



IMMERSION-NO WELL, DUCT

BACnet™ MS/TP | Modbus RTU Immersion, Duct

The BN Series Duct and Immersion networked temperature sensors are a cost effective, single point native BACnet™ or Modbus sensing solution designed to reduce the need for additional input modules or building management controllers when a limited number of input points are available. The BN series offers both BACnet™ and Modbus protocols in one device, providing great flexibility with various systems. The BTL Certification provides confidence that these sensors may be used in any new or retrofit installation using a BACnet™ MS/TP controller with third party BACnet™ devices. These sensors incorporate a conformally coated printed circuit

board for long-term reliability. The ABS enclosure features an easy open latch for easy access to the wiring and internal dip switches for quick setup and installation. Please contact ACI for more information regarding the BN Series communicating sensors.

Applications: Supply / Return / Discharge / Mixed Duct Air Temperature Sensing, Chilled Water / Hot Water / Hydronic Heating Systems, Air / Gas Temperatures, Chillers, Boilers, Hot Water Heaters & Refrigeration Systems

The ACI BN Series BACnet™ sensors are covered by ACI's Five (5) Year Limited Warranty. The warranty can be found in the front of ACI's Sensors & Transmitters catalog, as well as on ACI's website, www.workaci.com

PRODUCT SPECIFICATIONS

Supply Voltage:	12 to 36 VDC / 24 VAC +/- 10%, 50/60 Hz (Reverse Polarity Protected)
Current Consumption:	25 mA maximum (0.67 VA)
Temperature Measurement Range:	-40 to 302°F (-40 to 150°C)
Temperature Measurement Accuracy @ 77°F (25°C):	+/- 1.0°F (+/- 0.5°C)
Temperature Calibration Offset:	+/- 9°F (+/- 5°C) (Field Configurable)
Temperature Units:	°F (Factory Default), °C, °K (Field Configurable)
Resolution:	+/- 0.1° +/- 0.1%
Temperature Update Rate:	4 seconds
Communication Protocol:	BACnet™ MS/TP or Modbus RTU = Field Selectable; EIA RS-485
Sensor Addresses:	0 = Factory Default 1-127 = Field Selectable
Supported Baud Rates:	Auto Baud (Factory Default) 9600, 19200, 38400, 57600, 76800, 115200 (Field Selectable)
Parity (Modbus RTU):	None/Even/Odd = Field Selectable
Stop Bits (Modbus RTU):	1 or 2 = Field Selectable
Databits (Modbus RTU):	8
Maximum Distance:	4000 ft (1219 m)
End of Line Termination Resistance:	120 Ohms Termination Resistance (Field Selectable)
Tri-Color Status LED:	Connection Status
Connections Wire Size:	Screw Terminal Blocks 16 AWG (1.31 mm ²) to 22 AWG (0.33 mm ²)
Transmitter Operating Temperature Range:	-40 to 176°F (-40 to 80°C)
Storage Temperature Range:	-40 to 185°F (-40 to 85°C)
Operating Humidity Range:	10 to 95% RH, non-condensing
Probe Material Probe Diameter:	304 Stainless Steel 0.250" (6.35mm)
Immersion Thermowell Thread Size:	½" NPS Male Thread
Enclosure Color Material UL Flammability Rating:	Black ABS Plastic UL94-HB
Enclosure Temperature Rating Plenum Rating:	-22 to 194°F (-30 to 90°C) Plenum Rated
Foam Pad Material Flammability Rating:	Neoprene/EPDM/SBR Polymer UL94-HBF; FMVSS-302; MIL-R-6130C
Product Dimensions (L x W x D):	See Dimensional Drawings on Back
Product Weights:	See Dimensional Drawings on Back
Agency Approvals:	BTL Certified, CE, RoHS2, WEEE, China RoHS



MAXIMUM VELOCITY VS THERMOWELL INSERTION LENGTH Machined Thermowell

Straight Shank Insertion Length "U"					Stepped Shank Insertion Length "U"	
Material:	Media Type:	1.0" (25.4 mm)	2.5" (63.5 mm)	8.0" (203.2 mm)	4.0" (101.6 mm)	6.0" (152.4 mm)
304/316 SS	Air/Gas/Steam ¹	349 ft/s (106.3 m/s)	349 ft/s (106.3 m/s)	71.9 ft/s (21.9 m/s)	109 ft/s (33.2 m/s)	39.5 ft/s (12.0 m/s)
304/316 SS	Water	360 ft/s (109.7 m/s)	360 ft/s (109.7 m/s)	71.9 ft/s (21.9 m/s)	82.2 ft/s (25.1 m/s)	39.5 ft/s (12.0 m/s)

Note 1: Values are for Air/Gas/Steam and similar density media | All velocity ratings are based upon an operating temperature of 1000°F (537.8°C)

MAXIMUM PRESSURE VS TEMPERATURE RATINGS Two-Part Fabricated / Welded Thermowell

Material:	70°F (21.1°C)	200°F (93.3°C)	400°F (204.4°C)	600°F (315.6°C)	800°F (426.7°C)	1000°F (537.8°C)	1200°F (648.9°C)
304/316 SS	982 PSI (67.7 Bar)	820 PSI (56.5 Bar)	675 PSI (46.5 Bar)	604 PSI (41.6 Bar)	550 PSI (37.9 Bar)	510 PSI (35.1 Bar)	290 PSI (20.0 Bar)

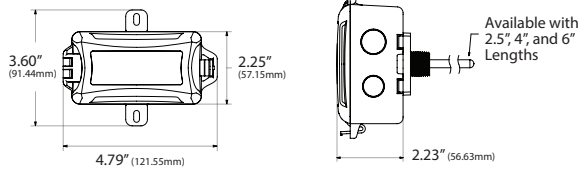
MAXIMUM FLUID VELOCITY RATINGS Two-Part Fabricated / Welded Thermowell

Straight Shank Insertion Length "U"				
Material:	Media Type:	2.5" (63.5 mm)	4.0" (101.6 mm)	6.0" (152.4 mm)
304/316 SS	Air/Gas/Steam ²	169 ft/s (51.5 m/s)	61 ft/s (18.6 m/s)	20 ft/s (6.1 m/s)
304/316 SS	Water	88 ft/s (26.8 m/s)	20 ft/s (6.1 m/s)	10 ft/s (3.05 m/s)

Note 2: Values are for Air/Gas/Steam and similar density media

DIMENSIONAL DRAWING, WEIGHTS

Immersion-No Well [PB]

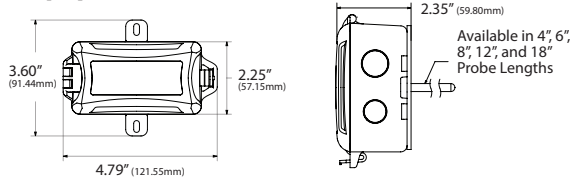


yy = Insertion Length

Immersion [PB] Weights

ACI Model #	2.5" (Insertion Length)	4" (Insertion Length)	6" (Insertion Length)
A/BN21110-INW-yy-PB	0.31 lbs. (0.141 kg)	0.35 lbs. (0.159 kg)	0.39 lbs. (0.178 kg)

Duct [PB]



Duct [PB] Weights

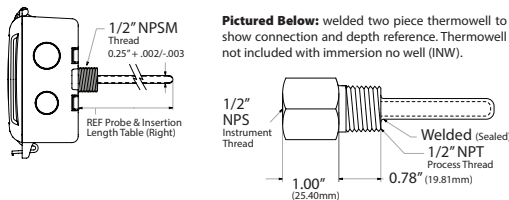
ACI Model #	4" (Probe Length)	6" (Probe Length)	8" (Insertion Length)
A/BN21110-D-yy-PB	0.31 lbs. (0.141 kg)	0.32 lbs. (0.145 kg)	0.33 lbs. (0.150 kg)

ACI Model #	12" (Probe Length)	18" (Probe Length)
A/BN21110-D-yy-PB	0.35 lbs. (0.159 kg)	0.37 lbs. (0.168 kg)

Front & Right Views

Product Weights

PROBE AND INSERTION LENGTH IMMERSION NO WELL



Pictured Below: welded two piece thermowell to show connection and depth reference. Thermowell not included with immersion no well (INW).

Probe & Insertion Length

Probe Length	Insertion Length	ACI Part #	Thermowell Part #
4.5" (114.3 mm)	4.31" (109.5 mm) +/- 0.13" (±3.3 mm)	A/BN1110-INW-2.5-PB	A/2.5" or A/M2.5"
6" (152.4 mm)	5.81" (147.6 mm) +/- 0.13" (±3.3 mm)	A/BN1110-INW-4-PB	A/4" or A/M4"
8" (203.2 mm)	7.81" (198.38 mm) +/- 0.13" (±3.3 mm)	A/BN1110-INW-6-PB	A/6" or A/M6"





STANDARD ORDERING		
Model #	Item #	Description
BN2110-D-4-PB	146516	BACnet™ MS/TP, Modbus RTU, Temperature, Duct, SS, 4", Plastic Enclosure
BN2110-D-6-PB	146519	BACnet™ MS/TP, Modbus RTU, Temperature, Duct, SS, 6", Plastic Enclosure
BN2110-D-8-PB	146534	BACnet™ MS/TP, Modbus RTU, Temperature, Duct, SS, 8", Plastic Enclosure
BN2110-D-12-PB	146538	BACnet™ MS/TP, Modbus RTU, Temperature, Duct, SS, 12", Plastic Enclosure
BN2110-D-18-PB	146539	BACnet™ MS/TP, Modbus RTU, Temperature, Duct, SS, 18", Plastic Enclosure
BN2110-INW-2.5-PB	146544	BACnet™ MS/TP, Modbus RTU, Temperature, Immersion No Well, 2.5", Plastic Enclosure
BN2110-INW-4-PB	146545	BACnet™ MS/TP, Modbus RTU, Temperature, Immersion No Well, 4", Plastic Enclosure
BN2110-INW-6-PB	146546	BACnet™ MS/TP, Modbus RTU, Temperature, Immersion No Well, 6", Plastic Enclosure

Model # Example: BN2110-D-8-PB -OR- 146534

ACCESSORIES ORDERING		
Model #	Item #	Description
NSG HEAT TRANSFER PASTE 2OZ	102595	Thermal Grease, 2 oz. Tube, Silicone Free, -40 to 320°F (-40 to 160°C)
NSG HEAT TRANSFER PASTE 16OZ	140574	Thermal Grease, 16 oz. Jar, Silicone Free, -40 to 390°F (-40 to 198°C)
A/2.5"	128349	2.5" (63.5mm) Insertion, 304 Stainless, Welded, 1/2" NPT Thermowell
A/4"	128350	4" (101.6mm) Insertion, 304 Stainless, Welded, 1/2" NPT Thermowell
A/6"	128351	6" (152.4mm) Insertion, 304 Stainless, Welded, 1/2" NPT Thermowell
A/M1"	128337	1" (25.4mm) Insertion, 304 Stainless, Machined, 1/2" NPT Thermowell
A/M2.5"	128338	2.5" (63.5mm) Insertion, 304 Stainless, Machined, 1/2" NPT Thermowell
A/M4"	128343	4" (101.6mm) Insertion, 304 Stainless, Machined, 1/2" NPT Thermowell
A/M6"	128344	6" (152.4mm) Insertion, 304 Stainless, Machined, 1/2" NPT Thermowell
A/M8"	138725	8" (203.2mm) Insertion, 304 Stainless, Machined, 1/2" NPT Thermowell
A/M2.5"-316SS	128352	2.5" (63.5mm) Insertion, 316 Stainless, Machined, 1/2" NPT Thermowell
A/M4"-316SS	128353	4" (101.6mm) Insertion, 316 Stainless, Machined, 1/2" NPT Thermowell
A/M6"-316SS	128354	6" (152.4mm) Insertion, 316 Stainless, Machined, 1/2" NPT Thermowell

Model # Example: NSG HEAT TRANSFER PASTE 2OZ -OR- 102595

