



# IMMERSION

## Stainless Steel Immersion, Platinum RTD

The ACI Platinum Immersion Series features a stainless steel probe with Etched Teflon colored lead wires to differentiate the different sensor types. The three-wire “-3W” option should be ordered when using with a 3-Wire temperature transmitter or sensor configuration on your building management system or PLC (Programmable Logic Controller). The purpose of the 3rd wire is to compensate for external lead wire resistance that affects the sensor output. ACI recommends the use of 18 AWG lead wires to reduce the external lead wire resistance when using a Platinum RTD. The sensors in this series are manufactured using ACI’s proven double encapsulation process to eliminate the effects of moisture upon the sensors and to increase thermal response times using our high quality, thermally conductive epoxy. The immersion sensors “-I” include a welded thermowell but can be ordered without the thermowell “-INW” version. The “-INW” includes a standard ½” NPS process thread to be used with an optional machined thermowell or an existing

thermowell application. Optional NEMA/IP rated weather proof enclosures and NIST Certificates are available as referenced on the back of the product data sheet.

**Applications:** Chilled Water Systems, Hot Water Systems, Boilers, Pumps, Compressors, Chillers, Cooling Towers

**The ACI Platinum Immersion Series is 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 web site, [workaci.com](http://workaci.com).**

**Disclaimer:** Specification of any thermowell and the materials of construction are the sole responsibility of the designer of the system that incorporates the thermowell. Sole responsibility for ensuring compatibility of the process fluid with the system rests with the end user.

## PRODUCT SPECIFICATIONS

<b>Sensor Type   Sensor Curve:</b>	Platinum RTD   PTC (Positive Temperature Coefficient)
<b>Number Sensing Points:</b>	One
<b>Number Wires:</b>	<b>A/100-2W-I Series and A/1K-2W-I Series:</b> Two (Non-Polarity Sensitive) <b>A/100-3W-I Series and A/1K-3W-I Series:</b> Three (Polarity Sensitive)
<b>Sensor Output @ 0°C (32°F):</b>	<b>A/100-xW-I Series:</b> 100 Ohms nominal   <b>A/1K-xW-I Series:</b> 1000 Ohms nominal +/- 0.06% Class A ( <b>Tolerance Formula:</b> +/- °C = (0.15°C + (0.002 *  t ))) where  t  is the absolute value of Temperature above or below 0°C in °C
<b>Sensor Accuracy 0°C (32°F):</b>	<b>-40°C (-40°F):</b> +/- 0.23°C (+/- 0.414°F)   <b>0°C (32°F):</b> +/- 0.15°C (+/- 0.27°F) <b>200°C (392°F):</b> +/- 0.55°C (+/- 1.00°F)
<b>Din Standard   Temperature Coefficient:</b>	DIN EN 60751 (IEC 751)   3850 ppm / °C
<b>Sensor Stability:</b>	+/- 0.03% after 1000 Hours @ 300°C (572°F)
<b>Response Time (63% Step Change):</b>	8 Seconds nominal
<b>Self-Heating   Maximum Operating Current:</b>	<b>100 Ohm RTD:</b> 7 mW/°C (Still Air)   5 mA   <b>1K Ohm RTD:</b> 4 mW/°C (Still Air)   3 mA
<b>Sensor Operating Temperature Range:</b>	-40 to 200°C (-40 to 392°F)
<b>Enclosure Specifications (Temperature, Flammability, NEMA/IP Ratings):</b>	<b>“-GD” Enclosure:</b> Galvanized Steel, -40°C to 121°C (-40°F to 250°F), NEMA 1 (IP10) <b>“-PB” Enclosure:</b> ABS Plastic, -30°C to 90°C (-22°F to 194°F), UL94-HB, Plenum Rated <b>“-BB” Enclosure:</b> Aluminum, -40°C to 121°C (-40°F to 250°F), Plenum Rated, NEMA 3R <b>“-4X” Enclosure:</b> Polystyrene Plastic, -40°C to 70°C (-40°F to 158°F), UL94-V2, NEMA 4X (IP 66)
<b>Storage Temperature Range:</b>	-40 to 85°C (-40 to 185°F)
<b>Operating Humidity Range:</b>	10 to 95% RH, non-condensing
<b>Probe Diameter   Thermowell Bore Diameter:</b>	0.250" (6.35mm)   0.260"
<b>Probe Material   Thermowell Material:</b>	304 Stainless Steel   304 Series Stainless Steel
<b>Thermowell Instrument   Process Thread Size:</b>	½" NPS (National Pipe Straight) Female Thread   ½" NPT (National Pipe Tapered) Male Thread
<b>Fitting Material   Flammability Rating:</b>	Polyamide 66 (High Performance Nylon 66)   UL94-HB
<b>Foam Pad Material   Flammability Rating:</b>	Neoprene/EPDM/SBR Polymer   UL94-HBF; FMVSS-302; MIL-R-6130C
<b>Fitting Thread Size:</b>	½" NPS (National Pipe Straight) Male Thread
<b>Lead Length   Conductor Size:</b>	14" (35.6 cm)   22 AWG (0.65mm)
<b>Lead Wire Insulation   Wire Rating:</b>	Etched Teflon (PTFE) Colored Leads   Mil Spec 16878/4 Type E
<b>Conductor Material:</b>	Silver Plated Copper
<b>Product Dimensions   Product Weight:</b>	See table on back of Product Data sheet
<b>Agency Approvals:</b>	CE, RoHS2, WEEE





**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)	12.0" (304.8 mm)	18.0" (457.2 mm)	24" (609.6 mm)
304/316 SS	Air/Gas/Steam <sup>1</sup>	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)	73.6 ft/s (22.4 m/s)	19.4 ft/s (5.9m/s)	8.8 ft/s (2.7m/s)	5.2 ft/s (1.6m/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)	26.9 ft/s (8.2 m/s)	11.3 ft/s (3.4m/s)	4.7 ft/s (1.43m/s)	2.5 ft/s (0.8m/s)

**Note 1:** Values are for Air/Gas/Steam and similar density media based upon Max pressure of 2900 PSI @ 1000°F (537.8°C) | **Note 2:** Values are for Water (No Glycol or other Chemicals factored in) @ 68 °F (20°C) and max pressure of 5700 PSI. (Calculated to ASME PTC 19.3 TW-2016 Code B31.1) | **Note 3:** 6-24" Machined Thermowells meet ASME PTC 19.3 TW-2016 Code B31.1.

**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 (56.6 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 <sup>2</sup>	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)

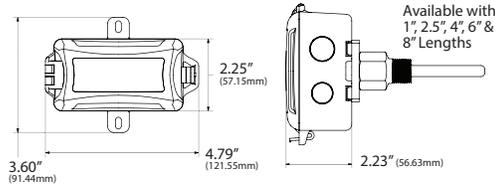
**Note 2:** Values are for Air/Gas/Steam and similar density media





**DIMENSIONAL DRAWINGS, WEIGHTS**

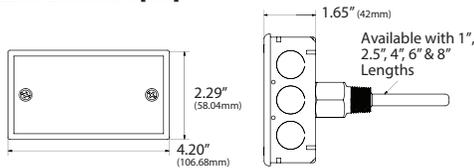
**Plastic Box Enclosure [PB]**



**Plastic Box Enclosure [PB] Weights**

ACI Model #	1.0"	2.5"	4.0"	6.0"	8.0"
A/xx-INW-yy-PB	0.20 lbs. (0.091 kg)	0.24 lbs. (0.109 kg)	0.28 lbs. (0.127 kg)	0.32 lbs. (0.145 kg)	0.36 lbs. (0.163 kg)
A/xx-I-yy-PB	N/A	0.24 lbs. (0.109 kg)	0.60 lbs. (0.272 kg)	0.64 lbs. (0.290 kg)	N/A
A/xx-IM-yy-PB	0.40 lbs. (0.182 kg)	0.58 lbs. (0.263 kg)	0.74 lbs. (0.336 kg)	0.92 lbs. (0.417 kg)	1.15 lbs. (0.522 kg)

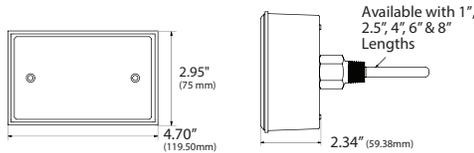
**Galvanized Enclosure [GD]**



**Galvanized Enclosure [GD] Weights**

ACI Model #	1.0"	2.5"	4.0"	6.0"	8.0"
A/xx-INW-yy-GD	0.62 lbs. (0.281 kg)	0.66 lbs. (0.299 kg)	0.70 lbs. (0.318 kg)	0.74 lbs. (0.336 kg)	0.78 lbs. (0.354 kg)
A/xx-I-yy-GD	N/A	0.88 lbs. (0.399 kg)	1.00 lbs. (0.454 kg)	1.04 lbs. (0.472 kg)	N/A
A/xx-IM-yy-GD	0.81 lbs. (0.367 kg)	1.00 lbs. (0.454 kg)	1.16 lbs. (0.526 kg)	1.32 lbs. (0.599 kg)	1.55 lbs. (0.703 kg)

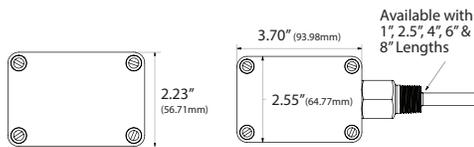
**Bell Box Enclosure [BB]**



**Bell Box Enclosure [BB] Weights**

ACI Model #	1.0"	2.5"	4.0"	6.0"	8.0"
A/xx-INW-yy-BB	0.64 lbs. (0.290 kg)	0.68 lbs. (0.308 kg)	0.70 lbs. (0.318 kg)	0.74 lbs. (0.336 kg)	0.80 lbs. (0.363 kg)
A/xx-I-yy-BB	N/A	1.02 lbs. (0.463 kg)	1.00 lbs. (0.454 kg)	1.04 lbs. (0.472 kg)	N/A
A/xx-IM-yy-BB	0.83 lbs. (0.376 kg)	1.02 lbs. (0.463 kg)	1.16 lbs. (0.526 kg)	1.32 lbs. (0.599 kg)	1.59 lbs. (0.721 kg)

**NEMA 4X Enclosure [4X]**

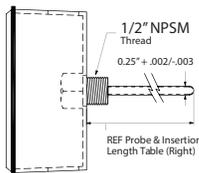


**NEMA 4X Enclosure [4X] Weights**

ACI Model #	1.0"	2.5"	4.0"	6.0"	8.0"
A/xx-INW-yy-4X	0.28 lbs. (0.127 kg)	0.32 lbs. (0.145 kg)	0.36 lbs. (0.163 kg)	0.40 lbs. (0.181 kg)	0.44 lbs. (0.200 kg)
A/xx-I-yy-4X	N/A	0.64 lbs. (0.290 kg)	0.68 lbs. (0.308 kg)	0.72 lbs. (0.327 kg)	N/A
A/xx-IM-yy-4X	0.48 lbs. (0.218 kg)	0.66 lbs. (0.299 kg)	0.82 lbs. (0.372 kg)	1.00 lbs. (0.454 kg)	1.27 lbs. (0.576 kg)

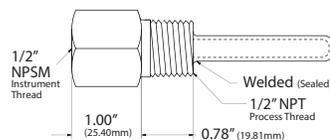
N/A = Not Available | xx = Sensor Type | yy = Insertion Length

**PROBE AND INSERTION LENGTH IMMERSION NO WELL**



**Pictured Above:** immersion no well (INW) sensor in Bell Box Enclosure (BB).

**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 #
3"	2.81" +/- 0.13"	A/xx-INW-1"-yy-zz	A/M1"
4.5"	4.31" +/- 0.13"	A/xx-INW-2.5"-yy-zz	A/2.5" or A/M2.5"
6"	5.81" +/- 0.13"	A/xx-INW-4"-yy-zz	A/4" or A/M4"
8"	7.81" +/- 0.13"	A/xx-INW-6"-yy-zz	A/6" or A/M6"
10"	9.81" +/- 0.13"	A/xx-INW-8"-yy-zz	A/M8"
13"	12.75" +/- 0.13"	A/xx-INW-12"-yy-zz	A/M12"
19"	18.75" +/- 0.13"	A/xx-INW-18"-yy-zz	A/M18"
25"	24.75" +/- 0.13"	A/xx-INW-24"-yy-zz	A/M24"





CUSTOM ORDERING WELDED THERMOWELL		Model # Example: <span style="border: 1px solid black; padding: 2px;">A/</span> <span style="border: 1px solid black; padding: 2px;">1K</span> <span style="border: 1px solid black; padding: 2px;">2W</span> <span style="border: 1px solid black; padding: 2px;">I</span> <span style="border: 1px solid black; padding: 2px;">1"</span> <span style="border: 1px solid black; padding: 2px;">GD</span> <span style="border: 1px solid black; padding: 2px;">NIST</span>	MODEL #
A. Sensor Series <i>No Selection Required</i>	A/ <span style="border-bottom: 1px solid black; display: inline-block; width: 150px;"></span> →	A. B. C. D. E. F. G.	A/
B. Model Series <i>Select One (1)</i>	100 = 100 Ohm Platinum RTD   1K = 1K Ohm Platinum RTD		
C. Number of Wires <i>Select One (1)</i>	2W = Two Wires   3W = Three Wires		
D. Configuration <i>Select One (1)</i>	I=Immersion with Welded Thermowell		
E. Insertion Length <i>Select One (1)</i>	2.5" = 2.5" Insertion   4" = 4" Insertion   6" = 6" Insertion		
F. Enclosure <i>Select One (1)</i>	GD=Galvanized   PB=Plastic   BB=Aluminum, NEMA 3R   4X=NEMA 4X		
G. NIST <i>Select One (1)</i>	---- = No NIST Certificate   NIST= NIST Certificate (3 Points)		

CUSTOM ORDERING MACHINED THERMOWELL		Model # Example: <span style="border: 1px solid black; padding: 2px;">A/</span> <span style="border: 1px solid black; padding: 2px;">1K</span> <span style="border: 1px solid black; padding: 2px;">2W</span> <span style="border: 1px solid black; padding: 2px;">IM</span> <span style="border: 1px solid black; padding: 2px;">1"</span> <span style="border: 1px solid black; padding: 2px;">GD</span> <span style="border: 1px solid black; padding: 2px;">NIST</span>	MODEL #
A. Sensor Series <i>No Selection Required</i>	A/ <span style="border-bottom: 1px solid black; display: inline-block; width: 150px;"></span> →	A. B. C. D. E. F. G.	A/
B. Model Series <i>Select One (1)</i>	100 = 100 Ohm Platinum RTD   1K = 1K Ohm Platinum RTD		
C. Number of Wires <i>Select One (1)</i>	2W = Two Wires   3W = Three Wires		
D. Configuration <i>Select One (1)</i>	IM=Immersion with Machined Thermowell		
E. Insertion Length <i>Select One (1)</i>	1" = 1" Insertion   2.5" = 2.5" Insertion   4" = 4" Insertion   6" = 6" Insertion   8" = 8" Insertion		
F. Enclosure <i>Select One (1)</i>	GD=Galvanized   PB=Plastic   BB=Aluminum, NEMA 3R   4X=NEMA 4X		
G. NIST <i>Select One (1)</i>	---- = No NIST Certificate   NIST= NIST Certificate (3 Points)		

Note: Machined Thermowells with lengths of 12", 18" and 24" are available and must be ordered separately | See the Machined Thermowells Data Sheet (Accessories)

CUSTOM ORDERING SENSOR ONLY NO THERMOWELL		Model # Example: <span style="border: 1px solid black; padding: 2px;">A/</span> <span style="border: 1px solid black; padding: 2px;">1K</span> <span style="border: 1px solid black; padding: 2px;">2W</span> <span style="border: 1px solid black; padding: 2px;">INW</span> <span style="border: 1px solid black; padding: 2px;">1"</span> <span style="border: 1px solid black; padding: 2px;">GD</span> <span style="border: 1px solid black; padding: 2px;">NIST</span>	MODEL #
A. Sensor Series <i>No Selection Required</i>	A/ <span style="border-bottom: 1px solid black; display: inline-block; width: 150px;"></span> →	A. B. C. D. E. F. G.	A/
B. Model Series <i>Select One (1)</i>	100 = 100 Ohm Platinum RTD   1K = 1K Ohm Platinum RTD		
C. Number of Wires <i>Select One (1)</i>	2W = Two Wires   3W = Three Wires		
D. Configuration <i>Select One (1)</i>	INW = Immersion without Thermowell		
E. Insertion Length <i>Select One (1)</i>	1" = 1" Insertion   2.5" = 2.5" Insertion   4" = 4" Insertion   6" = 6" Insertion   8" = 8" Insertion   12" = 12" Insertion   18" = 18" Insertion   24" = 24" Insertion		
F. Enclosure <i>Select One (1)</i>	GD=Galvanized   PB=Plastic   BB=Aluminum, NEMA 3R   4X=NEMA 4X		
G. NIST <i>Select One (1)</i>	---- = No NIST Certificate   NIST= NIST Certificate (3 Points)		

ACCESSORIES ORDERING		Model # Example: <span style="border: 1px solid black; padding: 2px;">NSG HEAT TRANSFER PASTRE 2 oz.</span>	Or	<span style="border: 1px solid black; padding: 2px;">102595</span>
Model #	Item #	Description		
NSG Heat Transfer Paste 2 oz.	102595	Thermal Grease, 2 oz. Tube, Silicone Free, -40 to 320°F (-40 to 160°C)		
NSG Heat Transfer Paste 16 oz.	140574	Thermal Grease, 16 oz. Jar, Silicon Free, -40 to 390°F (-40 to 198°C)		
A/2.5"	128349	2.5" (63.5 mm) Insertion, 304 Stainless, Welded, 1/2" NPT Thermowell		
A/4"	128350	4" (101.6 mm) Insertion, 304 Stainless, Welded, 1/2" NPT Thermowell		
A/6"	128351	6" (152.4 mm) Insertion, 304 Stainless, Welded, 1/2" NPT Thermowell		
A/M1"	128337	1" (25.4 mm) Insertion, 304 Stainless, Machined, 1/2" NPT Thermowell		
A/M2.5"	128338	2.5" (63.5 mm) Insertion, 304 Stainless, Machined, 1/2" NPT Thermowell		
A/M4"	128343	4" (101.6 mm) Insertion, 304 Stainless, Machined, 1/2" NPT Thermowell		
A/M6"	128344	6" (152.4 mm) Insertion, 304 Stainless, Machined, 1/2" NPT Thermowell		
A/M8"	138725	8" (203.2 mm) Insertion, 304 Stainless, Machined, 1/2" NPT Thermowell		
A/M12"	128339	12" (304.80 mm) Insertion, 304 Stainless, Machined, 1/2" NPT Thermowell		
A/M18"	128341	18" (457.20 mm) Insertion, 304 Stainless, Machined, 1/2" NPT Thermowell		
A/M24"	128342	24" (609.6 mm) Insertion, 304 Stainless, Machined, 1/2" NPT Thermowell		
A/M2.5" - 316SS	128352	2.5" (63.5 mm) Insertion, 316 Stainless, Machined, 1/2" NPT Thermowell		
A/M4" - 316SS	128353	4" (101.6 mm) Insertion, 316 Stainless, Machined, 1/2" NPT Thermowell		
A/M6" - 316SS	128354	6" (152.4 mm) Insertion, 316 Stainless, Machined, 1/2" NPT Thermowell		

