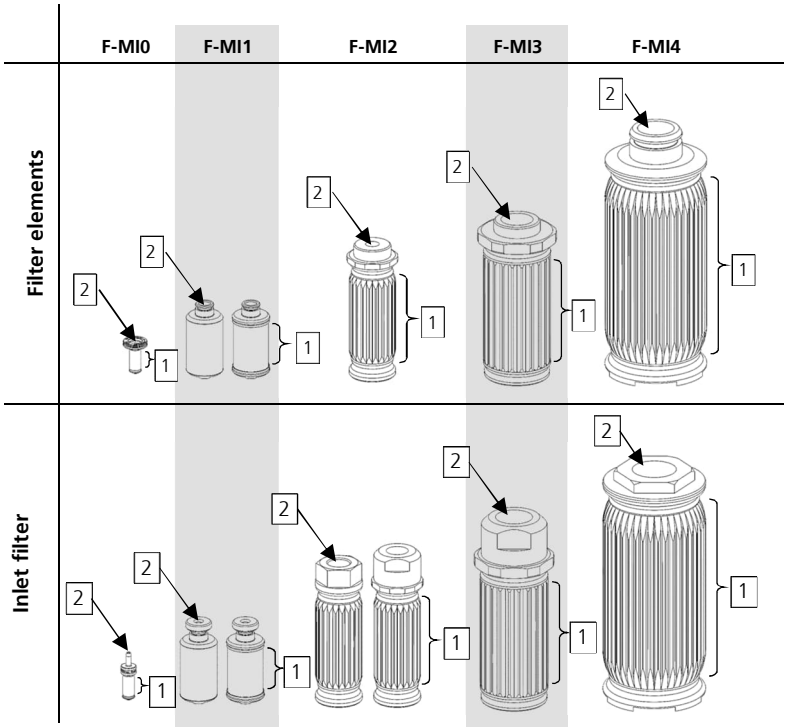
Cleaning recommendation

Filter elements and inlet filters of the F-MI filter series



Technical Data

Item no.	Description
1	Filter surface
2	Outlet port

	Aids
	Suitable and filtered solvents / cleaning solutions *
	Ultrasonic bath
	Filtered DI water
	Filtered, oil-free compressed air
	Drying cabinet / oven **

* Questions regarding the selection of suitable solvents or cleaning solutions, please contact the media manufacturer or HNPM

** Alternative: Drying for 2 days at 20 – 25 °C room temperature

⚠ Safety instructions

– All of the following tasks must be carried out only by professional and qualified personnel.
– Legal and operational regulations on the handling of chemicals, hazardous substances and other aids must be observed. Suitable safety precautions and protective measures are to be taken.

General information

ℹ *These cleaning instructions are to be understood as a recommendation. It is **not** guaranteed that complete cleaning or the new condition of the filter element will be achieved. If the filter performance after cleaning differs noticeably from that of a new filter element, the filter element must be replaced.*

– Before cleaning the filter element, remove the O-ring, if present
– Always handle filter elements by the solid parts and not by the filter surface [1]
– Depending on the type of contamination, suitable cleaning media must be used (see following flow charts)
– The outlet port [2] of the filter element must be open during the entire cleaning process.
– During the entire cleaning procedure, no unfiltered medium may enter the interior of the filter through the outlet opening [2] of the filter element. If possible, connect a clean piece of hose to the filter element for the cleaning procedure in the ultrasonic bath using a hose nozzle, the upper end of which protrudes from the ultrasonic bath. The hose also makes it easier to rinse the filter element and blow it out with compressed air.
– A 10 µm filter is recommended for filtering the rinsing and solution media. In particular, the mesh size must not be larger than the mesh size of the filter to be cleaned.
– Always store unpacked filter elements upside down (outlet port [2] pointing downwards) to prevent dust particles out of the air from entering the filter interior.
– Storage of filter elements only in clean, low-particle packaging (e.g. in twist packs)

⚠ **Attention!** In a µDispense or a functional module, the flow through the F-MI0 filter element is in the opposite direction. Therefore, when cleaning, the filter element must be positioned upside down and flushed from the outside to the inside.

Cleaning instructions according to contamination type

On the following pages, three different cleaning sequences are shown schematically. The selection of the suitable sequence is made depending on the contamination with

A Aqueous media and for fouling
B Nucleic acids (DNA)
C Other media / particle loading.

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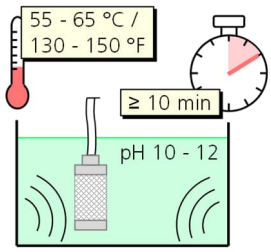
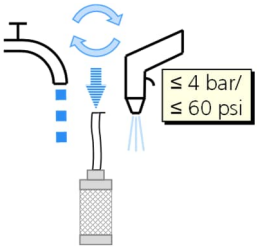
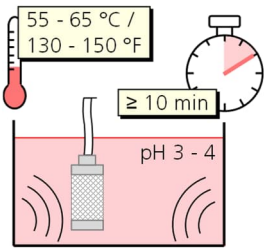
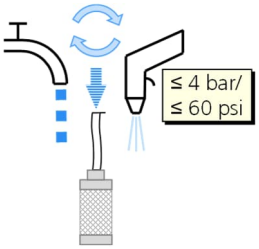
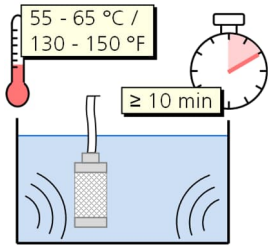
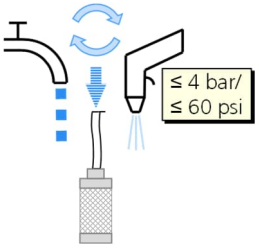
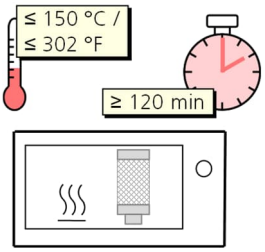
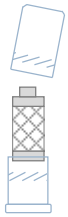
A Cleaning after contamination with aqueous media and for fouling

1. Alkaline cleaning	2. Rinsing	3. Acid cleaning	4. Rinsing
			
Ultrasonic bath with alkaline cleaning solution (if possible with surfactant)	Alternately rinsing with DI water and blowing out with compressed air until the air comes out bubble-free when blowing out	Ultrasonic bath with acid cleaning solution	Alternately rinsing with DI water and blowing out with compressed air until the air comes out bubble-free when blowing out
5. Neutral cleaning	**6. Rinsing**		**7. Drying**
		If the filter element is **not** reused immediately, carry out the following steps 7 and 8.	
Ultrasonic bath with DI water	Alternately rinsing with DI water and blowing out with compressed air until the air comes out bubble-free when blowing out		Dry in drying cabinet / oven ⚠ **Attention!** Put the filter upside down (see General information). Alternative: Drying for 2 days at 20 – 25 °C room temperature
8. Packaging			
			
Pack the filter element for further storage (see General information)			

Reference for above items: A

DI water

Filter element

Ultrasonic bath

Acid detergent (pH 3 – 4)

DI water

Drying cabinet / oven

Alkaline detergent (pH 10 – 12)

Compressed air (≤ 4 bar)

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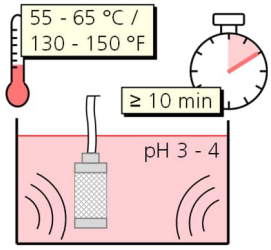
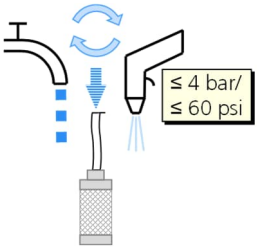
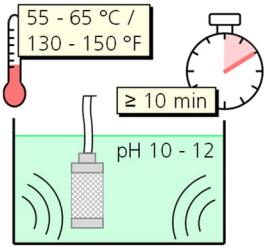
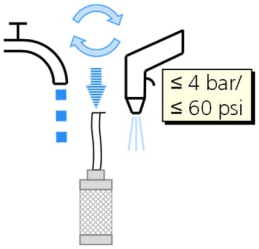
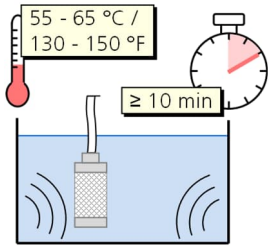
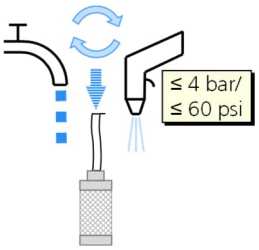
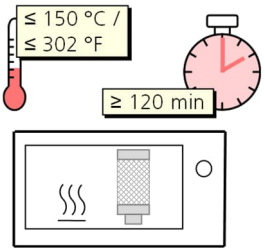
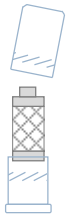
B Cleaning after contamination with nucleic acids (DNA)

1. Acid cleaning	2. Rinsing	3. Alkaline cleaning	4. Rinsing
			
Ultrasonic bath with acid cleaning solution	Alternately rinsing with DI water and blowing out with compressed air until the air comes out bubble-free when blowing out	Ultrasonic bath with alkaline cleaning solution (if possible with surfactant)	Alternately rinsing with DI water and blowing out with compressed air until the air comes out bubble-free when blowing out
5. Neutral cleaning	**6. Rinsing**		**7. Drying**
		If the filter element is **not** reused immediately, carry out the following steps 7 and 8.	
Ultrasonic bath with DI water	Alternately rinsing with DI water and blowing out with compressed air until the air comes out bubble-free when blowing out		Dry in drying cabinet / oven ⚠ **Attention!** Put the filter upside down (see General information). Alternative: Drying for 2 days at 20 – 25 °C room temperature
8. Packaging			
			
Pack the filter element for further storage (see General information)			

Reference for above items: B

- DI water
- Filter element
- Ultrasonic bath
- Acid detergent (pH 3 – 4)
- DI water
- Drying cabinet / oven
- Alkaline detergent (pH 10 – 12)
- Compressed air (≤ 4 bar)

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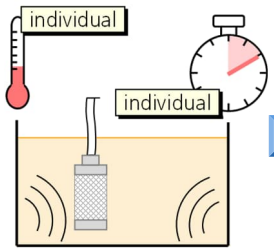
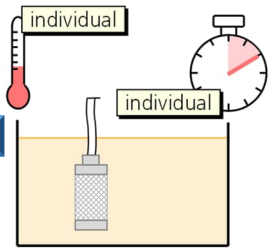
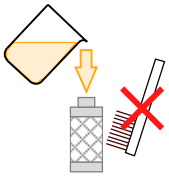
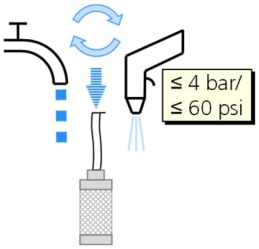
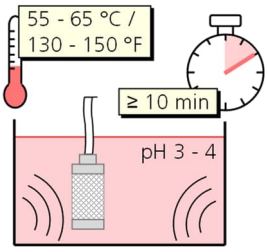
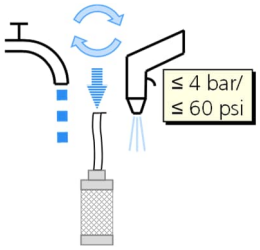
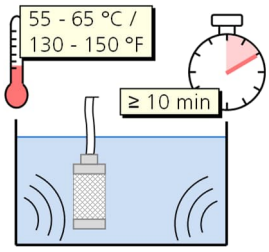
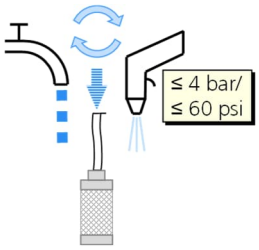
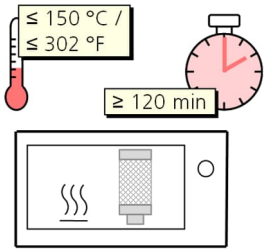
C Cleaning after contamination with other media / particle loading

1a. Cleaning	1b. Cleaning	2. Flushing	3. Rinsing
			
Ultrasonic bath with solvent; adjust duration and temperature to type and degree of contamination	Immersion bath with solvent; adjust duration and temperature to type and degree of contamination	Rinsing from the inside to the outside with solvent for particle removal ⚠ **Attention!** Do not perform any additional mechanical cleaning from the outside!	Alternately rinsing with DI water and blowing out with compressed air until the air comes out bubble-free when blowing out

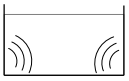
	4. Acid cleaning	5. Rinsing	6. Neutral cleaning
If the filter element is **not** reused immediately, carry out the following steps 4 and 10.			
	Ultrasonic bath with acid cleaning solution	Alternately rinsing with DI water and blowing out with compressed air until the air comes out bubble-free when blowing out	Ultrasonic bath with DI water

7. Rinsing	9. Drying	10. Packaging	
			
Alternately rinsing with DI water and blowing out with compressed air until the air comes out bubble-free when blowing out	Dry in drying cabinet / oven ⚠ **Attention!** Put the filter upside down (see General information). Alternative: Drying for 2 days at 20 – 25 °C room temperature	Pack the filter element for further storage (see General information)	

Reference for above items: C

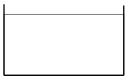
 DI water

 Filter element

 Ultrasonic bath

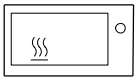
 Acid detergent (pH 3 – 4)

 DI water

 Immersion bath

 Solvent (unspecified)

 Compressed air (≤ 4 bar)

 Drying cabinet / oven

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