

# HD 2108.1, HD 2108.2, HD 2128.1, HD 2128.2



# HD 2108.1, HD 2108.2, HD 2128.1, 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 logger, 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.

All models are equipped with RS232C serial port and are able to transfer the acquired measures, in real time, to a PC or a portable printer.

Functions Max, Min and Avg calculate maximum, minimum and average values. Further functions are: REL relative measure, HOLD and automatic switchingoff 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.





# I.01.570-E-181102 www.tempco.be

	HD2108.1	HD2108.1 HD2108.2		HD2128.2	
TC input:	TC input: 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	

185x90x40mm

ABS, rubber

-5 ... 50°C

-25 ... 65°C

**IP66** 

470g (complete with Batteries)

0 ... 90% RH, no condensation

2x41/2 digits plus symbols Visible area: 52x42mm

## **TECHNICAL SPECIFICATIONS OF THE INSTRUMENTS**

Instrument Dimensions

(Length x Width x Height) Weight Materials Display

Operating conditions Operating temperature Storage temperature Working relative humidity **Protection degree** 

Power supply Batteries 4 Batteries 1.5V type AA 200 hours with 1800mAh alkaline batteries Autonomy Current consumption with instrument off 20µA

12Vdc / 1000mA Output main adapter

Unlimited, independent of battery charge conditions

2000 pages each one containing 38 samples.

2000 pages each one containing 19 samples,

1,5,10,15,30 s.; 1,2,5,10,15,20,30 min.; 1 hour

°C - °F - °K - mV - mV\*C

1min/month max drift

1min/month max drift

76000 samples in total

38000 couples of samples

In real time

Security of stored data

Unit of measurement

Time Date and time

Main

Accuracy

Measured values storage Model HD2108.2

## Model HD2128.2

Serial interface RS232C

Type

Baud rate

Data bit

Stop bit

Flow Control

Print interval

Serial cable length

Paritv

Storage interval can be selected between

RS232C galvanically isolated can be set from 1200 to 38400 baud 8 None 1 Xon/Xoff Max 15m Immediate selectable between 1,5,10,15,30 s.; 1,2,5,10,15,20,30 min.; 1 hour

USB interface - model HD2108.2 and HD2128.2 1.1 - 2.0 galvanically isolated

Туре

Connections Probes input Serial interface USB interface Mains adapter

2-pole female polarized standard miniature connector 8-pole MiniDin connector 2-pole connector (positive at centre)

Type B Mini USB connector

Resolution	0.05°C up to 199.95°C
TC measuring range: E	-200+750°C
TC measuring range: B	+200+1800°C
TC measuring range: S	+200+1480°C
TC measuring range: R	+200+1480°C
TC measuring range: N	-200+1300°C
TC measuring range: T	-200+400°C
TC measuring range: J	-100+750°C
TC measuring range: K	-200+1370°C

	0.1°C from 200.0°C up to full scale
Instrument accuracy	
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

#### Accuracy is referred to the instrument only; error due to the thermocouple or to the cold junction reference sensor is not included.

or to the cold junction reference sensor	IS HOL INCLU
Temperature drift @20°C	0.02%/°C
Drift after 1 year	0.1°C/year

#### Thermocouple probes accuracy:

Tolerance of a type of thermocouple corresponds to the maximum acceptable shift from the e.m.f. of any thermocouple of that type, with reference junction at 0°C. The tolerance is expressed in degrees Celsius, preceded by the sign. The percentage tolerance is given by the ratio between the tolerance expressed in degrees Celsius and the measurement junction temperature, multiplied by one hundred.

The tolerances refer to the operating temperature expected for the thermocouple, in agreement with the thermo-elements' diameter.

Those thermocouples that comply with the limits for temperatures over  $0^{\circ}$ C, do not necessarily comply with the limits for ranges below  $0^{\circ}$ C.

## THERMOCOUPLE PROBES FOR PORTABLE INSTRUMENTS TOLERANCE CLASSES OF THERMOCOUPLES

Tolerances according to IEC 60584-2 standard. The values refer to thermocouples with reference junction at 0 °C.

	Tolerance class 1		Tolerance class 2		Tolerance class 3 <sup>(1)</sup>	
Type of thermocouple	Temperature range (°C)	Tolerance (°C)	Temperature range (°C)	Tolerance (°C)	Temperature range (°C)	Tolerance (°C)
В			+600+1700	± 0,0025 • t	+600+800	± 4
					+800+1700	± 0,005 • t
E	-40+375	± 1,5	-40+333	± 2,5	-167+40	± 2,5
E	+375+800	± 0,004 • t	+333+900	± 0,0075 • t	-200167	± 0,015 • t
J	-40+375	± 1,5	-40+333	± 2,5		
	+375+750	± 0,004 • t	+333+750	± 0,0075 • t		
K,N	-40+375	± 1,5	-40+333	± 2,5	-167+40	± 2,5
	+375+1000	± 0,004 • t	+333+1200	± 0,0075 • t	-200167	± 0,015 • t
R,S	0+1100	± 1	0+600	± 1,5		
	+1100+1600	± [1+0,003 • (t-1100)]	+600+1600	± 0,0025 • t		
T	-40+125	± 0,5	-40+133	± 1	-67+40	± 1
	+125+350	± 0,004 • t	+133+350	± 0,0075 • t	-20067	± 0,015 • t

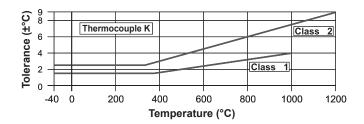
Note: t = temperature of measurement junction in °C.

<sup>(1)</sup> Materials for thermocouples are generally supplied so to comply with the factory tolerances specified in the table for temperatures over -40°C. However these materials can sometimes not comply with the factory tolerances for the low temperatures reported under Class 3, for thermocouples of T, E, K and N type, when thermocouples have to comply at the same time the limits of Class 3 and Class 1 and/or Class 2.

The K type thermocouple probes supplied by Delta OHM have tolerance class 1 in the operating temperature range, that depends on the thermoelements diameter.







#### **ORDERING CODES**

- HD2108.1: The kit consists of one input instrument HD2108.1, 4 per 1.5V alkaline batteries, instruction manual, case and DeltaLog9 downloadable from Delta OHM website software. 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 downloadable from Delta OHM website software. Probes and cables 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 downloadable from Delta OHM website software. 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 downloadable from Delta OHM website software. Probes and cables have to be ordered separately.

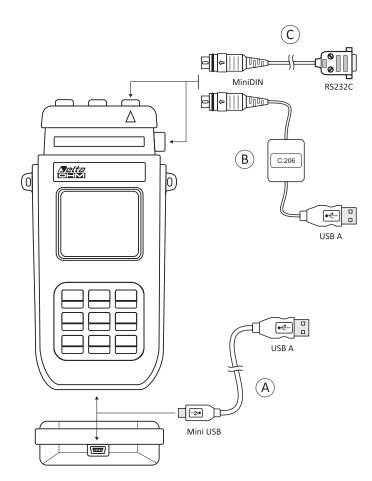
HD2110CSNM: 8-pole connection cable MiniDin - Sub D 9-pole female for RS232C. C.206: Cable for instruments of the serie HD21...1 to connect directly to USB input of PC.

SWD10: Stabilized power supply at 230Vac/12Vdc-1000mA mains voltage.

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

#### Thermocouple probes

Any thermocouple probe with standard miniature connector available can be connected to these instruments.



- A To the portable data loggers of the series HD21....2 a serial port mini USB type HID (Human Interface Device) has been inserted. For the connection to a PC with the cable USB type A - MiniUSB type B code CP23, it is not necessary to load any driver USB.
- B For the connection of the models HD21....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 in all the models, 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.