Installation Instructions
Flow assembly kit for CFS51

Retrofit kit/replacement for flow assembly of CFS51
# Table of contents

1. Overview of spare part sets .......................................................... 3  
2. Intended use ............................................................................ 3  
3. Authorized installation personnel ............................................... 3  
4. Safety instructions .................................................................... 4  
5. Symbols ..................................................................................... 5  
6. Scope of delivery ........................................................................ 6  
7. Tool list ....................................................................................... 11  
8. Mounting ...................................................................................... 12  
9. Replacing the spare part kits ..................................................... 26  
10. Disposal ...................................................................................... 36
1 Overview of spare part sets

<table>
<thead>
<tr>
<th>Order number</th>
<th>Original spare part kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>71546713</td>
<td>Kit CFS51 flow assembly scrubber</td>
</tr>
<tr>
<td>71546714</td>
<td>Kit CFS51 assembly scrubber seal kit</td>
</tr>
<tr>
<td>71546718</td>
<td>Kit CFS51 coupling nut and ring clip</td>
</tr>
<tr>
<td>71546716</td>
<td>Kit CFS51 titanium sensor adapter</td>
</tr>
<tr>
<td>71546719</td>
<td>Kit CFS51 2x adapter G1/4 -8 mm (0.31 in) OD PVDF</td>
</tr>
<tr>
<td>71546721</td>
<td>Kit CFS51 cleaning adapter PVDF</td>
</tr>
<tr>
<td>71546722</td>
<td>Kit CFS51 check valve 6 mm (0.24 in) OD PVDF</td>
</tr>
<tr>
<td>71546723</td>
<td>Kit CFS51 2x hose support DN6/8</td>
</tr>
</tbody>
</table>

2 Intended use

The flow assembly is designed exclusively for installing optical sensor CFS51. The assembly is designed exclusively for use in liquid media.

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 using the device incorrectly or for purposes for which it was not intended.

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 be performed only 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 by the manufacturer or by the service organization.
4 Safety instructions

Pay attention to the following safety instructions.

Follow the Operating Instructions BA02165C 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

**WARNING**

UV radiation from this product

Can cause damage to the eyes and skin!

- Avoid any exposure of the eyes and skin to the unshielded product.
- When the sensor is switched on, avoid looking directly into the sensor window without appropriate eye protection. The exposure limits according to IEC 62471:2008 are not exceeded within the first 100 seconds.
- Appropriate protective goggles must be worn to protect against UV radiation.
- Cover the light source when performing maintenance tasks that do not need UV light.

- The risk to the observer depends on how the user installs and uses the sensor.
- The sensor's lamp radiates light in the 254 nm wavelength range (UV radiation). The sensor's lamp is categorized as Risk Group 3 according to EN/IEC 62471.

4.2 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.

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 Safety information

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

5.2 Symbols used

- 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
## 6 Scope of delivery

### 71546713 Kit CFS51 flow assembly scrubber

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Base unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Assembly PE HD</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>b</td>
<td>Bearing block</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>c</td>
<td>Ring clip</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>d</td>
<td>Double sealing ring, assembly CFS51, PE HD</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>e</td>
<td>Sensor adapter, titanium 40 mm (1.57 in)</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>f</td>
<td>Coupling nut, PP</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>g</td>
<td>Allen screw, M5x40, titanium</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>h</td>
<td>Allen screw, M8x70, titanium</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>i</td>
<td>Silicone grease, medium-viscosity 2 g (0.07 oz)</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>j</td>
<td>Cleaning cloth, isopropyl alcohol</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td></td>
<td>Service kit instructions</td>
<td>1</td>
<td>Piece</td>
</tr>
</tbody>
</table>

![Kit CFS51 flow assembly scrubber](image)
### 71546714 Kit CFS51 assembly scrubber seal kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Base unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Double sealing ring, assembly CFS51, PE HD</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>b</td>
<td>O-ring ID 39.34 W 2.62 OD 44.58 FKM</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>c</td>
<td>O-ring ID 44.12 W 2.62 OD 49.36 FKM</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>d</td>
<td>Sealing ring G 1/4</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>e</td>
<td>Silicone grease, medium-viscosity 2 g (0.07 oz)</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td></td>
<td>Service kit instructions</td>
<td>1</td>
<td>Piece</td>
</tr>
</tbody>
</table>

![CFS51 assembly scrubber seal kit diagram]

**2**

### 71546716 Kit CFS51 titanium sensor adapter

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Base unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Titanium sensor adapter, 40 mm (1.57 in) sensor</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>b</td>
<td>Torx screw, M5x16, titanium</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>c</td>
<td>Cleaning cloth, isopropyl alcohol</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td></td>
<td>Service kit instructions</td>
<td>1</td>
<td>Piece</td>
</tr>
</tbody>
</table>
### 71546718 Kit CFS51 coupling nut and ring clip

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Base unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Coupling nut, PP</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>b</td>
<td>Ring clip holder</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>c</td>
<td>Spacer</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>d</td>
<td>Allen screw, M5x40, titanium</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>e</td>
<td>Silicone grease, medium-viscosity 2 g (0.07 oz)</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>f</td>
<td>Cleaning cloth, isopropyl alcohol</td>
<td>1</td>
<td>Piece</td>
</tr>
</tbody>
</table>

**Service kit instructions**
### 71546719 Kit CFS51 2x adapter G1/4-8 mm (0.24 in) OD PVDF

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Base unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Coupling, elbowed, PVDF</td>
<td>2</td>
<td>Piece</td>
</tr>
<tr>
<td>b</td>
<td>Hose adapter G1/4 PVDM /FKM + O-ring</td>
<td>2</td>
<td>Piece</td>
</tr>
<tr>
<td>c</td>
<td>Silicone grease, medium-viscosity 2 g (0.07 oz)</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td></td>
<td>Service kit instructions</td>
<td>1</td>
<td>Piece</td>
</tr>
</tbody>
</table>

![](image1.png)

4 Kit CFS51 coupling nut and ring clip

![](image2.png)

5 Kit CFS51 2x adapter G1/4 - 8 mm 8 mm (0.24 in) OD PVDF
### 71546721 Kit CFS51 cleaning adapter PVDF

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Base unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Coupling, elbowed, PVDF</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>b</td>
<td>Hose adapter G1/4 PVDM /FKM + O-ring</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>c</td>
<td>Check valve FKM</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td>d</td>
<td>Silicone grease, medium-viscosity 2 g (0.07 oz)</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td></td>
<td>Service kit instructions</td>
<td>1</td>
<td>Piece</td>
</tr>
</tbody>
</table>

![Diagram](image-url)

- **6**

*Kit CFS51 cleaning adapter PVDF*

### 71546722 Kit CFS51 check valve 6 mm (0.24 in) OD PVDF

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Base unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Check valve</td>
<td>1</td>
<td>Piece</td>
</tr>
<tr>
<td></td>
<td>Service kit instructions</td>
<td>1</td>
<td>Piece</td>
</tr>
</tbody>
</table>
Kit CFS51 check valve, PVDF

71546723 Kit CFS51 2x hose support DN6/8

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Base unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Hose support DN6/8</td>
<td>2</td>
<td>Piece</td>
</tr>
<tr>
<td></td>
<td>Service kit instructions</td>
<td>1</td>
<td>Piece</td>
</tr>
</tbody>
</table>

Kit CFS51 2x hose support DN6/8

7 Tool list

- 4mm, 6mm
- TX25
- 11 mm, 12 mm, 13 mm, 14 mm, 17 mm, 19 mm
8 Mounting

8.1 Mounting requirements

8.1.1 Dimensions

9 Sensor dimensions. Engineering unit: mm (in)

10 Dimensions of sensor with clamping ring. Engineering unit: mm (in)
11 Dimensions of assembly with securing plate (right). Engineering unit: mm (in)
12 Dimensions of mounted sensor with assembly. Engineering unit: mm (in)

- $x$: Variable length (depending on mounting)
- $y$: Variable angle (depending on mounting)
8.1.2 Installation instructions
The angle of inclination of the sensor can affect the formation of air bubbles below the sensor. The greater the angle of inclination of the sensor, the more insensitive the measurement is to air bubbles.

- Adjust the angle of inclination if many air bubbles form.

8.1.3 Orientation
The angle of inclination of the sensor can affect the formation of air bubbles below the sensor. The greater the angle of inclination of the sensor, the more insensitive the measurement is to air bubbles.

- Adjust the angle of inclination if many air bubbles form.
**Angle of inclination of sensor**

The angle of inclination of the sensor can be adjusted depending on the measuring point. The angle of inclination is determined by the position of the spacer on the panel → 12, 14.

![Diagram of sensor with 10° angle](image1.png)

![Diagram of sensor with 15° angle](image2.png)

1  Ring clip with spacer

### 8.1.4 Installing the assembly with sensor

The mounting materials used to secure the bearing block on the wall are not included in the scope of delivery and must be supplied by the customer. The holes of the bearing block are suitable for 5 mm (0.2 in) screws.
Before use, grease the O-rings with the silicone grease provided.

Using the cleaning cloth supplied, thoroughly degrease the sensor and the marking for fastening the clamping ring.

Orientation of the clamping ring on the sensor

1. Align the joint of the clamping ring vertically to the optical window of the sensor.
2. Slide the clamping ring exactly as far as the horizontal alignment line, using the installation marking as an aid.
An angle of 15° is recommended. By positioning the sensor at this angle, air bubbles can escape more easily.

The mounting materials used to secure the ring clip holder on the wall are not included in the scope of delivery and must be supplied by the customer. The holes of the ring clip holder are suitable for 5 mm (0.2 in) screws.
8.2 Mounting the adapters

Before use, grease the O-rings with the silicone grease provided.
1. Insert the pipe into the coupling as far as it will go.
2. Screw on the union nuts by hand until you feel resistance.
3. Use an open-ended wrench to tighten the union nuts by 1 3/4 turns.
The hoses are not included in the scope of delivery.

1. Insert the hoses into the coupling as far as they will go.
2. Screw on the union nuts by hand until you feel resistance.
3. Use an open-ended wrench to tighten the union nuts by 1 3/4 turns.

8.3 Mounting the cleaning adapter

- Before use, grease the O-rings with the silicone grease provided.
1. Insert the pipe into the coupling as far as it will go.
2. Screw on the union nut by hand until you feel resistance.
3. Use an open-ended wrench to tighten the union nut by 1 3/4 turns.

8.4 Mounting the check valve

- Before use, grease the O-rings with the silicone grease provided.

1. Insert the pipe into the coupling as far as it will go.
2. Screw on the union nut by hand until you feel resistance.
3. Use an open-ended wrench to tighten the union nut by 1 3/4 turns.

The hoses are not included in the scope of delivery.

1. Insert the hose into the coupling as far as it will go.
2. Screw on the union nut by hand until you feel resistance.
3. Use an open-ended wrench to tighten the union nut by 1 3/4 turns.

For detailed information on the electrical connection, see the "Electrical connection" section of the Operating Instructions for the device.

For detailed information on commissioning, see the "Commissioning" section of the Operating Instructions for the device.

8.5 Post-mounting check

Put the sensor into operation only if the following questions can be answered with "yes":

- Are the sensor and cable undamaged?
- Is the orientation correct?
- Is the sensor installed in the assembly and not suspended from the cable?

9 Replacing the spare part kits

9.1 Preparation

⚠️ CAUTION

Process medium and medium residues

Risk of injury from high pressure, high temperatures or chemical hazards!

- Wear protective gloves, protective goggles and protective clothing.
- Mount or dismantle the assembly only in vessels or pipes that are empty and unpressurized.
9.1.1 Removing hoses from assembly

1 → 2 → 3

9.1.2 Putting the assembly and sensor into the service position

‣ Secure the screw so that it doesn't fall off.
9.2 Replacing the check valve

- Carry out preparations for check valve in accordance with Section 9.1.1. → 27

1. Replace the used check valve with the new spare part.

2. Install the new spare part in accordance with Section 8.4. → 24

Pre-mounted couplings or repeat installation of adapters

1. Screw on the union nut by hand until you feel resistance.

2. Tighten the union nuts with one turn of the wrench for final installation.

9.3 Replacing the cleaning adapter

- Carry out preparations for check valve in accordance with Section 9.1.1. → 27

- Before use, grease the O-rings with the silicone grease provided.
Replace the used cleaning adapter with the new spare part.

Install the new spare part in accordance with Sections 8.3 and 8.4. → 23 → 24

**Pre-mounted couplings or repeat installation of adapters**

1. Screw on the union nut by hand until you feel resistance.
2. Tighten the union nuts with one turn of the wrench for final installation.

### 9.4 Replacing the adapters

Replace the used adapters with new spare parts.

Install the new spare parts in accordance with Section 8.2. → 20

**Pre-mounted couplings or repeat installation of adapters**

1. Screw on the union nuts by hand until you feel resistance.
2. Tighten the union nuts with one turn of the wrench for final installation.

Before use, grease the O-rings with the silicone grease provided.
9.5 Replacing the titanium sensor adapter

- Carry out preparations in accordance with Section 9.1. → \( \text{(26)} \)

1. Replace the used titanium clamping ring with the new spare part.

2. Using the cleaning cloth supplied, thoroughly degrease the sensor and the marking for fastening the clamping ring.
Orientation of the clamping ring on the sensor

1. Align the joint of the clamping ring vertically to the optical window of the sensor.
2. Slide the clamping ring exactly as far as the horizontal alignment line, using the installation marking as an aid.

3 →

4 →

5 →

6
9.6 Replacing the coupling nut and ring clip

- Carry out preparations in accordance with Section 9.1. →  ❙ 26

Replace the used coupling nut and ring clip with new spare parts.

Before use, grease the O-rings with the silicone grease provided.
Using the cleaning cloth supplied, thoroughly degrease the sensor and the marking for fastening the clamping ring.

Orientation of the clamping ring on the sensor

1. Align the joint of the clamping ring vertically to the optical window of the sensor.
2. Slide the clamping ring exactly as far as the horizontal alignment line, using the installation marking as an aid.
Replace the used spacer with the new spare part.

9.7 Replacing the seals
Carry out preparations in accordance with Section 9.1.1. → 27
1. Replace the used seals with new seals.
2. Before use, grease the new O-rings with the silicone grease provided.
1. Replace the used seals with new seals.
2. Before use, grease the new O-rings with the silicone grease provided.

- Install the adapter and hoses in accordance with Section 8.2. → 20

Pre-mounted couplings or repeat installation of adapters

1. Screw on the union nut by hand until you feel resistance.
2. Tighten the union nut with one turn of the wrench for final installation.

10 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.