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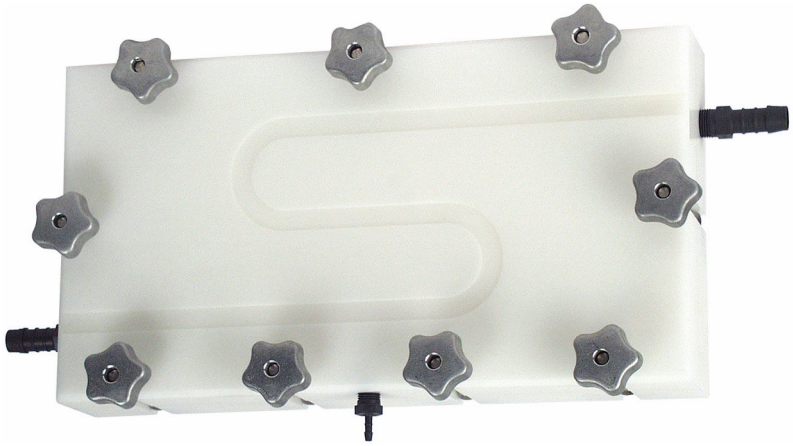
Operating Instructions
Stamoclean CAT411

Cross-flow filter for aqueous samples from pressure pipes



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People for Process Automation

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1 About this document

1.1 Warnings

Structure of information	Meaning
DANGER **Causes (/consequences)** If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation **will** result in a fatal or serious injury.
WARNING **Causes (/consequences)** If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation **can** result in a fatal or serious injury.
CAUTION **Causes (/consequences)** If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or more serious injuries.
NOTICE **Cause/situation** If necessary, Consequences of non-compliance (if applicable) ▶ Action/note	This symbol alerts you to situations which may result in damage to property.

1.2 Symbols

- Additional information, tips
- Permitted or recommended
- Not permitted or not recommended
- Reference to device documentation
- Reference to page
- Reference to graphic
- Result of a step

2 Basic safety instructions

2.1 Requirements for the personnel

- Installation, commissioning, operation and maintenance of the measuring system may be carried out only by specially trained technical personnel.
- The technical personnel must be authorized by the plant operator to carry out the specified activities.
- The electrical connection may be performed only by an electrical technician.
- The technical personnel must have read and understood these Operating Instructions and must follow the instructions contained therein.
- Faults at the measuring point may only be rectified by authorized and specially trained personnel.

Repairs not described in the Operating Instructions provided must be carried out only directly at the manufacturer's site or by the service organization.

2.2 Intended use

The CAT411 microfilter is a special cross-flow filter for sampling from pressure pipes for the purpose of continuous online monitoring.

A self-cleaning effect results from the flow of medium at the filter.

Application

- Wastewater treatment plant
  - Return activated sludge up to max. 4 g/l (4000 ppm) dry matter
  - Excess sludge up to max. 4 g/l (4000 ppm) dry matter
  - Secondary clarification
- Industry
  - Pressure on filter 0.2 to 1 bar (3 to 15 psi)
  - Sampling in the bypass at higher pressures

Use of the device for any purpose other than that described, poses a threat to the safety of people and of the entire measuring system and is therefore not permitted. The manufacturer is not liable for damage caused by improper or non-designated use.

2.2.1 Operating principle

A sample flow of 0.8 to 1.8 m^3/h (3.5 to 8 gal/min) is permanently conducted through the microfilter via a pressure pipe. Some of the sample passes the filter membrane and is then conveyed to the measuring device as filtrate.

The principle of cross-flow filtration is used for sampling. The PTFE filter membrane separates particles > 0.45 µm from the filtrate. These particles collect in front of the filter membrane and are washed away with the sample flow.

The medium is conducted in a meander-like channel through the filter element. A consistently high flow velocity is achieved in this way. This causes the self-cleaning effect. Mechanical drives to generate a flow at the filter surface are therefore not required.

2.3 Workplace safety

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

- Installation guidelines
- Local standards and regulations
- Regulations for explosion protection

2.4 Operational safety

Before commissioning the entire measuring point:

1. Verify that all connections are correct.
2. Ensure that electrical cables and hose connections are undamaged.
3. Do not operate damaged products, and protect them against unintentional operation.
4. Label damaged products as defective.

During operation:

- If faults cannot be rectified:
  products must be taken out of service and protected against unintentional operation.

2.5 Product safety

2.5.1 State-of-the-art technology

The product is designed to meet state-of-the-art safety requirements, has been tested, and left the factory in a condition in which it is safe to operate. The relevant regulations and international standards have been observed.

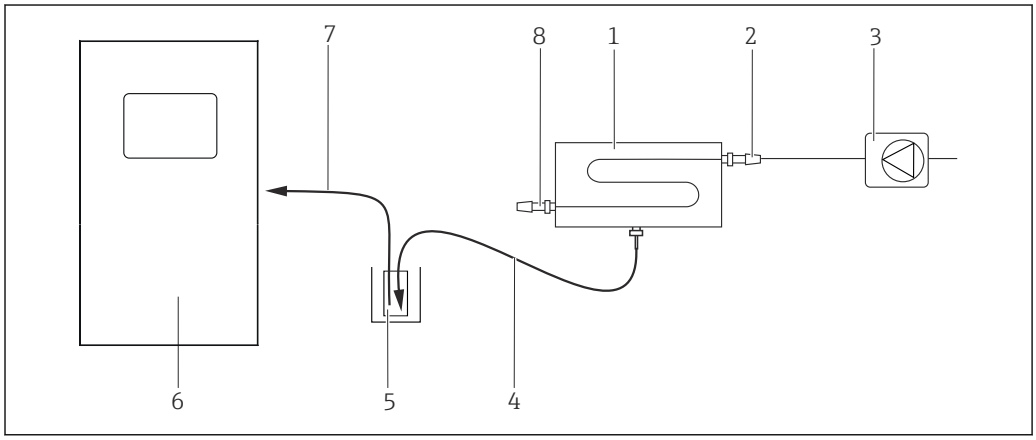
Devices connected to the cross-flow filter must comply with the applicable safety standards.

3 Product description

3.1 Measuring system

A complete sample conditioning system comprises:
- Stamoclean CAT411 microfilter
- Collecting vessel
- Analyzer

A sensor with a flow assembly can also optionally be integrated into the measuring system.



1 Complete measuring system

1	*CAT411*	*5*	*Collecting vessel (optional)*
2	*Inlet*	*6*	*Analyzer*
3	*Sample pump or pressure line*	*7*	*Analyzer suction line*
4	*Filtrate line*	*8*	*Free outlet*

4 Incoming acceptance and product identification

4.1 Incoming acceptance

1. Verify that the packaging is undamaged.
   ↳ Notify the supplier of any damage to the packaging.
   Keep the damaged packaging until the issue has been resolved.
2. Verify that the contents are undamaged.
   ↳ Notify the supplier of any damage to the delivery contents.
   Keep the damaged goods until the issue has been resolved.
3. Check that the delivery is complete and nothing is missing.
   ↳ Compare the shipping documents with your order.
4. Pack the product for storage and transportation in such a way that it is protected against impact and moisture.
   ↳ The original packaging offers the best protection.
   Make sure to comply with the permitted ambient conditions.

If you have any questions, please contact your supplier or your local Sales Center.

4.2 Product identification

4.2.1 Nameplate

The nameplate provides you with the following information on your device:
- Manufacturer identification
- Order code
- Serial number
- Power supply
- Degree of protection
- Ambient and process conditions

▶ Compare the information on the nameplate with the order.

4.2.2 Product identification

Product page

www.endress.com/cat411

Interpreting the order code

The order code and serial number of your product can be found in the following locations:
- On the nameplate
- In the delivery papers

Obtaining information on the product

1. Go to www.endress.com.
2. Page search (magnifying glass symbol): Enter valid serial number.
3. Search (magnifying glass).
   ↳ The product structure is displayed in a popup window.

4. Click the product overview.
   ↳ A new window opens. Here you fill information pertaining to your device, including the product documentation.

4.3 Scope of delivery

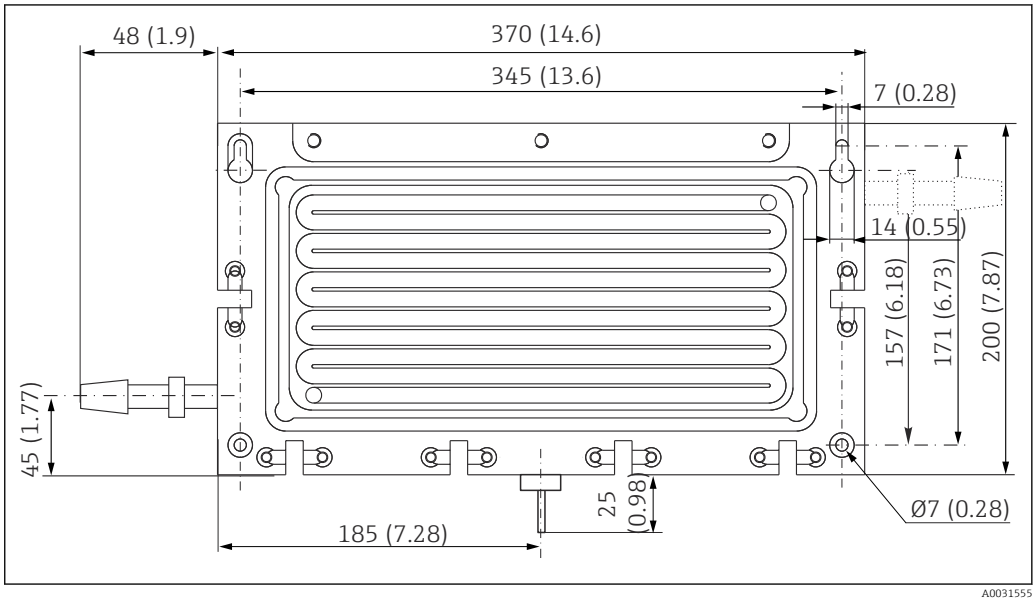
The scope of delivery comprises:
- 1 Filter holder
- 2 Perbunan seals
- 1 Operating Instructions

The materials to secure the filter holder on the wall are not included in the scope of supply and must be provided by the customer.

▶ If you have any queries:
Please contact your supplier or local sales center.

5 Mounting

5.1 Mounting requirements



2 *Dimensions*

Filter membrane	L x B: 300 x 135 mm (11.8 x 5.31")

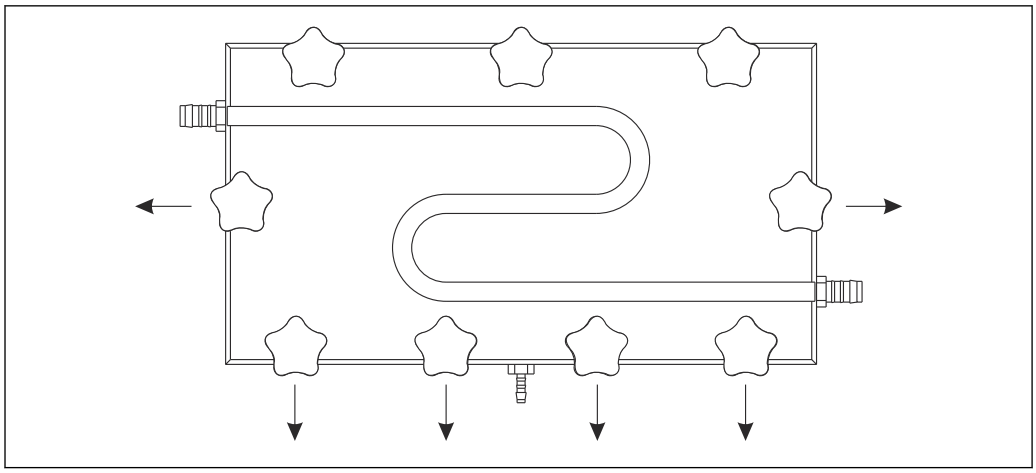
5.2 Mounting the sample preparation system

5.2.1 Wall mounting

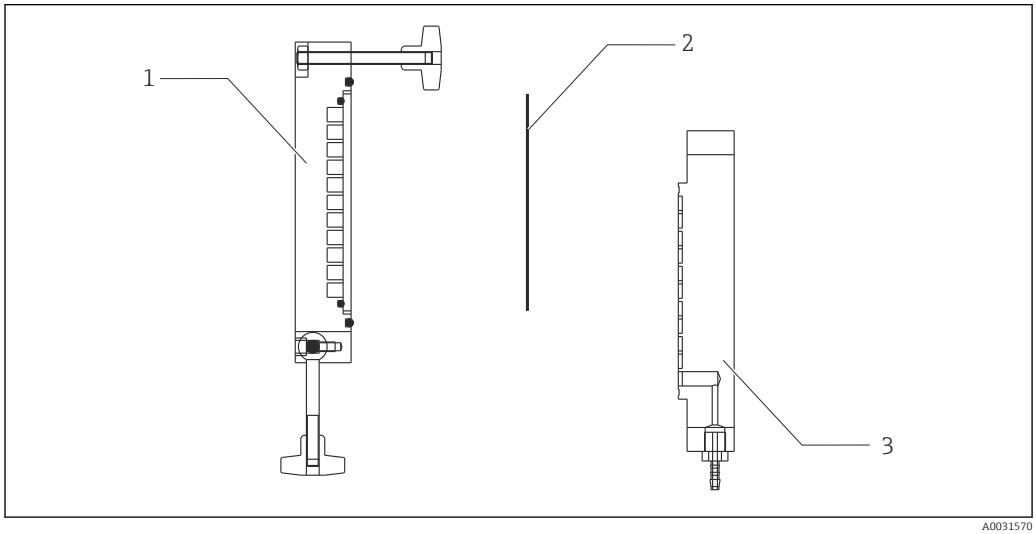
You require a hammer drill with a 6 mm drill bit. Wall plugs and screws are not included in the scope of delivery and must be provided by the customer.

Securing the filter holder

1. Drill four bore holes each with a diameter of 6 mm into the wall. Please refer to the graphic in the "Mounting requirements" section for the spacing between the bore holes.
2. To remove the top part of the filter holder:
   Slightly loosen all star knobs.
3. Fold the side and bottom knobs to the side → 11.
4. Remove the top part (→ 11 item 3) from the remaining threaded joints and place it to the side where it is readily available.
5. Secure the bottom part (item 1) of the holder to the wall with appropriate screws.



3 *Loosening the set screws*



4 *Structure*

1 Bottom part
2 Filter membrane
3 Top part

5.2.2 Inserting the filter membrane

Two filter membranes are included in the scope of delivery. You only need one membrane for correct operation. The other is a spare membrane.

Activating the filter membrane

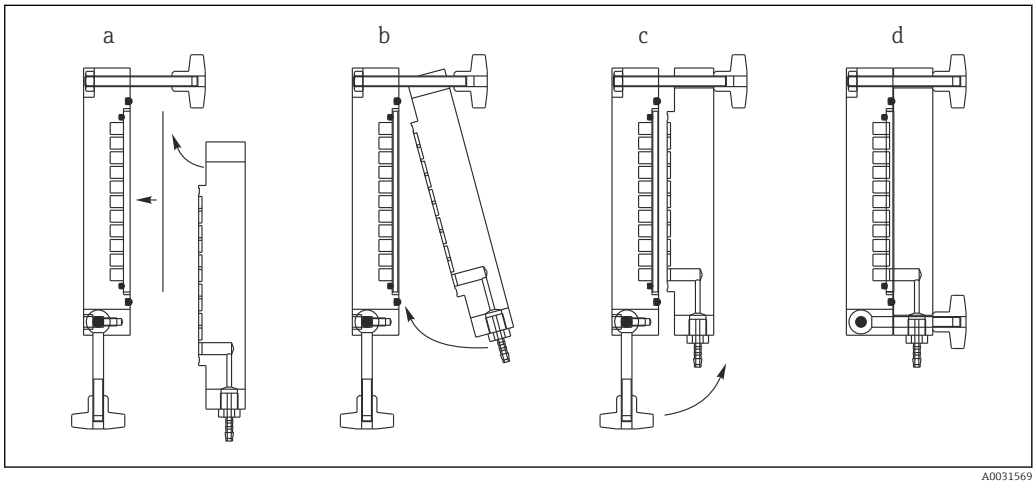
1. Remove the filter membrane from the packaging.
2. **CAUTION**

   Isopropanol
   Causes severe irritation to the eye! May cause drowsiness and dizziness! Liquid and vapor are highly flammable!
   - Wear protective gloves, goggles or a face shield.
   - Avoid contact with the eyes.
   - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources.
   - Follow all of the instructions on the manufacturer's safety data sheet.

   Wet the smooth side of the membrane (medium side) with 50% isopropanol solution.

Inserting the filter membrane

1. Insert the filter membrane into the bottom part of the filter holder which is still open after wall mounting. The smooth side of the filter membrane must face downwards (facing the bottom part = medium side).
2. Replace the top part of the filter holder.
3. Fold the star knobs back up again.
4. Tighten the star knobs by hand.



5 *Inserting the filter membrane*

5.2.3 Connecting the supply lines

1. Connect the sample line (ID 14 mm) to the inlet of the microfilter (on the top part of the filter holder).
2. Leave the outlet (ID 14 mm) free.
3. Screw the hose connection nipple for filtrate outflow into the thread on the bottom of the filter holder.
4. Connect the filtrate line (ID 4 mm).
5. Connect the other end of the filtrate tube to the inlet of the analyzer collecting vessel.

5.3 Post-mounting check

1. After installation, check the sample preparation system and hoses for damage.
2. Check all connections to ensure they are secure and leak-tight.
3. Ensure that the hoses cannot be removed without force.

6 Maintenance

6.1 Cleaning

You can clean the microfilter when it is closed (preliminary cleaning) or open. To clean the microfilter, treat the surface of the filter membrane with hydrochloric acid **or** sodium hypochlorite solution.

⚠ WARNING

Extremely caustic chemicals

Chemicals can cause fatal or serious injury!

- ▶ Never use hydrochloric acid and sodium hypochlorite together (in a mixture) as this causes a toxic chlorine gas to form!
- ▶ If necessary, use hydrochloric acid and sodium hypochlorite in separate cleaning stages. In this case, rinse thoroughly with water between the cleaning stages before you use the second cleaner.
- ▶ When working with hydrochloric acid or sodium hypochlorite, always wear protective gloves and protective goggles!
- ▶ Dispose of cleaning fluids properly.

6.1.1 Cleaning when the filter holder is closed

Cleaning when the filter holder is closed only constitutes preliminary cleaning. To perform intensive cleaning, you must open the filter holder, see the "Cleaning when the filter holder is open" section.

1. Disconnect and empty the sample supply and the filtrate line to the collecting vessel.
2. Fill the microfilter with cleaner manually or using an automatic cleaning unit. Allow to take effect for approximately 20 minutes.
3. Then rinse it with copious amounts of water.
4. Restore the sample supply and the filtrate line to the collecting vessel.

6.1.2 Cleaning when the filter holder is open

1. Disconnect and empty the sample supply and the filtrate line to the collecting vessel.
2. Open the filter holder at the star knobs and remove the top part and the filter membrane. Make sure that the top part does not come into contact with unfiltered media.
3. Remove any contamination and clogged material in the bottom part (medium side).
4. Remove any buildup on the filtrate side (top part).
5. **NOTICE**

   Carelessness

   Risk of damage to the filter membrane!

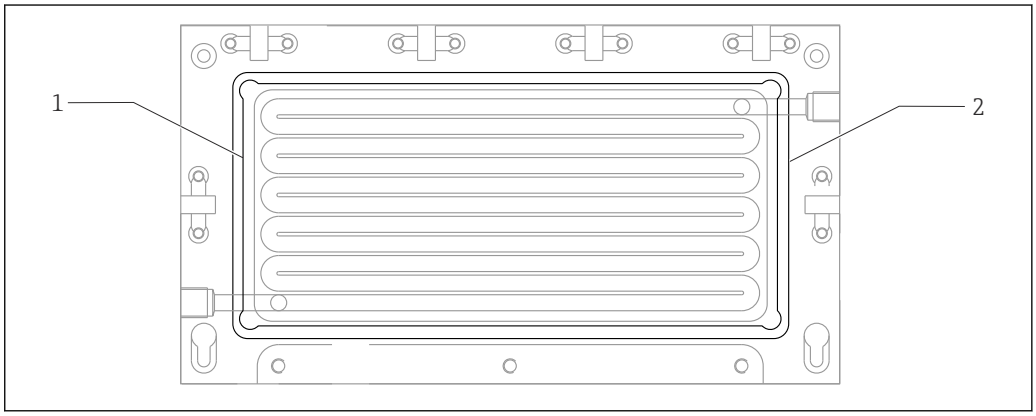
   - ▶ Do not damage the filtration layer of the filter membrane.
   - ▶ Do **not** use hard or pointed objects, such as a palette knife or screwdriver, to clean the membrane.

   Clean the filter membrane, or replace if necessary.
6. Restore the sample supply and the filtrate line to the collecting vessel.

6.2 Replacing the seals

If you discover that the seals are damaged when you open the filter holder, you must replace these seals:

1. Remove the damaged seal from the guide in the bottom part of the filter holder (→ 15).
2. **Seal for filtrate compartment:** Insert the filtrate seal (item 2, thin round cord, Ø 4 mm) into the guide so that both ends are flush mounted.
3. **Seal for top/bottom part:** Insert the seal for the top/bottom part (item 1, thick round cord, Ø 5 mm) into the outer guide.
4. Reassemble the filter holder together with the filter membrane and tighten the star knobs in a diagonally opposite sequence.



6 Seals

1 Seal for top/bottom part
2 Seal for filtrate compartment

7 Repair

7.1 General information

The repair and conversion concept provides for the following:
- The product has a modular design
- Spare parts are grouped into kits which include the associated kit instructions
- Only use original spare parts from the manufacturer
- Repairs are carried out by the manufacturer's Service Department or by trained users
- Certified devices can only be converted to other certified device versions by the manufacturer's Service Department or at the factory
- Observe applicable standards, national regulations, Ex documentation (XA) and certificates

1. Carry out the repair according to the kit instructions.
2. Document the repair and conversion and enter, or have entered, in the Life Cycle Management tool (W@M).

7.2 Spare parts

Device spare parts that are currently available for delivery can be found on the website:

www.endress.com/device-viewer

▶ Quote the serial number of the device when ordering spare parts.

7.3 Return

The product must be returned if repairs or a factory calibration are required, or if the wrong product was ordered or delivered. As an ISO-certified company and also due to legal regulations, Endress+Hauser is obliged to follow certain procedures when handling any returned products that have been in contact with medium.

To ensure the swift, safe and professional return of the device:

▶ Refer to the website www.endress.com/support/return-material for information on the procedure and conditions for returning devices.

7.4 Disposal

▶ Observe the local regulations.

8 Technical data

8.1 Process

8.1.1 Medium temperature

5 to 50 °C (41 to 122 °F)

8.1.2 Process pressure

0.2 to 1 bar (3 to 15 psi)

8.1.3 Flow velocity

2.5 to 5.5 m/s (8 to 18 ft/s)

8.1.4 Inlet volume

0.8 to 1.8 m^3/h (3.5 to 8 gal/min)

8.2 Mechanical construction

8.2.1 Dimensions

→ 🖹 11

8.2.2 Weight

Approx. 3 kg (6.6 lbs)

8.2.3 Materials

Housing	POM
Fixing screws	Stainless steel
Seals	Perbunan
Filter membrane	PTFE

8.2.4 Channel cross-section

9 x 10 mm (0.35 x 0.39")

8.2.5 Filter membrane pore size

0.45 µm

8.2.6 Connections

Inlet and outlet:	Hose connection nipple for hose ID 14 mm (0.55")
Filtrate outlet:	Hose connection nipple for hose ID 4 mm (0.16")

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