

# ADT 875 - Series Dry Well Calibrators



## Features

- Three models ranging from  $-40^{\circ}\text{C}$  to  $660^{\circ}\text{C}$
- Portable, rugged, and quick to temperature
- Metrology-level performance in stability, uniformity, accuracy and loading effect
- Dual-zone control
- Full HART field communication
- Process calibrator option provides a multi-channel readout for a reference thermometer, RTDs and TCs, task documentation, and HART communication
- Color touch screen display
- Choose your own range option
- Set point control by reference

Rev. # 20200422

By DAkkS according to DIN EN ISO / IEC 17025: 2018 accredited laboratory. The accreditation is valid only for the quantities listed in the accreditation scope. (Our Laboratory number is D-K-15055-01-00)

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Pressure • Electrical Quantities • Temperature • Flow • Humidity • Masses and Scales

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## **Overview**

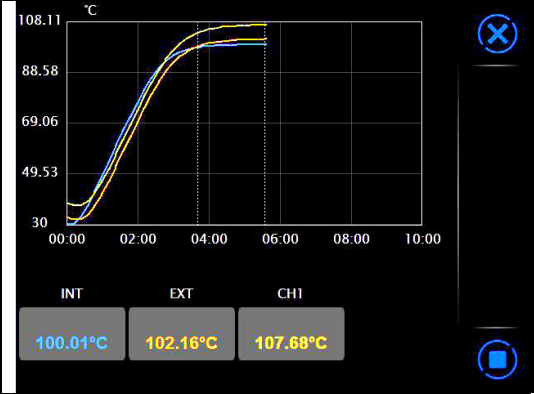

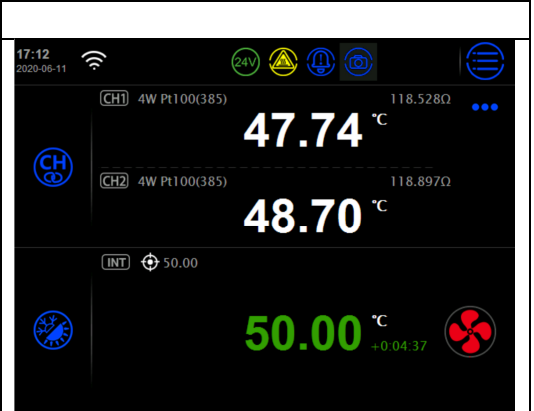
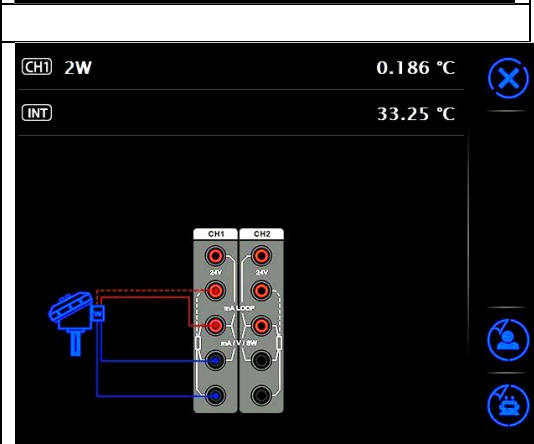
If you are serious about portable temperature calibration tools, then you know a good dry well calibrator is more than just a stable heat source. The Additel 875 Series Dry Well Calibrators combine excellent performance in stability, radial and axial uniformity, and loading with speed, ruggedness and portability. But we don't stop there! The Process Calibrator option adds the capabilities of a three-channel thermometer readout and a documenting process calibrator. We've also incorporated a unique option to select your own temperature range within the range of the model selected. We're calling this the CYOR option or Choose Your Own Range option. When you purchase the CYOR option, you pick the upper and lower temperature range needed and we calibrate and optimize the dry well's performance over your selected range. Each unit has a color touch screen display, dual-zone control, and much more. You are just going to love these new dry wells!

### **Process Calibrator Option**



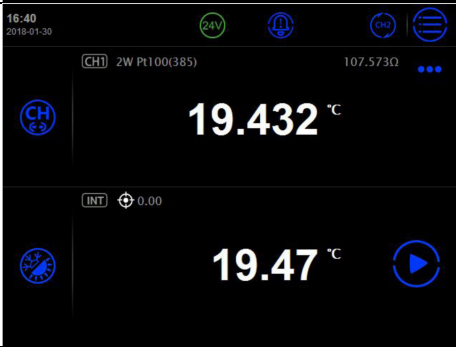

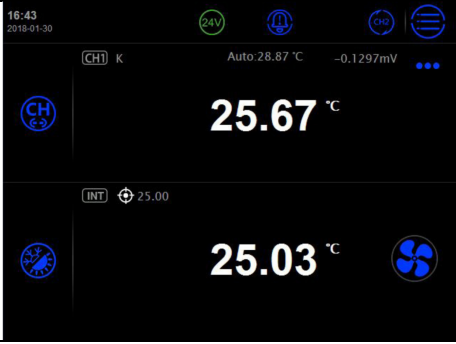



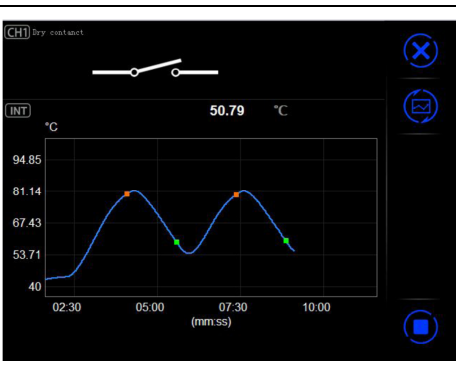

Each model offer has a Process Calibrator (PC) option. This process calibrator option combines the many features found in a HART documenting process calibrator with the temperature dry well. This option includes the ability to measure a reference PRT and two device under test channels which can measure, mA, voltage, switch, RTD or thermocouple. In addition to these measurement functions, this calibrator has full documenting capability of creating tasks, saving as found and as left results, and HART communication. The snap shot feature allows you to capture all information displayed on the screen with the push of a button. This optional add-on allows for data logging of all channels on an auto step function and a ramp function. By utilizing the reference PRT, you can select to control to the dry well set point using the internal sensor or the external reference PRT.

**Features**

Specification	Display 1	Display 2																																
Task	<table border="1"> <thead> <tr> <th>Set point °C</th> <th>Standard °C</th> <th>Indication °C</th> <th>Error °C</th> </tr> </thead> <tbody> <tr> <td colspan="4">Repeat 1</td> </tr> <tr> <td>20.00</td> <td>20.00</td> <td>20.08</td> <td>0.08</td> </tr> <tr> <td>40.00</td> <td>40.01</td> <td>39.95</td> <td>-0.06</td> </tr> <tr> <td>60.00</td> <td>59.99</td> <td>59.93</td> <td>-0.06</td> </tr> <tr> <td>80.00</td> <td>79.98</td> <td>80.04</td> <td>0.06</td> </tr> <tr> <td>100.00</td> <td>80.25</td> <td>80.05</td> <td></td> </tr> </tbody> </table>	Set point °C	Standard °C	Indication °C	Error °C	Repeat 1				20.00	20.00	20.08	0.08	40.00	40.01	39.95	-0.06	60.00	59.99	59.93	-0.06	80.00	79.98	80.04	0.06	100.00	80.25	80.05						
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mA Measurement		<p>Two independent measurement channel</p> <p>EXT. REF S External reference thermometer input to read PRTs and PRTs</p> <p>24V Loop power</p> <p>2-, 3-, or 4-wire RTD measurement</p> <p>±30 mA, ±30 V, and switch measurement</p> <p>TC measurement of 13 different types</p>																																
V Measurement		<p>Prozess Calibrator Optional Electronics</p>																																
Auto Step		<table border="1"> <thead> <tr> <th>Set Point °C</th> <th>INT °C</th> <th>CH1 °C</th> <th>REF Pt100(385)-1 °C</th> </tr> </thead> <tbody> <tr> <td>20</td> <td>20</td> <td>19.87</td> <td>20.61</td> </tr> <tr> <td>50</td> <td>49.92</td> <td>49.67</td> <td>50.41</td> </tr> <tr> <td>80</td> <td>79.92</td> <td>79.59</td> <td>81.22</td> </tr> <tr> <td>110</td> <td>110.01</td> <td>109.96</td> <td>112.41</td> </tr> <tr> <td>80</td> <td>79.99</td> <td>80.34</td> <td>81.87</td> </tr> <tr> <td>50</td> <td></td> <td></td> <td></td> </tr> <tr> <td>20</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Set Point °C	INT °C	CH1 °C	REF Pt100(385)-1 °C	20	20	19.87	20.61	50	49.92	49.67	50.41	80	79.92	79.59	81.22	110	110.01	109.96	112.41	80	79.99	80.34	81.87	50				20			
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Remote Control																																		

Specification	Display 1	Display 2
Data Logging		
Stability Indicator		
Connection Instruction		

**Applications**

Specification	Display	Application
<p>PRT Test (External Reference)</p>		
<p>RTD Test</p>		
<p>TC Test</p>		
<p>Transmitter Test</p>		
<p>Switch Test</p>		

## Specifications

### Base Unit Dry Well Specifications

Specification	875-155	875-350	875-660
Temperature Range at 23°C	-40°C to 155°C	33°C to 350°C	33°C to 660°C
Display Accuracy	± 0.18°C at Full Range	± 0.2°C at Full Range	± 0.3°C at 33°C
			± 0.3°C at 420°C
			± 0.5°C at 660°C
Stability (30 min.)	0.01°C at Full Range	± 0.02°C at Full Range	± 0.02°C at 33°C
			± 0.03°C at 50°C
			± 0.04°C at 420°C
			± 0.04°C at 660°C
Axial Uniformity at 60 mm (2.4 in)	± 0.07°C at Full Range	± 0.04°C at 33°C	± 0.05°C at 33°C
		± 0.1°C at 200°C	± 0.3°C at 420°C
		± 0.2°C at 350°C	± 0.5°C at 660°C
Radial Uniformity	± 0.01°C at Full Range	± 0.01°C at 33°C	± 0.02°C at 33°C
		± 0.015°C at 200°C	± 0.05°C at 420°C
		± 0.02°C at 350°C	± 0.1°C at 460°C
Loading Effect	± 0.01°C (Display Sensor)	± 0.15°C (Display Sensor)	± 0.15°C (Display Sensor)
	± 0.02°C (External Sensor)	± 0.015°C (External Sensor)	± 0.035°C (External Sensor)
Hysteresis (Display Sensor)	0.025°C	0.03°C	0.1°C
Environmental Conditions	8°C to 38°C guaranteed accuracy		
Storage Conditions	0°C to 50°C, 0% RH non-condensing, 3000 M altitude for normal operation		
IP Rating	IP20		
Immersion Depth	145 mm (5.7 in)	150 mm (5.9 in)	
Insert OD	25.8 mm (1.02 in)	24.8 mm (0.98 in)	
Heating Time	13 min.: -40°C to 155°C	10 min.: 33°C to 350°C	15 min.: 33°C to 660°C
	5 min.: -40°C to 23°C		
	8 min.: 23°C to 155°C		
Cooling Time	28 min.: 155°C to 40°C	15 min.: 350°C to 100°C	23 min.: 660°C to 100°C
	8 min.: 155°C to 23°C	10 min.: 100°C to 50°C	12 min.: 100°C to 50°C
	20 min.: 23°C to 40°C	10 min.: 50°C to 33°C	12 min.: 50°C to 33°C
Typical Time to Stability	10 min		
Resolution	0.01°C		
Units	°C, °F, and K		
Display	165 mm (6.5 in) colour touch screen		
Size (H x B x T)	320 x 170 x 330 mm (12.6 x 6.7 x 13.0 in)		
Weight	9.9 kg (21.8 lbs)	8.2 kg (18.1 lbs)	
Power Requirements	90 – 254 VAC, 45-65 Hz, 580 W	90-254 VAC, 45-65 Hz, 1200 W	
Mechanical Testing	Vibration: 2g (10-500 Hz), 30 min for 2 sides		
	Impact: 4g three times		
	Drop test: 500 mm (19.6 in)		
Communication	USB B, RJ45, WiFi, Bluetooth; (USB A not for customer usable)		
Localization	English, Chinese, Japanese, Russian, German, French, Italian & Spanish		
Warranty	1 year		

Specification	Description
Readout Accuracy for 100 ohm PRT (Probe Accuracy not included)	$\pm 0.009^{\circ}\text{C}$ at $-40^{\circ}\text{C}$
	$\pm 0.010^{\circ}\text{C}$ at $0^{\circ}\text{C}$
	$\pm 0.012^{\circ}\text{C}$ at $50^{\circ}\text{C}$
	$\pm 0.017$ at $155^{\circ}\text{C}$
	$\pm 0.019^{\circ}\text{C}$ at $200^{\circ}\text{C}$
	$\pm 0.026^{\circ}\text{C}$ at $350^{\circ}\text{C}$
	$\pm 0.030^{\circ}\text{C}$ at $420^{\circ}\text{C}$
	$\pm 0.042^{\circ}\text{C}$ at $660^{\circ}\text{C}$
Readout Resolution	1 $\Omega$
Reference Resistance Range	0 $\Omega$ to 400 $\Omega$
Reference Resistance Accuracy	0 $\Omega$ to 50 $\Omega$ : 0,002 $\Omega$
	50 $\Omega$ to 400 $\Omega$ : 0,008% RD
Reference Characterizations	IST-90, CVD, IEC-751, Resistance
Reference Measurement Capability	4-wire PRT
Reference Probe Connection	6-pin lemo smart connector
RTD Channels	2
RTD Measurement Accuracy (excl. sensor) Compliance	0 $\Omega$ to 25 $\Omega$ : 0,002 $\Omega$
	25 $\Omega$ to 400 $\Omega$ : 0,004% RD
	400 $\Omega$ to 4K $\Omega$ : 0,008% RD
RTD Measurement Resolution	0 $\Omega$ to 400 $\Omega$ : 1 m $\Omega$
	400 $\Omega$ to 4K $\Omega$ : 0,01 $\Omega$
RTD Measurement Resistance Range	0 $\Omega$ to 4 K $\Omega$
RTD Characterizations	PT10, PT25, PT50, PT100, PT200, PT500, PT1000, CU10, CU50, CU100, NI100, NI120
RTD Connection	Four 4 mm input jacks
RTD-Channels	2 channels. Both accept 2, 3, or 4-wire RTDs
TC Channel	2
TC Measurement Channel	Mini TC terminals: Accepting S, R, K, B, N, E, J, T, C, D, G, L, and U
TC Measurement Accuracy (excl. sensor)	Type K
	$\pm 0.13^{\circ}\text{C}$ at $0^{\circ}\text{C}$
	$\pm 0.16^{\circ}\text{C}$ at $155^{\circ}\text{C}$
	$\pm 0.19^{\circ}\text{C}$ at $350^{\circ}\text{C}$
	$\pm 0.25^{\circ}\text{C}$ at $660^{\circ}\text{C}$
TC-Range	-75 mV to 75 mV
TC-Resolution	0.0001 V, Input Impedance <100 M $\Omega$
TC Voltage Accuracy	0.02% RD + 5 $\mu\text{V}$
Internal CJC Accuracy	$\pm 0.35$ (ambient from 0 $^{\circ}\text{C}$ to 50 $^{\circ}\text{C}$ )
Current Range	-30 mA to 30 mA
Current Accuracy	0.02% RD + 2 $\mu\text{A}$
Current Resolution	0.001 mA, Input Impedance: < 10 $\Omega$
Voltage Range	-12V to 12 V and -30 V to 30 V
Voltage Accuracy	$\pm 0.02\%$ RD + 2 mV
Voltage Resolution	0.001V; Input impedance: < 1M $\Omega$
Switch Test	Mechanical or Electrical
DC 24V Output	24V $\pm$ 1V, MAX60 mA

Specification	Description
HART Communicator	Read, configure and calibrate HART devices – DD files updated periodically Optional (ADT875PC Model)
Documentation	Up to 1,000 tasks which store up to 10 results each containing as found and as left data. Snap shot feature allows for screen captures. Records auto step and ramp functions..
Temperature Coefficient 0°C to 8°C and 38°C to 50°C	ADT875 (PC) -155: ± 0.005°C/°C
	ADT875 (PC) -350/660: ±0.01 °C/°C
	Ref Readout: ±5 ppm FS/°C
	RTD Readouts: ±2 ppm FS/°C
	TC Readouts: ±5 ppm FS/°C
	Current: ±5 ppm FS/°C
	Voltage: ±5 ppm FS/°C




**TC Measurement Specification and Calculation** (Process Calibrator (PC)Option

TC Type	Temperature	Error(°C) <sup>[1]</sup>	TC Type	Temperature(°C)	Error (°C) <sup>[1]</sup>
B	250	±2	L	-40	±0.1
	350	±1.44		0	±0.1
	660	±0.84		155	±0.12
C	0	±0.38		350	±0.16
	155	±0.34		660	±0.21
	350	±0.33		N	-40
660	±0.38	0	±0.2		
D	0	±0.52	155		±0.19
	155	±0.37	350		±0.2
	350	±0.33	660		±0.24
	660	±0.36	R		-40
E	-40	±0.09		0	±0.95
	0	±0.09		155	±0.63
	155	±0.1		350	±0.56
	350	±0.13		660	±0.54
	660	±0.19		S	-40
G	0	±3.85	0		±0.93
	155	±0.71	155		±0.65
	350	±0.43	350		±0.6
	660	±0.36	660		±0.6
J	-40	±0.1	T	-40	±0.14
	0	±0.1		0	±0.13
	155	±0.12		155	±0.13
	350	±0.16		350	±0.15
	660	±0.21		400	±0.15
K	-40	±0.13		U	-40
	0	±0.13	0		±0.13
	155	±0.16	155		±0.13
	350	±0.19	350		±0.14
	660	±0.25	600		±0.17

[1]Excluding cold junction compensation errors










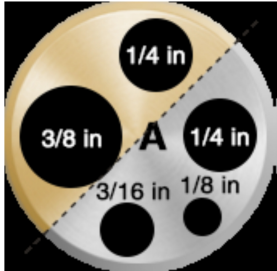
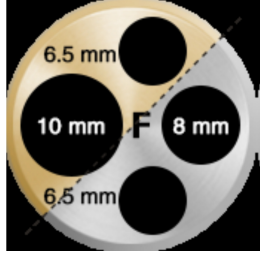
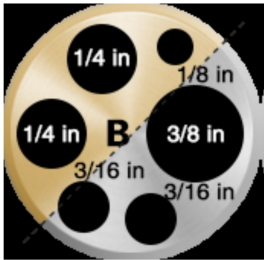

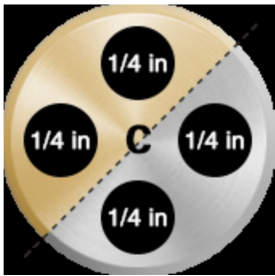
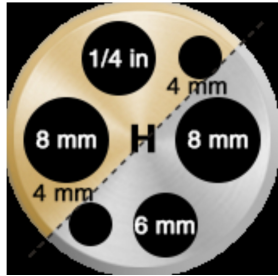
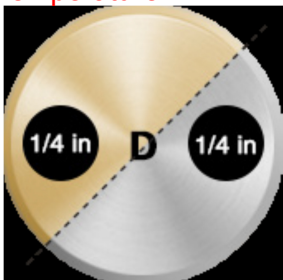

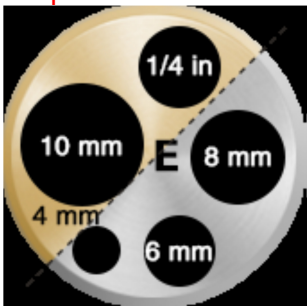
**CYOR Option (Choose Your OWN Range)**

Optional Accessories		
Model	Description	Picture
9875-155-CYOR	Range selection for ADT875-155 Dry Well Calibrator, Customize Range	
9875-350-CYOR	Range selection for ADT875-350 Dry Well Calibrator, Customize Range	
9875-660-CYOR	Range selection for ADT875-660 Dry Well Calibrator, Customize Range	

## Accessories

Standard Accessories		
Model	Quantity	Picture
Dry well and selected insert	1 pc.	
Power cable	1 pc.	
USB Cable	1 pc.	
Insert removal tool	1 pc.	
Thermal Shield (ADT875/PC-350/660 only)	1 pc.	
Silica gel plug (ADT875/PC-155 only)	1 Set (3 pcs.)	
Insulation plug (ADT875/PC-155 only)	1 pcs.	
Test leads (ADT875PC only)	2 Set (446 pcs.)	
Certificate of calibration	1 pc.	
CD Manual	1 pc.	

Optional Accessories		
Model	Description	Picture
9915-875	Carry case for ADT875-155/350/660 with wheels	
ADT110-875-X-Insert-X	Insert for ADT875, see insert ordering information on the next page	
AM17XX-12-ADT	Secondary PRT with dry well connector, see PRT information on page 14	
AM17XX-BEND-ADT	Bend Secondary PRT with dry well connector, see PRT information on page 14	
9070	Smart connector for reference PRT used with ADT878 Dry Well Calibrator	
9071	Connector Adapter from smart connector to 4-wire with goldplated spades for ADT878 Dry Well Calibrator	
9072	Smart connector with clamps for reference PRT used with ADT878 Dry Well Calibrator	
9080	CJC Cable Kit (includes TC to Plug, TC to TC, TC to Banana, and B,E,J,K,N,R,S,T,U cables)	

Insert Information			
Model	Specification	Model	Specification
A	High Temperature 	F	High Temperature 
	Low Temperature		Low Temperature
B	High Temperature 	G	High Temperature 
	Low Temperature		Low Temperature
C	High Temperature 	H	High Temperature 
	Low Temperature		Low Temperature
D	High Temperature 	Z	High Temperature 
	Low Temperature		Low Temperature
E	High Temperature 		
	Low Temperature		



AM17XX-12-ADT



AM17XX-BEND-ADT

Secondary PRT Information				
Specification	AM1710 Series	AM1730 Series	AM1751 Series	AM1760 Series
Temperature Range <sup>[3]</sup>	-60°C to 160°C	-200°C to 420°C	-200°C to 670°C	-200°C to 670°C
Resistance at 0°C	Nominal 100 Ω			
Temperature Coefficient	0.003925 Ω/Ω/°C			
Calibrated Accuracy (k=2) <sup>[2][3]</sup>	±0.025°C at -40°C ±0.015°C at 0.01°C ±0.025°C at 160°C	±0.025°C at -40°C ±0.015°C at 0.01°C ±0.035°C at 420°C	±0.025°C at -40°C ±0.015°C at 0.01°C ±0.035°C at 420°C ±0.05°C at 661°C	±0.010°C at -196°C ±0.006°C at 0.01°C ±0.015°C at 420°C ±0.025°C at 661°C
Drift	±0.01°C at TPW after 100 hours at 160°C	±0.01°C at TPW after 100 hours at 420°C	±0.01°C at TPW after 100 hours at 661°C	±0.004°C at TPW after 100 hours at 661°C
Short Term Stability	± 0.007°C			± 0.002°C
Thermal Shock	±0.005°C after 10 times thermal cycles from minimum to maximum temperatures			±0.002°C after (10) thermal cycles from min to max temperatures
Hysteresis	<=0.005°C			<=0.001°C
Self-heating	50 mW/°C			0.0015°C at 0.5 mA
Response Time	9 seconds for 63% response to step change in water moving at 3 feet per second			
Measurement Current	0.5 mA or 1 mA			
Sensor Length	32 mm			42 mm
Sensor Location	5 mm from tip			
Insulation Resistance	1000 MΩ at room temperature			
Sheath Material	Stainless Steel	Inconel tm		
Dimension	<b>AM1710-12-ADT</b> 0,25 in dia X 12 in (6.35 mm X 305 mm)	<b>AM1730-12-ADT</b> 0.25 in dia X 12 in (6.35 mm X 305 mm)	<b>AM1751-12-ADT</b> 0.25 in dia X 12 in (6.35 mm X 305 mm)	<b>AM1760-12-ADT</b> 0.25 in dia X 12 in (6.35 mm X 305 mm)
	<b>AM1710-BEND-ADT</b> 0.25 in dia X 12 in (6.35 mm X 305 mm), 90° bend at 7.4 inch (190 mm) from probe end	<b>AM1730-BEND-ADT</b> 0.25 in dia X 12 in (6.35 mm X 305 mm), 90° bend at 9.6 inch (245 mm) from probe end	<b>AM1751-BEND-ADT</b> 0.25 in dia X 12 in (6.35 mm X 305 mm), 90° bend at 9.6 inch (245 mm) from probe end	<b>AM1760-BEND-ADT</b> 0.25 in dia X 12 in (6.35 mm X 305 mm), 90° bend at 9.6 in (245 mm) from probe end
External Leads	Teflon <sup>tm</sup> –insulated copper wire, 4 leads, 2.5 meters			
Handle Dimension	15 mm (AD) x 65 mm (L)			
Handle Temperature Range <sup>[1]</sup>	-50°C to 160°C C	-50°C to 180°C		
Calibration	NIST traceable calibration (DAkkS Certificate available on request)			

[1] Handle temperature outside this range will cause damage to the probe.

[2] Includes calibration an 100 hours drift

[3] Probe calibration ranges may differ from probe temperature ranges (see Calibrated Accuracy for calibration ranges).

