

# AquaSensors Air Wash System

User Guide



Ross and the COIL trade dress are trademarks of Thermo Fisher Scientific, Inc. and its subsidiaries.

AQUAfast, AQUASensors, BOD AutoEZ, ionplus, KNiPHE, LogR, No Cal, ORION, perpHect, PerpHecT, pHISA, pHuture, Pure Water, Sage, ROSS, ROSS Ultra, Sure-Flow, Titrator PLUS, and TURBO2 are registered trademarks of Thermo Fisher Scientific, Inc. and its subsidiaries.

A+, All in One, Aplus, AUTO-BAR, AUTO-CAL, Auto-ID, AUTO-READ, AUTO-STIR, Auto-Test, AutoTraction, CISA, digital LogR, DuraProbe, EZ Startup, ISEasy, Low Maintenance Triode, Minimum Stir Requirement, MSR, NISS, Optimum Results, Orion Dual Star, Orion Star, SAOB, SMART AVERAGING, SMART STABILITY, Star LogR, Star Navigator 21, Stat Face, Triode are trademarks of Thermo Fisher Scientific, Inc. and its subsidiaries.

Guaranteed Success and The Technical Edge are service marks of Thermo Fisher Scientific, Inc. and its subsidiaries.

© 2010 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.

# Chapter 1 Introduction

## General Information

The product is designed for use in industrial process applications and complies with safety regulations currently in force. Improper use could lead to hazards for the user or a third-party, and/or adverse effects to the plant or other equipment.

**Thermo Fisher Scientific does not accept any liability for damage that may arise if information in this manual is not followed. Therefore, the operating instructions and specifications must be read and understood by all persons involved in installation and operation of this equipment.**

This manual identifies safety instructions and additional information by means of the following symbols:



This symbol draws attention to safety instructions and warnings of potential danger, which if neglected, could result in injury to persons and/or damage to property.



This symbol identifies additional information and instructions, which if neglected, could lead to inefficient operation and possible loss of production.

It is recommended that this manual be made accessible to everyone who may need it as a reference.

Please contact Thermo Fisher Scientific or an authorized representative with any questions.

### **Intended Use**

The Thermo Scientific AquaSensors Air Wash System is intended for use in process applications that are prone to sensor fouling. The Air Wash system uses compressed air to clean the sensor head on an automated cycle, improving the measurement stability and minimizing the amount of operator time required to maintain the sensor. The system can be installed using either regulated plant air or an optional dedicated compressor.

Any other use, or use not mentioned here, that is incompatible with the technical specifications is deemed inappropriate. The operator is solely responsible for any damage arising from such use.

Other prerequisites for appropriate use include:

- Observing the instructions, notes and requirements set out in this instruction manual.
- Observing all local safety regulations.
- Observing all warnings and cautions in the documentation regarding all products used in this measurement system, including the conductivity sensor, mounting hardware, analyzer electronics and cabling.
- Observing the prescribed environmental and operational conditions.
- Observing chemical compatibility with all wetted materials.

## Safety Instructions

The Thermo Scientific AquaSensors Air Wash System should be installed and operated only by personnel familiar with the system and qualified for such work.



A defective system should be returned to Thermo Fisher Scientific for repair or replacement. Contact Thermo Fisher Scientific to obtain a Return Material Authorization (RMA) number.

No modifications to the Air Wash system are allowed. The manufacturer/supplier accepts no responsibility for damage caused by unauthorized modifications. The risk is borne entirely by the user.

## Removal From Service/Correct Disposal of the System

### Removal From Service:

1. Disconnect the air supply to the solenoid air valve (if used).
2. Disconnect power from the optional dedicated compressor.
3. Disconnect the optional dedicated compressor or the solenoid air valve from the analyzer.
4. Disconnect the air lines to the wash head.
5. Remove the wash head from the sensor.

### Correct Disposal of Unit:

- When the system is taken out of service, observe the local environmental regulations for correct disposal.

## **Chapter II Product Description**

### **System Description**

The Thermo Scientific AquaSensors Air Wash system is used in conjunction with an AquaSensors process analyzer or an existing control system to automatically clean a Thermo Scientific AquaSensors process sensor in applications that are prone to fouling. The system is designed to be used in applications where the sensor is inserted into an open basin or channel using immersion-style mounting hardware. It is not intended for use in pressurized process applications.

The system consists of a wash head that is attached to the sensor. The wash head directs a blast of clean air over the sensor head to remove any film growth. The air can be supplied using plant air or the optional compressor assembly.

The optional compressor assembly includes an oil-free compressor mounted in a NEMA 4X enclosure. The assembly includes brackets to easily mount the enclosure to a panel, pipe or railing, allowing it to be installed close to the sensor mount. The compressor requires a switched 120VAC power supply and is easily wired to an AquaSensors process analyzer or PLC for system control.

If plant air is used instead of the optional compressor, it must be clean, free of oil, and it must be regulated to a suitable pressure. The installer must provide a suitable solenoid valve which is then connected to the process analyzer or PLC to control the air supply.

## Air Wash Specifications

### Wash Head

Process Temperature.....	35 °F to 150 °F (2 °C to 65 °C)
Wetted Materials .....	PVC, Acetal, 303 Stainless Steel
Maximum Air Line Length.....	25 ft (7.6 m)

### Optional Compressor Assembly

Enclosure Dimensions .....	9.2 x 7.2 x 5.1 inches (23 x 18 x 13 cm)
Compressor Assembly Weight.....	7 lb (3.2 kg)
Electrical Requirements .....	120VAC, 1.5A
Maximum Duty Cycle.....	300 seconds every 4 hours

# Chapter III Air Wash System Installation

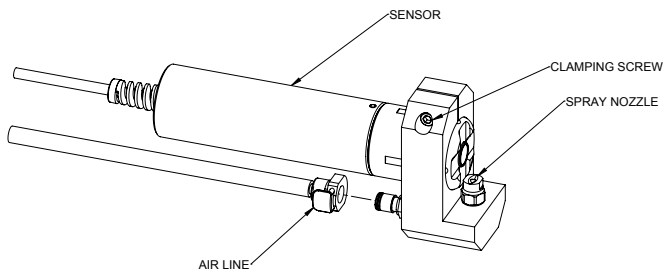
## General Information

The air wash system is intended for use with a Thermo Scientific AquaSensors process sensor, immersion mount hardware, and process analyzer. Refer to the respective product manuals for instructions to install and configure these components.

## Wash Head Installation

The wash head assembly mounts directly to the process sensor. Wash head assemblies are available for a variety of sensors. Before installing the unit, verify that the wash head model is correct for the sensor application. The different wash head models accommodate different sensor designs, but the installation procedure is the same for all models of the wash head. The sensor should be assembled to the appropriate immersion hardware before installing the wash head. Assemble the wash head to the sensor according to the following procedure:

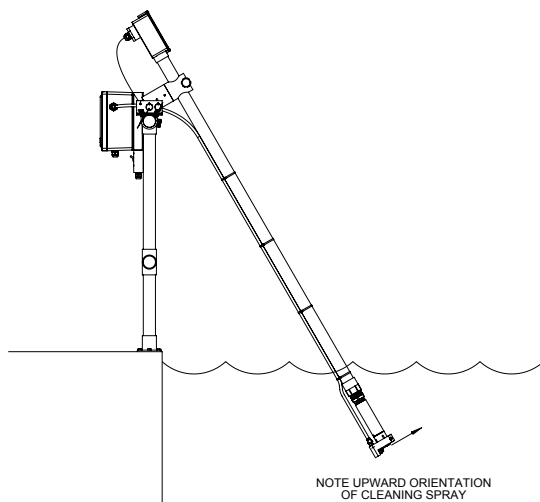
1. Place the wash head onto the end of the sensor. Position the wash head so that the spray nozzle is aimed at or just above the tip of the sensor. To maximize the wash head's effectiveness, it should be positioned so that the spray is directed slightly upward when the sensor is in the process.



**Figure 3.1** Assembling the wash head to a sensor



2. Tighten the clamping screw on the wash head to secure it to the sensor.
3. Connect one end of the supplied air line tubing to the wash head by assembling the quick-connect fitting on the end of the hose to the mating fitting on the wash head. Press the two fittings together until the connector locks into place with a snap.
4. Route the air line up the sensor mounting pipe. Secure it to the pipe with tie wraps placed at 1-foot (0.3 m) increments along the pipe.
5. Bundle the remaining air line tubing at the top of the sensor mounting pipe. This tubing will be routed to the air supply (see further instructions below).



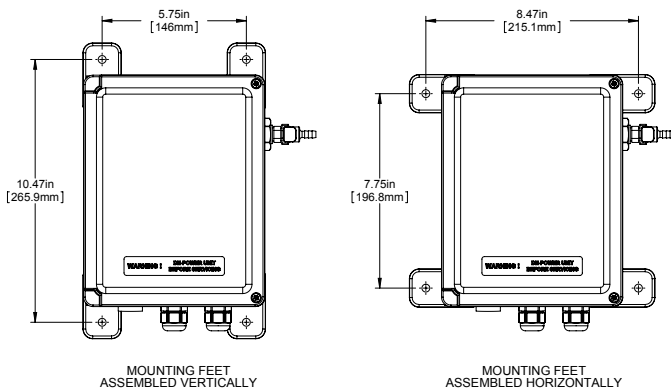
**Figure 3.2** Immersion mount with wash head

## Optional Compressor Installation

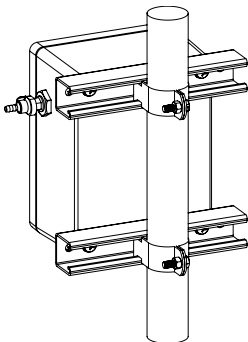
If the optional compressor assembly is to be used, install it according to the following procedure:

1. Mount the compressor enclosure.
  - The optional compressor assembly should be located as close to the sensor installation as possible.
  - The assembly includes two mounting kits. One kit includes four feet that are mounted directly to the back of the enclosure with the supplied screws. This kit allows the compressor enclosure to be mounted directly to a wall or panel. The feet can be assembled to the enclosure either horizontally or vertically to accommodate different panel requirements. The second kit allows the enclosure to be mounted to standard 1.5" pipe or handrail. The kit includes two brackets that are secured to the back of the enclosure and a pair of pipe clamps that secure the brackets to the pipe or handrail. The pipe mount brackets can be assembled to the enclosure for either vertical or horizontal pipe mounts (figure 3.4). See figure 3.3 below for full mounting specifications.
2. Connect the air line tubing to the Air Wash enclosure.
  - Do not extend the air line tubing to the wash head beyond the supplied

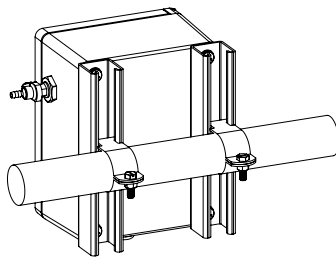
**Figure 3.3**  
Enclosure  
wall/panel  
mounts



**Figure 3.4**  
Enclosure  
pipe mounts



VERTICAL PIPE MOUNT



HORIZONTAL PIPE MOUNT

25 feet (7.6 m). Additional length can force the system to exceed the capacity of the compressor and reduce the performance of the Air Wash system.

- Measure the amount of air line tubing required to reach the compressor enclosure. Add approximately 12–24 inches of extra length and cut off any excess tubing.
- Assemble the barbed quick-connect fitting included with the enclosure to the end of the tubing.
- Connect the air line to the mating fitting on the enclosure. Press the two fittings together until the connector locks into place with a snap.

## System Installation

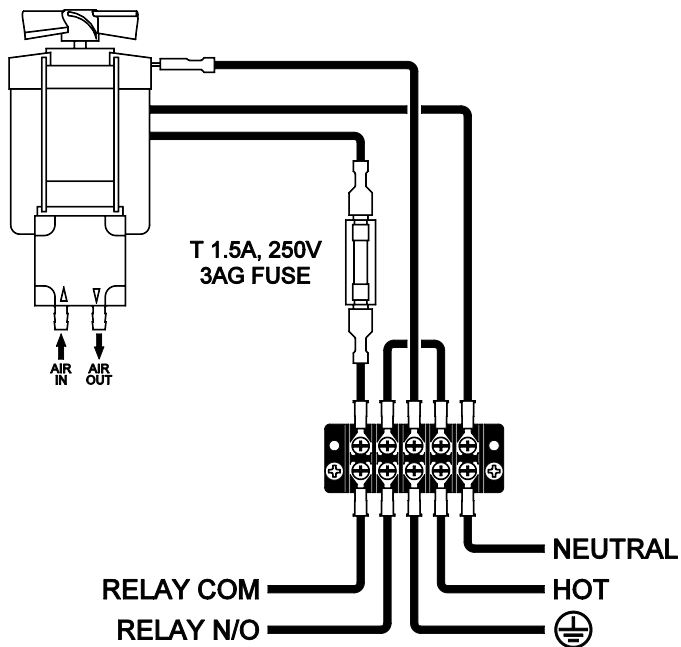
### 3. Connect the compressor to the controller.

- Use 18-12 AWG wire (minimum wire size to be determined by application load).
- Observe local codes and regulations regarding cable type and routing requirements.
- De-power the analyzer or PLC.
- Identify which relay on the analyzer or PLC will be used to drive the Air Wash system.
- Connect the “RELAY COM” terminal in the compressor enclosure to the “COM” terminal on the selected control relay.
- Connect the “RELAY N/O” terminal in the compressor enclosure to the “NO” terminal on the selected control relay.

### 4. Connect AC Power to the compressor.

- Use standard, 18-12AWG three-conductor wire to connect power to the compressor.
- Observe local codes and regulations regarding cable type and routing requirements.
- AC power should be supplied by a customer-supplied dedicated local disconnect. The disconnect should meet all local code requirements and be identified as the Air Wash system shut off.
- Connect the ground wire to the ground terminal on the compressor terminal block.
- Connect the neutral wire to the neutral terminal on the compressor terminal block.
- Connect the hot wire to the hot terminal on the compressor terminal block.

**Figure 3.5**  
Air Wash system  
electrical connection



## System Installation

### 5. Power the system.

- Close the enclosure door and tighten the two door screws.
- Reconnect power to the analyzer.
- Activate line power to the compressor.



The enclosure must be securely closed during operation. Failure to close the enclosure exposes the operator to the risk of electric shock and exposes the internal equipment to damage from the environment.

### 6. Configure the analyzer or PLC to operate the Air Wash system.

- Refer to the analyzer or PLC user guide for detailed instructions on configuring the Air Wash control and cycle.
- The total duty cycle for the system should not exceed 300 seconds over a four hour period.

## Plant Air Installation

If plant air will be used to supply the wash head, the installer must provide a solenoid to control the air supply to the system. Connect it according to the following procedure:

1. Install the solenoid valve and related hardware.
  - The air supplied to the wash head must be free of oil and contaminants. Many plant air systems contain oil. Install oil and particulate filters ahead of the solenoid valve as necessary.
  - The Air Wash system must not exceed 20 psi (1.4 bar) pressure. Install a regulator and pressure gauge ahead of the solenoid and set the regulator to the appropriate pressure.
  - Mount the solenoid valve. Observe local codes regarding enclosure requirements for the valve. The solenoid valve should be located as close to the sensor installation as possible.
  - Connect the filtered and regulated air supply to the inlet on the solenoid valve.
2. Connect the solenoid valve air supply to the wash head.
  - Do not extend the air line tubing to the wash head beyond the supplied 25 feet (7.6 m). Additional length can reduce the performance of the Air Wash system.
  - Measure the amount of air line tubing required to reach the solenoid valve. Add approximately 12–24 inches of extra length and cut off any excess tubing.
  - Connect the tubing to the solenoid valve using an appropriate barb fitting (not supplied).

## System Installation

3. Connect the solenoid valve to power through the process analyzer or PLC.
  - Identify which relay on the analyzer or PLC will be used to drive the Air Wash system.
  - Note that the solenoid valve's power requirements must not exceed the contact ratings on the control relay. Refer to the analyzer or PLC user guide for the specific relay contact ratings.
  - Use 18-12 AWG wire (minimum wire size to be determined by application load).
  - Observe local codes and regulations regarding cable type and routing requirements.
  - Power should be supplied by a customer-supplied dedicated local disconnect. The disconnect should meet all local code requirements and be identified as the Air Wash system shut off. The solenoid valve power supply should be fused according to local code.
  - De-power the analyzer.
  - Connect the hot or positive wire from the power supply to the "COM" terminal on the control relay.
  - Connect the "NO" terminal on the control relay to the hot or positive lead on the solenoid valve.
  - Connect the neutral or negative lead on the solenoid valve to the neutral or negative wire from the power supply.
  - Ground the solenoid valve as required.



4. Power the system.
  - Reconnect power to the analyzer.
  - Activate power to the solenoid valve control relay.
  
5. Configure the analyzer to operate the Air Wash system.
  - Refer to the analyzer user guide for detailed instructions on configuring the Air Wash control and cycle.
  - The total duty cycle for the system should not exceed 300 seconds over a four hour period.

# Chapter IV Air Wash System Maintenance

## Routine Maintenance

Clean the enclosure by wiping the exterior with a damp cloth. Be sure that the enclosure is securely closed when cleaning.

Check the enclosure vent (located on the bottom of the enclosure) on a regular basis to make sure that it is not clogged. Wipe off any accumulation from the vent.

## Fuse Replacement

The power supply on the optional compressor is equipped with an overload protection fuse. If the fuse fails, replace it according to the following procedure:

1. De-power the Air Wash system and the control analyzer.
2. Open the Air Wash enclosure.
3. Replace the fuse. Use a new fuse of the same type and rating (T 1.5A, 250V 3AG).
4. Close the Air Wash enclosure.
5. Re-power the Air Wash system and the control analyzer.





## Process Water Instruments

### North America

166 Cummings Center  
Beverly, MA 01915 USA  
Toll Free: 1-800-225-1480  
Tel: 1-978-232-6000  
info.water@thermo.com

### Netherlands

Tel: (31) 033-2463887  
info.water.uk@thermo.com

### India

Tel: (91) 22-4157-8800  
wai.asia@thermofisher.com

### Japan

Tel: (81) 045-453-9175  
wai.asia@thermofisher.com

### China

Tel: (86) 21-68654588  
wai.asia@thermofisher.com

### Singapore

Tel: (65) 6778-6876  
wai.asia@thermofisher.com

[www.thermoscientific.com/water](http://www.thermoscientific.com/water)

© 2010 Thermo Fisher Scientific Inc. All rights reserved.



266815-001\_A\_1110

**Thermo**  
SCIENTIFIC