AirPure S

User manual

1. Description

The AirPure S is a plug & play mobile filter that is delivered to the customer filled with activated carbon.

The AirPure S is equipped with the following manual connections/valves:

T1 = DN 200 flange for gas inlet connection

T2 = DN 200 flange for gas outlet connection

T3 = Camlock DN25 + ball valve for drainage (after use and before retrieval) and connection for inert gas (e.g. N_2 or CO_2)

The AirPure S is equipped with the following instrument:

- I1: GPS tracker

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2. Commissioning

The AirPure S is ready for use upon delivery. To use it, connect the gas supply to T1 and the gas outlet to T2. Ensure T3 is closed.

Gradually increase the influent flow rate to the desired level, taking into account the technical specifications of the filter. The overpressure in the filter must always remain below 100 mbar. The negative pressure must not drop below 50 mbar.

3. Operation

The filter must always be grounded during use, as indicated by the following symbol on the frame:
A grounding clamp can be mounted on the filter for this purpose.

It is essential to maintain a constant flow to the filter and to adhere to the prescribed minimum air/gas flow rate (see “Technical info AirPure S”). The minimum air/gas flow rate depends on the process and can be discussed with Cargen.

For every process interruption, the filter must be “flushed” with at least 6 Nm^3 (i.e. 3 times the filter volume) of inert gas, such as N_2 or CO_2 (see further details). If the filter is used in a discontinuous process, it must be flushed with ambient air at the minimum flow rate for the entire duration of the interruption.

Cargen strongly recommends that the customer provides monitoring on the outgoing gas flow (e.g. inline CO monitor or thermometer), i.e. after the activated carbon. This is necessary to detect any hotspots in and/or combustion of the activated carbon in a timely manner. This measurement can be performed in the customer’s piping system or via the 1” nozzle on top of the filter.

If hotspots in and/or combustion of the activated carbon are observed:
- the purification process must be stopped immediately
- the filter must be isolated from the rest of the process
- the filter must be extinguished immediately (see further details)

The presence of (a too high concentration of) dust or moisture in the gas to be purified is detrimental to the filter's operation and can cause excessive backpressure. Pre-treatment of the gas (cooling, demister, filter, etc.) may therefore be necessary. Cargen can advise the customer on this.

During use, the customer will periodically inspect the proper technical operation of the filter and check for defects. If defects are found, the customer should contact Cargen to discuss how to remedy the situation.

4. Inerting the filter

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If necessary (e.g. during interruptions of the purification process), the filter can be inerted to prevent combustion of the activated carbon.

Procedure:
- Stop the gas supply
- Close T1
- Send inert gas (e.g. N_2 of CO_2) through the filter via T3

At least 6 Nm^3 (i.e. 3 times the filter volume) of inert gas must be sent through the filter for inerting. The filling pressure of the inert gas must not exceed 100 mbar, and T2 must remain open.

Once fully flushed with inert gas (i.e. at least 6 Nm^3), the filter must remain untouched for at least 2 hours, i.e. stop the inert gas supply, close T3, and keep T1 closed, while T2 remains open.

5. Extinguishing the filter

If necessary, the filter can be filled with water to prevent combustion of the activated carbon.

Procedure:
- Stop the gas supply
- Close T1
- Pump water into the filter via the 1” nozzle on top of the filter

T2 must remain open to allow heat and water vapour to escape. Once fully filled with water (i.e. approximately 2 m^3 of water in the filter), the filter must remain untouched for at least 3 hours, i.e. stop the water supply, disconnect the firefighting water line and keep T1 closed while T2 remains open.
The extinguished filter can no longer be used and must be replaced. However, before replacing the filter, it must be drained. This must be done at least 3 hours after extinguishing, by opening T3 and allowing all free water to drain out of the filter via a drainage line connected to T3.

6. Decommissioning

If, during the process, the activated carbon becomes saturated and no longer provides adequate purification, the filter with the saturated carbon will be replaced by a new filter at the customer’s request. For this, the filter must first be decommissioned and drained. Non-drained filters cannot be replaced by Cargen.

The customer decommissions the filter by stopping the process flow, disconnecting the inlet and outlet lines, and closing T1 and T2.
Next, a drainage line is connected to T3 to drain the condensate.
CAUTION: This condensate may be corrosive.

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SAFETY

Avoid inhaling activated carbon dust. Wet-activated carbon removes oxygen from ambient air. In (partially) enclosed spaces, oxygen depletion can reach potentially dangerous levels. When entering such spaces, appropriate procedures for environments with potentially low oxygen levels must be followed. Adsorption of certain contaminants or reactions with the activated carbon can result in an exothermic reaction, leading to hot spots in the carbon. Proper monitoring is necessary for this.

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