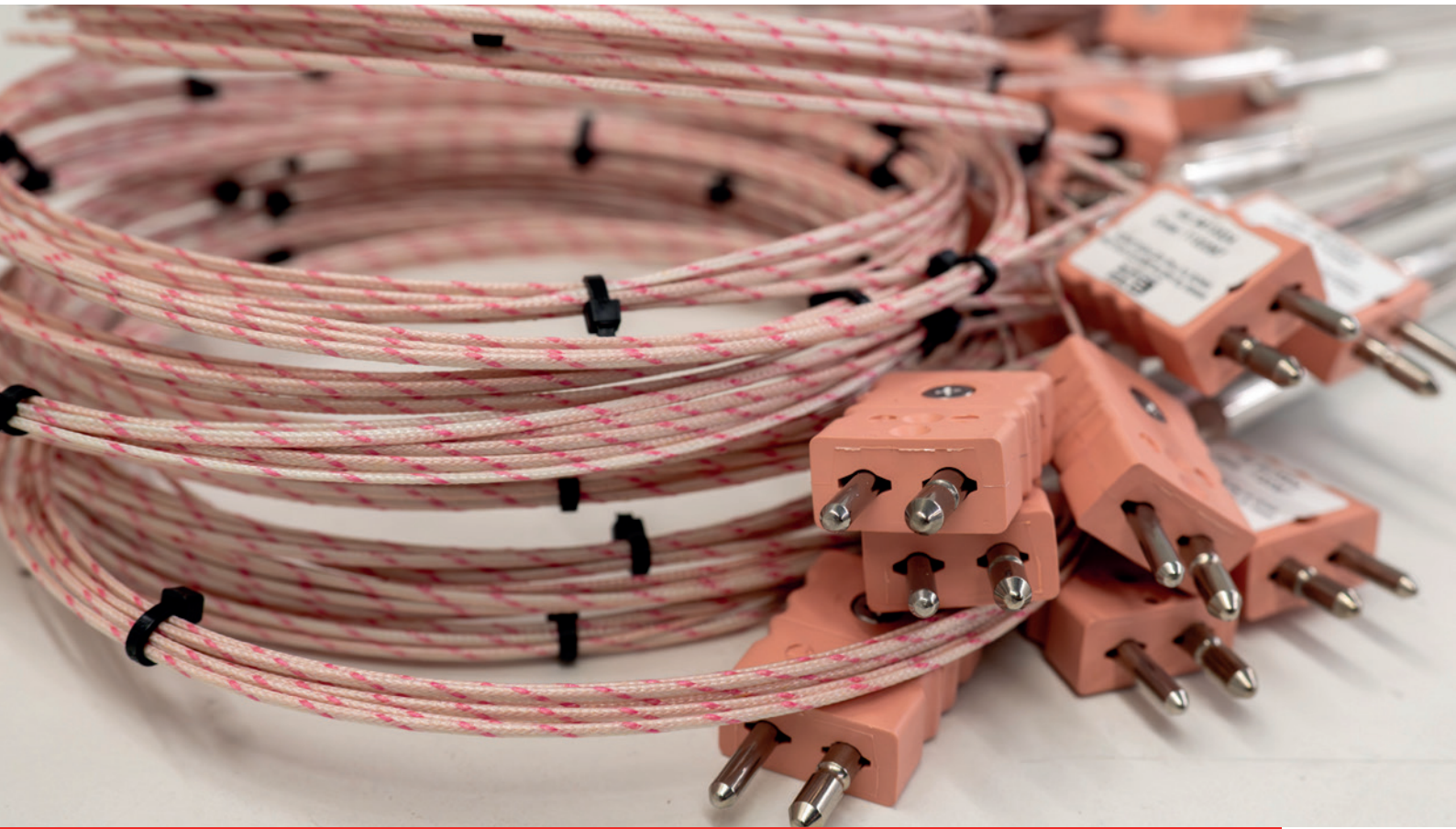
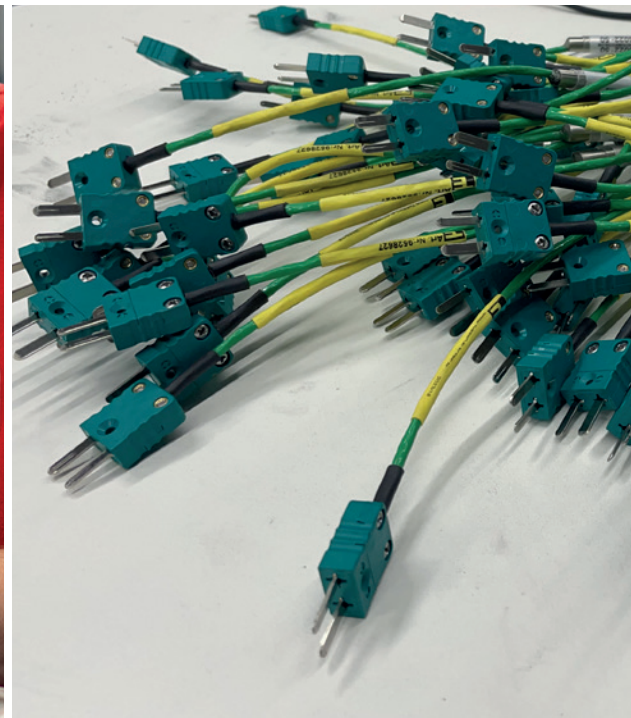


# YOUR PARTNER IN TEMPERATURE



**MINIATURE TEMPERATURE  
SENSORS**



## Miniature Sensors For Precise Temperature Measurement

Thermo Electric Instrumentation's miniature sensors are designed for applications that require temperature measurement in confined or difficult-to-reach areas. Despite their small size, our sensors provide exceptional accuracy and durability, making them perfect for industries that demand reliability in challenging conditions. Whether you are working in research and development or specialized industrial processes, our miniature sensors deliver dependable performance.

### WHY MINIATURE SENSORS MATTER

Temperature measurement in restricted spaces presents unique challenges that require specialized sensors. Miniature sensors are ideal for tight spaces, small equipment, or when the measurement point is otherwise inaccessible. Our miniature sensors are designed to provide accurate readings without compromising on reliability or performance.

### PARTNERING WITH INDUSTRY LEADERS

For decades, we have partnered with leading industries to deliver precise temperature measurement solutions. Our miniature sensors are trusted by professionals in sectors such as aerospace, semiconductor manufacturing, automotive, and medical devices, helping them achieve optimal performance and efficiency in their applications.







## Features And Benefits

### FEATURES

We offer a wide range of miniature MI-Cable thermocouples to suit specific needs:

- **Miniature MI-Cable Thermocouples:** Versatile sensors for general-purpose temperature measurement.
- **Subminiature MI-Cable Thermocouples:** Compact sensors for limited space.
- **Directly Mounted Miniature Plug:** Secure and easy installation.
- **Flexible Lead Wire:** Flexible routing for complex setups.
- **Spring-Loaded Thermocouples:** Fast response and easy installation, with adjustable bayonet cap for secure mounting.
- **Compact Design:** Ultra-small form factor for precise monitoring in confined spaces.
- **High Accuracy:** Reliable data in both laboratory and industrial environments.
- **Durable Materials:** Made from stainless steel, specialized alloys, and mineral insulation to withstand harsh conditions.
- **Fast Response Time:** Small diameters provide rapid temperature readings.
- **Versatile Terminations:** Various options, including miniature plugs, flexible lead wires, and ceramic connectors.

### KEY SPECIFICATIONS

- **Calibration Types:** J, K, T, E, R, S, and N.
- **Sheath Diameters:** From 0.25 mm to 6.4 mm.
- **Sheath Materials:** SS304, SS316, SS310, SS321, Inconel 600, Microbel C, NiCrosil.
- **Hot Junction Types:** Insulated, grounded, and reduced tip for single and duplex configurations.
- **Wire Types:** PVC, Kapton, Silicon, Teflon, Fibreglass, copper braiding, flexible armor.
- **Terminations:** Bare ends, connectors (standard, miniature, ceramic, phenolic, Lemo, junction box).

### BENEFITS

- **Flexibility:** Grounded or insulated options to meet different needs.
- **Space Efficiency:** Ideal for limited space applications.
- **Enhanced Precision:** High accuracy for tight temperature control.
- **Versatile Applications:** Suitable for vacuum chambers, medical equipment, and plastic processing.



## Applications And Customization

### APPLICATIONS

Our miniature sensors are designed for a wide range of specialized applications where precision and space efficiency are critical. Typical applications include:

- **Semiconductor Manufacturing:** Providing accurate temperature measurement for wafer processing, lithography, and other high-precision manufacturing steps.
- **Medical Devices:** Used in diagnostic and treatment equipment
- **Automotive Testing and Systems:** Measuring temperature in small, confined areas of automotive engines, exhaust systems, and electronic control units (ECUs).
- **Plastic Processing:** Monitoring temperatures during plastic molding to ensure optimal material properties and quality.
- **Food and Beverage Processing:** Measuring temperatures during the processing and packaging stages to ensure product safety and consistency.
- **Cryogenic Applications:** Providing rapid and precise temperature measurements in cryogenic systems used in research or industrial processes.

### ACCESSORIES

Enhance performance and installation with compatible accessories:

- **Adjustable Mounting Bushings:** Secure, adjustable mounting for various probe diameters.
- **Mounting Adapters:** Simplify installation and replacement of spring-loaded thermocouples.
- **Pipe Clamp Adapters:** Secure installation of thermocouples on pipes.

### CUSTOMIZATION OPTIONS

Our customization options ensure our miniature sensors meet your needs:

- **Sheath Material:** Stainless steel, Inconel, or other alloys.
- **Cable Types:** Mineral-insulated and high-performance materials.
- **Mounting Styles:** Threaded, flanged, or welded configurations.
- **Termination Options:** Miniature plugs, flexible lead wires, bayonet caps.





## Why Choose Us

We are committed to delivering high-quality miniature sensors that perform reliably in the most demanding environments. Our extensive experience, technical expertise, and dedication to customer satisfaction sets us apart in the industry.

- **Industry Experience:** With over 60 years of expertise in temperature sensing, we understand the unique challenges of miniature sensor applications. Our sensors are used in industries ranging from aerospace to medical, ensuring reliable performance across diverse applications.
- **Certified Quality:** Our miniature sensors are manufactured according to international standards, ensuring precision and reliability. Our management systems are certified to ISO9001, ISO17025, ISO14001, and ISO45001, guaranteeing the highest level of quality and consistency.
- **Customized Solutions:** We specialize in creating miniature sensors that fit seamlessly into your specific applications. Whether you need a custom length, specialized material, or unique mounting option, our engineering team is here to deliver a solution that fits your needs perfectly.
- **Commitment to Innovation:** Our focus on research and development allows us to bring the latest advancements to our sensor technology. We continually work to enhance the performance, precision, and reliability of our sensors, making them ideal for the most challenging environments.

## CUSTOMER FOCUSED

We prioritize building lasting relationships with our customers by understanding their needs and providing solutions that improve efficiency and performance. From the initial design stage to production and after-sales support, we ensure our products deliver exceptional value and quality.

## Commitment To Quality

Quality and safety are at the core of everything we do. Our rigorous quality control processes ensure that every sensor we manufacture meets or exceeds industry standards. We are committed to delivering products that provide the accuracy, safety, and reliability needed for critical temperature measurement applications.



## Manufacturing Facilities

Our production and engineering facilities are centrally located in the Netherlands and manned by our highly skilled employees. This setup is essential for upholding our high standards and best practices in engineering and design. The expertise of our personnel, coupled with state-of-the-art facilities, guarantees the efficient manufacture of Thermo Electric temperature sensors and their consistent high-quality performance in the field.

### CALIBRATION FACILITIES

Our laboratory holds ISO17025 accreditation for temperature measurements ranging from  $-200\text{ }^{\circ}\text{C}$  to  $1,500\text{ }^{\circ}\text{C}$ , as well as for evaluating electrical parameters including millivolts (mV), milliamperes (mA), ohms ( $\Omega$ ), and volts (V).



### SERVICES

- Wake frequency calculations for Thermowells as per ASME PTC19.3
- Cleaning for oxygen services
- Customized drawings
- Customized Inspection and test plans / procedures

### CERTIFICATIONS

- Material certificate as per EN10204 3.1 or 3.2 and NACE
- Welding procedure specification (WPS) including procedure qualification records (PQR) and Welder performance qualifications (WPQ) as per ASME IX and ISO15614
- Certificate of conformance (EN10204 2.1)
- Certificate of origin

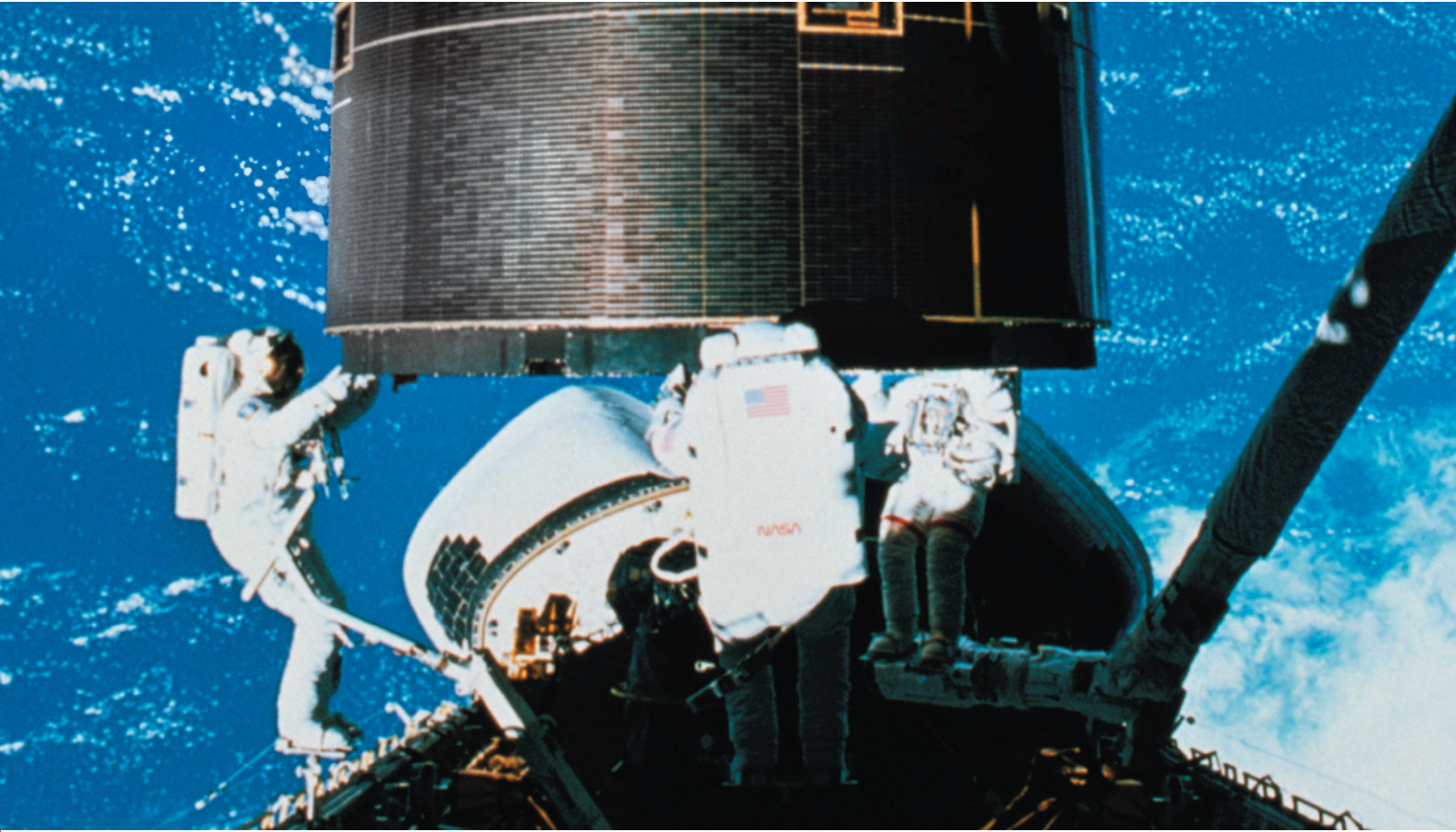
### HAZARDOUS AREA CERTIFICATES

	XPS1	XPS2	XPS3	XPS4
IECEX:	Exeb	Exia/b	Exdb	Exec
ATEX:	Exeb	Exia/b	Exdb	Exec
CSA/US:	(A)Exe	(A)Exia/b	(A)Exd	(A)ExnA
KTL:	Exe	Exia	Exd	ExnA
CCOE(PESO):	Exeb	Exia/b	Exdb	
CCC:	Exia	Exdb		

### TESTING FACILITIES

- Visual inspection
- Dimensional check
- Pressure testing (up to 1100Bar)
- High pressure testing (up to 5500Bar)
- Dye penetrant examination (DP)
- Radiographic testing (X-ray)
- Ultrasonic testing (US)
- Vacuum testing
- Helium leak testing
- Positive material identification (PMI)
- Batch calibration certificates
- Sensor calibration certificates





## Other Products and Services at a Glance

### TEMPERATURE SENSORS

- Industrial temperature sensors
- Multiple temperature sensors
- Profiling temperature sensors
- High-pressure temperature sensors
- Resistance temperature detectors
- PT100, PT1000, NTC
- Miniature temperature sensors
- Tubeskin temperature sensors

### INSTRUMENTS

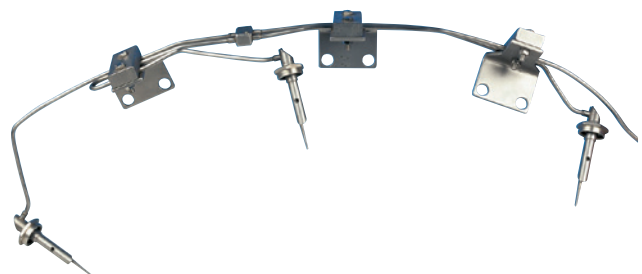
- Optical temperature meters
- Controllers
- Transmitters
- Dry well calibrators

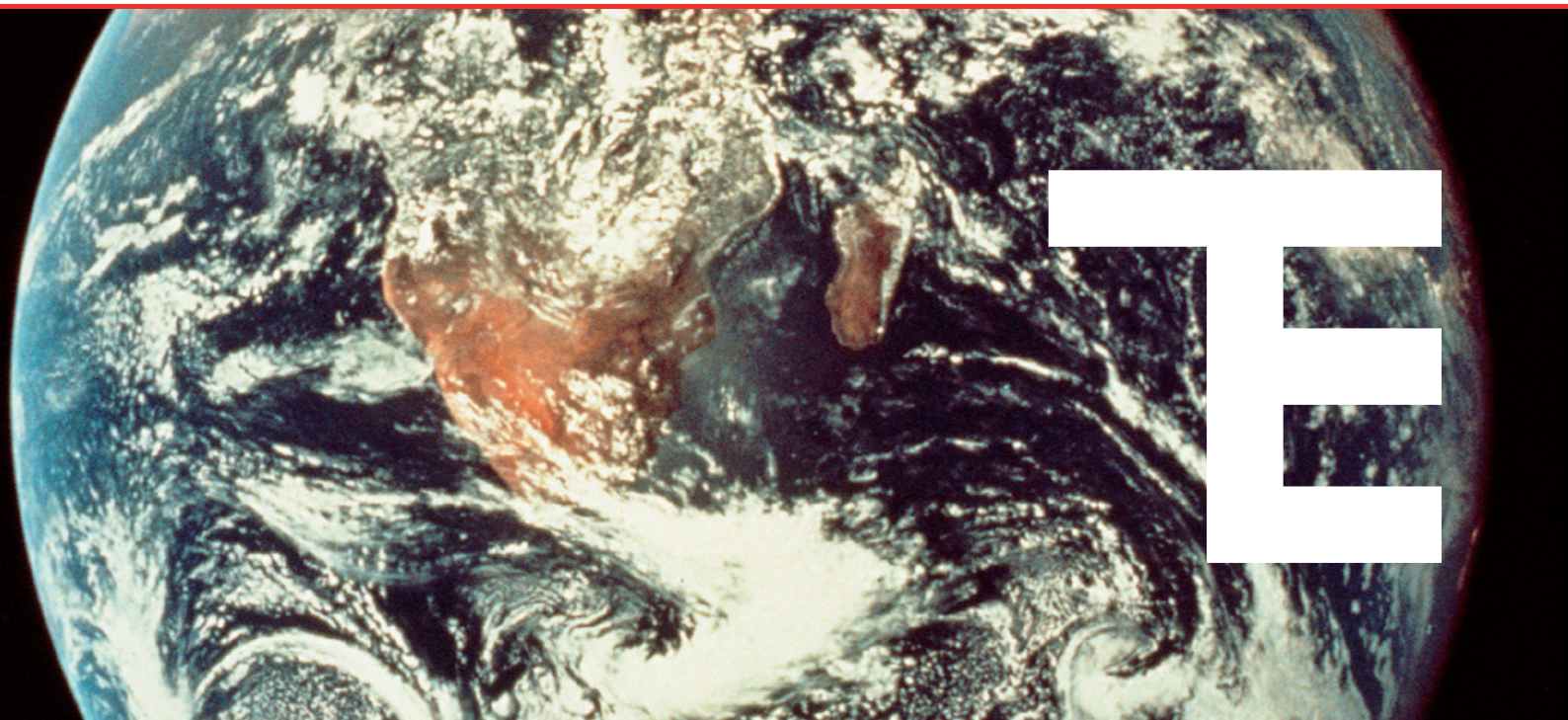
### CONNECTORS, PANELS AND WIRES

- Standard thermocouple connectors
- Miniature thermocouple connectors
- Standard thermocouple panels
- Miniature thermocouple panels
- PVC, PTFE, Kapton, Silicon, Glass Fiber

### SERVICES - RvA/ILAC ACCREDITED CALIBRATION

- Calibration of temperature sensors
- Repair of instruments





**Your trusted  
partner in the  
development and  
production  
of temperature  
measurement solutions**



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