

StamoClean CAT 430 **Micro / Ultra filtration**

Operating Instructions

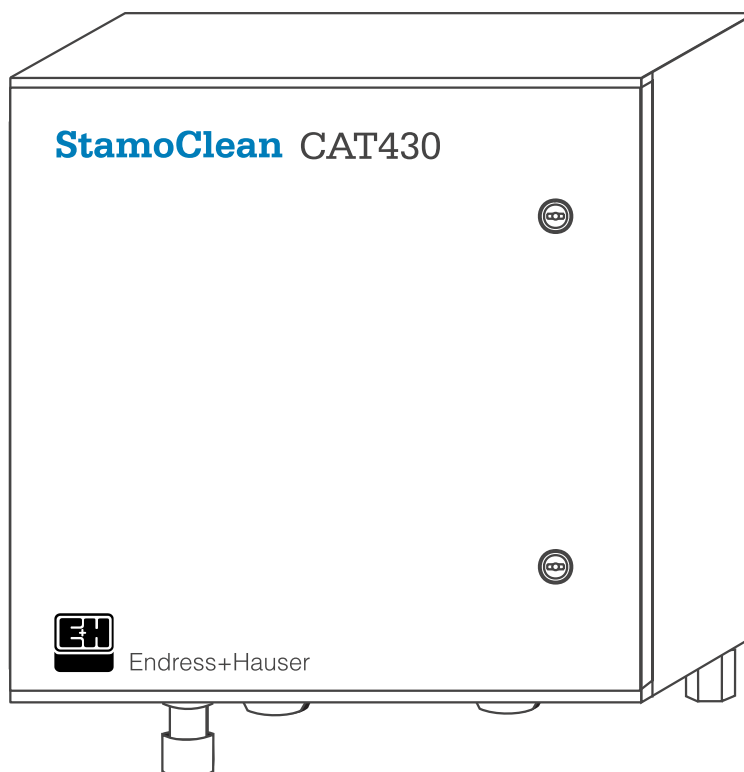


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1 Safety instructions

1.1 Designated use

The CAT 430 Micro/Ultra Filtration system is a filtration system for taking samples for process measuring devices in sewage treatment plants.

The system transports clear samples directly from the clarification basin to the measuring device.

Any other use than the one described here compromises the safety of persons and the entire measuring system and is, therefore, not permitted.

The manufacturer is not liable for damage caused by improper or non-designated use.

1.2 Installation, commissioning and operation

Please note the following items:

- Installation, electrical connection, commissioning, operation and maintenance of the measuring system must only be carried out by trained technical personnel.
The technical personnel must be authorised for the specified activities by the system operator.
- Technical personnel must have read and understood these Operating Instructions and must adhere to them.
- Before commissioning the entire measuring point, check all the connections for correctness. Ensure that electrical cables and hose connections are not damaged.
- Do not operate damaged products and secure them against unintentional commissioning. Mark the damaged product as being defective.
- Measuring point faults may only be rectified by authorised and specially trained personnel.
- If faults can not be rectified, the products must be taken out of service and secured against unintentional commissioning.
- Repairs not described in these Operating Instructions may only be carried out at the manufacturer's or by the Endress+Hauser service organisation.

1.3 Operational safety

The sample preparation unit has been designed and tested according to the state of the art and left the factory in perfect functioning order.

Relevant regulations and European standards have been met.

As the user, you are responsible for complying with the following safety conditions:

- Installation instructions
- Local prevailing standards and regulations.

1.4 Return

If the device requires repair, please send it *cleaned* to the appropriate Endress+Hauser sales office.

Please use the original packaging, if possible.

Please enclose the completed Dangerous Goods sheet (copy the second last page of these Operating Instructions) with the packaging and the transportation documents.

1.5 Notes on safety icons and symbols



Warning!

This symbol alerts you to hazards. They can cause serious damage to the instrument or to persons if ignored.



Caution!

This symbol alerts you to possible faults which could arise from incorrect operation. They could cause damage to the instrument if ignored.



Note!

This symbol indicates important items of information.

2 Identification

2.1 Device designation

2.1.1 Nameplate

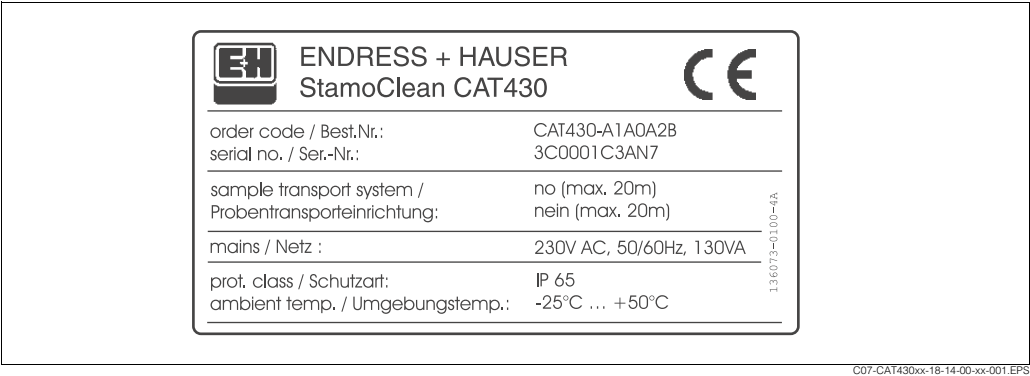


Fig. 1: Example of a nameplate

2.1.2 Product structure

Sample volume	
A	250 ml/h; 1-2 StamoLys CA 70 incl. 5 m hose t. filter and pump box
B	500 ml/h; 3-4 StamoLys CA 70 incl. 5 m hose t. filter and pump box
Y	Special version acc. to customers specification
Length of the sample tube (from pump box to analyzer)	
1	up to 20 m (without heater)
2	up to 100 m (with external compressor and 100 m hose without heater)
3	up to 100 m (with internal compressor and 100 m hose without heater)
9	Special version acc. to customers specification
Fittings (from pump box to analyzer)	
A	Without sample hose heater
D	With 8 m sample hose heater
F	With 18 m sample hose heater
Y	Special version acc. to customers specification
Power supply	
0	230 V AC
1	115 V AC
Sampling between filter and hose pump box	
A	with heating
B	without heating
Mounting hose pump box	
2	Wall mounting
3	Basin rim mounting
9	Special version acc. to customers specification
Filter element holder	
A	No filter element holder
Y	Special version acc. to customers specification
CAT 430 -	complete order code

2.2 Scope of delivery

The scope of delivery comprises:

- 1 Pump box, complete with filtrate line connected, length 4.5 m, hose heating 24 V
- 2 Hose clamps 44 - 49 mm, set screw M8
- 1 Cushions with screw
- 1 Collecting vessel with PE hose 10/8 mm, length 2.5 m
- 1 Roll PE hose 4/2 mm, length 2.5 m
- 1 Roll PVC hose 4/2 mm, length 2.0 m
- 1 Bag:
 - 1 Mini screw driver
 - 1 Blind plug
 - 2 Silicon hose nozzles
 - 2 Tierap
- 1 or 2 Filter plate(s) with threaded elbow joint (depending on ordered version)
- 1 Filter element holder (depending on ordered version)
- 1 Filtrate line with PE filtrate hose 4/2 mm, length 20 m, without hose heating
- 1 Acceptance certificate
- 1 Operating Instructions BA 317CDE (german)
- 1 Operating Instructions BA 317CEN (english)

2.3 Certificates and approvals

Declaration of conformity

The product meets the legal requirements of the harmonised European standards.
Endress+Hauser confirms compliance with the standards by affixing the **CE** symbol.

3 Installation

3.1 Incoming acceptance, transport, storage

- Make sure the packaging is undamaged!
Inform the supplier about damage to the packaging.
Keep the damaged packaging until the matter has been settled.
- Make sure the contents are undamaged!
Inform the supplier about damage to the delivery contents.
Keep the damaged products until the matter has been settled.
- Check that the scope of delivery is complete and agrees with your order and the shipping documents.
- The packaging material used to store or to transport the product must provide shock protection and humidity protection. The original packaging offers the best protection. Also, keep to the approved ambient conditions (see "Technical data").
- If you have any questions, please contact your supplier or your Endress+Hauser sales centre responsible (see back page of these Operating Instructions).

3.2 Quick installation guide

The following figure provides you with an overview of the complete measuring point.

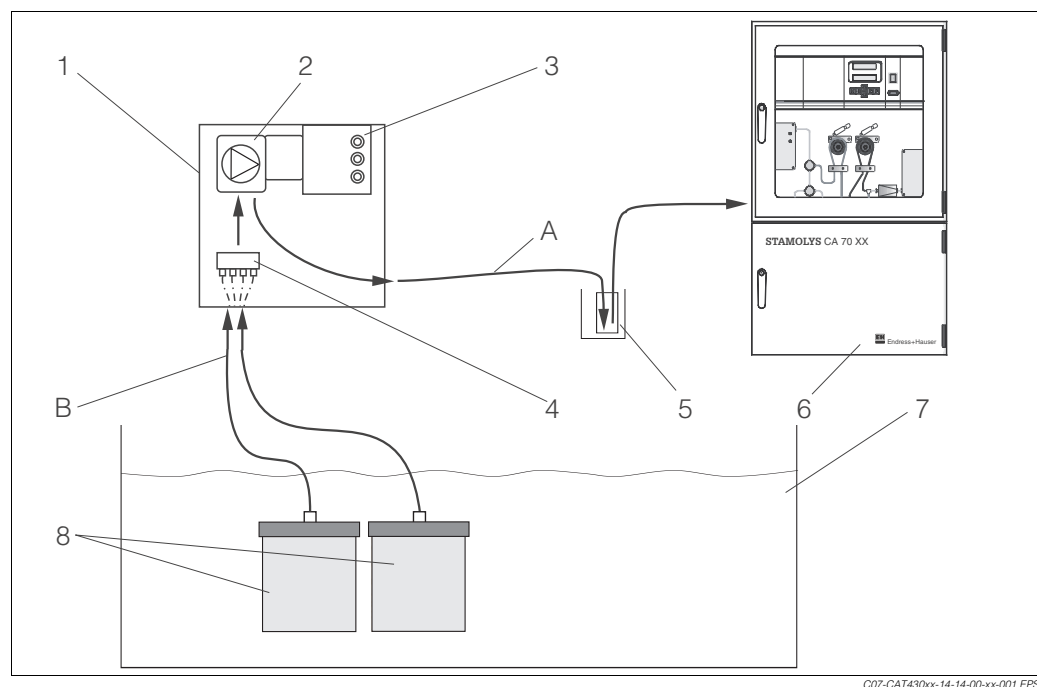


Fig. 2: Complete measuring device (without sample transportation unit)

- | | |
|---|--------------------------|
| 1 Hose pump box | 5 Collecting vessel |
| 2 Hose pump | 6 Analyzer |
| 3 Control unit | 7 Activated sludge basin |
| 4 Collecting block (optionally) | 8 Membrane filter |
| A PTFE hose 1.5/3 mm, max. 20 m without compressor ¹ | |
| B PE hose, 4.5 m standard version, with heating, max. length 17 m | |

- 1) With a device with sample transportation unit two sample hoses (1 x 1.5/3 mm PTFE hose + 1 x 2/4 mm PE hose) and a pressure hose are integrated in a protecting hose. The compressor is placed near the measuring devices (max. 100 m distance to hose pump box).

3.3 Installation conditions

3.3.1 Holders and filter elements dimensions

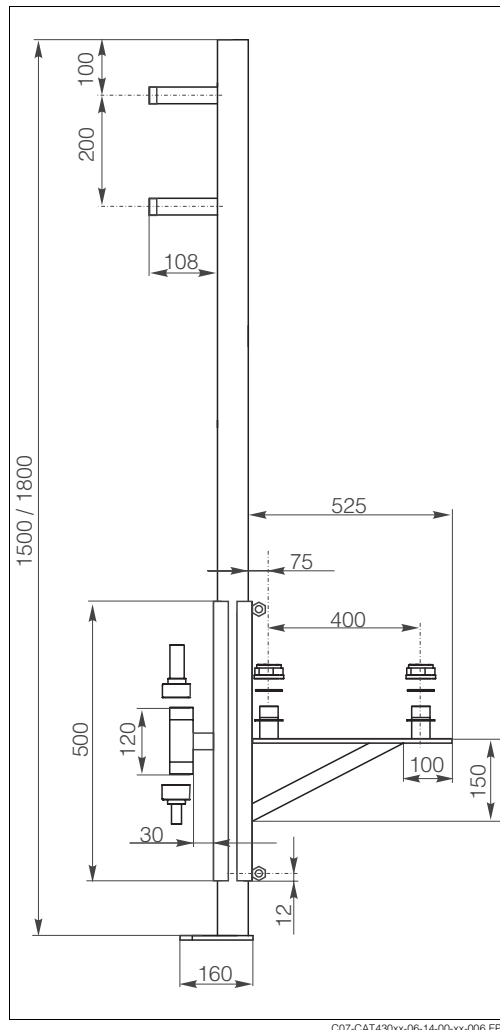


Fig. 3: Holder for open channel, side view

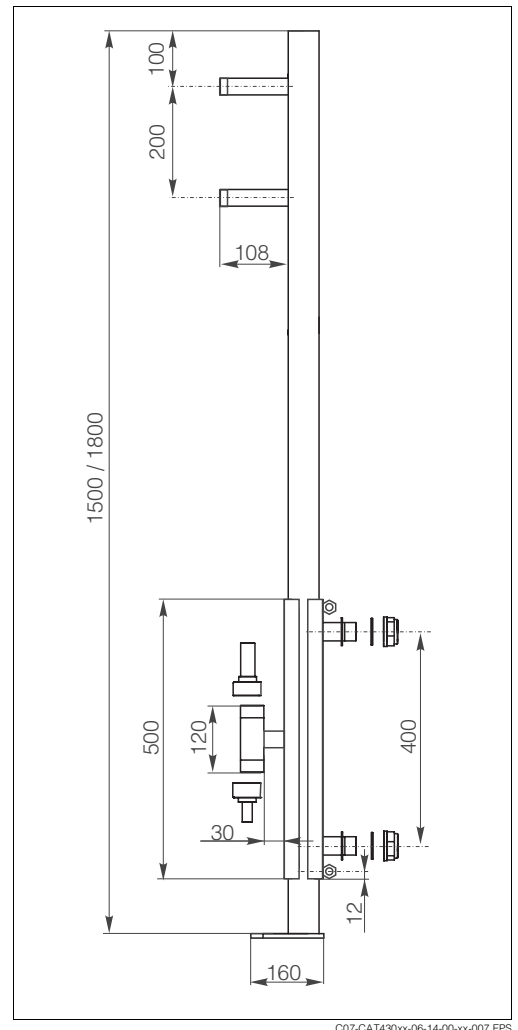


Fig. 4: Holder for basin, side view

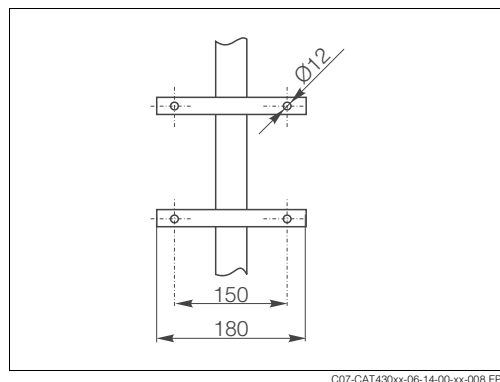


Fig. 5: Detail wall mounting, front view

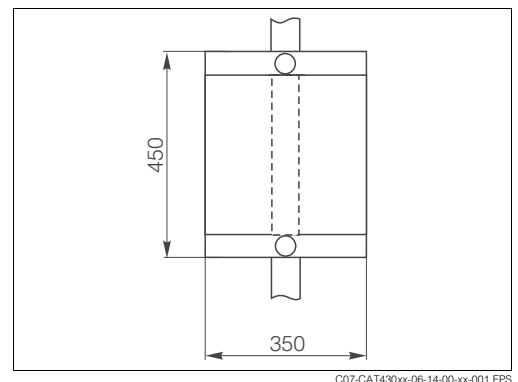


Fig. 6: Filter element

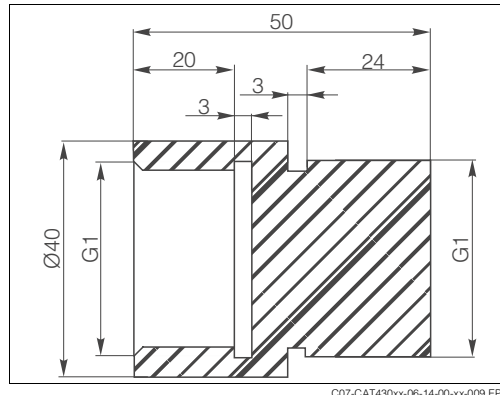


Fig. 7: Adapter for mounting of a 2nd filter plate

3.3.2 Hose pump box dimensions

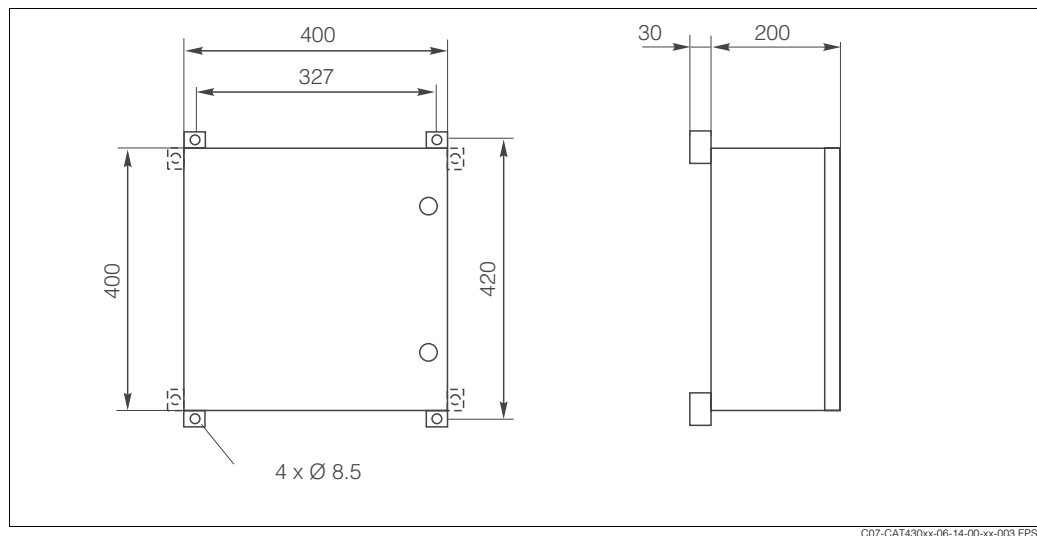


Fig. 8: Hose pump box dimensions, left front view, right side view

3.4 Installation instructions

To mount the individual modules, proceed as follows:

1. Mount the filter element holders
2. Mount the guide tube, retaining slide and filtrate pipe
3. Mount the filter elements
4. Mount the hose pump box
5. Connect the filtrate lines to the measuring devices



Caution!

- Before beginning installation, make sure that there are no pipes, stirrers or other equipment up to approx. 1 m below the surface of the water at the intended point of installation. This equipment can damage the filter elements.
- Check that there is sufficient space between the filter unit and the rim of the basin. This applies especially to filter units with numerous filter elements. If there is not sufficient space, a special holder must be used.
- The flow at the point of installation must not be > 2 m/s.

3.4.1 Mounting the filter element holders



Note!

You will need a hammer drill with a 12 mm drill bit.

1. Make four holes with diameter of 12 mm positioned each other into the side of the wall averted to the basin. The distance from the upper end of the wall should be approx. 10 cm.
2. Screw the holders in.
Make sure, the basin holder is at least 60 cm below the water level (resp. the open channel holder at least 35 cm).

3.4.2 Mounting the retaining slide and filtrate pipe

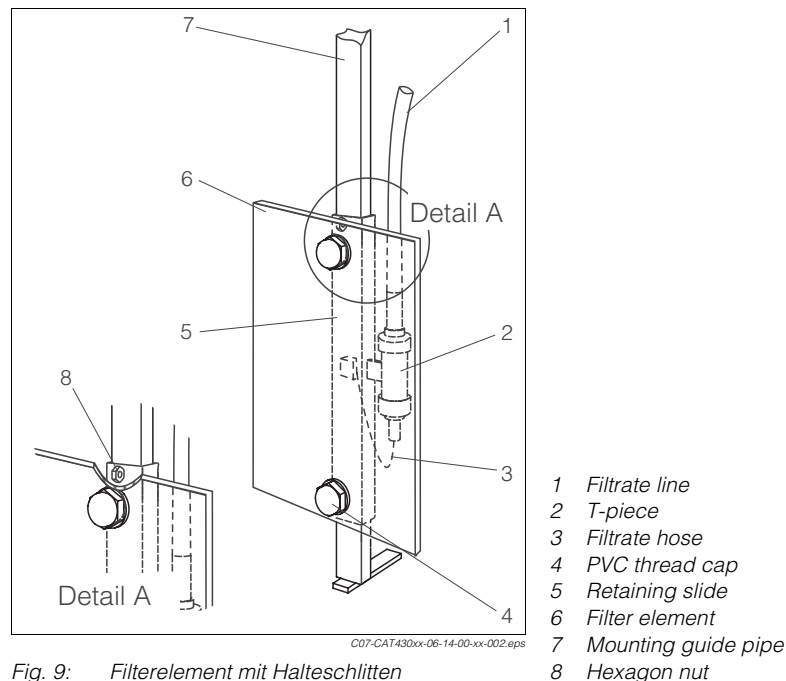


Fig. 9: Filterelement mit Halteschlitten

Proceed the following steps outside the basin resp. the open channel:

1. Feed the filtrate hose (Fig. 9, pos. 3) of the filtrate line (pos. 1) through the T-piece at the PVC retaining slide (pos. 5).
2. Screw the filtrate line in tight with the PVC hose gland of the T-piece.
3. Fasten the stainless steel chain at the retaining slide by directing it through the hexagon nut (pos. 8).
4. Remove the PVC screw caps (pos. 4) and place them so that they can be reached.



Caution!

- Secure the retaining slide, the stainless steel chain, the filtrate line and the PVC caps, in order to prevent them falling into the basin.
- Do not push the retaining slide onto the mounting guide pipe before having mounted the filter elements.

3.4.3 Mounting the filter elements

The filter elements are delivered ready for use. They are heat-sealed in plastic packaging. The packaging is filled with a preservative solution. The packaging is also protected against mechanical damage through press boards.



Caution!

- The surface of the filter element membrane (bright surface) must not be touched or in any way scratched with sharp objects or fingernails. Otherwise, the membrane is irreparably damaged.

Therefore, always handle the filter element at the free-standing PVC ends.

- Always keep the membrane moist. Otherwise, it becomes brittle and breaks.



Note!

You will need an open-end wrench 14/15 a/f.

To mount the filter elements, proceed as follows:

1. Cut the adhesive strips on the packaging with a knife. Remove the press board.
2. Cut the upper end of the bag open and take the filter element out.
3. Screw the supplied threaded elbow joint into the threaded hole on the reverse side of the filter element. Carefully tighten the threaded elbow joint with the open-end wrench, so that the O-ring on the threaded elbow joint seals cleanly to the PVC carrier plate. Avoid over-tightening the thread.
4. Have the PVC screw caps (s. Chap. 3.3.2, fig. 9, pos. 4) ready.
5. Put the filter plate onto both threaded adapters at the retaining slide such that the threaded elbow joint faces the retaining slide.
6. Screw the PVC cap on by hand.
7. Cut the filtrate tube (pos. 3) to the right length, so that it runs in the bend.



Note!

When using numerous filter elements, ensure that the coloured identification sleeves on the filtrate tubes do not fall off and are not cut off.

Used tubes should be shortened by approx. 10 mm because the lateral surface always gets scratched somewhat when pulled out. This leads to leakages.

8. Slide the filtrate tube into the threaded elbow joint coupling and press it all the way in. There is an O-ring in the coupling, so that the tube has to be pressed in until a pressure point has been overcome.
9. Push the retaining slide with the filter element (pos. 5) onto the mounting guide pipe.
10. Put the retaining slide with the filter element down by the chain until the limit stop. Secure the chain end at the rail.
The complete filter unit has to be below the water level.

3.4.4 Mounting the hose pump box

Depending on the version, the hose pump box is delivered with two clips for rail mounting or with four plastic brackets for wall mounting.

1. Mount the clips or the brackets at the holes intended for that purpose on the reverse side of the hose pump box. For this, the clips must be fixed to the upper holes.
2. **Rail mounting:**
Screw the clips on the highest, horizontally-running rail pipe, right by the filter station. For the box to hang straight, the supplied rubber buffer must be attached to the reverse side of the box. For this, drill a hole with a 4 mm diameter in the middle of the box position, on which a lower horizontal rail pipe is situated. To secure the rubber buffer, use the supplied Phillips screw.
3. **Wall mounting:**
Hold the box with the brackets screwed onto it against the wall and mark the holes. Then drill the holes and use the supplied anchor pins to secure the box to the wall.

3.4.5 Connecting the filtrate lines to the measuring devices

For the connection of the filtrate lines please refer to the following figures.

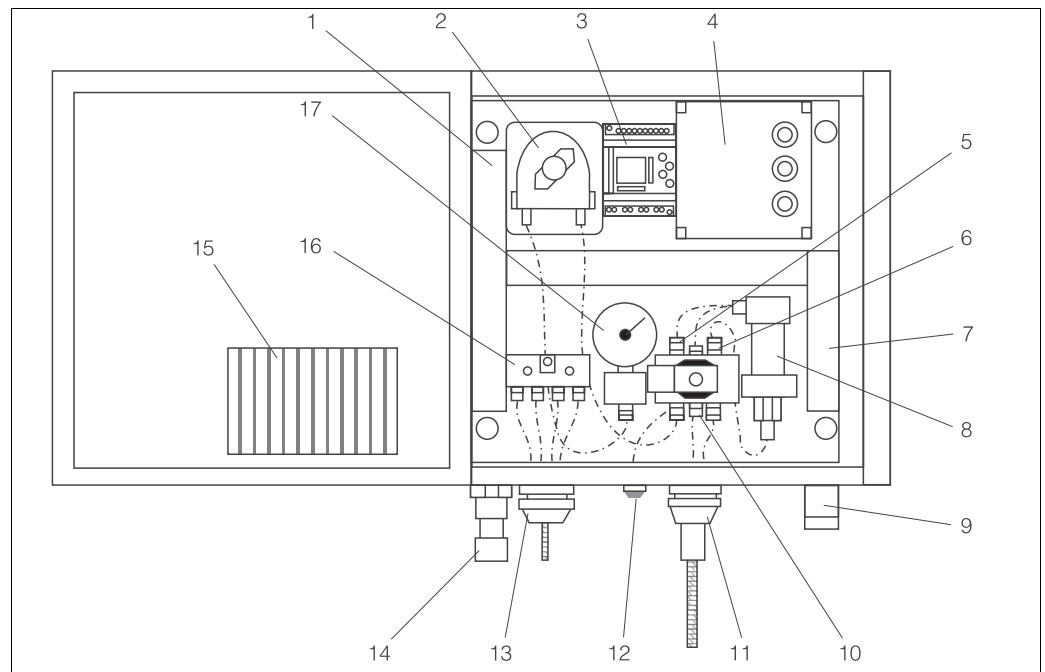
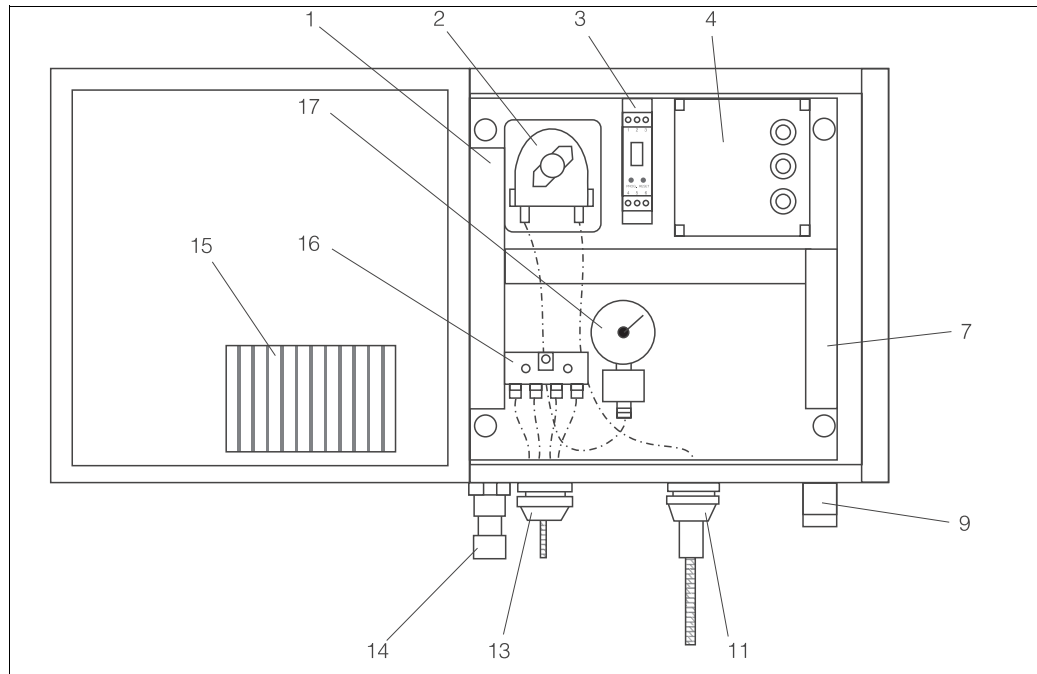


Fig. 10: Hose pump box, version with sample transportation unit

- | | |
|--|---|
| 1,7 Cable duct | 10 Compressed air connection |
| 2 Hose pump | 11 Electric band heater |
| 3 Timer (version see "Human interface") | 12 Vent |
| 4 Connection box (see "Electrical connection") | 13 Pg hose gland f. filtrate pipe f. filter element |
| 5 Check valve 1 | 14 Pipe socket with micro thermostat |
| 6 Check valve 2 | 15 Housing heater |
| 8 Collecting vessel | 16 Filtrate collecting block |
| 9 Pg cable gland for mains connection | 17 Manometer |



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Fig. 11: Hose pump box, version without sample transportation unit

- | | |
|--|---|
| 1,7 Cable duct | 13 Pg hose gland f. filtrate pipe f. filter element |
| 2 Hose pump | 14 Pipe socket with micro thermostat |
| 3 Timer (version see "Human interface") | 15 Housing heater |
| 4 Connection box (see "Electrical connection") | 16 Filtrate collecting block |
| 9 Pg cable gland for mains connection | 17 Manometer |
| 11 Electric band heater | |

Filtrate line to the filter elements

If the filtrate pipe to the filter elements has not already been connected in the factory, proceed as follows:

- Slide the filtrate tubes protruding from the filtrate pipe (one to four, depending on version) and the feed line of the heater cables through the Pg hose gland (Pos. 13). Slide the spiral hose far enough into the Pg hose gland that it is flush inside and then tighten the Pg hose gland.
- Cut the filtrate tubes such that you can insert them comfortably into the filtrate collecting block plug-in connectors (pos. 16).

The filtrate line to the measuring devices consists of a spiral jacket hose, a thin filtrate tube and, depending on scope of order, an electric band heater and a PE 8/6 compressed air hose.

With the version with sample transportation unit in the spiral jacket hose are:

- a compressed air hose (PE 6/8 mm)
- two hoses for sample transportation:
 - PTFE hose 1.5/3 mm (standard)
 - PE hose 2/4 mm (reserve).



Caution!

Lay hose lines such that they are protected against frost, where possible in underground cable ducts. Make sure that you do not overstretch the hose.



Note!

- Versions with one or two filter elements have a pre-mounted Y-piece in the box instead of a filtrate collecting block.
- When installing a number of filter elements, ensure that the coloured plastic sleeves for marking remain on the filtrate tubes.

Electric band heater up to 20 m and more (connection in the hose pump box):

If the hoses and the electric band heater have not already been connected in the factory, proceed as follows:

1. Remove the plug from the thermal element's feeder cable with an edge-cutter.
2. Loosen the nut on the Pg hose gland (→ Fig. 9, pos. 11) from the end of the spiral hose.
3. Pull the thin filtrate tube first, then the compressed air hose and finally the thermal element incl. its feeder cable through the nut.
4. Guide all hose ends and the thermal element through the hole into the hose pump box.
5. Insert the Pg hose gland into the hole and screw the nut on tight.
6. Slide the thermal element into the pipe socket (pos. 14), such that the end of the electric band heater is at the top and the feeder cable is at the bottom.

**Caution!**

There is a micro thermostat for the housing heater in the pipe socket. Be careful when inserting the thermal element because there is not much space to work in.

7. Guide the feeder cable for the thermal element through the cable duct (pos. 1) to the connection box (pos. 4). For electrical connection, please read the Chap. 4 "Wiring".
8. Cut the filtrate tube to the right length.
9. *Only standard version:*
Insert the hose into the plug-in connector on the pressure side of the pump.
10. *Only version with sample transportation unit:*
Connect the filtrate tube to the lower end of the check valve 2 (Pos. 6) and connect the compressed air hose to the compressed air connection (Pos. 10).
11. Now lay the filtrate line from the hose pump box to the measuring devices. Where possible, use available cable ducts or empty underground pipes. With the corresponding order, the filtrate tube is protected by the electric band heater over the entire area exposed to frost.

Electric band heater > 20 m (connection in the measuring device compartment):

Guide the filtrate line (opposite end from the thermal element) and the electric band heater from the measuring device compartment to the hose pump box.

1. Guide the thermal element near to the electrical connection (in the measuring device compartment) into the open. Insert the thermal element plug into an earth leakage breaker protected socket.
2. Lay the filtrate line with the electric band heater to the hose pump box. For this, use available cable ducts or empty pipes.
3. Slide electric band heater, compressed air hose and filtrate line into the spiral hose.
4. Proceed as described above from item 8 for connection of the band heater in the hose pump box.

**Caution!**

In both cases, do not guide the band heater parallelly to the thermal element! Otherwise the thermal element reacts to the temperature of the heater instead of the ambient temperature and therefore switches off the heater.

3.5 Post-installation check

- After installation, check that all connections are fitted tightly and are leakage resistant.
- Ensure that the hoses can not be removed without effort.
- Check all hoses for damage.

4 Wiring

4.1 Electrical connection



Warning!

- The electrical connection must only be carried out by authorised technical personnel.
- Technical personnel must have read and understood the instructions in this manual and must adhere to them.
- Ensure **before beginning** the connection work that there is no voltage at the power cable.

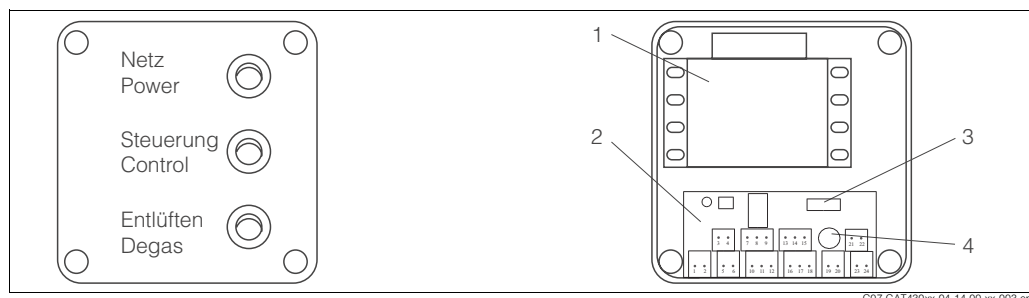
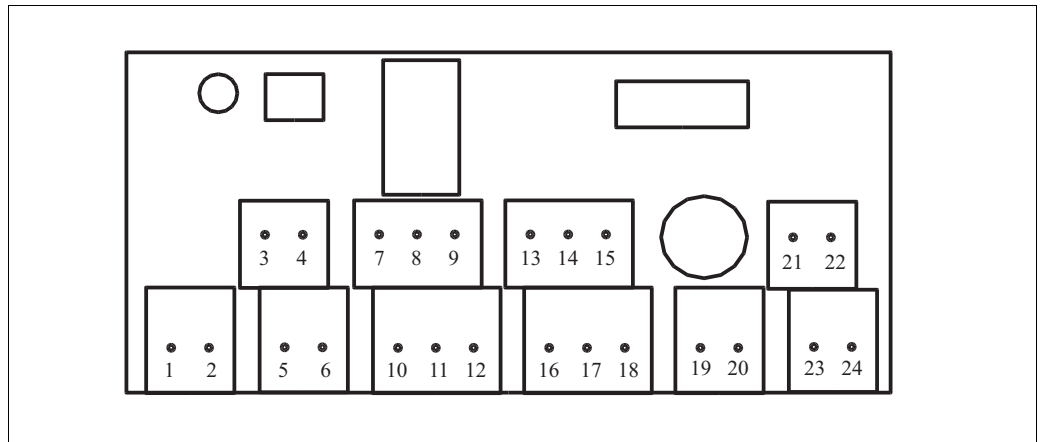


Fig. 12: Connection box: left cover, right inside the box

- 1 Transformer 24 V / 2A
- 2 Terminal block
- 3 4-pole connection
- 4 Fuse 1.6 A 5 x 20 mm

1. First of all, remove the covers on the cable ducts (→ Fig. 12) and screw the connection box on.
2. Disconnect the 4-pole connection between cover and terminal PCB (pos. 3) and secure the cover.
3. Guide the power cable through the Pg cable gland into the pump box. Pull the cable through the right-hand cable duct into the connection box.
4. Shorten the cable accordingly and connect the wires to terminals 18, 20 and 24.
5. Pull both wires for the supply lead of the 24 V - hose heater through the left-hand cable duct to the connection box and clamp the wires to terminals 1 and 6.
6. Pull the supply lead of the orange thermal element on the electric band heater in the left-hand cable duct up to the connection box.
7. Shorten the cable accordingly and connect the wires to terminals 17, 19 and 23.



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Fig. 13: Control unit terminal block

1	24 V to hose heater	9	Phase L for hose pump continuous operation	17	Electric band heater zero conductor
2	24 V to micro thermostat	10	Phase L from relay	18	Mains supply zero conductor
3	24 V to valve	11	Phase L (can be assigned as required)	19	Phase L electric band heater
4	24 V to control Out 2 f. valve	12	Phase L control	20	Phase L mains supply
5	24 V from micro thermostat	13	Housing heater zero conductor	21	PE Housing heater
6	24 V to hose heater from micro thermostat	14	Hose pump zero conductor	22	PE (can be assigned as required)
7	Phase L housing heater from relay	15	Zero conductor (can be assigned as required)	23	PE Electric band heater
8	Phase L to control 6 or Out 1 f. hose pump	16	Control zero conductor	24	PE Mains supply

4.2 Post-connection check

After wiring up the CAT 430 electrical connection, carry out the following checks:

Checks	Remarks
Does the supply voltage match the specifications on the nameplate?	230 V AC / 115 V AC
Are the mounted cables slack and not twisted?	
Factory-set cable routing split properly?	Power cable/weak current cable
Are all the cable entries installed, tightened and sealed?	
Are all cable entries mounted downwards or sideways?	For lateral connections: cable loops downwards, so that water drains off

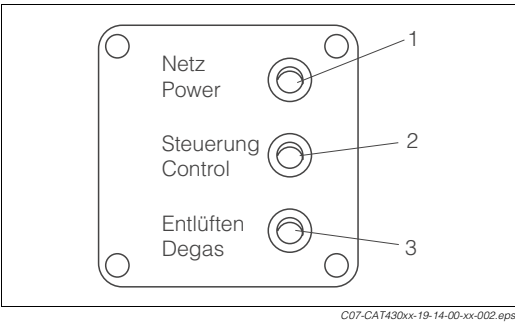
5 Operation

5.1 Operation and commissioning

The following chapters provide you with information on the sample preparation unit's operating elements and explain how to make settings.
In Chap. 6, "Commissioning", you will find the procedure for initial start-up and for daily operation.

5.2 Display and operating elements

Main switch



- 1 Heating / Power on
- 2 Control
- 3 Suction hose degassing (pump runs at continuous operation)

Fig. 14: Cover of connection box

Timer

The timer type delivered depends on the ordering version.
With the version without sample transportation unit a time relay of "Trumeter 7955 X" type is ready to use installed and connected.
With the version with sample transportation unit a mini controller of "Crouzet Millenium" type controls the process. The controller is also ready to use installed and connected.
Please refer to the following figures for information only.

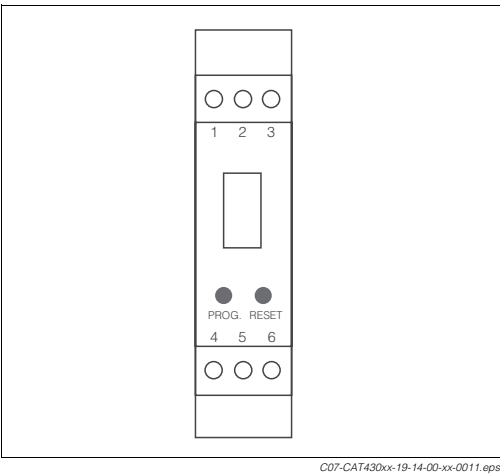


Fig. 15: Trumeter 7955 X

- 1 KL 16
- 2 KL 12
- 5 Hose pump and KL U 9
- 6 KL 8
- 3,4 not connected

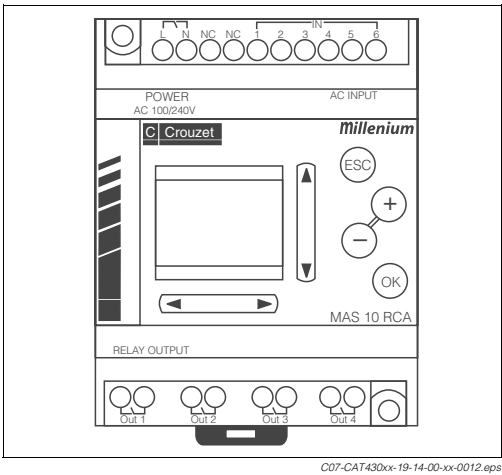


Fig. 16: Crouzet Millenium

- L KL 12
- N KL 16
- IN1 KL 9
- Out1 KL 10 (right), hose pump (left)
- Out2 KL 4 (right), valve (left)

5.3 Timer settings

5.3.1 Cycle times and pumping output

For reliable operation and achievement of long rinsing intervals, sufficient time delays between the pumping cycles are necessary.

The time delays depend on the number of filter elements and on the pumping parameters for supply output and speed.

The factory-set values for pumping cycles (On) and time delays (Off), as well as the fluid quantities per pumping cycle are displayed in the following table.

Number of filter elements	Standard version		Version with sample transportation unit	
	On / Off [s]	Fluid quantity per cycle [ml]	On / Off [s]	Fluid quantity per cycle [ml]
1	10 / 50	4	60 / 240	20
2	15 / 45	8	60 / 180	40
3	20 / 40	16	60 / 120	48

The speed of the pump must be set such that the specified fluid quantity is reached for the predefined On / Off times.

The speed of the pump can be set as follows:

1. Remove the small plastic plug on the top left of the pump. There is a potentiometer under the plug.
2. Turn the potentiometer clockwise with the supplied miniature screwdriver. This increases the speed and thereby the output of the pump.
3. Turn the potentiometer counter-clockwise. This decreases the speed and thereby the output of the pump.



Note!

- In principle, you can make other settings for the cycle times. Extending the pump time with constant time delays tends to result in shorter rinse intervals. You should, therefore, check whether this is acceptable for your application. The operating time of the pump, however, must not be more than 40%.
- Only for version with sample transportation unit:
For each pumping cycle, at least 20 ml of the sample must be fed into the collecting vessel. This is the only way in which efficient further transport of the sample by means of compressed air can be ensured.
The fluid quantity, however, must not exceed 50 ml, otherwise the collecting vessel overflows.

5.3.2 Trumeter 7955 X

(Standard version only)

During operation of the CAT 430, the "Trumeter 7955 X" display shows the respective operating status (On = Pumping, Off = Paused) and the remaining time until switching over to the next operating status.

During programming, the current settings for pumping cycle and time delay are displayed.

This is how to program the time relay:

1. Hold down the **"PROG"** key until the countdown (3-2-1-0) is completed and **"RC"** appears in the display.
If **"RC"** does not appear after the countdown, keep pressing **"PROG"** until **"RC"** appears.
2. Press **"RESET"**.
3. **"0 SEC"** (SEC under the number) appears on the right of the display.
4. Press **"RESET"** again.
5. A three-digit value for seconds now appears in the display. The last figure flashes. Here, you can configure the *Operating time* of the pump (pumping cycle).
6. Pressing **"PROG"** increases the flashing figure one at a time, with **"RESET"** you can switch to setting the next figure.
7. Set the desired value for the pumping cycle.
8. After setting the value for the third figure, press **"RESET"** again.
The setting for another three-digit value appears. Here, you can set the *Time delay*.
9. Proceed exactly as with the pumping cycle configuration.
10. Pressing **"RESET"** after setting the third figure, the **"LEU"** message appears in the display. The time controller is activated as soon as voltage is supplied to the relay.
11. Keep pressing **"RESET"** until the relay icon appears in the display again.
The programming procedure is completed.
12. Now switch the middle switch (controller) on the connection box off and on again.
The controller starts.

5.3.3 Crouzet Millenium

(Version with sample transportation unit)

As well as the pumping times and time delays, the opening time of the compressed air valve can be set here.

The following figure shows an enlarged version of the operating field with the programming keys and the display.

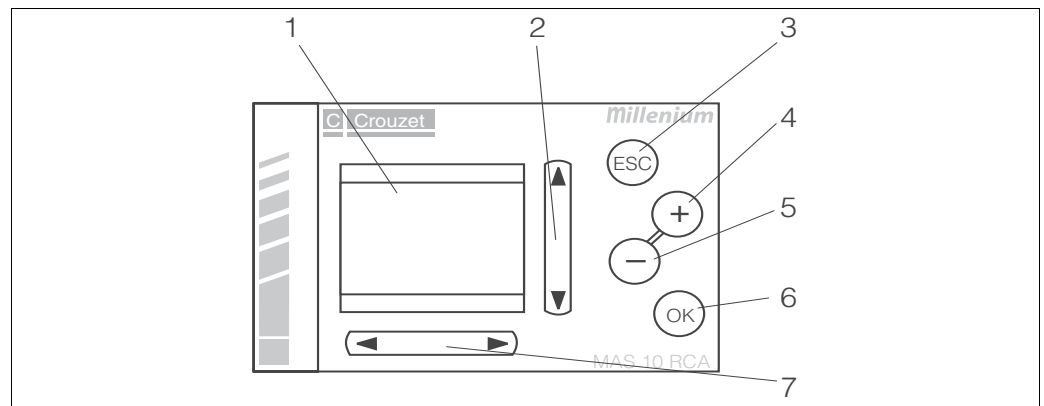


Fig. 17: Crouzet Millenium operating field

- | | | | |
|---|-----------------------|---|----------------------|
| 1 | Display | 5 | "Decrease value" key |
| 2 | "Up and down" key | 6 | "O.K." key |
| 3 | "Esc" key | 7 | "Left and right" key |
| 4 | "Increase value" key" | | |

In the second line of the display (Fig. 17, pos. 1) the active operating status is displayed. The following operating statuses are possible:

- Pump on
- Valve on
- Pause

To change the duration of an operating status, proceed as follows

1. Wait until the operating status that is to be changed is active.
2. Hold key 7 down until the value, that you want to change, is displayed.
3. Push key 2 until the set point flashes.
4. With key 4 (+) you can increase the value, with key 5 (–) you can decrease the value. Holding the respective key down changes the value quicker. Keep pressing or holding down the key until the desired value is reached.
5. Confirm the value by pressing key 6.
A "Writing" message appears and then the controller automatically returns to normal operation.



Note!

- If you switch to another operating status during the configuration procedure, you can still continue with the configuration. The set point that is to be configured flashes alternately with the previous value.
- A configuration procedure can be aborted at any time by pressing key 3. The previous value is thereby maintained.

6 Commissioning

6.1 Function check



Warning!

Check that all connections have been made correctly. Especially check that all hose connections are firmly attached, so that no leakages occur. This is especially important for the version with sample transportation unit. In case of a leakage at the sample transportation unit, samples and compressed air can shoot out with a force of 8 bar and damage persons and equipment!

Air would be sucked in on the suction side instead of sample.

6.2 Switch-on

6.2.1 Initial start-up

Loosen the filtrate tube from the pressure side (right-hand side) of the hose pump and insert the supplied, approx. 50 cm long hose piece in its place. The end of this hose piece should be hung up such that the sample being delivered can not run into the cabinet or cause any other damage. Have a 100 ml measuring cup ready, so that you can check the filtrate quantity later.

6.2.2 Switch "Power"

The upper flip switch is used to switch on the housing heater and the heater cables in the filtrate pipe (see "Display and operating elements"), the middle flip switch for switching on the controller. The latter is used to activate the timer and the CAT 430 starts operation with the cycles configured at the factory (initial start-up) or with your individual settings.

The lower flip switch is used to set the pump to ventilate when the timer is switched on (continuous operation of the pump).



Note!

- To start the entire system immediately, the "Power" switch and the "Control" switch must be activated.

If you are starting the machine in frosty conditions, only switch "Power" on first. Wait approx. 30 mins before starting the controller and thereby the pumping operation. This time is needed to bring the filtrate tubes and the pump box above 0 °C.

- For the version with sample transportation unit, the compressed air valve switches after completion of the pumping interval. This causes compressed air to flow through the filtrate tube to the measuring devices. After switching off the compressed air valve, remaining compressed air escapes from the vent of the pump box, making a hissing noise.
- Continuous operation of the hose pump (3) is necessary above all for degassing the filter elements and the filtrate tubes. Switch the continuous operation on for approx. 10-15 minutes during commissioning. The vacuum at the manometer must not be larger than 0.4 bar. Otherwise, stop the continuous operation and switch it on again when there are many air bubbles in the filtrate tube.

1. Switch the heater and the controller on.
2. Switch the pump to degas.



Warning!

Sample is leaking out of the hose piece. Prevent persons or equipment being affected. Be sure to set the "Degas" switch back to "0" after commissioning. Otherwise, the pump will be destroyed.

6.3 Checking the sampling quantity

1. Switch the degassing off. Leave the controller switched on.
2. Check that the sample is being supplied free of bubbles. Air bubbles can be seen in the transparent filtrate tubes on the suction side of the pump.
3. Measure the sampling quantity.
For this, use the prepared measuring cup. Measure the amount of sample that is supplied within the space of 10 minutes.
4. Calculate the filtrate output per hour.
Depending on the number of filter elements (one, two or four), the filtrate output must be at 250, 500 or 1000 ml/h.
5. If necessary, correct the filtrate output by increasing the fluid quantity or extending the cycle.



Caution!

For the version with sample transportation unit, the fluid quantity must not exceed 50 ml per cycle. Otherwise, the volume of the collecting vessel in the pump box is not sufficient.

6.4 Checking the sample transportation

Remove the hose piece from the pressure side of the pump and connect the filtrate tube again.

Standard version

Measure the time that the sample requires from switching on the pump until arriving in the collecting vessel at the measuring devices.

This time is the minimum delay time that passes between taking the sample and measurement.

Change the delay time by increasing the fluid quantity or extending the operating time of the pump. The delay time can also be shortened by using a filtrate tube with small diameter. The maximum pump pressure of 1 bar, however, limits the use of filtrate tubes with very small diameters.



Note!

At the same cycle duration, the delay time drops by a third when the operating time is increased by 50%.

Version with sample transportation unit

At the beginning of a cycle the pump pumps sample into the collecting vessel in the pump box. After the pumping interval the compressed air valve opens. The factory setting for the valve opening time is 40 seconds.

Check that the sample is completely transported in this period from the collecting vessel into the collecting vessel at the measuring devices.

If the sample arrives completely in the collecting vessel within a clearly shorter time, the valve switching time can be shortened and thereby compressed air saved.

If the sample does not arrive completely in the collecting vessel within the set valve switching time, extend the valve switching time. Extending the valve switching time is limited by the cycle and operating time of the pump.



Note!

At a sampling quantity of 40 ml, an air pressure of 8 bar, a transportation path of 50 m and a filtrate tube internal diameter of 1.5 mm, 40 seconds is the optimum valve switching time. With a transportation path of 100 m approx. 90 seconds valve switching time are necessary (other conditions the same as above).

6.5 Setting the collecting volume

In the following figure the collecting vessel is shown on the measuring device side.

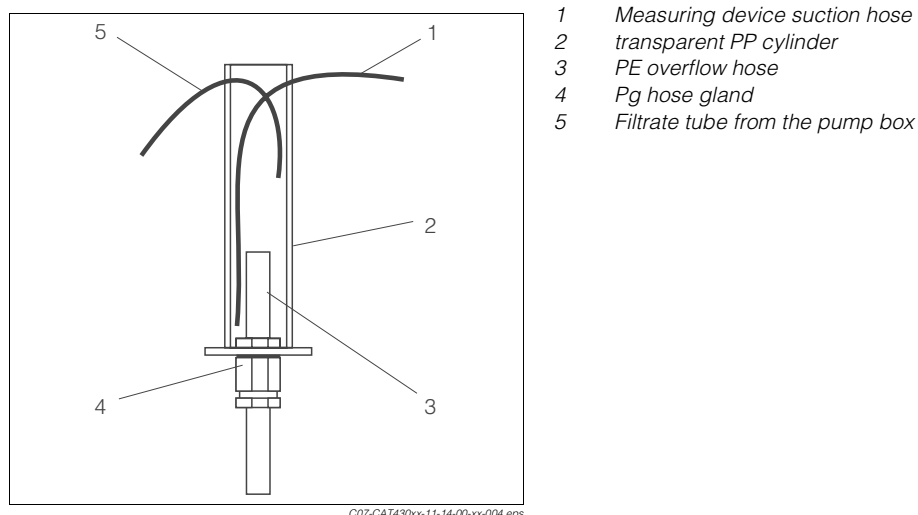


Fig. 18: Collecting vessel (measuring device side)

The overflow hose (pos. 3) must be set such that the measuring devices suck just enough sample out of the collecting vessel within a pumping cycle that the bottom is still covered and thereby no air is sucked in.

For measuring devices working intermittently the collecting volume must always be larger than the amount that can be sucked in by the measuring device in one go.

This is how to set the collecting volume:

1. Loosen the Pg hose gland (4).
2. Set the length of the overflow hose (3) in the collecting vessel such that the desired volume is reached.
3. Tighten the Pg hose gland again and check that it is leakage-resistant.

7 Maintenance

7.1 Maintenance activities

All maintenance activities that have to be carried out during normal operation of the CAT 430 are described below.

7.1.1 Cleaning the filter elements

From time to time the filter elements have to be cleaned.

You will know when they need to be cleaned when the pressure at the manometer falls below – 0.75 bar towards the end of a pumping interval. The filtrate output then begins to drop.

1. Please switch the controller off first (middle switch on the connection box) and then pull the entire filter unit out of the water by the plastic rope.
2. Hang the chain up on the rail or another suited place so that you prevent the filter unit falling back into the basin.
3. Now wash down the filter membranes with a water hose. The cleaning effect can be seen when the brownish coating dissolves from the bright membrane surface.



Caution!

It is best to use a garden hose with a spray nozzle to wash down the filter elements. If a firehose is used, set the stream somewhat wider in order to avoid damaging the filter elements.

4. If no water supply is available, a high-pressure cleaner with water canister can also be used to wash down.
5. After washing down, check whether the membrane is damaged.
6. Finally, lower the filter unit back into the basin by the chain. Ensure that the filter elements are completely under the the water level again.

Normally, no chemicals are required for cleaning the filter elements. At measuring points with a high grease and protein content, however, it can be necessary to treat the membranes from time to time with a mixture of 200 ml 30% H_2O_2 , 1 l water and 30 ml concentrated HCl.



Warning!

Highly corrosive!

Be sure to wear protective gloves and protective goggles when handling hydrochloric acid (HCl) and hydrogen peroxide (H_2O_2).

1. Wash the filter elements down first with water.
2. Then spray the solution onto the filter elements with a plastic watering can with spraying nozzle.
3. Repeat the procedure three times at intervals of 5 minutes.



Caution!

Ensure that the filter membranes do not dry out because otherwise they will be irreparably destroyed!

4. Then wash the filter elements down again with water and lower the filter unit into the basin again by the rope.

The time interval between two rinses depends to a great extent on the condition of the wastewater. It can be assumed that the service life of a normal working sewage treatment plant is at least 6 weeks, if the operating time of the pump compared to the values in the table in Chapter Kap. 5.3.1 is not considerably increased. In summer, however, it can even be a number of months.

7.1.2 Replacing the pump hose

The service life of the silicon pump hose depends considerably on the speed and the operating time of the pump. Normally, a service life of a number of months can be expected. After half a year at most, however, the hose should be replaced in order to avoid a leakage.

To replace the pump hose, proceed as follows:

1. Disconnect the filtrate tubes from the suction side and the pressure side of the pump.
2. Then, loosen the small Phillips screw on the transparent cover plate and remove the cover plate.

The actual hose change must be carried out when the pump is switched on.



Warning!

Handle the pump with care when it is switched on. There is a risk of getting your fingers jammed.

1. First switch the pump to ventilate (lower switch on the connection box).
2. Hold the old pump hose on the suction side and pull it out of the pump cage in the direction of rotation of the impeller. For this, the plastic discs pushed over the hose must be pulled out of the slots in the pump housing.
3. Pull the plug-in connector together with the hose clips from the old pump hose.
4. Mount the plug-in connector on the new pump hose.
5. Hold one end of the new pump hose with the left hand.
6. Insert the plastic disc pushed over the hose into the correct slot on the pump.
7. Then guide the hose with your right hand, running with the impeller, vertically into the pump cage, whereby the vertically-standing hose piece should always be between two arms of the impeller.
8. Then insert the second plastic disc into the slot on the pressure side of the pump housing. This procedure requires some practise and do not worry if the hose should "somersault" from the impeller at the start. If in doubt, pay more attention to your fingers than to the hose.
9. After the hose has been attached, switch the ventilation off and mount the cover plate back onto the pump housing.
10. Finally, both ends of the filtrate tube must be connected to the pump hose again. Please do not get the suction side and pressure side mixed up.

7.1.3 Replacing filtrate tubes

In the course of a few months a coating builds up in the transparent PVC filtrate tubes in the hose pump box despite ultra filtration. It is not worth cleaning them. Replace the tubes as described below.

1. Switch the controller off.
2. Pull all transparent tubes out of the black PP plug-in connectors, by pressing the retaining ring of the respective plug-in connector against the pull out direction of the tube into the connector.
3. Cut tube pieces to the right size, according to the old tubes, out of the 4/2 mm PVC tube.
4. Slide the ends of the tube all the way into the plug-in connectors.
When inserting the tubes into the O-ring seals, a pressure point must be overcome.

Should the filtrate tubes become dirty again after a short time, it is possible that a filter element is defective and must be replaced.

7.1.4 Cleaning the collecting vessel

As with the filtrate tubes, a coating also builds up in the collecting vessel over the course of a few months, which has to be removed.

1. Wait until the sample has completely disappeared from the collecting vessel in the cycle procedure and the collecting vessel is ventilated, i.e. unpressurized.
2. Switch the controller off.
3. Loosen all three PVC tubes from the plug-in connectors of the collecting vessel.
4. Pull the collecting vessel downwards out of the pipe holder and unscrew the cap on the underside of the vessel.
5. Wipe the inside of the vessel with a damp cloth. For this, a fluid all-purpose cleaner can also be used.



Caution!

Do not use any abrasives, otherwise the transparency of the PVC pipe will be impaired.

6. After cleaning, screw the cap back on and tighten it fully, so that no leaks occur later on.
7. Slide the collecting vessel back into the holder.
8. Insert the filtrate tubes back into the plug-in connectors.



Note!

If necessary, make use of the opportunity to replace the filtrate tubes at the same time.

9. After all connections have been correctly mounted again, the controller can be switched back on.

7.1.5 Rinsing the filtrate tube between pump box and measuring devices

In the course of time, a coating also builds up in the filtrate tube between the pump box and measuring devices, that can result in nitrification and slurring effects. Consequently, this leads to incorrect measurement results.

This is especially the case for the version with compressed air sample transportation. To prevent these effects, the filtrate tube must be rinsed approx. every 6 weeks (PE hose) resp. every 3 months (PTFE hose) with a 30% H_2O_2 (hydrogen peroxide) solution.



Warning!

Highly corrosive!

Be sure to wear protective gloves and protective goggles when handling hydrogen peroxide.

To rinse the filtrate tube, proceed as follows:

1. Pull the filtrate tube out of the collecting vessel and insert it into a plastic bottle. Secure the tube with an adhesive strip to stop it jumping out of the bottle.
2. Disconnect the hose pump suction hose from the filtrate collecting block or the plug-in connector and insert it into a 500 ml bottle with the H_2O_2 solution. This bottle can be put into the housing under the hose pump.
3. Leave the CAT 430 to run for 20-30 minutes with H_2O_2 .
4. Then connect the suction hose back to the filtrate collecting block or the plug-in connector.
5. Leave the CAT 430 to run for another 20 minutes with filtrate, until the H_2O_2 solution has been completely removed from the system.
6. Finally, insert the filtrate feed hose back into the collecting vessel.

7.2 Repairs

The repairs that have to be carried out on damaged CAT 430 components are described below.



Warning!

Work on electrical components must only be carried out by authorised and trained technical personnel.

Before beginning work, switch the factory-fitted fuses for the complete machine off.

7.2.1 Replacing a filter element

The filter element membranes have a service life of approx. 2 years, depending on operating conditions. After this time or in case of mechanical damage, the membrane becomes permeable to contamination. This can be detected by turbidity of the sample and by strong soiling in the relevant PVC filtrate tube or in the corresponding duct of the filtrate collecting block in the pump box. In this case, the defective filter element(s) have to be replaced.

Proceed as follows:

1. Switch the "Controller" switch on the connection box off.
2. Pull the filter unit out of the water and rinse the entire unit thoroughly with a jet of water.
3. Pay attention to the colour of the plastic sleeve on the filtrate tube that leads to the contaminated duct of the filtrate collecting block. On the end of the tube at the defective filter element there is a plastic sleeve of the same colour. This is how you can tell which element is affected.
4. Pull the filtrate tube of the affected filter element out of the threaded elbow joint on the reverse side of the element.
Press the retaining ring of the hose gland against the pull out direction of the tube.
5. Loosen both PVC screw caps on the front side of the element.



Caution!

Do not allow the coupling nut or filter element to fall into the activated sludge basin.

6. The defective filter element can now be easily removed and replaced with a new one.
7. Mount the new filter element as described in Chapter 3.3.3.

7.2.2 Replacing the hose pump

In case of a hose pump defect, e.g. if a bearing has run out, the pump has to be replaced.

This is how to replace the pump:

1. Switch the controller off.
2. Remove both filtrate tubes from the plug-in connectors on the pump hose.
3. Remove the covers of the left and the middle cable ducts. Disconnect the plug-in connector in the left cable duct.
4. The pump can now be slid upwards out of the support, whilst feeding in the connecting cable from below.
5. To install a new pump, carry out in the procedure in reverse order.

7.2.3 Replacing the device fuses

On the terminal PCB in the connection box, there is a circuit fuse 5x20 mm that melts in case of a current flow of more than 1.6 A.

Before replacing the fuse, it must be determined what caused the fuse to blow.



Warning!

Determining what caused the fuse to blow must only be carried out by authorised and trained technical personnel.

Before beginning work, switch the factory-fitted fuses for the complete machine off.

To replace the fuse, proceed as follows:

1. Unscrew the four plastic screws on the corners of the connection box cover and remove the cover.
2. Now take the screw caps together with the circuit fuse out by turning it and replace it with a new one.
3. Screw the cover of the connection box back on.
4. Switch the machine fuses back on and check that the CAT 430 functions properly.

7.2.4 Replacing the timer

It is assumed that the timer is defective if, despite mains voltage being present and the middle switch on the connection box being switched on, the Crouzet Millenium display is blank or the relay for the hose pump or compressed air valve does not switch on as intended in the cycle.



Warning!

Before replacing the timer, be sure to switch the factory-fitted fuses for the entire machine off.

1. Loosen all wires from the terminals on the timer.
2. Both Trumeter and Crouzet Millenium are mounted on top-hat rails. Loosen the timer by pulling a flap on its underside from the top-hat rail with a screwdriver.
3. Simply slide the new timer onto the top-hat rail.
4. Connect the new timer (see "Display and operating elements").

7.2.5 Replacing check valves (only version with sample transportation unit)

The check valves are placed under heavy load by the air pressure of 8 bar and, as a result, are worn down by this (see fig. 10 in chapter 3.3.6, pos. 5 and 6).

If you determine that compressed air presses back into the hose pump, check valve 1 (pos. 5) must be replaced:

1. Switch the controller off as soon as the collecting vessel is unpressurized.
2. Disconnect the PVC hoses from the plug-in connectors on both sides of the check valve.
3. Loosen the Phillips screws of the valve holder and remove the holder and compressed air valve.
4. Remove the check valve situated under the holder.
5. When inserting the new valve, ensure that it is installed in the right position. The thin end of the valve must face upwards.
6. Mount the holder and valve and insert the PVC tubes all the way into the plug-in connector.

If you can see filtrate bubbling out of the filtrate tube back into the collecting vessel, check valve 2 (pos. 6) must be replaced:

1. Switch the controller off as soon as the collecting vessel is empty and unpressurized.
2. Then disconnect the filtrate tube from both sides of the valve, whilst pressing the retaining rings against the pull out direction of the tubes to the valve, exactly as with the plug-in connectors.
3. When installing a new valve, again ensure that it is installed in the right position. The thin end must face downwards this time. The upper connection is the input and must be connected to the tube from the collecting vessel.
4. Press both tubes all the way into the valve.

7.2.6 Replacing the compressed air valve (only version with sample transportation unit)

A damaged compressed air valve can be recognised in that, despite air pressure being present, no pressure builds up in the collecting vessel and the filtrate is not being pushed away. In addition, the ventilation of the collecting vessel may also not function properly any more.

1. Switch the controller off.
2. Unscrew the screw on the left-hand side of the valve plug.
3. Remove the plug from the valve.
4. Disconnect all three tubes from the plug-in connectors at the valve.
5. Loosen both screws on the sides of the PVC valve holder and remove the entire valve holder.
6. The valve is secured with two screws that can be loosened from the reverse side of the valve holder.
7. To mount a new valve, carry out the procedure in reverse order.

8 Accessories

- ☐ Adapter for mounting a 2nd filter plate,
order no. 51511355 (2 adapters needed per filter plate)
- ☐ Filter element holder with vertical retaining slide, 1.50 m, for basin
order no. 51511353
- ☐ Filter element holder with vertical retaining slide, 1.80 m, for basin
order no. 51511354
- ☐ Filter element holder with horizontal retaining slide, 1.50 m, for open channel
order no. 51511373
- ☐ Filter element holder with horizontal retaining slide, 1.80 m, for open channel
order no. 51511374
- ☐ Compressor for CAT 220/430
order no. 51511868

Placement:	near the measuring devices, max. 100 m to the hose pump box
Sample transportation:	
PTFE hose 1.5/3 mm:	40 ml sample within 90 s at 8 bar, transportation distance 100 m
PE hose 2/4 mm:	40 ml sample within 80 s at 8 bar, transportation distance 100 m
Max. pressure:	8 bar
Output performance:	95 l/min
Filling performance:	50 l/min
Vessel volume:	6 l
Noise:	65 dB

9 Trouble-shooting

9.1 Trouble-shooting instructions

Although CAT 430 is not very prone to faults due to its simple construction, problems can, of course, not be completely ruled out.

In the following table you can find, therefore, possible faults, their causes and possible fault eliminations.

Fault	Possible cause	Tests and / or corrective measures						
No or too little filtrate	Hose pump not running	Ensure that on the connection box the upper and the middle switch are at "ON" or "I" and the lower switch at "OFF" or "O". <table><tr><th>Standard version</th><th>Version with sample transportation unit</th></tr><tr><td> – 230 V between timer connections 1 and 2 (→ Fig. 15, P. 20) ? No: Fuse on terminal PCB blown ? Replace. (→ Chap. 7.2.3) Yes: Controller running ? If not, then replace timer. (→ Chap. 7.2.4) – 230 V between connections 1 and 5 ? No: Check cable connection between connection 6 and terminal 8 in the connection box. – 230 V between connections 1 and 5 when the relay is switched on (closed relay symbol in the display) ? No: Timer defective, replace. – All voltages present, pump still does not run ? Pump defective, replace. </td><td> – 230 V between timer connections L and N (→ Fig. 16, P. 20) ? No: Fuse on terminal PCB blown ? Replace. (→ Chap. 7.2.3) Yes: Controller running ? If not, then replace timer. (→ Chap. 7.2.4) – 230 V between connections Out 1 ri and N ? No: Check cable connection between connection Out 1 ri and terminal 8 in the connection box. – 230 V between connections Out 1 le and N when the relay is switched on ("Pump on" in the display) ? No: Timer defective, replace. – All voltages present, pump still does not run ? Pump defective, replace. </td></tr></table>	Standard version	Version with sample transportation unit	– 230 V between timer connections 1 and 2 (→ Fig. 15, P. 20) ? No: Fuse on terminal PCB blown ? Replace. (→ Chap. 7.2.3) Yes: Controller running ? If not, then replace timer. (→ Chap. 7.2.4) – 230 V between connections 1 and 5 ? No: Check cable connection between connection 6 and terminal 8 in the connection box. – 230 V between connections 1 and 5 when the relay is switched on (closed relay symbol in the display) ? No: Timer defective, replace. – All voltages present, pump still does not run ? Pump defective, replace.	– 230 V between timer connections L and N (→ Fig. 16, P. 20) ? No: Fuse on terminal PCB blown ? Replace. (→ Chap. 7.2.3) Yes: Controller running ? If not, then replace timer. (→ Chap. 7.2.4) – 230 V between connections Out 1 ri and N ? No: Check cable connection between connection Out 1 ri and terminal 8 in the connection box. – 230 V between connections Out 1 le and N when the relay is switched on ("Pump on" in the display) ? No: Timer defective, replace. – All voltages present, pump still does not run ? Pump defective, replace.	Hose pump running	– Switch controller off – Disconnect the filtrate tube from the pressure side of the pump and connect the supplied hose piece in its place – Switch on controller. Is the filtrate coming through ? Measure the amount with a measuring cup. No filtrate or too little ? Check the vacuum at the manometer. – No vacuum or less than – 0.4 bar and strong pulsating during pumping ? Pump hose worn out, replace. (→ Chap. 7.1.2). Or pump rotor bearing has run out. Replace pump. (→ Chap. 7.2.2) – More vacuum than – 0.7 bar ? Filter element or filtrate tube blocked. Clean filter element first (→ Chap. 7.1.1), if this does not help, disconnect the filtrate tube from the threaded elbow joint on the reverse side of the filter element. Vacuum now 0 ? Replace filter element. (→ Chap. 7.2.1) Vacuum still more than – 0.7 bar ? Filtrate tube blocked. Causes are frost or soiling. Frost: see below, soiling: press the filtrate tube out with the help of the supplied connection piece with compressed air. – All the checks mentioned above carried out and if necessary faults remedied ? Check the filtrate quantity being supplied. – Switch controller off, connect filtrate tube again, controller on. Is the measured filtrate quantity arriving at the measuring devices ? No: Frost or soiling in filtrate pipe to the measuring devices! Frost: see below, remove soiling with compressed air. – Only for standard version: Pump delivers too little pressure for the sample transportation. Causes: run-down bearing or worn-out pump hose, for measures, see above
	Standard version	Version with sample transportation unit						
– 230 V between timer connections 1 and 2 (→ Fig. 15, P. 20) ? No: Fuse on terminal PCB blown ? Replace. (→ Chap. 7.2.3) Yes: Controller running ? If not, then replace timer. (→ Chap. 7.2.4) – 230 V between connections 1 and 5 ? No: Check cable connection between connection 6 and terminal 8 in the connection box. – 230 V between connections 1 and 5 when the relay is switched on (closed relay symbol in the display) ? No: Timer defective, replace. – All voltages present, pump still does not run ? Pump defective, replace.	– 230 V between timer connections L and N (→ Fig. 16, P. 20) ? No: Fuse on terminal PCB blown ? Replace. (→ Chap. 7.2.3) Yes: Controller running ? If not, then replace timer. (→ Chap. 7.2.4) – 230 V between connections Out 1 ri and N ? No: Check cable connection between connection Out 1 ri and terminal 8 in the connection box. – 230 V between connections Out 1 le and N when the relay is switched on ("Pump on" in the display) ? No: Timer defective, replace. – All voltages present, pump still does not run ? Pump defective, replace.							

Fault	Possible cause	Tests and / or corrective measures
No sample transportation	Defect in the compressed air system	The checks mentioned above carried out and still no or too little filtrate at the measuring devices ? – Switch machine off – Disconnect the compressed air line from the compressed air connection (→ Fig. 10, P. 14) – Disconnect all hoses from the plug-in connectors at the collecting vessel and let any remaining sample run into a cup.  Warning! The collecting vessel is possibly still under pressure. Secure your clothing and the device against any sample spraying out. – Hold a measuring cup under the filtrate tube from check valve 1 and switch the machine on. No or too little sample ? Check valve 1 defective, replace. (→ Chap. 7.2.5) – Insert the filtrate tube back into the plug-in connector on the top right of the collecting vessel. Check that sample is running into and back out of the collecting vessel. No ? Upper or lower plug-in connector congested. Unscrew (open-end wrench 14 a/f) and clean. – Switch off. Insert one of the supplied red dummy plugs into the upper left plug-in connector. Connect the filtrate tube to the lower plug-in connector again and disconnect it from the lower side of check valve 2. Switch on. Full sampling quantity out of check valve 2 ? No: Check valve 2 defective, replace. (→ Chap. 7.2.5) – Check the filtrate tube to the measuring devices with compressed air. Blocked ? Remove frost or soiling. – Connect the filtrate tube to check valve 2 again. The same with the compressed air hose on the upper left plug-in connector of the collecting vessel. – Check the air pressure from the compressor (up to 8 bar, for longer carrying distances 8 bar is required). – Connect the hose to the compressed air connection again. – Is sample pressed downwards out of the collecting vessel when the compressed air valve is opened ? No ? Valve defective, replace. (→ Chap. 7.2.6) – Is the compressed air escaping through check valve 1 into the hose pump ? Check valve 1 defective, replace. (→ Chap. 7.2.5) – Is there still sample in the collecting vessel after the compressed air valve has been switched off ? Check programming.(→ Chap. 5.3.1) – The surplus air pressure must escape from the pump-box ventilator, making a hissing sound. No ? Compressed air valve defective, replace. (→ Chap. 7.2.6) – The hissing must stop after a short while and no compressed air or sample must flow back into the collecting vessel from below. Otherwise, check valve 2 is defective. Replace. (→ Chap. 7.2.5)
Frost problems	Housing and filtrate line heater failure	Problems with the housing and filtrate pipe heater are evident when the filtrate pipes in the pump box are frozen. A timer failure is also possible. This is how to check the housing heater: – 24 V between terminals 3 and 4 on the terminal PCB in the connection box ? No: Trafo (→ Fig. 13, P. 19, pos. 4) or cable connection to the Trafo defective. – Remove the connections from terminals 2 and 5 (24 V, safe). Connect the terminals with a piece of wire. Housing heater switches on and is warm after approx. 1 min ? The same with the heater cable in the filtrate pipe to the filter elements ? No: Check for 230 V between terminals 7 and 13. If not, the relay switch on the PCB is defective. Repair required. Yes: Heating element defective, repair required. – The checks mentioned above are o.k. and still no housing heating ? Micro thermostat defective, repair required.
	Failure in filtrate line heater to the measuring devices	Problems with the filtrate pipe heater to the measuring devices are evident when the sample is not transported on from the pump box to the measuring devices and all other causes mentioned above have been ruled out. – Check that the entire part of the filtrate pipe in danger of frosting over is heated by the electric band heater. Otherwise, a longer or an additional electric band heater must be used. – Check that the electric band heater has been connected properly – Is the thermal element correctly attached to the pipe socket (→ Chap. 3.3.6)? Otherwise, the electric band heater heats the thermal element up, which then does not switch properly. If the electric band heater is externally connected, the thermal element must be in the open. – All of the checks mentioned above are o.k. and the pipe is still frozen ? Thermal element defective, replace electric band heater.

9.2 Spare parts

Spare part	Order number
Hose set	51509225
Hose pump	51509226
Manometer with connector	51509228
Electrical time relay	51509229
Connection box cover incl. switch	51509230
Terminal PCB	51509231
Thermal element	51509232
Cabinet heater	51509233
Filtrate heater	51509234
Filter element	51509236
Securing nut for filter element	51509237
Collecting vessel	51509238
Electronic controller	51509239
Compressed air valve 3/2-way	51509240
Check valve	51509241
Pressure cylinder	51509242

9.3 Return

If the device requires repair, please send it *cleaned* to the appropriate Endress+Hauser sales office.

Please use the original packaging, if possible.

Please enclose the completed Dangerous Goods sheet (copy the second last page of these Operating Instructions) with the packaging and the transportation documents.

9.4 Disposal

The device contains electronic components and must therefore be disposed of in accordance with regulations on the disposal of electronic waste.

Please observe local regulations.

10 Technical data

10.1 Power supply

Hose pump box connection	230 V AC, 50/60 Hz, 130 VA 115 V AC, 60 Hz
Analyzer compartment	- For electric band heater > 20 m: 15 VA per meter electric band heater, socket 230 V AC, 50/60 Hz, earth leakage breaker protected - For sample transportation unit: Socket 230 V AC, 50/60 Hz, 2000 VA

10.2 Performance characteristics

Filtrate volume	approx. 250 ml/h per filter element	
Sample transportation distance	max. 20 m without sample transportation unit max. 100 m with sample transportation unit	
Compressor (external/internal) for sample transportation	see accessories	
Separation performance	Precipitation of particles, colloids and high molecular substances (50 µm)	
Life cycle	approx. 1 to 2 years	
Cleaning interval	Filter element:	2 to 6 months, depending on contamination level
	PTFE hose:	1 to 2 months
	PE hose:	3 weeks
Chemical resistance	pH 1 ... 13	

10.3 Environment

Ambient temperature	-25 ... 50 °C	
Humidity	0 ... 95 %, no splash water	
Ingress protection	Hose pump box:	IP 54
	Compressor:	IP 54

10.4 Process

Sample temperature	5 ... 50 °C
---------------------------	-------------

10.5 Mechanical construction

Design, dimensions	see chapter 3	
Weights	Hose pump box, standard version	12 kg
	Hose pump box, sample transportation version	15 kg
	Filter unit, 1 filter element	2 kg
	Filter unit, 2 Filterelements	4 kg
	Filter element	1 kg
	Filter element holders	18 kg
	Compressor	approx. 14 kg
Materials	Compressed air valve	3/2 way valve, 24 V, 8 W, stainless steel housing
	Housing heater	Resistance heater, 230 V, ~ 50 W, splash-proof, on Al-heat exchanger plate
	Filter element	PVC carrier plate, PES membrane
	Filter element holders	Stainless steel, 1.4301 (AISI 304)
	Mounting guide pipe	Stainless steel, 1.4301 (AISI 304)
Components	Hose pump	Electric motor 230 V, 15 VA 2 rolls with plastic cage, Suction rate max. 7.5 mWS Pressure rate max. 10 mWS
	Connection box	2.5 A 5 x 20 mm PRI 230 V, 50/60 Hz SEC 24 V, 50 VA 3 x On/Off 250 V, 3 A 24 x screw terminal 250 V, 24 A, conductor up to 1.5 mm ²

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Geräte- / Sensortyp: _____

Seriennummer: _____

Medium / Konzentr.: _____

Temperatur: _____ Druck: _____

Gereinigt mit: _____

Leitfähigkeit: _____ Viskosität: _____

Warnhinweise zum Medium:



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explosiv



ätzend



giftig



gesundheits-
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