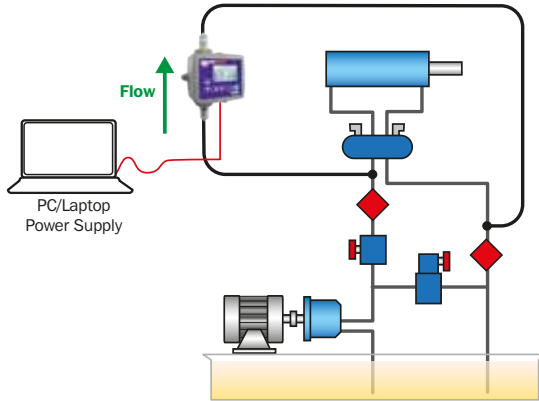
### Alarm Types

- Contamination codes and/or individual particle sizes
- Water content
- Temperature

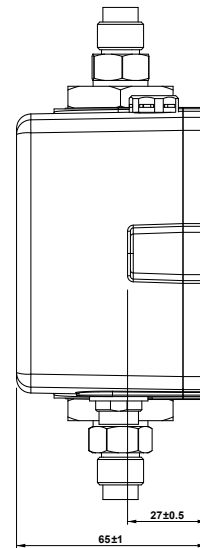
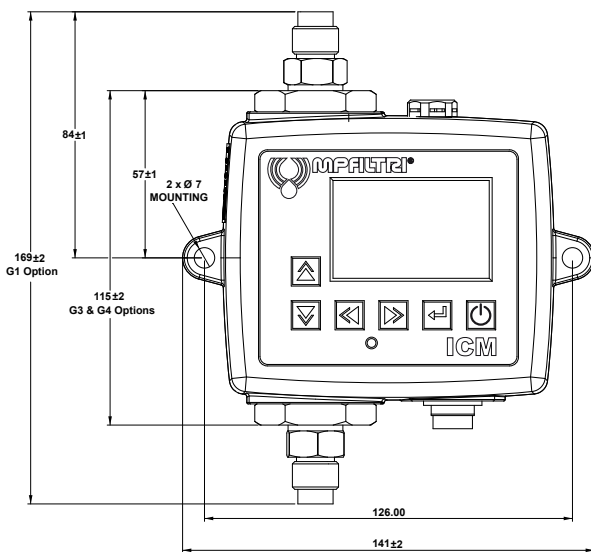
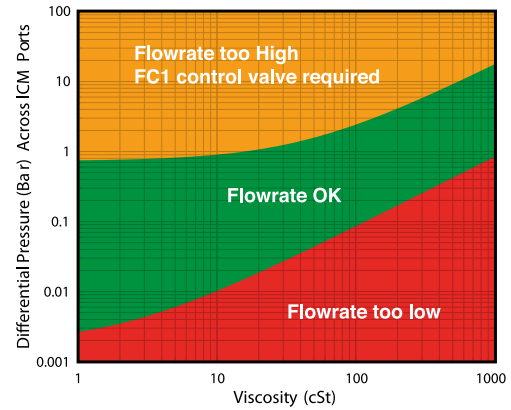
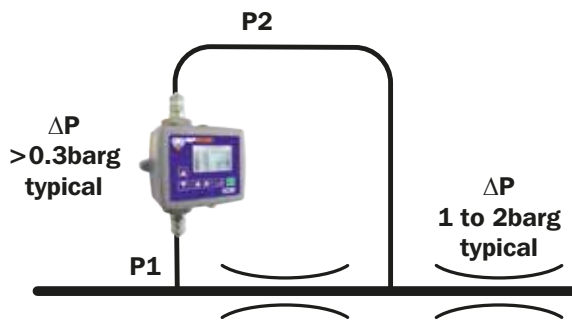
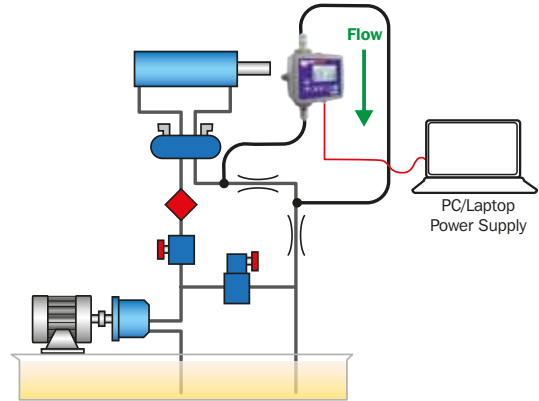
\* Note; When purchasing an “R” model, the alarms are factory set to off, and must be activated via LPA View

# ICM – Installation Guidance

Typical Pressure Line



Typical Return Line



The ICM must be in a vertical orientation, with the oil flowing upwards through it.

# Accessories

## Auxiliary Communications

Two auxiliary communication devices are available to order with the ICM. A USB interface which allows for communication via a laptop (RS485 to RS232 converter) & an ethernet device for remote access via a network hub.

Both devices can transmit power to the ICM/RDU electrical circuit using a DC power adapter. The USBi has the additional benefit of supplying power via the USB cable directly.

Both devices come with a DC Power adapter and 3m twisted pair cable as standard.

### How to Order

|     |      |
|-----|------|
| ICM | USBi |
| ICM | ETHi |



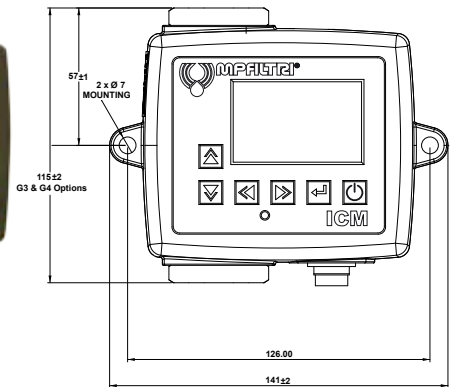
## ICM-RDU

The ICM RDU (Remote Display Unit) is advantageous when the ICM is out of reach or in a location unsuitable for viewing. The ICM can also be controlled via the RDU.

\*Note; Installation dimensions are the same as the ICM.

### How to Order

|     |     |              |
|-----|-----|--------------|
| ICM | RDU | O (painted)  |
| ICM | RDU | A (anodised) |



## ICM-FC1

A pressure compensated flow control valve specifically designed to fit the ICM. This may be needed if the application produces an oil flow greater than 400ml/min through the ICM.

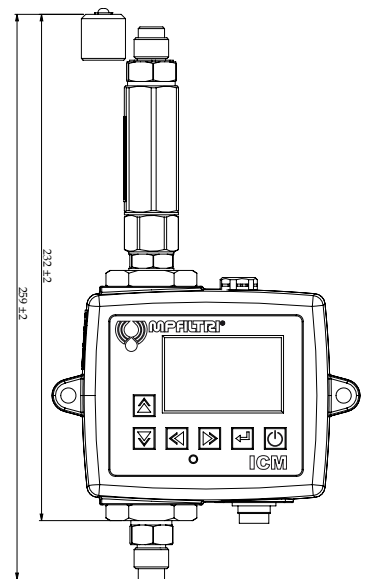
ICM-FC1 - is supplied with adaptors which enable the valve to be fitted to the ICM.

Max Pressure - 400barg

Usable Flow Range - 4barg to 400barg ΔP

### How to Order

|     |     |   |    |
|-----|-----|---|----|
| ICM | FC1 | M | G1 |
| ICM | FC1 | M | G3 |
| ICM | FC1 | N | G1 |
| ICM | FC1 | N | G3 |
| ICM | FC1 | S | G1 |
| ICM | FC1 | S | G3 |



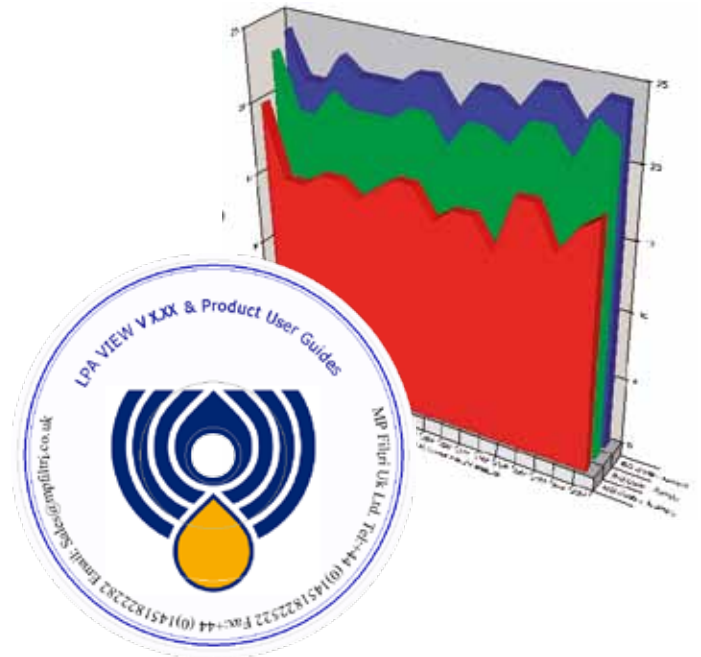
ICM with Flow Control Valve and Minimes fitting

# Software

## LPA View Software

When connected to LPA View, the ICM can transfer results in realtime, or alternatively historical results can be downloaded from the ICM's inbuilt memory.

- Runs on Windows 2000, XP, Vista and Windows 7.
- Full adjustment & control of product settings, test times and alarms
- Easy test report generation
- Trend analysis
- Graphical display options
- Universal format across our contamination monitoring product range



# Website

## www.mpfiltri.co.uk

- Whether you know what you require or not, our easy to use quotation request form will send your enquiry direct to technical sales. Alternatively, our friendly sales teams are always available to give you advice over the telephone.
- Our fluid compatibility chart is constantly being updated with existing, new & emerging fluid types. If you have a fluid specification which is not on the chart, contact us for testing/trialling possibilities.
- Existing customers benefit from being able to download the latest version of product software when it is released.
- Product literature & supporting information is available in print ready pdf. format.
- Get all the latest information on product releases, website/literature updates and company news by subscribing to our RSS feed!



# Warranty and Recalibration

**Warranty** The ICM is guaranteed for 12 months from date of receipt.

**Re-calibration** As with all types of measurement equipment, MP Filtri recommend returning your ICM for a calibration check/re-calibration at regular intervals. This timeframe may vary depending on individual customer quality management system requirements. Please note, it is the customers responsibility to plan for business continuity whilst products are away for calibration. For more information on our re-calibration service, contact your local MP Filtri sales team.

The RDU, FC1, USBi & ETHi do not require re-calibration.

## How to Order

## Example: ICM - W - M - K - R - A - G1



**ICM** Can be used as a standalone product or can be controlled by an external PC, PLC or the ICM-RDU Remote Display Unit. 3m control cable supplied as standard.

### Water Option

**W** Water and Temperature Sensing

**0** No Water and Temperature Sensing

\* For high frequency pressure pulse applications contact MP Filtri.

### Fluid Options

**M** Mineral Oil Fluid Compatibility.

**N** Offshore and selected water based fluids\*.

**S** Phosphate Ester and aggressive fluids\*.

\* Consult MP Filtri. Note: N and S models are supplied with anodised outer case and are not available with water sensing option.

### Keypad Option

**K** Keypad – Adds 6 key keypad and 128 x 64 pixel back-lit graphical display.

**0** No Keypad

### Relay Option

**R** Relays.

**0** No Relays.

### Finish

**A** Anodised.

**0** Painted.

### Port Options

**G1** ICM complete with minimess connections M16 x 2.

**G3** 1/4" BSP Ports.

**G4** 7/16" UNF.

## Caution

Hydraulic systems contain dangerous fluids at high pressures and temperatures. Installation, servicing and adjustment are only to be performed by qualified personnel. Do not tamper with this device. Do not use this product outside the parameters specified in this document & other related literature.



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