SENSOFIT IMM 2920 Handbook

Immersion assembly for pH / ORP sensors with PG 13.5 and 3/4 NPT connection thread
All rights reserved. It is prohibited to reproduce this documentation, or any part thereof, without the prior written authorisation of KROHNE Messtechnik GmbH.

Subject to change without notice.

Copyright 2018 by
KROHNE Messtechnik GmbH - Ludwig-Krohne-Str. 5 - 47058 Duisburg (Germany)
1.1 Intended use

**CAUTION!**
Responsibility for the use of the measuring devices with regard to suitability, intended use and corrosion resistance of the used materials against the measured fluid lies solely with the operator.

**INFORMATION!**
The manufacturer is not liable for any damage resulting from improper use or use for other than the intended purpose.

The SENSOFIT IMM 2920 assembly can be mounted to tanks or open basins. The assembly serves for mounting a sensor in such a way that it is immersed into the process fluid in order to measure chemical or physical properties. The material characteristics of the assembly, the gaskets, the sensors and the housing must be chosen depending on the process parameters (e.g. pressure, temperature, abrasivity). The assembly has to be maintained on a regular basis. Establish a maintenance plan which is adjusted to your process.

1.2 Safety instructions from the manufacturer

1.2.1 Copyright and data protection

The contents of this document have been created with great care. Nevertheless, we provide no guarantee that the contents are correct, complete or up-to-date.

The contents and works in this document are subject to copyright. Contributions from third parties are identified as such. Reproduction, processing, dissemination and any type of use beyond what is permitted under copyright requires written authorisation from the respective author and/or the manufacturer.

The manufacturer tries always to observe the copyrights of others, and to draw on works created in-house or works in the public domain.

The collection of personal data (such as names, street addresses or e-mail addresses) in the manufacturer’s documents is always on a voluntary basis whenever possible. Whenever feasible, it is always possible to make use of the offerings and services without providing any personal data.

We draw your attention to the fact that data transmission over the Internet (e.g. when communicating by e-mail) may involve gaps in security. It is not possible to protect such data completely against access by third parties.

We hereby expressly prohibit the use of the contact data published as part of our duty to publish an imprint for the purpose of sending us any advertising or informational materials that we have not expressly requested.
1.2.2 Disclaimer

The manufacturer will not be liable for any damage of any kind by using its product, including, but not limited to direct, indirect or incidental and consequential damages.

This disclaimer does not apply in case the manufacturer has acted on purpose or with gross negligence. In the event any applicable law does not allow such limitations on implied warranties or the exclusion of limitation of certain damages, you may, if such law applies to you, not be subject to some or all of the above disclaimer, exclusions or limitations.

Any product purchased from the manufacturer is warranted in accordance with the relevant product documentation and our Terms and Conditions of Sale.

The manufacturer reserves the right to alter the content of its documents, including this disclaimer in any way, at any time, for any reason, without prior notification, and will not be liable in any way for possible consequences of such changes.

1.3 Product liability and warranty

The operator shall bear responsibility for the suitability of the device for the specific purpose. The manufacturer accepts no liability for the consequences of misuse by the operator. Improper installation or operation of the devices [systems] will cause the warranty to be void. The respective "Standard Terms and Conditions" which form the basis for the sales contract shall also apply.

1.3.1 Information concerning the documentation

To prevent any injury to the user or damage to the device it is essential that you read the information in this document and observe applicable national standards, safety requirements and accident prevention regulations.

If this document is not in your native language and if you have any problems understanding the text, we advise you to contact your local office for assistance. The manufacturer can not accept responsibility for any damage or injury caused by misunderstanding of the information in this document.

This document is provided to help you establish operating conditions, which will permit safe and efficient use of this device. Special considerations and precautions are also described in the document, which appear in the form of icons as shown below.
1.3.2 Warnings and symbols used

Safety warnings are indicated by the following symbols.

**DANGER!**
This warning refers to the immediate danger when working with electricity.

**DANGER!**
This warning refers to the immediate danger of burns caused by heat or hot surfaces.

**DANGER!**
This warning refers to the immediate danger when using this device in a hazardous atmosphere.

**DANGER!**
These warnings must be observed without fail. Even partial disregard of this warning can lead to serious health problems and even death. There is also the risk of seriously damaging the device or parts of the operator’s plant.

**WARNING!**
Disregarding this safety warning, even if only in part, poses the risk of serious health problems. There is also the risk of damaging the device or parts of the operator’s plant.

**CAUTION!**
Disregarding these instructions can result in damage to the device or to parts of the operator’s plant.

**INFORMATION!**
These instructions contain important information for the handling of the device.

**LEGAL NOTICE!**
This note contains information on statutory directives and standards.

- **HANDLING**
  This symbol designates all instructions for actions to be carried out by the operator in the specified sequence.

- **RESULT**
  This symbol refers to all important consequences of the previous actions.

1.4 Safety instructions for the operator

**WARNING!**
In general, devices from the manufacturer may only be installed, commissioned, operated and maintained by properly trained and authorized personnel.
This document is provided to help you establish operating conditions, which will permit safe and efficient use of this device.
2.1 Scope of delivery

**INFORMATION!**
Inspect the packaging carefully for damages or signs of rough handling. Report damage to the carrier and to the local office of the manufacturer.

**INFORMATION!**
Do a check of the packing list to make sure that you have all the elements given in the order.

**INFORMATION!**
Look at the device nameplate to ensure that the device is delivered according to your order.

**Figure 2-1: Scope of delivery**
1. Ordered assembly
2. Documentation

**Consumables / Spare parts available**
- O-ring set EPDM SENSOFIT IMM 2920 (12/120 mm sensors)
- O-ring set FKM SENSOFIT IMM 2920 (12/120 mm sensors)

**INFORMATION!**
For further information contact your local sales office.
2.2 Device description

Figure 2-2: Description of the assembly

1. Holder
2. Cable gland with bend protection (sensor cable)
3. Flange (process connection)
4. Immersion pipe
5. Rinsing hose (optional)
6. Sensor support
7. Protective cage
8. Union nut
9. Cable gland with bend protection (rinsing pipe)
2.3 Nameplate

![Nameplate Example]

Figure 2-3: Example for a nameplate

1. Device name
2. Order code
3. Serial number
4. Max. process pressure and max. temperature
5. Country of manufacture
6. Manufacturer
7. Website of manufacture
3.1 General notes on installation

DANGER!
No use in areas with potential flammable surroundings.

CAUTION!
Do not expose the assembly to intense vibration.

CAUTION!
If using abrasive media or processes which lead to accelerated wearing, check the assembly in shorter intervals.

INFORMATION!
Inspect the packaging carefully for damages or signs of rough handling. Report damage to the carrier and to the local office of the manufacturer.

INFORMATION!
Do a check of the packing list to make sure that you have all the elements given in the order.

INFORMATION!
Look at the device nameplate to ensure that the device is delivered according to your order.

Figure 3-1: Installation requirements
① Measuring medium
② Maximum deviation of 75° from vertical position

The mounting position of the assembly should ensure, that when installed, the sensor is typically at an angle of 0 ... 75 degrees from the vertical.
3.2 Storage and transport

- Store the assembly in its original packaging.
- Store and transport the device in a dry, dust-free environment.
- Store and transport the device in an environment with a temperature between -10...+80°C / 14...+176°F.
- The original packing is designed to protect the equipment. It has to be used if the device is transported or sent back to the manufacturer.

3.3 Pre-installation requirements

**CAUTION!**
Choosing the right gasket for the process connection as well as for the sensor connection depends on the process conditions; e.g. pressure, temperature, chemically aggressive media.

Versions with rinsing options: appropriate components for sensor cleaning (flushing valve, tank for rinsing solution, controller/timer for rinsing...) must be supplied by the customer. The MAC 100 and MAC 300 controllers are supplied with a control input that can be used to put the signal outputs on "HOLD" for the sensor rinsing duration.

3.3.1 Flange version

Ensure for the measuring point that

- the process is switched off.
- there is sufficient working space available for mounting of the assembly.
- pipelines are de-pressurised, empty and clean.
- the assembly connection and the process connection fit together.
- the device must not be heated by radiated heat (e.g. exposure to the sun) to a surface temperature above the maximum permissible ambient temperature. If it is necessary to prevent damage from heat sources, a heat protection (e.g. sun shade) has to be installed.

Ensure for the assembly that

- the sensor connection fits to the assembly.

3.3.2 Holder version

Ensure for the measuring point that

- there is sufficient working space available for mounting of the assembly.
- the device must not be heated by radiated heat (e.g. exposure to the sun) to a surface temperature above the maximum permissible ambient temperature. If it is necessary to prevent damage from heat sources, a heat protection (e.g. sun shade) has to be installed.

Ensure for the assembly that

- the sensor connection fits to the assembly.
- an appropriate mounting set (e.g. with chain or rope) is available to hold the assembly in the desired position in the open basin or the tank
3.4 Installation

**DANGER!**
*It should be noted that the rinsing function will work properly only when being operated with sufficient pressure (max. 6 bar). Take process pressure into account (flange versions). Make sure that all components come with a sufficient pressure rating and are mounted pressure-tight. To avoid backflow of process fluid into the rinsing hose consider installing a check-valve.*

Make sure that
1. the system is prepared.
2. the assembly is prepared.
   For more information refer to *Pre-installation requirements* on page 11.

**CAUTION!**
*Before removing the union nut, first loosen the cable gland with bend protection.*

![Diagram of installation steps](image)

Figure 3-2: Installing the sensor

**Steps to install the sensor**
1. Unscrew the union nut ①.
2. Detach the protective cage and the sensor support ②.
3. Insert the sensor ③ in the sensor support.
4. Connect the sensor cable to the sensor ④.
5. Unscrew the screws on the flange ⑤.
6. Slide the cable ⑥ through the immersion pipe, through the cable gland with bend protection and attach the sensor support ⑦.
7. Tighten the union nut without rotating the sensor support ⑧.
8. Tighten the screws on the flange and the cable gland with bend protection ⑨.

For versions with rinsing option you have to attach the rinsing hose to the external flushing valve.
Steps to install the assembly (Flange)
1. Insert the assembly into the prepared installation position and insert an appropriate gasket.
2. Connect the process connection and tighten.

Steps to install the assembly (Holder)
1. Attach the holder to the mounting set (e.g. chain or rope).
2. Immerse the assembly into the prepared installation position.

Check the correct installation
1. Check if all connections are tight.
2. Check if no fluid escapes the process if the process starts again.
3. With rinsing option: make sure that all rinsing pipe connections are mounted pressure-tight.
4.1 Maintenance

4.1.1 Service instructions

**WARNING!**
Installation, assembly, start-up and maintenance may only be performed by appropriately trained personnel. The regional occupational health and safety directives must always be observed.

For standard applications we recommend the following schedule.

**Maintenance schedule**

<table>
<thead>
<tr>
<th>Maintenance action</th>
<th>Once every three months</th>
<th>Once a year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual check of the assembly</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Check wetted O-rings</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Check of the rinsing pipe</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**WARNING!**
Pressurised process connections have to be depressurised before removing the device. In the case of devices used for measuring aggressive or hazardous media, appropriate safety precautions must be taken with regard to residual liquids in the measuring unit. New gaskets have to be used when re-installing the device.

**WARNING!**
For devices with rinsing option: Before removing the device, shut-off the rinsing solution pump/compressed air supply, or disconnect the rinsing pipe from the flushing valve.
4.1.2 Replace the sensor

"CAUTION!"
Before removing the union nut, first loosen the cable gland with bend protection.

Replace the sensor
1. Unscrew the union nut ①.
2. Detach the protective cage and the sensor support ②.
3. Disconnect the sensor cable ③ from the sensor.
4. Detach the sensor ④.

After changing the sensor, you can reassemble the assembly in reverse order.
4.1.3 Replace the rinsing hose

CAUTION!
Before removing the sensor cable or the rinsing hose, you have to loosen the cable clasp.

Replace the rinsing hose
1. Unscrew the union nut 1.
2. Detach the protective cage and the sensor support 2.
3. Unscrew the sensor cable 3 from the sensor.
4. Detach the sensor 4 from the sensor support.
5. Unscrew the protection cage 5 from the sensor support.
6. Remove the ferrule 6 from the hose and remove the hose from the assembly.

After changing the hose, you can reassemble the fitting in reverse order.

4.1.4 Availability of services

The manufacturer offers a range of services to support the customer after expiration of the warranty. These include repair, maintenance, technical support and training.

INFORMATION!
For more precise information, please contact your local sales office.
4.1.5 Spare parts availability

The manufacturer adheres to the basic principle that functionally adequate spare parts for each device or each important accessory part will be kept available for a period of 3 years after delivery of the last production run for the device.

This regulation only applies to spare parts which are subject to wear and tear under normal operating conditions.

4.2 Returning the device to the manufacturer

4.2.1 General information

This device has been carefully manufactured and tested. If installed and operated in accordance with these operating instructions, it will rarely present any problems.

WARNING!

Should you nevertheless need to return a device for inspection or repair, please pay strict attention to the following points:

• Due to statutory regulations on environmental protection and safeguarding the health and safety of the personnel, the manufacturer may only handle, test and repair returned devices that have been in contact with products without risk to personnel and environment.

• This means that the manufacturer can only service this device if it is accompanied by the following certificate (see next section) confirming that the device is safe to handle.

WARNING!

If the device has been operated with toxic, caustic, radioactive, flammable or water-endangering products, you are kindly requested:

• to check and ensure, if necessary by rinsing or neutralising, that all cavities are free from such dangerous substances,

• to enclose a certificate with the device confirming that it is safe to handle and stating the product used.
4.2.2 Form (for copying) to accompany a returned device

**CAUTION!**
To avoid any risk for our service personnel, this form has to be accessible from outside of the packaging with the returned device.

<table>
<thead>
<tr>
<th>Company:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department:</td>
<td>Name:</td>
</tr>
<tr>
<td>Tel. no.:</td>
<td>Fax no. and/or Email address:</td>
</tr>
<tr>
<td>Manufacturer’s order no. or serial no.:</td>
<td></td>
</tr>
</tbody>
</table>

The device has been operated with the following medium:

<table>
<thead>
<tr>
<th>This medium is:</th>
<th>radioactive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>water-hazardous</td>
</tr>
<tr>
<td></td>
<td>toxic</td>
</tr>
<tr>
<td></td>
<td>caustic</td>
</tr>
<tr>
<td></td>
<td>flammable</td>
</tr>
<tr>
<td>We checked that all cavities in the device are free from such substances.</td>
<td></td>
</tr>
<tr>
<td>We have flushed out and neutralized all cavities in the device.</td>
<td></td>
</tr>
</tbody>
</table>

We hereby confirm that there is no risk to persons or the environment through any residual media contained in the device when it is returned.

<table>
<thead>
<tr>
<th>Date:</th>
<th>Signature:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stamp:</td>
<td></td>
</tr>
</tbody>
</table>

4.3 Disposal

**CAUTION!**
Disposal must be carried out in accordance with legislation applicable in your country.
5.1 Technical data

Design

<table>
<thead>
<tr>
<th>Type of assembly</th>
<th>Immersion assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process connections</td>
<td>Holder for basins / open channels</td>
</tr>
<tr>
<td></td>
<td>Flange DN 50</td>
</tr>
<tr>
<td></td>
<td>Flange ANSI 2</td>
</tr>
<tr>
<td>Sensor connection</td>
<td>3/4 NPT (pH/ORP sensors)</td>
</tr>
<tr>
<td></td>
<td>PG 13.5 (pH/ORP sensors)</td>
</tr>
</tbody>
</table>

Installation conditions

<table>
<thead>
<tr>
<th>Operating conditions</th>
<th>Temperature range</th>
<th>0...+80°C / 0...+176°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process pressure</td>
<td>Max. 4 bar / 58 psi</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambient conditions</th>
<th>Ambient temperature</th>
<th>-10...+70°C / 14...+158°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport and storage</td>
<td>temperature</td>
<td>-10...+80°C / 14...+176°F</td>
</tr>
</tbody>
</table>

Materials

<table>
<thead>
<tr>
<th>Assembly</th>
<th>PP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaskets</td>
<td>EPDM / FPM</td>
</tr>
</tbody>
</table>

Cleaning (only available with PG 13.5)

<table>
<thead>
<tr>
<th>Hose</th>
<th>outer Ø</th>
<th>6 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>inner Ø</td>
<td>4 mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rinsing pressure</th>
<th>1...+6 bar / 14.5...+87 psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hose material</td>
<td>PTFE</td>
</tr>
</tbody>
</table>

5.2 Pressure-temperature diagram

Figure 5-1: Pressure - temperature diagram

① Process pressure
5.3 Dimensions

<table>
<thead>
<tr>
<th>Holder</th>
<th>[mm]</th>
<th>[inch]</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>50</td>
<td>1.97</td>
</tr>
<tr>
<td>b</td>
<td>1000 / 2000</td>
<td>39.37 / 78.74</td>
</tr>
<tr>
<td>c</td>
<td>302</td>
<td>11.89</td>
</tr>
<tr>
<td>d</td>
<td>161</td>
<td>6.34</td>
</tr>
<tr>
<td>e</td>
<td>108</td>
<td>4.25</td>
</tr>
</tbody>
</table>

Figure 5-2: Dimensions
Flange version

Figure 5-3: Dimensions

<table>
<thead>
<tr>
<th></th>
<th>[mm]</th>
<th>[inch]</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>50</td>
<td>1.97</td>
</tr>
<tr>
<td>b</td>
<td>1000 / 2000</td>
<td>39.37 / 78.74</td>
</tr>
<tr>
<td>c</td>
<td>161</td>
<td>6.34</td>
</tr>
</tbody>
</table>
KROHNE – Process instrumentation and measurement solutions

- Flow
- Level
- Temperature
- Pressure
- Process Analysis
- Services

Head Office KROHNE Messtechnik GmbH
Ludwig-Krohne-Str. 5
47058 Duisburg (Germany)
Tel.: +49 203 301 0
Fax: +49 203 301 10389
info@krohne.com

The current list of all KROHNE contacts and addresses can be found at:
www.krohne.com