

# IC3AM, IC3DM, IC4AM and IC4DM Monnier International Ultraclean Compressed Air Filters

## 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

# 1. Safety information

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 2014/68/EU and fall within the category 'SEP'.

It should be noted that products within this category are required by the Directive not to carry the  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.

## 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.

## 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.

Please visit the Spirax Sarco product compliance web pages

<https://www.spiraxsarco.com/product-compliance>

for up to date information on any substances of concern that may be contained within this product. Where no additional information is provided on the Spirax Sarco product compliance web page, this product may be safely recycled and/or disposed providing due care is taken. Always check your local recycling and disposal regulations.

### **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 Monnier International Ultraclean high efficiency oil removing filters have been designed to provide high quality compressed air (free from liquid and solid contaminants) for pneumatic systems.

For use in applications where compressed air of a particularly high quality is required. Typical examples include air bearings on machine tools, air gauging equipment, instrument air supplies, breathing air, etc.

#### Principal features:

- Internal and external high quality black anodised finish.
- Maximum flow 15.57 dm<sup>3</sup>/s (33 scfm).
- Efficiency testing carried out in accordance with ISO 12500 at 51 mg/m<sup>3</sup> (40 ppm) inlet concentration.
- Oil efficiency = 99.95%.
- Oil carryover less than 0.025 5 mg/m<sup>3</sup> (0.02 ppm).
- Particle efficiency = 99.6%.
- 100% water removal in liquid or aerosol form at line temperature.
- Polycarbonate bowl.

#### Available types

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**IC3A** With pilot operated automatic drain.

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**IC3D** With semi-automatic dump valve for quick action manual override.

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**IC4A** With pilot operated automatic drain and a unique colour change indicator (changes from white to **yellow**) fitted to show the condition of the element.

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**IC4D** With semi-automatic dump valve for quick action manual override. This filter is supplied complete with a unique colour change indicator (changes from white to **yellow**) fitted to show the condition of the element.

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#### Optional extras

For further data regarding the following options see Technical Information sheet TI-P504-13:

- Metal bowl with or without sight level.
- Easy fit stainless steel bowl guard.

### 2.2 Sizes and pipe connections

¼", ⅜" and ½" screwed BSP T Rp (ISO 7-1).

### 2.3 Operating limits

Maximum working pressure	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)
Maximum working temperature	Polycarbonate bowl	50 °C @ 10 bar g	(122 °F @ 145 psi g)
	Metal bowl	80 °C @ 17 bar g	(176 °F @ 246.5 psi g)

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## 2.4 Materials

Part	Material
Bowl	Polycarbonate or aluminium (anodised)
Head	Anodised aluminium
Element	Borosilicate glass with polypropylene support core
Auto-drain	Plastic



Fig. 1 IC\_M Monnier international ultraclean compressed air filter

# 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 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 TI-P504-13 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** Do not overload the filter cartridge (see Section 4 - Operating principals) 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.
- 3.3.6** The polycarbonate bowl may be fitted with a bowl guard.

# 4. Operation

## 4.1 Principle of operation

Monnier oil-coalescing filters remove more than 99.95% of all oil and dirt from the air you use. Oil vapors and aerosols are removed by coalescent action, forming them into drops heavy enough to be separated by gravity. Unlike absorption filters, they do not become filled with oil, and will not clog on oil alone. If dirt particles are removed upstream, these filters will separate oil from air indefinitely.

### Points to note

1. Coalescing filters should be installed as close as possible to the equipment they are protecting.
2. Do not exceed the maximum flowrate (for any given pressure) as shown on the graphs or there is chance that some of the coalesced liquids will be re-entrained and carried on downstream.
3. Do not overload the filter cartridge or there will be a reduction in its efficiency and/or life. It is advisable to fit a conventional pneumatic auto-filter (International IF2AM) immediately in front of the coalescing filter for maximum efficiency and life.
4. For hydrocarbon vapour and odour removal use the Monnier IX1M International compressed air filter - For specific product data see Technical Information sheet TI-P054-21.

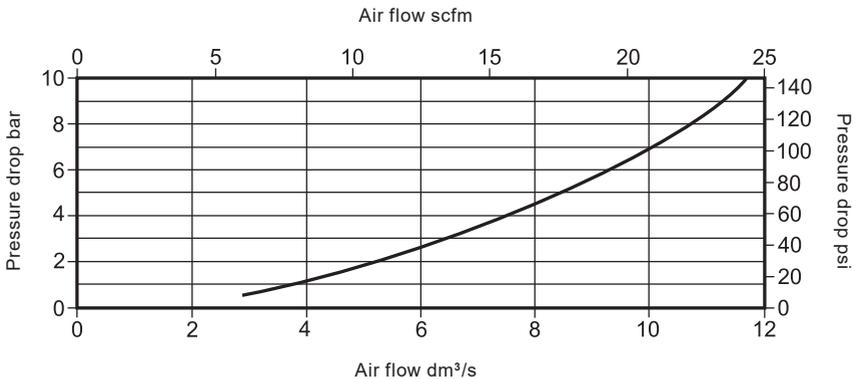
## 4.2 Performance selection

(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 Capacities

5  $\mu$ m element



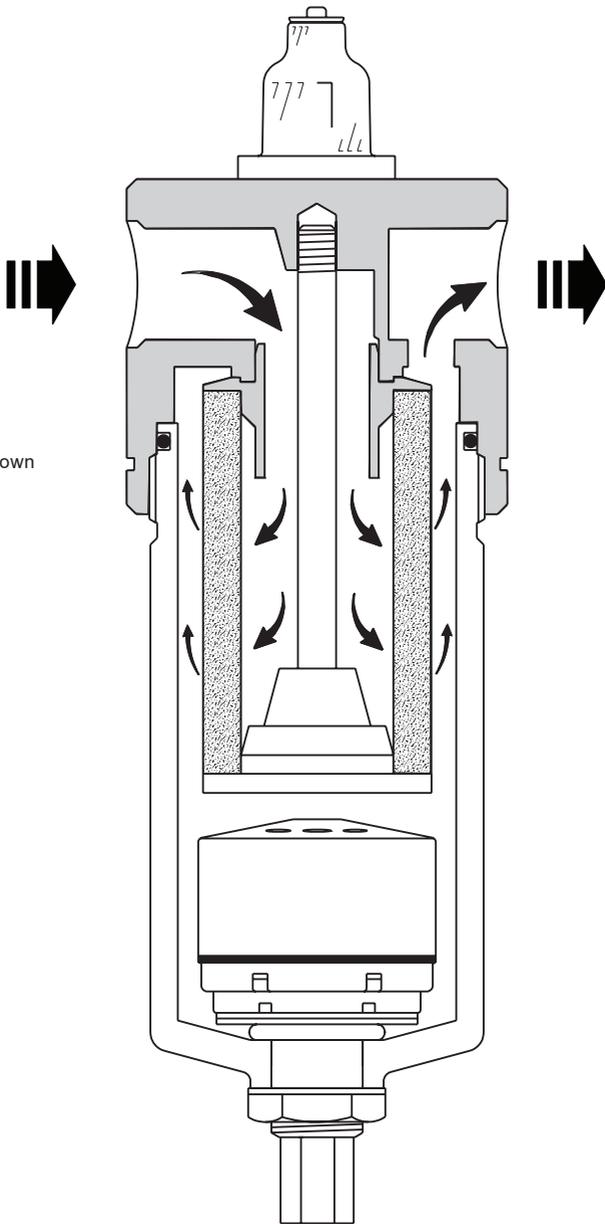


Fig. 2 IC4DM shown

# 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

Bowl assembly including the appropriate drain - state polycarbonate or metal (with or without sight level)	A, B
Element set 5 µm	B, C
Flow indicator assembly (IC4DM and IC4AM only)	D, E, F
Auto-drain	See Figure 2

**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 off Polycarbonate bowl assembly for a ¼" IC4DM Monnier international compressed air filter.

## 5.2 Maintenance

### To service filter

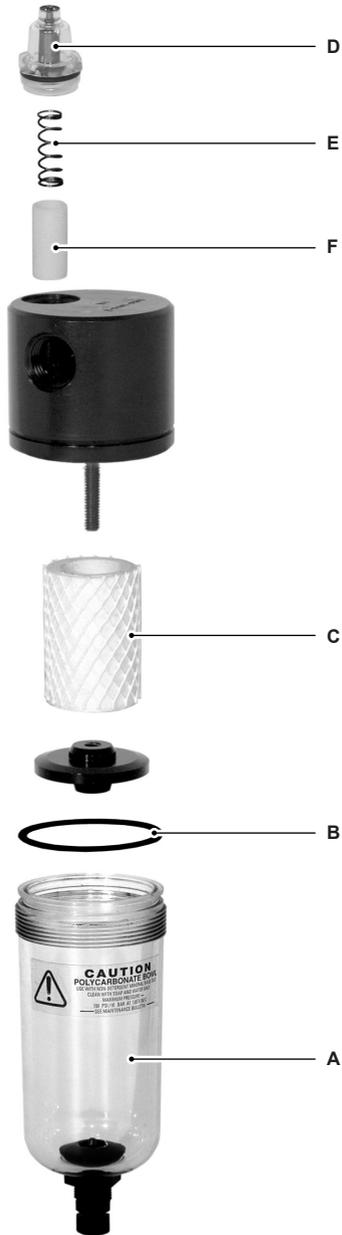
- Shut off air.
- Remove bowl guard if fitted.
- Release pressure by actuating dump valve or gently unscrewing bowl until pressure relieves.
- Remove bowl and unscrew element assembly.
- Wipe all parts clean using soap and water.
- Dry thoroughly.
- Replace in reverse order using new filter element and 'O' rings if necessary.
- Reset indicator by unscrewing sight dome and gently pushing down the indicator itself.
- Refit sight dome.

### To replace indicator

- Shut off and release system pressure.
- Unscrew indicator body and remove complete indicator.
- Clean pressure transfer ports with a bristle or fine wire.
- Remove tape from new indicator assembly and screw new assembly into filter head.
- Remove sight dome and gently push indicator down fully in order to reset.
- Replace sight dome finger tight.
- Do not attempt to replace any components of indicator assembly with non-standard parts.

## Warning

Polycarbonate bowls are attacked by phosphate ester fluids, solvents, paint thinners and carbon tetrachloride. These and similar substances should never be allowed to come into contact with the bowl. Certain compressor lubricating oils also contain additives harmful to polycarbonate and, where there is any doubt we recommend, in the interests of safety, that a metal bowl or guard be fitted.



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