Proteus Industries Inc.

8000XHT Series

Extreme-Temperature Flow Meters

This document provides the basic steps necessary to install and make operational your 8000XHT Series flow meter.

For complete installation and operating instructions, including important safety information, please see the 8000XHT Series Technical Reference Manual, available on the Proteus Industries website at **www.proteusind.com/8000XHT**.

Model Numbers, Flow Ranges, and Connections

MODEL NUMBER		FLOW RANGE*		CONNECTIONS
FLOW ONLY	FLOW & TEMPERATURE	LPM	GPM	
08006XHTSA2	08006XHTSA2-T	0.95–9.5	0.25–2.5	9/16-18 SAE
08006XHTSA4	08006XHTSA4-T	1.1–17	0.3–4.5	9/16-18 SAE
08008XHTSA6	08008XHTSA6-T	1.5–23	0.4–60	3/4-16 SAE
08008XHTSA10	08008XHTSA10-T	3.0–38	0.8–10	3/4-16 SAE
08012XHTSA16	08012XHTSA16-T	4.5–60	1.2–16	1 1/16-12 SAE

*Listed flow ranges are for water at 25 °C / 77 °F.

Flow Meter Specifications

Output Formats	Voltage: 0–10 VDC (default) or 0–5 VDC • Current: 4–20 mA
Fluid Temperatures*	10–200 °C / 50–392 °F
Ambient Temperatures	-40–75 °C / -40–167 °F
Operating Pressure Limit	1724 kPa / 250 psi
Burst Pressure (5:1)	8618 kPa / 1250 psi
Pressure Drop	Less than 69 kPa / 10 psi at maximum flow rate
Input Power Voltage	+24 VDC ± 10%
Cable Connection	M12 male 8-pin connector

*The fluid temperature that can be sustained with the unit cooled by ambient air up to 30 °C / 86 °F.

Temperature Sensor Specifications

Sensor Type	Pt1000 RTD probe (DIN EN 60751 Class A)
Measurement Range	10–200 °C / 50–392 °F
Output Format	Resistance
Lead Wires	3-wire • 30 AWG • Length: 3.0 m / 118.5 in

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1. Plumbing Connections

The flow response of an 8000XHT Series flow meter, and thus its calibration, may be affected by the inner diameter (ID) of the incoming pipe as well as any devices attached to the inlet connection and any nearby upstream devices.

NOTE
(i) The inner diameter (ID) of the inlet pipe or the through-hole of a tube connector, hose barb, or other connecting element must be greater than or equal to the ID of the flow meter.

The table below lists the minimum pipe/connection IDs necessary for standard 8000XHT Series product calibrations to be valid. If the ID of your pipe or fitting at the point where it connects to the inlet port is less than the orifice ID of your instrument as shown on the table, the factory calibration values may be invalid.

MODEL NUMBER		MINIMUM I.D. OF INLET CONNECTION	MINIMUM STRAIGHT RUN OF PIPE AT INLET
FLOW ONLY	FLOW & TEMP.		
08006XHTSA2	08006XHTSA2-T	4.775 mm / 0.188 in	47.75 mm / 1.88 in
08006XHTSA4	08006XHTSA4-T	6.858 mm / 0.270 in	68.58 mm / 2.70 in
08008XHTSA6	08008XHTSA6-T	7.112 mm / 0.280 in	71.12 mm / 2.80 in
08008XHTSA10	08008XHTSA10-T	10.160 mm / 0.400 in	101.60 mm / 4.00 in
08012XHTSA16	08012XHTSA16-T	15.494 mm / 0.610 in	154.94 mm / 6.10 in

Proteus recommends that a run of straight pipe with a length of at least 10 times the pipe ID be present between the instrument and any upstream devices. Refer to the table above to identify the minimum straight-pipe length recommended for your instrument.

NOTE
(i) Appropriate calibration procedures can be applied to allow 8000XHT Series instruments to be used with pipes/connections with IDs smaller than those shown or to be used with elbows attached directly to the inlet. For more information, please contact Proteus Technical Support at tech@proteusind.com or (650) 964-4163.

a. Identify the connection size and ID of your 8000XHT Series instrument.

b. Make connections to adjustable or non-adjustable SAE fittings as required. The O-rings and threads should be lubricated with system fluid or a compatible lubricant before installation to prevent galling.

c. Slowly turn the liquid flow ON and check for leaks at the connections. Tighten connections as required to eliminate leaks.

d. Eliminate entrained air from the instrument flow cavity.
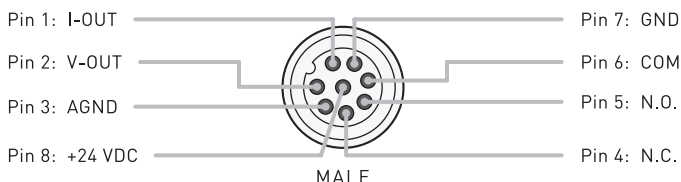
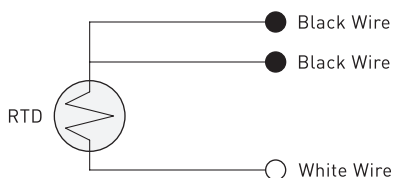| CAUTION! |
|------|
| ⚠ DO NOT exceed the maximum flow, temperature, or pressure limits of your instrument. |
| Operation above the rated limits can cause failure and create a hazard to operators and equipment. |

2. Electrical Connections

a. Locate the 24 VDC power source and turn it OFF.

b. Make all wire connections for your 8000XHT Series instrument as shown below.

Flow Meter

Pin 1: I-OUT
Pin 2: V-OUT
Pin 3: AGND
Pin 8: +24 VDC

Pin 7: GND
Pin 6: COM
Pin 5: N.O.
Pin 4: N.C.

MALE

Temperature Sensor

RTD

● Black Wire
● Black Wire
○ White Wire

c. Confirm that all connections are secure.

d. Turn the 24 VDC power source ON.

e. The flow status LED will turn on. The color of the LED is determined by the relationship between the actual flow rate and the selected alarm trip point value. See below.

Flow Status, LED Color, and Relay State

Flow status is determined by the relationship between the measured **Flow Rate**, the **Alarm Trip Point** value, and the **Warning Limit**, which is a calculated value equal to the trip point value plus a specified percentage of the instrument's upper flow limit. (The default percentage for standard products is **10%**.)

FLOW STATUS	FLOW RATE CONDITION	LED COLOR	RELAY STATE	
			N.O.	N.C.
Flow OK	Flow Rate > Warning Limit	Green	Closed	Open
Warning	Warning Limit ≥ Flow Rate > Alarm Trip Point	Amber	Closed	Open
Alarm	Alarm Trip Point ≥ Flow Rate	Red	Open	Closed

> If liquid is NOT flowing, the LED will be RED, indicating that power is on and liquid flow is below the selected alarm trip point value.

> If liquid is flowing, the LED may be GREEN, AMBER, or RED, depending on the actual measured rate of flow and the selected alarm trip point value.

NOTE
ⓘ The alarm trip point value is factory-set to ensure accuracy and prevent unwanted tampering. The default value for standard products is 15% of the upper flow limit.

3. Flow Measurement

Standard 8000XHT Series flow meters provide both current and voltage outputs. Refer to the **Electrical Connections** section for output wiring assignments.

For voltage output, 0–10 VDC and 0–5 VDC options are available.

NOTE
(i) Unless otherwise specified on your purchase order, all 8000XHT Series flow meters are shipped with a voltage output setting of 0–10 VDC.

The analog output of an 8000XHT Series instrument is directly proportional to the flow rate of the liquid passing through the device. Flow response curves for standard products are available in the 8000XHT Series Technical Reference Manual.

a. Connect the COM or negative (−) terminal of a digital multimeter or equivalent device to Pin 3 (analog ground).

b. Connect the positive (+) terminal of the multimeter to Pin 1 for current output -OR- Pin 2 for voltage output.

c. Measure the current or voltage output.

d. Estimate the flow rate according to the flow response curves for your specific model number as shown in the 8000XHT Series Technical Reference Manual.

4. Temperature Measurement

8000XHT Series products with temperature measurement capability are equipped with a Pt1000 resistance temperature detector (RTD) probe that conforms to the DIN EN 60751 Class A specification.

The temperature sensor has a measurement range of 0–200 °C / 50–392 °F and a nominal resistance of 1000 Ω at 0 °C / 32 °F.

NEED MORE INFORMATION?

A comprehensive 8000XHT Series Technical Reference Manual containing detailed product information, including technical descriptions, performance specifications, flow-response and pressure-drop curves, installation instructions, and maintenance guidelines is available on the Proteus Industries website at:

www.proteusind.com/8000XHT

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