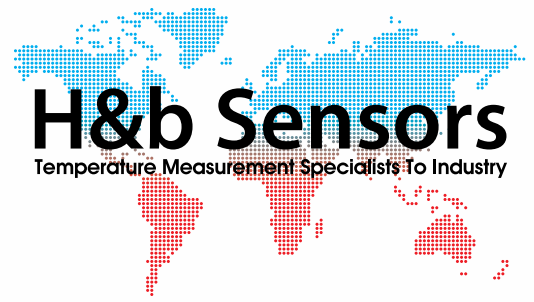
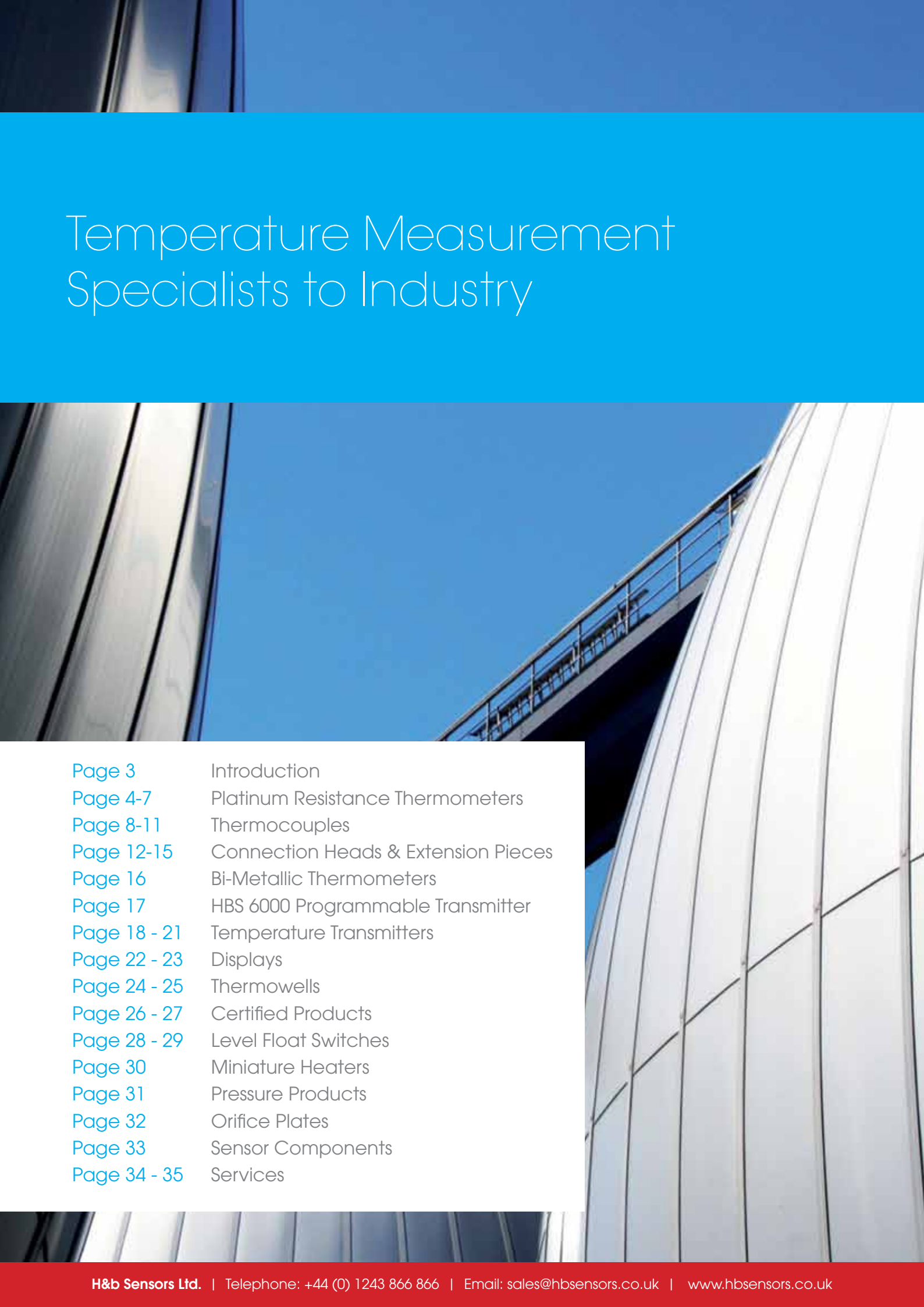




product

OVERVIEW



Temperature Measurement Specialists to Industry

Page 3	Introduction
Page 4-7	Platinum Resistance Thermometers
Page 8-11	Thermocouples
Page 12-15	Connection Heads & Extension Pieces
Page 16	Bi-Metallic Thermometers
Page 17	HBS 6000 Programmable Transmitter
Page 18 - 21	Temperature Transmitters
Page 22 - 23	Displays
Page 24 - 25	Thermowells
Page 26 - 27	Certified Products
Page 28 - 29	Level Float Switches
Page 30	Miniature Heaters
Page 31	Pressure Products
Page 32	Orifice Plates
Page 33	Sensor Components
Page 34 - 35	Services



Introduction

Established in 1978, H&b Sensors specialise in the manufacture of a wide range of temperature sensors and associated products in accordance with our ISO 9001:2008 certified management system. Exporting temperature measurement products to over 100 countries worldwide, H&b have become a world leader in the temperature sensor market.

H&b's core product range includes platinum resistance thermometers, thermocouples, thermowells, bi-metallic thermometers, platinum detectors, temperature transmitters, level float switches, and miniature heaters.

H&b supply temperature products into a wide range of different industries including: Petro-Chemical, Oil & Gas, Power Generation, Energy Management, Aerospace, Automotive, Marine, Pharmaceutical, Machine Building, Refrigeration, Food and Drink.

Our commitment to our customers is for a fast, efficient and cost effective service. We are confident that through our wide range of professional expertise and flexibility we can offer a service second to none.

Platinum Resistance Thermometers

H&b Sensors manufacture both mineral insulated and fabricated platinum resistance thermometers.

Suitable for temperature ranges between -200°C and $+600^{\circ}\text{C}$, platinum resistance thermometers provide highly repeatable, long term and high accuracy readings. Utilising our specialist manufacturing facilities, H&b are able to manufacture platinum resistance temperature sensors for virtually any industrial or scientific application in accordance with national, international and customer specific standards.

Built to customer specification; platinum resistance thermometers may be configured with options including; but not limited to the following: connection head, wiring configuration, termination style, sheath material, lengths and diameters, detector type, tip style, thermowells and surface mount packages.

In addition H&b are licensed to manufacture sensor assemblies for use in hazardous areas requiring Exd or Exia certification.



Sensor Types

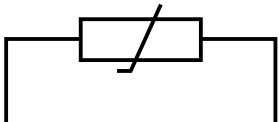
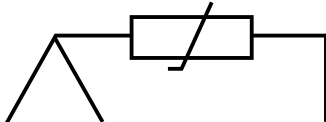
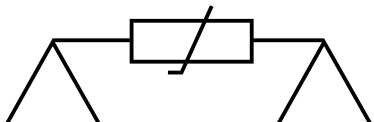
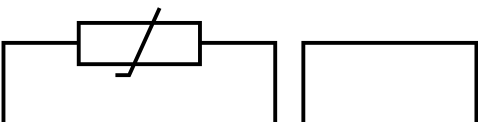
- Pt10** Platinum, $10\ \Omega$ at 0°C
- Pt100** Platinum, $100\ \Omega$ at 0°C
- Pt130** Platinum, $130\ \Omega$ at 0°C
- Pt500** Platinum, $500\ \Omega$ at 0°C
- Pt1000** Platinum, $1000\ \Omega$ at 0°C

Others available on request

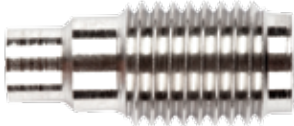
Detector Tolerances

Class	Accuracy @ 0°C
1/10 DIN	$\pm 0.03^{\circ}\text{C}$
1/5 DIN	$\pm 0.06^{\circ}\text{C}$
1/3 DIN	$\pm 0.08^{\circ}\text{C}$
Class A	$\pm 0.15^{\circ}\text{C}$
Class B	$\pm 0.30^{\circ}\text{C}$

Wiring Configurations

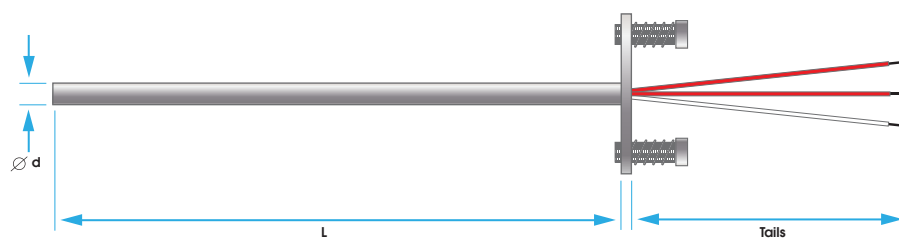
	
2 Wire	3 Wire
	
4 Wire	4 Wire Compensated (Blind Loop)

Cold End Connections

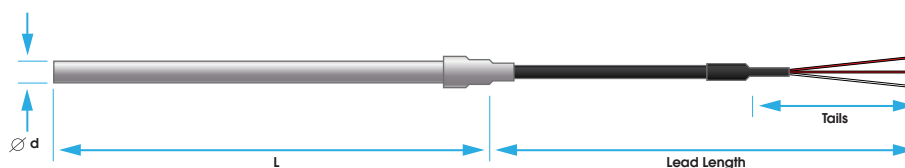
	
Plain Pot	ISO Pot
	
Plugs and Connectors	Cable
	
Terminal Block	Transmitter (See pages 18 - 19 for technical information)

Platinum Resistance Thermometers

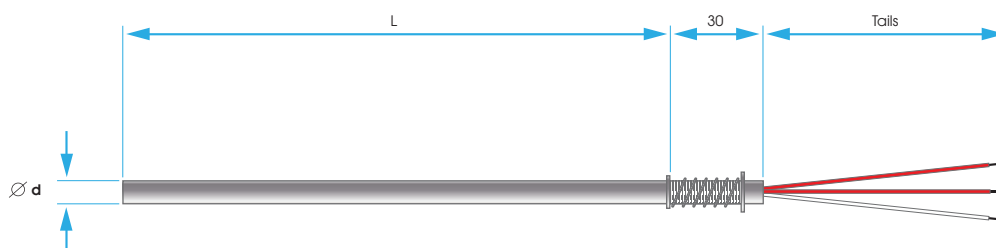
Sensor Configurations



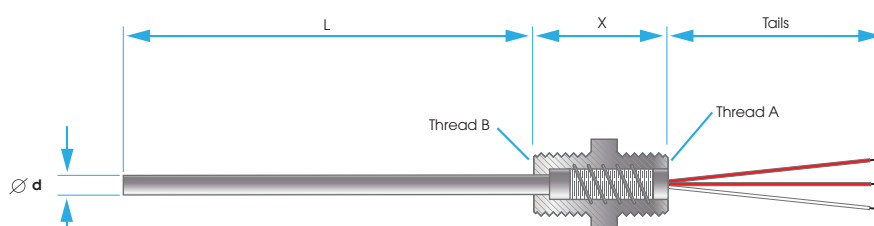
Spring Loaded Din Plate Insert



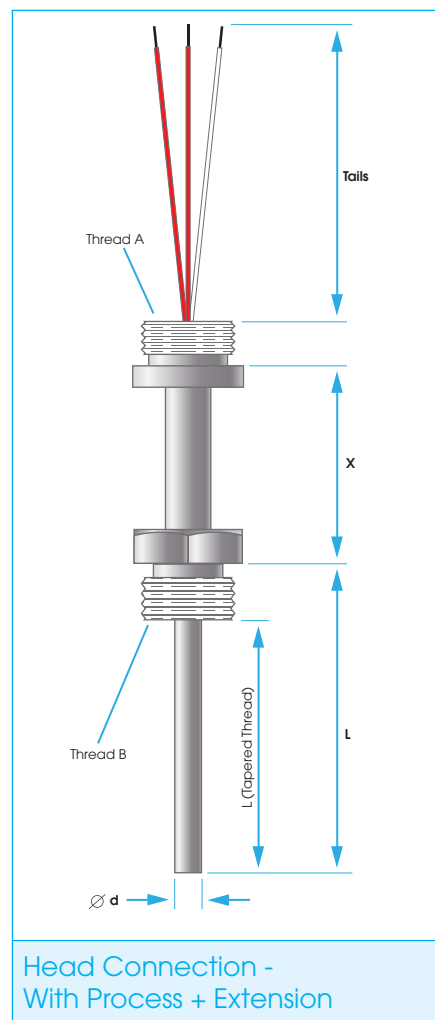
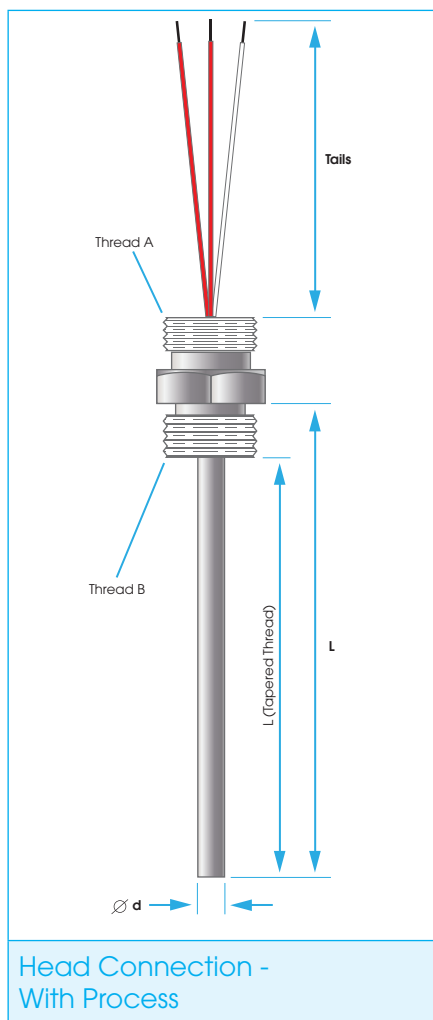
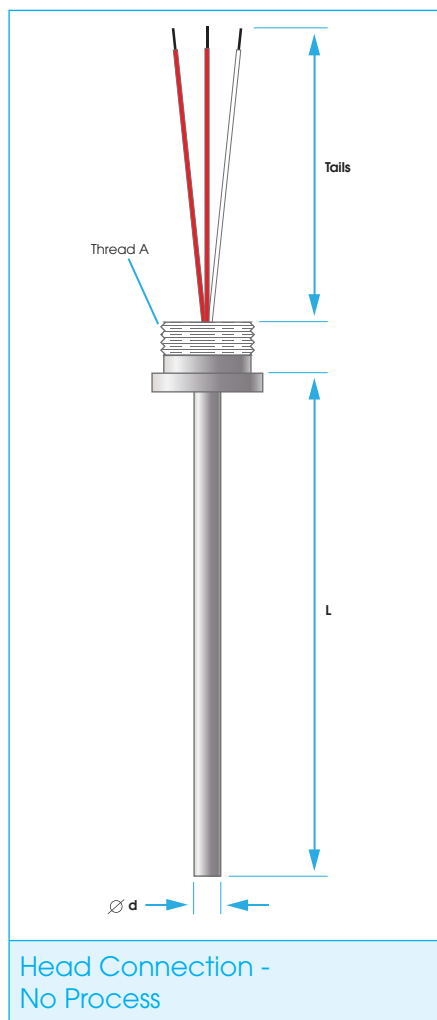
Cable Connection



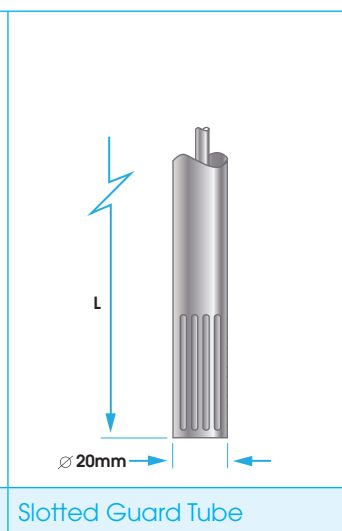
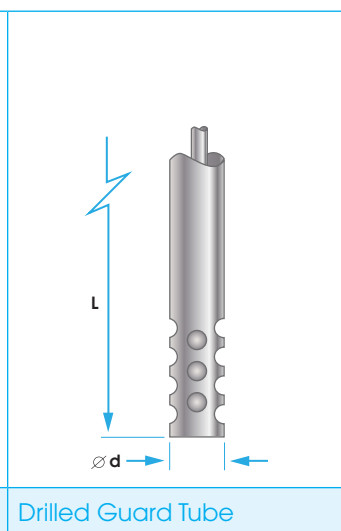
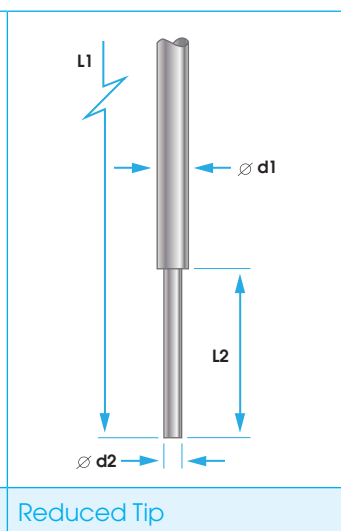
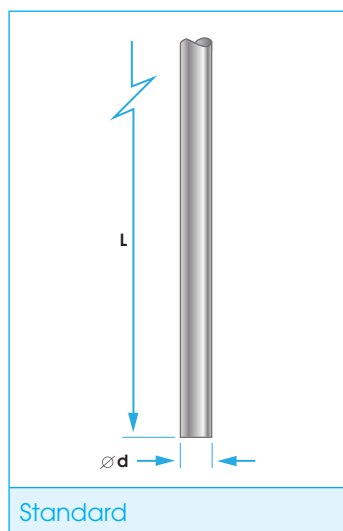
Spring Mounted Insert



Spring Mounted Head Connection - With Process



Tip Styles



Thermocouples

H&b Sensors manufacture both class 1 and class 2 mineral insulated, fabricated and bare wire thermocouples suitable for temperature ranges between -250°C and +1300°C.

Utilising our specialist manufacturing facilities, H&b are able to manufacture thermocouple sensors for virtually any industrial or scientific application in accordance with national, international and customer specific standards.

Built to customer specification; thermocouples may be configured with options including, but not limited to the following: connection head, thermocouple type, wiring configuration, termination style, sheath material, lengths and diameters, junction type, tip style, ceramic sheath, thermowells and surface mount packages.

In addition H&b are licensed to manufacture sensor assemblies for use in hazardous areas requiring Exd or Exia certification.

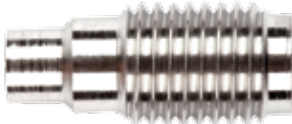
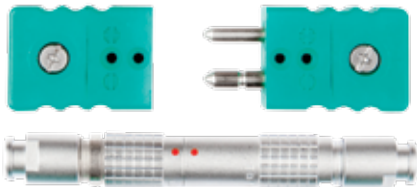


Type	Conductors +/- Operating Range	BS	ANSI	DIN	IEC/CEI
J	Iron Constantan 0-850°C				
K	Nickel Chromium / Nickel Aluminium -200°C - 1100°C				
T	Copper Constantan -250°C - 400°C				
E	Nickel Chromium / Constantan -200°C - 800°C				
N	Nicrosil/Nisil -250°C - 1300°C				

Wiring Configurations

		
Simplex	Duplex	Triplex

Cold End Connections

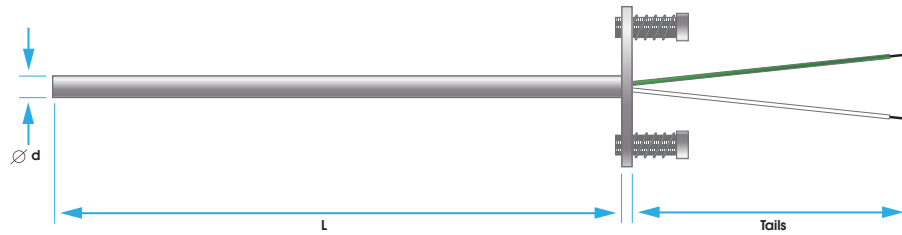
	
Plain Pot	ISO Pot
	
Plugs and Connectors	Cable
	
Terminal Block	Transmitter (See page 18 - 19 for technical information)

Hot End Junctions

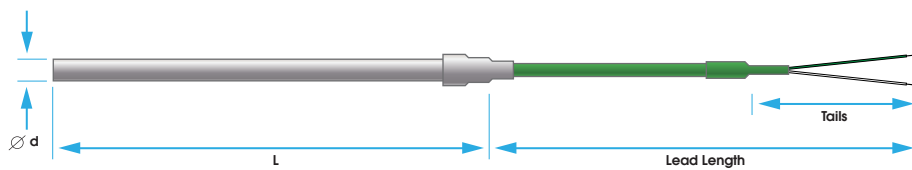
		
Grounded Thermocouple	Insulated Thermocouple	Exposed Thermocouple

Thermocouples

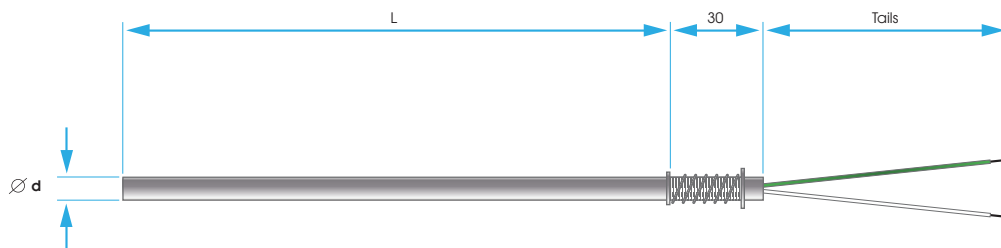
Sensor Configurations



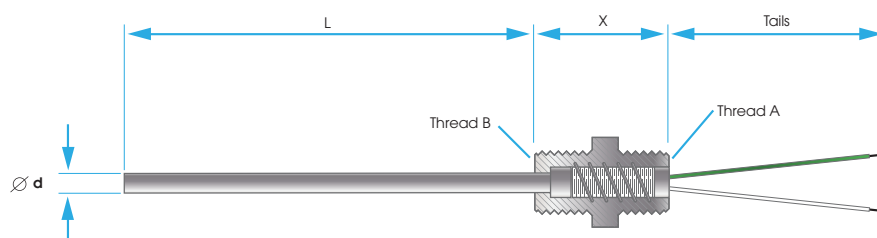
Spring Loaded Din Plate Insert



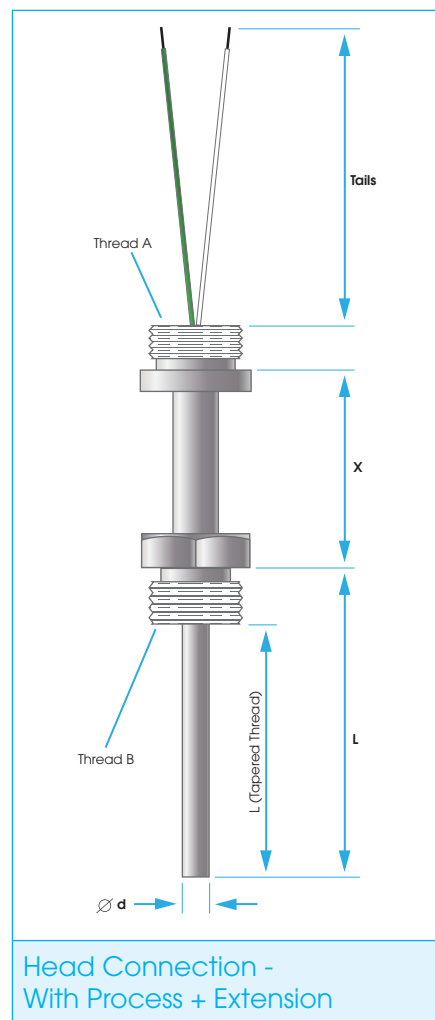
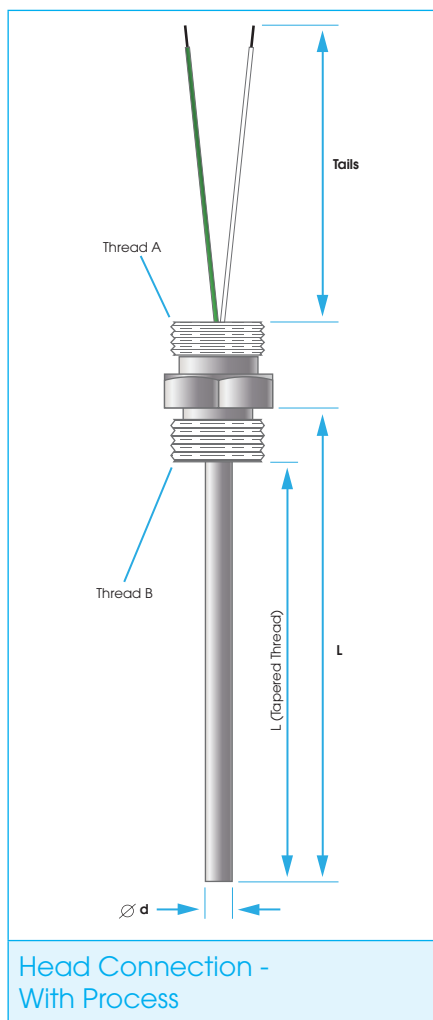
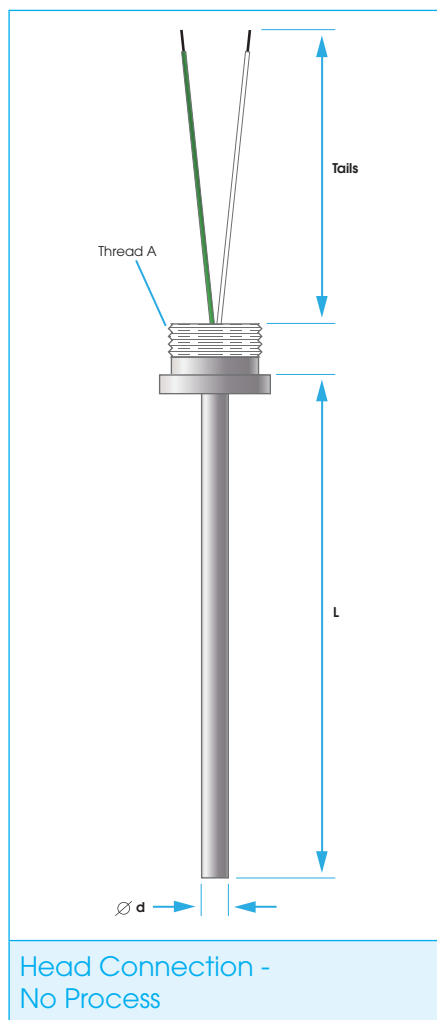
Cable Connection



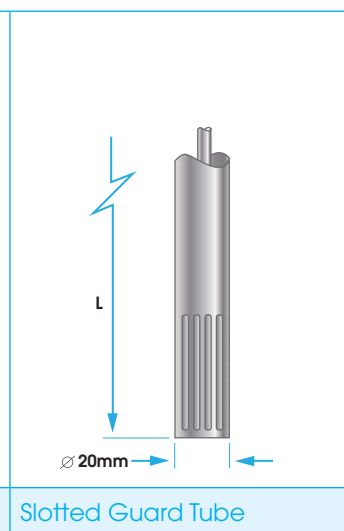
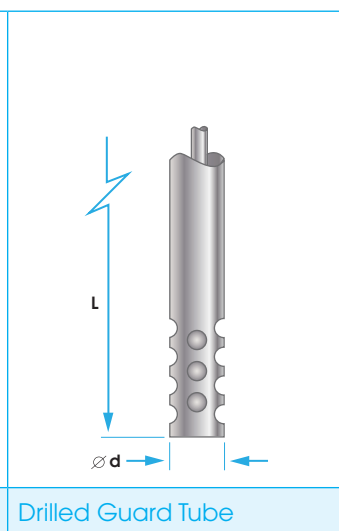
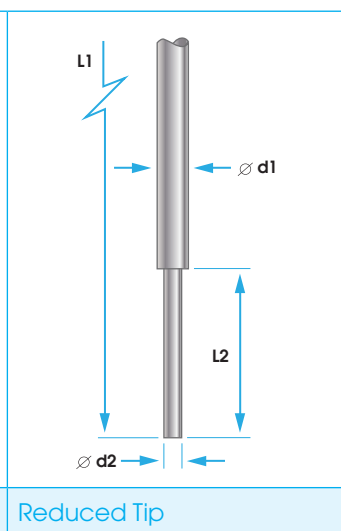
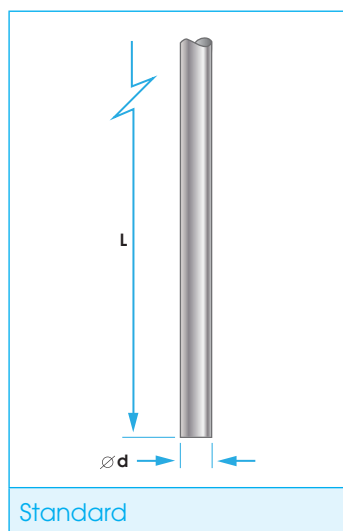
Spring Mounted Insert



Spring Mounted Head Connection - With Process



Tip Styles



Connection Heads

Aluminium

Type 2		Type 4		Type 11	
					
Cable Entry	M16 x M16	Cable Entry	M20 x 1.5	Cable Entry	M20 x 1.5
IP Rating	None	IP Rating	IP68	IP Rating	IP65
Certified	No	Certified	No	Certified	Exia*
Options	None	Options	None	Options	None

Type 15		Type 16		Type 17	
					
Cable Entry	M20 x 1.5	Cable Entry	M20 x 1.5 / PG16	Cable Entry	M16 x 1.5
IP Rating	IP68	IP Rating	IP68	IP Rating	IP66
Certified	No	Certified	No	Certified	No
Options	None	Options	Dual Entry	Options	None

Type 38		Type 45		Type 47	
					
Cable Entry	M20 x 1.5 / 1/2" NPT	Cable Entry	M20 x 1.5	Cable Entry	M16 x 1.5
IP Rating	IP68	IP Rating	IP68	IP Rating	IP68
Certified	No	Certified	No	Certified	No
Options	Dual Entry	Options	None	Options	None

Type 49		Type 50/0/1		Type 51/0/1	
					
Cable Entry	M20 x 1.5 / ½" BSP / ½" NPT	Cable Entry	M20 x 1.5 / ½" NPT	Cable Entry	X2 M20 x 1.5 / ½" NPT
IP Rating	IP68	IP Rating	IP68	IP Rating	IP68
Certified	No	Certified	Exd and Exia*	Certified	Exd and Exia*
Options	None	Options	Window (50/0/3)	Options	Window (51/0/3)

Plastic

Type 8		Type 24		Type 46	
					
Cable Entry	M20 x 1.5	Cable Entry	M16 x 1.5 / M20 x 1.5	Cable Entry	M20 x 1.5
IP Rating	IP54	IP Rating	IP67	IP Rating	IP68
Certified	No	Certified	No	Certified	FDA Approved
Options	None	Options	High Cap	Options	White or Black

Cast Iron

Type 21	
	
Cable Entry	M20 x 1.5
IP Rating	IP67
Certified	No
Options	None

* When part of an assembly.

Connection Heads

316 Stainless Steel

Type 34		Type 37		Type 41	
					
Cable Entry	M20 x 1.5 / ½" BSP	Cable Entry	M16 x 1.5	Cable Entry	M20 x 1.5
IP Rating	None	IP Rating	IP65	IP Rating	IP68
Certified	No	Certified	No	Certified	No
Options	None	Options	None	Options	None

Type 44		Type 50/1/1		Type 51/1/1	
					
Cable Entry	M20 x 1.5	Cable Entry	M20 x 1.5 / ½" NPT	Cable Entry	X2 M20 x 1.5 / ½" NPT
IP Rating	IP68	IP Rating	IP68	IP Rating	IP68
Certified	No	Certified	Exd and Exia*	Certified	Exd and Exia*
Options	None	Options	Window (50/1/3)	Options	Window (51/1/3)

Type 80/X	
	
Cable Entry	M16 x 1.5 / M20 x 1.5 / ½" NPT
IP Rating	IP68
Certified	No
Options	None

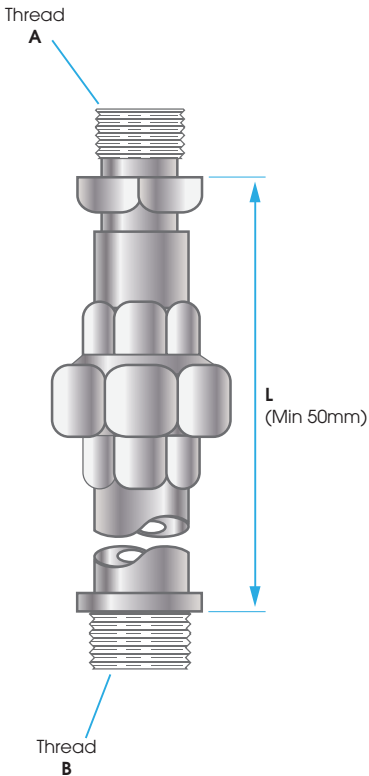
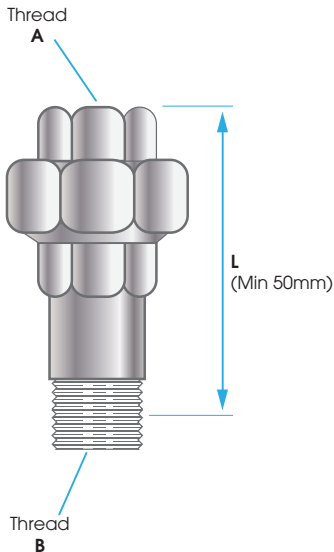
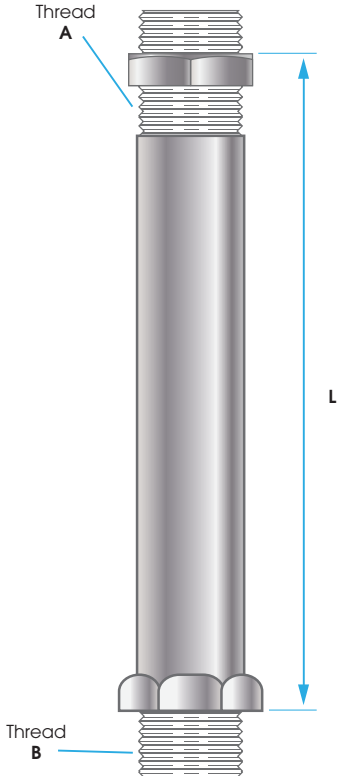
* When part of an assembly.

Junction Boxes

Type 25		Type 40		Type 53/0/1	
					
Material	Plastic	Material	Aluminium	Material	Aluminium / St.St
Cable Entry	X2 M16 x 1.5 / X2 M20 x 1.5	Cable Entry	X2 M20 x 1.5	Cable Entry	X2 M20 x 1.5 / X2 ½" NPT
IP Rating	IP67	IP Rating	IP65	IP Rating	IP68
Certified	No	Certified	No	Certified	Exd and Exia*
Options	High Cap	Options	High Cap	Options	Window (53/0/3)

Extension Pieces

Used for positioning the connection head, lagging extension, easy removal of sensor and protecting the head from excessive temperature.

					
Nipple Union Nipple		Nipple Union		Nipple & Locknut	

Temperature Transmitters

Head Mounted Transmitters

5331A		5331D		5333A	
					
Input	PRT (2,3,4 Wire) / Thermocouple	Input	PRT (2,3,4 Wire) / Thermocouple	Input	PRT (3 Wire)
Output	4...20 mA	Output	4...20 mA	Output	4...20 mA
Communication	No	Communication	No	Communication	No
Certified	No	Certified	Exia	Certified	No

5333D		5334A		5334B	
					
Input	PRT (3 Wire)	Input	Thermocouple	Input	Thermocouple
Output	4...20 mA	Output	4...20 mA	Output	4...20 mA
Communication	No	Communication	No	Communication	No
Certified	Exia	Certified	No	Certified	Exia

5335A		5335D		5350A	
					
Input	PRT (2,3,4 Wire) / Thermocouple	Input	PRT (2,3,4 Wire) / Thermocouple	Input	PRT (2,3,4 Wire) / Thermocouple
Output	4...20 mA	Output	4...20 mA	Output	4...20 mA
Communication	HART®	Communication	HART®	Communication	Profibus®PA / Foundation™F
Certified	SIL2	Certified	Exia, SIL2	Certified	No

5350B		SEM 110P		SEM 110XP	
					
Input	PRT (2,3,4 Wire) / Thermocouple	Input	PRT (3 Wire)	Input	PRT (3 Wire)
Output	4...20 mA	Output	4...20 mA	Output	4...20 mA
Communication	Profibus®PA / Foundation™F	Communication	No	Communication	No
Certified	Exia	Certified	No	Certified	Exia

SEM 110TC		SEM 110XTC		SEM 203P	
					
Input	Thermocouple	Input	Thermocouple	Input	PRT (3 Wire)
Output	4...20 mA	Output	4...20 mA	Output	4...20 mA
Communication	No	Communication	No	Communication	No
Certified	No	Certified	Exia	Certified	No

SEM 203TC		SEM 206P		SEM 206TC	
					
Input	Thermocouple	Input	PRT (2,3 Wire)	Input	Thermocouple
Output	4...20 mA	Output	4...20 mA	Output	4...20 mA
Communication	No	Communication	No	Communication	No
Certified	No	Certified	No	Certified	No

Temperature Transmitters

Head Mounted Transmitters

SEM 210		SEM 210X		SEM 310	
					
Input	PRT (3 Wire) / Thermocouples	Input	PRT (3 Wire) / Thermocouples	Input	PRT (2,3,4 Wire) / Thermocouple
Output	4...20 mA	Output	4...20 mA	Output	4...20 mA
Communication	No	Communication	No	Communication	HART®
Certified	No	Certified	Exia	Certified	SIL2

SEM 310X		TTC 200		TTC 200X	
					
Input	PRT (2,3,4 Wire) / Thermocouple	Input	Thermocouple	Input	Thermocouple
Output	4...20 mA	Output	4...20 mA	Output	4...20 mA
Communication	HART®	Communication	No	Communication	No
Certified	Exia, SIL2	Certified	No	Certified	Exia

TTR 200		TTR 200X	
			
Input	PRT (3 Wire)	Input	PRT (3 Wire)
Output	4...20 mA	Output	4...20 mA
Communication	No	Communication	No
Certified	No	Certified	Exia

Din Rail Mounted Transmitters

6331A		6331B		6333A	
					
Input	PRT (2,3,4 Wire) / Thermocouple	Input	PRT (2,3,4 Wire) / Thermocouple	Input	PRT (3 Wire)
Output	4...20 mA	Output	4...20 mA	Output	4...20 mA
Communication	No	Communication	No	Communication	No
Certified	No	Certified	Exia	Certified	No

6333B		6334A		6334B	
					
Input	PRT (3 Wire)	Input	Thermocouple	Input	Thermocouple
Output	4...20 mA	Output	4...20 mA	Output	4...20 mA
Communication	No	Communication	No	Communication	No
Certified	Exia	Certified	No	Certified	Exia

6335A		6335D		6350A		6350B	
							
Input	PRT (2,3,4 Wire) / Thermocouple	Input	PRT (2,3,4 Wire) / Thermocouple	Input	PRT (2,3,4 Wire) / Thermocouple	Input	PRT (2,3,4 Wire) / Thermocouple
Output	4...20 mA	Output	4...20 mA	Output	4...20 mA	Output	4...20 mA
Communication	HART®	Communication	HART®	Communication	Profibus®PA / Foundation™F	Communication	Profibus®PA / Foundation™F
Certified	SIL2	Certified	Exia, SIL2	Certified	No	Certified	Exia

Displays

Head Mounted Displays

HBS 16000		HBS 16000/X		HBS 16001	
					
Input	PRT / Thermocouple	Input	PRT / Thermocouple	Input	4...20 mA
Supply	AA Battery Powered	Supply	AA Battery Powered	Supply	Loop Powered
Communication	No	Communication	No	Communication	No
Certified	No	Certified	Exia	Certified	No

HBS 16001/X		HBS 16002		HBS 16002/X	
					
Input	4...20 mA	Input	PRT	Input	PRT
Supply	Loop Powered	Supply	AA Battery Powered	Supply	AA Battery Powered
Communication	No	Communication	No	Communication	No
Certified	Exia	Certified	No	Certified	Exia

HBS 16003		HBS 16003/X		HBS 16004/X	
					
Input	4...20 mA	Input	4...20 mA	Input	4...20 mA
Supply	Loop Powered	Supply	Loop Powered	Supply	Loop Powered
Communication	No	Communication	No	Communication	HART®
Certified	No	Certified	Exia	Certified	Exia, SIL2

Panel Mounted Displays

5331A		5531B		5714	
					
Input	4...20 mA	Input	4...20 mA	Input	PRT / Thermocouple / Ω / mA / V
Supply	Loop Powered	Supply	Loop Powered	Supply	AC / DC
Communication	No	Communication	No	Communication	No
Certified	No	Certified	Exia	Certified	No

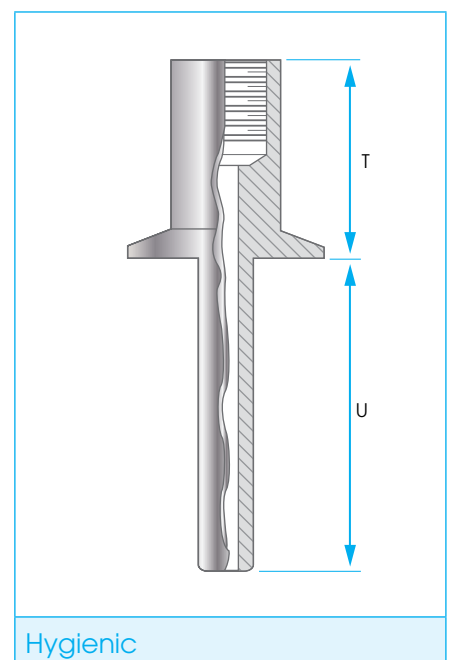
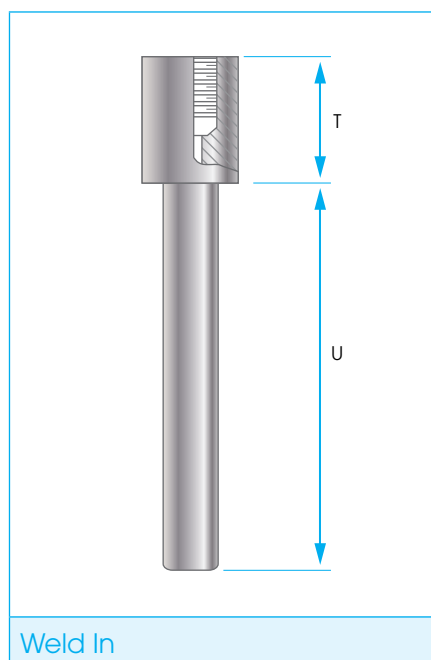
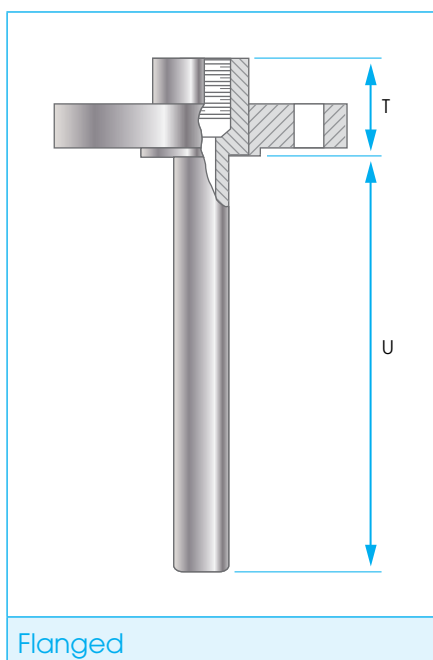
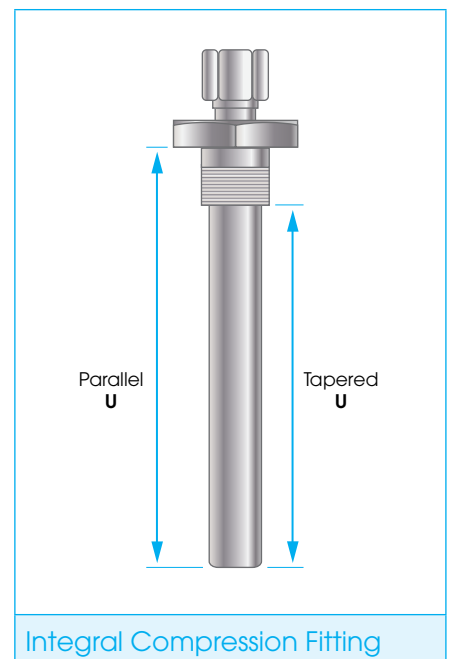
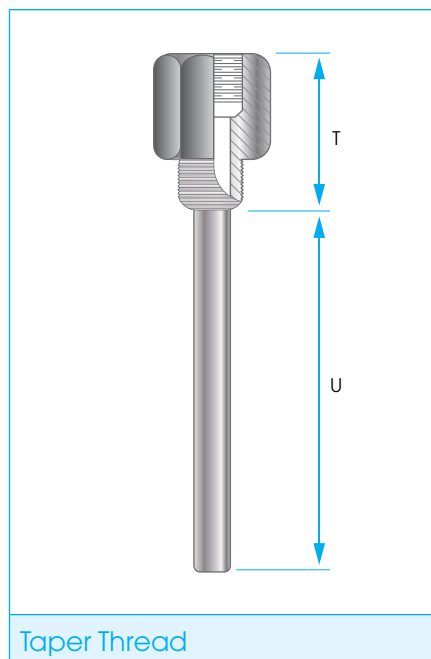
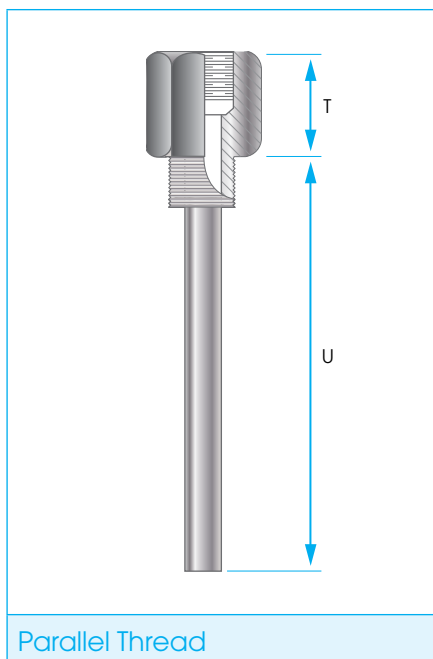
5715		5725	
			
Input	PRT / Thermocouple / Ohms / mA / V	Input	kHz / μ S
Supply	AC / DC	Supply	AC / DC
Communication	No	Communication	No
Certified	No	Certified	No

Thermowells

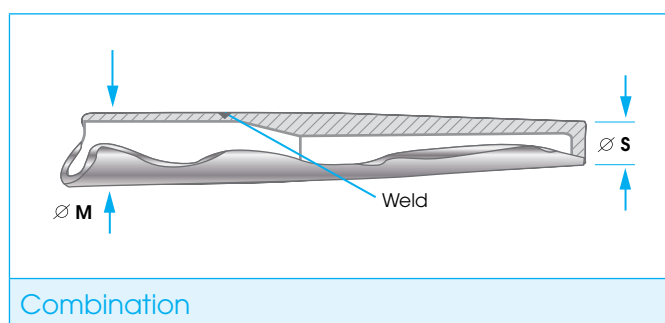
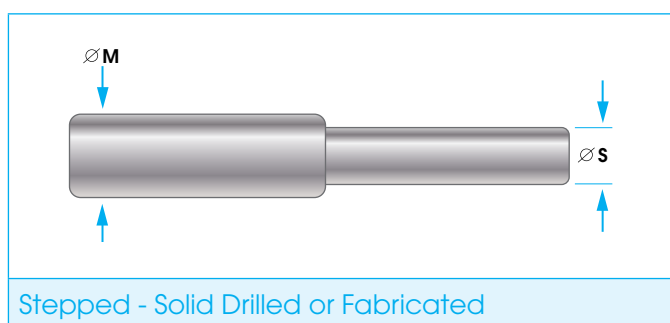
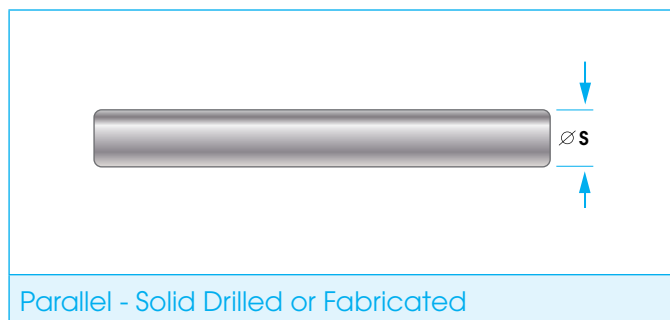
H&b manufacture a comprehensive range of both solid drilled, fabricated and forged thermowells.

A wide selection of configurations are available including screwed, flanged, welded or hygienic process attachments complete with a wide variety of extension pieces and additional options. Solid drilled thermowells as standard include 3.1 material certificates and internal pressure test. Fabricated thermowells include 3.1 material certificates and a leak test. Additional Testing is available including: Wake Frequency, Dye Penetrant, X-Ray, Positive Material Identification (PMI), Heat Treatment, Magnetic Particle Inspection, Oxygen Cleaning, Ultrasonic and Charpy Impact Testing.

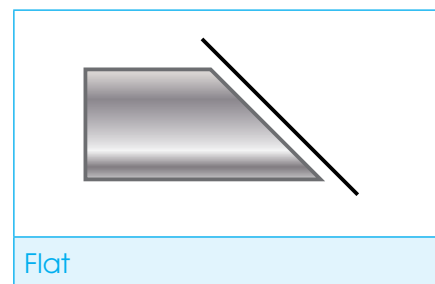
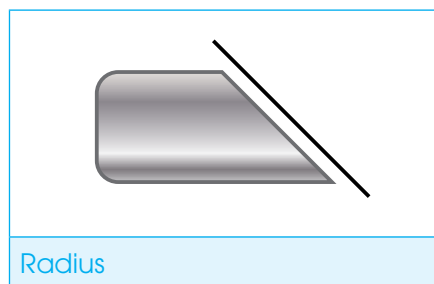
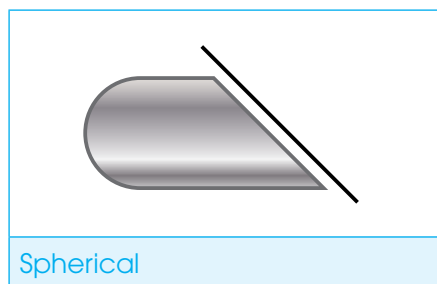
Process Connection



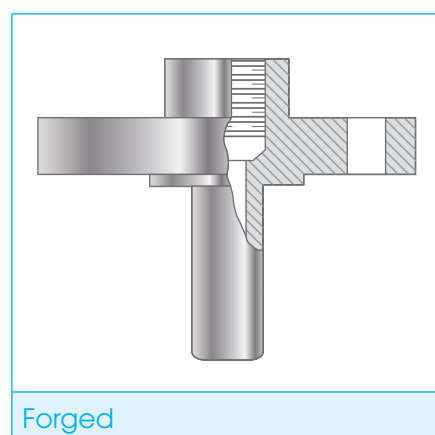
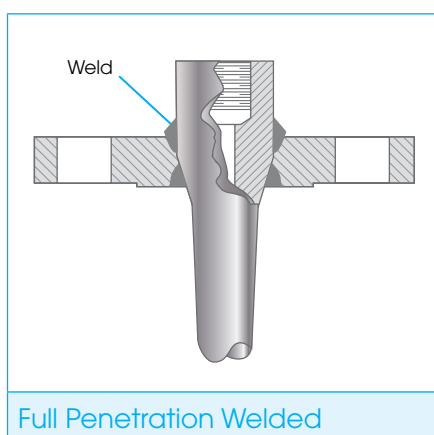
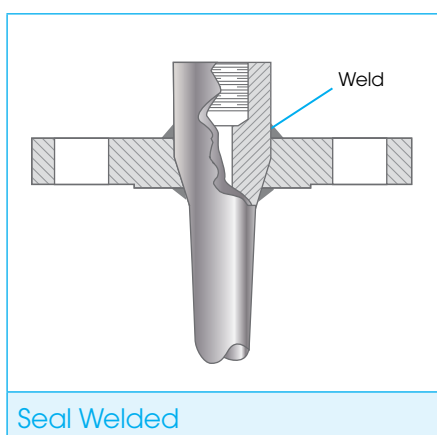
Stem Types



Tip Styles



Flange Connections



Certified Products

H&b Sensors manufacture a wide range of Exd (explosion proof) and Exia (intrinsically safe) products for use in hazardous areas and harsh environments.

Exd certification is available for both temperature measurement and level detection assemblies conforming to both ATEX and IECEx standards. Using either our aluminium or stainless steel Type 50 series connection head, a variety of different assembly configurations are available.

Exia certified temperature assemblies conforming to ATEX are available using both our Type 50 series and Type 11 connection heads.

Connection Heads and Junction Box See Pages 12 - 15 For Full Technical Specification.

Type 11		Type 50		Type 51		Type 53	
							
Material	Aluminium	Material	Aluminium & Stainless Steel	Material	Aluminium & Stainless Steel	Material	Aluminium & Stainless Steel
Certified	Exia*	Certified	Exd and Exia*	Certified	Exd and Exia*	Certified	Exd and Exia*

Exia Head Mounted Temperature Transmitters See Pages 18 - 19 For Full Technical Specification.

	5331D	5333D	5334D	5335D	5350B
	2-wire programmable transmitter	2-wire programmable transmitter	2-wire programmable transmitter	2-wire transmitter with HART® protocol	Profibus®PA/ Foundation™ Fieldbus transmitter
Input	PRT / Thermocouple	PRT	Thermocouple	PRT / Thermocouple	PRT / Thermocouple
Output	4...20mA	4...20mA	4...20mA	4...20mA	4...20mA

Exia Head Mounted Temperature Transmitters See Pages 18 - 19 For Full Technical Specification.

	SEM 110XP	SEM 110XTC	SEM 210X	SEM 310X	TTC 200X	TTR 200X
	2-wire programmable transmitter	2-wire programmable transmitter	2-wire programmable transmitter	2-wire transmitter with HART® protocol	2-wire programmable transmitter	2-wire programmable transmitter
Input	PRT	Thermocouple	PRT / Thermocouple	PRT / Thermocouple	Thermocouple	PRT
Output	4...20mA	4...20mA	4...20mA	4...20mA	4...20mA	4...20mA



Exia Din Rail Mounted Temperature Transmitters See Pages 20 - 21 For Full Technical Specification.



6331B	6333B	6334B	6335D	6350B
2-wire programmable transmitter	2-wire programmable transmitter	2-wire programmable transmitter	2-wire transmitter with HART® protocol	Profibus®PA/ Foundation™ Fieldbus transmitter

Input	PRT / Thermocouple	PRT	Thermocouple	PRT / Thermocouple	PRT / Thermocouple
Output	4...20mA	4...20mA	4...20mA	4...20mA	4...20mA

Exia Head Mounted Displays See Page 23 For Full Technical Specification.



HBS 16000/X	HBS 16001/X	HBS 16002/X	HBS 16003/X	HBS 16004/X
Battery Powered Programmable LCD display	Loop-Powered Programmable LED display	Battery Powered Programmable LCD display	Loop-Powered Programmable LCD display	Loop-Powered HART® Programmable LCD display

Input	PRT / Thermocouple	PRT	Thermocouple	PRT / Thermocouple	PRT / Thermocouple
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Panel Mounted Display See Page 22 For Full Technical Specification.



5531B
Loop-Powered LCD display

Input	3.6...23 mA
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Exd 316 Stainless Steel Compression Fitting



HBS/4/6600/1	HBS/4/6600/2	HBS/4/6600/3	HBS/4/6600/4	HBS/4/6600/5	HBS/4/6600/6	HBS/4/6600/7	HBS/4/6600/8	HBS/4/6600/9	HBS/4/6600/10	HBS/4/6600/11	HBS/4/6600/12
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Bore Ø	3mm	3mm	3mm	3mm	3mm	3mm	6mm	6mm	6mm	6mm	6mm	6mm
Thread Size	¼" BSP	M16 x 1.5	½" NPT	½" BSP	M20 x 1.5	¾" NPT	¼" BSP	½" NPT	½" BSP	M20 x 1.5	¾" NPT	M16 x 1.5

* When part of an assembly.