



Instruction Manual



M2 Filter for Liquids

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ATTENTION

**Please read this document carefully before installing and operating the product.
Not following the guidelines could result in personal injury and/or damage to the equipment.**



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Symbols in this document



Important information. Disregarding this information could increase the risk of damage to the equipment, or the risk of personal injuries.



Tips, useful information, attention points. This will facilitate the use of the instrument and/or contribute to its optimal performance.



Additional information available in the referenced documentation, on the indicated website(s) or from your Bronkhorst representative.

Receipt of equipment

Check the outside packaging box for damage incurred during shipment. If the box is damaged, the local carrier must be notified at once regarding his liability. At the same time a report should be submitted to your Bronkhorst representative.

Carefully remove the equipment from the box. Verify that the contents of the package was not damaged during shipment. Should the equipment be damaged, the local carrier must be notified at once regarding his liability. At the same time a report should be submitted to your Bronkhorst representative.



- *Check the packing list to ensure that you received all items included in the scope of delivery*
- *Do not discard spare or replacement parts with the packaging material*

Refer to [Removal and return instructions](#) about return shipment procedures.

Equipment storage

- The equipment should be stored in its original package in a climate controlled storage location.
- Care should be taken not to subject the equipment to excessive temperatures or humidity.
- See technical specifications (data sheet) for information about required storage conditions.

Warranty

Bronkhorst® products are warranted against defects in material and workmanship for a period of three years from the date of shipment, provided they are used in accordance with the ordering specifications and not subject to abuse or physical damage. Products that do not operate properly during this period may be repaired or replaced at no charge. Repairs are normally warranted for one year or the balance of the original warranty, whichever is the longer.



See also section 9 (Guarantee) of the Conditions of sales:
www.bronkhorst.com/int/about/conditions-of-sales/

The warranty includes all initial and latent defects, random failures, and indeterminable internal causes. It excludes failures and damage caused by the customer, such as contamination, improper electrical hook-up, physical shock etc.

Re-conditioning of products primarily returned for warranty service that is partly or wholly judged non-warranty may be charged for.

Bronkhorst High-Tech B.V. or affiliated company prepays outgoing freight charges when any part of the service is performed under warranty, unless otherwise agreed upon beforehand. The costs of unstamped returns are added to the repair invoice. Import and/or export charges as well as costs of foreign shipping methods and/or carriers are paid by the customer.

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1 Introduction

1.1 Scope of this document

The Bronkhorst® M2 Filter for Liquids offers great flexibility, thanks to the modular concept, whereby it can be equipped with different fluid connectors, filter cartridges and sealing materials. In the default configuration, the drain outlet is provided with a drain plug, which can be replaced by a regular fitting to accommodate proper connection to a drainage facility. Regular maintenance can be done in-place, without having to remove the filter from the fluid system.



This document contains general product information, installation instructions and troubleshooting tips for the M2 filter.

In the images in this document the M2 filter is fitted with 1/4" OD fluid connectors. Depending on the ordering details of your M2 filter as ordered, its appearance may deviate from the images in this document.

1.2 Intended use

The M2 filter has been developed to remove particles from a liquid flowing into a fluid system, using the media and operating conditions as specified at ordering time.

Any other use than mentioned here is considered unintended.

Responsibility for the use of the equipment with regard to suitability, intended use, cleaning and corrosion resistance of the applied materials against the processed media lies solely with the end user.

Bronkhorst High-Tech B.V. cannot be held liable for any damage and/or injury resulting from unintended, improper or unsafe use, or use with other media and/or under other conditions than which the applied materials are suitable for.

1.3 Documentation



This section lists all necessary documentation for installation and operation of the M2 filter. Documents that are not included in the scope of delivery can be provided on request or downloaded from www.bronkhorst.com/downloads.

Document name	Document no.
Instruction Manual M2 Filter for Liquids (this document)	9.17.134
Brochure filters	9.60.041
Dimensional drawing	7.05.960

2 Product specifications

Before installing the M2 filter, check that the product specifications match your requirements. The model key (second line on the serial number label) contains information about the technical properties of the product as ordered. The actual properties of your product can be retrieved from the diagram below.



If you have a question about the product or if you think the product does not meet the agreed specifications, do not hesitate to contact us. To enable us to help you quickly and effectively, make sure to have the serial number (SN) ready whenever seeking contact with Bronkhorst or your Bronkhorst representative about a specific item.

See section [Service](#) for contact information.

2.1 Model key



Code	Pore size
AF	10 µm
AH	25 µm
AG	40 µm

Code	Wetted material
S	Stainless steel 316L

Code		Fluid connectors
Inlet	Outlet	
0	0	None
1	1	1/8" OD compression type
2	2	1/4" OD compression type
3	3	6 mm OD compression type
4	4	12 mm OD compression type
5	5	1/2" OD compression type
7	7	1/4" face seal female
8	8	1/4" face seal male
A	A	3 mm OD compression type
B	B	1/8" face seal male
C	C	1/16" OD compression type
D	D	3/8" OD compression type
G	G	8 mm OD compression type
H	H	10 mm OD compression type
L	L	1/2" Face seal male
M	M	1/4" O-ring face seal
9	9	Other (on request)

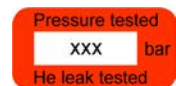
Code	Seals
A	Viton® 514178 USP/FDA
B	EPDM 559291 USP/FDA
C	Kalrez® 6230 USP/FDA
K	Kalrez® 6375
V	Viton® 51415

Code	Drain connector
1	1/8" OD compression type
2	1/4" OD compression type
3	6 mm OD compression type
4	12 mm OD compression type
5	1/2" OD compression type
7	1/4" face seal female
8	1/4" face seal male
A	3 mm OD compression type
B	1/8" face seal male
C	1/16" OD compression type
D	3/8" OD compression type
G	8 mm OD compression type
H	10 mm OD compression type
L	1/2" Face seal male
M	1/4" O-ring face seal
Z	Blind nut
9	Other (on request)

2.2 Pressure rating



At the factory the M2 filter has been pressure tested and tested with helium for outboard leakage. The test pressure used in this test includes a safety factor, so that it is always higher than the specified maximum operating pressure.



The operating pressure must never exceed the test pressure.

- The test pressure is specified on the device with a red label; if this label is missing or if the test pressure is insufficient, the device must not be used and should be returned to the factory.
- Before installation, make sure that the test pressure is in accordance with the safety factor of your application.
- Disassembling the device and/or replacing parts will invalidate the test pressure and leak test specification.

2.3

Wetted materials



- *The wetted materials incorporated in the M2 filter are compatible with media and conditions (e.g. pressure, temperature) according to the technical specifications.*
- *If you are planning to use the product (including any third party components supplied by Bronkhorst) with other media and/or other conditions, always check the wetted materials (including seals) for compatibility.*

3 Installation

3.1 Mounting

- The M2 filter should be installed in a fluid system upstream from a component that has to be protected against particles (e.g. a pump).
- Mount the filter in an upright position, with the FLOW arrow facing upwards.
- Prevent the filter from 'hanging' on the fluid connections, by fixating it to a stable surface or construction, using the mounting holes on top of the housing. Check the [dimensional drawing](#) for the exact size and locations of the mounting holes.



3.2 Fluid connections

- Connect the filter to the fluid system in accordance with the direction of the FLOW arrow.
- Tighten connections according to the instructions of the manufacturer of the fittings.
- Ensure a stress-free connection between the system piping and the fluid connectors; do not let fluid lines get twisted or distorted.

3.3 Commissioning and decommissioning



- *Before pressurizing the fluid system, take appropriate protective measures as described in the Material Safety Data Sheet(s) of the processed media.*
- *Commissioning of the M2 filter should be done by enabling the liquid flow and switching on the system.*
- *Check the fluid system for leaks before applying full operating pressure, especially when using hazardous media (e.g. toxic or flammable).*
- *Before the M2 filter can be replaced or serviced, the system must be switched off, depressurized and brought to ambient temperature.*

4 Maintenance



Inexpertly servicing instruments can lead to serious personal injury and/or damage to the instrument or the system it is used in. Servicing must therefore be performed by trained and qualified personnel.



Before opening the filter or disconnecting it from the fluid line, take appropriate protective measures as described in the Material Safety Data Sheet(s) of the processed media, to prevent the release of media into the working environment.

4.1 Replacing filter cartridge

1 Preparation

- Make sure the connected instrumentation is powered down, that the fluid system is depressurized and that the filter is at ambient temperature
- Disconnect the fluid inlet of the filter
- If necessary, lock the position of the filter body (1) with a wrench or a vise

2 Drain filter

Depending on the presence of a drainage facility, instead of a drain plug, a pipe fitting or similar can be installed in the drain outlet.

- Open the drain line if applicable
- Unscrew the drain plug or fitting (6) with a spanner AF17, while locking the position of the filter cover (4) with a spanner AF30
- Collect the remaining liquid in an appropriate container if necessary

3 Remove cartridge

- Unscrew the filter cover (4) with a spanner AF30
- Unscrew the filter cartridge (2) with a deep socket wrench AF21



To loosen and tighten the cartridge, a specially designed deep socket wrench (art.no. 2.18.861) must be used (a regular pipe wrench would damage the cartridge).

4 Inspect all components for damage and wear

If necessary, replace the [O-rings](#) on the filter cover and the drain plug/fitting (3 and 5)

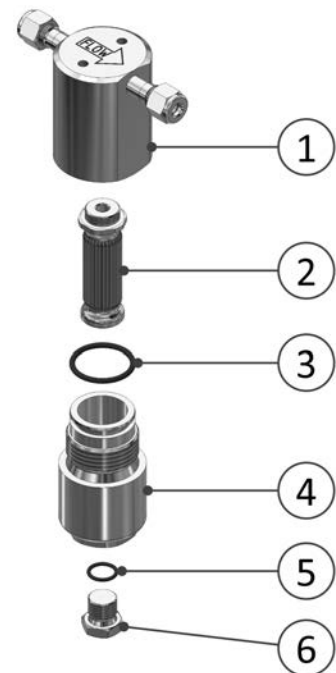
5 Install cartridge

- Insert the replacement cartridge **by hand** into the filter body
- Tighten the cartridge with deep socket wrench AF21
(do not tighten it by hand, or it could get damaged by twisting the mesh surface)
- Screw the filter cover back into the filter body
- Screw the drain plug/fitting back into the filter cover



6 Completion

Reconnect the fluid inlet of the filter



- Body
- Cartridge
- O-ring AS013
- Cover
- O-ring AS120
- Drain plug

4.2 Spare parts and tools

Position ¹	Name	Article no.
2	Filter cartridge 10 µm stainless steel	2.17.182
	Filter cartridge 25 µm stainless steel	2.17.374
	Filter cartridge 40 µm stainless steel	2.17.197
3	O-ring AS013 Viton® 51415	3.01.006
	O-ring AS013 Kalrez® 6375	3.01.436
	O-ring AS013 EPDM 559291 USP	3.01.805
	O-ring AS013 Viton® 514178 USP	3.01.872
	O-ring AS013 6230 USP	3.01.939
5	O-ring AS120 Viton® 51415	3.01.004
	O-ring AS120 Kalrez® 6375	3.01.447
	O-ring AS120 EPDM 559291 USP	3.01.832
	O-ring AS120 Viton® 514178 USP	3.01.899
	O-ring AS120 6230 USP	3.01.966

1) See [Replacing filter cartridge](#)

When replacing the filter cartridge, a specially designed deep socket wrench must be used to loosen and tighten the cartridge:

Name	Article no.
Deep socket wrench AF21	2.18.861



5 Troubleshooting and service

5.1 Common issues

Symptom	Possible cause	Corrective action
No flow	Filter cartridge clogged	Check filter cartridge; replace if necessary
System leakage	Parts and/or fluid connections not tightened sufficiently	Check assembly and fluid connections; tighten if necessary
	O-ring(s) worn or damaged	Check O-rings; replace if necessary

5.2 Service

For current information about Bronkhorst® and worldwide service addresses, please visit our website:



www.bronkhorst.com

Do you have any questions about our products? Our Sales department will gladly assist you selecting the right product for your application. Contact sales by e-mail:



sales@bronkhorst.com

For after-sales questions, help and guidance, our Customer Care department is available by e-mail:



aftersales@bronkhorst.com

No matter the time zone, our experts within the Customer Care department are available to answer your request immediately or take appropriate further action. Our experts can be reached at:



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Bronkhorst High-Tech B.V.
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NL-7261 AK Ruurlo
The Netherlands

6 Returns

6.1 Removal and return instructions

When returning materials, always clearly describe the problem, and, if possible, the work to be done, in a covering letter.

Instrument handling:

1. Purge all fluid lines (if applicable)
2. If the instrument has been used with toxic or otherwise hazardous fluids, it must be cleaned before shipping
3. Disconnect all external cabling and tubing and remove the instrument from the process line
4. If applicable, secure movable parts with appropriate transport safety materials, to prevent damage during transportation
5. The instrument must be at ambient temperature before packaging
6. Insert the instrument into a plastic bag and seal the bag
7. Place the bag in an appropriate shipping container; if possible, use the original packaging box

Add documentation:

- Reason of return
- Failure symptoms
- Contaminated condition
- Declaration on decontamination



It is absolutely required to notify the factory if toxic or dangerous fluids have been in contact with the device!
This is to enable the factory to take sufficient precautionary measures to safeguard the staff in their repair department.

All instruments must be dispatched with a completely filled in 'Declaration on decontamination'. Instruments without this declaration will not be accepted.



*A safety information document containing a 'Declaration on decontamination' form (document no 9.17.032) can be downloaded from the **Service & Support** section of the Bronkhorst website (www.bronkhorst.com).*

Important:

Clearly note, on top of the package, the customs clearance number of Bronkhorst High-Tech B.V.:

NL801989978B01

(only if applicable, otherwise contact your Bronkhorst representative for local arrangements.)