

## Manual CLF-5, CLF-5/W

### Application

The **M&C** fluid particle filter **CLF-5, CLF-5/W** is suitable for filtration of fluid particles of all types and is recommended for sample gases with an acid dew point above 100 °C (212 °F). Examples are measurements in flue gas of heavy oil and black coal combustions.

The filter separates the aerosols (very fine fluid particles) which still pass the gas cooler. The most effective position of the **CLF-..** filter is downstream the sample conditioning close to the flow meter of the analyser. For additional system protection we provide the version **CLF-5/W** with integrated hydrophobic diaphragm, working as a liquid stop.

### Description

The filter element of the **M&C** fluid particle filter is constructed in two sections with a flow direction from the inside to the outside of the filter element. The inner, very fine, fibre layer binds the fluid particles suspended in the gas and leads them together with the gas flow to the outer, larger layer. On their way through the filter element, the very fine fluid particles accumulate with others and form droplets. The vertical flow direction and the force of gravity cause the droplets to drip into the filter pot.

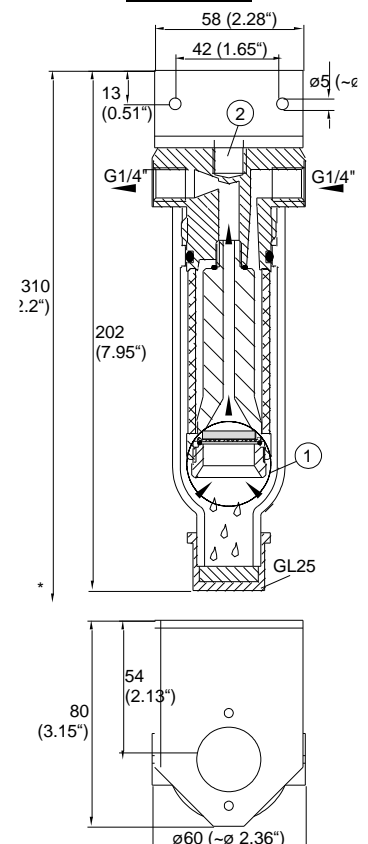
The filter element remains fully effective even when completely saturated with fluid. If it is not effected by solid particles the lifetime is nearly unlimited. The compressed Micro-Fibres are made with binding of PVDF in order to prevent influences on the sample gas.

The version **CLF-5/W** is equipped with an integrated liquid stop for water and water identical liquids. The modified filter element clamp has a protective hydrophobic diaphragm. In case the sample conditioning system doesn't work proper, the **CLF-5/W** will stop the liquid in front of the filter outlet.

The condition of the filter is visible through the glass body without opening the filter. The separated acid mist can continuously discharged with an external mounted peristaltic pump **SR25.1** (option) connected by a GL25 adapter. No tools are required to change the filter element. The optimised position of the o-ring always guarantees a safe sealing of the filter body to the filter head. The filter in- and outlet can be turned 180° on the mounting bracket to achieve easy mounting and flexible adaptation to local circumstances.



### Dimensions



\* Constructional size dimensions in mm


- ① Protective hydrophobic diaphragm unit only with version **CLF-5/W**
- ② As required the G $\frac{1}{4}$ "i thread connect to the gas outlet with a  $\varnothing$ 5mm hole by customers.

Technical data type CLF <sup>®</sup>	CLF-5	CLF-5/W
Part No.	03 F 3000	03 F 3005
Option: Water stop	NO	YES
Gas flow	max. 300 NI/h	max. 200 NI/h
Gas pressure	0.2 - 2 bar abs. $\Delta$ P max. 1,0 bar	0.3 - 2 bar abs. $\Delta$ P max. 0.5 bar
Pressure drop and flow rate for a new filter element, with air	3 6 10 <b>mbar</b> 100 200 300 <b>NI/hr</b>	17 35 <b>mbar</b> 100 200 <b>NI/hr</b>
Sample temperature	max. +80 °C (176 °F)	
Ambient temperature	0 °C to +60 °C (32 to 140 °F)	
Storage temperature	-25 °C to +80 °C (-13 to 176 °F)	
Filter element / Retention rate	2-layer <b>CLF-5</b> / 99.9999 % for particles >0.1 $\mu$ m	
Filter dead volume	70 cm <sup>3</sup>	
Reservoir capacity for liquid	20 ml	
Material of sample contacting parts	<b>PVDF, glass, FPM</b>	
Sample gas- / drain connection	G 1/4"i DIN ISO 228/1 / GL25 cap	
Type of mounting	wall mounting	
Weight	approx. 0.3 kg (0.66 lb)	

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


## Connection of the sample line

The connections of the sample lines are marked by red arrows.

 **When using the upper entry ② on the head of the filter for the measuring gas inlet resp. outlet, the function of the filter is not guaranteed (see flow direction in the filter).**

## Mounting Instruction Water-Stop CLF-5/W


The following instruction shows the mounting of the PTFE diaphragm into the liquid particle filter type **CLF-5/W**.

 **The system must be checked directly when flow is interrupted. A water breakthrough can damage the analyser(s). Pay attention to absolutely cleanness when mounting the diaphragm. Contaminations affect the function of the Water-Stop.**  
**The maximum working pressure is 2bar absolute and the maximum temperature is +80 °C (176 °F).**


 **Aggressive condensate possible. Wear safety glasses and protective clothes!**

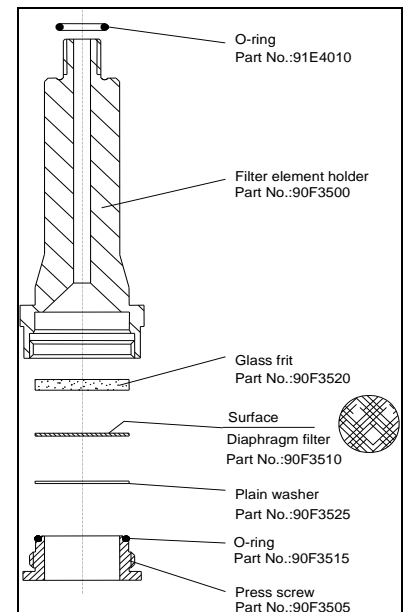
The following steps have to be carried out:

- Unscrew the filter glass counter-clockwise.
- Unscrew the filter element holder ②.
- Unlock the press screw ⑥ and dismantle the glass frit ① with the diaphragm filter ③ and the flat ring disc ④.

 **When re-fitting the glass frit be sure that the smooth side is opposite to the filter element holder.**

- Fit the diaphragm filter with the weft side towards the glass frit.
- Place the flat ring disc on the diaphragm filter.

 **When changing the O-ring of the press screw do not roll up. In case other materials for the O-ring have been used due to technical reasons, this is noted on the type plate. Please pay attention to this and specify when ordering replacement parts.**



Screw the press screw by hand into the filter element holder up to the diaphragm filter.

The assembly of the fluid particle filter happens in the opposite way.

## Recommended spare parts

Wear, tear and replacement part requirements depend on specific operating conditions.

Part No.	Description
90 F 3530	Spare part set consisting of: glass frit ①, diaphragm filter ③, flat ring disc ④ and O-ring ⑤
90 F 3535	Spare part set consisting of: diaphragm filter ③, flat ring disc ④