

8000XHT Series

Extreme-Temperature Liquid Flow Meters



Innovative technology and design, for use with liquid temperatures to 200 °C

- » Flow ranges from 0.95 to 60 LPM / 0.25 to 16 GPM
- » Accuracy of 3% of flow range
- » Optional temperature measurement capability from -80 to 200 °C / -112 to 392 °F with Pt1000 RTD sensor
- » Compatible with Galden®, Fluorinert™ and other advanced heat-transfer fluids
- » Enhanced accuracy and stability from digital signal processing
- » Factory-programmed relay trip point
- » Rugged stainless-steel construction
- » Standard 0–10 VDC or 0–5 VDC, and 4–20 mA outputs
- » Specialized calibration available to account for viscosity effects of fluid and operating temperature — traceable calibrations also available
- » Bright tricolor LED provides clear visual indication of flow status
- » NEMA 4X / IP66 packaging ensures reliable performance in wet environments

8000XHT Series flow meters provide accurate, reliable, and cost-effective measurement of heat transfer fluids and other liquids to 200 °C. The high-temperature capability is enhanced by Proteus' world-class calibration expertise, to deliver superior precision and reliability in flow and temperature measurement for critical heat-sensitive processes.

AT A GLANCE

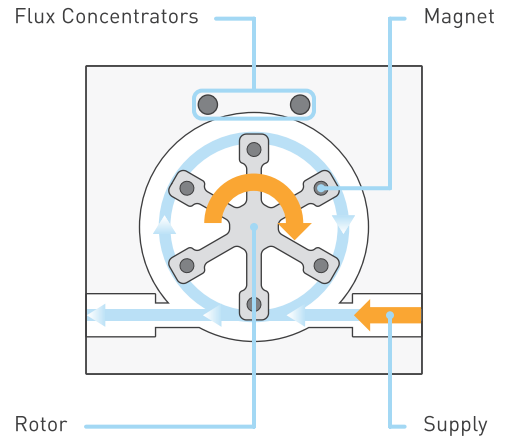
Flow Ranges	0.95 to 60 LPM 0.25 to 16 GPM
Temperature Limit	200 °C / 392 °F
Operating Pressure Limit	1724 kPa / 250 psi
Flow Output Formats	0–10 VDC OR 0–5 VDC 4–20 mA
Temperature Output*	Resistance
CE Marked	Yes
RoHS / REACH Compliant	Yes
NEMA 4X / IP66 Enclosure	Standard

*With optional Pt1000 RTD sensor.

How It Works

As liquid flows through the flow sensor cavity, it causes the rotor to spin. Alternating north and south magnets embedded in the rotor transfer pulses through two flux concentrators to switch two Hall-Effect sensors mounted on the main electronics board. The rotational frequency of the rotor is measured by a microcomputer, and scaling factors entered into flash memory allow the volumetric flow rate to be calculated. Flow rate information is output as 0–10 or 0–5 VDC and 4–20 mA.

A built-in relay is programmed to change state when the measured flow rate falls below a preset alarm value, and a bright tricolor LED indicates the flow status. The alarm trip point value is factory-set to ensure accuracy and prevent unwanted tampering. The default value is 15% of the upper flow limit; a customized trip point setting may be requested at the time of order.



Cost-Effective Temperature Measurement

8000XHT Series flow meters offer the capability to measure the liquid flow rate and temperature with a single instrument, requiring only one connection point in your line. An optional Pt1000 resistance temperature detector (RTD) probe mounted in the sensor body provides direct measurement of liquid temperatures from -80 to 200 °C / -112 to 392 °F, with temperature information transmitted as a resistance signal.

Uniquely Designed for Extreme Temperatures

Reliable performance in extreme-temperature applications requires proper cooling of the sensitive electronic components inside the flow meter. This is achieved by thermally isolating the electronics module from the flow path to enable convective cooling in ambient air.



Certified Calibrations Help You Control Your Most Critical Processes

A heat-transfer fluid's viscosity is highly dependent on its temperature: as temperature increases, viscosity decreases inversely. The response of a flow meter varies with the kinematic viscosity of a fluid at its targeted operating temperature.

Proteus' expert calibration capabilities allow us to deliver instruments with fluid- and temperature-specific calibrations to ensure accuracy in your most critical processes. Our world-class reference instruments and measurement assurance programs enable us to offer NIST-traceable, ISO 17025-compliant, and Z540.3-compliant calibrations.

Flow Ranges, Connections, and Model Numbers

FLOW RANGE*		CONNECTIONS	MODEL NUMBER	
LPM	GPM		FLOW ONLY	FLOW & TEMPERATURE
0.95 – 9.5	0.25 – 2.5	9/16-18 SAE	08006XHTSA2	08006XHTSA2-T
1.1 – 17	0.3 – 4.5	9/16-18 SAE	08006XHTSA4	08006XHTSA4-T
1.5 – 23	0.4 – 6.0	3/4-16 SAE	08008XHTSA6	08008XHTSA6-T
3.0 – 38	0.8 – 10	3/4-16 SAE	08008XHTSA10	08008XHTSA10-T
4.5 – 60	1.2 – 16	1 1/16-12 SAE	08012XHTSA16	08012XHTSA16-T

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

When selecting a flow meter for your application, your nominal flow rate should be around 50–60% of the upper flow limit of the meter. Customization is available to achieve flow ranges beyond those shown above. For assistance in identifying the 8000XHT Series product that is best suited to your flow measurement or control process, please contact Proteus Applications Support.

Flow Sensor Specifications

Output Formats	Voltage: 0–10 VDC (default) or 0–5 VDC • Current: 4–20 mA	
Fluid Temperatures – Standard ¹	10 to 200 °C / 50 to 392 °F	
Fluid Temperatures – Extended ^{1,2}	-80 to 200 °C / -112 to 392 °F	
Ambient Temperature ¹	-40 to 75 °C / -40 to 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	
Accuracy – Standard	± 3% of flow range with standard validation	
Accuracy – Validated	± 2% of calibration value	
Linearity	± 1.5% of flow range from 0.1 to 1.0 × flow range	
Repeatability	± 1% of flow range from 0.1 to 1.0 × flow range	
Hysteresis	5% of flow range	
Input Power Voltage	+24 VDC ± 10%	
Input Power Consumption	< 1 W	
Relay Contacts Maximum Current	1 A at 48 VDC	
Voltage Output Maximum Sourcing Current	15 mA at 2 VDC output	
Maximum Loop Resistance	900 Ω at 24 VDC	
Wetted Materials	Flow body: Cast 316 stainless steel O-ring: FKM (Viton®)	Rotor: PPS Rotor shaft: 316 stainless steel
Enclosure Protection	NEMA 4X • IP66	
Cable Connection	M12 male 8-pin connector	
Standards and Compliance	CE conformity • RoHS and REACH compliance	

¹ For high-temperature applications, the maximum fluid temperature that can be sustained without damage to the internal electronics is dependent on the temperature of the ambient air cooling the meter. Example maximum temperatures (°C): 75° fluid / 65° air; 120° fluid / 60° air; 200° fluid / 44° air. Note: The flow body is not insulated. It is recommended that a safety screen be placed around the meter to protect against burn injuries.

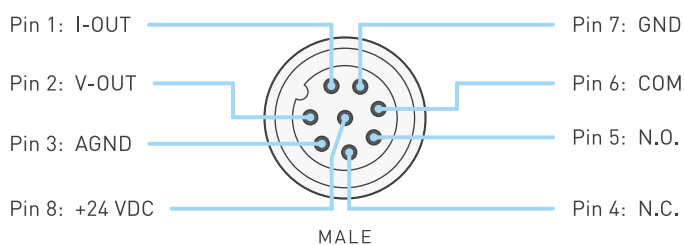
² For low-temperature applications, precautions must be taken to avoid condensation, which can damage the internal electronics. Please contact Proteus Applications Support for applications involving fluid temperatures below 10 °C / 50 °F.

Temperature Sensor Specifications

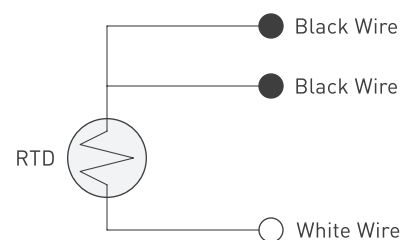
Sensor Type	Pt1000 RTD probe (DIN EN 60751 Class A)
Measurement Range	-80 to 200 °C / -112 to 392 °F
Output Format	Resistance
Output Value	0 °C = 1000.0 Ω • 10 °C = 1039.0 Ω • 125 °C = 1758.6 Ω
Accuracy	± 0.15 °C at T = 0 °C
Wetted Materials	Probe housing: 316 stainless steel
Lead Wires	3-wire • 30 AWG • PTFE insulation • Length: 3.0 m / 118.5 in

Wiring

» Flow Meter



» Temperature Sensor

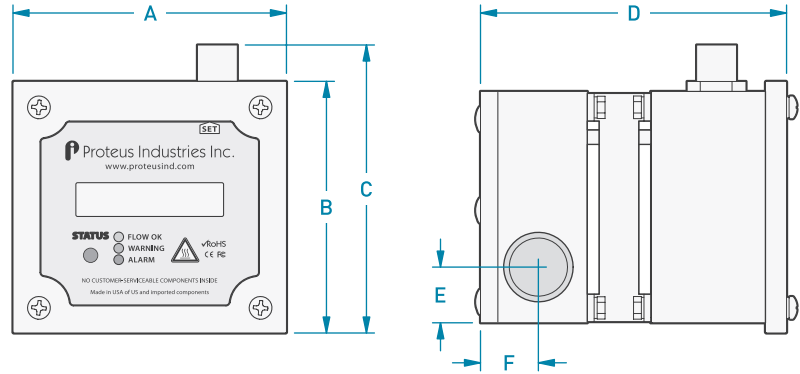


Dimensions and Drawings

Dimensions for standard 8000XHT Series products are shown in the table below.

Outline and 3D drawings are accessible on the Proteus Industries website at www.proteusind.com/8000XHT.

Solid models are available upon request; please contact Proteus Applications Support.



MODEL NUMBER		A	B	C	D	E	F
08006XHTSA2	08006XHTSA4	81.8 mm	75.2 mm	86.4 mm	89.4 mm	16.5 mm	15.7 mm
08006XHTSA2-T	08006XHTSA4-T	3.22 in	2.96 in	3.40 in	3.52 in	0.65 in	0.62 in
08008XHTSA6	08008XHTSA10	81.8 mm	75.2 mm	86.4 mm	91.9 mm	16.5 mm	17.5 mm
08008XHTSA6-T	08008XHTSA10-T	3.22 in	2.96 in	3.40 in	3.62 in	0.65 in	0.69 in
08012XHTSA16		81.8 mm	75.2 mm	86.4 mm	99.3 mm	16.8 mm	22.4 mm
08012XHTSA16-T		3.22 in	2.96 in	3.40 in	3.91 in	0.66 in	0.88 in

Proteus: Customization Experts

Bring us your specifications and let us create a flow management solution to meet your exact requirements. Materials can be modified or improved for compatibility with your fluid; flow ranges can be matched to large connections; adaptations can be implemented for high and low temperatures; and multiple devices can be integrated in cost-effective manifold assemblies for liquid distribution, measurement, and control.

When your new product goes to production, fittings will be properly positioned, entire units and sub-assemblies will be certified leak-tight, all electrical connections will be tested end-to-end, and the system's calibration will be certified to the specified accuracy. Our lean manufacturing processes and ISO 9001-certified procedures will ensure that your instruments will arrive at your location ready for use, the first time and every time.

Let us put our knowledge base to work on solving your most demanding flow measurement challenges! Contact Proteus Applications Support to discuss your requirements for a customized solution.

Need More Information?

- » Visit our website www.proteusind.com/8000XHT. A comprehensive technical reference manual, containing technical descriptions, performance specifications, flow-response and pressure-drop curves, installation instructions, maintenance guidelines, and other valuable information is accessible at www.proteusind.com/8000XHT.
- » Contact us tech@proteusind.com or call us at (650) 964-4163. Our flow management experts will be pleased to answer your questions! Email us at tech@proteusind.com or call us at (650) 964-4163.