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**MPC1M, MPC2M and MPC2AM Monnier**  
**High Efficiency Compressed Air Filter/Regulators**  
Installation and Maintenance Instructions

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1. Safety information
2. General product information
3. Installation and Commissioning
4. Operation
5. Spare parts and Maintenance

**MPC2M**

shown with optional pressure gauge



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# 1. Safety information

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The MPC1M compressed air filter/regulator is ATEX compatible -

## Directive 94/9/EC (ATEX95) Declaration

The MPC1M is intended for use in potentially explosive environments as defined by Equipment Group II Category 2.

- We have determined the MPC1M is a 'simple' mechanical product. It is therefore not covered by the scope of the ATEX directive and consequently does not need to carry any marking

As part of our conformity assesment, an ignition hazard analysis to EN 13463-1 was conducted with the following outcome:

- We have determined the MPC1M does not have its own effective sources of ignition - even in the event of rare failures.

Note: As defined by the European ATEX Standing Committee... "Electrostatic charges caused by the flow-through of a medium are not considered as "own" ignition source in the sense of directive 94/9/EC."

The MPC1M may be used in a potentially explosive environment, as defined by Equipment Group II Category 2, when used in accordance with its Installation and Maintenance Instructions (IM-P504-08).

Safe operation of these products can only be guaranteed if they are properly installed, commissioned, used and maintained by qualified personnel (see Section 1.11) in compliance with the operating instructions. General installation and safety instructions for pipeline and plant construction, as well as the proper use of tools and safety equipment must also be complied with.

## 1.1 Intended use

Referring to the Installation and Maintenance Instructions, name-plate and Technical Information Sheet, check that the product is suitable for the intended use/application. The products comply with the requirements of the European Pressure Equipment Directive 97/23/EC and fall within the category 'SEP'. It should be noted that products within this category are required by the Directive not to carry the CE mark.

- i) The products have been specifically designed for use on compressed air, which is in Group 2 of the above mentioned Pressure Equipment Directive. The products' use on other fluids may be possible but, if this is contemplated, Spirax Sarco should be contacted to confirm the suitability of the product for the application being considered.
- ii) Check material suitability, pressure and temperature and their maximum and minimum values. If the maximum operating limits of the product are lower than those of the system in which it is being fitted, or if malfunction of the product could result in a dangerous overpressure or overtemperature occurrence, ensure a safety device is included in the system to prevent such over-limit situations.
- iii) Determine the correct installation situation and direction of fluid flow.
- iv) Spirax Sarco products are not intended to withstand external stresses that may be induced by any system to which they are fitted. It is the responsibility of the installer to consider these stresses and take adequate precautions to minimise them.
- v) Remove protection covers from all connections and protective film from all name-plates, where appropriate, before installation on steam or other high temperature applications.

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## 1.2 Access

Ensure safe access and if necessary a safe working platform (suitably guarded) before attempting to work on the product. Arrange suitable lifting gear if required.

## 1.3 Lighting

Ensure adequate lighting, particularly where detailed or intricate work is required.

## 1.4 Hazardous liquids or gases in the pipeline

Consider what is in the pipeline or what may have been in the pipeline at some previous time. Consider: flammable materials, substances hazardous to health, extremes of temperature.

## 1.5 Hazardous environment around the product

Consider: explosion risk areas, lack of oxygen (e.g. tanks, pits), dangerous gases, extremes of temperature, hot surfaces, fire hazard (e.g. during welding), excessive noise, moving machinery.

## 1.6 The system

Consider the effect on the complete system of the work proposed. Will any proposed action (e.g. closing isolation valves, electrical isolation) put any other part of the system or any personnel at risk?

Dangers might include isolation of vents or protective devices or the rendering ineffective of controls or alarms. Ensure isolation valves are turned on and off in a gradual way to avoid system shocks.

## 1.7 Pressure systems

Ensure that any pressure is isolated and safely vented to atmospheric pressure. Consider double isolation (double block and bleed) and the locking or labelling of closed valves. Do not assume that the system has depressurised even when the pressure gauge indicates zero.

## 1.8 Temperature

Allow time for temperature to normalise after isolation to avoid danger of burns.

## 1.9 Tools and consumables

Before starting work ensure that you have suitable tools and/or consumables available. Use only genuine Spirax Sarco replacement parts.

## 1.10 Protective clothing

Consider whether you and/or others in the vicinity require any protective clothing to protect against the hazards of, for example, chemicals, high/low temperature, radiation, noise, falling objects, and dangers to eyes and face.

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## 1.11 Permits to work

All work must be carried out or be supervised by a suitably competent person. Installation and operating personnel should be trained in the correct use of the product according to the Installation and Maintenance Instructions.

Where a formal 'permit to work' system is in force it must be complied with. Where there is no such system, it is recommended that a responsible person should know what work is going on and, where necessary, arrange to have an assistant whose primary responsibility is safety.

Post 'warning notices' if necessary.

## 1.12 Handling

Manual handling of large and/or heavy products may present a risk of injury. Lifting, pushing, pulling, carrying or supporting a load by bodily force can cause injury particularly to the back. You are advised to assess the risks taking into account the task, the individual, the load and the working environment and use the appropriate handling method depending on the circumstances of the work being done.

## 1.13 Residual hazards

In normal use the external surface of the product may be very hot. If used at the maximum permitted operating conditions the surface temperature of some products may reach temperatures of 90°C (194°F).

Many products are not self-draining. Take due care when dismantling or removing the product from an installation (refer to 'Maintenance instructions').

## 1.14 Freezing

Provision must be made to protect products which are not self-draining against frost damage in environments where they may be exposed to temperatures below freezing point.

## 1.15 Disposal

Unless otherwise stated in the Installation and Maintenance Instructions, this product is recyclable and no ecological hazard is anticipated with its disposal providing due care is taken.

## 1.16 Returning products

Customers and stockists are reminded that under EC Health, Safety and Environment Law, when returning products to Spirax Sarco they must provide information on any hazards and the precautions to be taken due to contamination residues or mechanical damage which may present a health, safety or environmental risk. This information must be provided in writing including Health and Safety data sheets relating to any substances identified as hazardous or potentially hazardous.

# — 2. General product information —

## 2.1 General description

The MPC\_M Monnier range of (self-relieving) high efficiency oil removing filter/regulators provide very high quality compressed air, with accurate pressure control, for pneumatic actuators and general purpose systems.

### Principal features:

- Compact miniature oil removing filter/regulator.
- Self-relieving.
- High efficiency - Exceeding 99.95% against D.O.P. tests.
- Efficiency testing carried out in accordance with ISO 12500 at 51 mg/m<sup>3</sup> (40 ppm) inlet concentration.
- Oil carryover less than 0.0255 mg/m<sup>3</sup> (0.02 ppm).
- 100% water removal at line temperature.
- Polycarbonate bowl.
- External black anodised finish.
- Particle efficiency: 99.96%
- Inlet dry pressure drop: 1.5 psi d.

### Available types supplied as standard

|               |  |
|---------------|--|
| <b>MPC1M</b>  | ATEX compatible.<br>Metal bowl with manual drain and tamper-proof cap. |
| <b>MPC2M</b>  | Polycarbonate bowl with manual drain.                                  |
| <b>MPC2AM</b> | Metal bowl with autodrain.   |

### MPC optional extras - Selection table

**Airsets** - The MPC2M, MP2AM filter / regulators are also available as airsets consisting of Type 8 or FK21 bracket, mounting ring and pressure gauge (see the 'MPC\_M optional extras' table below).

**S** = Supplied as standard    **OE** = optional extra     = not available

| Feature                            |                   | MPC1M    | MPC2M    | MPC2AM   |
|------------------------------------|-------------------|----------|----------|----------|
| <b>Polycarbonate bowl</b>          | Without drain     |          | OE       |          |
|                                    | With manual drain |          | <b>S</b> |          |
| <b>Bowl guard</b>                  |                   |          | OE       |          |
| <b>Metal bowl (no sight glass)</b> | With manual drain | <b>S</b> | OE       |          |
|                                    | With autodrain    |          |          | <b>S</b> |
| <b>Tamper-proof cap</b>            | With locking seal | <b>S</b> | OE       | OE       |
| <b>Pressure gauge</b>              | 50 mm Ø           |          | OE       | OE       |
|                                    | 40 mm Ø           | <b>S</b> | OE       | OE       |
| <b>Type 8 mounting bracket</b>     |                   |          | OE       | OE       |
| <b>FK21 fixing kit</b>             |                   | <b>S</b> | OE       | OE       |
| <b>Aluminium mounting ring</b>     |                   | <b>S</b> | OE       | OE       |

**Note:** A tamper-proof cap with locking seal is recommended as an optional extra for MPC2M and MPC2AM airsets.

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## 2.2 Sizes and pipe connections

¼" screwed BSP (BS 21-Rp, ISO 7)

## 2.3 Spring range - Operating pressure ranges

All regulators can be adjusted to zero pressure, or above the figures shown. The operating range is marked on the unit:

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**Standard spring:** 0.7 - 9.0 bar g (10 -130 psi g)

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**Optional springs:** 0.2 - 2.0 bar g (2.9 - 29 psi g)

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0.3 - 4.0 bar g (4.3 - 58 psi g)

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## 2.4 Operating limits

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|                                     |                    |                                       |
|-------------------------------------|--------------------|---------------------------------------|
| <b>Maximum pressure/temperature</b> | Polycarbonate bowl | 10 bar g @ 50°C (145 psi g @ 122°F)   |
|                                     | Metal bowl         | 17 bar g @ 80°C (246.5 psi g @ 176°F) |

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## 2.5 Materials

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| <b>Part</b>     | <b>Material</b>                  |
|-----------------|----------------------------------|
| Body            | Aluminium - anodised finish      |
| Plastic bowl    | Polycarbonate or aluminium alloy |
| Bonnet assembly | Aluminium                        |
| Filter element  | Microfibre/stainless steel       |
| Valve           | Nitrile                          |

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Fig. 1 MPC2M Monnier high efficiency compressed air filter/regulator

# — 3. Installation and commissioning —

**Note:** Before actioning any installation observe the 'Safety information' in Section 1.

Referring to the Installation and Maintenance Instructions, name-plate and Technical Information Sheet, check that the product is suitable for the intended installation.

## 3.1 Specific product safety information

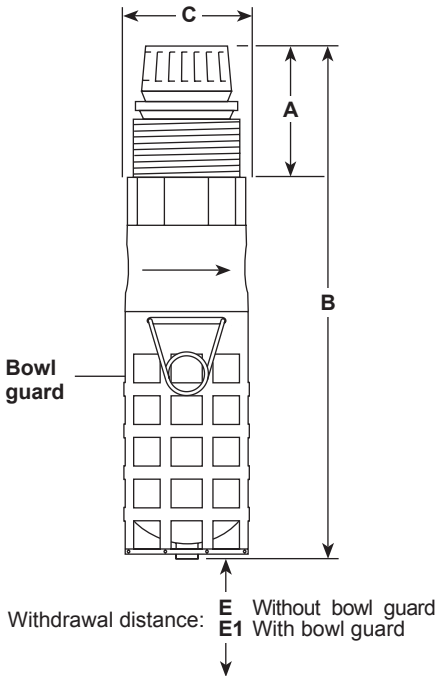
Polycarbonate bowls may be attacked by phosphate ester based fluids, solvents, chemical cleaners, carbon tetrachloride, etc. These and any other substances should not be allowed to come into contact with this component. Certain compressor lubricating oils also contain additives harmful to polycarbonate. Where there is any doubt we recommend, in the interests of personal safety, that bowl guards or metal bowls be fitted.

## 3.2 General information

### MPC\_M

Dimensions/weight  
(approximate) in mm and kg

| Unit  | Size | A  | B   | C  | E  | E1 | Weight |
|-------|------|----|-----|----|----|----|--------|
| MPC1  | ¼"   | 75 | 167 | 38 | 25 | -  | 0.2    |
| MPC2  | ¼"   | 67 | 156 | 38 | 25 | 45 | 0.2    |
| MPC2A | ¼"   | 75 | 167 | 38 | 25 | -  | 0.2    |



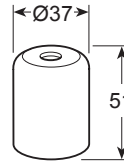
### Bowl guard

In the interest of safety Spirax Sarco recommend that a bowl guard should be fitted - see Section 3.1, Specific product safety information.

Fig. 2

### Tamper-proof cap

Dimensions (approximate) in millimetres



### Pressure gauge

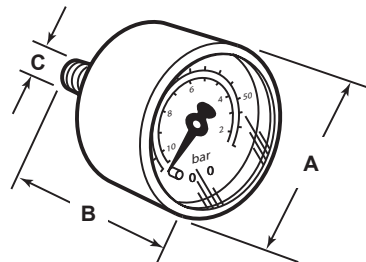
(Not for MPC2AM)

Available in two sizes (1½" and 2"), with 3 pressure ranges. The face is marked in both bar and psi. Please state, size and pressure range when placing an order.

|                        |             |              |
|------------------------|-------------|--------------|
|                        | 0 to 2 bar  | 0 to 30 psi  |
| <b>Pressure ranges</b> | 0 to 7 bar  | 0 to 100 psi |
|                        | 0 to 11 bar | 0 to 160 psi |

Dimensions (approximate) in millimetres

| Size | A  | B  | C   |
|------|----|----|-----|
| 1½"  | 40 | 47 | R½" |
| 2"   | 48 | 45 | R½" |





## Type 8 mounting bracket (Fig. 3) and mounting ring for general installations

The filter/regulator can be mounted using this zinc plated mild steel bracket and aluminium mounting ring. Both items are optional extras and must be specified when placing an order.

### Dimensions (approximate) in millimetres

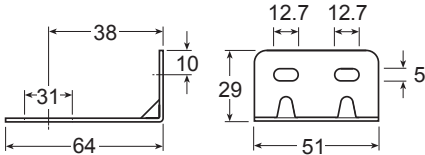


Fig. 3 Type 8 mounting bracket

## FK21 fixing kit (Fig. 4)

The FK21 fixing kit is required to mount the MPC\_M onto the Spirax Sarco range of PN pneumatic actuators. The fixing kit and aluminium mounting ring are optional extras and must also be specified when placing an order.

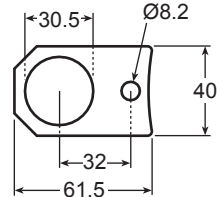


Fig. 4 FK21 fixing kit

## 3.3 Installation

- 3.3.1 The unit should be fitted in horizontal pipework with the bowl vertically downwards.
- 3.3.2 Adequate space should be provided around the unit to allow easy access for routine servicing requirements (see Figure 2 for withdrawal distances).
- 3.3.3 Connect the unit so that the airflow is in the direction indicated by the arrow on the body.
- 3.3.4 The unit should be installed as close as possible to the equipment it is serving.
- 3.3.5 The body has two  $R\frac{1}{8}$ " ports, one of which is available for fitting a pressure gauge to register the secondary pressure. In the event that a pressure gauge is not fitted, this port should be blanked off with the blank plug provided. Ensure that the range of the pressure gauge corresponds with that of the main control spring as indicated on the unit. The second port should not be used for any purpose and is sealed with a factory fitted plug which should not be removed.
- 3.3.6 Do not overload the filter cartridge (see Section 4 - Operation) or there will be a reduction in its efficiency and/or life. On heavily contaminated systems, it is advisable to fit a conventional pneumatic filter (Monnier International or Miniature) immediately in front of the unit for maximum efficiency and life cycle.
- 3.3.7 The polycarbonate bowl may be fitted with a bowl guard, or replaced with a metal bowl.

## 3.4 Adjustment

- Lift the locking ring.
- Turn the adjustment knob clockwise to increase the pressure.
- Depress the locking ring to lock.

**Note:** An optional tamperproof cap (not shown) may be fitted over the adjustment housing. It is recommended that all adjustments be made under flowing conditions. There will be a slight increase in set pressure when the flow stops.

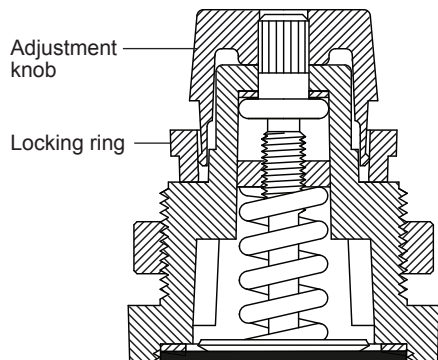


Fig. 5 Adjustment

# 4. Operation

## 4.1 Operating principles

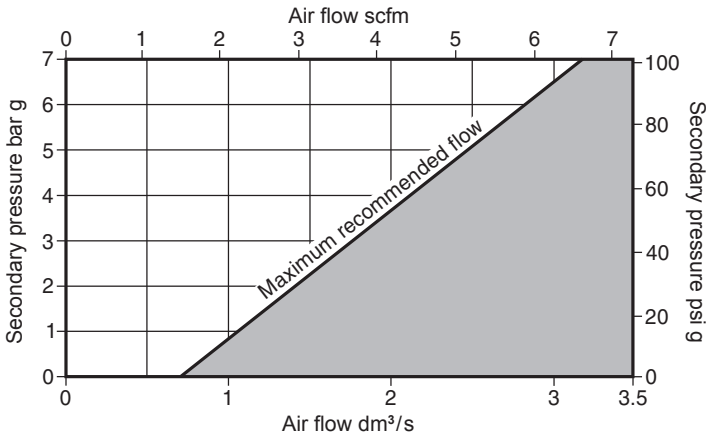
With system pressure on, the regulator poppet valve assembly is in the closed position when the adjusting knob is turned fully counter clockwise (no spring load). By turning the adjusting knob clockwise, the diaphragm/piston moves downward allowing flow to come in through the orifice created between the poppet assembly and seat. Increasing downstream pressure causes the poppet assembly to move upward until the load of the spring and diaphragm/piston are balanced. The outlet pressure has now been reduced. If a valve is opened downstream, the increased demand for pressure creates a reduced pressure under the control diaphragm/piston. The poppet assembly moves downward due to the load of the control spring opening the seat area and air is allowed to meet the downstream pressure demand.

Thus, the area of the opening meters the downstream flow.

## 4.2 Performance selection (with primary pressure 10 bar)

For any specified primary filtration pressure, there is a maximum recommended air flowrate. Keeping within this, will ensure that the element performance maintains the stated high efficiency levels, particularly for the removal of oil and water contaminants.

## 4.3 Maximum secondary flow at peak performance



Use of the product in this region may reduce the oil removing efficiency.

Adjustment knob

Locking ring

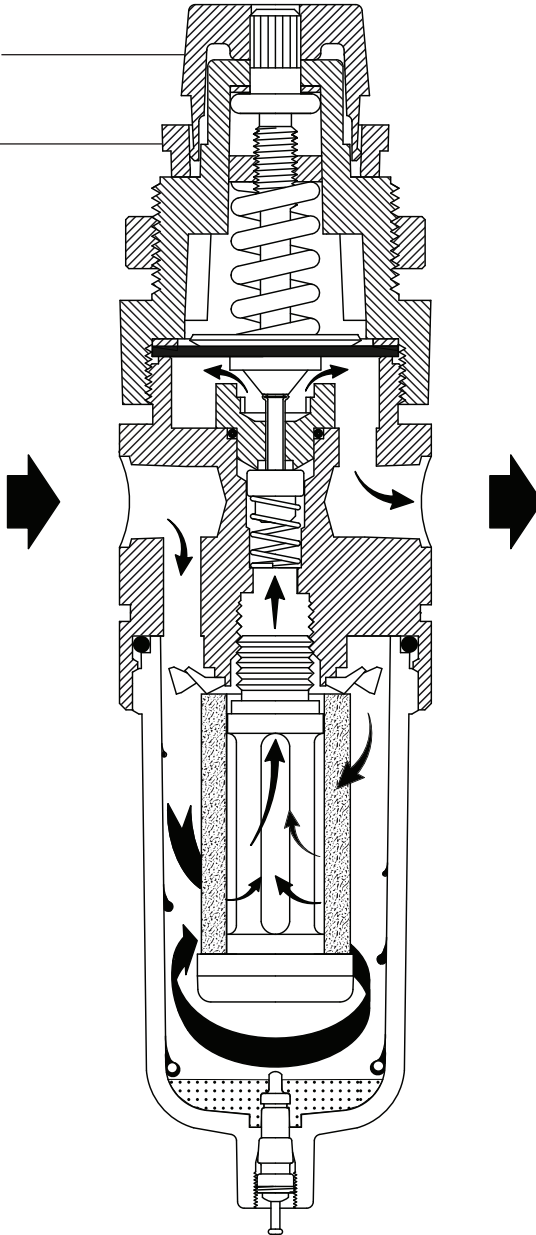


Fig. 6 Operation

# — 5. Spare parts and Maintenance —

## 5.1 Spare parts

The spare parts available are detailed below. No other parts are supplied as spares.

### Available spares

|  |      |
|--|------|
| Polycarbonate bowl,<br>Metal bowl, (specify with or without drain)<br>Drain assembly | 1, 2 |
| Element and 'O' ring set   | 2, 3 |
| Bowl guard assembly (optional extra)   | 4, 5 |

**Note:** In the interests of safety Spirax Sarco recommend that a bowl guard (an optional extra) should be fitted to polycarbonate bowls.

### How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of unit.

**Example:** 1 - Element and 'O' ring set for a 1/4" MPC2M Monnier high efficiency compressed air filter/regulator.

## 5.2 Maintenance

**To service the filter (no tools required):**

- Isolate the main air supply.
- Release the pressure by turning the main control knob fully anticlockwise, remove the bowl guard if fitted and depress the drain valve.
- Remove the bowl (1) and unscrew the filter element assembly (2, 3 and 4).
- Clean the bowl using soap and water and dry with a lint free cloth.
- Reassemble in reverse order, ensuring that the element 'O' ring (4) is fitted.
- The bowl should be firmly hand tightened.

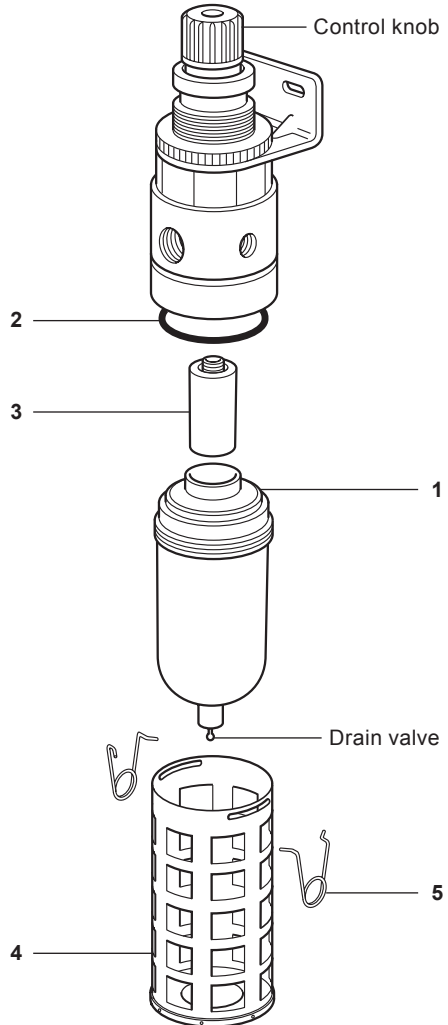


Fig. 7 Spares parts