TEMPERATURE SENSORS AND SOLUTIONS

IC istec International

Introduction

We are very pleased to present our new and detailed catalogue which will give you a good overview of our wide range of temperature sensors, 2-wire transmitters, signal conditioners and test/calibration equipment.

All the needs of industrial and laboratory applications can be met by our vast range of proven, durable sensors and instruments.

A wide variety of products will enable you to choose the best possible solution for your specific requirements.

Quality

We endeavor to continue and where possible, improve the quality and reliability of our products and service.

Production Facilities

Many years of design and application experience coupled with our well-equipped workshop will guarantee first-class products at short delivery times. Special items, even in low quantities, can be ordered and all production is in accordance with ISO 9001.

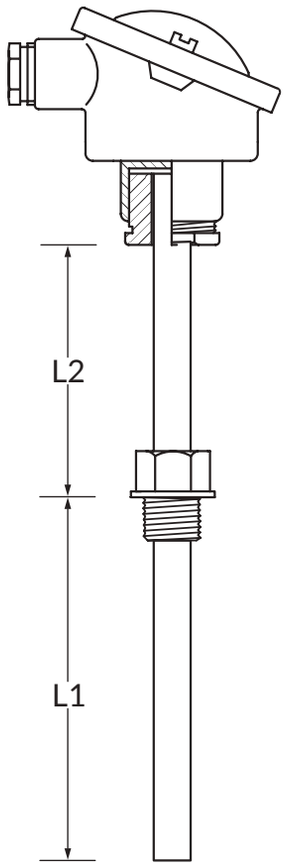
Product Range

- RTD sensors
- Thermocouples
- Thermowells
- 2-wire in-head and DIN-rail transmitters
- 19” signal conditioners
- Digital indicators
- Thermocouple extension cable
- Instrumentation cable
- Compression fittings
- Connectors
- Connection heads
- Test and calibration equipment
- Panel building

RTD Sensors and Thermocouples

RTD sensors and thermocouples are used as electronic temperature sensors.

These temperature sensors are suitable for use in industrial and laboratory temperature applications.



RTD Sensors (Pt-100)

Platinum resistance thermometers are well-known for their accurate and stable performance. A Pt-100 sensor has a value of 100 Ohms at 0 °C and varies with a positive temperature coefficient. Pt-100's are used in processes from -260 °C to +650 °C. The sensors consist of a single or duplex sensor which is built into a stainless steel sheath.

The standard tolerance is according to DIN/IEC 751 Class B or A, however, 1/3, 1/5 or 1/10 DIN tolerance sensors are also available.
The 2-, 3- or 4-wire Pt-100 sensors are the most popular types, but we can also supply Pt-20, Pt-50, Pt-500, Pt-1000 or Ni-100 versions.

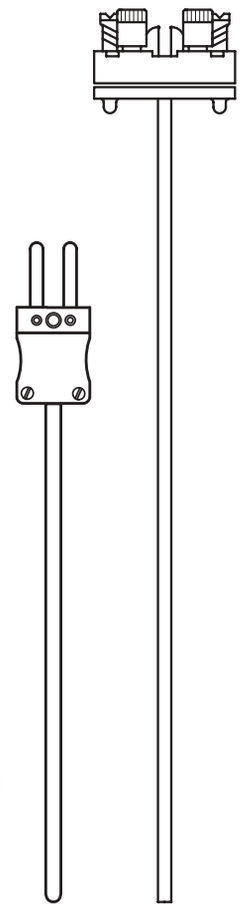
Thermocouples

Thermocouples essentially comprise a thermoelement (a junction of two specifed dissimilar metals) and an appropriate two wire extension lead. A thermocouple operates on the basis of the junction located in the process producing a small voltage which increases with temperature. It does so on a reasonably stable and repeatable basis.

Thermocouple probes have a short response time and can be used (depending on the element type) over a large temperature range (-40 °C to +1600 °C, or even as high as +2200 °C using Tungsten/Rhenium elements).

The materials are made according to internationally accepted standards as laid down in IEC 584 1,2 and 4 which is based on the international Practical Temperature Scale ITS 90. Max. operating temperatures are dependent on the conductor thickness of the thermoelements.

Types K (chomel/alumel), J (iron/constantan) are the most well-known types.
Thermocouple probes consist of thermocouple pairs which have been built into a ceramic or metal sheath with a cable, connector or connection head at the cold end.



Different Thermocouple Types

Thermocouple	Range	Code	DIN/IEC 584
Chromel/Alumel	-40... + 1000 °C	type K	NiChr/Ni
Iron/Constantan	-0... + 750 °C	type J	Fe/Cu/Ni (type L)
Copper/Constantan	-185... + 350 °C	type T	Cu/CuNi (type U)
Chromel/Constantan	-40... + 900 °C	type E	NiCr/CuNi
Nicrosil/Nisil	-40... + 1200 °C	type N	NiCrSi/NiSi
Platinum 10% Rhodium/Platinum	-0... + 1600 °C	type S	Pt10Rh/Pt
Platinum 13% Rhodium/Platinum	-0... + 1600 °C	type R	Pt13Rh/Pt
Platinum 30% Rhodium/ Platinum 6% Rhodium	100... + 1750 °C	type B	Pt30Rh/Pt6Rh

Sensor Types

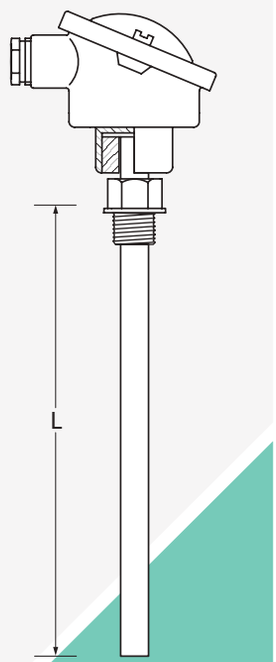
The RTD sensors (Pt-100) and thermocouples as shown in this catalogue are only an indication of our wide range of possibilities in the field of temperature sensors for surface, immersion and gas measurement.

Almost all RTD sensors and thermocouples can be custom made in any length, diameter, material and with any connection head, cable, transmitter, etc.

1000 SERIES THERMOCOUPLES AND RTD SENSORS

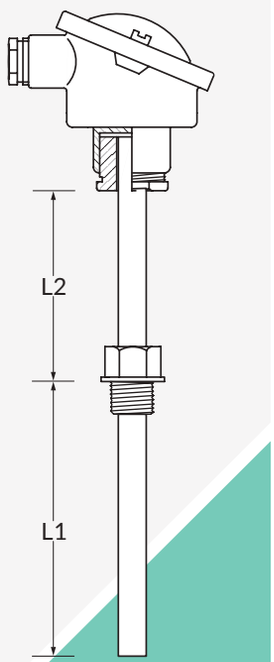
IC-1001

Form B head, R= ½"BSP



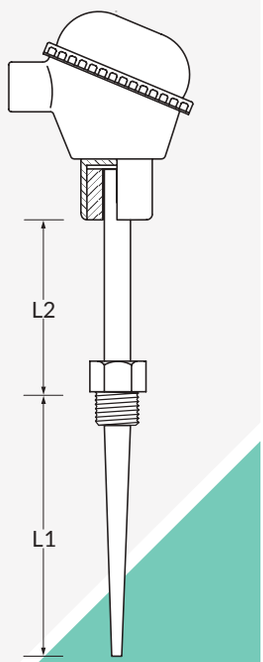
IC-1002

Form B head, extension, R= ½"BSP



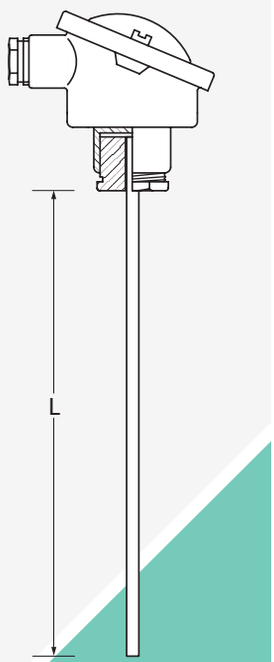
IC-1003

Aluminium head with screw cap, extension and thermowell



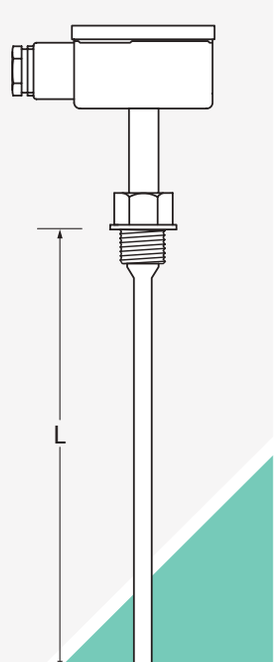
IC-1004

Form B head, no process connection



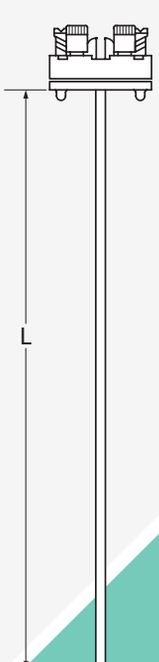
IC-1005

Stainless steel head, R= ½"BSP



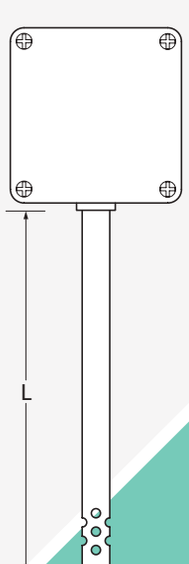
IC-1006

Spring loaded insert



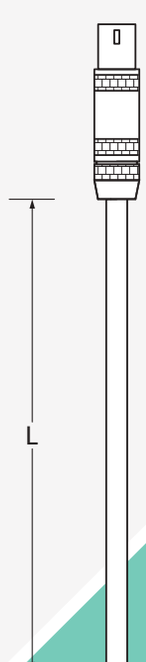
IC-1007

Outdoor sensor



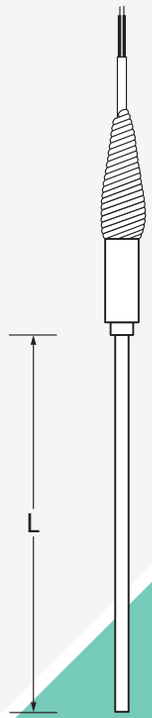
IC-1008

Fixed Lemo connector

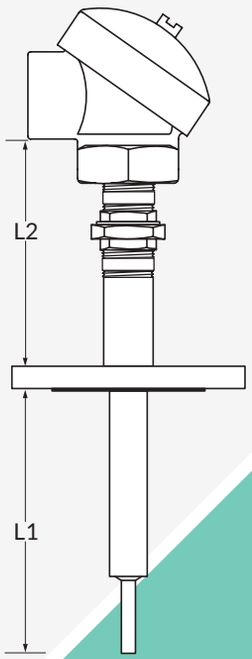


1000 SERIES THERMOCOUPLES AND RTD SENSORS

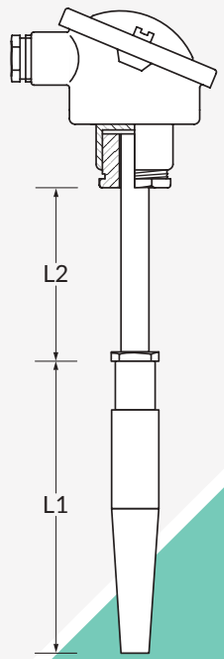
IC-1009
Fixed cable connection



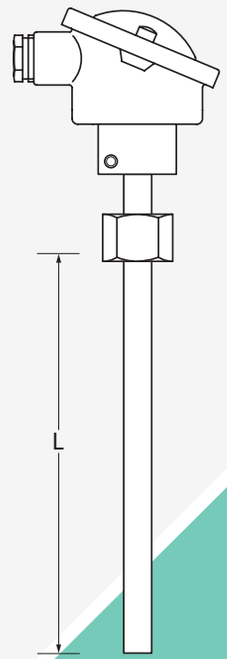
IC-1010
EExia/EExd sensor with thermowell



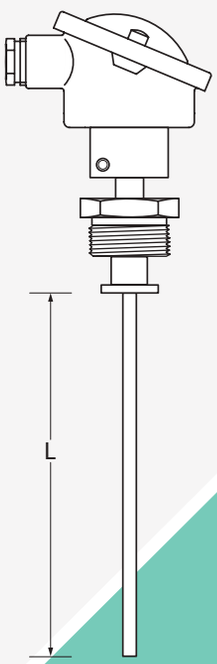
IC-1011
Form B head, weld-in thermowell



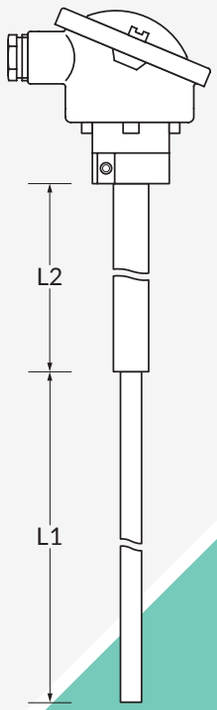
IC-1012
Form B head, female running nut



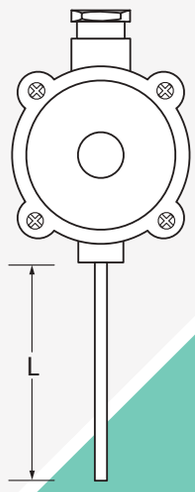
IC-1013
Form B head, male running nut



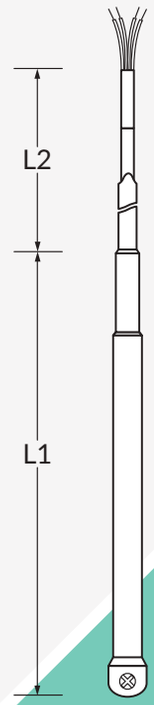
IC-1014
Form A head, ceramic protection tube



IC-1015
Room temperature sensor, a.o. Lloyd's approved



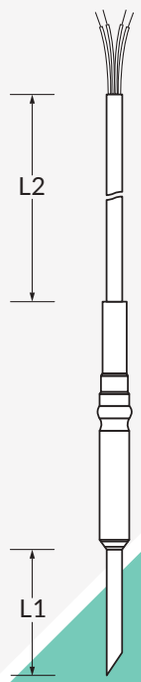
IC-1016
Cargo sensor, Lloyd's approved



1000 SERIES THERMOCOUPLES AND RTD SENSORS

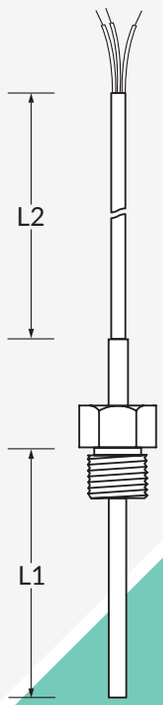
IC-1017

Insertion sensor, Lloyd's approved



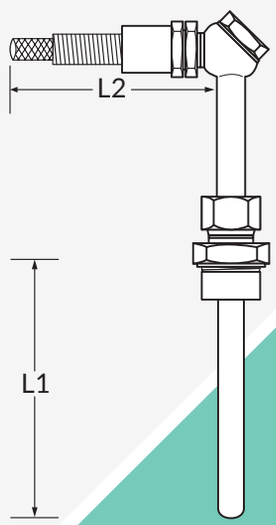
IC-1018

Threaded sensor with fixed cable



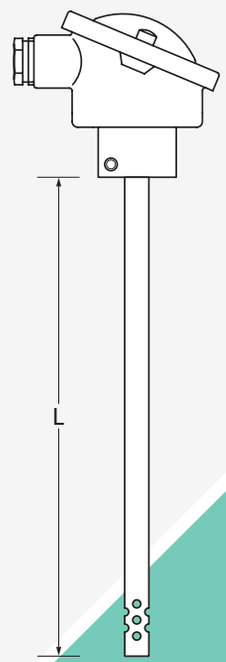
IC-1019

Exhaust sensor



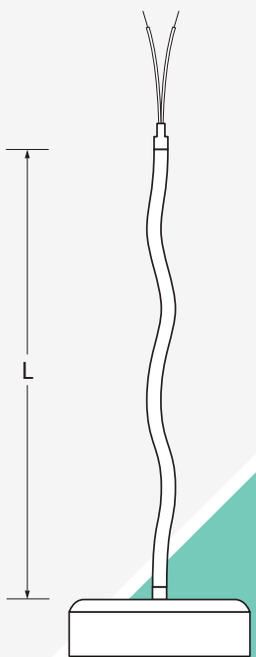
IC-1020

Duct sensor



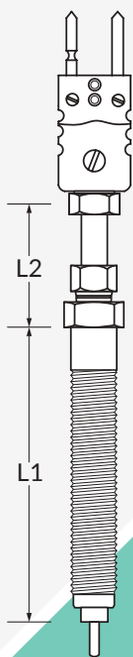
IC-1021

Magnet sensor



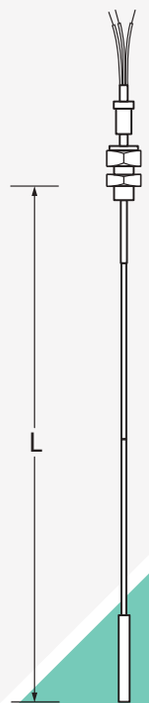
IC-1022

Sensor for plastic extruders



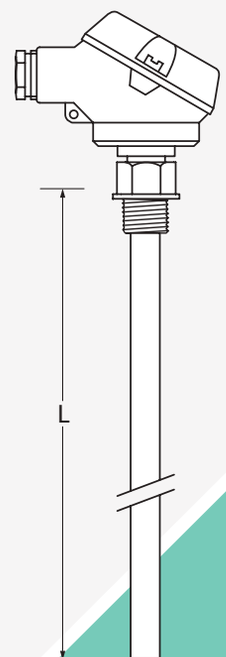
IC-1023

Mineral insulated sensor (flexible)



IC-1024

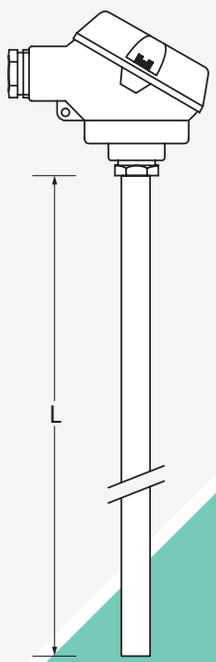
MA head, R= ½" BSP



1000 SERIES THERMOCOUPLES AND RTD SENSORS

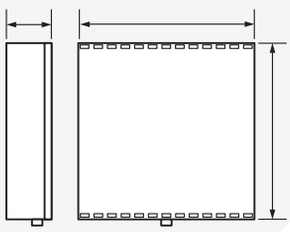
IC-1025

MA head, no process-connection



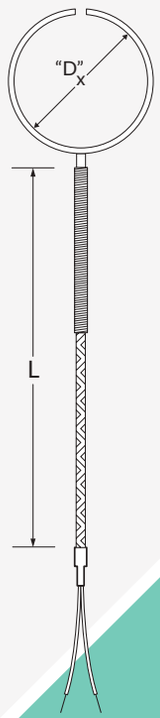
IC-1026

Room temperature sensor



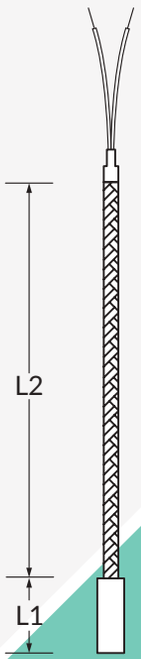
IC-1027

Pipe clamp surface sensor



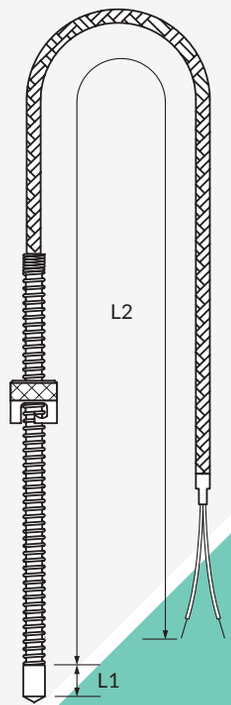
IC-1028

Bearing sensor



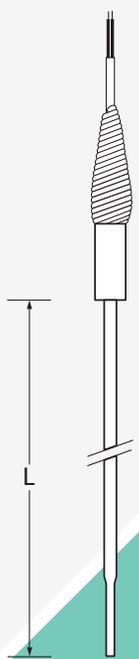
IC-1029

Bayonet connection, spring loaded



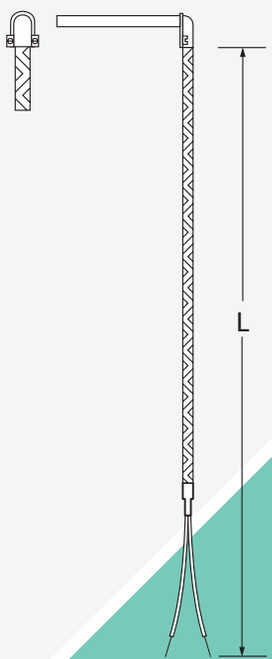
IC-1030

Reduced tip and fixed cable



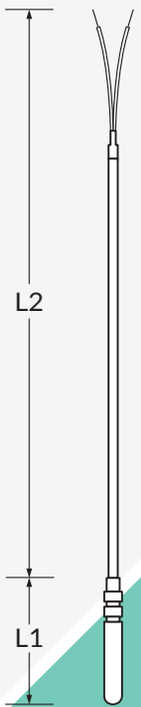
IC-1031

Right angle sensor



IC-1032

Low-cost sensor with fixed cable

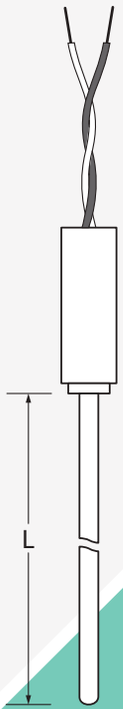


1000 SERIES MINERAL INSULATED THERMOCOUPLES AND RTD SENSORS

Diameter from 0,25 mm

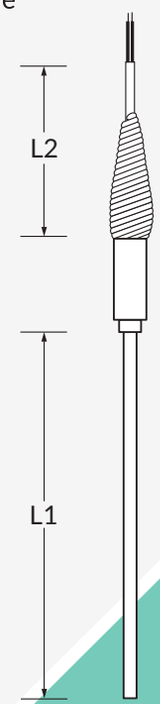
IC-1033

Stainless steel potseal and 100 mm leads



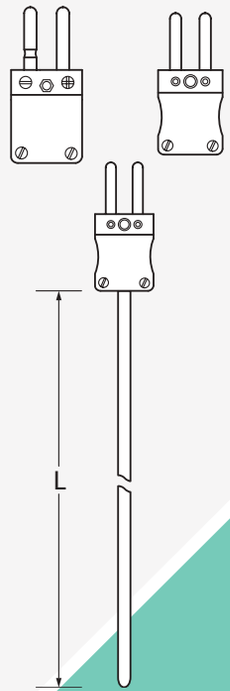
IC-1034

Stainless steel potseal with spring and fixed cable



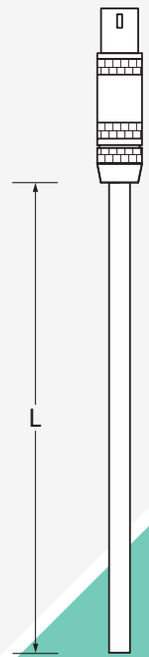
IC-1035

Miniature or standard connector



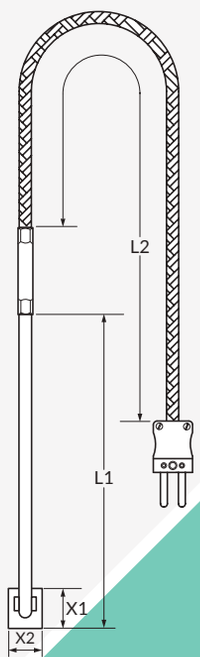
IC-1036

Lemo connector



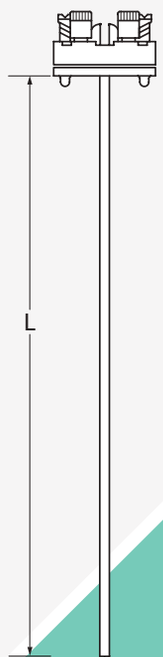
IC-1037

Welding pad



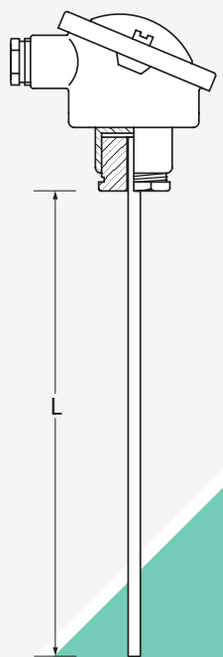
IC-1038

Spring loaded insert



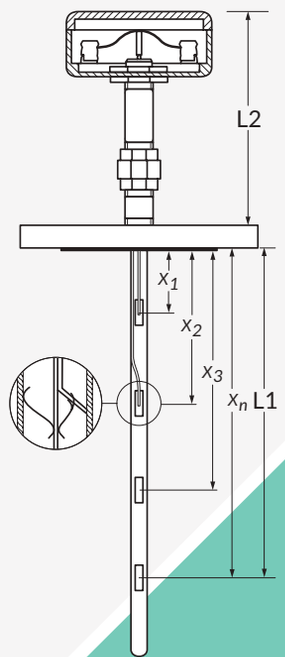
IC-1039

Form B head with/ without compression fitting



IC-1040

Multipoint assembly

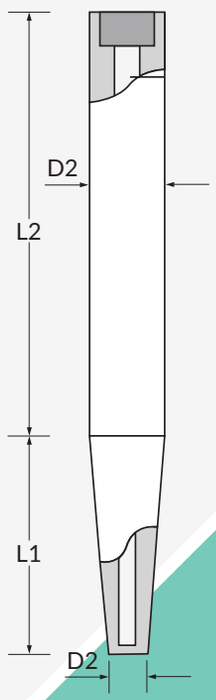


THERMOWELLS, FABRICATED AND SOLID DRILLED

Materials o.a. Stainless steel 316, 310, 446, Hastelloy, Monel, etc.

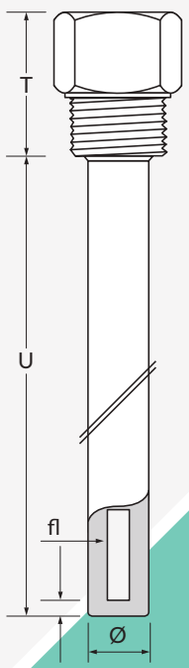
WRD

Weld-in acc to DIN 43763, Form D1 thru D6



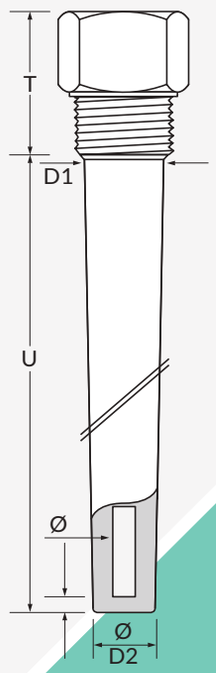
WR

Parallel stem



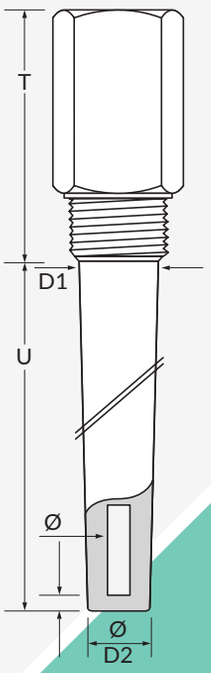
WRT

Tapered stem



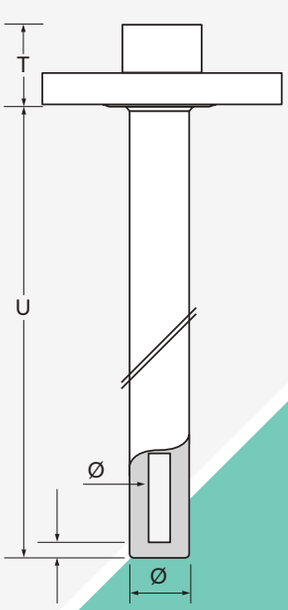
WRTV

Parallel or tapered stem with extension



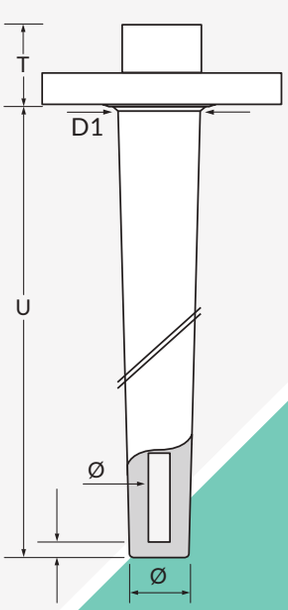
WRF

Flanged thermowell acc to DIN or ANSI, parallel stem



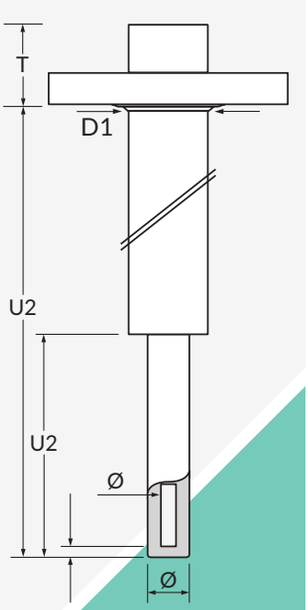
WRTF

Flanged thermowell acc to DIN or ANSI, tapered stem



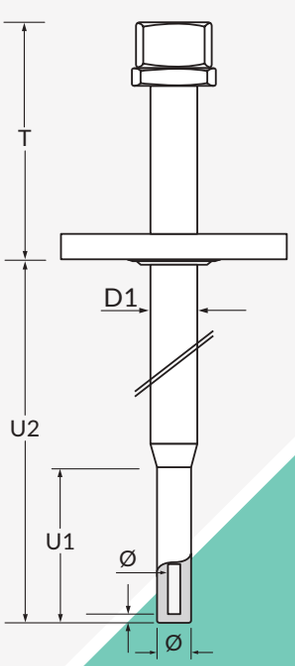
WRTR

Flanged thermowell acc to DIN or ANSI, stepped stem



WRTR/DIN

DIN type thermowell Form 1, 2 and 3 with flange DN25PN40 or to be specified



Thermocouple extension & compensating wire and cable

In single or multipair version and with electrical and/or mechanical screening if so required.
Available in types K, J, T(L), E, N, R, S and B in IEC, ANSI or DIN colour code.

Various insulation materials, such as PVC, PUR, silicone, telfon, glassfibre, ceramic fibre, kapton, etc.

Wire o.d. from 0.03 mm to 1.5 mm (stranded or solid conductors).

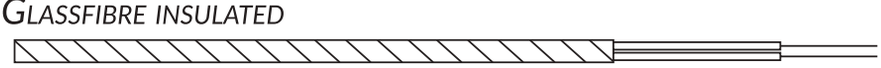
Customer specific cable on request at 500 meters minimum.

PVC/PVC insulated

PTFE insulated, twisted pair

PTFE/PTFE insulated

Glassfibre insulated



Glassfibre insulated with stainless steel overbraid

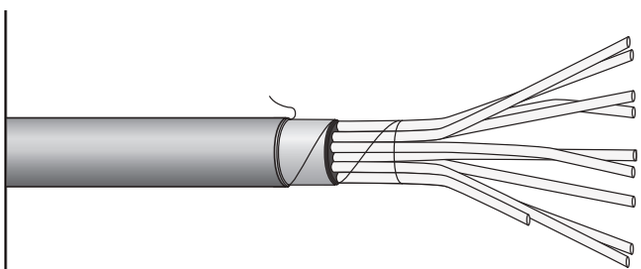
Silicone/silicone insulated

High temperature glassfibre insulated

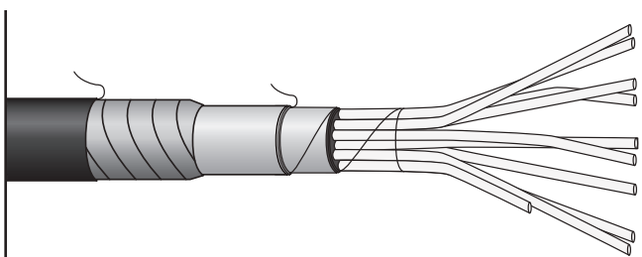
Ceramic fibre insulated

Instrument cable

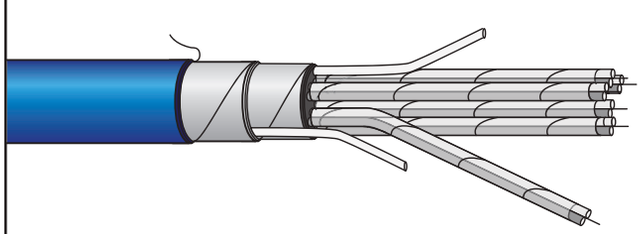
In single and multipair with/without screening and/or armour.
Standard copper cores in stranded or solid version. Colour coding acc to NEN 1597, DIN 47100 or to be specified. Various insulation materials, such as PVC, PUR, TPE, PTFE, silicone, glassfibre, etc.



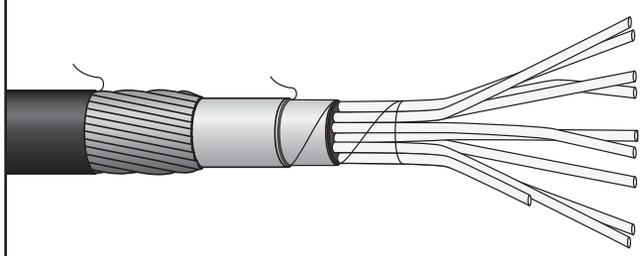
PVC per conductor, twisted pairs, overall screened, PVC outer sheath.



PVC per conductor, twisted pairs, overall screened, PVC sheath. Interlocked armour, PVC outer sheath.



PVC per conductor, twisted pairs, each pair and overall screened, PVC outer sheath.

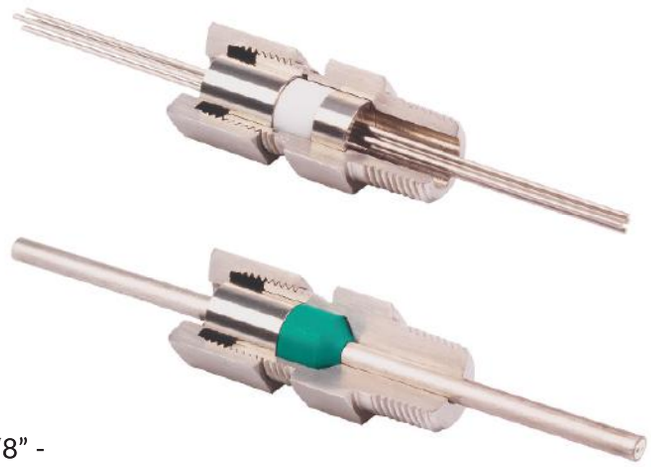


PVC per conductor, twisted pairs, overall screened, PVC sheath. Steel wire armour, PVC outer sheath.

Sensor installation fittings

Whatever the probe construction, whatever the process, we have a fitting that will suit your application. These fittings are pressure-tight gaskets for thermocouples and RTD sensors and the immersion length can easily be adjusted to the process.

Apart from the stainless steel ferrules, teflon or neoprene versions are also available.

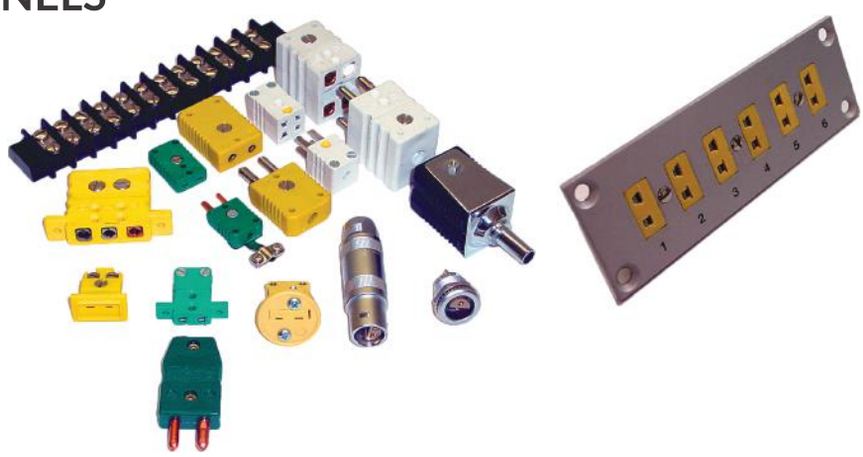


Process connections
Available process connections: 1/16” - 1/8” - 1/4” - 3/8” - 1/2” - 3/4” - 1”NPT/BSP or BSPT - M8x1 - M10x1 - M12x1.5

Diameters
Our fittings are suitable for sensors with an outside diameter from 0.5 mm.

Connectors and panels

Thermocouple connectors and panel jacks in miniature and standard version. Color code according to ANSI and IEC. Accessories including cable clamps, spade terminals, etc.



Connection Heads

Connections heads for RTD sensors and thermocouples are available in various versions (i.e. EExd) and materials.
The Form B aluminium head is most widely used. Other types are also available in plastic, stainless steel and cast iron.

Transmitters and Isolators

Transmitters and Isolators for in-head and DIN-rail mounting, with HART protocol, Pt-100, thermocouple, mV and mA entry.
Configurable by means of soldering links, push button, PC and HART protocol.

EMC approval according to EN50081-1/50082-2

Available in EE xia II C T5, FM 3610 (USA) and EXNII versions.

Low cost in-head transmitter

Programmable in-head transmitter with Pt-100 and thermocouple input

Programmable EE xia in-head transmitter

Programmable in-head HART protocol transmitter

SIL2-DIN Rail Devices

- Universal measuring transmitter in Failsafe Technology
- Certified according to IEC 61508 SIL2
- Input: Resistor Pt100 with 2-, 3- and 4-wire.
- Output: 0/4-20 mA, 1-5/0-10 VDC
- 3 individually adjustable limit values
- 2 relays contact outputs, 1 transistor output
- 1 SIL alarm relay output
- Galvanic separated between auxiliary energy, input and output
- RS 485 connection
- PC-connection at the front
- Option: Input II (1) G Ex ia IIC, (Zone 0)

- 1-channel measuring transmitter supply unit in Failsafe Technology transmitters
- Certified according to IEC 61508 SIL2
- Output: 0/4-20 mA, 1-5/0-10 VDC
- 3 individually adjustable limit values
- 2 relays contact outputs, 1 transistor output
- 1 SIL alarm relay output
- Galvanic separated between auxiliary energy, input and output
- HART-protocol sockets at the front
- RS 485 connection
- PC-connection at the front
- Option: Input II (1) G Ex ia IIC, (Zone 0)

19”-RACK Mounted Devices

- Universal measuring transmitter in Failsafe Technology
- Certified according to IEC 61508 SIL2
- Input: Resistor Pt100 with 2-, 3- and 4-wire
- All types of thermocouple, current and voltage
- Output: 0/4-20 mA, 1-5/0-10 VDC
- 3 individually adjustable limit values
- 2 relays contact outputs, 2 transistor output
- 1 SIL alarm relay output
- Safe galvanic separation between auxiliary energy, input and output
- Option: Input II (1) G Ex ia IIC, (Zone 0)

- 1-channel measuring transmitter supply unit in Failsafe Technology
- Certified according to IEC 61508 SIL2
- Output: 0/4-20 mA, 1-5/0-10 VDC
- 4 individually adjustable limit values
- 2 relays contact outputs, 2 transistor output
- 1 SIL alarm relay output
- Safe galvanic separation between auxiliary energy, input and output
- HART-protocol sockets at the front
- Option: Input II (1) G Ex ia IIC, (Zone 0)

Fuji Recorder

The Fuji PHL Paperless Graphic Recorder is a recorder that displays measured data on the LCD in real time and stores data in CompactFlash. The type of input such as thermocouple, resistance bulb, D.C. voltage (current), etc. can be arbitrarily set to 18 channels at the maximum. The data stored in CompactFlash can be regenerated on the screen, and the use of supplied support software allows the data to be regenerated on a PC screen. The data recorded in ASCII format can be directly read in a spreadsheet such as Excel, which facilitates the processing on a PC.

Features

- 5,7" Colour screen
- 9 or 18 inputs, up to 30 data trends
- Easy to use, fast response
- Programmable units and inputs (RTD, T/c, mA and Vdc)
- 2 alarms per channel with various options
- Large capacity storage by CompactFlash
- Quick search and display of past data
- Various display options and formats
- PC support software included for easy display and processing
- Compact size

Gefran Indicator

Microprocessor based indicator in 96x48 (mm) format. The instrument has a lexan membrane faceplate (guaranteed to IP65) which has 3 keys, a 3 / 4 digit display format, and 3 indicating LED's for the output statuses.
The input signal can be selected from a wide range of sensors:

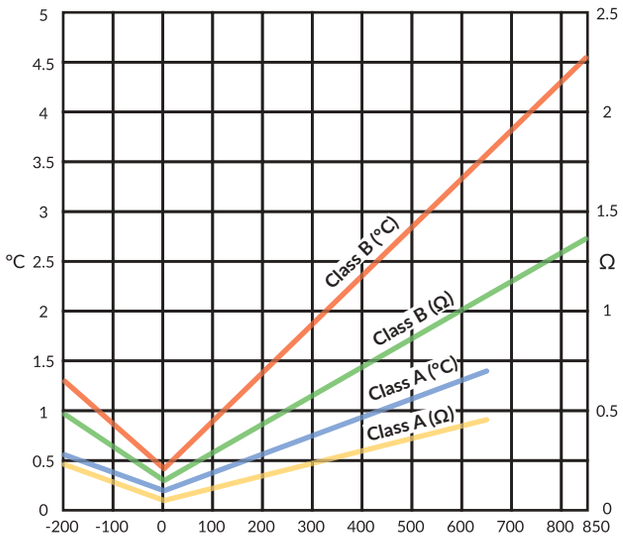
- Thermocouples of type J, K, R, S, T, B, E, N, L
- Resistance thermometers Pt100
- PTC and NTC themistors
- Linear inputs 0 to 60/12 to 60mV, 0 to 20/4 to 20mA, 0 to 10V.

The selection is made using the faceplate keys.
The instrument is available in version base, with two relay outputs (2R), and expandible versions.
The instruments have a maximum of 4 outputs that can be mechanical relays (5A,250Vac/30Vdc) or logic outputs.
A digital input (24Vdc/5mA) is available (for resetting, hold, flash, peak handling or releasing latch) and one output of 0...10V, 0/4 to 20mA (max. 500) is available for retransmitting the measured input signal.
The retransmission output, the digital input and the third output are available contemporaneously.

Tolerance values

Tolerance values for RTD Sensors to DIN/IEC 751

CLASS	TOLERANCE IN °C AT 0 °C
A	0.15 + 0.002 (t)
B	0.3 + 0.005 (t)

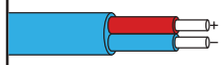
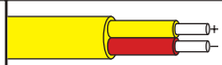
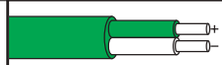
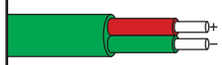
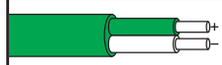
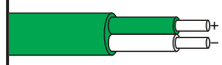
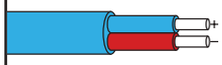
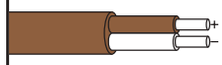
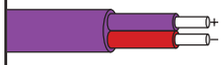
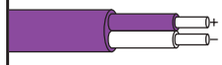
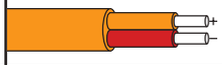
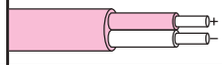
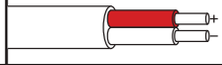
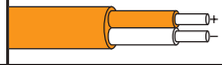
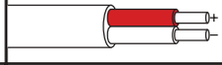
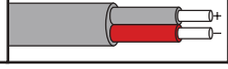
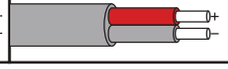


Tolerance values as a temperature function for RTD sensors

Tolerance values for Thermocouples to DIN/IEC 584

TYPE	CLASS	TEMPERATURE RANGE	ACCURACY
Type J	Class 1	-40°C to +750 °C	±1.5°C or 0.004.t
Iron/Constantan	Class 2	-40°C to +750 °C	±2.5°C or 0.0075.t
Type T	Class 1	-40°C to +350 °C	±0.5°C or 0.004.t
Copper/ Constantan	Class 2	-40°C to +350 °C	±1.0°C or 0.0075.t
Type K	Class 1	-40°C to +1000 °C	±1.5°C or 0.004.t
Nickel Chromium/ Nickel Aluminium	Class 2	-40°C to +1200 °C	±2.5°C or 0.0075.t
Type N	Class 1	-40°C to +1000 °C	±1.5°C or 0.004.t
Nicrosil/Nisil	Class 2	-40°C to +1200 °C	±2.5°C or 0.0075.t
Type E	Class 1	-40°C to +800 °C	±1.5°C or 0.004.t
Nickel Chromium/ Constantan	Class 2	-40°C to +900 °C	±2.5°C or 0.0075.t
Type R/S	Class 1	-0°C to +1600 °C	±1.0°C or [1+(t-1000).0.003]°C
PtRh/Pt	Class 2	-0°C to +1600 °C	±1.5°C or 0.0025.t
Type B	Class 2	+600°C to +1700 °C	±1.5°C or 0.0025.t
Pt30Rh/Pt6Rh	Class 3	+600°C to +1700 °C	±4.0°C or 0.005.t

Colour codes for thermocouples extension and compensating cables

Thermocouple conductor combination type:	Extension cable: (Original thermocouple alloys)	Compensating cable: (Compensating alloys)	ANSI / MC 96.1	DIN: 43714	IEC: 584
Iron/Constantan TYPE J	JX				
Iron/Constantan	L (DIN)				
Chromel/Alumel TYPE K	KX				
Chromel/Alumel		WX (KCA)			
Chromel/Alumel		VX (VCA)			
Copper/Constantan TYPE T	TX				
Chromel/Constantan TYPE E	EX				
Nicrosil/Nisil TYPE N	NX				
Platinum 13% Rhodium/ Platinum TYPE R		RX			
Platinum 10% Rhodium/ Platinum TYPE S		SX			
Platinum 30% Rhodium/ Platinum 6% Rhodium TYPE B		BX			

Istec Delivery Program

Services, Sensors and Systems

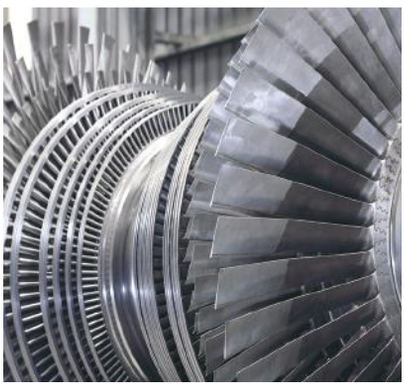
Rotating equipment

Istec offers the most versatile and advanced range of machine protection systems and other rotating equipment, including:

Vibration
- Vibration protection systems
- Condition monitoring systems
- Handheld vibration meters
- Vibration sensors and switches

Speed
- Overspeed protection systems
- Tachometers
- Speed sensors

JAQUET TECHNOLOGY GROUP METRIX MEGGiTT



Vibration measurement

Istec Rotating specialists can cover all types of machinery, including steam- and gas turbines, generators, engines, fans and gearboxes. We provide service in trouble shooting on existing problems or in setting up and executing a condition monitoring program with frequently performed measurements.

The services Istec offers include online and offline condition monitoring programs, periodic measurement contracts and troubleshooting. Istec also offers training and support.

ISO 18436-2 certified
Analyzing and interpreting the measurement data is specialized work, where knowledge and experience play an important role in order to come to the right conclusions. Istec's vibration specialists are certified according to ISO 18436-2 level 3 and 4.

Rotating services

Istec Rotating offers many years of worldwide experience in machine condition monitoring, preventive maintenance planning and machine diagnostics. Our brand independent services include:

- Vibration measurements and condition monitoring
- Remote monitoring
- Specialist vibration analysis and reporting
- Trouble shooting
- System engineering and design
- System replacement or overhaul
- System maintenance and verification

Rotating

Condition monitoring

Istec is an expert in machine condition monitoring, trouble shooting, preventive maintenance planning and machine diagnostics. Analyzing vibration data can provide a crucial contribution to predictive maintenance programs.

Turn around support and field service

Istec provides specialized services on rotating equipment in the field and during turn arounds, including system replacement, system verification, sensor calibration and consultancy on system design, SIL and ATEX.

Sensors and equipment

Istec offers a wide range of industrial sensors, transmitters and equipment of both its own label and various major brands, including:

Temperature
- PT-100 sensors
- Thermocouple sensors
- Special execution sensors
- Cables and connectors
- Thermowells
- Fittings

Pressure
- Pressure sensors
- Differential pressure sensors
- Remote seal
- Pressure switches
- ATEX sensors
- Special execution sensors

Flow
- Solid flow sensors
- Dust sensors
- Fluid flow sensors

Moisture
- Moisture sensors for solids

Indicator / recorder
- Indicators
- Alarm units
- Recorders

Transmitters
- 19" signal converters
- Din rail signal converters

Speed
- Speed sensors
- Tachometers

Vibration
- Vibration sensors
- Vibration switches
- Handheld vibration meters

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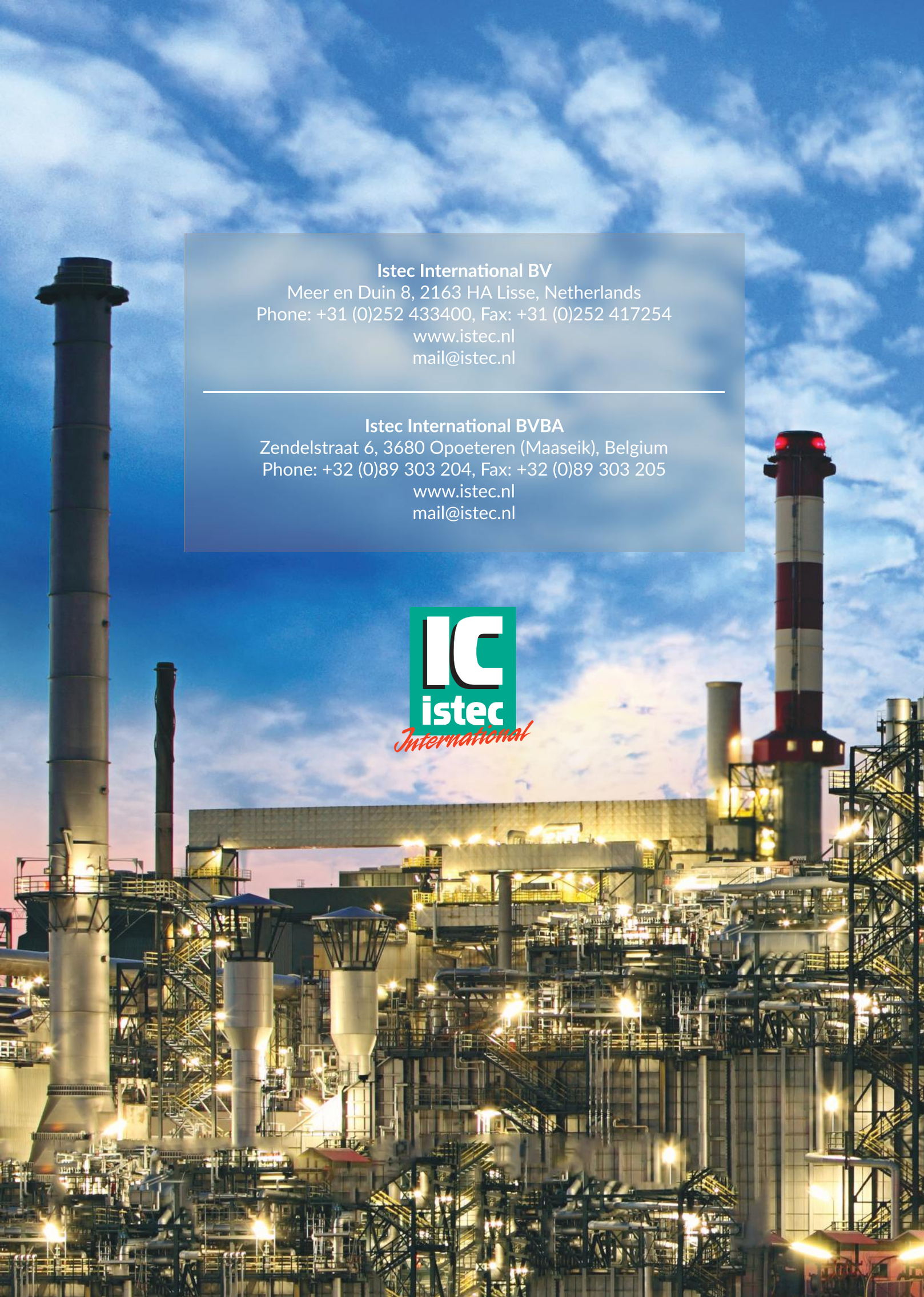

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