AquaPure L

User manual

1. Description

The AquaPure L is a patented plug & play mobile filter filled with activated carbon, delivered to the location requested by the customer.

The AquaPure L is equipped with the following manual connections/valves:

T1 = Camlock DN100 + butterfly valve for influent water connection

T2 = Camlock DN100 + butterfly valve for effluent water connection

T3 = butterfly valve DN100 for drainage and backwash

T4 = ball valve on the aeration line for siphon break in the effluent line

T5 = ball valve on the venting and aeration line of the filter

T6 = ball valve on the influent line for sampling

T7 = ball valve on the effluent line for sampling

The AquaPure L is equipped with the following instruments:

- I1: analogue pressure gauge on influent line (inlet pressure)
- I2: analogue pressure gauge on effluent line (outlet pressure)
- I3: GPS tracker
- I4: pressure relief valve on the filter, set to 4 bar
- I5: automatic aerator and vent on the filter
- I6: aerator at the highest point of the effluent line for syphon break

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2. Commissioning

The AquaPure L is delivered filled with activated carbon. Since it still contains a significant amount of air, the filter must be vented before use. This is done by slowly filling the filter from the bottom to the top with clear water (i.e., virtually free of suspended and settleable solids). This flow direction is called backwash flow (see further). For this, the supply of clear water is connected to valve T3, the effluent valve T2 is closed and the influent valve T1 is temporarily used as the water outlet.

Procedure:

- Connect an effluent line to T1 and open valve T1
- Close T2 on the effluent line
- Connect a supply line to T3 and open valve T3
- Open T5 to allow the filter to vent
- Ensure that both sampling valves T6 and T7 are closed
- Fill the filter via T3 with clear water at a maximum rate of 15 m^3/h
- After 1 to 1.5 hours the filter is fully vented

Once the filter is completely filled with water, vent I5 will automatically close, and valves T1 and T3 can be closed until the filter is put into actual use. The clear water supply line can be disconnected. The AquaPure L is fully vented and ready for further commissioning.

Now the supply line for the water to be purified can be connected to T1 and the effluent line of the filter to T2. The respective valves are then opened.

During operation, check that the venting and aeration valve T5 remains open at all times.
During operation check that the aeration valve T4 remains open at all times.

Gradually increase the influent flow rate to the desired level. The influent and effluent pressures can be read on the respective gauges I1 and I2.

Activated carbon may cause a slight pH increase in the effluent water upon first use. If this pH increase is not desirable, it is best to temporarily return the effluent water to a previous step in the water purification process to neutralize this effect. Cargen can advise the customer in this regard.

3. Operation

Both ball valves T4 and T5 must remain open during filter use, as these valves allow air to enter the filter or effluent line in case of negative pressure.

During use, the filter must always be grounded. If necessary, the grounding tab at the bottom of the filter, marked with the following symbol, can be used:

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Additionally, for environmental reasons, it is advisable to regularly sample and analyze the quality of the effluent. This is the only way to accurately determine the efficiency and saturation of the activated carbon in the filter.

No special actions are required for short process interruptions.

In case of prolonged downtime at freezing temperatures, the filter must always be fully drained to avoid frost damage. The filter is first taken out of service (see below), and then T1, T2, and T3 are opened so that all water can drain from both the pipes and the filter. When draining, drain lines must always be connected to prevent water from flowing over the outside of the filter.
An alternative to draining at freezing temperatures is to maintain a continuous minimum process flow of 3 m^3/h. If the AquaPure L has been drained during downtime, it must be vented again before it can be put back into use.

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. Backwashing

If the pressure across the filter rises (too quickly), a brief backwash may be considered. This should only be done with clear water.

Procedure:

- Stop the process
- Close the valve on the influent line T1
- Disconnect the influent line
- Connect a drain line to valve T1
  (Note: this drainage water may contain suspended and settleable solids)
- Close the valve on the effluent line T2
- Connect a water line (with clear water) to T3
- Open valve T3
- Open valve T1
- Gradually increase the water flow to a maximum of 15 m^3/h

Backwashing is always a brief action to counteract pressure increases. Once the backwashing is complete, the purification process can continue, provided the lines are reconnected correctly (see commissioning).

5. 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.

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The customer decommissions the filter by stopping the process flow, closing valves T1 and T2, and disconnecting the influent and effluent lines.
To drain, simply connect a drain line to T1, T2, and T3 (to prevent wastewater from flowing over the filter) and then open the drainage valve T3, together with T1 and T2, and wait until little to no water flows out of the filter.

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.

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