

# Installation Instructions

## **Liquistation CSFxx kit**

For the maintenance of vacuum samplers



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# 1 Overview of maintenance kits

Product			
	A	CSF28	
	B	CSF33	
	C	CSF34	
	D	CSF39	
	E	CSF48	
		Sample collection technique	
	2A	Vacuum pump, dosing chamber acryl	
	2B	Vacuum pump, dosing chamber glass	
		Maintenance use	
	B	Yearly maintenance; Components for yearly maintenance	
	E	Large maintenance 6 m (19.69 ft); component replacement every 3 - 5 years	
	F	Large maintenance 8 m (26.25 ft); component replacement every 3 - 5 years	
		Accessory enclosed	
	PB	Vacuum pump 6 m (19.69 ft)	
		PC	Vacuum pump 8 m (26.25 ft)
		PD	Air manager
		PE	Distribution arm
CSV18-			Complete order code

## 2 Intended use

The spare part set and the Installation Instructions are used to replace a defective unit with a functioning unit of the same type. Only original parts from Endress+Hauser may be used. As a matter of principle, only spare part sets that Endress+Hauser has intended for the measuring device may be used.

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

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-intended use.

### 3 Authorized installation 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 perform the stated tasks.
- The electrical connection may only be established by an electrical technician.
- The technical personnel must have read and understood the Operating Instructions and must follow the instructions contained therein.
- Measuring point faults may be repaired only by authorized and specially trained personnel.



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

### 4 Safety instructions

- Pay attention to the following safety instructions.



Follow the Operating Instructions for the device.

#### 4.1 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

#### WARNING

##### **Process pressure and temperature, contamination, electrical voltage**

Risk of serious or fatal injury

- If a sensor has to be removed during maintenance work, avoid hazards posed by pressure, temperature and contamination.
- Make sure the device is de-energized before it is opened.
- Power can be supplied to switching contacts from separate circuits. Also de-energize these circuits before work is performed on the terminals.

#### CAUTION

##### **Activities while the sampler is in operation.**

Risk of injury and infection from the medium!

- Wear protective clothing, goggles and gloves or take other suitable measures to protect yourself.
- Wipe up any medium that escapes with a disposable tissue and rinse with clear water. Then dry the cleaned areas with a cloth.

## 4.2 Operational safety

### Before recommissioning 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.

## 4.3 Product safety









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.

# 5 Symbols

## 5.1 Warnings


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

## 5.2 Symbols

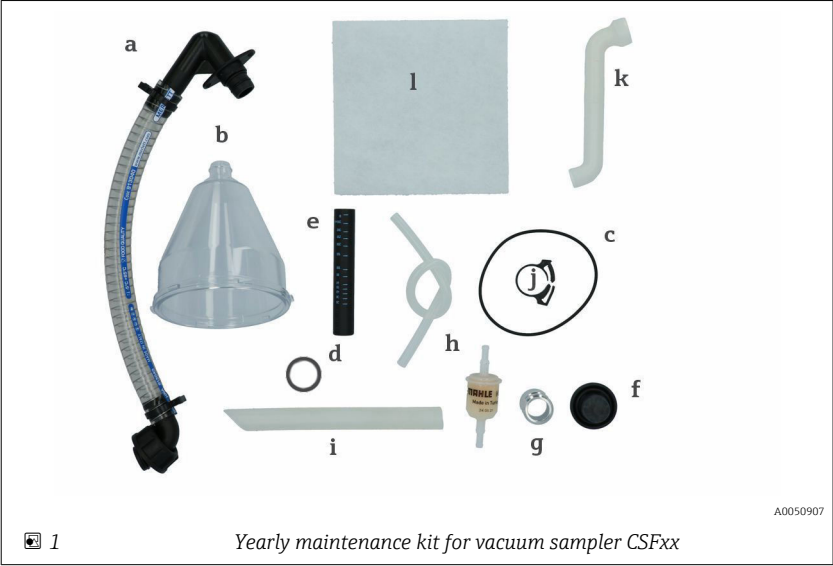
	Additional information, tips
	Permitted
	Recommended
	Forbidden or not recommended
	Reference to device documentation
	Reference to page
	Reference to graphic
	Result of a step

## 6 Scope of delivery


### Overview of yearly maintenance kit for vacuum sampler CSFxx

 The kit contents shown is an example only and illustrates the maximum contents of the yearly maintenance kit for CSFxx. The kit contents you receive will vary depending on the ordered version.

Item	Description
a	Intake hose
b	Dosing chamber
c	O-ring (ID 102.00, W 3.00, OD 108.00, NBR)
d	O-ring (ID 15.00, W 2.00, OD 19.00, EPDM)
e	Dosing tube
f	Elastomer membrane
g	Mounting tool for membrane
h	Filter for air manager with hose (5 x 2 mm (0.08 in), 320 mm (12.60 in) length, silicone)
i	Hose for dosing chamber (15 x 2 mm (0.08 in), length 210 mm (8.27 in), silicone)
j	Hose clip
k	Downpipe
l	Filter mat G2 (167 mm (8.27 in) x 167 mm (8.27 in) x 5 mm (0.2 in))
	Service kit instructions



Overview of large maintenance kit for vacuum sampler CSFxx

 The kit contents shown is an example only and illustrates the maximum contents of the large maintenance kit for CSFxx. The kit contents you receive will vary depending on the ordered version.

Item	Description
a	Intake hose
b	Dosing chamber
c	O-ring (ID 102.00, W 3.00, OD 108.00, NBR)
d	O-ring (ID 15.00, W 2.00, OD 19.00, EPDM)
e	Dosing tube
f	Elastomer membrane
g	Mounting tool for membrane
h	Hose for dosing chamber (15 x 2 mm (0.08 in), length 210 mm (8.27 in), silicone)
i	Hose clip
j	Downpipe
k	Filter mat G2 (167 mm (8.27 in) x 167 mm (8.27 in) x 5 mm (0.2 in))
l	Vacuum pump
m	Rotary tap



## 8 Replacement of spare parts

### 8.1 Preliminaries

The following preparatory measures must be performed before maintenance tasks can be carried out:


- Open the upper door of the sampler.

Stop the active sampling program.


1. On the program screen, select **MODE**.
2. Select **Stop/pause program XY**.
3. The message **No sampling program active!** appears on the start screen.

- Read out all the logbooks.
- Disconnect the sampler from the mains voltage.

### 8.2 Maintenance

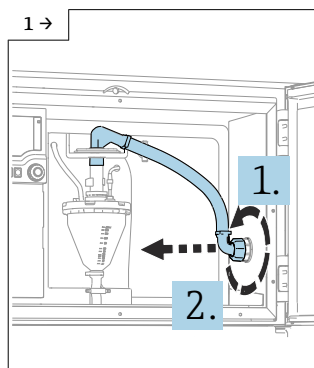
 The maintenance tasks to be performed depend on whether a yearly or large maintenance kit has been ordered. The steps of the yearly maintenance are also contained in the large maintenance.

#### 8.2.1 Cleaning of the dosing unit and replacement of consumables

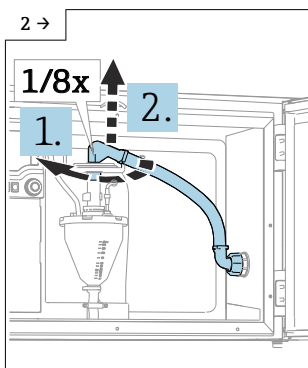
 The following images show the capacitive version of the sampler.

#### Removal of the spiral hose and dosing unit

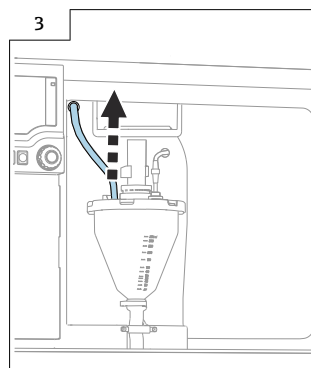
- Hold a paper towel under the connection inside on the right to catch any liquid that may escape.



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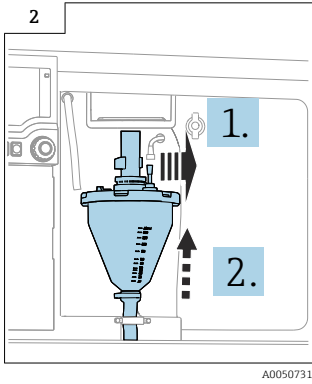
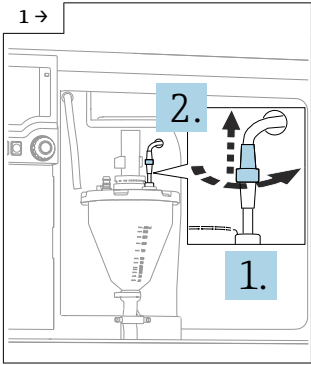


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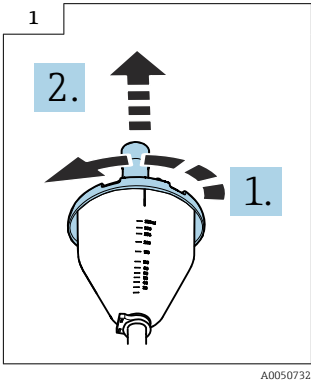


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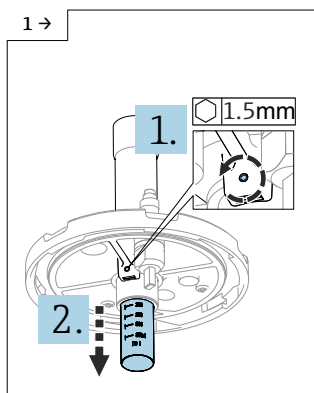
- In the case of samplers with capacitive medium detection, also release the plug-in lock of the capacitive sensor.



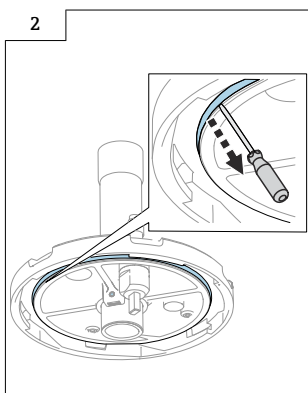
### Replacement of consumables on the dosing unit



- Put the dosing chamber aside.

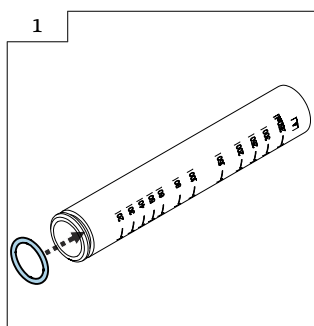


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- Carefully clean the flange and electrode(s).
- Insert a new O-ring from the kit into the flange.
- Take the new dosing tube and check whether the O-ring is already fitted on the tube. If not, take the new O-ring (ID 15 mm (0.59 in)) out of the kit and slide it into the slot of the dosing tube.

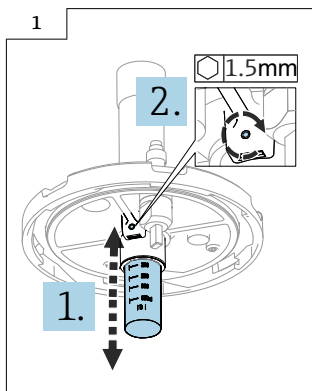


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- Insert the new dosing tube into the flange and set the dosing volume according to the desired scale.

**i** Pay attention to the two different scales:

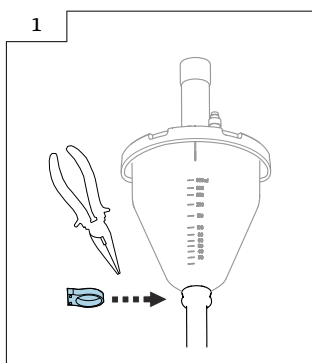
- White scale – dosing without pressure
- Blue scale – dosing with pressure



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- Take the new dosing chamber and the small fastening clip out of the kit.

**i** If using the glass version, clean the glass and put it back in.

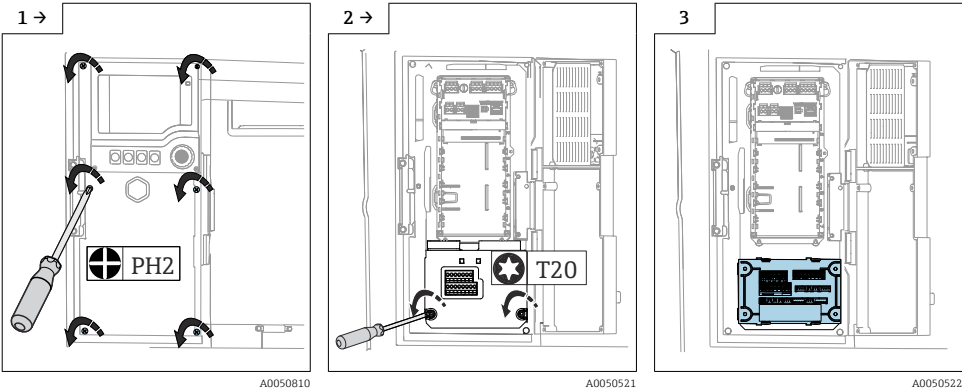


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- Assemble the dosing unit in reverse order.
- Put the assembled dosing unit aside for the time being. It is installed in the sampler later on.

# 8.2.2 Replacement of the elastomer membrane

## Disconnection of the plugs from the FMSY1 control module

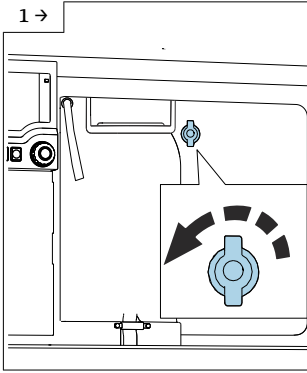


- Disconnect plug **X5** or plug **X3** from the FMSY1 control module.

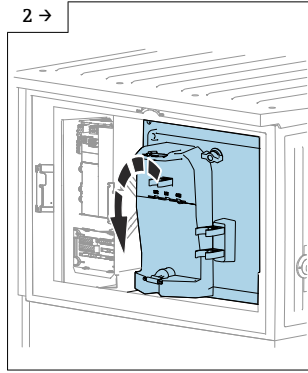
Sampler with conductive medium detection	Sampler with capacitive medium detection
Disconnect plug <b>X5</b> from the FMSY1 control module.	Disconnect plug <b>X3</b> from the FMSY1 control module.
<p>A0050634</p>	<p>A0050635</p>

### Tilting the carrier plate of the sampler

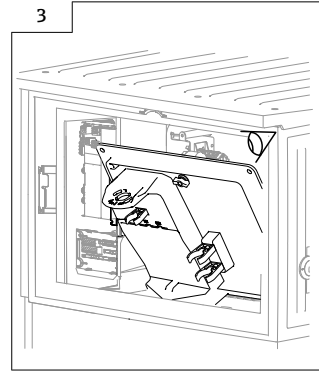
- Tilt the carrier plate approx. 20 cm (7.87 in) towards the front without removing it entirely.



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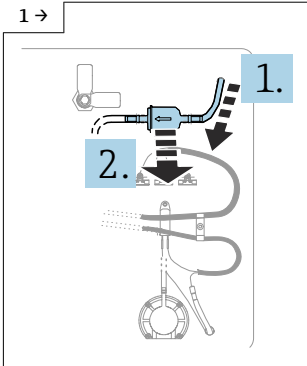


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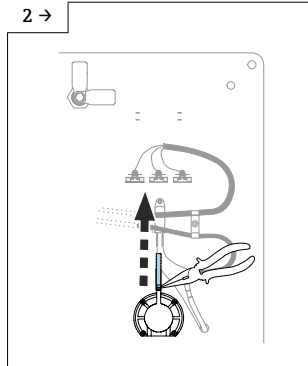
### Removal of the hoses, air filter and plugs on the back of the carrier plate

**i** The carrier plate remains in the tilted position in the sampler for the removal of the hoses, the air filter and the plugs from the rear of the carrier plate.

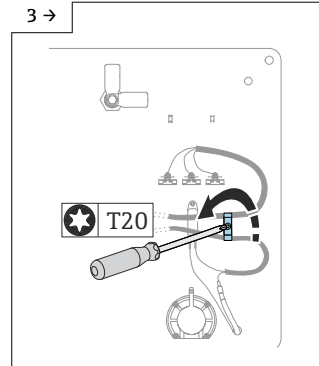
**i** The following images show the rear of the carrier plate.



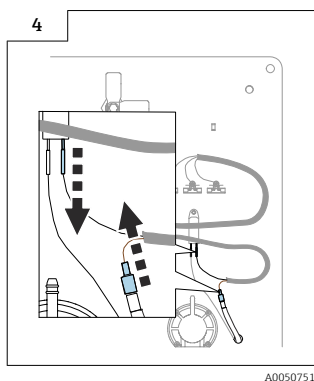
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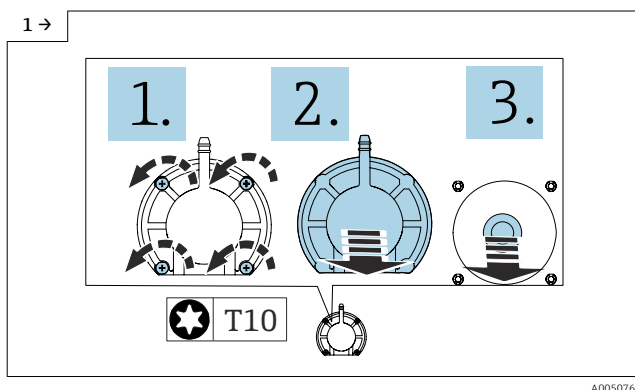


- ▶ Remove the seal in the cable duct.
- ▶ Guide all the loosened cables through the cable duct from the FMSY1 control module into the sampler.
- ▶ Carefully remove the carrier plate from the sampler.

### Replacement of the elastomer membrane

 The membrane can be firmly seated on the cylinder piston.

- ▶ Using a screwdriver, carefully prise the edge of the membrane off the piston.



- ▶ Replace the old elastomer membrane with a new elastomer membrane from the kit.

- ▶ Insert the membrane into the tool in the right direction. The "hat" inserted into the tool must have a smooth surface.



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- ▶ Insert the "hat" with the smooth surface into the mounting tool as far as it will go.
- ▶ The bulge on the edge of the membrane must point upwards.
- ▶ Place the edge of the membrane over the mounting tool.



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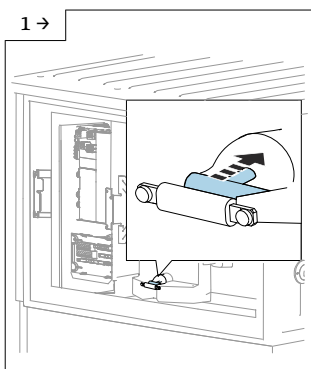
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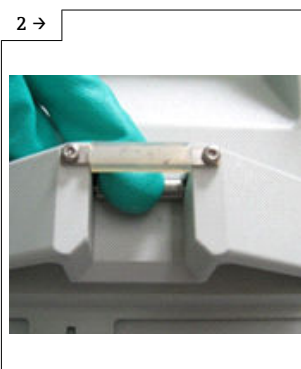
A0050546

- ▶ To insert the membrane, press against the pressure fitting on the front of the carrier plate.
- ▶ Slide the membrane onto the cylinder piston up to the stop.
- ▶ Carefully unscrew the mounting tool from the membrane.

- Make sure the cylinder piston turns smoothly.



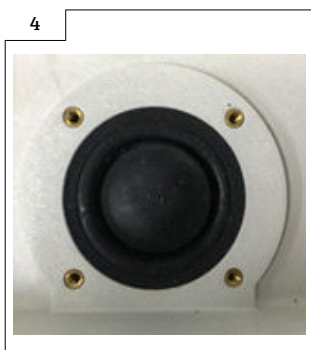
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#### NOTICE

**The back of the membrane bead projects out.**

The vacuum cannot be generated.

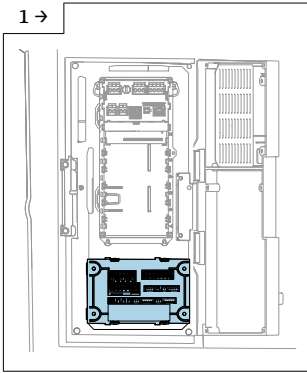
- The back of the membrane bead must be pressed flatly into the cavity of the carrier plate.
- Carefully tighten the cylinder head cover again. Do not tighten the screws too tightly.
- Put the carrier plate aside. It is installed again later on.



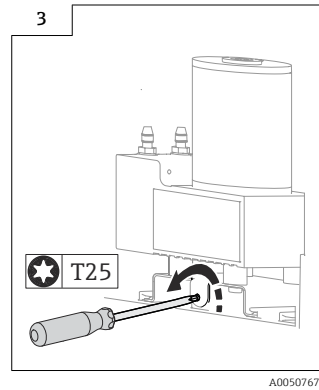
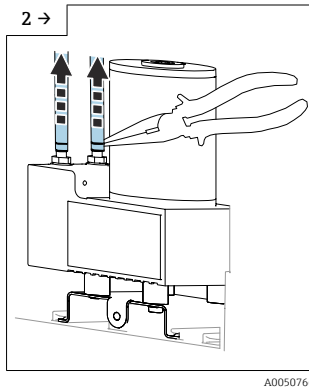
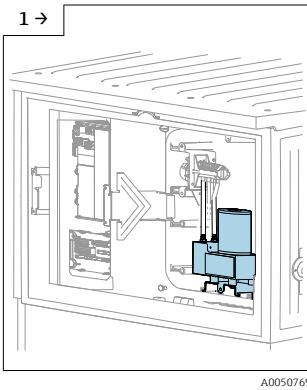
In the case of a yearly maintenance, skip the next two sections and continue with section 8.2.5. →  20

### 8.2.3 Replacement of the vacuum pump

- ▶ Disconnect plug **X7** from the FMSY1 control module.



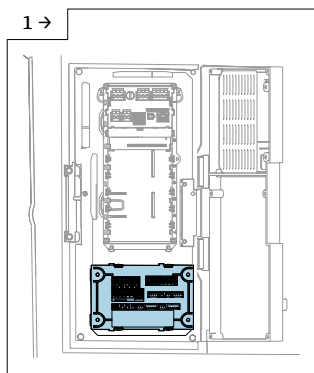
- ▶ Replace the old vacuum pump with the new vacuum pump from the kit.



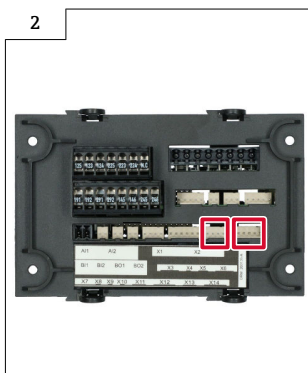
- ▶ Install the new vacuum pump in the sampler in the reverse order.
- ▶ Connect the hoses after replacing the air manager.

## 8.2.4 Replacement of the air manager

- ▶ Disconnect plug **X13** and **X14** from the FMSY1 control module.

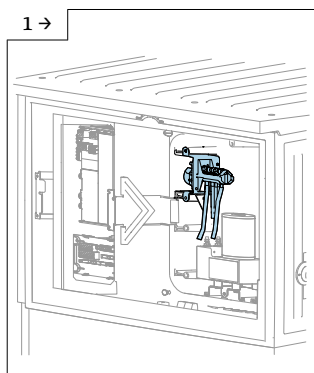


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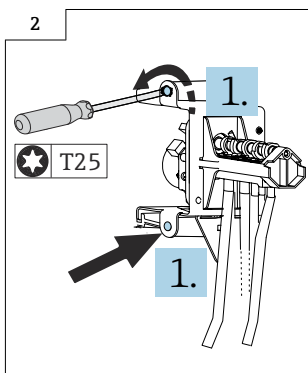


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- ▶ Pull the cables through the cable duct into the interior area of the sampler.
- ▶ Replace the old air manager with the new air manager from the kit.



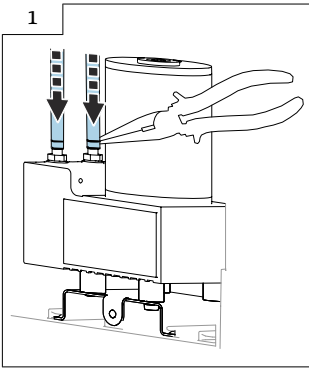
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- ▶ Install the new air manager in the sampler in reverse order and plug the cables into the FMSY1 control module.

- Connect the hoses of the air manager to the vacuum pump.



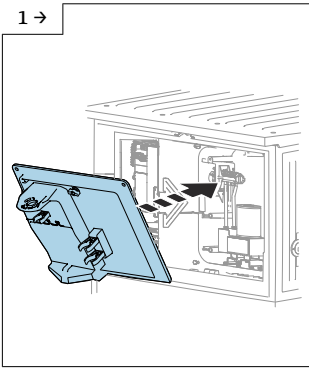
A0050771

- Fix the yellow hose to the back of the sampler.

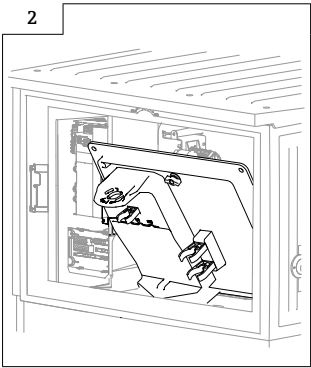
Hose label	Connections
Red	Vacuum pump inlet
Black	Cylinder head
Blue	Flange dosing unit (air filter)
Yellow	Rear panel (condensate drain)
Without label	Vacuum pump outlet

**8.2.5 Reinserting the carrier plate into the sampler**


- With the carrier plate tilted slightly forwards, insert the carrier plate back into the sampler.



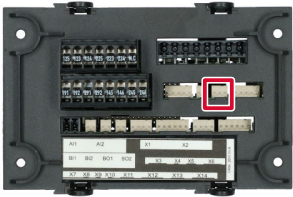
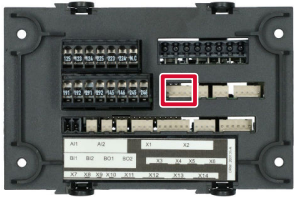
A0050660




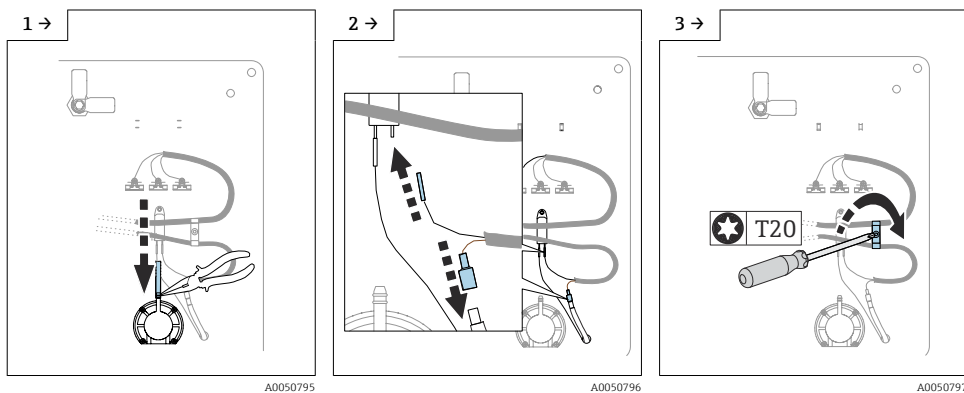
A0050677

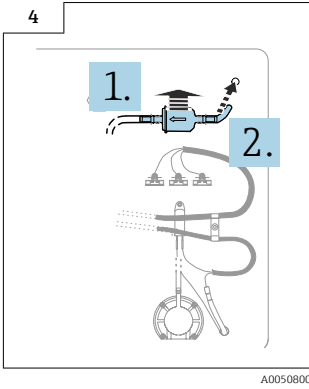
 The carrier plate must be in the tilted position in the sampler for the reconnection of the plugs, the air filter and the hoses on the rear of the carrier plate.

- ▶ Guide the plug cable **X5** (sampler with conductive medium detection) or plug cable **X3** (sampler with capacitive medium detection) through the cable duct.
- ▶ Put the seal back into the cable duct.
- ▶ Insert plug **X5** or plug **X3** back into the FMSY1 control module.

Conductive sampler	Capacitive sampler
Insert plug <b>X5</b> into the FMSY1 control module	Insert plug <b>X3</b> into the FMSY1 control module
 A0050634	 A0050635

 The following images show the rear of the carrier plate.



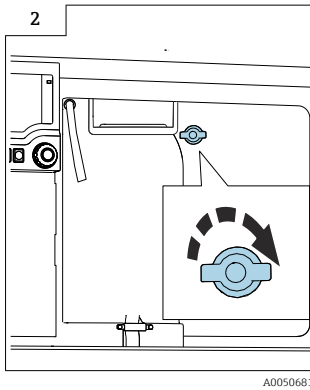
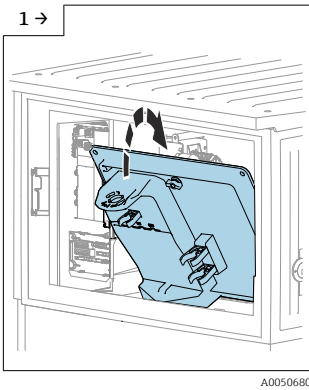


**NOTICE**

**Bent hose.**

Insufficient air supply.

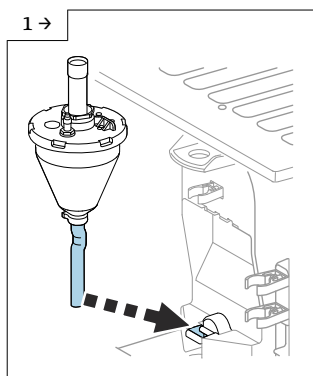
- Make sure the hose is not bent.



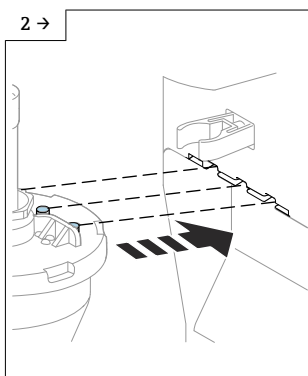
**8.2.6 Insertion of new spiral hose and connections**

- Guide the dosing hose through the opening of the pinch valve.

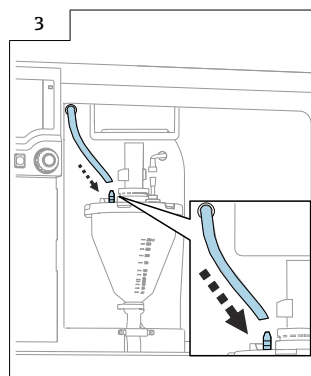
- Press the three pins of the flange into the three lashes on the carrier plate.



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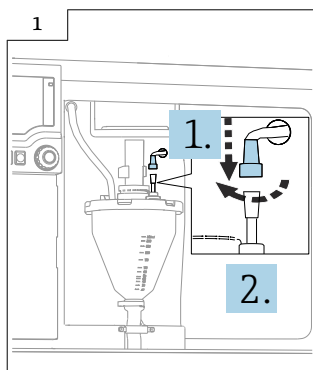


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A0050900

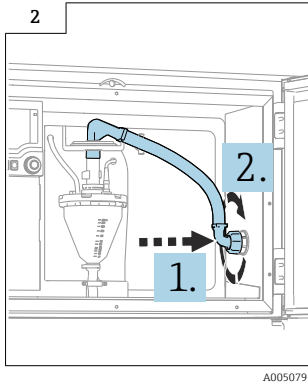
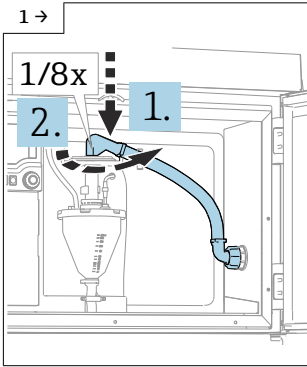
- In the case of samplers with capacitive medium detection, also close the plug-in lock of the capacitive sensor again.



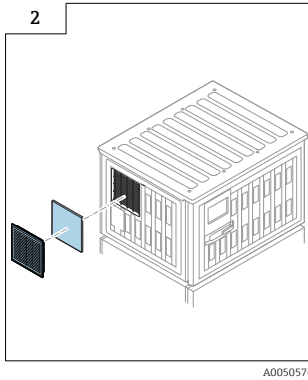
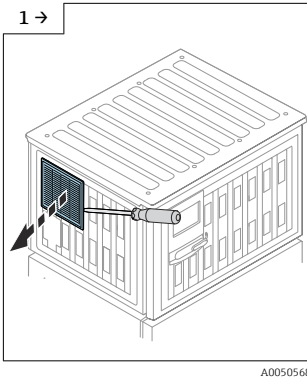
A0050816

- Take the new spiral hose out of the kit. The elbow connector and hose connector with coupling nut are already fitted on the hose.

- Put the elbow connector on the dosing unit, lock it and fix the hose on the right side at the sampler housing.



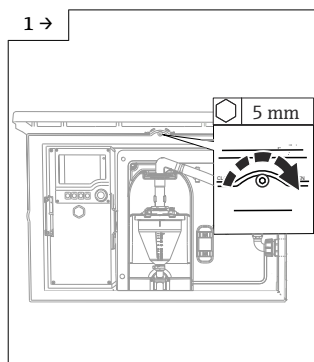
### 8.2.7 Replacement of the filter mat in samplers with a plastic housing



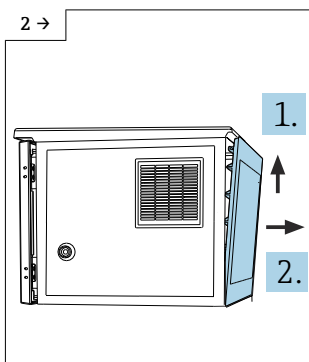
- Replace the old filter mat with a new filter mat from the kit.

**i** Viewed from the outside, the angled slats of the ventilation grid must slope downwards.

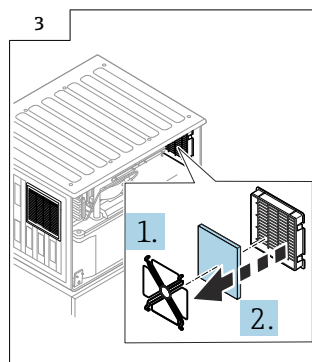
## 8.2.8 Replacement of the filter mat in samplers with a stainless steel housing



A0050579

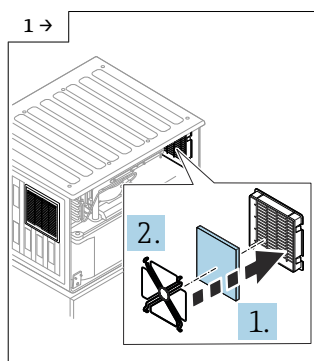


A0050575

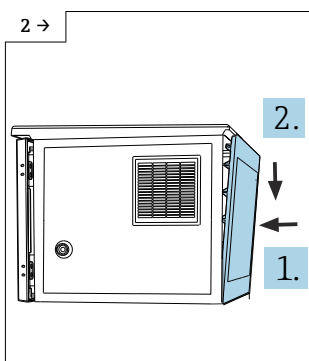


A0050783

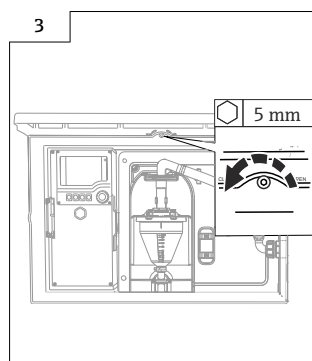
- Replace the old filter mat with a new filter mat from the kit.



A0050745

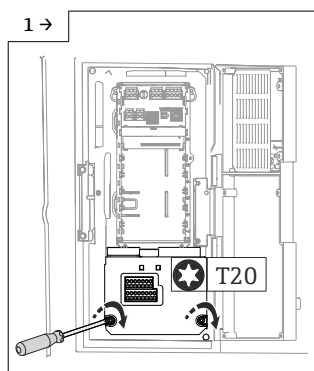


A0050580

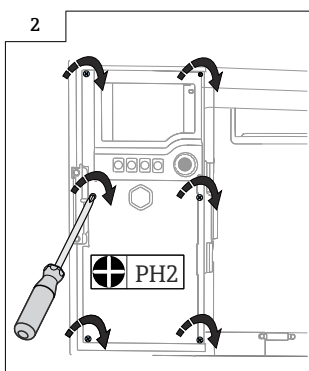


A0050581

- Check that all connections on the FMSY1 control module are installed correctly.



A0050582

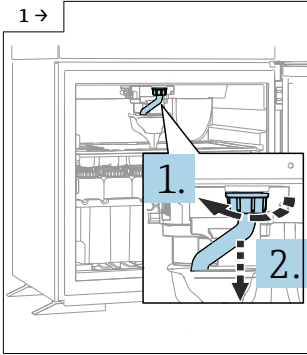


A0050811

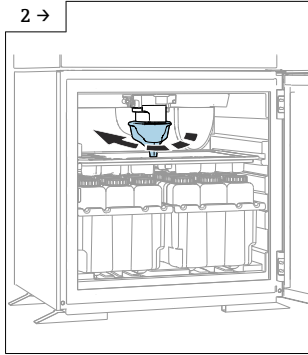
### 8.2.9 Replacement of the downpipe and distribution arm

- Open the lower door of the sampler.

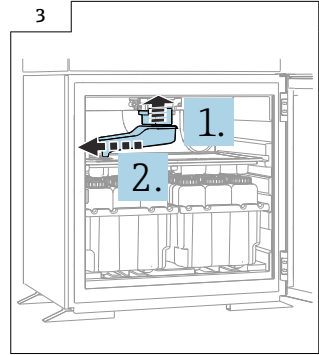
**i** If the sampler has only one bottle or if this is the yearly maintenance kit, you only need to replace the downpipe.



A0050638

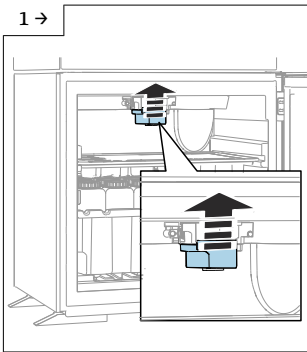


A0050639

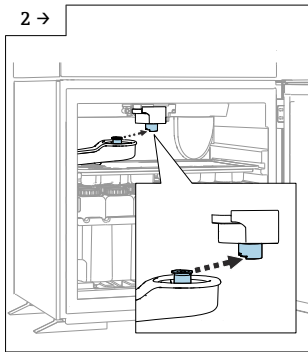


A0050641

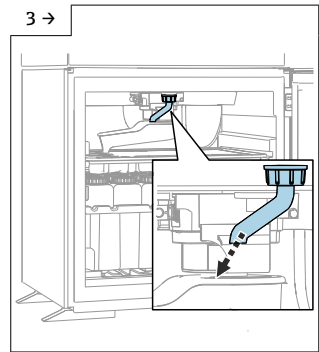
- Replace the old downpipe and the old distribution arm with the new downpipe and new distribution arm from the kit.



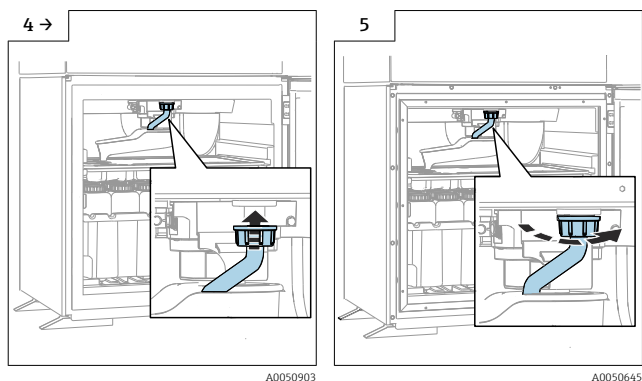
A0050794



A0050904



A0050899



### 8.2.10 Resetting the counters

The counters must be reset once the elastomer membrane and vacuum pump have been replaced.

**i** It is recommended to note down all the operating times before resetting the counters.

- Connect the sampler to the mains voltage.

Select the following path in the menu:  
Menu/Diagnostics/Operating time information

1. Select **Dosing valve** and reset.
2. Select **Vacuum pump** and reset. (Choose only when pump has been replaced.)

### 8.2.11 Calibration of the distribution arm

**i** You can skip this section if the sampler has only one bottle.

#### NOTICE

#### Replacement of the distribution arm and downpipe.

The safe operation of the sampler can no longer be guaranteed.


- The distribution arm must be calibrated.

Select the following path in the menu:

- CSF28: Menu/Application/Calibration/Distribution arm
- CSF33/34/39/48: Menu/Calibration/Distribution arm

1. Select **Ref. point** to perform a reference run.
2. Check whether the reference point is correct.
3. If **Yes**, press **OK** to confirm.
4. If **No**, select **Adjust**. Use the arrow keys to set the distribution arm. Press the softkey several times until the reference point is reached. Press the softkey **"OK"** to confirm.

5. The distribution arm is now calibrated and moves back to the parking position.

-  Reference point
- Sampler with distribution plate: arrow at front on distribution plate
  - Sampler with direct distribution: at front in the middle between the bottles

### 8.2.12 Preparation for sampling routine

1. Check whether all the bottles and the distribution plate are inserted correctly.
2. Take a manual sample to check that everything is working correctly without any problems.
3. Press the softkey **"MAN"** and select **Start sampling** in the menu.
4. Check the sampling program and continue it or start it again.

## 9 Disposal

- Observe the local regulations.



If required by the Directive 2012/19/EU on waste electrical and electronic equipment (WEEE), the product is marked with the depicted symbol in order to minimize the disposal of WEEE as unsorted municipal waste. Do not dispose of products bearing this marking as unsorted municipal waste. Instead, return them to the manufacturer for disposal under the applicable conditions.

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