Embracing Challenge

Universal Filter Series FT®

FT-...-H2

Instruction Manual
Version 1.00.01

Dear customer,

we have made up this operating manual in such a way that all necessary information about the product can be found and understood quickly and easily.
Should you still have any question, please do not hesitate to contact **M&C** directly or go through your appointed dealer. Respective contact addresses are to be found in the annexe to this operating manual.
Please also contact our homepage **www.mc-techgroup.com** for further information about our products. There, you can read or download the data sheets and operating manuals of all **M&C** products as well as further information in German, English and French.

Version: 1.00.01

Contents

List of illustrations

Head Office

M&C Tech**Group** Germany GmbH ◆ Rehhecke 79 ◆ 40885 Ratingen ◆ Germany
Telephone: 02102 / 935 - 0
Fax: 02102 / 935 - 111
E - mail: info@mc-techgroup.com
www.mc-techgroup.com

1 GENERAL INFORMATION

The product described in this operating manual has been examined before delivery and left our works in perfect condition related to safety regulations. In order to keep this condition and to guarantee a safe operation, it is important to heed the notes and prescriptions made in this operating manual. Furthermore, attention must be paid to appropriate transportation, correct storage, as well as professional installation and maintenance work.
All necessary information a skilled staff will need for appropriate use of this product are given in this operating manual.

2 DECLARATION OF CONFORMITY

CE - Certification

The product described in this operating manual complies with the following EU directives:

EMV-Instruction

The requirements of the EU directive 2014/30/EU “Electromagnetic compatibility“ are met.

Low Voltage Directive

The requirement of the EU directive 2014/35/EU “Low Voltage Directive“ are met.
The compliance with this EU directive has been examined according to DIN EN 61010.

Declaration of conformity

The EU Declaration of conformity can be downloaded from the **M&C** homepage or directly requested from **M&C**.

3 SAFETY INSTRUCTIONS

Please take care of the following basic safety procedures when mounting, starting up or operating this equipment:

Read this operating manual before starting up and use of the equipment. The information and warnings given in this operating manual must be heeded.

Any work on electrical equipment is only to be carried out by trained specialists as per the regulations currently in force.

Attention must be paid to the requirements of VDE 0100 (IEC 364) when setting high-power electrical units with nominal voltages of up to 1000 V, together with the associated standards and stipulations.

Check the details on the type plate to ensure that the equipment is connected to the correct mains voltage.

Protection against touching dangerously high electrical voltages:
Before opening the equipment, it must be switched off and hold no voltages. This also applies to any external control circuits that are connected.

The device is only to be used within the permitted range of temperatures and pressures.

Check that the location is weather-protected. It should not be subject to either direct rain or moisture.

The device must not be used in hazardous areas.

Installation, maintenance, monitoring and any repairs may only be done by authorized personnel with respect to the relevant stipulations.

4 WARRANTY

If the equipment fails, please contact **M&C** directly or else go through your **M&C** authorised dealer.
We offer a one year warranty as of the day of delivery as per our normal terms and conditions of sale, and assuming technically correct operation of the unit. Consumables are hereby excluded. The terms of the warranty cover repair at the factory at no cost or the replacement at no cost of the equipment free ex user location. Reshipments must be send in a sufficient and proper protective packaging.

5 USED TERMS AND SIGNAL INDICATIONS

 **DANGER!**	This means that death, severe physical injuries and/or important material damages **will occur** in case the respective safety measures are not fulfilled.
 **WARNING!**	This means that death, severe physical injuries and/or important material damages **may occur** in case the respective safety measures are not fulfilled.
 **CARE!**	This means that minor physical injuries **may occur** in case the respective safety measures are not fulfilled.
CARE!	Without the warning triangle means that a material damage may occur in case the respective safety measures are not met.
ATTENTION!	This means that an unintentional situation or an unintentional status may occur in case the respective note is not respected.
 **NOTE!**	These are important information about the product or parts of the operating manual which require user's attention.
SKILLED STAFF	These are persons with necessary qualification who are familiar with installation, use and maintenance of the product.

6 INTRODUCTION AND APPLICATION

The **M&C** electrically heated universal filter **FT-…-H2** reliably separates off solids, in particular extremely fine particles, occurring in analysis techniques in gas filtration, using very fine, deep-acting filter elements. It is constructed especially for hot gas analysis technique at 180°C.

6.1 SERIAL NUMBERS

The nameplates bearing the serial number are located on the mounting plate.

NOTE!

Always quote the device's serial number when making enquiries and ordering replacement parts.

6.2 POWER SUPPLY

The universal filter series FT-…-H2 can be operated on alternating current in the range from 230 to 240V, 50Hz or 115V, 60Hz.

6.3 WARNINGS AND INSTRUCTIONS

NOTE!

The instructions and warnings listed in the instructions for use must be complied with!

7 TECHNICAL DATA

Filter series FT®	**FT-3G-H2**	**FT-3SS-H2**	**FT-0,1GF-H2**
Part number	01 F 3006(a)	01 F 3008(a)	01 F 3007(a)
Filter finess/material of filter element	3µm / glass	3µm / stainl. steel	0,1µm / glassfibre
Power supply	230 - 240V 50Hz, 350VA or 115V 60Hz (a)		
Electrical connection	2,5mm^2 terminals, 2x PG13 cable glands		
Protection classification/electrical standard	IP44-EN60529 / EN61010, EN60519-1		
Ambient temperature max.	+50°C		
Sample temperature max.	+180°C		
Ready for operation	after approx. 30 minutes		
Temperature alarm contact	alarm point ΔT 30°C at T_{set}, contact rating 250V, 3A, 0,25A=		
Regulation of temperature	thermostat (PT100 as option)		
Sample connections	G1/4" i (DIN ISO 228/1)		
Stagnant space	65cm³		
Filter surface	70cm³		
Ma. pressure	4 bar g		
Dimensions (w x h x d) / weight	350 x 300 x 140mm / 6kg		
Method of mounting	wall mounting		
Material of sample contacting parts	PTFE, glass, FPM		

(a) 115V-Version

8 DESCRIPTION

The universal-filter out of PTFE with integrated filter elements (fineness 3 or 0,1 µm) is placed in an electrically heated 2-part aluminium construction.

The temperature is controlled by an integrated compact capillary sensor thermostat with an excess temperature limit switch with reset key at **+**30°C above T_{set} and an alarm function for low temperature alarm at **-**30°C below T_{set} with voltage free status-alarm contact. The thermostat as well as the electrical terminals are placed in the junction box.

The temperature of the filter is shown on a thermometer. For isolation and protection reasons, the heated filter part is covered with a cap.

To prevent heating-interruptions, the in- and outlet connection area is heated too. The clamps are fixed in order to support the sample lines.

The filter in- and outlet can be turned 180° on the oven top position to achieve easy mounting and flexible adaptation to local circumstances.

The following diagram illustrates the differential pressures of the different filter element materials in dependance on the gas flow.

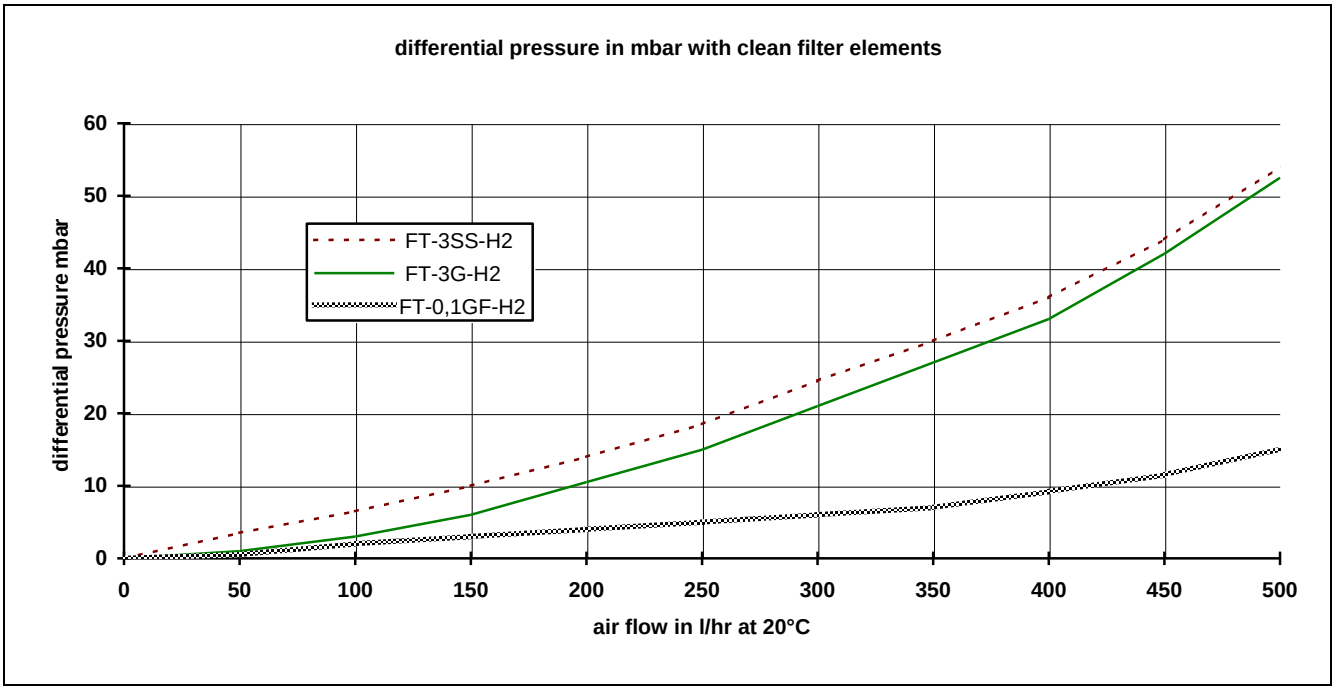

Figure 1 Flow characteristcs

9 RECEPTION AND STORAGE

The universal filter series FT-…-H2 is normally delivered in one packaging unit:
The universal filter series FT-…-H2 should be removed carefully from the packaging and checked immediately for completeness against the delivery note.
Check the goods for any damage incurred during transport and if necessary inform your transport insurer of any damage.

10 PREPARATION AND INSTALLATION

Locate the universal filter series FT-…-H2 in such a way that there is adequate space for removing the cover and replacing the filter elements. Fix the aluminium plate with 4 screws.
Make certain that the universal filter series FT-…-H2 is easily accessible so that you can carry out any subsequent maintenance work without trouble.

11 MOUNTING

For mounting the filter we recommend the following procedure:

- Remove the cover of the heated filter after opening the two clamping devices.
- Disconnect the thermal conductivity jaws on the left and right side of the filter head in by loosening the screws.
- In order to connect the sample lines, screw in suitably sized threaded connectors with a G ¼" connecting thread using PTFE sealing tape.

NOTE!

Use only connectors approved for 180°C!
Make sure that the connection is leak proof!

Factory set the filter is mounted with inlet on the right and outlet on the left side. To turn that by 180 ° consider the following:

- Loosen, the 2 screws (M4), placed at the outside of the the top plate.
- Pull out the filter from heating jacket
- Loosen the 2 screws, at the inside of the top plate
- Turn the filter by 180° and fix it with the inner screws at the top plate
- Put in the filter into the aluminium heating jacket and fix it with the two outer screws at the top plate
- Connect the sample lines and assemble the two thermal conductivity jaws on the in and outlet once again.
- Put the cover of the heated filter on top again and close the clamping devices.

12 ELECTRICAL CONNECTION

WARNING!

When connecting the equipment, please ensure that the supply voltage is identical with the information provided on the model type plate.

After mounting the filter, the posssibility of getting in touch with live parts has to be prevented!

The use of temperature resistant cable is necessary !

NOTE!

Attention must be paid to the requirements of IEC 364 (DIN VDE 0100) when setting high-power electrical units with nominal voltages of up to 1000 V, together with the associated standards and stipulations.

A main switch and matching fuse must be provided externally!

The main circuit must be equipped with a fuse corresponding to the nominal current (over current protection), for electrical details see technical data.

- Remove the lid of the electrical connection box. The electrical connection layout is located in the lid.
- Insert the mains cable (min. 3 x 1.5 mm²) through the cable gland and connect to the appropriate terminals (Fig.2).
- Insert the signal cable through the cable gland and connect to the appropriate terminals.
- Screw lid back on.

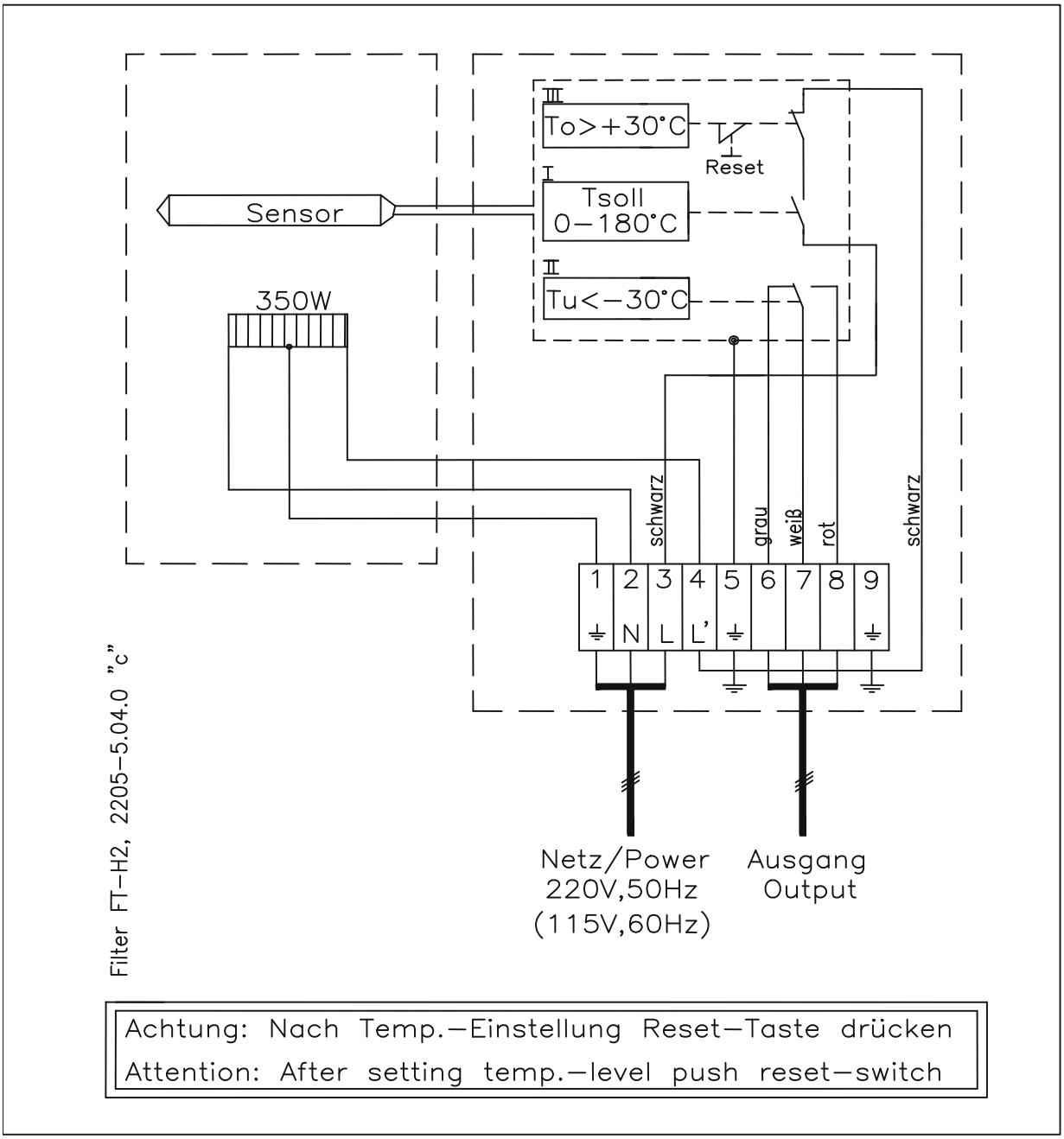

Figure 2 **Electrical connecting diagram**

13 STARTING

Before using the equipment for the first time, check that the safety measures specific to the installation and process are complied with!

For the carried media the corresponding safety regulations and measures have to be considered.

WARNING!

Before starting up check whether the mains power supply voltage corresponds with the information stated on the nameplate.

Beware of touching the filter surface during operation. Serious burns can occur because of high surface temperatures. Wear protective gloves and protect the filter from unauthorized access.

The following procedure is recommended:

- Check the rated value setting on the built-in thermostat.

NOTE!

If the rated value temperature needs to be lowered more than 30°C in one step duration operation, the thermostat's excess temperature switch-off is triggered (for re-start press reset key).

- Switch on mains power supply.

NOTE!

The total heating-up time is approximately 30 minutes. After exceeding the low temperature limit (30°C below set temperature) the filter is ready for operation.

In case of low temperature alarm (failure of heating) the gas flow has to be interrupted by adequate measures!

14 MAINTENANCE

The safety instructions specific to the plant and process are to be consulted prior to any maintenance work!

W A R N I N G !

Aggressive condensate is possible.
Wear protective glasses and proper protective clothing!

High surface temperatures!
Touching the filter surface can cause serious burns!
Wear protective gloves and protect the filter of unauthorized access!

Prior to carrying out maintenance work on electrical parts, mains voltage should be disconnected from all poles!
This also applies to any external control circuits, which may be connected.

It is difficult to give any recommendations as to a particular maintenance cycle. Depending on your process conditions, a meaningful maintenance cycle must be elaborated for the specific application.
An indication that filter-maintenance may be necessary could be shown by a constant decline in the amount of sample gas in the analysis system.

Filter maintenance is restricted essentially to replacing filter elements and checking seals.

The filter element has to be replaced as follows:

- Remove cover lid.
- Open the clamps of the aluminium heating body and remove the lower part.
- Unscrew the glass of the filter by turning left.
- Screw out the filter's knurled screw and replace filter element. (If more than 70% of the filter has changed colour, it must be replaced!)
- Check filter element seals and replace if necessary.
- Clean filter chamber.

Assemble the filter in reverse sequence. The lower part of the heating body is supplied with 2 pins for easy assembling. The pins must fit to the two holes in the upper part of the heated body.

15 SPARE PARTS LIST

Wear, tear and replacement part requirements depend on specific operating conditions.
The recommended quantities are based on experience and they are not binding.

Universal filter series FT®-..-H2 **(C) Consumables, (R) recommended spare parts, and (S) spare parts**		V/E/T	Recommended quantity For operating period [years] 1	2	3
90 F 0005	Filterelement F-3G, Glas, 3µm, 75mm	C	a.t.r.	a.t.r.	a.t.r.
90 F 0016	Filterelement F-0,1GF, Glasfaser, 0,1µm, 75mm	C	a.t.r.	a.t.r.	a.t.r.
90 F 0008	Filterelement F-3SS, rostfr. Stahl, 3µm, 75mm	C	a.t.r.	a.t.r.	a.t.r.
90 F 0040	Viton O-Ring	R	2	4	8
90 F 3000	Heizpatrone HLPSR, 100mm, 230VAC/350W	R	1	1	1
90 F 3010	Heizpatrone HLPSR, 100mm, 115VAC/350W	R	1	1	1
90 P 5020	Thermostat (0-180°C) für FT-..-H2	R	1	1	1
90 F 0012	Filterglas F-120G	R	1	1	1
90 F 0085	Filterkopf FT-..-H2 (inkl. O-Ring)	R	1	1	1

a.t.r. = according to requirements

16 APPENDIX

Further product documentation can be seen and downloaded from our home page:
www.mc-techgroup.com