Member of GHM GROUP

HD2108.1, HD2108.2, HD2128.1, HD2128.2

HD2108.1, HD2108.2, HD2128.1, HD2128.2 THERMOCOUPLE THERMOMETERS: K, J, T, N, R, S, B, E

The **HD2108.1 and HD2108.2 with one input** and the **HD2128.1 and HD2128.2 with two inputs** are portable instruments with a large LCD display. They measure the temperature using immersion, penetration, air or contact probes. The sensor may be a thermocouple of type K, J, T, N, R, S, B or E.

Instruments HD2108.2 and HD2128.2 are data loggers, they store up to 76.000 samples the first and 38.000 couples of values the second. These data can be transferred into a PC connected to the instrument through the serial ports RS232C and USB 2.0. It is possible to configure the storage interval, the printing and the baud rate by the menu.

Functions Max, Min and Avg calculate maximum, minimum and average values.

Further functions are: REL relative measure, HOLD and automatic switching-off system (excludable). HD2128.1 and HD2128.2 calculate A-B difference of the temperatures acquired by the two input channels.

Instruments have IP66 protection degree.

	HD2108.1	HD2108.2	HD2128.1	HD2128.2
TC input:	1	1	2	2
Storage capacity	----	76000 samples	----	38000 couples of temperatures
PC interface	RS232C	RS232C + USB2.0	RS232C	RS232C + USB2.0
Data logger	NO	YES	NO	YES
A-B function	NO	NO	YES	YES

Technical specifications	
Measurement of temperature by instrument	
TC measuring range: K	-200…+1370°C
TC measuring range: J	-100…+750°C
TC measuring range: T	-200…+400°C
TC measuring range: N	-200…+1300°C
TC measuring range: R	+200…+1480°C
TC measuring range: S	+200…+1480°C
TC measuring range: B	+200…+1800°C
TC measuring range: E	-200…+750°C
Resolution	**0.05°C in the range ±199.95°C 0.1°C in the remaing range**
Instrument accuracy Accuracy is referred to the instrument only; error due to the thermocouple or to the cold junction reference sensor is not included.	
Thermocouple K	±0.1°C up to 600°C ±0.2°C over 600°C
Thermocouple J	±0.05°C up to 400°C ±0.1°C over 400°C
Thermocouple T	±0.1°C
Thermocouple N	±0.1°C up to 600°C ±0.2°C over 600°C
Thermocouple R	±0.25°C
Thermocouple S	±0.3°C
Thermocouple B	±0.35°C
Thermocouple E	±0.1°C up to 300°C ±0.15°C over 300°C
Temperature drift @20°C	0.02%/°C
Drift after 1 year	0.1°C/year
Unit of measurement	°C - °F - K - mV - mV*C
Measured values storage	
Model HD2108.2	2000 pages each one containing 38 samples, 76000 samples in total
Model HD2128.2	2000 pages each one containing 19 samples, 38000 samples in total
Storage interval can be selected among	1,5,10,15,30 s; 1,2,5,10,15,20,30 min.; 1 hour
Security of stored data	Unlimited, independent of battery charge conditions.
Power Supply	
Batteries	4 Batteries 1.5V type AA
Autonomy	200 hours with 1800mAh alkaline batteries
Current consumption with instrument off	20µA
Main	12Vdc / 1000mA Output main adapter
Serial interface RS232C	
Type	RS232C galvanically isolated
Baud rate	can be set from 1200 to 38400 baud
Data bit	8
Parity	None
Stop bit	1
Flow Control	Xon/Xoff
Serial cable lenght	Max 15m

Print interval	Immediate or selectable among: 1,5,10,15,30 s; 1,2,5,10,15,20,30 min.; 1 hour
USB interface model HD2108.2 and HD2128.2	
Type	1.1 - 2.0 galvanically isolated
Connections	
Probes input	2-pole female polarized standard miniatur connector
Serial interface	8-pole MiniDin connector
USB interface	Type B Mini USB connector
Mains adapter	2-pole connector (positive at centre)
Operating conditions	
Operating Temperature	-5...50°C
Storage temperature	-25 … 65°C
Working relative humidity	0 … 90%RH, no condensation
Protection degree	IP66
General characteristics	
Dimensions (Length x Width x Height)	185x90x40mm
Weight	470g (complete with batteries)
Materials	ABS, rubber
Display	2 rows 4½ digits plus symbols Visible area: 52x42mm
Time	
Date and time	in real time
Accuracy	1min/month max drift

ORDERING CODES

HD2108.1: The kit consists of one input instrument HD2108.1, 4 per 1.5V alkaline batteries, instruction manual, case and Deltalog9 software downloadable from Delta OHM website. Probes and cables have to be ordered separately.

HD2108.2: The kit consists of one input instrument HD2108.2, data logger, 4 per 1.5V alkaline batteries, instruction manual, CP23 USB cable, case and Deltalog9 software downloadable from Delta OHM website. Probes have to be ordered separately.

HD2128.1: The kit consists of two inputs instrument HD2128.1, 4 per 1.5V alkaline batteries, instruction manual, case and Deltalog9 software downloadable from Delta OHM website. Probes and cables have to be ordered separately.

HD2128.2: The kit consists of two inputs instrument HD2128.2, data logger, 4 per 1.5V alkaline batteries, instruction manual, CP23 USB cable, case and Deltalog9 software downloadable from Delta OHM website. Probes have to be ordered separately.

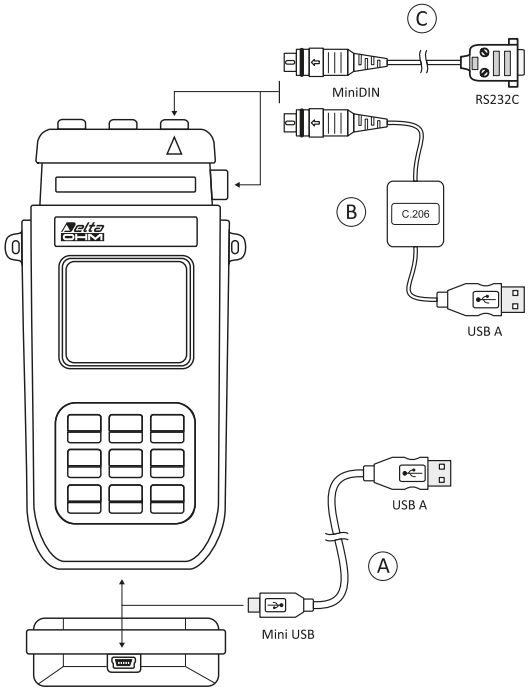
HD2110CSNM: 8-pole connection cable MiniDin - Sub D 9-pole female for RS232C.

C.206: Cable for instruments of the series HD21...**1** to connect to USB input of PC.

SWD10: Stabilized 230Vac/12Vdc-1000mA mains adapter.

HD40.1: Upon request, portable, serial input, 24 column thermal printer, 58mm paper width. Use cable HD2110CSNM (option).

For all thermocouples probes, see from **pag.36** onwards.



A The portable data loggers HD2108.2 HD2128.2 are equipped with HID (Human Interface device) type USB port with mini USB connector.

For the connection to a PC with the CP23 cable it is not necessary to load any USB driver.

B For the connection of the models HD2108.1 HD2128.1 to the USB port of a PC, is necessary the USB/serial converter C.206. The converter is supplied with its own drivers which must be installed before the connection of the converter to the PC (see details in the Cd-Rom supplied with the converter).

C The port with the miniDin connector is a serial port type RS232C. The serial port RS232C of a PC or the printer HD40.1 can be connected by the cable HD2110CSNM.

HD2108

HD2128

TEMPERATURE PROBES – THERMOCOUPLES

Delta OHM offers a wide choice of K-type thermocouples, meeting the characteristics defined by the IEC 60584 standard..

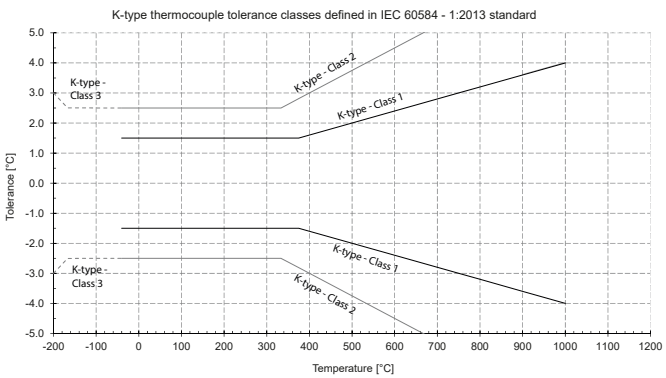
The response time $\tau_{0.63}$ indicated for each probe is the reaction time of the sensor to a temperature variation, with a variation of the measured signal corresponding to the 63% of the total variation. The response times are referred:

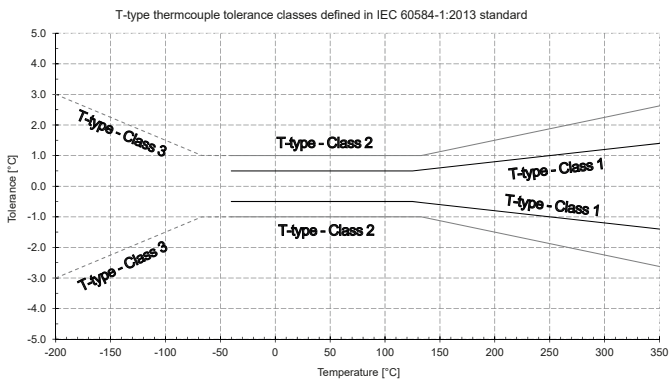
- in water at 100 °C for immersion probes;
- to the contact with a metal surface at 200 °C for surface probes;
- to an air temperature of 100 °C for air probes.

The IEC 60584-1:2013 standard defines the tolerance classes of the thermocouples as summarized in the following table:

	Class 1		Class 2		Class 3	
Thermocouple Type	Tolerance[1]	Temp. range	Tolerance[1]	Temp. range	Tolerance[1]	Temp. range
T	0.5 °C or 0.004·|t|	-40 °C...+350 °C	1 °C or 0.0075·|t|	-40 °C...+350 °C	1 °C or 0.015·|t|	-200 °C...+40 °C
E	1.5 °C or 0.004·|t|	-40 °C...+800 °C	2.5 °C or 0.0075·|t|	-40 °C...+900 °C	2.5 °C or 0.015·|t|	-200 °C...+40 °C
J		-40 °C...+750 °C		-40 °C...+750 °C	---	---
K		-40 °C...+1000 °C		-40 °C...+1200 °C	2.5 °C or 0.015·|t|	-200 °C...+40 °C
N		-40 °C...+1000 °C		-40 °C...+1200 °C		-200 °C...+40 °C
R	1 °C [1+0.003·(t-1100)]	0 °C...+1100 °C	1.5 °C or 0.0025·|t|	0 °C...+1600 °C	---	---
S		+1100 °C...+1600 °C		0 °C...+1700 °C	---	---
B	---	---		+600 °C...+1700 °C	4 °C or 0.005·|t|	600 °C...+1700 °C
C	---	---	0.01·|t|	+426 °C...+2315 °C	---	---
A	---	---		+1000 °C...+2500 °C	---	---

[1] Tolerance is expressed as a numerical value or as a function of temperature. The greater of the two values is valid





The elements that make up the thermocouple wires, with their respective polarity, are shown below.

	Alloy standard elements and composition	
Thermocouple type	Positive conductor	Negative conductor
R	Platinum – 13 % Rhodium	Platinum
S	Platinum – 10 % Rhodium	Platinum
B	Platinum – 30 % Rhodium	Platinum
J	Iron	Copper - Nickel
T	Copper	Copper - Nickel
E	Nickel - Chrome	Copper - Nickel
K	Nickel - Chrome	Nickel - Aluminium
N	Nickel - Chrome - Silicon	Nickel - Silicon
C	Tungsten - 5 % Rhenium	Tungsten - 26 % Rhenium
A	Tungsten - 5 % Rhenium	Tungsten - 20 % Rhenium

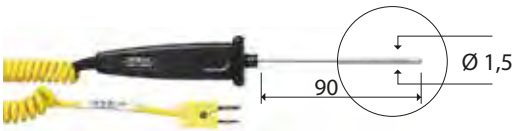
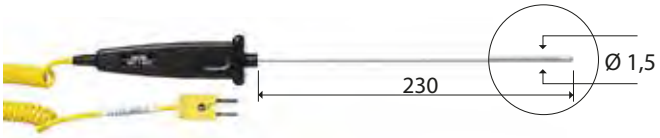
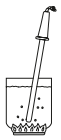
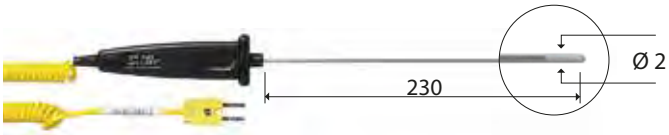
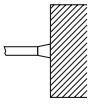
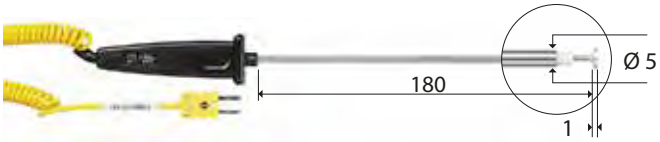
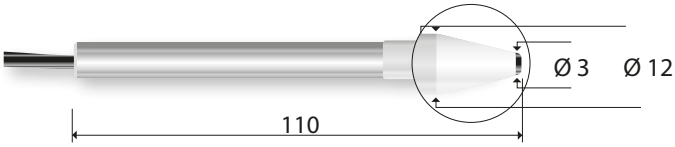
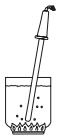
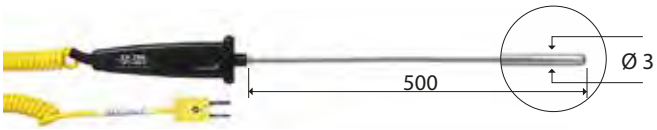
By means of the calibration, the purchased instrument can be metrologically characterized, determining the systematic error of the thermometer and ensuring at the same time the traceability to international standards. Delta OHM Laboratories are able to provide this service by issuing calibration reports according to ISO 9001 or ACCREDIA LAT certificates in compliance with ISO/IEC 17025 standard, recognized internationally through ILAC MRA agreements.

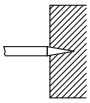
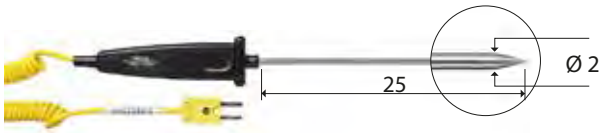
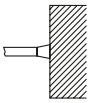
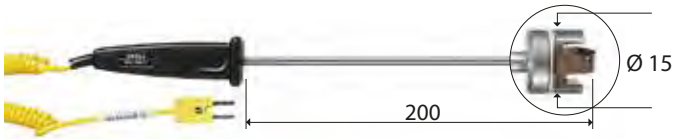
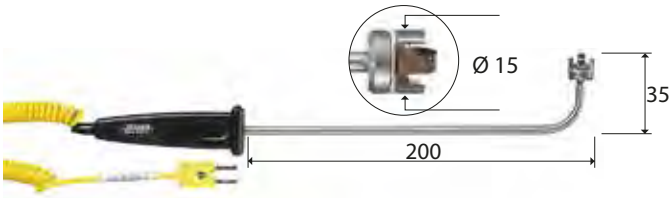
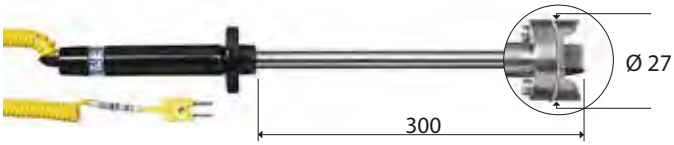
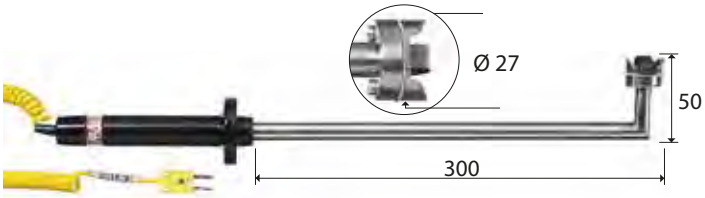
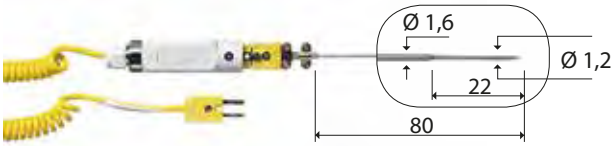
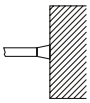
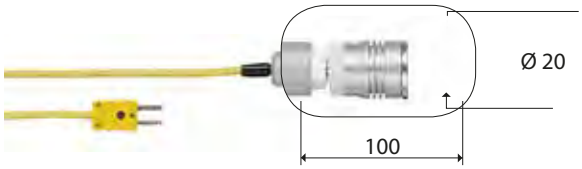
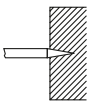
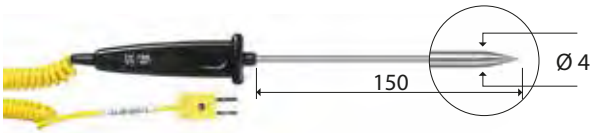
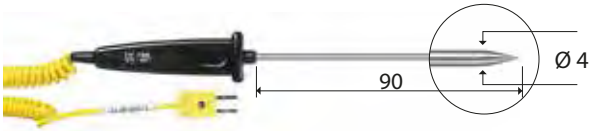
ilac-MRA

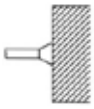
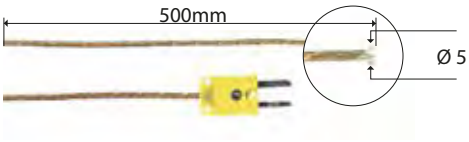
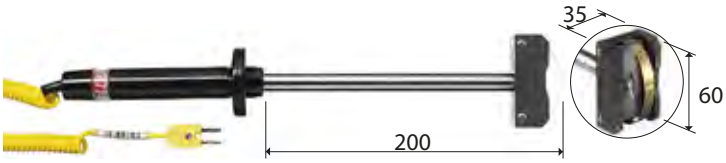
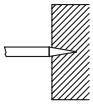
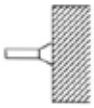
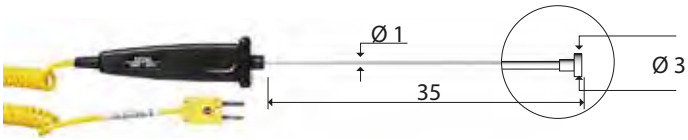
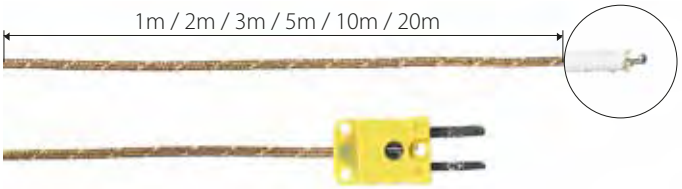
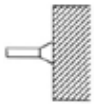
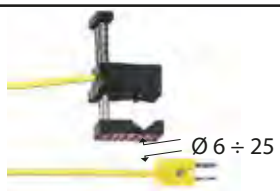
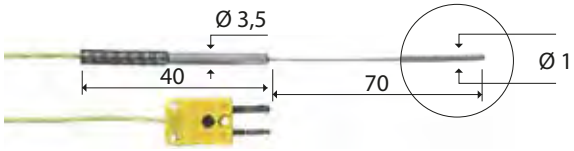
ACCREDIA
ENTE ITALIANO DI ACCREDITAMENTO

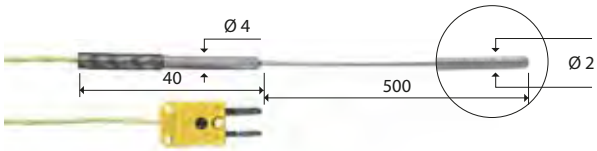
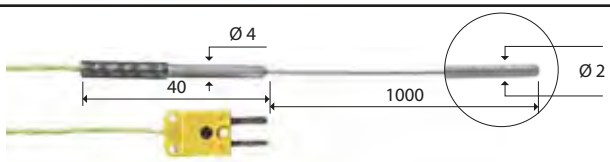
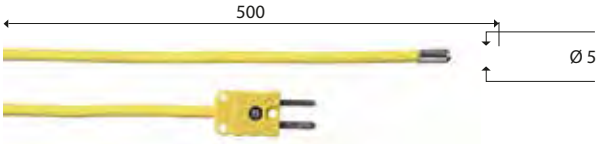
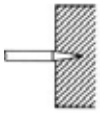
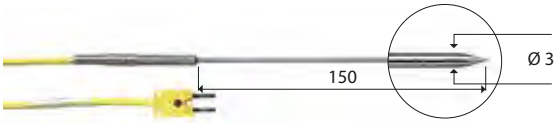
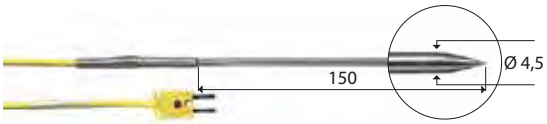
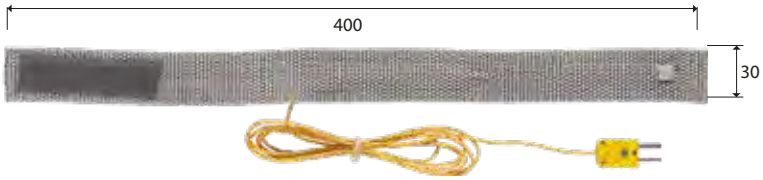
LAT N° 124

Temperature - Humidity - Pressure - Air speed
Photometry/Radiometry - Acoustics

"K" type THERMOCOUPLES - Chromel (Ni-Cr) / Alumel (Ni-Al) - Class 1				
CODE	T_{max}(°C)	USE	$\tau_{0.63}$	DIMENSIONS
TP741	+800		2s	
TP741/1	+400		2s	
TP741/2	+800		2s	
TP742	+800		2s	
TP742/1	+400		2s	
TP742/2	+800		2s	
TP743	+800		3s	
TP744	+400		4s	
TP745	+500		5s	
TP746	+250		2s	
TP750	+1000		3s	
TP750.0	+800		3s	

"K" type THERMOCOUPLES - Chromel (Ni-Cr) / Alumel (Ni-Al) - Class 1				
CODE	T_{max}(°C)	USE	$\tau_{0.63}$	DIMENSIONS
TP751	+200		2s	
TP754	+500		2s	
TP754/9	+500		2s	
TP755	+800		2s	
TP755/9	+800		2s	
TP756	+200		2s	
TP757	+180		30s	Magnetic probe for contact measurements on magnetic metal surfaces 
TP758	+400		4s	
TP758.1	+400		4s	

"K" type THERMOCOUPLES - Chromel (Ni-Cr) / Alumel (Ni-Al) - Class 1				
TP772	+400		3s	
TP774	+250		2s	
TP776	+200		2s	
TP777	+200		3s	
TP647	+300		2s	Fiberglass cable 
TP647/2				
TP647/3				
TP647/5				
TP647/10				
TP647/20				
TP651	+1200		6s	
TP652	+1200		6s	
TP655	+180		2s	
TP656	+200		1s	

"K" type THERMOCOUPLES - Chromel (Ni-Cr) / Alumel (Ni-Al) - Class 1				
CODE	T_{max}(°C)	USE	$\tau_{0.63}$	DIMENSIONS
TP656/1	+1000		1s	
TP656/2	+1000		1s	
TP657/1	+100		5s	
TP659	+400		3s	
TP660	+400		4s	
TP661	+50		30s	
TP662	+180		120s	 Strap probe with velcro for measurements on pipes with Ø max 110 mm
TP663	+1050		3s	
THERMOCOUPLE CONNECTORS AND CABLES				
CM CS	"K"	CS CM		
PW	"K"	Cable Lenght: 2m/5m/10m/15m/20m		