

ECEFast Sensor Division

Custom Built Temperature Probes



"With more than 25 years experience in the manufacturing & application of temperature sensors, we can give you the best solutions with the lowest cost of ownership. Price alone is no measure of cost. We consider the sensor reliability & service life to be premium design criteria"

- Large range of stock sensors
- Custom design max. 5 days
- All M.I. & base metals
- Rare metal sensors R, S & B
- Precision RTD's
- Sound technical solutions
- Premium quality

FastLab

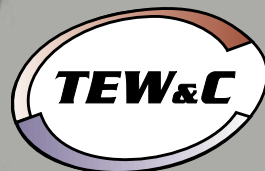


*In-House NATA laboratory
Low cost certificates
for sensors exclusive
to ECEFast*

Excalibur

*The strongest M.I.
thermocouple
available
exclusive to
ECEFast*

Quality Suppliers



HALDENWANGER

Email sales@ecefast.com.au

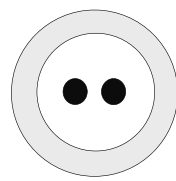
Free Call 1800 811 818 (Australia)

Custom Manufactured Sensors



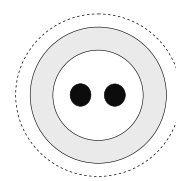


The Strongest Thermocouple Available



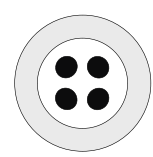
22 mm diameter

3.2 mm wires
3.5 mm wall



18 mm diameter
optional dual skin 6mm

2.7 mm wires
3 mm wall



18 mm diameter – duplex

2.7 mm wires
2 mm wall

Custom Made For Your Application

- Heavy wall, and large gauge wires for maximum life.
- Cold welded end closure for consistent properties.
- Swaged (reduced OD) to compact MgO high purity insulation and exclude air & gases.
- Faster response due to compacted insulation.
- Good electrical isolation at high temperatures.
- NATA certificate of calibration as standard – if requested.



Accreditation No 5473

The Excalibur was developed in Australia over a long period, and has been extensively tested in a wide variety of applications. Users report significant increase in life, no bending or distortion and enhanced protection for multi-loop process control systems due to improved isolation. It has been in commercial use for more than 5 years.



Model	Sheath	Mounting	Cal.	Diameter	Length
TS-6			K	25 mm	
310 SS	0	0 no fitting		22 mm	standard to 1500mm
253 MA	1	1 screw fitting*	N	18 mm	custom to 2000mm
(Inconel™) alloy 601	2	2 adjustable flange		14 mm	
446 SS	0	3 OEM version – bare			
		4 custom design			

* specify type & position

- Alternative sheath materials available – including Alloy TD (some sizes)
- Plasma sprayed ceramic coating for extreme abrasion resistance.
- Cast iron head in place of standard alloy head.

Industries

- Aluminium
- Cement
- Steel
- Power
- Chemical
- Brick & Tile
- Heat Treatment
- Mineral Processing



Ask for a copy of our technical paper on Excalibur

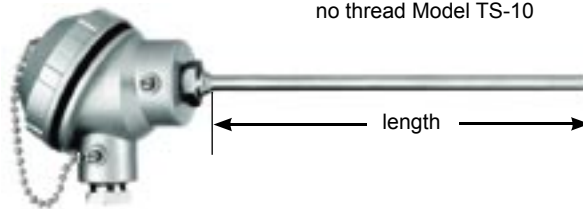
Contact A Consultant

1800 811 818 - Australia
0800 ECE FAST - New Zealand
sales@ecefast.com.au



Model TS - 10
TS - 11

small Aluminium Head



no thread Model TS-10

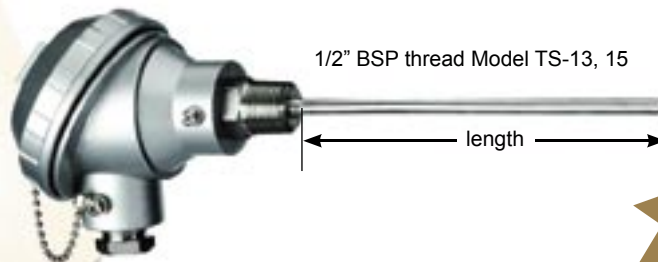
- Thermocouple (J, K, T, N) mineral insulated cable construction, ungrounded junction, 310 SS sheath.
- Pt100, 3 wire 316 SS sheath. Max 260°C. Accuracy Band 1.

Model	Cal.	Diameter	Length	Optional Head Types
TS-1 0	no thread	J type J 3 mm	mm	O standard alloy head
1	1/2" BSP SS thread	K type K 4.5 mm		A bakelite head
		T type T 6 mm		C machined SS head
		N type N ? mm		
		P Pt100		

* Fittings & wells as required

Model TS-12, 14
TS-13, 15

large Aluminium Head



1/2" BSP thread Model TS-13, 15

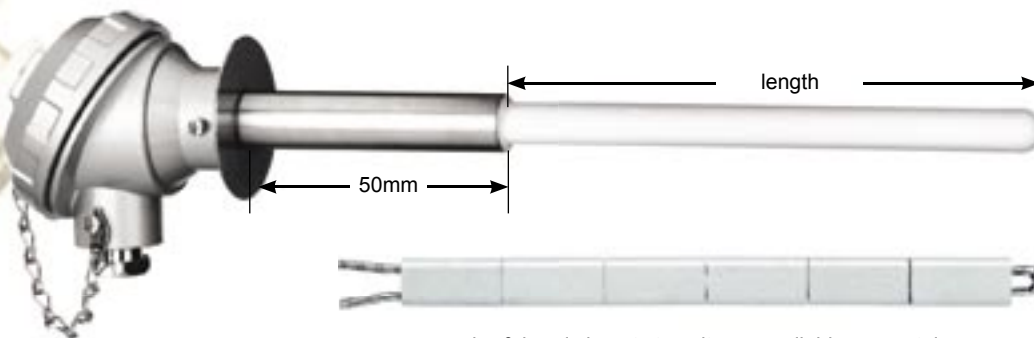
head transmitters on all models option see page 45

- Thermocouple (J, K, T, N) mineral insulated cable construction, ungrounded junction, 310 SS sheath.
- Pt100, 3 wire 316 SS sheath. Max 260°C. Accuracy Band 1.

Model	Cal.	Diameter	Length	Optional Head Types
TS-1 2	no fitting simplex	J type J 3 mm	mm	O standard alloy head
3	1/2" BSP SS thread	K type K 4.5 mm		A bakelite head
4	no fitting duplex	T type T 6 mm		B cast SS head
5	1/2" BSP SS thread, duplex	N type N ? mm		C machined SS head
		P Pt100		

* Fittings & wells as required

Model TS-32, 34, 35



wire & beads inserts to suit, are available separately

- Thermocouple (K, N, R, S) with alloy head & SS support tube for ceramic sheath & insulator.

Model	Cal.	Length
TS-3 2	14G type K, N	mm
4	0.35mm type R, S	
5	0.5mm type R, S	
	K type K	
	J type N	
	R type R	
	S type S	

head transmitters on all models option see page 45

Optional Alumina Construction to 1700°C R, S & B only

Email sales@ecefast.com.au

Free Call 1800 811 818 (Australia)

Custom Manufactured Sensors



Model TS-30, 31, 33, 36



- Thermocouple (K, N, R, S) with ceramic terminal block & SS support tube for ceramic sheath & insulator.

Model

TS-3	0	8G type K, N*
	1	14G type K, N
	3	0.35mm type R, S
	6	0.5mm type R, S

Cal.

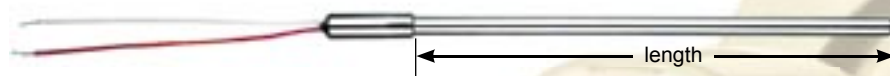
K	type K
N	type N
R	type R
S	type S

Length

mm

* No SS support bracket for terminal block

Model TS-16



TS-17



TS-19, 20



- Thermocouple (J, K, T, N) mineral insulated cable construction, ungrounded junction, 316 SS sheath with different end features.
- Pt100, 3 wire 316 SS sheath. Max 260°C. Accuracy Band 1.

Model

TS-1	6	75mm PVC tails
	7	1/2"/1/2" BSP SS fixed
	8	2 metre lead*
	9	mini plug connector
	2	0 full size connector

Cal.

J	type J
K	type K
T	type T
N	type N
P	Pt100

Diameter

1.5 mm	mm
3 mm	mm
4.5 mm	mm
6 mm	not for TS-19

Length

mm

Options

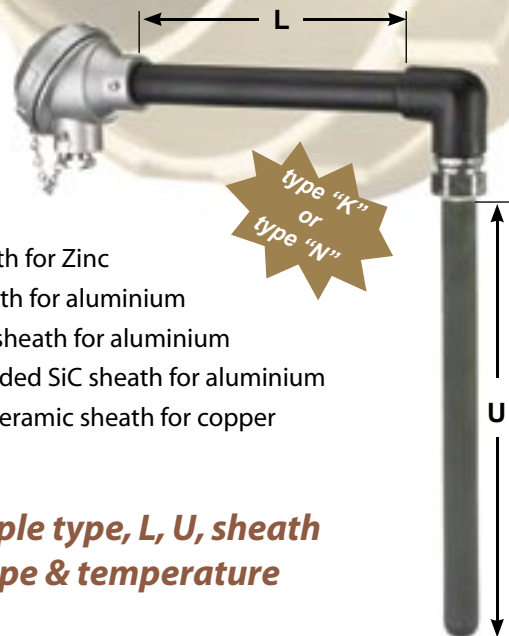
O	jack in place of plug
---	-----------------------

* PVC for T/C, Teflon for RTD

Thermocouples for Crucibles & Baths

- Made very heavy duty for rugged applications
- Life is usually limited by sheath material – if you have a preference – ask us!
- Some sheath types have restricted sizes – request your preference size & we will quote you the options
- In many cases more expensive materials last longer

TS-60	metal sheath for Zinc
TS-61S	Sialon sheath for aluminium
TS-61L	laminated sheath for aluminium
TS-61C	nitride bonded SiC sheath for aluminium
TS-62	LT1 metal ceramic sheath for copper



specify thermocouple type, L, U, sheath preference, melt type & temperature



Plastic Industry Thermocouples

Model TS 40



Model	Cal.	Length
TS-40	J type J	1 1 metre
	K type K	2 2 metres
		4 4 metres
		6 6 metres

- Plastic Industry adjustable bayonet "YM3" style complete with spring, clamp & bayonet cap, using tinned copper covered fibreglass wire - 4.5mm diameter tip.

Model TS 41



Model	Cal.	Length
TS-41	J type J	1 1 metre
	K type K	2 2 metres
		4 4 metres
		6 6 metres

- Plastic Industry adjustable bayonet thermocouple with wind-on bayonet cap. Constructed using tinned copper covered fibreglass wire - 4.5mm diameter tip.

Brass Adapters

Model	Length	Options
TS-BEA-12X	22 mm	5 for TS-40
	38 mm	7 for TS-41
	72 mm	



Model TS 43

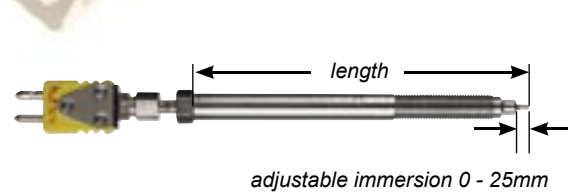


other bolt sizes on request

Model	Cal.	Length
TS-43	J type J	1 1 metre
	K type K	2 2 metres
		4 4 metres
		6 6 metres

- M6 thread, bolt type thermocouple complete with swivel retention - using tinned copper covered fibreglass wire.

Extrusion Melt Thermocouples



Model	Cal.	Length
MA-3110	J type J	100 mm CK 1
	K type K	150 mm CK 1

Model	Cal.	Length	Tip Immersion
MA-3090	J type J	100 mm	0 mm CK 2
	K type K	150 mm	6 mm CK 2



flexible extension

fixed immersion

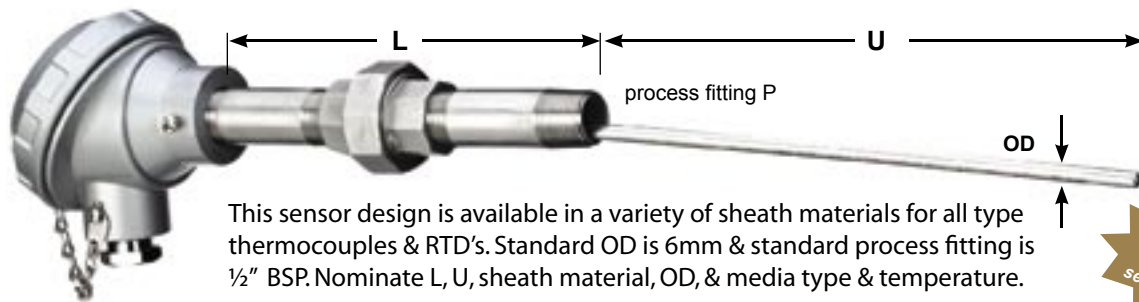
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Custom Manufactured Sensors



Industrial Nipple Union Nipple With Spring Loaded Sensor

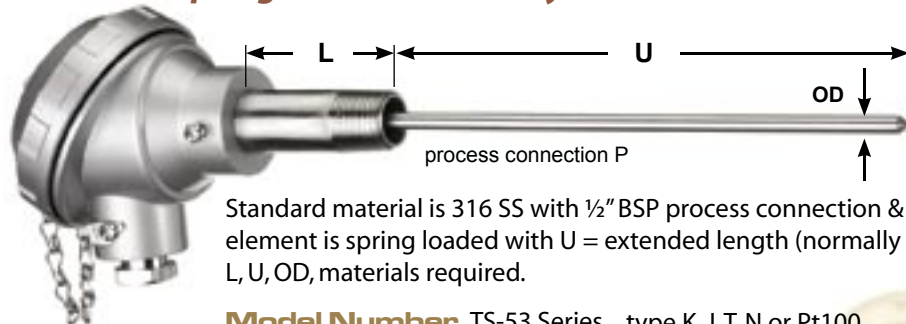


This sensor design is available in a variety of sheath materials for all type thermocouples & RTD's. Standard OD is 6mm & standard process fitting is 1/2" BSP. Nominate L, U, sheath material, OD, & media type & temperature.

Model Number TS-63 Series type K, J, T, N or Pt100

head transmitter optional see page 45

Industrial Spring Loaded Assembly With Standoff

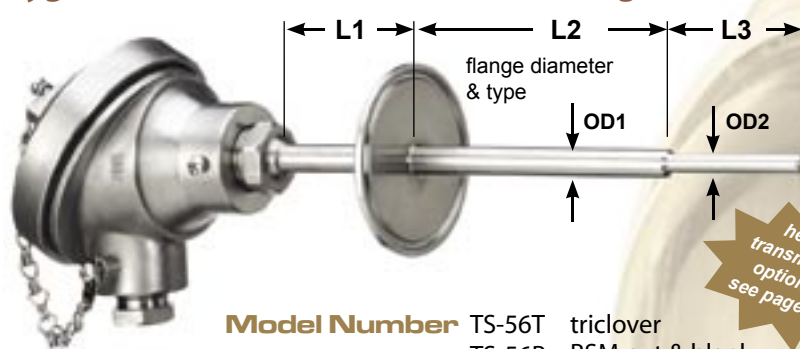


Standard material is 316 SS with 1/2" BSP process connection & 6 mm OD sensor. The sensor element is spring loaded with U = extended length (normally fitted in thermowell). Nominate L, U, OD, materials required.

Model Number TS-53 Series type K, J, T, N or Pt100

head transmitter optional see page 45

Hygenic Sensor Construction with Flange - Pt100



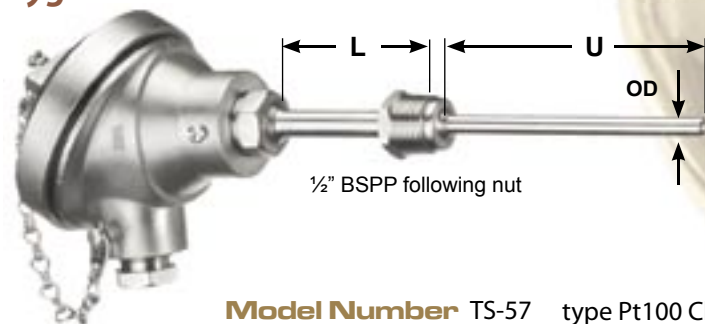
Model Number TS-56T triclover
TS-56B BSM nut & blank

The assembly can be supplied with tri-clover, BSM nut & blank or other standard sanitary flanges in a diameter to suit. Standard value of OD 1 is 10mm, OD 2 6mm & L3 = 30mm.

Operating temperature is assumed to be <200°C with Pt100 sensor in class A, Custom or special details to be supplied for quotation.

head transmitter optional see page 45

Hygenic Sensor - Loose Nut & Shoulder



Model Number TS-57 type Pt100 Class A

The standard assembly will be supplied in 316SS with 1/2" BSPP following nut. Other sizes are possible when full details or a sample are supplied. Nominate L, U, OD & process connection.

head transmitter optional see page 45

Special Sensor Types (samples only shown)

Glow-wire Test - AS/NZS 4695.2.10:1996

A test to determine the ignitability & flame propagation of insulating materials subject to a controlled heat source. ECEFast can supply thermocouple or complete test machines according to the Australian Standard.

- Sensor 0.5 mm OD with insulated junction
- Sensor clamped in tip - not brazed or welded
- NATA certificate supplied



Warning!

Many similar thermocouples are made which do not comply with the very stringent requirements of the standard. Be sure your sensors comply or your tests are invalid.

Model Number TS-GLOWASY-NATA



Small Diameter M.I. Thermocouple Assemblies

- Sensors in K & T
- Diameters 0.25 & 0.5 mm
- Material Inconel & Stainless Steel
- Custom designs possible
- 1000mm extension wires

ECEFast can manufacture Mineral Insulated thermocouples down to 1 mm diameter with insulated junctions. For sizes less than 1mm O.D. we use our partner Marlin Manufacturing in USA, who use special equipment to fabricate these tiny probes. The thermal mass is very low, & being point measuring devices, these small sensors can measure very tiny samples & have extremely fast response – but also have a hygenic all SS construction.

First consider construction of the junction.

Exposed Junction



Not frequently specified because does not utilize benefits of this material.

Bare thermocouple wires are welded to form a junction that extends beyond the sheath for a distance equal to the sheath diameter. Used where fast response is required and contamination is not a factor.

1mm to 22mm diameter available



Grounded Junction



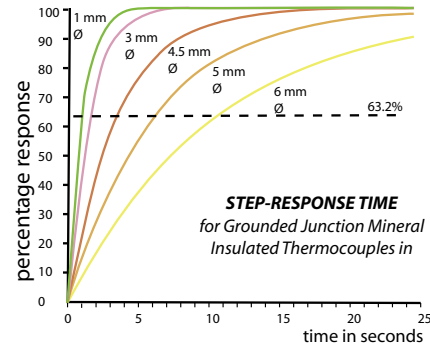
The thermocouple junction is welded directly to the sheath. Provides good thermocouple protection against pressure, moisture & mechanical damage yet retains good response characteristics.

Ungrounded Junction



The junction is electrically & mechanically insulate from the sheath for long life characteristics under maximum corrosion, thermal

shock, and vibration conditions. This is the most popular construction & avoids a number of problems when using modern instrumentation. Consider Probe Diameter based on response time desired.



High Temperature Thermocouples For Special Applications

ECEFast offers thermocouples utilising noble metals & exotic materials for the sheath, thermocouple wires & insulation. These thermocouples are fabricated utilising hard fired refractory oxides & incorporate the highest manufacturing standards to ensure performance & to prevent contamination.

Thermocouples

Platinum-Rhodium vs Platinum

Recommended for use in inert or oxidising atmospheres or for short periods of time in vacuum.

Tungsten vs Tungsten-Rhenium

Recommended for use in vacuum, high purity hydrogen & purity inert atmospheres only.

Sheath Alloys

Platinum virtually non-oxidisable, soluble only in acids generating free chlorine, Halogens attack it at high temperatures. Malleable. Recommended for use in oxidising or inert environments. Maximum operating temperature 1650°C.

Platinum 10% Rhodium has the character of platinum with increased resistance to erosion & higher heat strength. Suitable for oxidising or inert environments. Maximum operating temperature 1700°C.

Tantalum A reactive & refractory metal; reactive because it will oxidise above 290°C, refractory because of its extremely high melting point. Suitable for use in inert or vacuum environments. Hard & tough with good ductility, maximum operating temperature 2480°C.

Molybdenum oxidises at elevated temperatures. Relatively good hot strength. Suitable for inert, vacuum or reducing environments. Maximum operating temperature 2200°C.

Molybdenum 50%/Rhenium 50% Ductile with high hot strength. Suitable in vacuum, hydrogen, nitrogen, cracked ammonia & inert atmospheres. Maximum operating temperature 2200°C

Thermocouples

Calibration	Maximum Op. Temperature	Maximum Exposure Temperature	Recommended Environment
Pt-10% Rh/Pt ANSI type S	1482°C	1704°C	Oxidising Inert
Pt-13% Rh/Pt ANSI type R	1482°C	1704°C	Oxidising Inert
Pt-30% Rh/Pt-6% Rh ANSI type B	1704°C	1770°C	Oxidising Inert
W-5% Re/W-26% Re (C)	2760°C	3000°C	Vacuum, High Purity, Hydrogen Inert

Refractory Oxide Insulators

Material	Approx. Melt Temperature	Maximum Recommended Temperature	
		Hard Fired	Swaged
Magnesia MgO	2800°C		1870°C
Alumina Al ₂ O ₃	2010°C	1760°C	1650°C
Beryllia* BeO	2550°C	2315°C	N/A

*Caution: Beryllia dusts are TOXIC!

Sheath Alloys

Material	Approx. Melt Temperature	Maximum Op. Temperature	Recommended Environment
Platinum	1770°C	1650°C	Oxidising Inert
Platinum 10% Rhodium	1850°C	1705°C	Oxidising Inert
Tantalum	2996°C	2482°C	Vacuum
*Molybdenum	2610°C	2205°C	Vacuum Inert
*Moly 50% Rhenium 50%	2440°C	2205°C	Vacuum, Hydrogen, Nitrogen, Inert, Cracked Ammonia

Email sales@ecefast.com.au

Free Call 1800 811 818 (Australia)

Custom Manufactured Sensors



Process Indicators

(no power required)



- Ranges from -50°C to 600°C
- Accuracy 0.1% - based on Pt100 sensor
- Large 18mm liquid crystal display
- Battery life 2 years
- Waterproof SS construction - 100mm O.D.

Probe entry & design to your requirements.
Optional NATA certificates at low prices .



Thermowells



parallel - machined or fabricated



tapered - machined



step Down - machined or fabricated

Materials

- ★ 304 SS
- ★ 310 SS
- ★ 316 SS
- ★ Inconel 600
- ★ Chrome Moly
- ★ Monel 400
- ★ Hastelloy
- ★ Titanium
- ★ Tantalum



tapered C/W Lagging Extension



weld-In - machined



flanged - machined

Ceramic Material



- ★ Alsint (re-crystallised alumina) 1700°C
- ★ Pythagoras 1400°C
- ★ Sillimantin 1300°C
- ★ Sialon (silicon nitride & alumina)
- ★ Metal ceramic 1375°C
- ★ Halsic I & R. - Silicon Carbide 1600°C



Thermocouple Protection Tubes



Alsint - for Platinum thermocouples to 1700°C.



transparent Quartz - Copper,Gold.



Taylor - Laminated Sheaths.
aluminium, zinc & galvanising applications



Halsic I/R Sintered SiC - corrosion/erosion
resistant to 1650°C.



type LT1 - Metal Ceramic - Copper & Brass

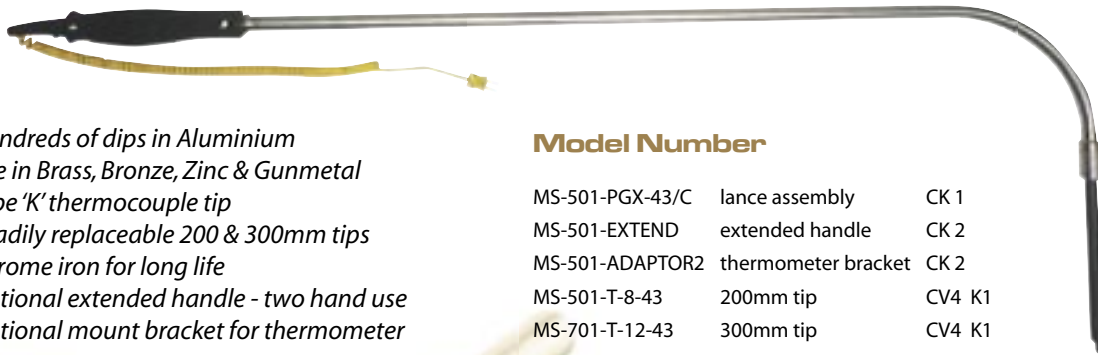


fused silica - non ferrous metals.



Replaceable Sensor Lance for Non-Ferrous Metals

Marshall Lances & Tips - The Original



- Hundreds of dips in Aluminium
- Use in Brass, Bronze, Zinc & Gunmetal
- Type 'K' thermocouple tip
- Readily replaceable 200 & 300mm tips
- Chrome iron for long life
- Optional extended handle - two hand use
- Optional mount bracket for thermometer

Model Number

MS-501-PGX-43/C	lance assembly	CK 1
MS-501-EXTEND	extended handle	CK 2
MS-501-ADAPTOR2	thermometer bracket	CK 2
MS-501-T-8-43	200mm tip	CV4 K1
MS-701-T-12-43	300mm tip	CV4 K1

Sensors For Any Measurement - If It's Not Here We Will Make It



Immersion Probe

type K & T, SS, 3mm dia x 150mm
max. temperature 500°C (400°C for type T)

Model

TS-TP02A BK 1
TS-TP02A-T BK 1

Immersion Probe

type K & T, SS, 3mm dia x 250mm
max. temperature 500°C (400°C for type T)

Model

TS-TP02A-250 BK 1
TS-TP02A-250-T BK 1

Quick Response Surface Probe

Type K 15mm dia x 100mm
max. temperature 500°C

Model

TS-TP04 BK 1

Quick Response Surface Probe

Type K right angle 15mm dia x 100mm
max. temperature 500°C

Model

TS-TP04-RA BK 1

Insertion Probe

Type K & T chisel point 3mm dia x 100mm
max. temperature 300°C

Model

TS-TP05 BK 1
TS-TP05-T BK 1

Insertion Probe

Type K & T, hypodermic 1.5mm dia x 100mm
max. temperature 300°C

Model

TS-TP06 BK 1
TS-TP06-T BK 1

Miniature Surface Probe

Type K 7.5mm dia x 100mm
max. temperature 250°C

Model

KM-SK21M BK 1

General Purpose Air Probe

Type K 3mm dia x 100mm
max. temperature 500°C in 1.5 seconds

Model

KM-AK21M BK 1

Email sales@ecefast.com.au

Free Call 1800 811 818 (Australia)

Custom Manufactured Sensors



Custom Sensors To Your Design

Photocopy this page & fax to +61 3 9538 8197

standard choice for this category

Type **thermocouple**

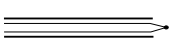


temperature at hot junction °C
 temperature at cold junction °C

Type **RTD**

minimum operating temperature °C
 maximum operating temperature °C

Calibration J K N T R S Pt100 ohms other



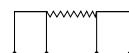
Junction

exposed 
 grounded 
 ungrounded 

Form

simplex
 duplex

Wiring Configuration

2 wire 3 wire 4 wire
  

standard A.N.S.I. thermocouple tolerances & colour codes supplied - for others please enquire

Sheath Material

310 SS
 Inconel 600™
 alloy TD
 other

Element Type

ceramic wire wound flat film
 class B band 1 class A
 band 2 band 3 band 5

Probe Size length mm diameter mm

N.A.T.A. Calibration Certificate required number of points not required

Termination

thermal head

large/small alloy
 cast iron
 stainless cast
 stainless machined
 bakelite

connection block

large/small
 bakelite/ceramic
 spring loaded (large head only)

transmitter see next page

low cost, prog., RTD, non-isolated
 low cost, prog., T/C, isolated
 universal, prog., isolated
 universal, prog., HART
 universal, prog., Profibus/Fieldbus
 intrinsically safe

temperature range

high/low °C
 for transmitter calibration

Connector

Marlin plug

standard/mini
 high temp.

Marlin jack

standard/mini
 high temp.

transition/pot seal

tails - sep. wires length
 standard tail length 75mm
 extension lead length
 (above 5M use shielded wire)

PVC
 teflon
 fibreglass
 fibreglass (TCB outer)
 fibreglass (SS outer)

Process Connection

fixed SS

1/2" BSP
 1/2" BSPP
 other

adjustable

1/8" BSP
 SS / brass 1/4" BSP
 1/2" BSP
 3/4" BSP

nipple/union/nipple

50mm/75mm standard

specify full details

SS
 other

flange

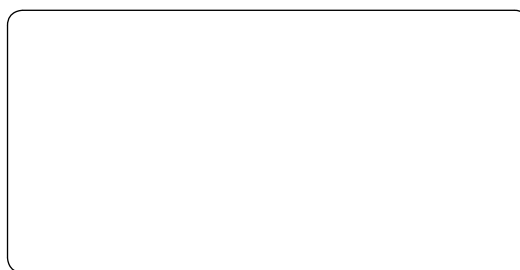
Well

fabricated SS
 machined SS



'U' length
 internal thread
 external thread

Sketch With Dimensions



Client Details

Name
 Company
 Address
 Phone
 Fax
 Email



Economy 2 Wire Head Transmitters



PR-5333A – RTD

- Pt100, Pt1000, Ni100 + linear
- Resistive input to 10 K Ω
- Non isolated
- Accuracy $\pm 0.3^{\circ}\text{C}$

Model Number

PR-5333A AV3 K1

awesome value
high accuracy!

PR Electronics are the only IP68 head transmitter offering protection from condensation & pressure washing in food & dairy plants



PC configuration 5905



PR-5331A – universal

- 12 thermocouples + RTD 2, 3, 4 & R
- Isolated 1500V
- Accuracy $0.2^{\circ}\text{C} - 1^{\circ}\text{C}$
- Accuracy $\pm 0.3^{\circ}\text{C}$

Model Number

PR-5331A3B AV3 K1

high performance
at low price



PR-5334A – T/C

- 12 thermocouple types
- Isolated 1500V
- 18 bit $\pm 1^{\circ}\text{C}$ accuracy

Model Number

PR-5334A3B AV3 K1

flexible
economy!

Common Specifications

- ★ PC programmable
- ★ IP68 + Ex. ATEX versions
- ★ 8V to 35V DC supply
- ★ Digital filter
- ★ Inverted output
- ★ Offset to 50% span
- ★ Ambient -40 to 85°C



Economy 2 Wire Head Transmitters



PR-5335A

advanced
universal!

- B, E, J, K, L, N, R, S, T, U, W3, W5 thermocouple inputs
- Internal or external CJC – min. span 10°C
- Pt100, Pt1000, Ni100 & Lin R to 7K
- Programmable by P.C. – type 5905
- Programmable with HART communications
- Differential temperature input

Using the PR 5335, ECEFast can supply complete temperature or level sensors with isolated 4-20 mA output + HART digital output. Accuracy is from 0.1°C to 0.5°C & 22 bit.

Model Number

PR-5335A BV3 K2

PR-5335B-IS AV3 K1

5 years
warranty!



Profibus & Foundation Fieldbus – Universal Transmitters



PR-5350

- Universal thermocouple, RTD & R inputs
- Bus powered 9 to 32V DC < 11 mA
- Isolated to 1500V AC
- Differential temperature measurement
- Program via bus
- Alarm & PID outputs to bus

The PR 5350 hockey puck & PR 6350 DIN Rail are the first auto detect bus transmitters for Profibus PA or Foundation Field Bus. These transmitters are extremely rugged, highly accurate & offer advanced functions such as PID control. (see also page 30)

Model Number

PR-5350A CV3 K2

PR-5350B-IS CV3 K1

5 years
warranty!



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Custom Manufactured Sensors