

IMMERSION

Stainless Steel Immersion, Balco RTD

The ACI Balco Immersion Series features a 1/4" diameter stainless steel probe with two, 14 inch 22 AWG Etched Teflon colored lead wires to differentiate the many different sensor types. 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 the thermal response times using our high quality, thermally conductive epoxy. The immersion sensors come standard with a welded thermowell "-I" version but can also be ordered without the thermowell "-INW" version. The "-INW" Version includes a standard 1/2" NPS (National Pipe Straight) process thread to be used with an optional machined thermowell or in an existing thermowell application. This series can be ordered with optional NEMA rated weather proof enclosures and NIST

Certificates as referenced on the back of the product data sheet.

Applications: Chilled Water Systems, Hot Water Systems, Boilers, Pumps, Compressor, Chillers

The ACI Balco 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 website, www.workaci.com.

PRODUCT SPECIFICATIONS

Sensor Type Sensor Curve:	Balco RTD PTC (Positive Temperature Coefficient)
Number Sensing Points:	One
Number Wires:	Two (Non-Polarity Sensitive)
Sensor Output @ 70°F (21°C) Lead Wire Colors:	1000 Ohms nominal (Orange/Yellow)
Sensor Accuracy:	70°F (21°C): +/- 1%
Temperature Coefficient (0-100°C):	4618 ppm/°C
Sensor Stability:	+/- 0.05% after 1000 Hours @ 150°C (302°F)
Response Time (63% Step Change):	8 Seconds nominal
Operating Current (Maximum)	5 mA
Sensor Operating Temperature Range	-40 to 121°C (-40 to 250°F)
Enclosure Specifications (Temperature, Flammability, NEMA/IP Ratings):	<p>"-GD" Enclosure: Galvanized Steel, -40 to 121°C (-40 to 250°F), NEMA 1 (IP10)</p> <p>"-PB" Enclosure: ABS Plastic, -30 to 90°C (-22 to 194°F), UL94-HB</p> <p>"-BB" Enclosure: Aluminum, -40 to 121°C (-40 to 250°F), Plenum Rated, NEMA 3R</p> <p>"-4X" Enclosure: Polystyrene Plastic, -40 to 70°C (-40 to 158°F), UL94-V2, NEMA 4X (IP 66)</p>
Storage Temperature Range:	-40 to 85°C (-40 to 185°F)
Operating Humidity Range:	10 to 95% RH, non-condensing
Probe Diameter Thermowell Bore Diameter:	0.250" (6.35mm) 0.260"
Probe Material Thermowell Material:	304 Stainless Steel 304 Series Stainless Steel
Thermowell Instrument Thread Process Thread:	1/2" NPS (National Pipe Straight) Thread 1/2" NPT (National Pipe Tapered) Male Thread
Fitting Material Flammability Rating:	Polyamide 66 (High Performance Nylon 66) UL94-HB
Fitting Thread Size:	1/2" NPS (National Pipe Straight) Male Thread
Foam Pad Material Flammability Rating:	Neoprene/EPDM/SBR Polymer UL94-HBF; FMVSS-302; MIL-R-6130C
Lead Length Conductor Size:	14" (35.6 cm) 22 AWG (0.65mm)
Lead Wire Insulation Wire Rating:	Etched Teflon (PTFE) Colored Leads Mil Spec 16878/4 Type E
Conductor Material:	Silver Plated Copper
Product Dimensions Product Weight:	See table on back of Product Data sheet
Agency Approvals:	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)
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)

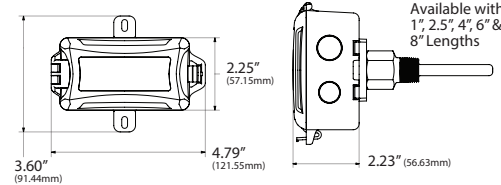
MAXIMUM FLUID VELOCITY RATINGS Two-Part Fabricated / Welded Thermowell

Straight Shank Insertion Length "U"		2.5" (63.5 mm)	4.0" (101.6 mm)	6.0" (152.4 mm)
Material:	Media Type:			
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

Plastic Box Enclosure [PB]



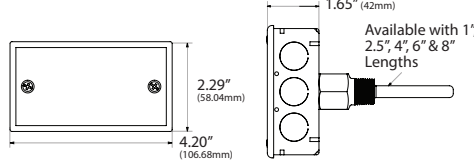
xx = Sensor Type | yy = Insertion Length

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	0.56 lbs. (0.254 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)

N/A = Not Available

Galvanized Enclosure [GD]



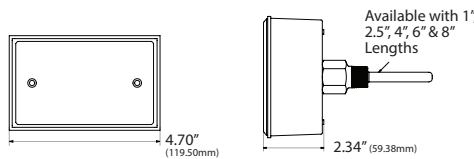
xx = Sensor Type | yy = Insertion Length

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)

N/A = Not Available

Bell Box Enclosure [BB]



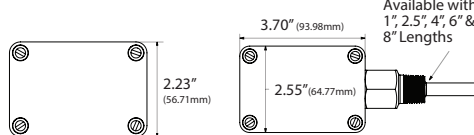
xx = Sensor Type | yy = Insertion Length

Bell Box Enclosure [GD] 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)

N/A = Not Available

NEMA 4X Enclosure [4X]



xx = Sensor Type | yy = Insertion Length

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

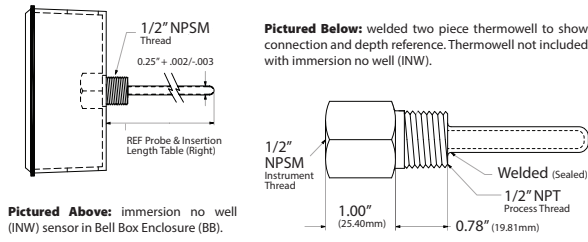
Standard Views

Product Weights





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"

ORDERING Welded Thermowell or No Thermowell

Model # Example: A/ BALCO I 4" GD NIST

A. Sensor Series No Selection Required	A/	MODEL #	A/
B. Model Series No Selection Required	BALCO	MODEL #	BALCO
C. Configuration Select One (1)	I = Immersion with Welded Thermowell INW = Immersion without Welded Thermowell		
D. Insertion Length Select One (1)	2.5" = 2.5" Insertion 4" = 4" Insertion 6" = 6" Insertion		
E. Enclosure Select One (1)	GD = Galvanized PB = Plastic BB = Aluminum, NEMA 3R 4X = NEMA 4X		
F. NIST Select One (1)	---- = No NIST Certificate NIST = NIST Certificate (3 Points)		

ORDERING Machined Thermowell or No Thermowell

Model # Example: A/ BALCO IM 4" GD NIST

A. Sensor Series No Selection Required	A/	MODEL #	A/
B. Model Series No Selection Required	BALCO	MODEL #	BALCO
C. Configuration Select One (1)	IM = Immersion with Machined Well INW = Immersion without Thermowell		
D. Insertion Length Select One (1)	1" = 1" Insertion 2.5" = 2.5" Insertion 4" = 4" Insertion 6" = 6" Insertion 8" = 8" Insertion		
E. Enclosure Select One (1)	GD = Galvanized PB = Plastic BB = Aluminum, NEMA 3R 4X = NEMA 4X		
F. NIST Select One (1)	---- = No NIST Certificate NIST = NIST Certificate (3 Points)		

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

ACCESSORIES ORDERING

Model # Example: NSG HEAT TRANSFER PASTE 20Z -OR- 102595

Model #	Item #	Description
NSG HEAT TRANSFER PASTE 20Z	102595	Thermal Grease, 2 oz. Tube, Silicone Free, -40 to 320°F (-40 to 160°C)
NSG HEAT TRANSFER PASTE 160Z	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

