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THERMOCOUPLE THERMOMETERS

HD2328.0 Thermocouple thermometer with two inputs



The **HD2328.0 with two inputs** is a portable instrument with a large LCD display. It measures the temperature using immersion, penetration air or contact probes. The sensor may be a thermocouple of type K, J, T or E. The Max, Min and Avg function calculate the maximum, minimum or average values. Other functions include: the relative measurement REL, the HOLD function, and the automatic turning off that can also be disabled. **The instruments have IP67 protection degree.**

TECHNICAL CHARACTERISTICS

Instrument

Dimensions (Length x Width x Height) 140x88x38mm
Weight 160g (complete with batteries)
Materials ABS
Display 2x4 1/2 digits plus symbols
Visible area: 52x42mm

Operating conditions

Operating temperature -5...50°C
Warehouse temperature -25...65°C
Working relative humidity 0...90%RH without condensation
Power Batteries 3 1.5V type AA batteries
Autonomy 200 hours with 1800mAh alkaline batteries

Power absorbed with instrument off 20µA

Measuring unit °C - °F

Connections

Input module for the probes 2-pole female polarized standard miniature connector

Measurement of temperature by Instrument - Tc

TC measurement range: K -200 ... +1370°C

TC measurement range: J -100 ... +750°C

TC measurement range: T -200 ... +400°C

TC measurement range: N -200 ... +1300°C

TC measurement range: E -200 ... +750°C

Resolución 0,1 °C

Accuracy

Thermocouple K ±0.1°C up to 600°C
±0.2°C over 600°C

Thermocouple J ±0.1°C up to 400°C
±0.2°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 E ±0.1°C up to 300°C
±0.2°C over 300°C

The accuracy only refers to the instrument. Error due to the thermocouple or to the cold junction reference sensor is not included.

Temperature drift @ 20°C 0.02%/°C

Drift after 1 year 0.1°C/year

Accuracy of the thermocouple probes:

The 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 thermocouples conforming to regulations must comply with one of the following tolerance levels, the values of which are reported in the table. **G I** (special tolerances) **G II** (normal tolerances) The tolerances refer to the operating temperature expected for the thermocouple, in agreement with the thermoelements' diameter..

Type	Range °C	G I	G II
K	0 a 1370 °C	±1,1 °C o ±0,4%	±2,2 °C o ±0,75%
K	-200 a 0 °C	-	±2,2 °C o ± 2%
J	0 a 750 °C	±1,1 °C o ±0,4%	±2,2 °C o ±0,75%
T	0 a 400 °C	±0,5 °C o ±0,4%	±1 °C o ±0,75%
T	-200 a 0°C	-	±1 °C o ±1,5%
E	0 a 750 °C	±1 °C o ±0,4%	±1,7 °C o ±0,5%
E	-200 a 0 °C	-	±1,7 °C o ±1%

ORDER CODES

HD2328.0K: The kit is composed of the instrument HD2328.0 with two inputs, 3 1.5V alkaline batteries, operating manual, case.

The probes must be ordered separately.

THERMOCOUPLE PROBES

The instruments can be connected to all the thermocouple probes fitted with standard miniature connector available on our price-list.

HD2108.1 HD2108.2 Thermocouple Thermometers, K, J, T, N, R, S, B, E with one input
HD2128.1 HD2128.2 Thermocouple Thermometers, K, J, T, N, R, S, B, E with two inputs



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. The HD2108.2 and HD2128.2 instruments are **dataloggers**. The HD2108.1 memorizes up to 76,000 samples, the HD2128.2 up to 38,000 pairs of values. These data can be transferred from the instrument connected to a PC via the multi-standard RS232C serial port and USB 2.0. The storing interval, printing, and baud rate can be configured using the menu. All the models are fitted with an RS232C serial port and can transfer the acquired measurements in real time to a PC or to a portable printer. The Max, Min and Avg function calculate the maximum, minimum or average values. Other functions include: the relative measurement REL, the HOLD function, and the automatic turning off that can also be disabled. The HD2128.1 and HD2128.2 calculate the A-B difference of the temperatures captured by the two input channels. **The instruments have IP67 protection degree.**

	HD2108.1	HD2108.2	HD2128.1	HD2128.2
TC Inputs	1	1	2	2
Storage capacity	-	76000 samples	-	38000 temperature pairs
PC Interface	RS232C	RS232C+USB2.0	RS232C	RS232C+USB2.0
Datalogger	NO	YES	NO	YES
A-B Function	NO	NO	YES	YES

ORDER CODES

HD2108.1K: The kit is composed of the instrument HD2108.1 **with one input**, connection cable for serial output HD2110CSNM, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software. **The probes must be ordered separately.**

HD2108.2K: The kit is composed of the HD2108.2 **with one input, datalogger**, connection cable HD2101/USB, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software. **The probes must be ordered separately.**

HD2128.1K: The kit is composed of the instrument HD2128.1 **with two inputs**, connection cable for serial output HD2110CSNM, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software. **The probes must be ordered separately.**

HD2128.2K: The kit is composed of the HD2128.2 **with two inputs, datalogger**, connection cable HD2101/USB, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software. **The probes must be ordered separately.**

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

HD2101/USB: Connection cable USB 2.0 connector type A - 8-pole MiniDin.

DeltaLog9: Software for download and management of the data on PC using Windows 98 to XP operating systems.

AF209.60: Stabilized power supply at 230Vac/9Vdc-300mA mains voltage.

S'print-BT: On request, portable, serial input, 24 column thermal printer, 58mm paper width.

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TECHNICAL CHARACTERISTICS

<u>Instrument</u>	
Dimensions	(Length x Width x Height) 140x88x38mm
Weight	160g (complete with batteries)
Materia	ABS
Display	2x4 1/2 digits plus symbols Visible area: 52x42mm
<u>Operating conditions</u>	
Operating temperature	-5...50°C
Warehouse temperature	-25...65°C
Working relative humidity	0...90%RH without condensation
Power	Batteries 4 1.5V type AA batteries Autonomy 200 hours with 1800mAh alkaline batteries with instrument off 20µA
Power absorbed	
Measuring unit	°C - °F - °K
<u>Security of stored data</u>	Unlimited, independent of battery charge conditions
<u>Time</u>	
Date and time	Schedule in real time
Accuracy	1min/month max departure
<u>Measured values storage</u>	
Type - model HD2108.2	2000 pages containing 38 samples each Total of 76,000 samples
Type - model HD2128.2	2000 pages containing 19 samples each 38,000 pairs of samples
Storage interval	1s...3600s (1hour)

Serial interface RS232C

Type	RS232C electrically 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 length	Max 15m
Immediate print interval	1s...3600s (1hour)

USB Interface - models **HD2108.2** y **HD21128.2**

Type	1.1 – 2.0 electrically isolated
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Connections

Input module for the probes	2-pole female polarized standard miniature connector
Serial interface and USB	8-pole MiniDin connector
Mains adapter	2-pole connector (positive at centre)

Measurement of temperature by Instrument - Tc

TC measurement range: K -200 ... +1370°C

TC measurement range: J -100 ... +750°C

TC measurement range: T -200 ... +400°C

TC measurement range: N -200 ... +1300°C

TC measurement range: E -200 ... +750°C

Resolución 0,1 °C

Accuracy

Thermocouple K ±0.1°C up to 600°C

±0.2°C over 600°C

Thermocouple J

±0.1°C up to 400°C

±0.2°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 E

±0.1°C up to 300°C

±0.2°C over 300°C

The accuracy only refers to the instrument. Error due to the thermocouple or to the cold junction reference sensor is not included.

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J	0 a 750 °C	±1,1 °C o ±0,4%	±2,2 °C o ±0,75%
T	0 a 400 °C	±0,5 °C o ±0,4%	±1 °C o ±0,75%
T	-200 a 0°C	-	±1 °C o ±1,5%
N	0 a 1300 °C	±1,1 °C o ±0,4%	±2,2 °C o ±0,75%
R o S	200 a 1480 °C	±0,6 o ±0,1%	±1,5 o ±0,25%
B	-200 a 1800 °C	±0,25%	±0,5%
E	0 a 750 °C	±1 °C o ±0,4%	±1,7 °C o ±0,5%
E	-200 a 0 °C	-	±1,7 °C o ±1%

