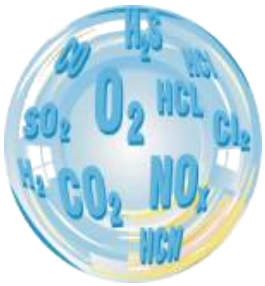


STATIONARY HEATED GAS FILTER

User guide
Version: 2.0
05/2014

madur
ELECTRONICS

Content

1. INTRODUCTION

Stationary heated gas filter is simple in its construction, yet very useful for all CEMS analysers. Especially in places where pollution of tested gas sample reaches high levels. This filter was designed and perfected, with minimal maintenance work from the end user in mind.

Drawing 1. Stationary heated gas filter.

2. PACKAGE CONTENT

- Fully assembled stationary heated gas filter with 3m power cord with no plug.
- One spare sintered steel filter insert
- Four wall plugs with screws for wall mounting
- Two PVDF 6-1/4 NPT elbow adapters for 6mm Teflon tubes
- One ¼ NPT male-female extension
- Two 1 meter pieces on Tygon tubing in coating

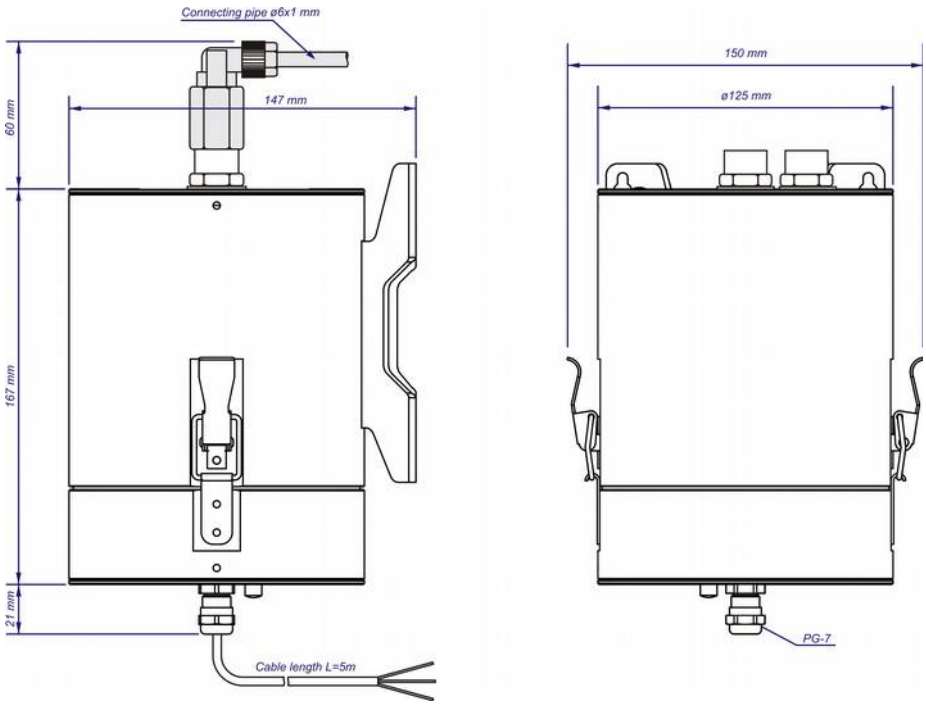
3. GENERAL INFORMATION

Stationary heated gas filter connected inline to the CEMS system is responsible for filtering all mechanical contamination of the tested gas sample. In consequence effectively protects fragile measuring equipment. The filter is also equipped with a heating

chamber. Its purpose is to prevent water vapour from condensing what allows high precision capabilities of the analysers.

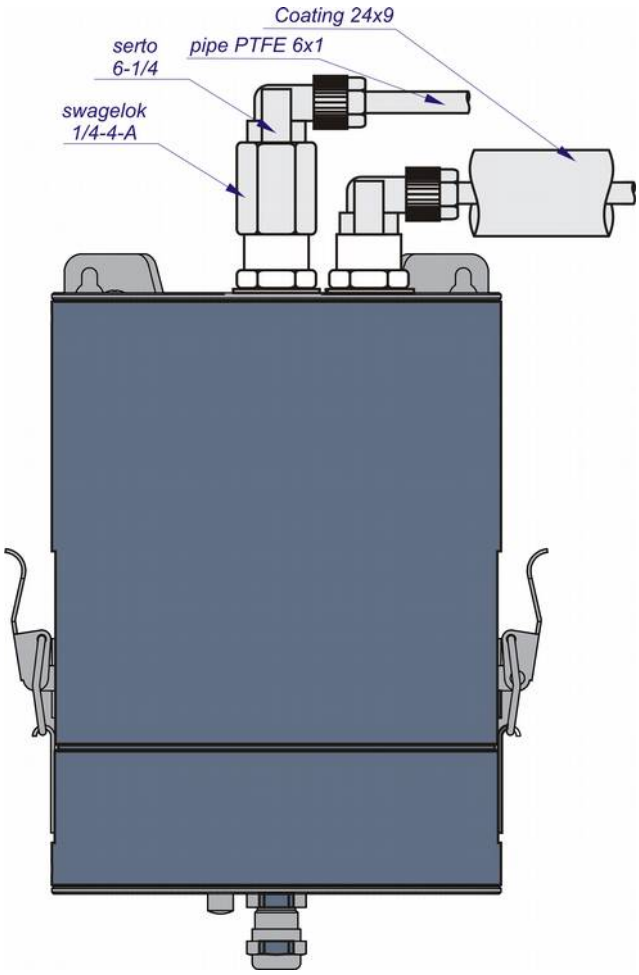
4. CONSTRUCTION

4.1. Filter body



Drawing 2. Filter's external view

The filter is designed to prevent vapour inside the gas sample from condensing and to clean the sample of all mechanical pollution. For this purpose a special filter insert of stainless sintered steel is placed inside the heating chamber. It can be removed for cleaning (more information available in section 4.2).



Drawing 3. Gas connections

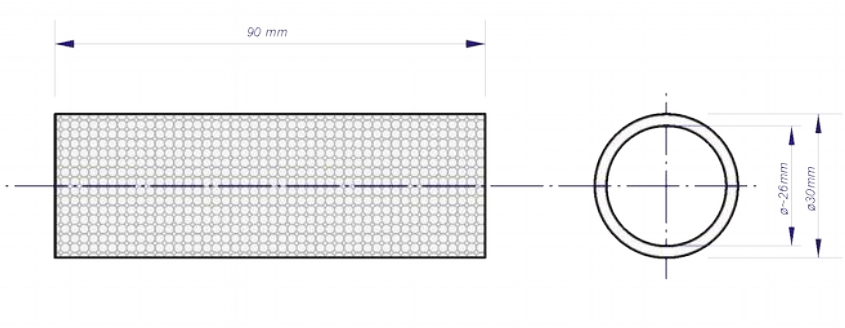
Filter electronic parts placed in the bottom part of the filter have the Ingress Protection Rating of 65. The pressure inside the filter can be a little lower than the ambient air pressure thanks to the suction force created by the pump of an analyser or dryer connected to the filter. Filter power plug is not provided. For more information go to section 4.4

4.2. Stationary heated gas filter sintered stainless insert

Drawing 4. Sintered stainless filter

Stainless steel filter was especially designed for prolonged work with highly polluted air. It is made of sintered stainless steel and in consequence can be cleaned mechanically and chemically. It is machine washable.

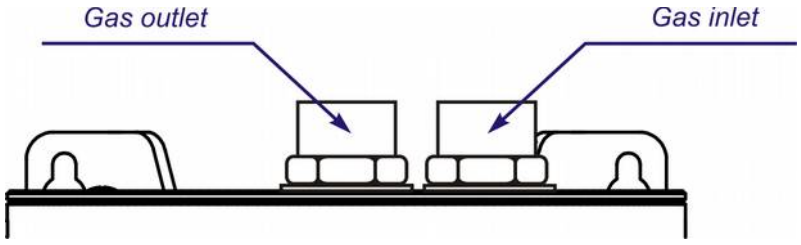
For information on how to remove the filter insert from the filter casing go section 5.6.



Drawing 5. Schematics of sintered stainless steel filter

4.3. Gas connections

There are 2 gas connections in the casing of the filter, one gas inlet (from the probe) and one outlet (to the analyser). Both connections have 1/4 NPT female thread.

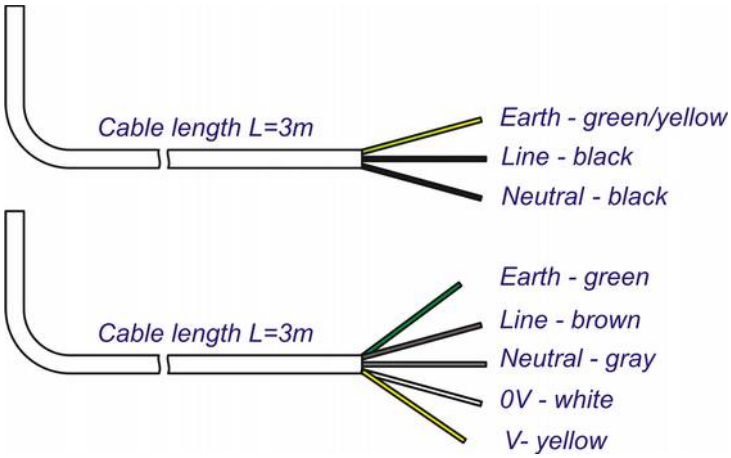


ATTENTION

Because temperature inside the filter can reach 150°C, flowing gas can heat the gas connections to high temperatures.

Make sure you allow the filter to cool down before you touch the aluminium casing or gas connections.

4.4. Electric connections

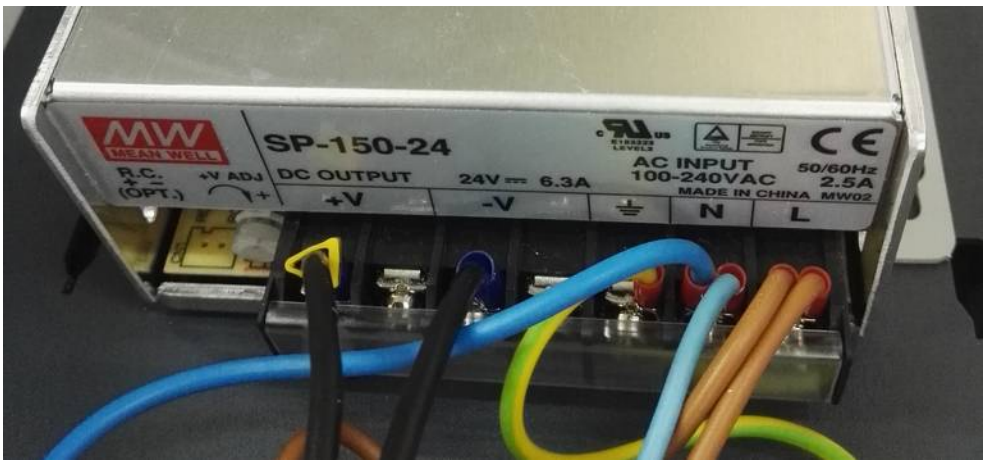


Drawing 6. Power cable wiring (version standard - top and premium - bottom

Filter is equipped with 3m electric cable with (in the standard version) 3 wires (Neutral, Power and GND). Depending on a version, filter can work in 115V or 230V voltage.

In premium version the filter can be equipped with 5 wire 3m cable (where 2 additional wires allow the filter to be switched (ON-OFF) remotely).

Electric cables might be connected to e.g. MD3 dryer's power supply (or analyser's power supply). Picture below shows view at example power supply's connectors



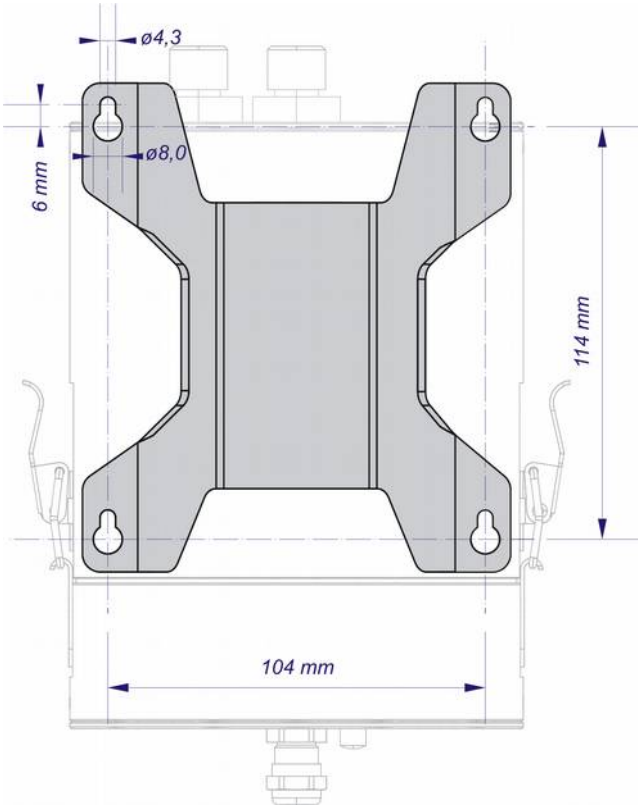
Drawing 7. Mamos power supply; Heated filter might be connected to 3 pins on the right: ⏚ - Earth, N – Neutral, L – Line

5. WORKING WITH THE STATIONARY HEATED GAS FILTER

5.1. Safety precautions

1. **Please be advised that the filter should always be connected to the EARTH/GND via attached power cable. Otherwise it may electrocute.**
2. **The filter must cool down before any maintenance is executed.**
3. **Always use protective temperature resistant gloves while working with the filter.**
4. **Be advised that the filter, when opened, creates a passage for gasses from the stove, that can be harmful and life threatening when inhaled. Make sure that the filter is opened for the shortest time possible.**
5. **Use protective gloves while cleaning the filter insert.**

5.2. Wall mounting



Drawing 8. Wall mounting hole

The filter was designed for immobile work, with 4 mounting holes allowing hanging the filter on a flat vertical surface.

Please use the supplied wall plugs to attach the filter to a wall in a close proximity of the gas probe.

All gas tubes and elbows should be temperature protected with appropriate isolation to prevent vapour condensation.

ATTENTION

Filter can work ONLY while hanging from a high temperature resistant, vertical surface.

5.3. Connecting the filter to the probe

The filter should be connected to a gas probe for gas extraction. We recommend that you use madur stationary gas probe available on our **website**.

5.4. Connecting the filter to analyser

We recommend that you connect the filter to the madur analyser with a use of a heated hose that can be bought through our **website**.

5.5. Heated filter

Please be aware that the filter should not supply gas to the analyser while switched off, as it may lead to vapour condensation (especially when the filter is mounted in a cold environment) and, in extremal cases, damage to the analyser connected to the filter.

The LED placed in the bottom part of the filter's casing informs user about:

- green colour light – the filter is connected to mains power supply
- red colour light – the heater is switched on.

Filter's buckles can be padlocked to restrict unauthorised access (padlocks not included).

ATTENTION

Please remember that the filter MUST be connected to Earth/GND via attached power cable. Otherwise it may electrocute.

5.6. Removing the filter insert from the filter

Filter insert can be removed from the filter for replacement or cleaning purposes.

Opening the filter casing, sequence of necessary steps:

- **Always use protective gear when dealing with high temperatures.**
- **Make sure** that the filter cools down after switched off and that there is no smoke coming out of the chimney. Please remember that the filter has high thermal inertia and its temperature (while closed) will drop very slowly.
- Open both buckles placed on left and right side of the filter, the bottom part of the filter will drop down moving away from the top part of the filter.
- Remove the bottom part of the filter and remove the filter insert.
- Make sure that the EARTH/GND wire connecting top and bottom parts of the filter is connected securely before you attempt to close the filter.

Drawing 9. Opened filter with filter insert

Filter is machine washable and can be cleaned with household detergents, pressurised air/water or a brush. Be aware of filters sharp edges. Make sure you use protective gloves.

6. TECHNICAL DATA

Weight:	2.8 kg
Dimensions w/o external connectors (H x W x D)	167mm x 125mm x 147mm
Dimensions w/ external connectors (H x W x D)	209mm x 150mm x 147mm
Casing material	Anodised aluminium
Mounting holes distance	Left-right: 104mm Top-bottom:114mm
Storage and operating temperature range:	-20°C – 55°C
Working pressure:	Ambient (+/- 10%)
Power supply, (dependent on a version):	110V AC (+/- 10%) 230V AC(+/- 10%)
Power consumption:	Max 130W
Warming up time:	Up to 15 minutes (from 0°C)
Desired filter working temperature / hysteresis:	130°C / 4°C
Filter wetted materials:	Stainless steel polyamid anodised aluminium FKN gaskets
Gas connection elbows:	PVDF 6-1/4 NPT
Gas elbows tube outside diameter:	6mm
Gas elbows thread:	RNPT -1/4 inch
Remote switching of the filter via 5 wire cable:	0-3V DC – OFF 3-20V DC – ON
Filter's locking buckle's padlock's shackle's maximum diameter:	6mm

Power cable wiring:

Wire colour	**3 wire version**	**5 wire version**
Line	black	brown
Neutral	black	grey
Earth	green/yellow	green
0V		white
V		yellow