7 Service and repair

If an error occurs during operation, you will find troubleshooting and corrective information in this chapter.

Repairs to the equipment may only be performed by Bühler authorised personnel.

If you have any questions, please contact our service department:

Tel.: +49-(0)2102-498955 or your local representative.

Further information about our individual service solutions for repair, modification and commissioning can be found at https://www.buehler-technologies.com/service.

If, after rectifying any faults and switching on the mains voltage, the device does not function correctly, it must be checked by the manufacturer. Please send the equipment inside suitable packaging to:

Bühler Technologies GmbH

- Reparatur/Service -

Harkortstraße 29

40880 Ratingen

Germany

In addition, please attach the completed and signed RMA decontamination declaration to the packaging. Otherwise, your repair order cannot be processed. You can find the form in the appendix of these instructions, or simply request it by e-mailing:

service@buehler-technologies.com.

7.1 Troubleshooting

Problem/malfunction	Possible cause	Action
No LED lights up	– Mains voltage interrupted	– Connect to mains; check the plug is correctly inserted
	– Fuse defective	– Check fuse and replace if necessary
	– LED defective	– Send in cooler
	– Internal error	– Send in cooler
Red LED flashing (f = 1 Hz) Excess temperature Temperature low	– Operating point not yet reached	– Wait (max. 15 min)
	– Cooling output too low despite the cooler running	– Ensure the vents are not covered (heat buildup)
	– Flow rate too high/dew point too high/gas temperature too high	– Maintain limits / install pre-separator
	– Built-in fan stopped	– Check and replace if necessary
	– Controller defective	– Send in cooler
	– Short circuit	– Temperature sensor failure: Send in cooler
	– Broken wire	– Temperature sensor failure: Send in cooler
Red LED flashing (f = 5 Hz)	– Internal error	– Send in cooler
Steady red LED Moisture in sample gas (If the moisture detector was triggered it will then need to be dried)	– Cooler overloaded flow rate too high/dew point/gas temperature too high	– Maintain limits/install pre-separator
	– Cooling output too low despite the cooler running	– Ensure the vents are not covered (heat buildup); maintain limits
	– Condensate trap full	– Empty condensate trap
	– Water entering from water bag	– Observe delivery rate of peristaltic pumps – Install condensate drain with downward slope
	– Cable break in the moisture detector connection line	– Check connection line and plug-in connection
Condensate inside the gas output	– Condensate trap full	– Empty condensate trap
	– Valve inside the automatic condensate drain may be stuck	– Flush in both directions
	– Cooler overload	– Maintain limits
Reduced gas flow rate	– Gas circuit clogged	– Remove and clean heat exchanger – if necessary, replace filter element
	– Condensate output iced over	– Send in cooler
Modbus communication error	– Bus connection fault	– Check electrical connections
	– Line termination fault	– Check bus line
	– Check bus configuration	– Check/reset configurator

7.2 Carrying out maintenance, repair and modification work

For all work on the device, the general instructions in the chapter Safety instructions [> page 3] **must be observed!**

DANGER **Toxic, corrosive gas/condensate**

Sample gas/condensate may be hazardous to health.

a) If necessary, ensure a safe gas/condensate discharge.

b) Always disconnect the gas supply when performing maintenance or repairs.

c) Protect yourself from toxic/corrosive gasses/condensate when performing maintenance. Wear appropriate protective equipment.

CAUTION **Health hazard if the heat exchanger leaks**

The heat exchanger is charged with glycol-based coolant.
In the event of a heat exchanger leak:

a) Avoid contact with the skin and eyes.

b) In the event of a leak, do not restart the cooler under any circumstances The cooler must be repaired by the manufacturer.

7.2.1 Cleaning and removal of the heat exchanger

Heat exchangers only need to be replaced or maintained if clogged or damaged. If they are clogged, we recommend checking if using a filter will avoid future occurrences.

- Close gas supply.
- Switch off device and disconnect all plugs (e.g. status output connector, supply input, etc.).
- Disconnect gas connections and condensate drain.
- Pull the heat exchanger up and out.
- Clean cleaning nest (hole inside the cooler block), as the heat exchangers are installed with silicone grease.
- Flush the heat exchanger until all contaminants have been removed.
- Grease the cooled outside surface external surface with silicone grease.
- Reinsert the heat exchanger into the cooling nest with a rotating movement.
- Reconnect the gas supply and condensate drain. The gas inlet is marked red.
- Restore power/gas supply and wait for unit to be ready for operation.
- Open gas supply.

7.2.2 Replacing the fuse of the cooler

- Close the gas supply.
- Switch off and unplug the device.
- Loosen the screws on the cover.
- Carefully remove the cover.
- The fuse is located on the board under a plastic cap. Replace microfuse and put the cap back on. Please note the mains voltage in order to select the correct microfuse.
- Reattach cover. Screw in mounting screws.
- Restore the power and gas supply.

7.2.3 Replacing the filter element (option)

CAUTION

Gas leakage

The filter should not be dismantled under pressure.
Don't use damaged parts again.

- Shut off the gas supply.
- Pull the bracket while holding the filter glass in place.
- Whilst holding the filter head, move the glass back and forth and carefully remove downward.
- Remove the filter element and insert a new one.
- Check for leaks and replace, if necessary.
- Refit the glass while simultaneously holding the filter head and gently moving it back and forth, attach the bracket and ensure it is securely seated.
- Restore the gas supply.

NOTICE! Observe legal regulations when disposing of filter elements.

7.2.4 Drying of the moisture detector (option)

The moisture detector must be dried if moisture enters.

- Close the gas supply.
- Switch off and unplug the device.
- Loosen the swivel nut for the moisture detector connection line and disconnect the line.
- Unscrew the moisture detector counter-clockwise and remove.
- Dry moisture detector.
- Reinsert the moisture detector and carefully tighten the screw connection.
- Connect the connection line and tighten the swivel nut.
- Restore the power and gas supply.

7.3 Spare parts

Please also specify the model and serial number when ordering parts.

Upgrade and expansion parts can be found in our catalog.

Available spare parts:

Item no.	Description
4011000	Flow adapter type G, PVDF G1/4
4011000I	Flow adapter type NPT, PVDF NPT 1/4"
4111100	Moisture detector FF-3-N, without cable
9144050081	Moisture detector connection cable, 300 mm
9144050082	Moisture detector connection cable, 450 mm
9110000031	Sample gas cooler micro-fuse 24 VDC, 5 x 20 mm, 5 A, delayed action
5530009932	Fan, 24 VDC

7.3.1 Consumables and accessories

Item no.	Description
9112000039	24 V top-hat rail power supply
9112000040	24 V top-hat rail power supply for using the 24 V output
4510008	Automatic condensate drain AK 5.2
4510028	Automatic condensate drain AK 5.5
4410004	Automatic condensate drain AK 20
4410001	Automatic condensate drain 11 LD V 38
41030050	Replacement filter element F2; 2 µm, Unit 5 count
4381045	Screw connection G1/4 - DN 8/12 for passive condensate connection MTS and MTV
4381048	Screw connection NPT 1/4" for passive condensate connection MTS and MTV