HANI™ Clamp Sensor - High Accuracy Non-Invasive Clamp Temperature Sensor for Plastic Pipe Applications

Ω OMEGA™

Hybrid temperature sensing on plastic pipes integrated with Omega Link connectivity

- Non-invasive temperature measurement
- Measure the fluid temperature inside of a plastic pipe
- Accuracy for Industrial Plastic Pipes:±1.5°C (±2.7°F)
- Response time[1] = 30 sec (τ_{63}) / 60 sec (τ_{90})
- 4 to 20 mA loop powered analog output
- -20 to 100ºC process temperature range
- Available for 1" to 2" pipe diameters (other sizes on request)
- Omega Smart Core enabled
  - Data logging
  - Plug and play device detection
- IP67 environmental rating
- Patent pending

Ease of Installation

Install your HANI™ Clamp Sensor in seconds

Omega's innovative clamp-on design makes sensor installation easy. Unlike invasive sensors, HANI™ Clamp Sensors mount to the outside of a plastic pipe and read the temperature of the process media inside the pipe.

- No drilling
- No cutting
- No epoxies
- No downtime

Need to relocate the sensor? Un-clamp and go!

Non-Invasive & Non-Contact Operation

No penetration, no risk of contamination

The HANI™ Clamp Sensor never comes into contact with the process media flowing through the pipe. There is no risk of buildup, sensor wear or breakage from high flow rates, corrosive/abrasive liquids, wake frequency, pressure drop and water hammer.

High Accuracy & Fast Response Times

Outperforms a surface sensor

Omega's patent pending

Hybrid Temperature Sensing platform uses multiple sensors and a proprietary algorithm to achieve better accuracy and faster response times than a surface sensor.
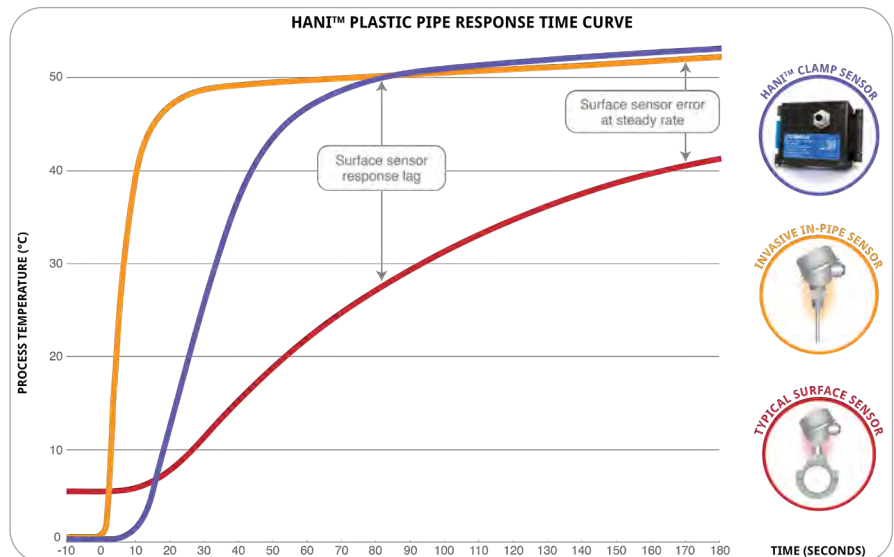
Common Applications

New and retro itting existing systems

Lower the total cost of ownership and reduce contamination risk without sacrificing performance by upgrading to a HANI™ Clamp Sensor.

Quality control & ad-hoc sensing

Clamp-on the sensor in seconds and connect to your laptop or PC for readings anytime - anywhere.

HANI™ PLASTIC PIPE RESPONSE TIME CURVE

1. τ_{63} is the time constant or response time required to reach 63.2% of the final value after an instantaneous temperature change. τ_{90} is the response time required to reach 90% of the final value after an instantaneous temperature change.

Specifications

Input Power

Voltage: 8 V_{DC} - 28 V_{DC} (loop powered)

Max Loop Resistance:
$R_{max} (\Omega)= (V_{supply} -8V)/0.24\ A$

Analog Output

Current: 4 to 20 mA
User scalable analog output, default scaling 0-100°C

Process Parameters

Process Medium: Water, water-based fluids (others upon request)
Pipe Materials: PVC, CPVC, PP, PFA
Nominal Pipe Size:
1", 2" nominal
(others upon request)
Process Temperature Range:
-20 to 100ºC liquid

Performance

Accuracy with fluid flowing:
±1.5°C from factory and improved accuracy possible with
in-situation 1 or 2-point calibration
Response Time (τ_{63}): 30 seconds
Response Time (τ_{90}): 60 seconds

Environmental

Ambient Operating Temperature:
0 to 40°C (32 to 104°F)
Rating: IP67 when mated

Mechanical

Dimensions:
60.3 W x 64.31 L x 51.54 mm H
(2.38 W x 2.53 L x 2.03" H)
Materials: PA12, silicone rubber, nickel-plated brass, stainless steel

General

Agency Approvals: CE, EMC, UKCA, 2014/30/EU, LVD 2014/35/EU class II product, (low voltage 8 to 28 V_{DC})

Smart Core Enabled

Smart Core is integral to all Omega Link integrated Smart Sensing devices. In addition to allowing for modular integration using any Omega Link Smart Interface, this powerful suite of advanced features enables alarms and notifications, data assurance, data logging, storage, wireless connectivity and SYNC configuration.
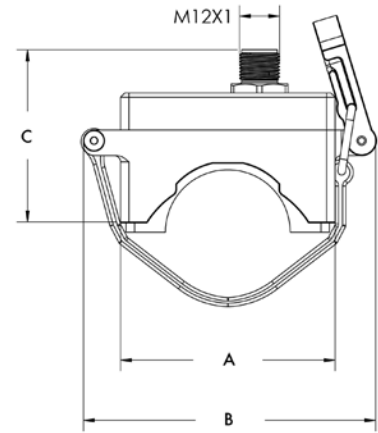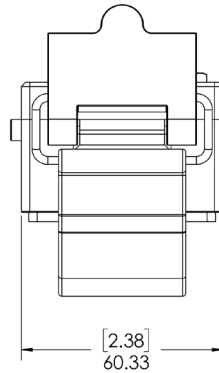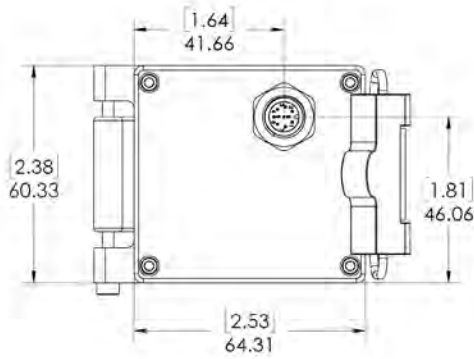
Sensor Pipe Diameters	A	B	C
1.0", 2.0"	64.3 (2.53)	87.6 (3.45)	51.5 (2.03)

Sensor Dimensions: mm (in)

Frequently Asked Questions

How can a HANI™ temperature sensor have faster response times and better accuracy than a surface sensor?

Omega's innovative HANI™ Clamp Sensor includes multiple sensors along with a proprietary algorithm to achieve faster response times and better accuracy than a surface sensor.

Will ambient temperature affect the reading of the HANI™ Clamp Sensor?

Ambient temperature will not affect the reading of the HANI™ Clamp Sensor. Operating temperature for the clamp-on sensor is 0 to 40°C (32 to 104°F).

Is there any special preparation required to properly setup and mount the HANI™ Clamp Sensor?

There is no special preparation or tools required to setup and mount the sensor, however, when setting up any sensor ensure the mounting area is clean, dry, and free from any debris.

How should the sensor be oriented on the pipe?

The sensor can be mounted on any straight pipe at least 2.5" long. It is suggested to mount the sensing surface on the bottom half of the pipe for best results.

Are other pipe diameters / sizes available?

Yes, other diameters / sizes are available. Please contact us to discuss your specific application.

How can I improve the accuracy of ±1.5°C with my industrial pipe application?

Industrial pipes have a wide variety of tolerances, surface finishes, and coatings which can affect the accuracy. An in-situation user calibration can be done to improve the accuracy for your specific application. Use the free Omega Sync software to do a 1 or 2-point calibration with the HANI™ Clamp Sensor and an in place immersion sensor. See the user manual for additional details.

Other than water-based process mediums, can other liquids and viscosities be measured?

Yes, please contact us to discuss your specific application.

M12 8-Pin Wiring

Pin	Name	Function	Wiring
Pin 1	Loop -	4 to 20 mA Return	4 to 20 mA
Pin 2	INTR	Interrupt Signal	Omega Link
Pin 3	SCL	I2C Clock Signal	Omega Link
Pin 4	SDA	I2C Data Signal	Omega Link
Pin 5	Shield	Shield Ground	Omega Link
Pin 6	Loop +	4 to 20 mA Source	4 to 20 mA
Pin 7	GND	Power Ground	Omega Link
Pin 8	3.3VDD	Power Supply	Omega Link
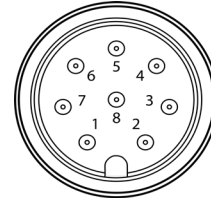
HANI™ Clamp Temperature Sensor for Industrial Plastic Pipes

Model Number	Process Temp Range	Pipe Size	Accuracy	Response Time	Features
HANI-C-1.0I-P-MA	-20° (-4°F) to 100°C (212°F)	1.0"	±1.5°C	30 sec (τ_{63}), 60 sec (τ_{90})	—
HANI-C-1.0I-P-MA-CAL-3	-20° (-4°F) to 100°C (212°F)	1.0"	±1.5°C	30 sec (τ_{63}), 60 sec (τ_{90}) Cal/Cert	
HANI-C-2.0I-P-MA	-20° (-4°F) to 100°C (212°F)	2.0"	±1.5°C	30 sec (τ_{63}), 60 sec (τ_{90})	—
HANI-C-2.0I-P-MA-CAL-3	-20° (-4°F) to 100°C (212°F)	2.0"	±1.5°C	30 sec (τ_{63}), 60 sec (τ_{90}) Cal/Cert	

CAL-3 option is a 3 point calibration at 10°, 50° and 90° C. CAL-4 option is a user selected number and value of temperature points, please contact us for a quote.

Omega Link Smart Interface

Omega Link Smart Sensing devices require an Omega Link Smart Interface to operate and connect to your Omega Link Ecosystem. There are both wired and wireless options. Omega Sync software is free and enables you to read the fluid temperature digitally in just a few seconds.

Model Number	Description
IF-001	USB Smart Interface
IF-002	RS485/Modbus Smart Interface
IF-006-1-NA	Wireless Interface 915 MHZ (for North America)
IF-006-1-EU	Wireless Interface 868 MHZ (for Europe)

Omega Link Gateway

An Omega Link Gateway is required to connect the Smart Interface and sensing device to the Omega Link ecosystem.

Model Number	Description
GW-001-0	Wired IIoT Gateway, Standard, Ethernet connectivity, Modbus RTU RS232/RS485 and Modbus TCP
GW-001-2-NA	Wireless IIoT Gateway Standard, Ethernet connectivity, connects up to 100 Omega Link Smart Sensors- 915 MHz
GW-001-2-EU	Wireless IIoT Gateway Standard, Ethernet connectivity, connects up to 100 Omega Link Smart Sensors- 868 MHz
GW-001-3-NA	Wireless IIoT Gateway Standard, Ethernet connectivity, connects up to 100 Omega Link Smart Sensors- 915 MHz
GW-001-3-EU	Wireless IIoT Gateway Standard, Ethernet connectivity, connects up to 100 Omega Link Smart Sensors- 868 MHz
GW-002-1-LTE	Wireless LTE IIoT Gateway Pro connects up to 40 Omega Link Smart Sensors, Modbus RTU RS232/RS485 and Modbus TCP, 1x RJ45 port, 1x USB port - 915 MHz

Accessories

Model Number	Description
M12.8-T-SPLIT	Smart Probe M12-8 pin shielded T-splitter — enables access to I/O pins
M12.8-S-F-FM	M12-8 pin female straight plug field install connector with screw terminals
DM12CAB-8-1-RA	1m (3.3') cable dual M12-8 connector, right angle terminator
DM12CAB-8-3-RA	3m (9.8') cable dual M12-8 connector, right angle terminator
DM12CAB-8-5-RA	5m (16.4') cable dual M12-8 connector, right angle terminator
DM12CAB-8-1	1m (3.3') cable dual M12-8 straight connector
DM12CAB-8-3	3m (9.8') cable dual M12-8 straight connector
DM12CAB-8-5	5m (16.4') cable dual M12-8 straight connector