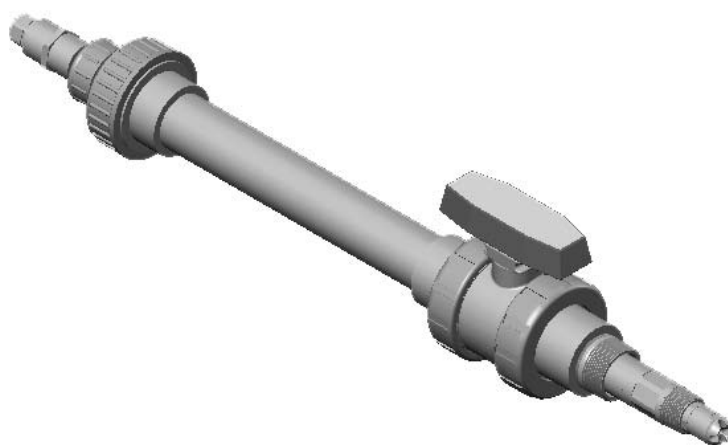


**Thermo Scientific AquaSensors™  
AnalogPlus™ and DataStick™  
Insertion Mounting Hardware  
User Guide**



ROSS and the COIL trade dress are trademarks of Thermo Fisher Scientific Inc. U.S. patent 6,793,787.

AQUAfast, Cahn, ionplus, KNiPHE, No Cal, ORION, perpHect, PerpHecT, PerpHecTion, pHISA, pHuture, Pure Water, Sage, Sensing the Future, SensorLink, ROSS, ROSS Ultra, Sure-Flow, Titrator PLUS and TURBO2 are registered trademarks of Thermo Fisher.

1-888-pHAX-ION, A+, All in One, Aplus, AQUAsnap, AssuredAccuracy, AUTO-BAR, AUTO-CAL, AUTO DISPENSER, Auto-ID, AUTO-LOG, AUTO-READ, AUTO-STIR, Auto-Test, BOD AutoEZ, Cable-Free, CERTI-CAL, CISA, DataCOLLECT, DataPLUS, digital LogR, DirectCal, DuraProbe, Environmental Product Authority, Extra Easy/Extra Value, FAST QC, GAP, GLPcal, GLPcheck, GLPdoc, ISEasy, KAP, LabConnect, LogR, Low Maintenance Triode, Minimum Stir Requirement, MSR, NISS, One-Touch, One-Touch Calibration, One-Touch Measurement, Optimum Results, Orion Star, Pentrode, pHuture MMS, pHuture Pentrode, pHuture Quatrode, pHuture Triode, Quatrode, QuiKcheK, rf link, ROSS Resolution, SAOB, SMART AVERAGING, Smart CheK, SMART STABILITY, Stacked, Star Navigator 21, Stat Face, The Enhanced Lab, ThermaSense, Triode, TRIUMpH, Unbreakable pH, Universal Access are trademarks of Thermo Fisher.

Guaranteed Success and The Technical Edge are service marks of Thermo Fisher.

PerpHecT meters are protected by U.S. patent 6,168,707.

PerpHecT ROSS electrodes are protected by U.S. patent 6,168,707.

ORION Series A meters and 900A printer are protected by U.S. patents 5,198,093, D334,208 and D346,753.

ionplus electrodes and Optimum Results solutions are protected by U.S. patent 5,830,338.

ROSS Ultra electrodes are protected by U.S. patent 6,793,787.

ORP standard is protected by U.S. patent 6,350,367.

No Cal electrodes are protected by U.S. patent 7,276,142.

© 2009 Thermo Fisher Scientific Inc. All rights reserved. All trademarks are the property of Thermo Fisher Scientific Inc. and its subsidiaries.

The specifications, descriptions, drawings, ordering information and part numbers within this document are subject to change without notice.

This publication supersedes all previous publications on this subject.

# Table of Contents

Table of Contents .....	1
<b>1 Introduction.....</b>	<b>2</b>
<b>2 Fastening the DataStick to the Insert/Extract Shaft Assembly .....</b>	<b>3</b>
<b>3 Setting DataStick Insertion Depth.....</b>	<b>4</b>
<b>4 Mounting the Ball Valve into a Non-Pressurized Pipe .....</b>	<b>5</b>
<b>5 Installing the DataStick into the Ball Valve Housing .....</b>	<b>6</b>
<b>6 Inserting the DataStick into a Pressurized Pipe.....</b>	<b>7</b>
<b>7 Extracting the DataStick from a Pressurized Pipe .....</b>	<b>8</b>
<b>8 Limited Warranty .....</b>	<b>9</b>
<b>9 Terms and Conditions .....</b>	<b>10</b>

## Contact Information

To contact Thermo Scientific AquaSensors Technical Support:

Within the United States call 1.800.225.1480 or fax 978-232-6015.

Outside the United States call 978.232.6000 or fax 978.232.6031.

In Europe, the Middle East and Africa, contact your local authorized dealer.

Visit us on the web at [www.thermo.com/processwater](http://www.thermo.com/processwater)

## Insertion Mounting Hardware Part Numbers:

- MH1111: 1.5” Ball Valve, Manual, 316 Stainless Steel
- MH1112: 1.5” Ball Valve, Manual, CPVC
- MH1121: 1.5” Ball Valve, Assist, 316 Stainless Steel
- MH1122: 1.5” Ball Valve, Assist, CPVC
- MH1171: 2.0” Ball Valve, Manual, 316 Stainless Steel
- MH1172: 2.0” Ball Valve, Manual, CPVC
- MH1181: 2.0” Ball Valve, Assist, 316 Stainless Steel
- MH1182: 2.0” Ball Valve, Assist, CPVC

# 1 Introduction

The Thermo Scientific AquaSensors™ Insertion Mounting Hardware allows the DataStick measurement system to be inserted and extracted from a pressurized process line without stopping the flow in the pipe. The mounting hardware is available in manual and air/water assisted units in both Stainless Steel and CPVC. The air/water assisted mounting hardware is fitted with a 3-way control for air or water assist with a maximum pressure of 120 psi. The manual mounting hardware does not have a valve but a drain valve may be added by replacing the ¼” NPT plug with a valve.

Maximum pressure for the insertion mounting hardware is determined by the material, construction and maximum temperature. Please consult the following table for your particular model number.

MODEL NUMBER	MAXIMUM PRESSURE @ TEMPERATURE	CONSTRUCTION	OPERATING TEMPERATURE
MH1111	50 psi max @ 95° C	SS, MANUAL	-5 to 95° C
MH1112	50 psi max @ 90° C	CPVC, MANUAL	-5 to 80° C
MH1121	100 psi max @ 95° C	SS, POWER ASSIST	-5 to 95° C
MH1122	50 psi max @ 90° C	CPVC, POWER ASSIST	-5 to 80° C
MH1171	50 psi max @ 95° C	SS, MANUAL	-5 to 95° C
MH1172	50 psi max @ 90° C	CPVC, MANUAL	-5 to 80° C
MH1181	100 psi max @ 95° C	SS, POWER ASSIST	-5 to 95° C
MH1182	50 psi max @ 90° C	CPVC, POWER ASSIST	-5 to 80° C

**CAUTION: SOME SENSOR SYSTEMS MAY HAVE LOWER RATINGS THAN THE MOUNTING HARDWARE. ALWAYS USE THE LOWER RATING WHEN DETERMINING THE MAXIMUM PRESSURE AND TEMPERATURE FOR YOUR SENSOR/MOUNTING SYSTEM.**

The Insertion mounting hardware consists of two sections the ball valve housing and the insert/extract shaft assembly. The following sections describe their installation and use.

## 2 Fastening the DataStick to the Insert/Extract Shaft Assembly

If equipped remove the guard from its shipping position and reattach as shown in figure 1.

**CAUTION: FAILURE TO ATTACH THE GUARD MAY RESULT IN PERSONAL INJURY. AT HIGHER PRESSURES, THE INSERT/EXTRACT SHAFT ASSEMBLY MAY TRAVEL RAPIDLY TO ITS MAXIMUM OUTWARD POSITION, POTENTIALLY INJURING ANYONE IN ITS PATH.**

Unscrew the lock ring (item D figure 1) to remove the insert/extract shaft assembly.

Loosen the cord grip cap at the back of the insert/extract shaft assembly. Refer to figure 1 and route the DataStick Communications Adapter cable through the shaft assembly and out the cord grip.

Apply Teflon tape to the DataStick threads at the cable end to avoid leaks. Do not use pipe sealant it may not provide adequate sealing at higher temperatures and voids warranty. Fasten the DataStick onto the insert/extract shaft assembly.

Pull any excess slack cable through the cord grip, and tighten the cord grip cap.

Connect the DataStick Communications Adapter cable to your PLC, HMI, SCADA system or an AV38 making sure all fittings are watertight. If a junction box is used make sure all connections are made properly and watertight fittings are used. Refer to the DataStick Manual (MAN011DS) and the AV38 Manual (MAN018AV38) for proper connections and configuration. Refer to the proper communications manual for your communications adapter.

### 3 Setting DataStick Insertion Depth

The DataStick insertion depth is the distance the measuring surface of the sensor head extends beyond the threaded close nipple of the ball valve housing as shown in figure 1. It is factory set at the maximum distance 8.5 inches (216 mm). If the factory-set insertion depth is satisfactory for your application, disregard the following procedure, and mount the ball valve housing into the non-pressurized pipe or vessel. If you need to reduce the insertion depth, carefully determine and set it using this procedure before installing the hardware:

Unfasten the retaining cap (item A) from the flanged bushing (item B) at the back of the insert/extract pipe assembly to access the metal locking collar (item C).

On models with a compression fitting loosen the retaining cap.

Slide the locking collar towards the DataStick as needed to reduce the insertion depth.

**NOTE: Do not reduce the insertion depth to less than 1 inch (25 mm), since optimum performance depends upon the sensing surfaces being fully immersed in the process.**

Tighten both setscrews to secure the metal locking collar (item C) to the insert/extract shaft assembly.

Or tighten compression fitting on models so equipped.

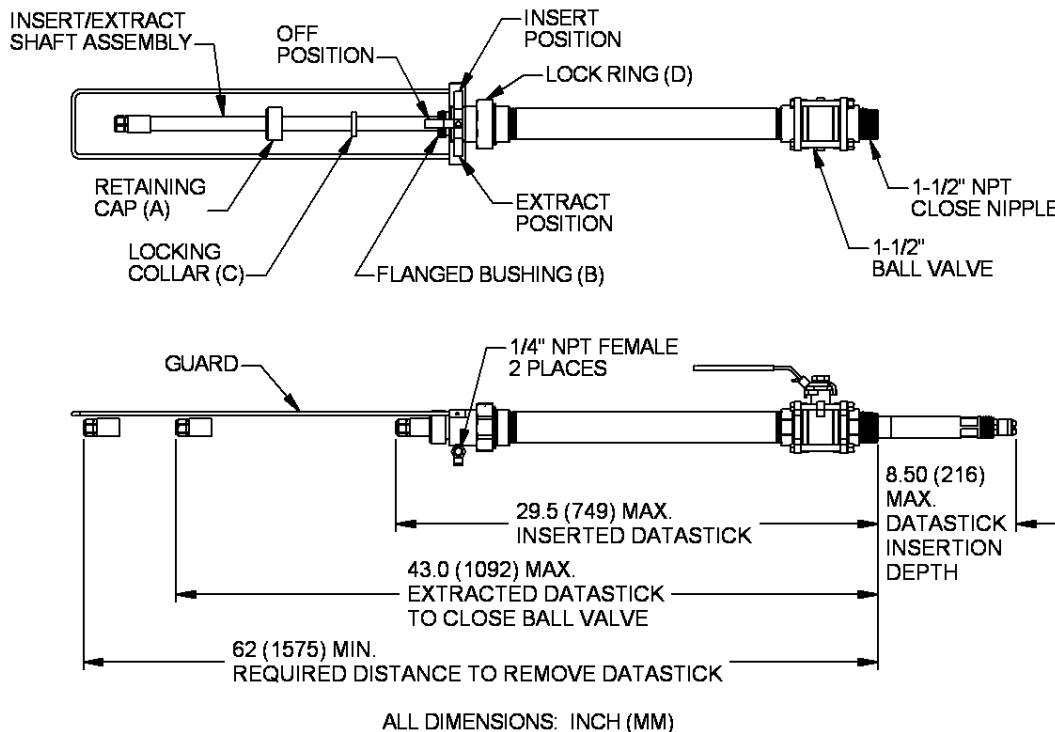


Figure 1 INSERTION MOUNTING HARDWARE (MH1112 shown)

## 4 Mounting the Ball Valve into a Non-Pressurized Pipe

With the insert/extract shaft assembly removed, mount the ball valve housing assembly into a portion of the process pipe where air cannot be trapped and subsequently contact the sensor head.

Apply Teflon tape to the 1-1/2 inch NPT (2 inch NPT for MH117X & MH118X) close nipple threads to avoid leaks. Do not use pipe sealant it may not provide adequate sealing at higher process temperatures and voids warranty.

Fasten the ball valve housing into the non-pressurized pipe at the desired location.

Turn the ball valve to its full **OPEN** position.

If using a high pressure unit with a 3-way valve, connect a 1/4" air or water assist line to the 1/4" NPT fitting of the 3-way control valve on the ball valve housing. Turn the control valve to its center **OFF** position.

Connect a drain line to the fitting on the other side of the control valve.

**CAUTION: THE AIR OR WATER LINE PRESSURE MUST BE GREATER THEN THE PROCESS PRESSURE, BUT CANNOT EXCEED 120 PSI.**

Some low-pressure units have a pipe plug in place of the 3-way control valve. In some applications it may be necessary to replace the plug with a drain valve.

## 5 Installing the DataStick into the Ball Valve Housing

After installing the DataStick into the insert/extract assembly, setting the insertion depth and mounting the ball valve housing, install the DataStick into the non-pressurized pipe.

Remove the protective cap from the DataStick sensor head and save it for when the sensor is temporarily out of service.

If using a high-pressure unit apply a small amount of silicone grease to the two O-rings on the insert/extract shaft assembly located behind the DataStick.

With the ball valve open, fully insert the sensor into the ball valve housing by pushing the insert/extract shaft assembly to its limit.

Tighten the large lock ring to secure the insert/extract shaft assembly to the ball valve housing.

Tighten the retaining cap onto the flanged bushing.

Pull the insert/extract shaft assembly outward to its limit to fully extract the DataStick from the ball valve housing.

Turn the ball valve to its full **CLOSE** position. The process pipe or vessel now can be pressurized.

## 6 Inserting the DataStick into a Pressurized Pipe

After installing the DataStick into the ball valve hardware, the DataStick can be inserted into a pressurized process pipe.

**WARNING: INSERTING THE DATASTICK INTO A PRESSURIZED PROCESS PIPE OR VESSEL MAY BE DANGEROUS. DO NOT STAND DIRECTLY BEHIND THE ASSEMBLY WHEN OPENING THE BALL VALVE. DEPENDING UPON THE PROCESS PRESSURE, THE INSERT/EXTRACT SHAFT ASSEMBLY MAY RAPIDLY TRAVEL OUTWARD UNTIL THE LOCKING RING STOPS IT.**

Slowly turn the ball valve to its full **OPEN** position.

With the air or water-assist line (if equipped) at a pressure higher than the process but not exceeding 120 psi, slowly turn the 3-way control valve to its full **INSERTION** position. The DataStick will begin moving into the process pipe or vessel.

When the DataStick is fully inserted, it is at the preset insertion depth. The 3-way control valve can remain in the **INSERTION** position or may be placed to **OFF**.

## 7 Extracting the DataStick from a Pressurized Pipe

**WARNING: EXTRACTING THE DATASTICK FROM A PRESSURIZED PROCESS PIPE OR VESSEL MAY BE DANGEROUS. DO NOT STAND DIRECTLY BEHIND THE INSERTION ASSEMBLY WHEN REMOVING THE RETAINING CAP (ITEM A, FIGURE 1) TO EXTRACT THE DATASTICK. IT IS RECOMMENDED TO REDUCE THE PROCESS PRESSURE TO BELOW 10 PSI BEFORE EXTRACTING THE DATASTICK. IF THIS IS NOT POSSIBLE, USE EXTREME CAUTION. AT HIGHER PRESSURES, THE INSERT/EXTRACT SHAFT ASSEMBLY MAY TRAVEL RAPIDLY TO ITS MAXIMUM OUTWARD POSITION, POTENTIALLY INJURING ANYONE IN ITS PATH.**

With air or water pressure supplied (if using a high-pressure unit) to the insertion hardware assembly, use the 3-way control valve to extract the DataStick from the process.

Slowly turn the 3-way control valve to its full **EXTRACTION** position. Permit the insert/extract shaft assembly to move to its maximum outward travel. This ensures that the DataStick has cleared the ball valve opening.

With the insert/extract shaft assembly fully extended, place the 3-way control valve to its **OFF** position, and immediately turn the ball valve to its full **CLOSE** position.

Loosen and remove the retaining cap (item A figure 1).

To remove the DataStick for routine maintenance and calibration:

- Loosen and remove the lock ring from the ball valve housing.
- Firmly extract the insert/extract shaft assembly from the ball valve housing.

## 8 Limited Warranty

### WARRANTY/REPLACEMENT PLAN

Thermo Fisher Scientific warrants its Insertion Mounting Hardware against material and workmanship defect for a period of one year from the date of shipment.

In the event that a defect is discovered during the warranty period, Thermo Fisher Scientific agrees, at its option, to repair or replace the defective product. Any product repaired or replaced under this warranty will be warranted only for the remainder of the original product warranty period.

This warranty does not apply to consumable products associated with this product including, but not limited to, chemical reagents and salt bridges.

Products may not be returned without authorization from Thermo Fisher Scientific. To obtain authorization, please call Thermo Fisher Scientific for a return material authorization number.

#### Limitations:

This warranty does not cover:

1. Damage caused by misuse, neglect (lack of appropriate maintenance), alteration, accident or improper application or installation.
2. Damage caused by any repair or attempted repair not authorized by Thermo Fisher Scientific.
3. Any product not used in accordance with the instructions furnished by Thermo Fisher Scientific.
4. Damage caused by acts of God, natural disaster, acts of war (declared or undeclared), acts of terrorism, work actions, or acts of any governmental jurisdiction.
5. Freight charges to return merchandise to Thermo Fisher Scientific.
6. Travel fees associated with on-site warranty repair.

This warranty is the sole expressed warranty made by Thermo Fisher Scientific in connection with its products. All other warranties, whether expressed or implied, including without limitation, the warranties of merchantability and fitness for a particular purpose, are expressly disclaimed.

The liability of Thermo Fisher Scientific shall be limited to the cost of the item giving rise to the claim. In no event shall Thermo Fisher Scientific be liable for incidental or consequential damages.

This warranty is the sole and complete warranty for Thermo Fisher Scientific. No person is authorized to make any warranties or representations on behalf of Thermo Fisher Scientific.

Thermo Fisher Scientific reserves the right to change or modify this warranty at any time.

## 9 Terms and Conditions

### Terms and Conditions of Sale

The following terms and conditions will be presumed acceptable unless changes are made in writing and accepted by both parties in a reasonable amount of time.

Any standard or boilerplate terms and conditions supplied with a written purchase order will not be applicable unless accepted in writing by both parties.

**Quotations:** All quotations shall be in writing. Written quotations shall be valid for 30 days from the date issued. Verbal quotations or price lists are not valid.

**Pricing:** All pricing is in **US Dollars**. Thermo Fisher Scientific reserves the right to change pricing without notice.

**Terms:** Payment terms are **net 30 days** from the date of invoice with approved credit. Thermo Fisher Scientific reserves the right to deny credit or revoke previously extended credit. Past due accounts are subject to interest charges. Other acceptable payment terms are cash, certified check, money order, credit card or letter of credit confirmed by any United States of America bank. Other payment terms are not valid unless accepted in writing.

Sales taxes shall be included on the invoice unless a valid tax exemption certificate is supplied.

**Return Material Authorization:** Contact Thermo Fisher Scientific Customer Service for a Return Material Authorization (RMA) number. Items returned without an RMA number will be rejected.

All returned merchandise must be in unused, resalable condition, and must not be contaminated with hazardous materials.

Cancelled orders must be returned within 30 days of the date on the invoice and shall be subject to expenses incurred that may include, but are not limited to, inspection and restocking fees. Items returned within 60 days shall be subject to a restocking charge that is equal to 15% of the purchase price. Items returned after more than 60 days shall be subject to a restocking charge equal to 25% of the purchase price. Thermo Fisher Scientific reserves the right to reject any return that is not under warranty after 60 days. Non-stock items are normally not returnable.

**Transportation:** Orders are shipped FOB Thermo Fisher Scientific, or factory, by the most efficient means available. Appropriate charges, such as freight and insurance will be added to invoices. All shipments will be insured. Goods damaged in shipment must be reported by the recipient to the freight carrier for claims.



# Thermo Fisher Scientific

## Environmental Instruments

Process Water Instruments



### North America

166 Cummings Center  
Beverly, MA 01915 USA  
Toll Free: 1-800-225-1480  
Tel: 1-978-232-6000  
Dom. Fax: 1-978-232-6015  
Int'l Fax: 978-232-6031

### Europe

P.O. Box 254, 3860 AG Nijkerk  
Wallerstraat 125K, 3862 BN Nijkerk,  
Netherlands  
Tel: (31) 033-2463887  
Fax: (31) 033-2460832

### Asia Pacific

Blk 55, Ayer Rajah Crescent  
#04-16/24, Singapore 139949  
Tel: 65-6778-6876  
Fax: 65-6773-0836

[www.thermo.com/processwater](http://www.thermo.com/processwater)

© 2009 Thermo Fisher Scientific Inc. All rights reserved.

258492-001 Rev. A 01-09