

ITS TCIN Process Temperature Sensors



ITS is one of the leading manufacturers of thermocouples, RTDs, PT100s and thermowells in Ireland. ITS produces a variety of temperature sensors and assemblies in both standard and custom designs, which can be found on equipment and in process applications in the chemical, petrochemical, power generation, food & beverage, dairy, plastics, heat-treating, oil & gas, pharmaceutical, aerospace, biomass, metal processing, rubber, mining, HVAC, water & wastewater, incineration, and many other industries.

- RTDs and thermocouples available to meet any process requirement
- Integrated temperature assembly with transmitters available
- Temperature range of -196 to 650 °C for RTD, -196 to 1450 °C for thermocouple
- Industry-standard sensor types, including RTD and thermocouple varieties
- Variety of enclosure and connection head options
- Calibration services available

Overview

- Spring loaded Thermocouple
- Length configurable
- Thermocouple, 4 ... 20 mA or HART output
- Various Thermocouple Types



Technical data

Performance characteristics

Thermocouple accuracy class IEC 60584-1:2013	See page 9
Thermal response time T63 Grounded/Insulated	3.0 ± 0.4s/1.0s 6.0 ± 1.6s/3.2s
Process temperature	Selection dependant"
Max. flow velocity	40 m/s , gases 5 m/s , liquids

Stem

Sensor diameter outside	Standard ø 6mm Available in ø 3mm
Sensor length	Configurable in mm
Process pressure	Refer to section "Operating conditions"
Process temperature	Refer to section "Operating conditions"

Optional Process connection

Connection variants	Refer to Configuration & Order page
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Operating Temperature

Thermocouple Type Dependant	-200 °C +1250 °C
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Sensor tube material	AISI 316L (1.4404) AISI 310 (1.4845) Inconel Microbell
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Thermocouple Type Class & material dependant

Type T	-200 °C +300 °C
Type J	0 °C +750 °C
Type K	0 °C +1110 °C
Type N	0 °C +1250 °C

Surface roughness wetted parts

Surface roughness wetted parts	Ra ≤ 0.8 µm
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Ambient conditions

Storage temperature range	-40 ... 85 °C
Degree of protection (EN 60529)	IP 65
Humidity	≤ 100 % RH , condensing
Vibration (sinusoidal)(EN 60068-2-6)	1.6 mm p-p (2 ... 25 Hz), 4 g (25 ... 100 Hz), 1 octave / min.

Output signal

Without transmitter	1 x Thermocouple 2 x Thermocouple
With transmitter	4 ... 20 mA , 2-wire 4 ... 20 mA , 2-wire + HART®

Optional Housing

Style	Configurable
Overall size	Refer to section "Dimensional drawings"
Material	Configurable

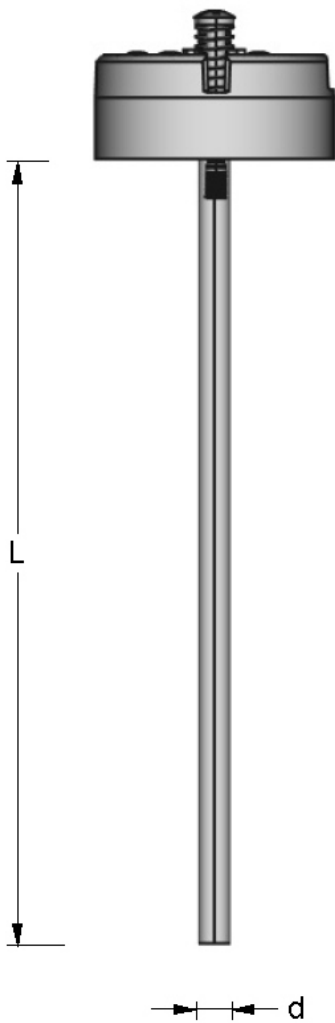
Housing Electrical connection

Cable gland	M20x1.5, nickel plated brass
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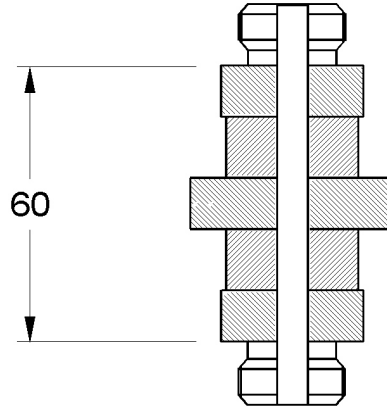
ATEX II 1G Ex ia IIC T4/T5

Maximum values for barrier selection, Ui	28 V DC
Maximum values for barrier selection, Ii	0.1 A

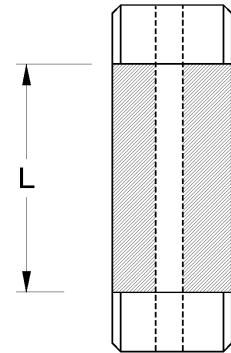
Dimensional drawings (mm)



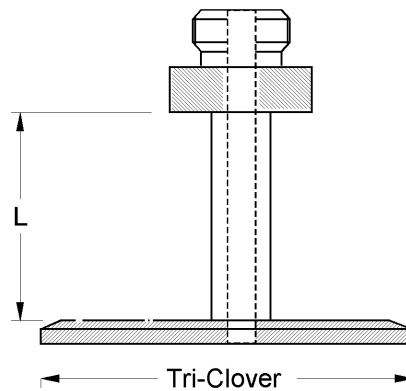
Nipple Union Nipple (NUN)



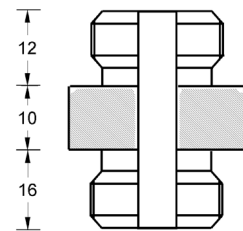
Threaded Nipple (NIP)



Lag with Tri-Clover (LAGTC)

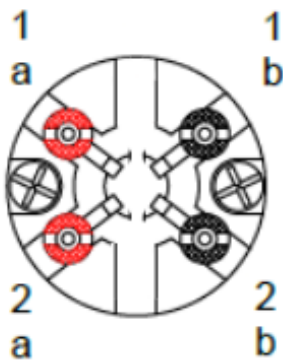


Thread Fixed Under Head (FUH)

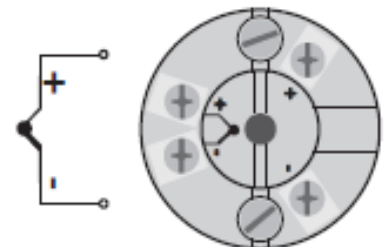
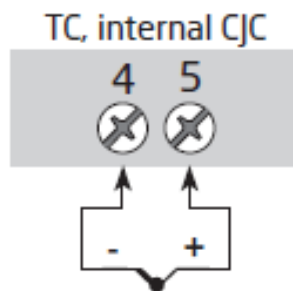


Pt100 sensor wiring & colour code

Terminal Block Wiring



Transmitter Wiring



Transmitter

5334A

Input	Thermocouple input
Accuracy	Better than 0.05% of range
Min. measuring span	25 °C
Output	4 ... 20 mA , 20 ... 4 mA 2 wire
Isolation voltage, test / working	1.5 kVAC / 50 VAC
Power supply	7.2...35 VDC
Programmability	With Loop Link interface 5909
Please note	For further information please see data sheet 5334A

5333D

Input	Thermocouple input
Accuracy	Better than 0.05% of range
Min. measuring span	25 °C
Output	4 ... 20 mA , 20 ... 4 mA 2 wire
Isolation voltage, test / working	1.5 kVAC / 50 VAC
Power supply	7.2...35 VDC
Programmability	With Loop Link interface 5909
Please note	For further information please see data sheet 5334D

5331A

Input	RTD, TC, Ohm, or mV input
Input Accuracy	Better than 0.05% of selected range
Min. measuring span	25 °C
Output	4 ... 20 mA , 20 ... 4 mA , programmable
Output Accuracy	$\leq \pm 0.025 \%$, measuring span $\leq \pm 0.004 \text{ mA}$
Power supply	8 ... 35 V DC
Programmability	With Loop Link 5909
Please note	For further information please see data sheet for 5331A

5331D

Input	RTD, TC, Ohm, or mV input
Input Accuracy	Better than 0.05% of selected range
Min. measuring span	25 °C
Output	4 ... 20 mA , 2-wire 20 ... 4 mA , programmable
Output Accuracy	$\leq \pm 0.025 \%$, measuring span $\leq \pm 0.004 \text{ mA}$
Power supply	8 ... 35 V DC
Programmability	With Loop Link 5909
Please note	For further information please see data sheet for 5331D

5337D

Input	RTD, TC, Ohm, and bipolar mV input
Input Accuracy	Better than 0.05% of selected range
Min. measuring span	10 °C
Output	4 ... 20 mA , 2-wire + HART® 20 ... 4 mA , programmable
Output Accuracy	$\leq \pm 0.025 \%$, measuring span $\leq \pm 0.004 \text{ mA}$
Power supply	8 ... 30 mA
Programmability	With Loop Link 5909 With HART®modem
Please note	For further information please see data sheet for 5337D

7501

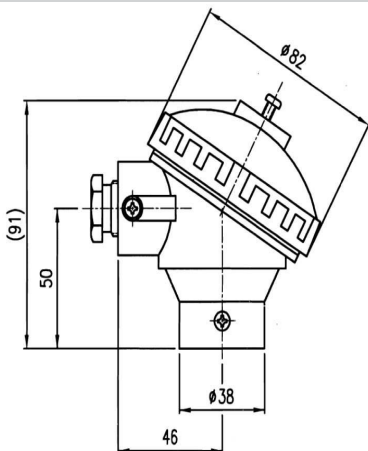
Input	RTD, TC, Ohm, and bipolar mV input
Input Accuracy	Better than 0.05% of selected range
Min. measuring span	10 °C
Output	4 ... 20 mA , 2-wire 20 ... 4 mA , programmable
Output Accuracy	$\leq \pm 0.025 \%$, measuring span $\leq \pm 0.004 \text{ mA}$
Power supply	10 (12 - with backlight)...30 VDC
Programmability	With Local operator interface With HART® modem
Please note	For further information please see data sheet for 7501

Factory settings

Output range	0 ... 150 °C
Input	PT100 3-wire
Output at sensor fault	Upscale

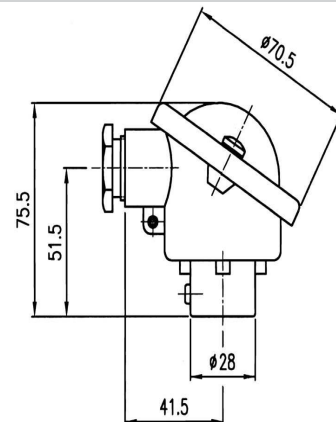


KN



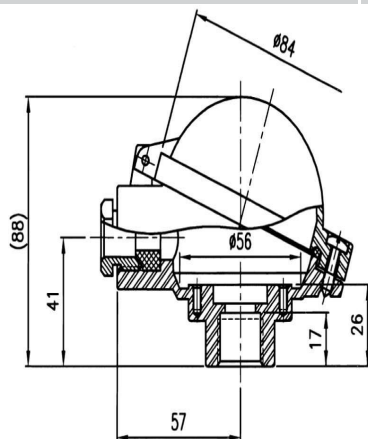
- Material: Epoxy Coated Aluminium
- Cover Locking: Screw Cap & Chain
- IP Rating: IP68

Din B



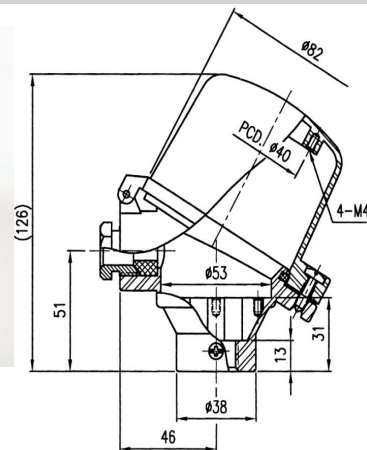
- Material: Epoxy Coated Aluminium
- Cover Locking: Screw
- IP Rating: IP68

Buzz



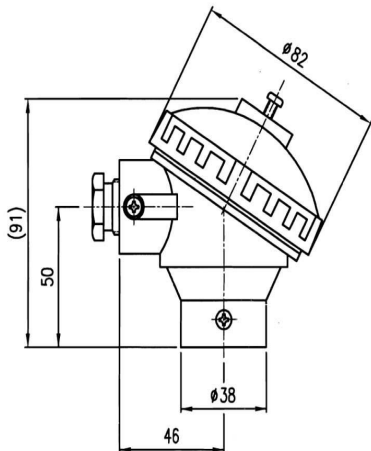
- Material: Epoxy Coated Aluminium
- Cover Locking: Screw Flip Cap
- IP Rating: IP66

KNH



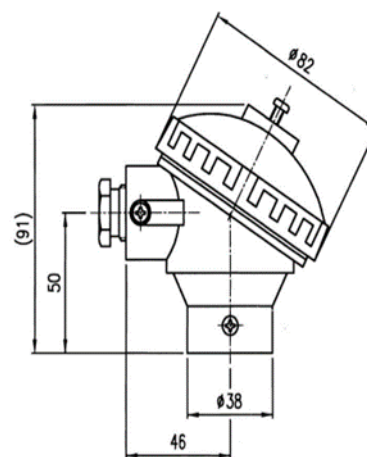
- Material: Epoxy Coated Aluminium
- Cover Locking: Screw Flip Cap
- IP Rating: IP68

KNB



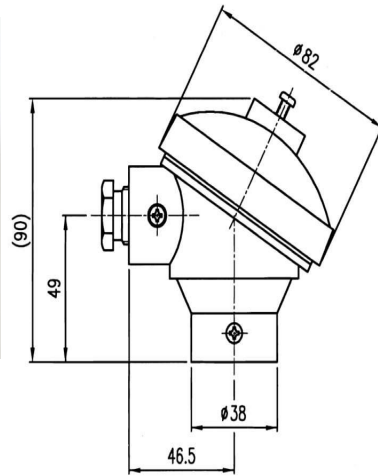
- Material: Nylon & Glass Fibre
- Cover Locking: Screw Cap & Chain
- IP Rating: IP65

KNW



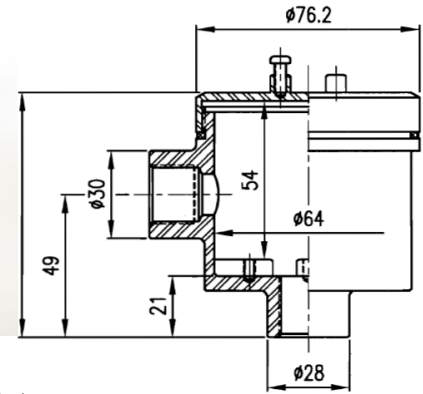
- Material: Polypropylene
- Cover Locking: Screw Cap & Chain
- IP Rating: IP65

KNSS



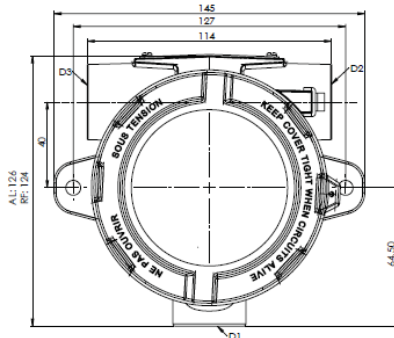
- Material: Stainless Steel 316
- Cover Locking: Screw Cap & Chain
- IP Rating: IP68

316L



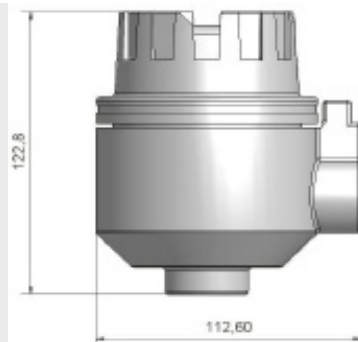
- Material: Stainless Steel 316L
- Cover Locking: Screw Cap & Chain
- IP Rating: IP68

7401



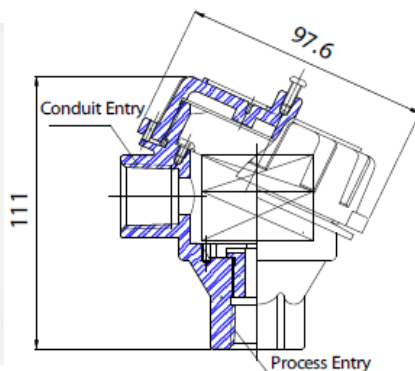
- Material: Epoxy Coated Aluminium
- Cover Locking: Screw Cap
- IP Rating: IP68
- Suitable for Ex / I.S. installation

SCH50



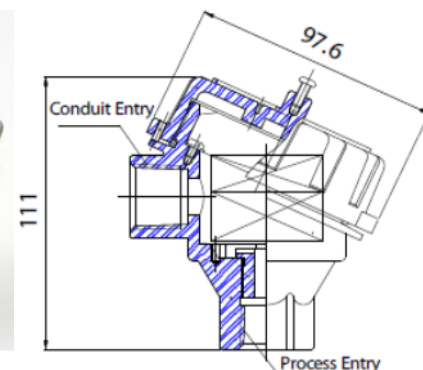
- Material: Epoxy Coated Aluminium
- Cover Locking: Screw Cap
- IP Rating: IP68
- Ex d flame Proof Connection Head
- Ex d Atex & IECEx APPROVED
- Aluminum or Stainless Steel

XDA



- Material: Epoxy Coated Aluminium
- Cover Locking: Screw Cap & Chain
- IP Rating: IP68
- EEx d IIC T6 IP68

XDS

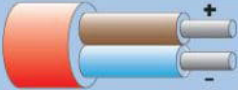
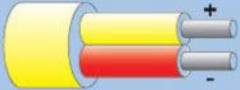
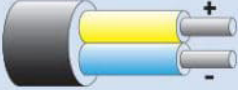
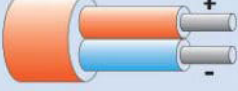
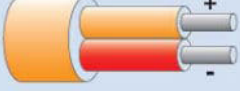
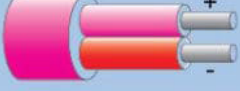
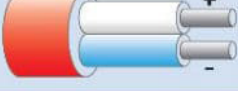


- Material: Stainless Steel
- Cover Locking: Screw Cap & Chain
- IP Rating: IP68
- EEx d IIC T6 IP68

Configuration & Order Information

Product	TCIN	####	- ##	- ###	- ##	####	- #####	- #####/	- ####	- ####
Max Operating Temperature °C										
250C		250C								
350C		350C								
750C		750C								
1150C		1150C								
1250C		1250C								
Thermocouple Type & Configuration										
Single Type K			SK							
Dual Type K			DK							
Single Type J			SJ							
Dual Type J			DJ							
Single Type T			ST							
Dual Type T			DT							
Single Type N			SN							
Dual Type N			DN							
Hot Junction										
Grounded			G							
Ungrounded			UG							
Sheath Diameter in mm										
Standard 6mm or 3mm					#					
Sheath Length in mm										
Specify in mm						####				
Optional Termination Head										
Aluminium Screw Cap Style							KN			
Aluminium Removable Cap Style							DinB			
Aluminium Flip Cap Style							BUZ			
Dual Aluminium Screw Cap Style							KNH			
Exd Aluminium Screw Cap Style							SCH50			
Exd Aluminium Screw Cap Style							XDA			
Exd Aluminium Screw Cap Style							7501H			
Exd Stainless Steel 316 Screw Cap Style							7501SS			
Steel 316 Screw Cap Style							KNSS			
Steel 316 Screw Cap Style							316L			
Steel 316 Exd Screw Cap Style							SCH50SS			
Black Polypropylene Screw Cap Style							KNB			
White Polypropylene Screw Cap Style							KNW			
Termination If 4...20mA selected specify required programmed range ex. /0+100C										
Flying Leads								FL		
Ceramic Din Style Termination Block								TB		
2-wire programmable transmitter TC Input 4/20ma Output								5334A		
2-wire programmable transmitter Universal Input 4/20ma Output								5331A		
Ex Rated 2-wire programmable transmitter TC Input 4/20ma Output								5334D		
Ex Rated 2-wire programmable transmitter Universal Input 4/20ma Output								5331D		
Ex Rated 2-wire programmable transmitter Universal Input 4/20ma OutputHART 5 or HART 7								5337D		
Optional Process Connection Fitting										
1/2" BSP Nipple Union Nipple length in mm Standard 60mm (60NUN)									##NUN	
1/2" BSP or NPT Threaded Nipple length in mm									##NIP	
Thread Fixed Under Termination Head Specify Thread									FUH	
Lag with Tri-Clover Process Connection Specify Tri-Clover Size									LAGTC	
Options										
Traceable Calibration 3 Point										3PCC
Traceable Calibration 5 Point										5PCC

Thermocouple Colour Code

Thermocouple Type	IEC BS EN 60584-3:2008	BS BS4937:1993	ANSI ANSI MC96.1	DIN DIN 43714
K				
J				
T				
N				NONE SPECIFIED
E				
KCA/KCB				
RCA/SCA				

Thermocouple Materials & Accuracy Tolerances

Thermo-couple	Material (+ / -)	Class 1 Tolerance	Class 2 Tolerance	Class 3 Tolerance
Type J	Iron / Constantan	-40 to +375 : $\pm 1.5^{\circ}\text{C}$ +375 to +750 : $\pm 0.4\%$	-40 to +333 : $\pm 2.5^{\circ}\text{C}$ +333 to +750 : $\pm 0.75\%$	N/A
Type K	Chromel / Alumel	-40 to +375 : $\pm 1.5^{\circ}\text{C}$ +375 to +1000 : $\pm 0.4\%$	-40 to +333 : $\pm 2.5^{\circ}\text{C}$ +333 to +1200 : $\pm 0.75\%$	-200 to -167 : $\pm 1.5\%$ -167 to +40 : $\pm 2.5^{\circ}\text{C}$
Type N	Nicrosil / Nisil	-40 to +375 : $\pm 1.5^{\circ}\text{C}$ +375 to +1000 : $\pm 0.4\%$	-40 to +333 : $\pm 2.5^{\circ}\text{C}$ +333 to +1200 : $\pm 0.75\%$	-200 to -167 : $\pm 1.5\%$ -167 to +40 : $\pm 2.5^{\circ}\text{C}$
Type R & Type S	Platinum-Rhodium / Platinum	0 to +1100 : $\pm 1^{\circ}\text{C}$ +1100 to +1600 : $\pm (1^{\circ}\text{C} + 0.003^{\circ}\text{C})$	0 to +600 : $\pm 1.5^{\circ}\text{C}$ +600 to +1600 : $\pm 0.25\%$	N/A
Type T	Copper / Constantan	-40 to +125 : $\pm 0.5^{\circ}\text{C}$ +125 to +350 : $\pm 0.4\%$	-40 to +133 : $\pm 1^{\circ}\text{C}$ +133 to +350 : $\pm 0.75\%$	-200 to -67 : $\pm 1.5\%$ -67 to +40 : $\pm 1^{\circ}\text{C}$