

pH Insert T

Operating Instructions



Hamilton Warranty

Please refer to the General Terms of Sales (GTS).

Important note

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1 General Information

1.1 Intended Use

The pH Insert T (REF 10155128) is a single-use (SU) fitting for integration into a SU container. It is intended for the installation of the OneFerm pH sensor with an a-length of 70 mm. Do not reuse the pH Insert T. The Operating Instructions describe the features and operation of the pH Insert T. Please find the technical data on the Specification Sheet on www.hamiltoncompany.com.

1.2 About these Operating Instructions

These Operating Instructions are designed to support the integration, operation and qualification of the Hamilton SU pH Insert T built-in in the SU container together with OneFerm pH sensors.

To achieve this, it will describe the features of the Hamilton SU pH Insert T and its installation with the sensor. Both the mechanical connection to the single-use container and the OneFerm pH sensor into the pH Insert T are described detailed in this manual. After reading this manual the system manufacturer should be capable of installing the pH Insert T.

 **WARNING! Essential information for avoiding personal injury or damage to equipment.**


 **CAUTION: Alerts the user to the possibility of a problem with the device associated with its use or misuse, such as device malfunction, device failure, damage to the device, or damage to other property.**

 **NOTE:** Emphasizes information of particular importance.

2 Liability

The liability of Hamilton Bonaduz AG is detailed in the document «General Terms and Conditions of Sale and Delivery».

Hamilton is expressly not liable for direct or indirect losses arising from use of the pH Insert T or the sensors. It must in particular be insured in this conjunction that malfunctions can occur on account of the inherently limited useful life of pH Insert T or the sensors contingent upon their relevant applications. The user is responsible for the calibration, maintenance and regular replacement of the pH Insert T and the sensors. In the case of critical sensor applications, Hamilton recommends using back-up measuring points in order to avoid consequential damages. The user is responsible for taking suitable precautions in the event of a sensor failure.

 **NOTE:** The pH Insert T together with the OneFerm pH sensor is not intended and specified as a safety device. A SIL (Safety Integrity Level) certification is not available. It is in the sole responsibility of the user to validate the pH Insert T according the safety requirements of his application.

3 Safety Precautions and Hazards

⚠ WARNING! Read the following safety instructions carefully before installing and operating the pH Insert T.

3.1 General Precautions

For safe and correct use of the pH Insert T, it is essential that installing personnel follow generally accepted safety procedures as well as the safety instructions given in this document (see chapter 3 «Safety Precautions and Hazards»), the pH Insert T Operating Instructions.

The specification given in the «Specification Sheet» (available on www.hamiltoncompany.com) as regards temperature, pressure etc. may under no circumstances be exceeded. Inappropriate use or misuse can be dangerous.

The lifetime of the pH Insert T highly depends on the specific conditions of the application. Temperature, pressure, chemicals used may accelerate the ageing of both the pH Insert T and the OneFerm pH sensor.

The pH Insert T shall not be repaired and must be disposed after use.

If the conditions described in these Operating Instructions are not adhered to or if there is any inappropriate interference with the equipment, all of our manufacturer's warranties become obsolete.

Necessary precautions should be taken when transporting the pH Insert T. Use the original reusable packaging box for shipment.

⚠ CAUTION: Make sure that:

- **The thread, the O-ring of the OneFerm pH sensor and sealing surfaces are not damaged when installing the pH Insert T and the sensor into the container. Even when all required safety measures have been complied with, potential risks still exist with respect to leaks or mechanical damage to the armature. Wherever there are seals or screws, gases or liquids may leak out undetected.**
- **No process medium can be accidentally spilled before removing the pH Insert T or OneFerm pH sensor from its measurement setup.**
- **Do not put stress on the system by vibration, bending or torsion.**

Before use, verify that the sensor is properly configured for your application.

Failure to observe and carry out the maintenance procedures may impair the reliability and correct functioning of the measurement system.

3.2 Chemical, Radioactive or Biological Hazard Precautions

Selection of the appropriate safety level and implementation of the required safety measures for working with pH Insert T is the sole responsibility of the system manufacturer.

If working with hazardous liquids observe and carry out the maintenance procedures, paying particular attention to cleaning and decontamination. If pH Insert T becomes contaminated with biohazardous, radioactive or chemical material, it should be cleaned. Failure to observe and carry out the maintenance procedures may impair the reliability and correct functioning of the measuring module.

4 Product Description

The pH Insert T (REF 10155128) is an armature for the installation of the OneFerm pH sensors. It can be integrated into a SU container from manufacturers of SU equipment.

Further information to the measurement setup can be found in the Operating Instructions of the OneFerm pH with an a-length of 70 mm (REF 243216, 243235 and 243266) at www.hamiltoncompany.com.



Figure 1: pH Insert T

5 Installation

5.1 Unpacking and Cleaning

The pH Insert T is double bagged.

 **NOTE:** Products are cleaned and or packed under clean room conditions – Class 9.

Please remove the outer bag carefully. Make sure that you do not damage the inner bag or the label. If needed, when entering a clean room, remove the inner bag and wipe down the pH Insert T with a lint-free cloth soaked with Isopropanol (70 - 80%) or Ethanol (70 - 80%). The following decontamination procedure must be performed:

1. Soak the lint free cloth with alcohol.
2. Wipe the pH Insert T clean.
3. Repeat steps 1 and 2 with a new lint free cloth.
4. Air dry the alcohol residue on the pH Insert T before you install it into the container.

5.2 Installation in the single-use container

The pH Insert T is intended to be installed in a SU bag within a 1 inch barb port where it is fixated and sealed by a silicone sleeve.

The following table provides information on the pH Insert T and the specification used in the test setup:

Parameter	Specification
1 inch barb port	Eldon James - PND16E8402-QC
Silicone Sleeve	<p>Silicone Sleeve (LSR 60)</p> <p>> OD = 1.188 +/-0.02 inch (30.2 +/- 0.50 mm) > ID = 0.938 +/-0.01 inch (23.8 +/- 0.25 mm) > Length = 2.625 +/- 0.2 inch (66.7 +/- 0.5 mm)</p> <p>Silicone tube - Dow Corning Pharma 80</p> <p>> OD = 1.375 inch (34.9 mm) > ID = 1 inch (25.4 mm) > Length = 3 +/- 0.25 inch (76 +/- 6 mm)</p>
Cable Ties	<p>Nylon 6.6 cable ties: 4.8 mm "RND 475-0068"</p> <p>Steel cable ties: "Oettiker StepLess 16705000 038.1-706R"</p>

⚠ CAUTION: You must do an integrity test separately before you use the pH Insert T with other bag ports (barbed) or silicone sleeve or cable ties.

📄 NOTE: The product specification for this product as published on www.hamiltoncompany.com are only valid in the setup mentioned in this Operating Instructions. Setups deviating from this needs to be verified separately.

⚠ CAUTION: Make sure the barb port is leak free when you use the silicone sleeve with a length longer than 3 inch.

For a correct integrity the pH Insert T must be inserted until the stop position. A silicone sleeve covering the barb port and the pH Insert T (see Figure 2) ensure leak tightness and mechanical fixation of the pH Insert within the barb port. Additional cable ties around the silicone sleeve in the neck area of the barb port and the pH Insert secure the positioning.



Figure 2: OneFerm pH installed in pH Insert T

⚠ CAUTION: Make sure that the seat of the O-ring, the thread of the pH Insert T, and the O-ring of the OneFerm pH VP 70 is intact. In case of any defect (e.g., scratches or voids) discard the part to avoid any leakage.

To avoid electrostatic damage, it is recommended that the OneFerm pH sensor is installed with the protective cap when inserting into the pH Insert T. Make sure that the stop position of the OneFerm pH VP 70 is reached in the pH Insert T. The stop position ensures tightness when applying the installation torque ($1.5 \text{ Nm} \pm 0.1 \text{ Nm}$).

⚠ CAUTION: Do not touch the contacts of the VP connector during installation.

6 Operation

⚠ CAUTION: Only use the pH Insert T and the OneFerm pH sensor within the specifications.

Installation: Do not apply excessive forces during installation of the OneFerm pH into the pH Insert T. Do not exceed the specified torque when you connect the cable or the Arc Module SU pH to the OneFerm pH sensor. To avoid excessive torque, always the cable at the connector end with one hand and tighten the nut with the other hand. Do not twist the OneFerm pH VP 70. If you overtighten the thread, the integrity of the system can be compromised.

Removal of the OneFerm pH sensor: Ensure that the user does not unthread the OneFerm pH VP 70 when removing the cable or Arc Module SU pH. Do not turn the OneFerm pH VP 70 on the connector counter clockwise. Failure to do so may lead to damages to the OneFerm pH or pH Insert T, measurement failure or leakage.

Installing the cable or Arc Module pH to OneFerm pH sensor mounted in the pH Insert T:

Following steps has to be performed:

1. Installation of the cable or Arc Module pH to the OneFerm pH sensor mounted in the pH Insert T. To avoid electrostatic damage, it is recommended that the protective cap protecting the connector be removed only before connecting the cable.
2. Enter the calibration parameters into the Arc Module pH SU or the transmitter.

Further information about the operation can be found in the Operating Instructions of the OneFerm pH at www.hamiltoncompany.com.

7 Maintenance

The pH Insert T and the OneFerm pH VP 70 are designed for SU application. No maintenance measures are required. Make sure that the user transfers the calibration values from the calibration label of the OneFerm pH VP 70 to the Arc Module SU pH. Use the ArcAir™ or PLC (Programmable Logic Controller) if integrated to enter the calibration values of the OneFerm pH. If you experience problems with the measurement readings, contact Hamilton Technical Support. Refer to the contact information provided in these Operating Instructions.

8 Disposal

The pH Insert T is a SU device that has to be disposed at the end of the process together with the SU bag. The disposal of the pH Insert T in the SU bag is in the responsibility of the user according to the guideline of the system supplier while considering local recycling regulation. If the process requires decontamination, the pH Insert T must be decontaminated prior to disposal.

9 Ordering Information

9.1 pH Insert T



REF	Description
10155128	pH Insert T

9.2 Arc Module SU pH



REF	Description
243233	Arc Module SU pH

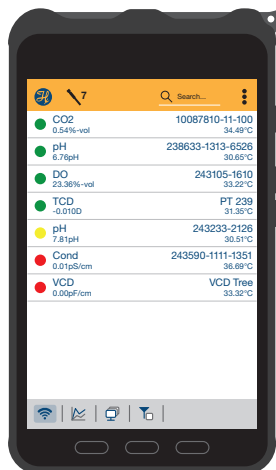
9.3 OneFerm pH Sensor for the use with the pH Insert T



REF	Description	Length
243216	OneFerm pH VP 70 Pt100	70
243235	OneFerm pH VP 70 NTC	70
243266	OneFerm pH VP 70 Pt1000	70

9.4 Parts and Accessories

Arc View Mobile Basic/Advanced for none Ex environment



REF	Product Name
10071111	Arc View Mobile Basic for none Ex environment
Description: The pre-configured Arc View Mobile, Hamilton's mobile solution for monitoring measurement values, calibrating Arc sensors and configuring various parameters with the unified user interface for pH, DO, Conductivity and ORP. The Arc View Mobile is based on the Samsung Galaxy Tab Active tablet and comes pre-configured with the ArcAir basic, app blocker application, power supply cable, instruction manual and Hamilton quick guide.	
10071113	Arc View Mobile Advanced for none Ex environment
Description: The pre-configured Arc View Mobile, Hamilton's mobile solution for monitoring measurement values, calibrating Arc sensors and configuring various parameters with the unified user interface for pH, DO, Conductivity and ORP. The Arc View Mobile is based on the Samsung Galaxy Tab Active tablet and comes pre-configured with the ArcAir advanced application, including features for CFR 21 Part 11 and Eudralex Volume 4 Annex 11 compliance, app blocker application, power supply cable, instruction manual and Hamilton quick guide.	

Arc USB power cable: USB/VP8 or USB/M12-8 Pole Connector

The Arc USB power cable provides power supply for the Arc Module and Arc Wi Adapter (see page 11) and enables digital communication to ArcAir installed on a computer.



REF	Description
243490-01	Arc USB Power Cable with VP8 connector (for the Arc Wi 1G Adapter BT)
243490-02	Arc USB Power Cable with M12 8-pole connector (for the Arc Wi 2G Adapter BT)

Arc Wi 1G/2G Adapter BT

The Arc Wi 1G BT Adapter enables wireless communication between the Arc sensors and mobile devices via Bluetooth®.

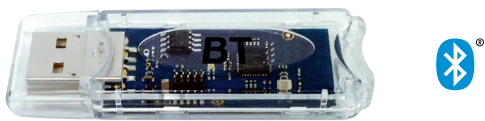
The Arc Wi 2G BT Adapter is used to convert Modbus to 4-20 mA signals and to enable Bluetooth® communication for sensor configuration and monitoring.



REF	Description
243460	Arc Wi 1G Adapter BT
243470	Arc Wi 2G Adapter BT

Arc Wireless Converter BT Advanced

Designed for wireless communication between ArcAir and Arc Wi Adapter BT.



REF	Description
242333	Arc Wireless Converter BT Advanced

Sensor Data Cable VP8



REF	Description	Length
355263	Sensor Data Cable VP8	1 m
355264	Sensor Data Cable VP8	3 m
355265	Sensor Data Cable VP8	5 m
355266	Sensor Data Cable VP8	10 m
355267	Sensor Data Cable VP8	15 m
355268	Sensor Data Cable VP8	20 m

Data Cable VP8 / M12



REF	Description	Length
10070910	Data Cable VP8 / M12	1 m
10071905	Data Cable VP8 / M12	3 m
10067844	Data Cable VP8 / M12	5 m
10067846	Data Cable VP8 / M12	10 m

9.5 Services

Hamilton service engineers provide customers with on-site services. Hamilton offers a wide range of services from technical support to initial operation, qualification, and maintenance of the sensors.

Various tailored services are offered especially for OEM customers. Experienced service engineers ensure an optimal and professional service.

In order to find your local service support please visit: www.hamiltoncompany.com/process-analytics/support

Overview of service offers



Online service



Technical support



Initial operation/calibration



Qualification IQ/OQ



Service contract



Maintenance



User training



Repair



Application support



To find a representative in your area, please visit:
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