# THERMOCOUPLE & RESISTANCE THERMOMETER SENSORS & PROBES

A wide range of configurations for industrial and laboratory applications



TEMPERATURE & PROCESS TECHNOLOGY



### THERMOCOUPLE & RESISTANCE THERMOMETER SENSORS & PROBES

### Choosing the sensor type:

**Thermocouples** are less expensive than PRT sensors, more versatile, less accurate, more rugged, more sensitive, have a wider operating range, are tip sensitive and can be smaller. Extension cabling is more expensive. Various calibrations are available for different applications.

**PRT assemblies** are much more accurate and stable, permit greater resolution of measurement but over a more limited range, are stem sensitive, larger and more expensive. Extension cabling is inexpensive copper wire.

Remember the type of sensor chosen must suit the associated instrumentation.

- Thermocouple & platinum resistance thermometers in a wide range of configurations & dimensions
- Ranges from -200°C to 1700°C
- Mineral insulated, flexible and fabricated, rigid probes
- Fine wire thermocouples
- Hand held probes
- Plastics, surface & air sensors
- Furnace thermocouples
- Calibrated sensors
- General purpose and application specific designs
- Installation fittings
- Head mounting temperature transmitters
- Pt100 & Pt1000 detectors
- ISO 9001 registered
- Full compliance with IEC specifications
- Thermocouple calibration types J,K,T,N,E,R & S available

### **CONTENTS** Mineral Insulated, Flexible Sheath Thermocouples....3 Welded Tip, Fine Wire Thermocouples .......5 Thermocouples for specific Applications including Mineral Insulated, Flexible Sheath Platinum Resistance Thermometers......8 Fabricated, Riaid Sheath Platinum Resistance Thermometers ...... 8 **Platinum Resistance Thermometers for** specific Applications......10 Hand Held Platinum Resistance Thermometers ...... 10 Platinum Resistance Thermometer Custom Sensors......12 Probe Certification......12 Installation Fittings for Temperature Sensors........13



# THERMOCOUPLE CONNECTORS, EXTENSION AND COMPENSATING WIRES AND CABLES

INSULATION COLOUR CODES Extension & Compensating Leads					Č	CABLE
TY	PE CONDUCTORS +/-	BRITISH BS1843: 1952	AMERICAN ANSI/MC 96.1	GERMAN DIN 43713 / 43714	IEC584-3: 198 BS4937. Part 30.	
E	NICKEL CHROMIUM/CONSTANTAN (Nickel Chromium/Copper Nickel, Chromel/Constantan, T1/Advance, NiCr/Constantan)		<u>+</u>			EX
J	IRON*/CONSTANTAN (Iron/Copper Nickel, Fe/Konst Iron/Advance, Fe/Constantan I/C)	±	<u>+</u>	<u>+</u>	±±	JX
K	NICKEL CHROMIUM/NICKEL ALUMINIUM* (NC/NA, Chromel/Alumel, C/A, T1/T2, NiCr/Ni, NiCr/NiAL)	<u>+</u>	± ±	<u>+</u>		КХ
N	NICROSIL/NISIL	<u>+</u>	<u></u>			NX NC
ī	COPPER/CONSTANTAN (Copper/Copper Nickel, Cu/Con, Copper/Advance)		<u>+</u>	<u>=</u> =±		TX
Vx	COPPER/CONSTANTAN (LOW NICKEL) (Cu/Constantan) Compensating for K (Cu/Constantan)	±±		= ±	± ±	КСВ
U	COPPER/COPPER NICKEL Compensating for Platinum 10% or 13% Rhodium/Platinum (Codes S & R respectively) (Copper/Cupronic Cu/CuNi, Copper/No. 11 Alloy)		<u>+</u>		<b>=</b> ±	RCA SCA
	* Magnetic, ( ) Alternative & Trade	Name	FOR THERMOCOUPLE CONNECTORS body colours are similar to outer sheath colours		FOR THERMOCOUPLE CONNECTORS body colours are similar to outer sheath colours	

The British Standard Colour Code for Thermocouple Cables, BS1843: 1952 is superseded by BS4937 PART 30 1993 (=IEC 584-3 1989)

Additional identification as to whether a thermocouple cable type is extension or compensating is indicated in the example which follows; however, please note that a letter A or B after the C for Compensating refers to the Cable Temperature Range in accordance with the table of Tolerance Values set out with this standard.

K - X - 1 = K EXTENSION CLASS 1 K - CA - 2 = K COMPENSATION CLASS 2

All technical information published in this brochure is for guidance and not necessarily definitive. All thermocouple items comply with IEC 584 colour codes, cable and thermoelement tolerances unless otherwise stated. All platinum resistance thermometer items comply with IEC 751 tolerance and termination colour codes. All dimensions stated are nominal. Product availability & specifications may be subject to change. E & OE

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#### MINERAL INSULATED THERMOCOUPLES

Mineral insulated thermocouples are for use up to 1300°C depending on the configuration. They are rugged, steel sheathed probes with flexible sheaths allowing bending or forming. They offer long life (depending on use) and can be used in high pressure and vibration applications. Stainless steel sheaths provide optimum flexibility Inconel 600 offers better corrosion resistance in many applications.

Alternative cable types available.

### MINERAL INSULATED THERMOCOUPLES WITH TAILS. STYLE MD



- Mineral insulated thermocouple type K
- Choice of stainless steel 310 or Inconel 600 sheath
- M8 x 1.0mm threaded pot (200°C)
- Sensor temperature range -100 to 1100°C
- Tails 100mm, PFA insulated twin twisted, 7/0.2mm

ORDE	R CODES	
Probe	Probe	less steel sheath Code
Probe dia (mm) 0.5 0.5 0.5 1.0 1.0 1.5 1.5 1.5 1.5 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	Probe length (mm) 150 250 1000 150 250 500 1000 150 250 500 1000 150 250 500 1000 150 250 250 250 250 250 250 250 250 250 2	MD-ISK-S05-150-P5 MD-ISK-S05-250-P5 MD-ISK-S05-500-P5 MD-ISK-S05-1000-P5 MD-ISK-S10-150-P5 MD-ISK-S10-150-P5 MD-ISK-S10-1500-P5 MD-ISK-S110-1000-P5 MD-ISK-S15-1500-P5 MD-ISK-S15-500-P5 MD-ISK-S15-500-P5 MD-ISK-S15-500-P5 MD-ISK-S30-150-P5 MD-ISK-S30-150-P5 MD-ISK-S30-150-P5 MD-ISK-S30-150-P5 MD-ISK-S30-150-P5 MD-ISK-S30-1500-P5 MD-ISK-S30-250-P5 MD-ISK-S30-250-P5 MD-ISK-S30-2500-P5 MD-ISK-S30-2500-P5 MD-ISK-S30-2500-P5
6.0 6.0 6.0	500 1000 2000	MD-ISK-S60-500-P5 MD-ISK-S60-1000-P5 MD-ISK-S60-2000-P5

	ER CODES	ath
Prob dia	e Probe length	Code
	) (mm)	
1.0	500	MD-ISK-I10-500-P5
1.0	1000	MD-ISK-I10-1000-P5
1.5	500	MD-ISK-I15-500-P5
1.5	1000 500	MD-ISK-I15-1000-P5 MD-ISK-I30-500-P5
3.0	1000	MD-ISK-I30-300-P5
3.0	2000	MD-ISK-I30-2000-P5
6.0	1000	MD-ISK-I60-1000-P5
6.0	2000	MD-ISK-I60-2000-P5

# MINERAL INSULATED THERMOCOUPLES WITH EXTENSION LEAD & PLAIN POT SEAL. STYLE MA



### Mineral insulated thermocouple type J or K

- Plain, stainless steel pot (200°C)
- Stainless steel sheath, type K 310, type J 321
- Type K -100 to 1100°C sensor range
- Type J -100 to 760°C sensor range
- 2m PFA insulated lead, 7/0.2mm flat pair

ORDER CODES Type K Probe Probe Code						
dia	16	ength				
(mı	n) (ı	nm)				
0.5	150	MA-ISK-S05-150-P1-2.0-C2-T				
0.5	250	MA-ISK-S05-250-P1-2.0-C2-T				
1.0	150	MA-ISK-S10-150-P1-2.0-C2-T				
1.0	250	MA-ISK-S10-250-P1-2.0-C2-T				
1.5	150	MA-ISK-S15-150-P1-2.0-C2-T				
1.5	250	MA-ISK-S15-250-P1-2.0-C2-T				
3.0	150	MA-ISK-S30-150-P1-2.0-C2-T				
3.0	250	MA-ISK-S30-250-P1-2.0-C2-T				
6.0	150	MA-ISK-S60-150-P1-2.0-C2-T				
6.0	250	MA-ISK-S60-250-P1-2.0-C2-T				
(		222 230 1 1 210 02 1				

# ORDER CODES Type J Probe Probe Code dia length (mm) (mm) 1.5 150 MA-ISJ-S15-150-P1-2.0-C2-T 1.5 250 MA-ISJ-S30-150-P1-2.0-C2-T 3.0 150 MA-ISJ-S30-150-P1-2.0-C2-T 6.0 150 MA-ISJ-S60-150-P1-2.0-C2-T 6.0 250 MA-ISJ-S60-250-P1-2.0-C2-T 6.0 250 MA-ISJ-S60-250-P1-2.0-C2-T

# MINERAL INSULATED THERMOCOUPLES WITH EXTENSION LEAD & THREADED POT SEAL. STYLE MA



- Mineral insulated thermocouple type K or N
- Type N Nicrosil sheath, type K stainless steel sheath 310
- M8 x 1.0mm threaded pot seal (200°C)
- Type K -100 to 1100°C sensor range
- Type N -230 to 1300°C sensor range
- 2m PFA insulated lead, 7/0.2mm flat pair

	DER CO	ODES
Pro	be Pr	obe Code
dia	lei	ngth
(mn	n) (m	
1.0	300	MA-ISK-S10-300-P5-2.0-C2-T
1.5	300	MA-ISK-S15-300-P5-2.0-C2-T
3.0	300	MA-ISK-S30-300-P5-2.0-C2-T
6.0	300	MA-ISK-S60-300-P5-2.0-C2-T
1.0	500	MA-ISK-S10-500-P5-2.0-C2-T
1.5	500	MA-ISK-S15-500-P5-2.0-C2-T
3.0	500	MA-ISK-S30-500-P5-2.0-C2-T
6.0	500	MA-ISK-S60-500-P5-2.0-C2-T

ORI	DFR C	ODES			
Type N					
		obe Code			
dia	le	ngth			
(mn	n) (n	nm)			
1.0	300	MA-ISN-N10-300-P5-2.0-C2-T			
1.5	300	MA-ISN-N15-300-P5-2.0-C2-T			
3.0	300	MA-ISN-N30-300-P5-2.0-C2-T			
6.0	300	MA-ISN-N60-300-P5-2.0-C2-T			
1.0	500	MA-ISN-N10-500-P5-2.0-C2-T			
1.5	500	MA-ISN-N15-500-P5-2.0-C2-T			
3.0	500	MA-ISN-N30-500-P5-2.0-C2-T			
6.0	500	MA-ISN-N60-500-P5-2.0-C2-T			

Alternatives made to order - details on request









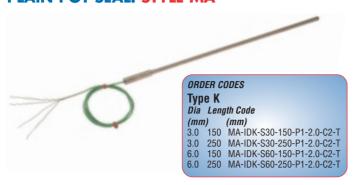






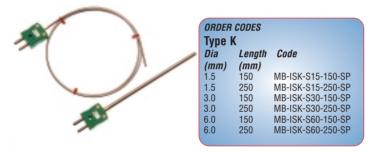


# DUPLEX MINERAL INSULATED THERMOCOUPLES WITH EXTENSION LEAD & PLAIN POT SEAL. STYLE MA



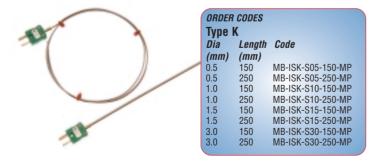
- 2 independent thermocouples in single sheath
- Mineral insulated thermocouples type K
- Stainless steel sheath 310
- Plain, stainless steel pot (200°C)
- Sensor temperature range -100 to 1100°C
- 2m PFA insulated lead, 4 core 7/0.2mm

### MINERAL INSULATED THERMOCOUPLES WITH STANDARD PLUG. STYLE MB



- Mineral insulated thermocouples, type K
- Quick, simple connection for easy installation
- Standard plug termination (220°C)
- Stainless steel sheath 310
- Sensor temperature range -100 to 1100°C

### MINERAL INSULATED THERMOCOUPLES WITH MINIATURE PLUG. STYLE MB



- Mineral insulated thermocouples, type K
- Quick, simple connection for easy installation
- Miniature plug termination (220°C)
- Stainless steel sheath 310
- Sensor temperature range -100 to 1100°C

Alternatives made to order - details on request

# INDUSTRIAL MINERAL INSULATED THERMOCOUPLE WITH TERMINAL HEAD, EXTENSION & REPLACEABLE INSERT. STYLE MC/ME



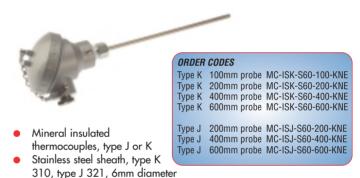
- Mineral insulated thermocouple, type K
- Áluminium IP67 terminal head, M20 x 1.5mm cable entry
- Sensor temperature range -100°C to 800°C
- Stainless steel sheath & extension
- Extension 12.5mm diameter x 75mm
- ½" BSP (P) process connection
- Replaceable spring loaded insert

# ORDER CODES Type K complete assembly: Probe length

150mm 010559TD-A 250mm 010559TD-B 500mm 010559TD-C Replacement inserts to suit:

150mm ME-ISK-S60-275-DPB 250mm ME-ISK-S60-375-DPB 500mm ME-ISK-S60-625-DPB

## INDUSTRIAL MINERAL INSULATED THERMOCOUPLE WITH TERMINAL HEAD. STYLE MC



- Aluminium IP67 terminal head, M20 x 1.5mm cable entry
- Sensor temperature range -100°C to 1100°C (K) -100°C to 760°C (J)
- Optional Transmitter-in-head, see page 14
- Thermowells & fittings available, see page 13

# INDUSTRIAL MINERAL INSULATED THERMOCOUPLE WITH TERMINAL HEAD & PROCESS CONNECTION. STYLE MC



- Mineral insulated thermocouple, type K
- Aluminium IP67 terminal head, M20 x 1.5mm cable entry
- ½" BSP (P) process connection, stainless steel
- Stainless steel sheath 310, 6mm diameter
- Sensor temperature range -100°C to 1100°C
- Optional transmitter-in-head, see page 14
- Thermowells available details on request

















### WELDED TIP FINE WIRE **THERMOCOUPLES**

### WELDED TIP THERMOCOUPLES, GLASSFIBRE **INSULATED. STYLE Z3**



#### ORDER CODES

Z3-K-F/G-1/0.315-2.0-T Z3-T-F/G-1/0.315-2.0-T Z3-J-F/G-1/0.315-2.0-T

FOR PACKS OF FIVE. ADD x5 TO CODE

Other thermocouple types available, details on request

Z2-T-PFA-TT-1/0.08-1.0-T

Other thermocouple types available,

FOR PACKS OF FIVE.

ADD x5 TO CODE

details on request

- Fast response, exposed junction
- Thermocouple types J,K & T
- Glassfibre insulated wires, silicone varnished
- Flat pair, 1/0.315mm, 2m long
- Rated -60°C to 350°C
- Ideal for test & development applications

### FINE WIRE WELDED TIP THERMOCOUPLES, **PFA INSULATED. STYLE Z2**



- Fast response, exposed junction
- Thermocouple type K&T
- PFA insulated wires, 1m singles 1/0.08mm, class 1
- Rated -75°C to 250°C
- IEC colours supplied (ANSI shown)
- Ideal for test & development applications

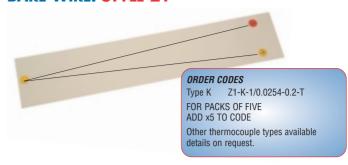
### WELDED TIP THERMOCOUPLES, PFA INSULATED, STYLE Z2



- Fast response, exposed junction
- Thermocouple types J,K & T
- PFA insulated wires
- Twin twist 1/0.2mm, Class 1, 2m long
- Rated -75°C to 250°C
- Ideal for test & development applications

Alternatives made to order - details on request

### **VERY FINE WELDED TIP THERMOCOUPLES. BARE WIRE, STYLE Z1**



- Optimum sensitivity, very responsive
- Exposed junction
- Thermocouple type K
- Bare wires 1/0.0254mm x 200mm
- Ideal for minimally invasive temperature sensing

### WELDED TIP THERMOCOUPLES WITH MINIATURE PLUGS & CHOICE OF LEAD. **STYLE Z2 & Z3**



#### ORDER CODES

Fitted plug PFA:

Z2-J-PFA-TT-1/0.2-2.0-MP Z2-K-PFA-TT-1/0.2-2.0-MP Z2-T-PFA-TT-1/0.2-2.0-MP

Fitted plug Glassfibre:

Z3-J-F/G-1/0.315-2.0-MP Type J Z3-K-F/G-1/0.315-2.0-MP Z3-N-F/G-1/0.315-2.0-MP

"Moulded-on" plug PFA Type J Z2-J-PFA-TT-1/0.2-2.0-MMP Type K Z2-K-PFA-TT-1/0.2-2.0-MMP Z2-T-PFA-TT-1/0.2-2.0-MMP

FOR PACKS OF FIVE, ADD x5 TO CODE

Other thermocouple types available, details on request

- Choice of fitted (220°C) or "moulded-on" miniature plug (100°C)
- Fast response, exposed junction
- Thermocouple types J,K,T & N
- Choice of PFA insulated wires 2m, twin twist 1/0.2mm, Class 1 or Glassfibre, flat pair 1/0.315mm
- Rated -75°C to 250°C, PFA (-60°C to 350°C glassfibre)
- Ideal for test & development applications

### **CABLE TIDY THERMOCOUPLE WITH** FITTED MINIATURE PLUG



- A complete, precision fine wire, high sensitivity thermocouple with a fitted miniature connector
- Quick and easy integral storage of the thermocouple
- Type K & T thermocouples, 1 & 2m lengths
- Class 1 wire for high accuracy
- PFA insulated wire, 0.2 & 0.315mm conductors
- Rated 220°C continuous
- Ideal & convenient for scientific and industrial test & measurement

Details on application

### ww.labfacility.co.uk







Z2-K-PFA-TT-1/0.2-2.0-T Z2-T-PFA-TT-1/0.2-2.0-T

Z2-J-PFA-TT-1/0.2-2.0-T

Other thermocouple types available,

FOR PACKS OF FIVE,

ADD x5 TO CODE

details on request.











### COPPER DISC, FINE WIRE THERMOCOUPLE, **PFA INSULATED**



#### ORDER CODES

DISC-K-PFA-TT-1/0.2-2.0-T DISC-J-PFA-TT-1/0.2-2.0-T

FOR PACKS OF FIVE ADD x 5 TO CODE

Other thermocouple types available, details on request

- Copper disc 6.35mm diameter x 0.3mm thick
- Thermocouples type J & K
- PFA insulated wires 2m, twin twist 1/0.2mm, class 1
- Rated 0°C to 200°C
- Adhesive kapton strip 13x18mm supplied x 5

#### **THERMOPADS**

Self-adhesive pads in PTFE glass cloth for locating welded tip thermocouples

- -50°C to 200°C
- Packs of 20 pads
- Pad 13x18mm



### ORDER CODES

Thermopads PE-021

### THERMOCOUPLES FOR SPECIFIC APPLICATIONS

### MAGNETIC STRIP THERMOCOUPLE. **STYLE FMS**



- Type K thermocouple in a flexible magnetic strip for use on ferro-magnetic surfaces
- Temperature range -50 to 120°C
- 2m PFA twisted pair insulated lead, 1/0.315mm
- Strip 50 x 25 x 1mm

### **BUTTON MAGNET THERMOCOUPLE. STYLE BMS**



- Type K thermocouple in a powerful magnet
- Grounded measuring junction
- Temperature range 0°C to 250°C
- 2m PFA twisted pair insulated lead 7/0.2mm
- Magnet 12.5mm diameter x 10mm

#### **PLASTICS & GENERAL USE**

### ADJUSTABLE BAYONET FITTING THERMOCOUPLE, STYLE FS



- A type J or K thermocouple with adjustable insertion depth
- 4.5mm or 6.0mm diameter tip
- 170mm spring with adjustable fixing cap
- Grounded tip for fast response
- Rated 350°C
- 2m Glassfibre, stainless steel braided lead, 7/0.2mm
- Male adaptor available 1/2" BSP thread, see page 13

#### WASHER THERMOCOUPLE. STYLE FW



- A type J or K thermocouple housed in a washer eyelet
- Grounded tip for fast response
- Rated 350°C
- Washer with 6mm clearance hole
- 2m glassfibre steel braided extension lead, 7/0.2mm

### MELT THERMOCOUPLE. STYLE FM



- Robust construction to withstand high pressure and temperatures
- Rated 450°C (sensor), 220°C (connector). Insulated junction
- Suits wide range of extruders and moulders
- 310 stainless steel: UNF 20 thread. 76 or 152mm bolt length
- Sheath; immersion depth 5mm, diameter 3mm

Alternatives made to order - details on request















### LABFACILITY TEMPERATURE & PROCESSTECHNOLOGY

### THERMOCOUPLES

#### NOZZLE THERMOCOUPLE. STYLE FN



#### **ORDER CODES**

J FN-J-M-2.0-C4-T K FN-K-M-2.0-C4-T

- A type J or K thermocouple housed in a threaded bolt
- Grounded tip for fast response
- Adjustable insertion via free running nut
- M6 x 1mm threaded stainless steel bolt
- Rated 350°C
- 2m glassfibre stainless steel braided extension lead, 7/0.2mm

### LEAF THERMOCOUPLE. STYLE FL



- A type J or K sensor mounted on a stainless steel shim
- Grounded tip for fast response
- Rated 350°C
- 2m glassfibre stainless steel braided extension cable, 7/0.2mm
- Stainless steel shim 25mm long x 13mm wide

### PATCH SURFACE THERMOCOUPLE. STYLE SRS



- Type K thermocouple in a moulded silicone rubber patch
- Dimensions 40 x 13mm
- Self-adhesive, aluminium foil backing
- 2m PFA twin twisted lead 1/0.2mm
- Resistant to many oils and chemicals

#### PIPE SURFACE THERMOCOUPLE. STYLE FP



- Fits pipe diameters 13mm to 55mm (4 sizes)
- A type K stainless steel pipe clamp sensor with adjustable diameter
- Grounded tip for fast response
- Rated 350°C
- 2m glassfibre stainless steel braided extension lead, 7/0.2mm

ORDER CODES

K, 13-20mm FP-K-13-2.0-C4-T

FP-K-20-2.0-C4-T

FP-K-30-2.0-C4-T

FP-K-40-2.0-C4-T

Type & Size

K, 20-30mm

30-40mm

K. 40-55mm

### **HEAVY DUTY RIGID PROBE. STYLE FA**



- Type J or K rugged, immersion thermocouple
- Probe 4.5mm diameter x 150mm long
- 2m glassfibre, stainless steel braided lead, 7/0.2mm
- Sensor temperature range -60°C to 350°C
- Grounded junction for fast response

### HAND HELD THERMOCOUPLE PROBES

A range of hand held probes provides alternative handle and sheath configurations for a wide variety of applications.

- A choice of handle designs
- Coiled lead or straight lead options
- Miniature plug termination
- Penetration, air & surface tip designs
- Use with any digital thermometer

### FURNACE THERMOCOUPLES

Labfacility offers a comprehensive range of base and rare metal thermocouples for high temperature applications including furnaces.

- Standard configurations or custom made
- Types K,N,R,S & B
- Temperature ratings up to 1750°C
- Wide range of sheath materials including stainless steel and Alumina
- Single and dual sheathed versions for optimum element protection

Details on application

Alternatives made to order – details on request



















### PLATINUM RESISTANCE THERMOMETERS

#### MINERAL INSULATED. FLEXIBLE SHEATH RESISTANCE THERMOMETERS

Mineral Insulated Resistance Thermometers are for use up to 500°C depending on the configuration. They are rugged, steel sheathed probes with flexible sheaths allowing bending or forming. They offer long life (depending on use) are resistant to vibration and can be used in high pressure applications. Alternative cable types available

4 wire thermometer can be connected as 4,3 or 2 wire; 3 wire can be connected as 3 or 2 wire

### MINERAL INSULATED Pt100 PROBE WITH EXTENSION LEAD. STYLE MIRA



- High temperature, rugged flexible Pt100 probe
- Pt100 Class B, 4-wire connection
- Sensor Temperature rating -100 to 500°C
- 2m PFA insulated screened lead, 7/0.2mm, 4 core
- Stainless steel sheath

### DUPLEX MINERAL INSULATED P1100 PROBE WITH EXTENSION LEAD. STYLE MIRA



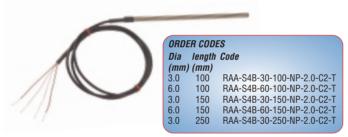
- High temperature, rugged, flexible Pt100 probe
- 2 independent Pt100 sensors in single sheath
- 2 x Pt100, Class B, 3 wire connection
- Sensor temperature range -100 to 500°C
- 2m PTFE insulated, screened lead, 6 core, 7/0.2mm
- Stainless steel sheath

### FABRICATED, RIGID SHEATH RESISTANCE THERMOMETERS

Fabricated or general purpose resistance thermometers are for use up to 350°C. The rigid, steel probes and alternative sensor configurations suit many applications. Alternative cable types available.

4 wire thermometer can be connected as 4,3 or 2 wire; 3 wire can be connected as 3 or 2 wire

### P+100 PROBE WITH EXTENSION LEAD. STYLE RA



- Accurate, general purpose temperature sensor
- Pt100, Class B, 4 wire connection
- Stainless steel probe
- Sensor Temperature range -50 to 250°C
- 2m PFA insulated screened lead, 7/0.2mm for 6.0mm probe
- 2m PFA insulated screened lead, 7/0.1mm for 3.0mm probe

### Pt100 GENERAL PURPOSE TEMPERATURE SENSOR. STYLE RA



- A heavy duty industrial probe with a tough, silicone rubber insulated lead
- Pt100, Class B, 4 wire
- Stainless steel rigid sheath
- 6mm diameter, 50mm and 100mm lengths
- 2m, 4 core 7/0.2mm silicone rubber insulated lead
- Sensor temperature range -50°C to 200°C

### Pt100 PRECISION PROBES. STYLE RA



450°C	6.0	350	H450

- High accuracy, close tolerance Pt100 sensors
- Suitable as reference probes
- Pt100 1/5DIN tolerance element, 4 wire connection
- Accuracy better than ±0.6°C at 0°C
- 2m PTFE insulated, screened lead, 7/0.2mm
- Sensor temperature range -50 to 250°C
- Alternative 450°C version
- Stainless steel sheath

Alternatives made to order



### PLATINUM RESISTANCE THERMOMETERS

### QUICK RESPONSE THIN FILM, GENERAL PURPOSE P+100 PROBE. STYLE RA



- Stainless steel sheath housing a thin film Pt100 in flat tip
- Adjustable, fitted compression gland
- Pt100, Class B element, 2 wire connection
- Probe 4mm diameter x 117mm
- Sensor temperature range -50 to 250°C
- Brass gland ½" BSP (P)
- 1m PTFE insulated, screened lead, 2 wire 7/0.2mm

### DUPLEX Pt100 PROBE WITH EXTENSION LEAD. STYLE RA



- 2 independent Pt100 sensors in single sheath
- Pt100, Class B, 2 x 3 wire
- Sensor temperature range -50°C to 250°C
- 2m PTFE insulated screened lead, 6 core 7/0.2mm
- Stainless steel sheath

### INDUSTRIAL Pt100 SENSOR WITH TERMINAL HEAD. STYLE RC



- High temperature, rugged probe with Pt100 element
- Pt100, Class B, 4 wire connection
- Stainless steel sheath, 6mm diameter
- Aluminium IP67 terminal head, M20 x 1.5mm cable entry
- Sensor temperature range -100 to 450°C
- Optional transmitter-in-head, see page 14
- Thermowells & fittings available, see page 13

# INDUSTRIAL, Pt100 SENSOR WITH TERMINAL HEAD, EXTENSION & REPLACEABLE INSERT. STYLE RC & RE



- High temperature, rugged probe with Pt100 element
- Pt100, Class B, 4 wire connection
- Stainless steel sheath & extension
- Extension 12.5mm diameter x 75mm
- Aluminium IP67 terminal head, M20 x 1.5mm cable entry
- ½" BSP (P) process connection
- Replaceable spring loaded insert
- Sensor temperature range -100°C to 450°C

# INDUSTRIAL P+100 SENSOR WITH TERMINAL HEAD & PROCESS CONNECTION. STYLE RC



- High temperature, rugged probe with Pt100 element
- Pt100, Class B, 4 wire connection
- Stainless steel sheath, 6mm diameter
- Aluminium IP67 terminal head, M20 x 1.5mm cable entry
- ½" BSP(P) process connection, stainless steel
- Sensor temperature range -100°C to 450°C
- Optional transmitter-in-head, see page 14
- Thermowells & fittings available, see page 13



### PLATINUM RESISTANCE THERMOMETERS

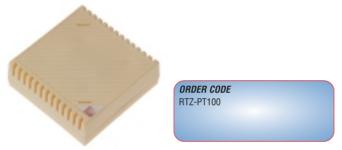
#### RESISTANCE THERMOMETERS FOR SPECIFIC APPLICATIONS

### EXTERNAL/COLD STORE Pt100 SENSOR. STYLE RTP



- Rugged, wall mounting Pt100 assembly for heavy duty applications
- Pt100, Class B for 2,3 or 4 wire connection
- Temperature range -50°C to 150°C
- Weatherproof assembly to IP67, H80 x W74 x D54mm
- Stainless steel perforated probe 12.5mm diameter x 75mm
- M20 cable gland
- 4-20mA transmitter option

### **CLEAN ROOM P1100 SENSOR. STYLE RTZ**



- Moulded, wall mounting Pt100 housing for accurate, indoor air temperature sensing
- Moulded case H85 x W85 x D30mm
- Surface or standard electrical conduit mounting
- Pt100, Class B for 2,3, or 4 wire connection
- Temperature range 0 to 70°C

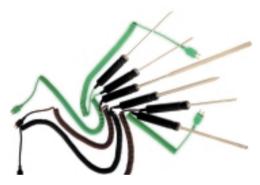
### PATCH, SURFACE Pt100. STYLE RTF



- Pt100 Class B sensor in a moulded silicone rubber patch
- Dimension L40mm, W13mm, thickness 5mm
- 4 wire connection
- Self-adhesive, aluminium foil backing
- 2m PTFE insulated, twisted pair lead, 4 core, 7/0.2mm
- Temperature range -50 to 150°C
- Resistant to many oils & chemicals

### **HAND HELD P1100 PROBES**

A range of hand held probes provides alternative handle and sheath configurations – details on application.



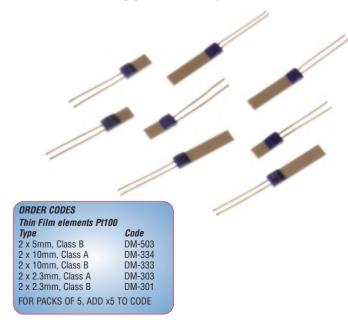
### PLATINUM RESISTANCE SENSING ELEMENTS

- Pt100 & Pt1000 elements to IEC751, Class A & B
- Wirewound & thin film construction
- Thin film elements are resistant to vibration & shock & provide better thermal sensitivity
- Wirewound elements provide optimum performance in process applications when used in a protective sheath
- Glass encapsulated options for hermetic sealing details on request
- Extended lead options, 2 & 4 wire with ceramic sheath
- Wide range of sizes
- Range –200 to 800°C wirewound, -70 to 500°C thin film
- Duplex versions (wirewound)

### **THIN FILM P†1000 ELEMENTS**



### THIN FILM Pt100 ELEMENTS

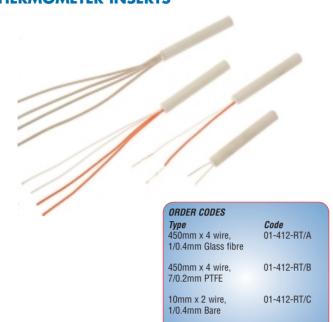


Alternatives made to order - details on request



### PLATINUM RESISTANCE HERMOMETERS

### THIN FILM ELEMENTS Pt100, CLASS B THERMOMETER INSERTS

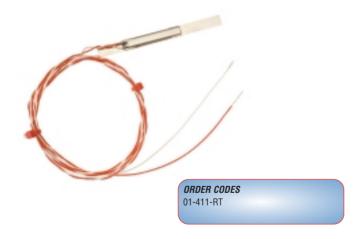


50mm x 2 wire, 7/0.2mm PTFE

01-412-RT/D

- Element housed in ceramic sheath 5mm dia x 35mm long
- Thin Film Pt100 Elements to BS1904 1984, class B
- Leads 1/0.4mm dia nickel wire
- 7/0.2mm singles copper wire, PTFE insulated
- 2 and 4 wire configurations
- Non sleeved or Glassfibre sleeved for -50°C to 450°C
- PTFE insulated wires for -50°C to 250°C

### FLAT SHEATHED, THIN FILM Pt100



- Sheathed Pt100 element in thin stainless steel body
- Dimentions, length x 35mm width x 6mm height 2mm Temperature range -50°C to 250°C
- 1m of PTFE insulated twin twist 7/0.2mm

Alternatives made to order - details on request

### **WIREWOUND ELEMENTS P+100**

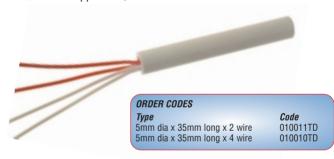


ORDER COL	DES				
Dimensions		Code	Dimensions	Tolerance Clas	s Code
Dia x lengtl	h		Dia x length		
(mm)			(mm)		
2.8 x 25	В	DA-016	1.5 x 15	В	DA-061
2.8 x 25	Α	DA-017	1.5 x 15	Α	DA-062
2.8 x 25	1/3	DA-018	1.5 x 15	1/3	DA-063
2.8 x 25	1/5	DA-019	1.5 x 15	1/5	DA-064
2.8 x 25	1/10	DA-020	1.5 x 15	1/10	DA-065
1.5 x 25	В	DA-026	1.5 x 8	В	DA-081
2.8 x 15	В	DA-041	1.5 x 8	Α	DA-082
2.8 x 15	Α	DA-042	1.5 x 8	1/3	DA-083
2.8 x 15	1/3	DA-043	1.5 x 8	1/10	DA-085
2.8 x 15	1/5	DA-044	2.3 x 25	В	DA-011
2.8 x 15	1/10	DA-045	1.6 x 15	1/10	DA-067
2.4 x 15	В	DA-046			
1.6 x 15	В	DA-056			

Also available with extended leads

### **WIREWOUND ELEMENTS, P1100 CLASS B** WITH EXTENDED LEADS

Leads 7/0.2mm copper wire, PFA sleeved



#### **DUPLEX WIREWOUND ELEMENTS, Pt100**



2 x Pt100 elements, single element shown.

Also available with extended leads

ORDER CODES					
Туре	Code				
1.5mm dia x 15mm Class A	DB-151				
1.5mm dia x 15mm Class B	DB-150				

### **LABFACILITY**

### **CUSTOM SENSORS**

Labfacility is a specialist designer and manufacturer for custom specified temperature sensors. Special assemblies can be supplied against a sample (existing) probe, a customer drawing or a written specification. Special close tolerance, high accuracy sensors can be produced for the most exacting requirements. New machinery or processes may require a new design of temperature sensor and Labfacility can undertake such

requirements. Advice is freely available on the best choice of sensor type, probe material, termination method and installation technique to best suit the process.



Special Autoclave Probe



Sensor capabilities and markets include:

- Vehicle ice-warning
- Steriliser
- Measurement of rotor-blade temperature
- Outside aircraft temperature measurement
- Medical and cryogenic applications
- Aircraft brake-disc temperature testing
- Formula 1 Racing engine testing and tyre warming
- Manifold automotive engine testing
- Vending machines

- Surface temperature measurement
- Laboratory test equipment
- Food processing Machinery
- Wind tunnel Testing
- Tobacco Machinery
- Heating and Ventilation
- Plastics Machinery
- Textile Industry
- Oil Industry

### PROBE CERTIFICATION

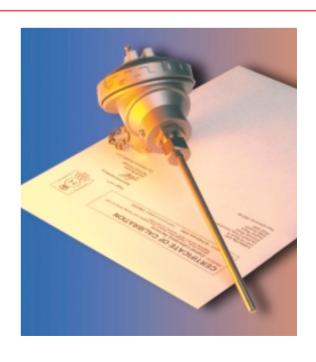
Labfacility can supply probes and instruments complete with a UKAS certificate of calibration to order.

Some stock resistance thermometer probes with a UKAS certificate are available for immediate delivery.

Custom calibration to specific customer requirements caters for routine, specified re-calibration for Quality control procedures. Calibration points can be specified between -20°C and +1100°C according to probe and instrumentation specifications. The certificate issued for each sensor will state any calibration error which is measured at the various test values and also the uncertainties which exist in the calibration measurement system.

#### **Thermal Temperature Calibration**

Essentially the test probe reading is compared with that of a certified reference probe whilst both are held at a common, stable temperature. Alternatively, if a fixed point cell is used, there is no comparison with a certified thermometer; fixed point cells provide a highly accurate, known reference temperature, that of their phase conversion.





### INSTALLATION FITTINGS FOR **EMPERATURE SENSORS**

#### COMPRESSION GLANDS



	R CODES	
Stainle BSPP %" %" '%" '4" '4" '8" BSPT	ss steel bore mm 1.5 3.0 6.0 3.0 6.0 6.0 6.0	code FC-132 FC-140 FC-138 FC-159 FC-168 FC-201
1%" 1%" 1%" 1%" 1%" 1%"	1.0 1.5 3.0 4.5 6.0 3.0 6.0 4.5 6.0	FC-130 FC-131 FC-133 XS-253-RS FC-136 FC-158 FC-167 XS-256-RS FC-200
1/8" 1/4" 1/4"	bore mm 3.0 3.0 6.0	code FC-003 FC-031 FC-036
BSPT '%" '%" '%" '4" '4" '4"	1.5 3.0 6.0 3.0 6.0 6.0	FC-001 FC-002 FC-011 FC-030 FC-037 FC-092

- Male coupling compression glands for positioning temperature probes
- Brass & stainless steel versions
- 1/8", 1/4", 1/2" BSPP & BSPT
- Suitable for probe diameters 1.0, 1.5, 3.0, 4.5 & 6.0mm
- Metric threads also available from stock
- Imperial probe Sizes available upon request

### **FLANGE PLATE**



ORDER CODES	
Stainless steel	CA-250
Brass	CA-251

- Stainless steel or brass for mounting temperature sensor through a vessel wall
- Suitable for probe diameter 1.5, 3.0,4.5 & 6mm
- 1/8" BSPP female thread to accept compression gland
- 3 x 4mm diameter holes on 40mm pcd

### **THERMOPOCKETS**



0	_
ORDER CODES	
High pressure version 303 Grade stainless steel (1000 PSI)	
To suit probe size/Length Up to 6.35mm x 200mm	<i>code</i> LB-005
High pressure version 316 Grade Stainless steel (Tapered) (5000 PSI)	
To suit probe size/Length 6mm x 100mm 6mm x 150mm	<i>code</i> LB-003 LB-001-RS
Standard Fabricated versions 316 stainless steel Outer Diameter 8mm To suit probe size/Length 3mm x 150mm 3mm x 200mm	<i>code</i> TPF-8.0-100 TPF-8.0-150
Outer Diameter 7/16" Dia To suit probe size/Length	code
6mm x 150mm 6mm x 200mm 6mm x 400mm 6mm x 600mm	TPF-11.1-100 TPF-11.1-150 TPF-11.1-350 TPF-11.1-550

- Solid drilled & fabricated versions
- Stainless steel 303 & 316 food grade
- Protect probes from corrosive media
- Facilitate probe replacement without process disturbance
- 1/2" BSPP process thread, 1/4" BSPP sensor connection
- To suit 3 & 6mm diameter probes
- Outside diameter 12mm
- High pressure version for 1000 & 5000 psi (solid drilled)

### **BAYONET FITTINGS & ADAPTORS**



ORDER CODES	
Bayonet Fittings Single pin / single slot 3.0mm Grub screw 4.5mm Grub screw 3.0mm Compression 4.5mm Compression	Code CA-302 CA-303 CA-300 CA-301
Bayonet Adaptors 22mm Long 35mm Long 48mm Long 64mm Long	CA-400 CA-401 CA-402 CA-403

- For quick fit & coupling of temperature probes
- Designed for installing "fixed mount" style temperature probes Adaptors = 303 ST/ST Bayonet fittings = BNP
- Compression gland or grub screw fitting
- Adaptors with 1/8" BSP thread
- Alternative fittings available on request

#### IN-HEAD INDICATORS

### **DM600 - BATTERY POWERED IN-HEAD** FIELD INDICATOR

- Temperature readout in-head
- Battery powered (3 year battery life)
- RTD or TC input options
- Push button configurable
- 4 digit display IP67 housing

Details on request



### **DM700 - LOOP POWERED IN-HEAD** FIELD INDICATOR

- Temperature readout in-head
- 4-20mA Loop Powered
- RTD or TC input options
- Push button configurable
- 4 Digit display
- IP67 housing

Details on request



Alternatives made to order - details on request



### **HEAD MOUNTING TEMPERATURE** RANSMITTERS & INDICATORS

#### **TX104 TEMPERATURE TRANSMITTER**

- Proven, reliable design
- Two wire 4-20mA
- Low cost
- Terminal head mounting, DIN form for KNE, B&N heads
- Thermocouple input J,K and T
- Pt100 input, 2 or 3 wire
- User re-scaleable
- Special ranges to order
- EMC compliant
- Supply 10 to 30V dc
- High accuracy



TX104J Type J Type K TX104K Type T Pt100 TX104T TX104RT



4-20mA loop powered, Max, 30mA Output Loop supply 10 to 30V dc reverse connection protected

Loop resistance 700Ω @ 24V Ambient temperature 0 to 70°C operating

42mm dia x 23mm. Holes 5.5mm x 33mm centres Dimensions

TX104P Pt100 input

Accuracy ±0.2°C plus +0.2% rdg Range adjustment 25°C to 500°C

TX104 K,T or J thermocouple input Accuracy

±0.1%fs plus cold junction errors Offset adjustment ±100°C, solder link & potentiometer

Span adjustment 100 to 1000°C Cold junction Automatic 0 to 70°C Type K between 0 and 1000°C Rescaleable

Type J between 0 and 400°C Type T between 0 and 400°C

Note: Thermocouple must have insulated measuring junction

### **TX203 DIGITAL PRT TEMPERATURE TRANSMITTER**

- Low cost, high accuracy
- Two wire, 4-20mA
- Pt100 input, 2 or 3 wire, -200°C to 850°C
- Terminal head mounting, DIN form for KNE, B & N heads
- **EMC** compliant
- Supply 10 to 30V dc
- "One shot" digital programming, without "pots"
- Sensor fail LED



### ORDER CODE

TX203

14

#### **Specifications**

Pt100, 2/3 wire, IEC751, 100Ω @ 0°C Input -200°C to 850°C Range

±0.1°C ±0.1% of reading Accuracy 4-20mA, loop powered Output

10-35V dc, reverse connection protected Loop supply

Loop resistance 700Ω @24V Ambient temperature -40°C to 85°C

43mm dia x 21.2 holes 5.5mm dia x 33mm center Dimensions

### **TX205 SMART TEMPERATURE TRANSMITTER**

- Low cost, entry level SMART transmitter
- Galvanic isolation
- High accuracy
- Pt100 input 2 or 3 wire, -200 to 850°C scaleable
- Programming via RS232 interface
- Two wire, 4-20mA
- Thermocouple input J,K,T,R,S,E & N -200 to 1760°C full range, scaleable
- Terminal head mounting
- **EMC** compliant
- Supply 10-30V dc
- IS version to EexialIC T4 T6 available

#### ORDER CODES

PRT version TX205P Thermocouple version TX205T PRT version IS TX205PX Thermocouple version IS TX205TX

**Specifications** 

Output 4-20mA loop powered

10-30V dc, reverse connection protected Loop supply

Loop resistance 700Ω @24V Ambient temperature -40°C to 85°C

43mm dia x 21. Holes 5.5mm dia x 33 centre Dimensions

Pt100 innut:

±0.1°C ±0.05% of reading Accuracy

Thermocouple input:

Types J,K,T,R,S,E,N

±0.04% full range ±0.4% of reading Accuracy

Cold junction Automatic, 0 to 70°C

Note: Thermocouple must have insulated measuring junction

### **TX210 SMART ISOLATED TEMPERATURE TRANSMITTER**

- Low cost, entry level
- Smart transmitter with galvanic isolation
- High accuracy
- Pt100 input 2 or 3 wire, -200 to 850°C scaleable
- Programming via RS232 interface
- Two wire, 4-20mA
- Thermocouple input J,K,T,R,S,E & N -200 to 1760°C full range, scaleable
- Terminal head mounting, DIN form
- EMC compliant
- Supply 10-30V dc
- IS version to EexiaIIC T4 T6 available

#### ORDER CODES

PRT version TX210P Thermocouple version TX210T PRT version IS TX210PX Thermocouple version IS TX210TX

**Specifications** 

Output 4-20mA loop powered

10-30V dc, reverse connection protected Loop supply Loop resistance 7000 @24V

Ambient temperature -40°C to 85°C

Dimensions 43mm dia x 21. Holes 5.5mm dia x 33 centre

Pt100 input:

Accuracy ±0.1°C ±0.05% of reading

Thermocouple input:

Types J.K.T.R.S.E.N

 $\pm 0.04\%$  full range  $\pm 0.4\%$  of reading Accuracy

Cold junction Automatic, 0 to 70°C

Alternatives made to order - details on request





### PRODUCT FOCUS -LABFACILITY RANGE AT A GLANCE

### **EUROPE'S LARGEST RANGE OF TEMPERATURE SENSORS**

- Industrial & laboratory thermocouple & PRT probes in configurations to suit any application, ranges from -200°C to 1700°C
- Custom design versions available
- Transmitter-in-head options
- Pt100 elements
- Probe fittings & accessories

### All in this brochure

### THE BEST IN THERMOCOUPLE CONNECTORS

- Full range of thermocouple connectors high quality plugs and sockets in IEC 60584, ANSI, JIS, and other colours
- Comprehensive range of fittings and accessories including mounting panels

### WIDE RANGE OF HIGH QUALITY THERMOCOUPLE & PRT CABLES

 Extension and compensating cables – a wide range of insulation types and configurations in IEC 60584 and BS 1843 colours including PFA, PTFE, PVC and fibreglass

### MARKET LEADING TEMPERATURE & PROCESS INSTRUMENTATION

- Precision digital thermometers
- Multi function digital thermometers
- Calibrators
- Multi-way switches
- Transmitters
- Controllers & Indicators
- Loggers and Scanners
- Digital test Meters

### **EQUIPMENT & COMPONENT PARTS FOR SENSOR MANUFACTURERS**

- Compact thermocouple welder and microwelder
- MI cables, stainless steel sheaths, pots and fittings
- Terminal heads & blocks

### **VERSATILE DRY BLOCK CALIBRATORS**

 Accurate, stable portable calibrators for -10°C to 1200°C to suit industrial & scientific temperature sensors

### **UKAS TRACEABLE CALIBRATIONS**

Certified probe calibrations between -10°C and 1200°C

### And our indispensable Temperature handbook

Extensive pdf downloads available from website































### LABFACILITY – LEADERS IN TEMPERATURE MEASUREMENT

Labfacility market leading products represent more than thirty years of design and applications

**experience** in industrial and laboratory, temperature and process measurement. Labfacility products and services are specified by leading UK and European distributors and manufacturers and are also exported to more than 85 countries.

Quality and Service are key elements in the continued growth of Labfacility; technical support is always freely available from our experienced technical sales teams and the company has ISO9001 accreditation.

Not only do we manufacture temperature sensors and fittings, thermocouple connectors, precision electronic thermometers and thermocouple welders, we also supply thermocouple cables, temperature transmitters, hand held digital thermometers and test instruments, dry block calibrators, loggers, scanners and temperature controllers.

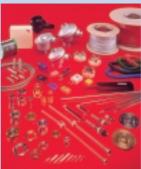
### LABFACILITY - MANUFACTURER AND STOCKIST

Applications and Industries include:

- Autoclaves
   Aerospace
   Automotive & Motorsport
- MedicalMetallurgyMeteorology
- Metrology, In particular, R&D, Temperature Calibration,

Laboratory and Quality Control departments.

Plastics & Rubber
 Power Generation.

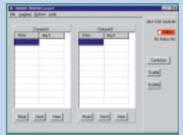


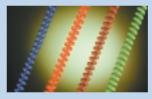














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### www.labfacility.co.uk









Certificate No. 4746

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