



Thermal and Cable Solutions

www.tempsens.com

Our Values



Reliability



Innovation



Passion



Excellence

Vision & Mission

Leading the

Thermal and Cable Industry

with

**Passion, Innovation,
Excellence & Reliability**

About us

Founded in 1976 as part of the Pyrotech Group. Tempsens is a multi-generational family business built on innovation and engineering excellence. Over the decades, it has established itself as a leading provider of thermal and cable solutions. Tempsens continues to set benchmarks by combining decades of expertise with cutting-edge technology to address industry challenges.

With a global footprint across six countries and sales in 75 countries, Tempsens partners with customers to design tailored solutions that enhance efficiency, productivity, and sustainability. Its product range includes thermocouples, RTDs, wires, cables, pyrometers, thermal imagers, industrial heaters, furnaces, and temperature calibration systems. Looking ahead, Tempsens promises to innovate and deliver top-quality thermal solutions that are built with integrity and excellence.

Innovating Thermal Solutions Since 1976

800
EMPLOYEES

45+
YEARS EXP.

13
PATENTS

OVER
4500
CUSTOMERS

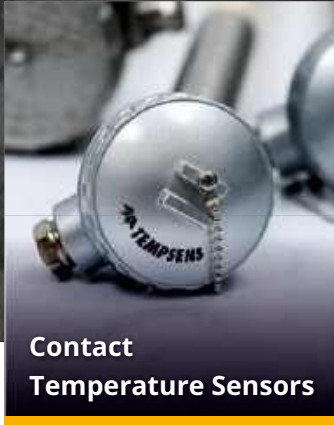
SALES
IN OVER
75
COUNTRIES

~30%
YOY GROWTH



INDIA
UAE
GERMANY
INDONESIA
SOUTH KOREA
POLAND

Our Business Units



**Contact
Temperature Sensors**

Thermocouple RTD, Gauges, Fiber Optics Sensors, Thermal Profiling Sytem, Wireless Temperature Sensors.



Conductors

Thermocouple, extension, compensating, pure nickel, and Cu-Ni alloys.



Cables

LT Control, Power, instrumentation, signal cables and Mineral Insulated Cables.



Industrial Heaters

Component, Process, Furnace Heaters, and Heat Tracing solutions.



**Non-Contact
Temperature Sensors**

Pyrometers, Thermal Imagers and Furnace Monitoring Cameras.



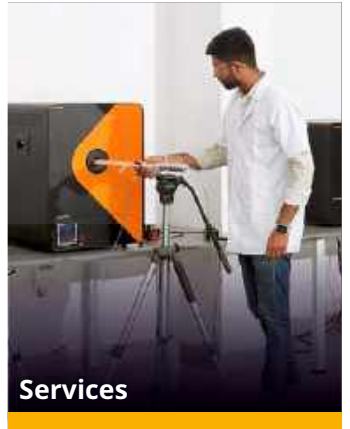
**Temperature
Calibrators**

Temperature calibrators, master sensors and meters for contact and non contact sensor calibration.



Furnaces

Customized and standard laboratory and industrial ovens and furnaces.



Services

Temperature calibration services for contact and non contact sensors from -196 to 3000° C.

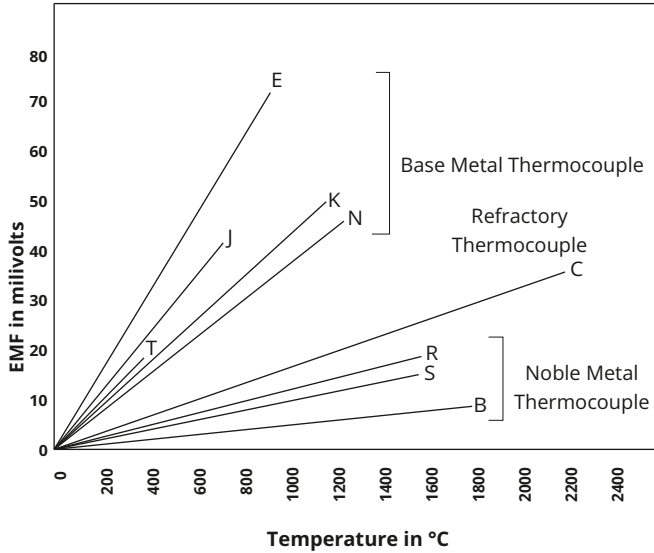


Contact Temperature Sensors

Basics of Thermocouples & RTDs

Thermocouples

Thermocouples consist of two dissimilar metals joined at one end, generating a thermoelectric voltage based on the temperature difference between the joined and open ends.



Tolerance Table for Type of Thermocouples

Type of T/C	Material (+ & -)	Temp. Range(°C)	Tolerance Grade	
			Standard	Special
T	Copper & Constantan	-200°C to 350°C	±1.0°C or ±0.75%	±0.5°C or ±0.4%
J	Iron & Constantan	0°C to 750°C	±2.2°C or ±0.75%	±1.1°C or ±0.4%
E	Chromel & Constantan	-200°C to 900°C	±1.7°C or ±0.5%	±1.0°C or ±0.4%
K	Chromel & Alumel	-200°C to 1250°C	±2.2°C or ±0.75%	±1.1°C or ±0.4%
N	Nicrosil & Nisil	-270°C to 1300°C	±2.2°C or ±0.75%	±1.1°C or ±0.4%
S	90% Platinum+10% Rhodium & Platinum	0°C to 1450°C	±1.5°C or ±0.25%	±0.6°C or ±0.1%
R	87% Platinum+13% Rhodium & Platinum	0°C to 1450°C	±1.5°C or ±0.25%	±0.6°C or ±0.1%
B	70% Platinum + 30% Rhodium & 94% Platinum + 6% Rhodium	650°C to 1700°C	±0.5%	---
C	95% Tungsten+5% Rhenium & 74% Tungsten+26% Rhenium	0°C to 2320°C	4.5°C or ±1.0%	---



Thermocouple Insert Construction

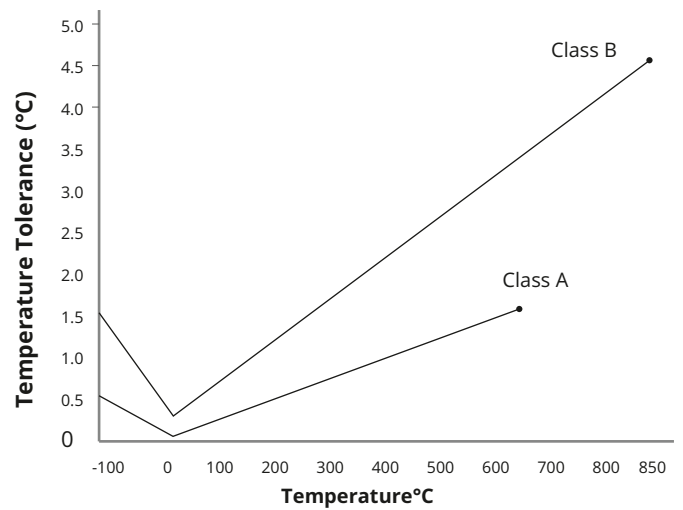
RTD

Resistance thermometers operate using metals that change their electrical resistance when exposed to heat.

Platinum is the most widely used material for industrial RTDs, though copper and nickel are also utilized for specific applications.

The resistance measured at 0°C, known as R₀, is a critical parameter. The most common RTD element is platinum, with a resistance of 100 Ω at 0°C, hence the designation Pt100.

Platinum RTDs are suitable for temperatures ranging from -200°C to 850°C, though in most industrial applications, they are typically used up to 400°C.



Tolerance Table for Type of RTD(as per IEC 751) Pt100

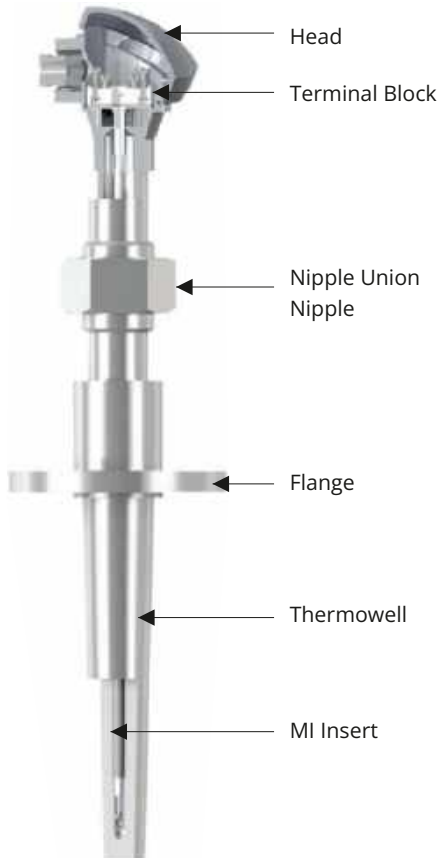
Temperature	Class A (±)	Class B (±)
-200°C	0.55°C	1.3°C
-100°C	0.35°C	0.8°C
0°C	0.15°C	0.3°C
100°C	0.35°C	0.8°C
200°C	0.55°C	1.3°C
300°C	0.75°C	1.8°C
400°C	0.95°C	2.3°C
500°C	1.15°C	2.8°C
600°C	1.35°C	3.3°C
700°C	-	3.8°C
800°C	-	4.3°C
850°C	-	4.6°C



RTD Insert Construction

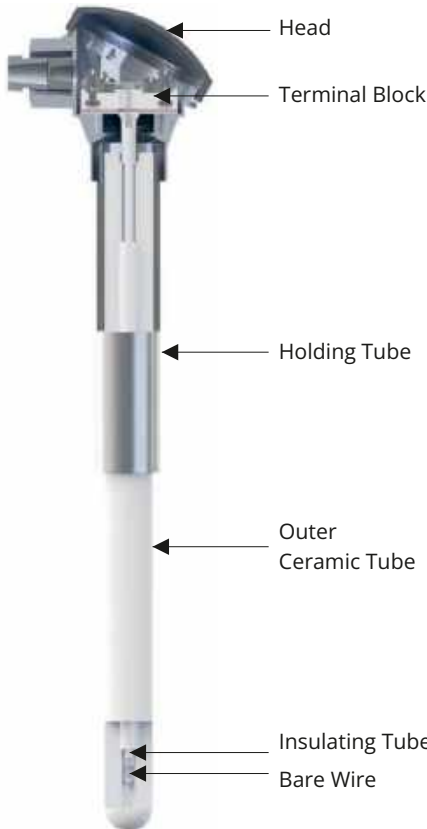
Basics of Thermocouples & RTDs

Metallic Protection Tubes



MI Construction

Sr. No.	Material	Allowable/ Max Temp(°C)	Feature
1	Monel	Oxi, 500°C Red. 600°C	Excellent resistance to water vapor and sea water at high temperature and corrosion.
2	304 S.S.	980°C	Common against heat and corrosion.
3	321 S.S.	980°C	Higher corrosion resistance.
4	316 S.S.	980°C	Excellent resistance to corrosives, heat, acids and alkalis.
5	310 S.S.	1000°C	Good high temperature strength with resistance to oxidation.
6	Inconel 800	1000°C	Excellent to high temperature oxidizing atmosphere and thermal shock.
7	Hastalloy C-276	1000°C	Excellent resistance to high temperature oxidizing and reducing atmospheres and also Cl ₂ gases.
8	Titanium	Oxi. 250, Red. 1000°C	Superior corrosion resistance in cryogenic temperature.
9	446 S.S.	1050°C	Excellent resistance to oxidizing and reducing flames containing sulphur.
10	Inconel 600	1050°C	Excellent resistance at high temperature, Avoid sulphurous atmospheres
11	Hastalloy X	1100°C	Excellent resistance to oxidizing and carburizing atmospheres at high temperatures. Better machinability and weldability.
12	Platinum	1650°C	Well suited for use at extremely high temperature specially for molten glass
13	Molybde-num	Oxi. 400, Red. 2000°C	Suitable for inert, vacuum & reducing applications
14	Tantalum	Oxi. 300, Red. 2200°C	Suitable for inert & vacuum applications



Non MI Construction

Ceramic Protection Tubes

Sr. No.	Material	Allowable/ Max. Temp(°C)	Feature
1	Tungsten Carbide	350°C	Good mechanical strength and high abrasion resistance
2	Silicon Nitride	1350°C	Excellent thermal shock resistance, most suitable for molten aluminium
3	Ceramic 60% Alumina (C-610)	1500°C	Sintered alumina, used in heating furnaces, regenerators etc.
4	Nitride Bonded Silicon Carbide	1500°C	Good resistance, mechanically strong, unsuitable for oxidizing atmosphere but resist fluxes.
5	Recrystallised Silicon Carbide	1500°C	Excellent thermal shock resistance
6	Recrystallised Alumina 99.7% purity (C-799)	1750°C	Good resistance to chemical attack, mechanically strong but avoid severe thermal shock

Thermocouples

MI Thermocouples

Mineral Insulated Thermocouples, commonly known as MgO (Magnesium Oxide) Thermocouples, are widely used in various process and laboratory applications. These thermocouples are available in all element types, with a diverse range of sheath diameters and materials. Renowned for their robust and flexible design, MI thermocouples are capable of withstanding high temperatures, making them a preferred option for numerous temperature measurement applications.



Type	K, N, J, T, E
Sheath Size (MI)	0.25, 0.5, 1.0, 1.5, 3.0, 4.5, 6.0, 8.0 mm, Other size on request
Sheath Material	SS321, SS316, SS310, HRS 446, Inconel 600, Nimonic, Pyrosil, Platinum etc.
Configuration	Simplex/Duplex/Multipoint
Special	<ul style="list-style-type: none">● Miniature Thermocouple with minimum 0.25 mm Dia● Swaged Tip Thermocouples● Tube Temperature Skin Type Thermocouples● Special Sensors as per ASTM-E235 for critical application● High Wall Thickness Thermocouple

Thermocouples

Base Metal Thermocouples With Thermowells / Protection Tubes

Base metal thermocouple the most commonly used thermocouples in this category are types K,N,J,T and E.



Type	K, N, J, T, E
Sheath Size (MI)	3.0, 4.5, 6.0, 8.0 mm, Other size on request
(Non-MI)	1.2, 1.6, 2.0, 2.5, 3.2 mm, Other size on request
Protection Sheath Material	SS304, SS321, SS316, SS310, INCONEL-600/601/625/800/825, HRS446 etc.
Thermowell Material	HRS 446, INCONEL-600/601/625/800/825, Nickel, Hastelloy, Titanium, Tantalum Sleeve, Ceramic 610 & C-799, Silicon Carbide, Monel etc.
Configuration	Simplex/Duplex/Multipoint

Thermocouples

Noble Metal Thermocouples

Noble Metal Thermocouples are produced using precious metals such as Platinum and Rhodium. These thermocouples must be enclosed in a ceramic protection tube to safeguard the thermocouple element. They are specifically designed for high-temperature applications upto 1700°C



Type	R, S, B
Element Diameter	0.25, 0.30, 0.35, 0.40, 0.45, 0.50 mm, Other size on request
Protection Sheath Material	Recrystallized Alumina Ceramic(C-799), Inconel, Silicon Carbide, Platinum etc.
Configuration	Simplex/Duplex/Multipoint
Special	<ul style="list-style-type: none"> ● Hot Blast & Stove Dome Thermocouples ● Tri Level Thermocouples ● Crown Thermocouples ● High temperature application more than 1200°C.

Thermocouples

Refractory Thermocouples

Refractory Metal Thermocouples are manufactured from exotic metals, specifically Tungsten and Rhenium. Although these metals are costly and challenging to manufacture, they are essential for high-temperature applications and are effective in reducing or vacuum atmospheric conditions. Their unique properties make them ideal for extreme environments, despite their inherent brittleness.



High Temperature Wire Types

Type	C	D	G
Name Of Materials	Tungsten 5%, Rhenium (+), Tungsten 26%, Rhenium (-)	Tungsten 3%, Rhenium (+), Tungsten 26%, Rhenium (-)	Tungsten(+), Tungsten 26%, Rhenium (-)
Application Range	0-2320°C	0-2320°C	0-2320°C
Standard Limit of Error*	±4.4°C or ±1%	±4.4°C or ±1%	

High Temperature Insulators

Insulation Type	Magnesia (MgO)	Alumina Oxide (Al ₂ O ₃)	Hafnium Oxide (HfO ₂)	Beryllium Oxide (BeO)
Max. Operating Temp.	1700°C	1550°C	2200°C	2200°C
Approx Melting Temp.	2800°C	2040°C	2790°C	2650°C
Comments	Very hygroscopic. Used mostly in compacted sheaths.	Excellent with Platinum alloys.	Comparable to Beryllium Oxide and safe to handle	Excellent High Temperature thermal conductivity and resistivity

High Temperature Sheath Materials

Sheath Type	Inconel 600	Platinum Alloy	Tantalum	Molybdenum
Max. Operating Temp.	1175°C	1550°C	2200°C	2000°C
Approx Melting Temp.	1345°C	1850°C	2995°C	2620°C
Allowable Environment	Inert, Vacuum, Oxidizing	Inert, Oxidizing	Inert, Vacuum	Inert, Vacuum, Reducing
Std Sheath Dia (mm)	1.016, 1.57, 3.17, 4.77, 6.35	1.016, 1.57, 3.17	1.016, 1.57, 3.17	1.57, 3.17, 4.77, 6.35
Min. Bend Radius	5 X Sheath Diameter	5 X Sheath Diameter	10 X Sheath Diameter	Do Not Bend

Resistance Temperature Detectors

Mineral Insulated RTDs

Mineral Insulated Resistance Thermometers are made with Platinum-measuring resistors (Pt100Ω) in accordance with DIN IEC 751 standards. The measuring resistor is connected to the inner conductors, embedded within the assembly, and enclosed by a metal sheath, ensuring a hermetically sealed design.



Type	Pt100, Pt200, Pt500, Pt1000, Pt5000 etc.
No. of Wires	2, 3, 4 wires
Sheath Size (MI)	1.5, 3.0, 4.5, 6.0, 8.0 mm
Configuration	Simplex/Duplex/Multipoint
Special	<ul style="list-style-type: none"> ● Vibration proof RTDs for Bearing & DG sets ● Motor & Transformer winding temperature RTDs ● Handheld & Probe in various designs ● Strap on RTDs for Nuclear application ● High Temperature RTDs. ● Autoclave Thermocouple & RTD.

Resistance Temperature Detectors

RTDs With Thermowells/ Protection Tubes

An RTD (Resistance Temperature Detector) with thermowell protection tubes is designed to measure temperature in corrosive, high-pressure, and fast-flowing media. The thermowell provides physical protection to the RTD sensor, ensuring reliable performance in harsh environments while preventing damage from the aggressive substances and mechanical stresses.



Type	Pt100, Pt200, Pt500, Pt1000, Pt5000 etc.
Type of Element (MI)	Wire wound ceramic encapsulated, Wire wound glass encapsulated, Thin film ceramic encapsulated
No. of Wires	2, 3, 4 Wires
Protection Sheath Material	SS304, SS321, SS316, SS310
Configuration	Simplex/Duplex/Others
Certifications	ATEX, IECEX, CCOE/PESO, UL, CE, NABL
Special	RTDs with IBR certified Thermowells

Thermowells and Protection Tubes

Thermowells

A thermowell is a tube closed at one end, designed to protect the probe while enabling its removal without breaking the liquid seal. Various materials and styles are available to meet specific application requirements.

Thermowells made from solid bar stock offer the highest pressure ratings, while welded models are also an option. We also provide special thermowells with machined or welded helical strakes. Wake frequency calculations in accordance with ASME PTC 19.3 are available upon request.



Material	SS304, SS316, SS316L, SS316H, SS321, SS310, HRS446, INCONEL600/601/625/800 Hastalloy, Monel, Titanium, Tantalum etc.
Type	Drilled Barstock, Built-up & Fabricated Welded
Construction	Tapered, Straight, Stepped & Helical
Process Connection	Screwed, Threaded, Flanged & Welded
Certification	IBR certification for boiler/steam applications, Radiography, PMI, Hydro test, Dye penetrate test etc. Calculation as per PTC 19.3.
Special	NACE 0175, HIC, MTC-3.1 & MTC-3.2 as per EN10204

Thermowells And Protection Tubes

Special Thermowells /Protection Tubes



- Metal Thermowells with Tungsten Carbide/Ceramic/PTFE/PVDF/PFA/Stellite/Zirconium coatings
- Solid Sintered Tungsten Carbide
- Silicon Carbide (Recrystallised & Nitride Bonded)
- Platinum Thimble
- Tantalum, Titanium, Nickle Cladding
- Solid Stellite Grade-6 Thermowells
- Other materials in various sizes available on request

Protection Tubes



Material	Recrystallised Alumina 99.7%
Type	KER 710(C-799), Hexoloy, Silicon Carbide, Silicon Nitride, Graphite, Open Ended, Close Ended
Length	350, 530, 600, 650, 740, 900, 1030, 1200, 1430 mm & Other size on Request
OD x ID	6x4, 8x5, 10x6, 12x8, 15x10, 17x13, 15x8, 20x15, 24x18, 28x22, 32x28 mm & Other size on Request High wall thickness tubes also available
Insulating Tubes/Beads	2/4/6 Holes etc.
OD	3.5, 5.5, 8.5 etc.

Gauges

Temperature Gauges



Sensing Elements	Bi-Metal, Liquid Mercury Filled, Gas Filled
Dia Size	63, 100, 150 mm
Stem Dia	6, 8, 10, 12 mm
Range	Min. -40°C, Max. 600°C
Accuracy	Class 1 as per EN13190
Connection	1/8", 1/4", 3/8", 1/2" BSP/NPT (M/F) & others on Request
Mounting	Center Back, Bottom Direct, Every Angle Mounting

Pressure Gauges



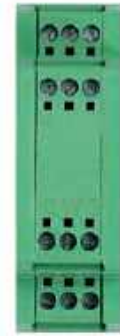
Sensing Elements	Bourdon Tube, Sealed Diaphragm, Compact Sealed Diaphragm, Schaffer Diaphragm, Capsule Type , Low Pressure Diaphragm, Differential Pressure Gauge, Meghnelic Gauge.
Dia Size	40, 50, 63, 80, 100, 150, 250 mm
Range	Vacuum, Compound, 0...1Kg/cm ² to 0....2100Kg/cm ²
Accuracy	±1% FSD
Connection	1/8", 1/4", 3/8", 1/2" BSP/NPT (M/F) & others on Request
Mounting	Bottom/Back Direct, Bottom Surface, Back Panel, Back Bracket Mounting

Accessories

Temperature Transmitters



Head Mounted Type



Din Rail Type

Input Type	RTD, TC, Ohm, mV, Universal Smart
Output Signal	Analog 4 ~ 20mA, 2 wire/4wire
Accuracy	Pt100 $\pm 0.2\%$ full scale, Thermocouple $\pm 0.3\%$ max. of full scale
Communication	HART Protocol / USB
Power Supply	12 to 25 V DC

Wireless Transmitter & Receiver



Input Type	RTD, TC, Ohm, mV
Accuracy	0.1% of full scale
Resolution	0.1°C
Battery Life	1 Year
Radio Frequency	868 MHz

Connectors

- Plug and jack compensated for Thermocouples.
K, N, J, T, E, R, S, B & C Types
- Standard, Miniature, Panel mounted, Simplex, Duplex
Material : Glass Filled Nylon and Ceramic
Colour Coding : Various Standards
- Lemo Connectors



Accessories

Hand Held Temperature Indicators



Model	TEMPMET 05	TEMPMET 08	TEMPMET 09
Thermocouple	K	B, C, D, E, J, K, N, R, S, T	
RTD	-	Pt100, Pt50, Pt10, Pt200, Pt500, Pt1000	
Dimensions	162 x 76 x 38.5 mm	135 x 76 x 27 mm	
Channels*	1 Channel	RTD-1 No., T/C-1 No.	
Measurement Range**	-50 to 1300°C	RTD's - (-200°C-800°C) T/C - (-210°C-2315°C)	
Resolution	1C /0.01 C	RTD - 0.01°C, T/C - 0.01°C	RTD - 0.001°C, T/C - 0.001°C
Accuracy	±2°C (-50°C to 0°C), ±0.5% of reading +1°C (0°C to 1000°C), ±0.8% of reading +1°C (1000 to 1300°C)	RTD & T/C - 0.1% of full scale	RTD & T/C - 0.05% of full scale
Unit	°C, F, K	°C, F	°C, F, Ohms, mV
Power	Standard 9V battery	Four 1.5v AAA Battery	

*2 Channel available on request

**As per thermocouple or RTD type selected

Temperature Indicators / Controllers



Wall Mounted



Panel Mounted

Input	mA, mV, J, K, E, T, N, Pt100
Output	Relay, 4 - 20mA, (Retransmission)
Power Supply	24VDC, 30mA or 230VAC
Range	-999 to 9999
Size	4", 6"

Fiber Optic Temperature Sensors

Fiber optic temperature sensing technology utilizes optical fibers as passive sensors in a range of applications, offering key advantages such as electromagnetic immunity, multi-point measurement, chemical inertness, reliability, compact size, and lightweight design.

FluoroSenz

The Fiber Optic Monitoring System enables real-time temperature and hotspot detection in transformers and high-voltage switchgear. It delivers precise, single-point measurements with high accuracy, even in harsh environments subject to EMI, RFI, and high voltage conditions.

Temp. Measurement Range	-40°C to 200°C
Temperature Accuracy	±1°C
Temperature Resolution	0.1°C
Number of Channels	Upto 16
Communication Interface	USB 2.0, RS-485, Ethernet (RJ-45)
Power Supply	100-230 V AC, 50-60 Hz



BraggSenz

A highly accurate multi-point Bragg wavelength shift detection system designed for precise temperature, strain, and vibration sensing. This advanced solution leverages Fiber Bragg Grating (FBG) technology and is ideal for a broad range of industrial, commercial, and R&D applications.

Temp. Measurement Range	-20°C - 650°C
Temperature Accuracy	±1°C
Temperature Resolution	0.1°C
Number of Channels	Upto 8
Number of Sensing Point	Upto 20
Communication Interface	USB 2.0, RS-485, Ethernet (RJ-45)
Power Supply	100-230 V AC, 50-60 Hz



DTSenz

The Distributed Temperature Sensing (DTS) System is an optimal solution for linear heat and fire detection in tunnels, conveyor belts, and power transmission lines. It provides a continuous temperature profile across the entire length of the optical fiber cable, ensuring real-time monitoring and precise detection over extensive areas.

Temp. Measurement Range	-40°C - 200°C (Sensor cable dependent)
Temperature Accuracy	±1°C
Temperature Resolution	0.1°C
Number of Channels	Upto 16
Communication Interface	USB 2.0, RS-485, Ethernet (RJ-45)
Power Supply	100-230 V AC, 50-60 Hz
Length of Fiber	Upto 10 km



Thermal Profiling System

Thermal Profiling System provides an in-situ temperature map of the process. It consists of three parts- SmarTrack data Logger, Thermal Barrier Box and Thermocouples.

SmarTrack10 data logger

No. of Channel	10
Thermocouple Type	"K" Type/Others
Accuracy	±1.0°C(for sampling interval ≥ 1sec.)
Resolution	0.1°C
Memory Size	50000 readings per channel with Date & Time
Sample Interval	100 msec to 1 hour
Communications	USB / Wireless Telemetry



Thermal Barrier Box



Thermal Duration

(The time during which the Thermal Barrier ensures safe operation)

Temperature °C	TBB-045	TBB-135	TBB-180	TBB-250	TBB-450	TBB-W-180	TBB-WQ-215	TBB-W-180 HT	TBB-W-300
150°C	26 Mins.	3.5 Hrs.	-	-	-	130 Hrs.	-	-	-
200°C	20 Mins.	2.5 Hrs.	9 Hrs.	12 Hrs.	13.8 Hrs.	65 Hrs.	-	-	-
250°C	15 Mins.	110 Mins.	-	-	-	40 Hrs.	-	-	-
300°C	9 Mins.	80 Mins.	4 Hrs.	8 Hrs.	-	30 Hrs.	-	-	-
400°C	-	-	1.5 Hrs.	-	7.6 Hrs.	15 Hrs.	-	-	-
500°C	-	-	45 Mins.	5 Hrs.	-	9 Hrs.	16 Hrs.	-	-
600°C	-	-	-	3 Hrs.	5.6 Hrs.	-	13 Hrs.	6 Hrs.	-
700°C	-	-	-	-	-	-	11 Hrs.	5 Hrs.	-
800°C	-	-	-	2 Hrs.	4.2 Hrs.	-	9 Hrs.	4.5 Hrs.	13 Hrs.
900°C	-	-	-	100 Mins.	-	-	-	4 Hrs.	11.5 Hrs.
1000°C	-	-	-	-	3 Hrs.	-	-	-	10 Hrs.
1100 °C	-	-	-	-	-	-	-	-	7.5 Hrs.

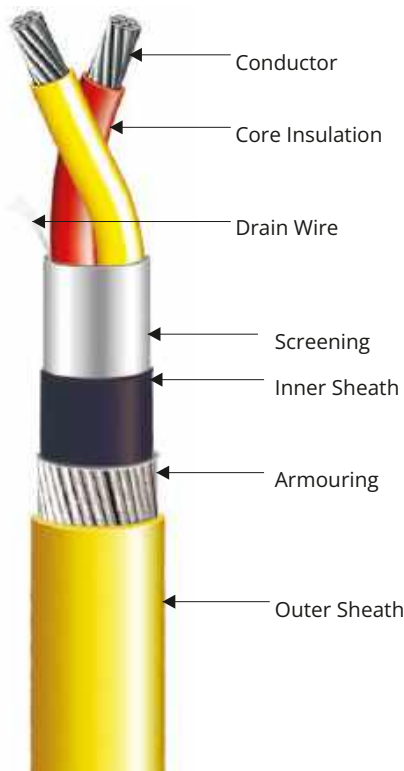
Thermocouple (250°C-1300°C)





Cables & Wires

Cables



INSULATION

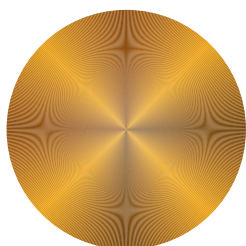
Insulation refers to the protective layer of plastic, polymer, or high-temperature compounds applied directly over a conductor. Tempsens offers a wide range of insulation materials, designed to perform across an extensive temperature spectrum, from -73°C to 1200°C.

Insulation Type

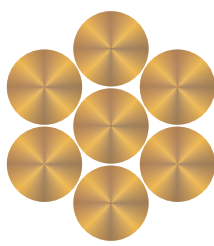
Temperature range for various insulations are listed below :

Alumina Fibre	-73°C	1200°C
Ceramic Fibre/Silica	-73°C	800°C
Fibre Glass	-73°C	550°C
Polyimide	-70°C	310°C
PTFE/PFA	-65°C	260°C
PEEK	-60°C	250°C
FEP	-65°C	200°C
ETFE/ X-ETFE	-65°C	200°C
SILICON	-50°C	200°C
XLPE	-40°C	105°C
XLPO	-40°C	125°C
PVC	-30°C	105°C
HDPE	-50°C	90°C
PUR	-55°C	90°C
LDPE	-50°C	70°C
TPE	-15°C	90°C

CONDUCTOR



Solid



Stranded

The core component of any cable is the conductor, responsible for transmitting signals or power.

Copper is the most widely used conductor for both signal and power transmission due to its superior conductivity and reliability.

Copper Conductors

Annealed Bare Copper (ABC), Tinned Plated Copper (TPC), Nickel Plated Copper (NPC), Silver Plated Copper (SPC), NPC 27%

Thermocouple Conductors

Thermocouple grade conductor (TC)

Extension grade conductor (EX)

Compensating grade conductor (C)

Other Conductors

Pure Nickel Conductor (Ni),

Silver Plated High Strength Copper Alloy etc.

SCREENING

Screening is utilized for electromagnetic protection and is available in two primary types:

- **Aluminum Foil with drain wire:** This method employs helically wound aluminum foil combined with a copper drain wire, providing 100% coverage.
- **Mesh Braided:** This type uses copper wire—available in bare, tinned, nickel-plated, or silver-plated variants—woven into a mesh braid. It offers coverage ranging from 70% to 95%.

INNER SHEATH

PVC, Silicon, Teflon, Polyimide, PUR, HDPE, etc. (as listed in insulation type)

MECHANICAL PROTECTION

- G.I. Armouring (Round wire / Flat strip as per IS 3975:99)
- SS Braiding as per JSS 51038, BS 50288-7, IEC 60502-1
- G.I. Wire Braiding as per BS 502887

OUTER SHEATH

PVC, Silicon, Teflon, Polyimide, Fibre Glass, PUR, ETFE, XLPO etc. (as listed in insulation type)

TESTING

Routine Test, Type test, Acceptance Test as per applicable national & International standards.



IS694 : 2010
CML No. - 8400077612



IS1554-1:1988
CML No. - 8400106609



IS7098-1:1988
CML No. - 8400128712

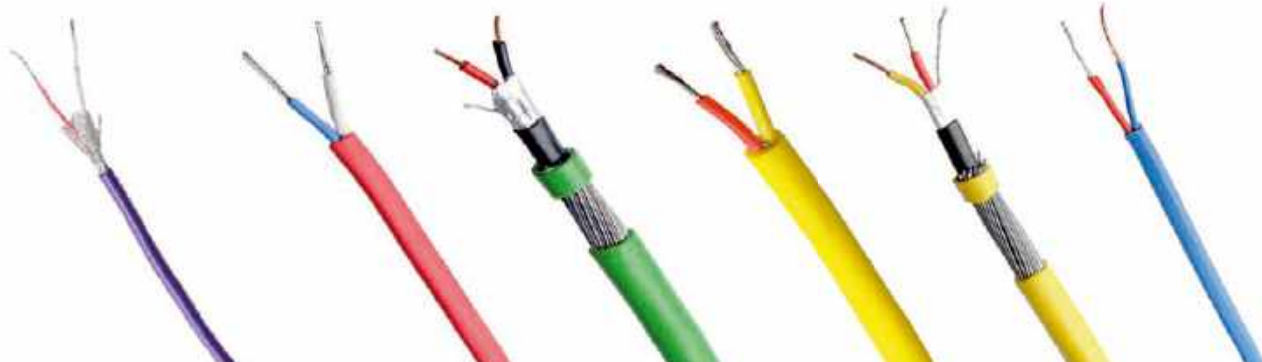


NABL T-4096

Cables

Thermocouple Cables

Thermocouple cables are designed for direct temperature measurement. In contrast, thermocouple extension or compensating wires are specifically used to transmit the thermocouple signal from the sensor to an instrument for accurate readings.



Construction	Single or Multi Pair
Voltage Grade	Up to 1.1 KV
Conductor	TC, EX, C (as per below table)
Type of Conductor	K, T, J, E, N, R, S, B, D, C
Conductor Size	AWG 12 to AWG 34
Conductor Stranding	Solid or Multi Strand
Core Insulation	PVC, XLPE, LSZH, PE, PTFE, FEP, PFA, PEEK, Silicon, ETFE, Polyimide, Fiber Glass, Ceramic Fiber, Alumina Yarn
Screening (If applicable)	Aluminum Foil with drain wire / Mesh Braided
Inner/Outer Sheath	PVC, LSZH, PTFE, FEP, PFA, ETFE, Silicon, Polyimide, Fiber Glass, Ceramic Fiber, PUR, Alumina Yarn
Armouring (If applicable)	G.I. Armouring (For High Temperature insulations)/SS Braiding
Color Code	As per below table
Standards	ANSI MC 96.1, IEC 584.3, IS 8784, JSS 51034, JSS 51038, IS1554, IS8130, IS7098-I, IS5831, IS3975, IEC 60228, IEC 60502, IEC60332, IS9968

Colour Code & Accuracy of Thermocouple, Extension & Compensating Cables

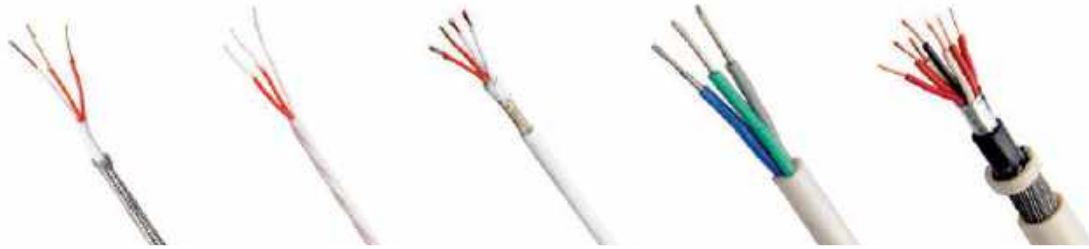
T/CTYPE	CONDUCTOR		CONDUCTOR COMBINATIONS		COLOR CODE		TOLERANCE CLASS AS PER IEC 584.3		CABLE TEMP. RANGE°C
	EXTENSION CABLE	COMPENSATING CABLE	+LEG	-LEG	IEC 5843:1989	ANSI/MC96.1	CLASS 1	CLASS 2	
K	KX		CHROMEL	ALUMEL			±1.5°C or 0.4% of T	±2.5°C or 0.75% of T	0°C TO +1100°C
			CHROMEL	ALUMEL			±1.5°C	±2.5°C	-25°C TO +200°C
		KCA	IRON	CONSTANTAN			-	±2.5°C	0°C TO +150°C
		KCB	COPPER	CONSTANTAN			-	±2.5°C	0°C TO +100°C
T	TX		COPPER	CONSTANTAN			±0.5°C or 0.4% of T	±1.0°C or 0.75% of T	-185°C TO +300°C
			COPPER	CONSTANTAN			±0.5°C	±1.0°C	-25°C TO +100°C
J	JX		IRON	CONSTANTAN			±1.5°C or 0.4% of T	±2.5°C or 0.75% of T	+20°C TO +700°C
			IRON	CONSTANTAN			±1.5°C	±2.5°C	-25°C TO +200°C
N	NX		NICROSIL	NISIL			±1.5°C or 0.4% of T	±2.5°C or 0.75% of T	0°C TO +1100°C
			NICROSIL	NISIL			±1.5°C	±2.5°C	-25°C TO +200°C
E	EX		CHROMEL	CONSTANTAN			±1.5°C or 0.4% of T	±2.5°C or 0.75% of T	0°C TO +800°C
			CHROMEL	CONSTANTAN			±1.5°C	±2.5°C	-25°C TO +200°C
R		RCA	COPPER	COPPER LOW VALUE NICKEL			-	±2.5°C	0°C TO +100°C
S		SCA	COPPER	COPPER LOW VALUE NICKEL			-	±2.5°C	0°C TO +100°C
B		BC	COPPER	COPPER			-	-	0°C TO +100°C
D		DC	ALLOY 203*	ALLOY 225*			-	±4.5°C	0°C TO +100°C
C		CC	ALLOY 405*	ALLOY 426*			-	±4.4°C	0°C TO +100°C



Cables

RTD Triad Cables

RTD triad cables are designed to transmit RTD signals to control rooms or field-mounted Instruments.



Construction	Single or Multi Triads
Voltage Grade	Up to 1.1 KV
Conductor	Electrolytic Grade Bare Copper/Tinned Copper/SPC/NPC
Conductor Size	0.50, 0.75, 1.0, 1.5 Sq. mm up to 48 triad
Conductor Stranding	Solid or Multi Strand
Core Insulation	PTFE, FEP, Silicon, PFA, PVC, PE, XLPE, LSZH Polymer etc.
Screening Method (If applicable)	Individual and Overall / Overall Shield
Screening (If applicable)	Aluminum Foil with drain wire / Mesh Braided Type
Inner/Outer Sheath	PTFE, FEP, Silicon, PFA, PVC, PUR, LSZH Polymer etc.
Armouring (If applicable)	G.I. Armouring/SS Braiding/G.I. Braiding (For High Temperature insulations)
Standards	As per BS 5308 Part 1 and Part 2, IS 1554, EN 50288-7, IS7098, DIN 43760, JSS 51038, JSS51034, IS7098-I, IS8130, IS3975, IS5831, IS9968

LT Control & Power Cables

Control & Power cables are designed for voltage ratings up to 1.1 kV and are available with a variety of insulation & sheath options. Power cables transfer energy from a source to equipment, control cables send signals to control the functioning of equipment.



Construction	Single or Multi Core
Voltage Grade	Up to 1.1 KV
Conductor	Electrolytic Grade Bare Copper/Tinned Copper
Conductor Size	0.50, 0.75, 1.0, 1.5, 2.5, 4.0, 6.0, 10.0, 16.0, 25.0, 35.0 upto 300Sq. mm
Conductor Stranding	Solid or Multi Strand
Core Insulation	PVC, HR PVC, PE, XLPE, LSZH Polymer, FR PVC, FRLS PVC, XLPO etc.
Screening (If applicable)	Aluminum Foil with drain wire / Mesh Braided Type (for Control Cable)
Inner/Outer Sheath	PVC, HR PVC, PE, LSZH Polymer, FR PVC, FRLS PVC, PUR, XLPO etc.
Armouring (If applicable)	G.I Round Wire/Flat Strip Armouring (As per IS3975:99), G.I. Braiding
Standards	As per IS694, IS1554, IS7098, IEC60227, IEC60502-1, IEC60332, IEC60228, IS8130, IS3975, IS5831



Cables

Instrumentation Signal Cables

Instrumentation Signal Cables are designed to minimize noise and signal interference, delivering clear signals in both harsh environments and standard manufacturing operations. These cables are specifically engineered for communication and instrumentation applications, providing reliable performance under demanding conditions.



Construction	Single / Multi, Pair/ Triads
Voltage Grade	Up to 1.1 KV
Conductor	Electrolytic Grade Bare Copper/Tinned Copper
Conductor Size	0.50, 0.75, 1.0, 1.5, 2.5 Sq. mm up to 48 pairs
Conductor Stranding	Solid or Multi Strand
Core Insulation	PVC, HR PVC, PE, XLPE, LSZH Polymer, FR, FRLS PVC, XLPO etc.
Screening Method	Individual and Overall (F Type) / Overall Shield (G Type)
Screening	Aluminum Foil with Drain Wire/ Mesh Braided
Inner/Outer Sheath	PVC, HR PVC, PE, LSZH Polymer, FR PVC, FRLS PVC, PUR, XLPO etc.
Armouring (If applicable)	G.I. Round Wire/Flat Strip Armouring, G.I. Wire Braiding
Standards	As per BS5308 Part 1 and Part 2, IS1554, EN50288-7, IS7098, IS8130, IS3975, IS5831, VDE0815

Fire Survival Cables/Resistant

Fire Survival Cables are essential for installations where critical circuits must remain operational during fire conditions. In emergencies, smoke and toxic fumes pose significant barriers to safe evacuation from buildings. Utilizing fire survival cables, along with halogen-free cables, plays a crucial role in mitigating these hazards and enhancing overall safety.



Construction	Electrolytic Grade Bare Copper/Tinned Copper
Fire Resist Heat Barrier	Glass Mica heat barrier Tape
Insulation	XLPE/SILICON
Screening	Aluminum Foil with Drain Wire/Metal Braided
Inner/Outer Sheath	Halogen Free Low Smoke Polymeric Compound / FRLS PVC
Armouring (If applicable)	G.I. Round Wire/ G.I. Flat Strip/ G.I. Wire Braiding
Standard	IEC 60331, IEC 60332, IEC 60754, BS 6387, EN 50290-2-27, BS 7655, BS 7629-1, IS 7098, IS 9968



Cables

High Temperature Cables

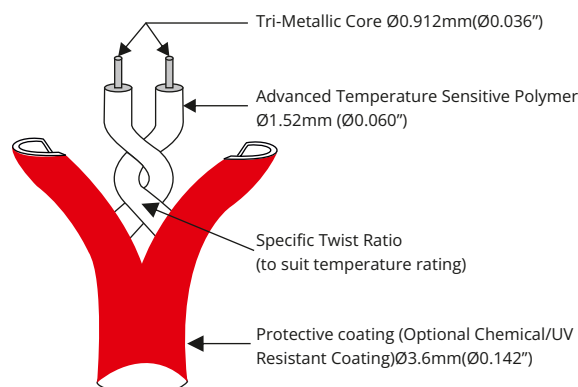
High-Temperature Cables are designed for applications where both working and ambient temperatures are elevated. These cables utilize various high-temperature insulation & Sheath materials, including alumina yarn, ceramic yarn, fiberglass, fluoroplastic polymers, and Special types elastomers, to function continuously at temperatures reaching up to 1200°C.



Construction	Single / Multi Cores, Single / Multi Pairs
Temperature Range	Up to 1200°C (for Thermocouple Cables) Max. 800°C (for Resistance Power & Control Cables) Max. 400°C (for control & Instrumentation Cables)
Voltage Grade	250/600/1100 V
Conductor Type	Annealed Bare Copper, Tinned Copper, Silver Plated Copper, Nickel Plated Copper, Pure Nickel, NPC 27%, High Strength Copper Alloy
Conductor Size	From 0.22 Sq. mm to 240 Sq. mm
Heat Barrier Tape(Optional)	Glass Mica Tape, Polyimide Tape
Core Insulation	FEP, PTFE, PEEK, PFA, Silicon, PEEK, ETFE/X-ETFE, Polyimide, Fiber Glass, Ceramic, Fiber, Alumina Fiber
Screening Method (If applicable)	Individual and Overall
Screening (If applicable)	Aluminum Foil with Drain Wire/ Mesh Braided
Inner/Outer Sheath	FEP, PTFE, PEEK, PFA, Silicon, PEEK, ETFE/X-ETFE, Polyimide, Fiber Glass, Ceramic Fiber, Alumina Fiber
Armouring (If applicable)	Stainless Steel Wire Braided
Generally Confirm to	JSS 51034, JSS 51038, JSS 51037, ASTM B298, ASTM B355, MIL 81381, MIL-DTL-27500H, MIL 16878, IS 9968, VDE 207 Part 6

Digital Linear Heat Sensing Cables

Digital LHS cable are used in advanced fire detection system then detects heat alloy their entire length. These cables provide read time tempsens monitoring and pin point the exact location of heat buildup, makeup them highly effective in critical fix safety like application like cable trays, tunnels etc.



Cables

Heat Resistance Cables

We offer a range of single and multi-core heat-resistant cables, designed to withstand temperatures up to 600°C. Our heat-resistant power cables are engineered to perform reliably in environments exposed to chemicals, fire, and flames.



Construction	Single / Multi Cores
Voltage Grade	Up to 1.1 KV Grade
Conductor	ABC, NPC, NPC 27%
Conductor Size	1.5, 2.5, 4.0, 6.0, 10.0, 16.0, 25.0, 35.0 Sq. mm up to 240 Sq. mm
Heat Barrier Tape	Polyimide Tape
Conductor Stranding	Multistrand as per IS 8130:84/ IEC 60228
Core Insulation	PTFE, FEP, PFA, Silicon, Fiber Glass, Ceramic Fiber etc.
Isolator	Polyimide, Sintered PTET Foil
Fire Barrier Type	Glass Mica Tape
Screening (If applicable)	Mesh Braided (Overall)
Inner/Outer Sheath	Teflon, Fiber Glass, Ceramic Fiber etc.
Outer Braiding	Asbestos
Armouring (If applicable)	SS Braiding
Standards	As per IS 8130:84, JSS 51038, JSS 51037
Max. Temperature Range	550°C for continuos, 600°C short time measurement

Sleeves

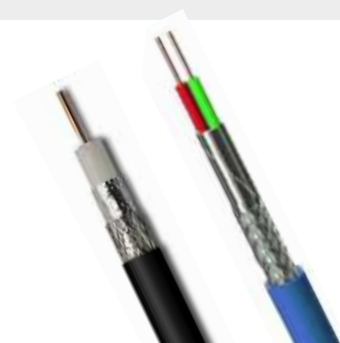
A wide range of sleeves designed for diverse temperature conditions, offering insulation options including PTFE, FEP, silicone, fiberglass, stainless steel wire, polyamide, and PVC



inner Diameter	0.50 mm to 30 mm
Voltage Grade	Up to 4KV
Color	As per Customer requirement

Other Special Cables

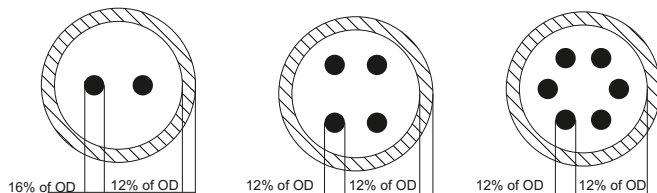
- Radiation Resistance Cables
- Automotive Wires & Cables
- Electron Beam Irradiated Cables
- RS-485 Communication Cables
- Lance Cables
- Load Cell Cables
- Composite Cables
- Co-axial Cables
- Cat 5 & Cat 6 Cables



Cables

Mineral Insulated Cables

Mineral insulated cables are designed for high-temperature applications and particularly strict requirements with regard to mechanical, chemical and electrical stability.



Mineral Insulated Thermocouple Cables

Mineral Insulated Thermocouple Cables Have Inner Conductors of Thermocouple Base Material As Per Standard ASTM E 585/585m and ASTM E 839.

OD (MM)	Type	SHEATH	MGO GRADE	ACCURACY
1.5	K-Simplex	304 - SS304L	STANDARD (≥96% PURE)	CLASS 1
2.0	KK-Duplex			
2.2	J-Simplex			
2.2	JJ-Duplex	316 - SS316L	HIGH PURITY (≥99.4% PURE)	CLASS 2
3.0	E-Simplex			
4.5	EE-Duplex			
5.0	N-Simplex	600 - INCONEL 600	As per IEC 584-2 or ANSI MC 96.1	HIGH PURITY (≥99.4% PURE)
6.0	NN-Duplex			
8.0	T-Simplex			
9.5	TT-Duplex	Note :- Diagonal Element		
10.0	R-Simplex	Supplied Unless Specified		
12.7	RRK-Duplex			
	S-Simplex			
	SS-Duplex			

Mineral Insulated RTD Cables

Mineral insulated cables for RTDs have inner conductors of copper, copper-nickel alloys, nickel etc.

OD (MM)	NO. OF CONDUCTOR	CONDUCTOR MATERIAL	SHEATH	MGO GRADE		
1.5	3	Ni - Nickel	304 - SS304L	STANDARD (≥96% PURE)		
2.0						
2.2						
3.0						
4.5				Cu - Copper	316 - SS316L	HIGH PURITY (≥99.4% PURE)
5.0				NiCu - Constantan	321 - SS321	
6.0					600 - INC 600	
8.0						
9.5						

Other Special Type of MI Cables

●Mineral Insulated Heating Cables

Mineral Insulated Heating Cables are constructed with a solid resistor element embedded in highly compacted mineral insulation. MI cables are built to handle high temperature, high wattage applications.

●Mineral Insulated Copper Cables (MI Power Cables)

Mineral Insulated Copper cable is used as an electric cable for critical areas of plant and follows standard of IEC/EN 60702 Part 1. It has two voltage grade 500V & 750V

Coaxial Cables/Triaxial Cables

Triaxial cable is a type of electrical cable similar to coaxial cable, but with the addition of an extra layer of insulation and a second conducting sheath. It provides greater bandwidth and rejection of interference than coaxial cable.



SPND's

Self-Powered Neutron Detectors are in-core flux monitors in nuclear power reactors. The typical SPND is a coaxial cable consisting of an inner electrode (the emitter), surrounded by insulation and an outer electrode (the collector).



Linear Heat Detector Cables

Linear heat detector cable is used to detect high temperature in critical equipments like engines etc. They use a semiconductor as insulation, the resistance drops characteristic in high temperature condition.



Industrial Heaters

Component Heaters

Tempsens provides a comprehensive range of heating solutions, including Cartridge Heaters, Strip Heaters, Band Heaters, Silicone Rubber Heaters, Coil Heaters, and custom heating solutions tailored to meet specific needs.

Cartridge Heaters



Temperature Range	UP TO 700°C
Sheath Material	SS304, SS316, Incoloy 600, Incoloy 800
Certifications	UL, CE

Air Heaters



Sheath Material	SS304
Sheath Outer Diameter	63.5 mm, 101.6 mm
Wattage	Available ranging from 2kW to 30 kW
Watt Density	Up to 77 W/inch ²
Insulation	High Density Cerawool
Resistance Tolerance	-5%, +10%
Certifications	CE

Coil Heaters

The basic construction of these heaters includes compacted magnesium oxide (MgO), high-temperature resistance wire, and a chrome-nickel steel tube. They can be manufactured with or without integrated thermocouples, offering flexibility based on application Requirements.



Band Heaters

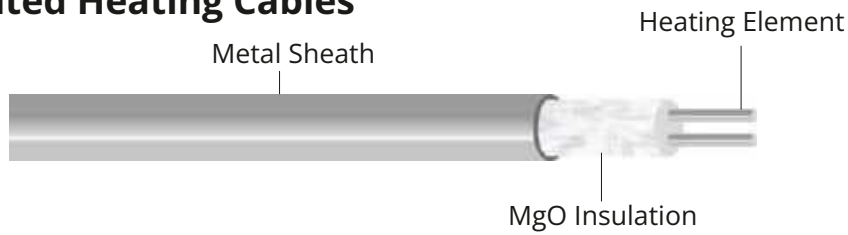
The basic construction of these heaters includes compacted magnesium oxide (MgO), high-temperature resistance wire, and a chrome-nickel steel tube. They can be manufactured with or without integrated thermocouples, offering flexibility based on application Requirements.



Component Heaters

Tempens offers a variety of surface heating solutions, including Open Electric Heat Tracing MI Cable, Panel-Type Hopper Heaters, and Silicone Rubber Heaters. These products are designed to maintain or elevate the temperature of pipes, vessels, hoppers, and other equipment Effectively.

Mineral Insulated Heating Cables



Temperature Range	Up to 500°C
Sheath Material	SS304, SS316, SS321, Alloy 600
Applications	Suitable for heating tanks, valves, pipes, pumps, tools and industrial process heating systems
Certifications	ATEX, IECEx, PESO

Flexible Heaters

Tempens offers flexible heaters suitable for various surface heating and specialized applications, operating at temperatures up to 200°C. These heaters can be customized to meet specific size and shape requirements.



Temperature Range	Up to 250°C
Applications	Surface of drum or heating barrel, Surface of pipe heating, de-icing, Medical Equipment
Insulation Material	Silicon Rubber, Polymide, PET
Type	Wire wound, Printed Circuit, Etched Foil
Certifications	UL, CE

Hopper Heating Modules

Tempens Hopper Heating Jackets are expertly designed to raise or maintain elevated temperatures of contents in reaction vessels, storage tanks, tankers, and industrial process equipment.

Additionally, flexible fiberglass blanket heaters are also employed for hopper heating applications, providing efficient thermal management.



Temperature Range	Up to 200°C
Applications	Moister prevention in silos & hoppers.
Certifications	CE

Process Heaters

Our Process Heating Systems include a comprehensive array of components: Tubular Heater Bundles, Vessels, Control Mechanisms, Circulating Heaters, Immersion Heaters, Air Heaters, and Fin-Type Tubular Heaters or Air Duct Heaters. These systems are designed for efficient and effective heating solutions in various industrial applications.



Temperature Range	Up to 750°C
Pressure Range	Up to 500 bar
Heating Element	NiCr 80:20 with MgO Insulation & Outer metallic sheathing
Vessel Material	SS/Alloys/CS
Application Areas	Oil and Gas, Refinery, Petrochemicals, Power, Marine, R&D and Nuclear, Chemical. Industrial Heating Applications
Certifications	ATEX, IECEX, UL, BIS, PESO, ECAS, EAC etc.

Process Heaters

Skid Heaters

Each heater skid is custom-designed to meet specific process specifications. A typical heater skid consists of: We offer additional services, including extended piping, scrubber installation, and instrumentation for flow, pressure, and level monitoring, tailored to specific requirements.

Our customized executions involve designing each skid to meet the unique needs of the end user. These skids may include thermal oil heaters, re-circulation units, or secondary groups. Our primary focus areas are the asphalt and petrochemical sectors, as well as the automotive and wood industries, where they are used for applications such as heating presses.



Furnace Heaters

High-temperature bundle rod heaters and metallic heating elements are utilized in various furnace applications, including heat treatment furnaces, annealing furnaces, galvanizing furnaces, and aluminum holding and melting furnaces.

Bundle Rod Heaters



Temperature Range	Upto 1100°C
Heating Element	NiCr 80:20, Ferritic Alloys (FeCrAl) (Powder Metallurgical Heating Element)
Radiant Tube Material	HU, Alloy-600 etc. (Customized Diameters and Length)
Application Areas	Annealing Furnace, Carousing Furnace, Other Heat Treatment Furnaces

Silicon Carbide & MoSi₂ Heating Elements



Temperature Range	Upto 1800°C
Heating Element	Ceramic material with relatively high electrical conductivity /Molybdenum disilicide
Application Areas	Aluminium Holding & Melting Furnace, Industrial Ovens, Glass feeder & Float Glass Line, Laboratory Furnaces

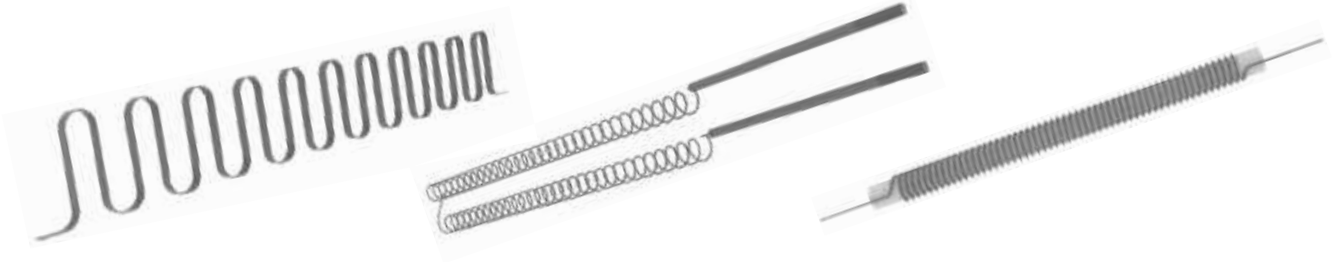
Edge Wound Heaters



Temperature Range	Upto 1100°C
Heating Element	NiCr 80:20
Radiant Tube Material	HU, Alloy-600 etc. (Customized Diameters and Length)
Application Areas	Annealing Furnace, holding Furnace, Other Heat Treatment Furnaces

Furnace Heaters

Metallic Heating Elements



Temperature Range	Upto 1100°C
Strip Element	NiCr 80:20, Ferritic Alloys (FeCrAl) (Powder Metallurgical Heating Element)
Application Areas	Ammonia Cracker, Furnace Elements etc.

Ceramic Bobbin Heaters



Temperature Range	Upto 800°C
Heating Element	NiCr 80:20
Application Areas	Low Temperature furnace heating, Indirect Oil heating, Water heating or any liquide heating etc.

Accessories

Radiant Tube Material

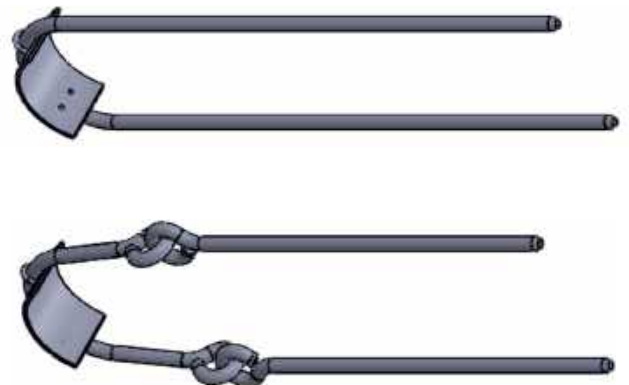
HU, HK-40, Alloy-600/800, SS310

Hanger Material

NiCr 80:20



Radiant Tubes



Hangers

Floor Heating Cables & Mats

Radiant floor heating is the most energy-efficient method for delivering warmth. This low-temperature technology directly heats people and objects instead of warming the air, allowing for individual temperature regulation in each area.

Floor Heating Cables



Floor Heating Mats



Specifications

Shielding Coverage	100% Coverage
Bending Radius	5 times of cable thickness
Jacketing	Heat Resistant and Flame Retardant Jacketing
Flexibility of Cable	Excellent Flexibility for easy installation
Long Cold Lead	3.5 meter cold tail (Can be customized as per requirement)
Comfort	Higher degrees of comfort can be achieved by using heating cables with close and consistent spacing, as well as thermostat to determine temperature needs.
Range	Standard heat loads are available in 100 watt to 3300 watt. As part of the offered product range, several sizes for various types / sizes of flooring are also available.
Custom-Built	In addition to this broad range, cables can be customized to meet specific length requirements, as well as heat loads and voltage needs.
Certifications	CE

Advantages of Marathon Heating Cables & Mats

- Easy installation and can be installed in any area in the house and any type of flooring.
- Can be an excellent option for low-energy homes.
- Works quietly from beneath the tiles/plywood.
- Underfloor heating distributes heat where it is needed, resulting in maximum heat efficiency and only very little heat loss.
- Easy to control required temperature in all weather by digital temperature controller with thermostat.
- To facilitate 'tape-down' installation, the mats are also available into the preassembled fiber glass mesh.

Heat Tracing Solutions

Constant Wattage Heat Tracing Cables

Parallel circuit heating cables feature a constant watt arrangement, delivering a specific wattage per linear foot. The entire cable is protected by a dielectric insulation layer, covered with an additional polymer jacket. The power output remains constant per unit length, irrespective of the overall length of the heating unit.



Output Wattage at 10°C	20, 30, 40, 50, 60 W/M
Braiding covering area	Over 85%
Surface Temperature	200°C
Max. Exposure temperature	230°C
Cut to Length	Yes
Min Bending Radius	25 mm
Voltage	230 V / Customise
Insulation	Dark Brown/Customised

Self Regulating Heating Cables

This self-regulating feature allows the cable to adjust its output in response to ambient temperatures along its entire length. As temperatures rise, the resistance of the heater increases, resulting in lower output wattage. Conversely, as temperatures drop, resistance decreases, allowing the cable to generate more heat. This dynamic capability ensures optimal performance in a variety of environments.



	LTSRH (Low Temperature Self Regulating Heating Cables)	MTSRH (Medium Temperature Self Regulating Heating Cables)
Output Wattage at 10°C	10, 15, 25, 30, 35 W/M	40, 45, 50, 60 W/M
Braiding Covering Area	Over 85%	Over 85%
Max. Maintain Temp@10°C	65°C	105°C
Max. Exposure Temp.	105°C	135°C
Min.Installation Temp.	-40°C	-40°C
Bending Radius	5 times*cable thickness	10 times*cable thickness
Voltage	208-277 V	208-277 V
Insulation Color	Black	Grey
Regular Size to Insulation	10*4mm (Width*Thickness)	11.8*3.4mm-polyolefin insulation 11.6*3.2 Fluoropolymer insulation (Width*Thickness)

Customized Heating Elements



Infrared Heater



Barrel Heater



Thermo Cutter

Integrated Control Panel System

Marathon provides control panels that integrate temperature controllers, customer inputs, and power control systems into a comprehensive package. This precise power control enables process temperatures to be maintained within $\pm 1^\circ\text{C}$. We also offer customized panel sizes tailored to meet unique application requirements.





Non-Contact Temperature Sensors

Pyrometers

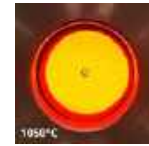
A pyrometer is a non-contact device that captures and measures thermal radiation. It allows for accurate temperature assessment of an object's surface without any physical contact, ensuring precise readings in various applications.

A+ Series

Focusable Optics, analog output and a digital interface along with advanced laser targeting, a through the lens viewfinder or video module sighting. It has keypad for easy parameterization and an integrated OLED display.



OLED Display



Video Module

Model	A250+	A250C+	A450+	A450C+
Temperature Range	210°C - 1350 °C 250°C - 1800°C 300°C - 2500°C 350°C - 3000°C	475°C - 1475°C	600°C - 2500°C	600°C - 1600°C 800°C - 2500°C
Emissivity	0.1....1.0 adj.	0.75....1.25 slope adj.	0.1....1.0 adj.	0.75....1.25 slope adj.
Spectral Range	1.6 µm	1.5µm/1.6 µm	1.0 µm	0.7....1.15 µm
Distance to Spot Size Ratio	75:1, 150:1, 300:1, 300:1	150:1	300:1	150:1 300:1
Response Time	2 msec. adjustable upto 10 sec.	100 msec. adj. upto 10 sec.	2 msec. adjustable upto 10 sec.	20 msec. adjustable upto 10 sec.
Accuracy	±0.3% of the measured value +1°C	± 0.5% of the measured value + 1°C	±0.3% of the measured value +1°C	±0.5% of the measured value +1°C
Analog Output	0-20mA, 4-20mA (User selectable)			
Digital Output	RS-485/RTU Modbus serial Interface	RS-485/RTU Modbus serial Interface	RS-485/RTU Modbus serial Interface	RS-485/RTU Modbus serial Interface

A+ Series With Fiber Optics(A+FOPL)

Digital IR Fiber Optic Pyrometer with Mono Fiber Optic Cable (Single & Two Color Options Available).



Model	A250+ FO PL	A250C+ FO PL	A450+ FO PL	A450C+ FO PL
Temperature Range	250°C - 1800°C 300°C - 2500°C	350°C - 1000°C 450°C - 1350°C	600°C - 2500°C	600 - 1600°C, 800- 2500°C, 1000 - 3200°C
Emissivity	0.1....1.0 adj.	0.75....1.25 slope adj.	0.1....1.0 adj.	0.75....1.25 slope adj.
Spectral Range	1.6 µm	1.5µm/1.6 µm	1.0 µm	0.7....1.15 µm
Distance to Spot Size Ratio	100:1 (OH I) 200:1 (OH II, OH II -V) 400:1 (OHIII-V)	100:1 (OH I) 200:1 (OH II, OH II -V) 400:1 (OHIII-V)	100:1 (OH I) 200:1 (OH II, OH II -V) 400:1 (OHIII-V)	100:1 (OH I) 200:1 (OH II, OH II -V) 400:1 (OHIII-V)
Response Time	2 msec. adjustable upto 10 sec.	100 msec. adjustable upto 10 sec.	2 msec. adjustable upto 10 sec.	20 msec. adjustable upto 10 sec.
Accuracy	±0.3% of the measured value +1°C	± 0.5% of the measured value + 1°C	±0.3% of the measured value +1°C	±0.5% of the measured value +1°C
Analog Output	0-20mA, 4-20mA (User selectable)			
Digital Output	RS-485/RTU Modbus serial Interface	RS-485/RTU Modbus serial Interface	RS-485/RTU Modbus serial Interface	RS-485/RTU Modbus serial Interface

Pyrometers

A Series

Standard Industrial Pyrometers with single & two color models, Analog output, Digital interface, Bluetooth, Laser targeting or Through the lens view finder



Model	A150	A250	A250C	A450	A450C
Temperature Range	50°C - 700°C	210°C - 1350°C 250°C - 1800°C 300°C - 2500°C 350°C - 3000°C	350°C - 1000°C 450°C - 1350°C	600°C - 2500°C	600°C - 1600°C 800°C - 2500°C
Emissivity	0.1....1.0 adjustable	0.1....1.0 adjustable	0.75....1.25 slope adjustable	0.1....1.0 adjustable	0.75....1.25 slope adjustable
Spectral Range	2 to 2.6 μm	1.6 μm	1.5μm/1.6μm	1.0 μm	0.7.....1.15 μm
Distance to Spot Size Ratio	40 : 1	50 : 1, 100 : 1, 200 : 1	100:1 200:1	200 : 1	100 : 1 200 : 1
Response Time	2 msec. adjustable upto 10 sec.		100 msec. adjustable upto 10 sec.	2 msec. adjustable upto 10 sec.	10 msec.
Accuracy	Upto 400°C : 3°C T> 400°C : 0.5% of measured value in °C +1°C	±0.3% of the measured value +1°C	±0.5% of the measured value + 1°C	±0.3% of the measured value +1°C	±0.5% of the measured value +1°C
Analog Output	0-20mA, 4-20mA, 0-10V (User selectable)				
Digital Output	Bluetooth/RS-232 / RS - 485/RTU Modbus Serial Interface (User Selectable)				

A Series with Fiber Optics

Fiber Optic Pyrometers (optical head withstands ambient upto 250°C) Mono Fiber Optic Cable, Laser Targeting, Digital Interface, Analog Output & Bluetooth for high ambient & EMF area applications.



Model	A250 FO PL	A250C FO PL	A450 FO PL	A450C FO PL
Temperature Range	250°C - 1800°C 300°C - 2500°C	350°C - 1000°C 450°C - 1350°C	600°C - 2500°C	600°C - 1600°C 800°C - 2500°C
Emissivity	0.1....1.0 adjustable	0.75....1.25 slope adjustable	0.1....1.0 adjustable	0.75....1.25 slope adjustable
Spectral Range	1.6μm	1.5μm/1.6μm	1.0 μm	0.7....1.15μm
Distance to Spot Size Ratio	100:1 (OH I) 200:1 (OH II), (OHII-V)	100:1 (OH I) 200:1 (OH II), (OHII-V)	100:1 (OH I) 200:1 (OH II), (OHII-V)	100:1 (OH I) 200:1 (OH II), (OHII-V)
Response Time	2 msec. adjustable upto 10 sec.	100 msec. adjustable upto 10 sec.	2 msec. adjustable upto 10 sec.	20 msec. adjustable upto 10 sec.
Accuracy	±0.3% of the measured value +1°C	±0.5% of measured value +1°C	±0.3% of the measured value +1°C	±0.5% of measured value +1°C
Analog Output	0-20mA, 4-20mA, 0-10V (User selectable)			
Digital Output	Bluetooth/RS-232 / RS - 485/RTU Modbus Serial Interface (User Selectable)			

Pyrometers

A Series with Thermopile (AL)

Pyrometers with Analog output, Digital interface, USB, Laser targeting light for temperature measurement.



Model	AL30	AL390	AL45
Temperature Range	-20°C - 1000°C 75°C - 1000°C	300°C - 1400°C 400°C - 2500°C	400°C - 1500°C
Emissivity	0.1....1.2 adjustable	0.1....1.2 adjustable	0.1....1.2 adjustable
Spectral Range	8....14µm	3.9 µm	4.43 µm
Distance to Spot Size Ratio	50 : 1, 100 : 1	50 : 1	40 : 1
Response Time	60 msec. adjustable upto 10 sec		
Accuracy	T < 200°C ; ±1.5% of measured value or 3°C T ≥ 200°C ; ±1.0% of measured value or 4°C	T < 500°C ; ±1.5% of measured value T ≥ 500°C ; ±1.0% of measured value	T < 500°C , ± 1.5% of measured value T ≥ 500°C, ± 1% of measured value
Analog Output	0-20mA, 4-20mA, 0-10V (User selectable)		
Digital Output	USB 2.0, RS-232 / RS - 485 (User Selectable)/ RTU Modbus serial Interface		

Pyrometer for Glass Industry

Pyrometers with Analog output, Digital interface, USB for temperature measurement.



Model	AST 450G2	AL 514	PGM+
Temperature Range	600°C - 1800°C	300°C - 1400°C 400°C - 2500°C	250°C - 600°C
Emissivity	0.05....1.0 adjustable	0.1....1.2 adjustable	0.1....1.0 adjustable
Spectral Range	1.0 µm	5.14 µm	1.6µm
Distance to Spot Size Ratio	100 : 1	50 : 1	-
Response Time	250msec. adjustable upto 10 sec.	60 msec. adjustable upto 10 sec	2 msec. adjustable upto 10 sec.
Accuracy	±0.3% of measured value or ±3°C whichever is greater	T < 500°C ; ±1.5% & T ≥ 500°C ; ±1.0% measured value	±0.3% of measured value +1°C
Analog Output	4 - 20 mA	0-20mA, 4-20mA, 0-10V (User selectable)	-
Digital Output	USB 2.0	USB 2.0, RS-232 / RS - 485 (User Selectable)/ RTU Modbus serial Interface	USB 2.0

Pyrometers

E Series

Economic Series Pyrometers with extended sensor head, Analog output, Digital interface, Relay output, USB Output, Inbuilt LCD, Laser Targeting & Keypad for parameterization.



Model	E150	E250	E450	E450C	EL50/EL50H/EL50H+	EL50/EL50H/EL50H+ EX
Temperature Range	50°C....600°C	250°C - 1000°C 300°C - 1300°C 350°C - 1800°C	600°C - 1900°C	800°C - 2500°C	-20°C - 800°C, 0°C - 800°C (EL50H+)	0°C - 800°C
Emissivity	0.1....1.0 adj.	0.1....1.0 adj.	0.1....1.0 adj.	0.75....1.25 slope adj.	0.1....1.2 adj.	0.1....1.2 adj.
Spectral Range	2.3....2.6 μm	1.6μm	1μm	0.7....1.15μm	8....14μm	8....14μm
Distance to Spot Size Ratio	20 : 1	20 : 1, 40 : 1, 80 : 1	80 : 1	80 : 1	2:1, 15:1, 15:1 (EL50H+)	15:1
Response Time	2 msec. adjustable upto 10 sec.	2 msec. adjustable upto 10 sec.	2 msec. adjustable upto 10 sec.	20 msec. adjustable upto 10 sec.	20 msec. adj. upto 10sec./60 msec. adj. upto 10sec. (EL50H/EL50H+)	60 msec. adj. upto 10sec.
Accuracy	±0.5% of the measured value ±2°C	±0.3% of the measured value +1°C	±0.3% of the measured value +1°C	±0.5% of the measured value +1°C	±1% of the measured value or 3°C whichever is greater	±1% of the measured value or 3°C whichever is greater
Analog Output	0-20mA, 4-20mA, 0-10V				0-20mA, 4-20, 0-10V, J&K type T/C (User Selection)	
Digital Output	USB 2.0, RS-232 / RS-485 (Optional)					

EL50H Sensor Head 180°C
EL50H+ Sensor Head 250°C

T3 Series

Pyrometers in 2 wire technology with Analog output, TTL output, USB interface and External Emissivity setting.



Model	T3-814	T3-250	T3-390	T3-514	T3-450
Temperature Range	-20°C - 1000°C 75°C - 1000°C	250 - 1300 °C 300 - 1800 °C 350 - 2500 °C	300°C - 1400°C	300°C - 1400°C 400°C - 2500°C	600°C - 2500°C
Emissivity	0.1....1.0 adjustable at device				
Spectral Range	8.0....14.0 μm	1.6 μm	3.9μm	5.14 μm	1.0 μm
Distance to Spot Size Ratio	50:1, 100:1	50:1, 100:1, 200:1	50:1	50:1	200:1
Response Time	60 msec. adjustable upto 10sec.	10 msec adjustable upto 10 sec.	60 msec. adjustable upto 10sec.	60 msec. adjustable upto 10sec.	10 msec. adjustable upto 10 sec.
Accuracy	T < 200°C; ± 1.5% of measured value or 3°C, whichever is greater T ≥ 200°C; ± 1% of measured value or 4°C is greater	± 0.3% of the measured value + 1°C	T < 500°C; ± 1.5% of measured value T ≥ 500°C; ± 1% of measured value	T < 500°C; ± 1.5% of measured value, T ≥ 500°C, ± 1% of measured value	± 0.3% of the measured value + 1°C
Analog Output	2 wire....4-20mA(Isolated)				
Digital Output	TTL Output				

Pyrometers

Portable Pyrometers

Economic Portable infrared non-contact Pyrometer with LCD display, Laser pointer/ Through the lens sighting.



Model	TI 1500	TI 1800	AST P250	AST P450	AST P250C	AST P450C
Temperature Range	0°C - 1500°C	250°C - 1800°C	210°C-1350°C 250°C-1800°C 300°C-2500°C	600°C - 2500°C 700°C - 3000°C	450°C - 1400°C	600°C - 1600°C 800°C - 2500°C
Emissivity	0.1 to 1.2	0.1 to 1.0	0.1 to 1.0 adjustable		0.75....1.25µm slope adj.	0.75....1.25µm slope adj.
Spectral Range	8....14µm	1.1....1.6µm	1.6µm	1.0µm	1.5/1.6µm	0.7....1.15µm
Distance to Spot Size Ratio	50:1	100:1	100:1, 200:1, 400:1	400:1, 400:1	200:1	200:1, 400:1
Response Time	200msec.	200msec.	5 msec. in Numerical Mode, 10 msec in Graphical Mode, 10 msec (when data storage is ON)		25 msec in Numerical Mode, 30 msec in Graphical Mode, 30 msec (when data storage is ON)	25 msec in Numerical Mode, 30 msec in Graphical Mode, 30 msec (when data storage is ON)
Accuracy	±1% of measured value (Non-Contact IR mode)±2°C whichever is greater 0.3% of full scale (thermocouple type K probe mode)	±0.5% of measured value (Non-Contact IR mode)±1°C whichever is greater 0.3% of full scale (thermocouple type K probe mode)	±0.3% of the measured value 1°C		±0.5% of the measured value 1°C	±0.5% of the measured value 1°C
Digital Output	NA	Bluetooth	USB 2.0			

Special Pyrometer



Model	AST IR CAST 2C+	SRU-FO for Petrochemical	450 G2 Pyrowell
Temperature Range	700°C - 1700°C	350°C - 2000°C	350°C - 1800°C
Emissivity	0.75....1.25 slope adjustable	0.01....1.00 adjustable	0.05....1.00 adjustable
Spectral Range	0.7....1.15µm	Special	1.6 µm
Distance to Spot Size Ratio	DV=166:1(V=Vertical) DH=33:1(H=Horizontal)	100:1 (OH-II)	100:1
Response Time	20msec. adj. upto 10 sec.	2msec. adj. upto 10 sec.	250msec. adj. upto 10 sec.
Accuracy	±0.5% of measured value +1°C	±0.25% of measured value +1°C	+/- 0.3% of the measured value or +/-3°C whichever is greater
Analog Output	4....20mA or (0-20mA/0-10V) user selectable	4-20mA & 0-20mA	4-20mA
Digital Output	RS-232 or RS-485 (user selectable)	RS 485 Serial Interface	USB 2.0

Furnace Monitoring Cameras

Application

Steel, Cement, Power, Glass Industries



Model	Specification
TFV-750/TFV-1100	Straight View Visual Camera
TE-750/TE-1100	Straight View Thermal Camera
TFV-750/OV & TFV-1100/OV	Elbow View Visual Camera
TE-750/OV & TE-1100/OV	Elbow View Thermal Camera

CCD Camera (Normal View)

Image Sensor	1/3" Super HD CCD
TV Line	Black and White 650 Lines
Illumination	0.005Lux@F2.0
Image	Manual Adjustable
Video Output	Composite 1[Vp-p]@75(Ω)
Power	DC12V(±10%)



Normal View

Thermal Camera (Thermal View)

Image Sensor	HD CMOS Sensor
Temperature Range	700°C to 1800°C
Accuracy	±0.3% of measure value
Resolution	1280 x 1024 pixels
Frame Rate	25 Hz
Spectral Range	0.85 to 1.1μm
Connectivity	Ethernet



Thermal View

Pinhole Lens

Lens Length	820 mm & 1100mm
Lens Type	Straight or Elbow (60°)
Field of View	67°(H) x 56°(V) x 81°(D)
Focus	Manual Adjustable



Features

- Water cooled lens tube, Vortex cooled camera chamber
- Auto retraction and shutter
- Pneumatic cylinder
- Air Purged
- Control panel with pneumatic system
- Software Infraview for Thermal camera
- Input/Output module

InfraVIEW Software (for Thermal Camera)

- Configurable ROI's : point, line, free shape
- Histogram and isotherm visualization
- Hot and cold spot detection
- Color pallet scaling
- Trend charts
- Alarm output
- Video and Image export
- Server client configuration

Thermal Imagers

Accuopt/Tempsens develops Thermal Imaging Camera for radiometric and security surveillance application.



Model	ThermCAM-80	ThermCAM-160	ThermCAM-384	ThermCAM-640	ThermCAM-HT
Description	Low Resolution, Long Wavelength Infrared Camera	Medium Resolution, Long Wavelength Infrared Camera	High Resolution, Long Wavelength Infrared Camera	High Resolution, Long Wavelength Infrared Camera	High Resolution, Camera for high temperature measurement
Temperature Range	-20°C to 120°C/ 100°C to 1000°C (Switchable via InfraVIEW Software)	-20°C to 120°C/ 100°C to 1000°C (Switchable via InfraVIEW Software)	-20°C to 120°C/ 100°C to 1000°C (Switchable via InfraVIEW Software)	-20°C to 120°C/ 100°C to 1000°C (Switchable via InfraVIEW Software)	700°C to 1800°C
	Other Temperature ranges (upto 1000°C) are also available on request	Other Temperature ranges (upto 1500°C) are also available on request	Other Temperature ranges (upto 2000°C) are also available on request	Other Temperature ranges (upto 2500°C) are also available on request	Other Temperature ranges (upto 2500°C) are also available on request
Optical IR Resolution	80 x 80 pixels	160 x 120 pixels	384 x 288 pixels	640 x 480 pixels	640 x 480 pixels
FOV	28° x 28°	31° x 23°	28.19° x 21.33° (Other FOVs also available)	23° x 17.3° (Other FOVs also available)	20.6° x 15.5° (Other FOVs also available)
Spectral Range	8 - 14µm	8 - 14µm	8 - 14µm	8 - 14µm	0.85 - 1.1µm
Frame Rate	25Hz	30Hz	30Hz	15Hz	25Hz
Detector	Uncooled FPA detector	Uncooled FPA detector	Uncooled FPA detector	Uncooled FPA detector	High Dynamic CMOS Detector
Ambient Temperature	0°C to 60°C	0°C to 60°C	0°C to 60°C	0°C to 60°C	0°C to 60°C

Accessories

Thermal Camera Cooling Jacket

AccuOpt's cooling jacket helps in cooling down the ambient temperature of the thermal imager and also provides protection from harsh industrial environmental conditions like dust, heat, etc.

The camera electronics is heat sensitive and get damaged at high temperature. By installing a thermal camera inside the cooling jacket, the thermal camera can bare temperatures near about 80°C with Air Cooling & 150°C with Water Cooling. The standard cooling jacket comes with an air purge/air knife, air/water inlet, air/water outlet and GE window.



Thermal Imagers

I/O Module for Thermal Camera

Simplified Solution for connecting thermal camera with peripheral devices

Input/ Output Features:

- 8 x Analog channel (4-20 mA)
- 2 x Analog Input (4-20mA)
- 4 x Digital Input
- 4 x Digital Output (Relay)
- Communication interface: - Ethernet
- Power supply: - 12 - 24V DC



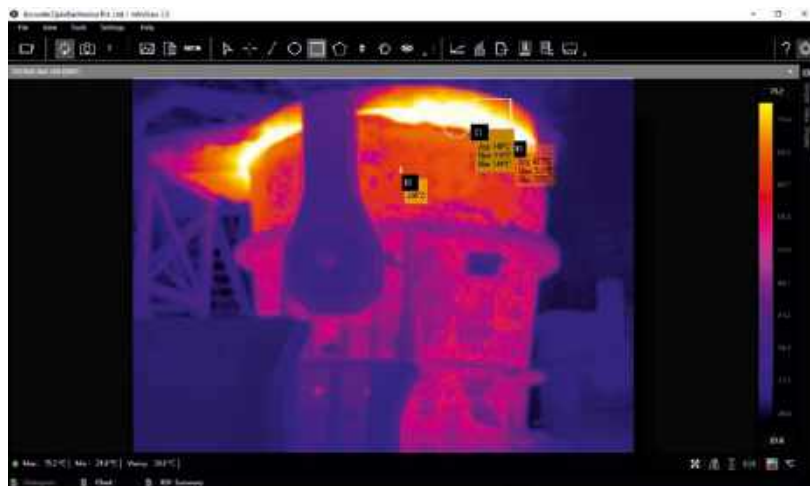
Functional Features:

- HDMI output for radiometric streaming with hot and cold detection.
- Autonomous mode:- Directly connect with camera and drive I/Os to make device standalone.
- Only as I/O:- Driven by InfraVIEW Software.
- ONVIF - RTSP streaming (Optional)

InfraVIEW Software

AccuOpt's InfraVIEW software is included as a standard scope of supply with our Thermal Imaging Cameras. This is a windows-based software which is particularly dedicated for industrial thermal imaging applications. The InfraVIEW software provides easy and quick framework for the documentation of the recorded raw data which has been continuously captured through thermal camera.

InfraVIEW software provides high-speed real time data acquisition through which one can easily record, view analyse and store the captured thermal videos/ images as well as the temperature data. It also allows captured temperature data to be integrated with I/O modules or can be connected to PLC via OPC/UA server.



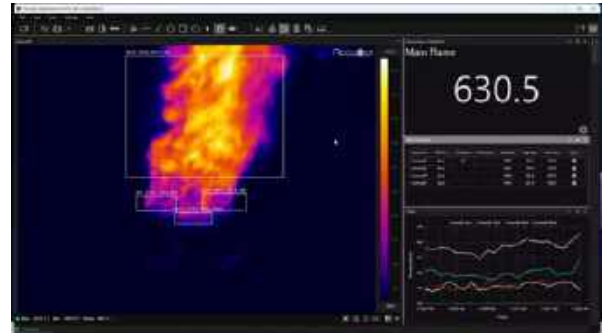
Salient features of InfraVIEW Software:

- Real-time display of thermal images.
- Includes 9 different colour palates, according to user application
- Multiple types of ROI including point, line, and area with min./max./avg. temperature display.
- Histogram and trend chart of ROI can be generated for data analysis.
- Temperature Display on Mouse Over.
- ROI based alarm generation on minimum, maximum or average temperature.

Thermal Imagers

Solutions

FlareVIEW : FlareStack Monitoring System



FlareVIEW

Infrared Flare Stack Monitoring System from AccuOpt is a high-resolution Thermal Imaging based solution for main as well as for pilot flame monitoring. In this solution AccuOpt's Thermal Imaging camera is coupled with a suitable lens and is put inside a weather-proof stainless-steel enclosure or Explosion Proof enclosure to prevent the camera from dust, rain, sunlight and other hazardous environment conditions.

This can also be equipped with automated alarm systems. If the temperature exceeds predefined thresholds or if any anomalies are detected, the system can trigger alarms, notifying operators or emergency response teams.

SparkVIEW : Automated Substation Hot-Spot Monitoring System

AccuOpt's SparkVIEW: Substation Hot Spot Monitoring System is a high-resolution thermal imaging based automated hot-spot monitoring and reporting system for predictive maintenance. It detects hot-spots in switchyard or substation's several electrical equipment such as CT (Current Transformer), PT (Power Transformer), CB (Circuit Breakers), Surge or Lightning arresters etc.



SparkVIEW

- Early detection of faults ensuring preventive maintenance
- Reduces human activity in the critical areas
- 24/7 Inspection leading towards reliable operation
- Email & SMS alerts on hot-spot detection
- 360° view for maximum coverage
- Dashboard and analytics feature for future evaluation



Reporting Software



Calibration Equipment

Calibration Equipments for Contact Type Sensors

Portable Dry Block Calibrator

Offers the most convenient and portable facilities for checking and calibrating contact-type temperature sensors. These devices feature rapid heating and cooling capabilities, ensuring a quick response time. Typically, dry-block calibrators include a removable metal insert for precise temperature measurement.



Model	CALsys -196/-80	CALsys -100/40	CALsys -30/110	CALsys 650	CALsys 1200
Temperature Range	-180°C to -80°C	-100°C to 40°C	-30°C to 110°C	50°C to 650°C	250°C to 1200°C
Stability	±0.1°C	±0.04°C	±0.07°C	±0.05°C	±0.3°C
Uniformity	±0.2°C	±0.05°C	±0.08°C	±0.09°C	±0.4°C
Insert Construction	Dia 25x330(L) (2x6.5 & 2x8.5 holes) of 280 (D)	Dia 37x160(L) (4x6.5 holes) of 150(D)	(1x8 & 2x6 holes) of 120(D)	Dia 32x150(L) 4 holes of 6.5 x 120(D)	Dia 37x180(L) (2x6.5 & 2x8.5 holes) of 160(D)
Dimensions (WxHxD) mm	310 x 165 x 350	245 x 545 x 350	230 x 425 x 305	195 x 355 x 265	230 x 425 x 305
Weight	10 Kg	16 Kg	12 Kg	10 Kg	12 Kg

Laboratory Furnace



Model	CALsys 1200L	CALsys 1500L	CALsys 1700L
Temperature Range	300°C to 1200°C	500°C to 1500°C	500°C to 1700°C
Stability	±0.35°C	±1.0°C	±1.5°C
Uniformity	±0.4°C	±1.2°C	±1.9°C
Insert Construction	Dia 37x240(L) (2x6 & 2x8 holes) of 160(D)mm	Dia 37x200(L) (2x6 & 2x8 holes) of 140(D)mm	Dia 37x225(L), (2x6 & 2x8 Holes) of 185(D)mm
Dimensions (WxHxD) mm	450 x 590 x 530	450 x 590 x 530	500 x 700 x 550
Weight	55 Kg	55 Kg	75 Kg

Calibration Equipments for Contact Type Sensors

Liquid Baths

The system ensures a superior thermal environment for probe immersion, eliminating any air gaps between the probe and the medium. The stirring mechanism facilitates uniform heat distribution throughout the medium. For optimal performance, methanol is utilized for temperatures ranging from -80°C to 50°C, water is effective from 5°C to 70°C, and silicone oil is suitable for temperatures up to 250°C.



Model	CALsys -80/50	CALsys -40/50	CALsys -35/200	CALsys 250
Temperature Range	-80°C to 50°C	-40°C to 50°C	-35°C to 200°C	50°C to 250°C
Stability	±0.07°C	±0.07°C	±0.04°C	±0.03°C
Uniformity	±0.09°C	±0.09°C	±0.07°C	±0.06°C
Calibration Volume (L x W x D)	90 x 90 x 230	110 x 70 x 150	105 x 105 x 150	90 x 140
Medium	Methanol	Methanol	Methanol/Silicon Oil	Silicon Oil
Dimensions (WxHxD) mm	675 x 1080 x 555	305 x 675 x 535	410 x 705 x 605	250 x 330 x 330
Weight	135 Kg	65 Kg	65 Kg	12 Kg

Reference Master Sensor

Accurate Master Temperature Sensors in various configuration are available with Calibration certificate from our NABL Accredited Lab.



Model	Type S	Type K	SSPRT	TPRT100
Temperature Range	0 to 1500°C	0 to 1200°C	-200°C to 670°C	-80°C to 400°C
Element Type	S(Pt10%Rh/Pt)	NI-CR-SI/N	PT 100	PT 100
No. of Element	Simplex	Simplex	Simplex	Simplex
Sheath Material	Alumina (99.7% pure Al2O3)	Inconel 600	Inconel 600	SS-316
Sheath Length	450 mm	450 mm	450 mm	450 mm
Extension Cable	1.5 mtr. Long Teflon insulated cable with male/female miniature connector	1.5 mtr. Long Teflon insulated cable with male/female miniature connector	1.5 mtr. Long Teflon insulated silver plated copper cable with flying leads	1.5 mtr. Long Teflon insulated silver plated copper cable with flying leads
Sheath Diameter	6 mm	6 mm	6 mm	6 mm
Calibration	At 5 points at Tempsens NABL Accredited Lab	At 5 points at Tempsens NABL Accredited Lab	5 Fixed Point Calibration	At 5 points at Tempsens NABL Accredited Lab
Accuracy	Special Class (0.6°C or 0.1% of temperature whichever is greater)	Special Class (1.1°C or 0.4% of temperature whichever is greater)	Drift ±0.03°C at 0°C after 100Hrs at 670°C	±0.15 at 0°C

Calibration Equipments

Automatic Temperature Calibrator



Autocal -80/50



Autocal -100/40



Autocal 650



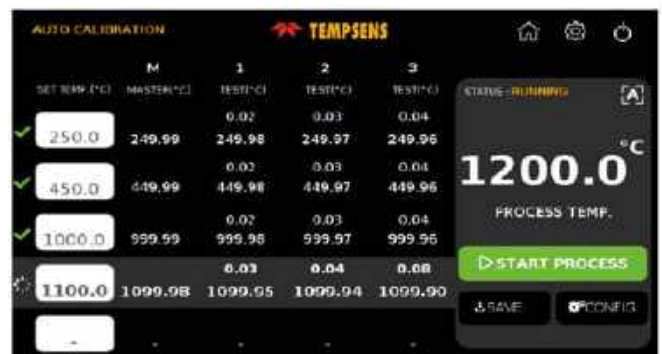
Autocal 1200

- Easy-to-read color 5 Inch LCD Display with perfect overview of actual Temp calibrator status.
- Intuitive, Fast and User-Friendly navigation.
- 4 Channel Calibration (4 No's Easy to use Universal input connector suitable for thermocouple and Rtd).
- Internal CJC Compensation.
- Ethernet (LAN) Communication with CALsys 650 AUTOCAL Model for PC/Laptop Interface.
- USB Connector for Data saving (Optional)
- Temperature Range from -196°C to 1700°C

Manual Mode:



Auto Mode:



Calfast

Quick And Easy To Carry Temperature Calibrator For On-site Calibration

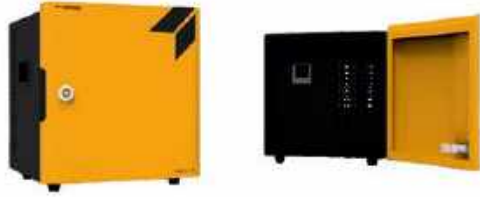


Model	Calfast 120	Calfast 350	Calfast 400BB
Temperature Range	-10°C to 120°C	50°C to 350°C	40°C to 400°C
Stability	±0.05°C	±0.05°C	±0.1°C
Uniformity	±0.5°C	±0.5°C	±0.2°C
Heating Time	10 Minutes	10 Minutes	12 Minutes
Weight (Kg)	2.0 Kg	1.5 Kg	2.0 Kg
Dimensions (WxHxD) mm	185 x 125 x 175	165 x 105 x 185	200 x 120 x 180

Calibration Equipments

Reference Junction Units

Reference Junction eliminates old fashioned ice bath and are used in industries and laboratories.



Type	CALref 0, CALref 60
Channel	20, 24
Ref. Temp.	0, 60°C
Type of Junction	J, K, T, E, N, R, S, B

Meters

TEMPMET 08/TEMPMET 09 - Thermocouple & RTD



Model	TEMPMET 08	TEMPMET 09
Input	B, C, D, E, J, K, N, R, S, T, Pt100, Pt50, Pt10, Pt200, Pt500, Pt1000	
Resolution	RTD - 0.01°C, T/C - 0.01°C	RTD - 0.001°C, T/C - 0.001°C
Accuracy	RTD & T/C - 0.1% of full scale	RTD & T/C - 0.05% of full scale

CALSYS C-4004 (High Accuracy Digital Thermometer)



- High Stability of Temperature measurement (.098° C)
- High Accuracy of RTD Measurement (0.01° C)
- High Accuracy of Thermocouple Measurement (0.1° C)
- High Resolution
- 2 Measuring inputs
- 10 Thermocouple (B, C, D, E, J, K, N, R, S, T)
- 6 RTD's (PT-10, PT-50, PT-100, PT-200, PT-500, PT-1000)

Heat Flux Sensor

Gardon Gauge heat flux sensors are capable of measuring high thermal radiation intensities. These sensors primarily assess heat transfer through radiation while also accounting for the effects of convection and radiation heat. Each transducer generates a nominal output of 10 millivolts at the designed heat flux level. The emf output thermocouple is produced by a single differential between the center and edge temperatures of the foil.

Additionally, we have another type of heat flux sensor known as **Schmidt Boelter Gauge** which ranges between 1 – 5 W/cm²



Parameters	Cooled & Uncooled both Type of Sensor
Heat Flux	10 & 30 W/cm ² (Other ranges are also available upto 1 - 800 W/cm ²)
Sensor Type	Gardon Gauge & Schmidt Boelter Gauge
Sensor Output	Linear output, 10 mV nominal at full range
Over Range	25% of Rated Heat Flux
Accuracy	±5% or better
Repeatability	2% - 5% or better
Measurement Duration	60s for 10 W/cm ²
Sensor	Differential Thermocouple and Thermopile Sensor
Dimension	Diameter 25 mm, Length 25 mm
Mounting	Smooth Body with flange
Cable Length	Specify either 2 meter
ISO Standard	ISO17025 Accredited calibration certificate (Optional)

Calibration Equipments for Non-Contact Type Sensors

Extended Area Black Body Temperature Calibrator

Our system offers convenient, portable solutions for checking and calibrating non-contact type temperature calibrators, featuring rapid heating and cooling capabilities. Extended area black body is defined by the large emitting surface area having precise temperature control with good uniformity. These calibrators are used to calibrate pyrometers, thermal imagers etc.



Model	LBBCH SP.	LBBCH	LBBH	LBBCH DUAL
Temperature Range	(-)40°C to 100°C	0°C to 110°C	50°C to 500°C	-20°C to 500°C
Stability	±0.1°C	±0.01°C	±0.1°C	±0.01°C at 50°C
Uniformity	±0.5°C at 50°C	±0.5 at 50°C	±2 at 400°C	±0.5 at 50°C
Emissivity	0.95 (±0.02)	0.95 (±0.02)	0.95 (±0.02)	0.95 (±0.02)
Emissivity Area	Upto 200 x 200 mm ²	Upto 300 x 300 mm ²	Upto 300 x 300 mm ²	Upto 50 x 50 mm ²

High Temperature Black Body Calibrator



Model	CALsys 1200BB	CALsys 1500BB	CALsys 1700BB	Fast Cal 3000
Temperature Range	300°C to 1200°C	500°C to 1500°C	500°C to 1700°C	600°C to 3000°C
Stability	±0.5°C	±0.5°C	±1.5°C	±1.0°C
Emissivity	0.99 (±0.01)	0.99 (±0.01)	0.97 (±0.02)	0.99 (±0.01)
Calibration Area (mm)	Dia 40 x 85 (D)	Dia 40 x 85 (D)	Dia 29 x 235 (D)	Dia 25 x 127 (D) Graphite Cavity

Master Pyrometers With Special Calibration

AST AL30	0°C to 1000°C
AST A250	250°C to 2500°C



Master Pyrometer A250



Furnaces

Furnaces

Laboratory Furnaces

Tempsens laboratory furnaces are designed to meet the demands of modern laboratories, research facilities, and industrial environments. Our furnaces support a wide range of applications, including annealing, soldering, material testing, ashing, pyrolysis, and dental processes.



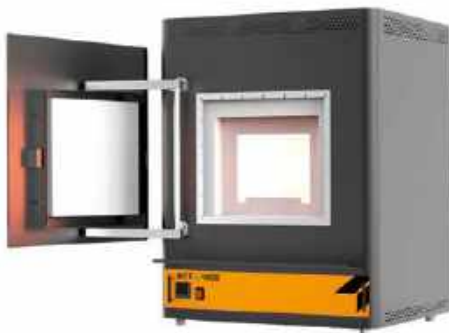
Muffle Furnace



Bottom Loading Furnace



Tube Furnace



High Temperature Furnace



Split Tube Furnace



Laboratory Vacuum Furnace

Maximum Temperature	500°C to 3000°C
Heating Elements	FeCrAl, NiCr, SiC, MoSi ₂ , Graphite, Mo, W
Controlling Sensors	N, R, B, S, C, D, K, Pyrometer
Power Rating	2 kW - 8 kW
Volume	1.5 Liters to 18.5 Liters

Furnaces

Industrial Furnaces

Tempens industrial furnaces provides a diverse range of solutions for various industrial applications including casting, tempering, and calcination. We offer customizable environments and chamber sizes tailored to meet specific customer requirements.



Industrial Bottom Loading Furnace



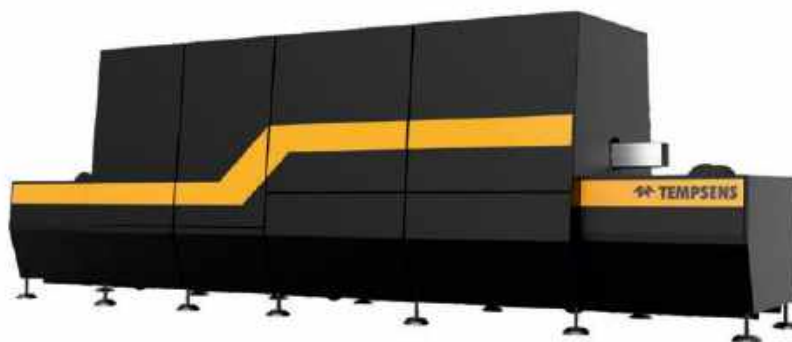
High Temperature Chamber Furnace



Pit Furnace



Box Furnace



Annealing Furnace

Maximum Temperature	250°C to 3000°C
Heating Elements	FeCrAl, NiCr, SiC, MoSi ₂ , Graphite, Mo, W
Controlling Sensors	N, R, B, S, C, D, K, Pyrometer
Tailorization	Gas & vacuum atmosphere, size and number of zones
Temperature Controller	Microprocessor based PID temperature controller

Furnaces

Laboratory / Industrial Ovens

Laboratory and industrial ovens series offers a range of precision electric ovens designed for low-temperature thermal treatments. These ovens facilitate drying, heating, and thermal testing in an airflow-assisted environment, ensuring consistent and reliable performance.



Hot Box - 500



Hot Box - 300



Hot Box - 50

Temperature Range	50°C to 500°C
Volume	4 Liters to 40000 Liters

Microwave Furnace

A microwave furnace employs microwave energy to heat dielectric materials. Unlike traditional furnaces that depend on conduction or convection heating methods, microwave furnaces utilize electromagnetic radiation in the microwave frequency range to generate heat directly within the material being processed.



Microwave Furnace

Temperature Range	250°C to 1600°C
Heating System	Microwave by Magnetron

Other Special Furnaces

- Hybrid-dual mode furnace (microwave & resistance heating).
- Special vacuum & gas atmosphere furnace.

Services

Calibration Services



The Tempsens Calibration Center is an independent unit of Tempsens Instruments (I) Pvt. Ltd., with laboratories located in Udaipur and Indonesia. It is accredited to ISO/IEC 17025:2017 standards, offering a comprehensive range of temperature calibration services. Tempsens accredited fixed-point temperature calibration facilities. Our lab features highly stable calibration furnaces, precise measuring instruments, and accurate master sensors that are traceable to both national and international standards.



CC-2840
Udaipur Lab



LK-345-IDN
Indonesia Lab

Operating in accordance with ISO/IEC 17025:2017 standards, we offer calibration services for contact-type sensors within a temperature range of -196°C to 1600°C. Non-contact sensors can be calibrated from 0°C to 3000°C. Additionally, our laboratory is accredited for on-site temperature calibration. We provide both in-lab and on-site calibration services for furnaces and baths from -80°C to 1600°C, as well as black body calibration from 50°C to 1700°C. Our services also include furnace/ chamber calibration (TUS) with multiple sensors, covering a range of -80°C to 1200°C.

IN HOUSE CALIBRATION FACILITY

Quality Measured/ Instruments	Temperature Range	Calibration & Measurement Capacity
Contact Type RTD, Thermocouple Thermometers	-196°C -180°C to -80°C -80°C to 0°C >0°C to 250°C >250°C to 650°C >650°C to 1200°C > 1200°C to 1600°C	0.05°C 0.05°C 0.03°C 0.04°C 0.08°C 1.30°C 2.20°C
Non-Contact Type Pyrometer	-40°C to 0°C -30°C to -15°C -15 to 250°C >250°C to 400°C >500°C to 1700°C >1700°C to 3000°C	2.70°C 2.40°C 2.16°C 2.44°C 3.74°C 7.08°C
Heat Flux Meter	25 Kw/m ² to 75 Kw/m ² (2.57mV to 7.57mV)	0.08mV

ON SITE CALIBRATION FACILITY

Quality Measured/ Instruments	Temperature Range	Calibration & Measurement Capacity
Contact Type RTD, Thermocouple Thermometers	-100°C to -25°C -25°C to 0°C >0°C to 250°C >250°C to 650°C >650°C to 1200°C	0.07°C 0.07°C 0.04°C 0.08°C 1.30°C
Non-Contact Type Pyrometer	-15°C to 250°C >250°C to 400°C >400°C to 1200°C 1200°C to 1700°C	2.16°C 2.44°C 3.50°C 3.74°C
Multipoint Position Calibration of Chamber, Oven, Furnaces (Thermal Mapping (TUS))	-80°C to 200°C >200°C to 1200°C	0.50°C 5.75°C

PRIMARY TEMPERATURE CALIBRATION FACILITIES

Quality Measured/ Instruments	Temperature Range	Calibration & Measurement Capacity
Calibration of SPRT/ PRTS/ Thermocouple etc.	Triple Point of Water (0.01°C)	0.0038°C
	Melting Point of Gallium (29.7646°C)	0.0065°C
	Freezing Point of Tin (231.928°C)	0.0065°C
	Freezing Point of Zinc (419.527°C)	0.0071°C
Calibration of Thermocouple at Secondary Fixed Point	Freezing Point of Aluminum (660.323°C)	0.0075°C
	Melting Point of Gold (1064.18°C)	0.72°C
	Melting Point of Palladium (1554.8°C)	0.83°C





INDIA

Tempsens Instruments (I) Pvt. Ltd.

B-188A, Road No.5, M.I.A.,
Udaipur-313003 (Rajasthan) INDIA
Mob. : +91 9116554600
Email : info@tempsens.com

GERMANY

Tempsens Instruments GmbH

Löhestraße 37,
D-53773 Hennef, GERMANY
Ph. : +49 2242870318
Fax : +49 2242870320
Email : info@tempsens.de
hnahl@tempsens.de

KOREA

Tempsens Korea Co.,Ltd

#502, 84, Gasan digital,
1-ro, Geumcheon-gu,
Seoul Republic of Korea (08590)
Ph. : +82 109519 9114
Email : korea@tempsens.com

POLAND

Tempsens Polska Sp. z o.o.

ul. Wiejska 37,
43-170 Laziska Gorne,
POLAND
Ph. : +48 722100067
Email : office@tempsens.eu

INDONESIA

Pt. Tempsens Asia Jaya

Pergudangan Lucky Point Unit,
B3-B5, Jakarta Utara -14460,
INDONESIA
Ph : +62 2138769039
Mob. : +62 87780804433
Email:info@tempsens-asia.com

UAE

Tempsens Gulf LLC

Plot No.0090, Shed No.3,
Al Bahia, Al Jurf 3, Ajman, U.A.E.
Ph. : +971 501770266
+971 528822908
+971 565462664
Email : tempsensgulf@tempsens.com
uae@tempsens.com
mesales@tempsens.com
mesales1@tempsens.com



www.tempsens.com