Thermal Comfort

HD32.3TC

DATA LOGGER FOR MICROCLIMATE INDEX & IAQ MEASUREMENT

INTRODUCTION

The HD32.3TC is a professional, portable data logger specifically designed for accurate **analysis of microclimatic conditions and indoor air quality (IAQ).** Ideal for civil, industrial, and institutional applications, the HD32.3TC is capable of detecting a wide range of environmental parameters and objectively assessing thermal comfort and indoor health, making it a valuable tool in Building Automation and HVAC control systems.

Thanks to its versatility, the HD32.3TC is the optimal choice for occupational safety professionals, environmental managers, facility managers, and energy consultants. It delivers reliable data for building diagnostics and verification of environmental well-being.

FEATURES

Multi-parameter and versatile
Simultaneously measures dry bulb, wet bulb, and globe temperature, humidity, air velocity, CO_2, VOCs, particulate matter (PM1.0, PM2.5, PM10), atmospheric pressure, and other environmental indices.

Automatic calculation of key environmental indices
Includes PMV, PPD, WBGT, UTCI, DR, TU, HI, TEP, and natural decay of the SARS-CoV-2 virus.

Compatible with DeltaLog10 software
For advanced analysis and the calculation of indices such as IREQ, DLE, WCI, and the indices from the PHS method.

High performance
Data logging functions, rechargeable battery with up to 24 hours of autonomy, integrated camera for visual documentation, and 4" graphical LCD display.

Smart connectivity
Features three inputs for SICRAM probes (with automatic parameter recognition), an RS485 port for auxiliary probes, and Wi-Fi connectivity for data transmission to FTP servers.

CONFIGURATION & MEASUREMENT

User-friendly interface and plug-and-play configuration
Each SICRAM probe can be inserted into any port with automatic parameter detection.

Configurable for both moderate and extreme environments
Measures thermal comfort indices (PMV/PPD), WBGT for severe hot environments, and IAQ parameters to evaluate indoor health in settings such as schools, offices, and factories.

Specialized applications
Includes HVAC ventilation assessment, analysis of Sick Building Syndrome, and thermal comfort studies in accordance with the most current standards.

BRIGHT AND CLEAR TOUCH DISPLAY
Measurements and calculated values are immediately visible on the screen.

HIGH MEMORY CAPACITY
Large memory capacity for extended measurement cycles.

DATA IMMEDIATELY AVAILABLE
Remotely accessible via FTP.

SELF-SUFFICIENT AND PORTABLE
Battery-powered with a minimum of 24 hours of operational autonomy.

MEASUREMENTS IN COMPLIANCE WITH STANDARDS:
ISO 7730
ISO 7726
ISO 7243
ISO 9886
ISO 8996
ISO 11079
ASHRAE Standard 55
ASHRAE Standard 62.1-2019

Making the unknown, known

Technical characteristics

Export formats	PDF - CSV (with DeltaLog10)
Inputs	3 inputs with 8-pole DIN45326 connector for probes with SICRAM module 1 input with M12 8-pole connector for the PMsense-P particulate matter transmitter
Connectivity	Wi-Fi (2,4 GHz) and USB OTG, Host and Device *The USB connection does not requires drivers installation*
Storage capacity	8 GB
logging interval	Configurable from 1 second to 1 hour
Power supply	Rechargeable lithium internal battery External power supply unit (SWD05), to be connected to the mini-USB connector of the instrument. If connected to PC, it is powered by the computer USB port (500 mA at least)
Battery life	At least 24 hours of continuous operation (starting from a fully charged battery) with display always on
Display	Backlit color graphic LCD with capacitive touch Active area 52x87 mm, 480x800 pixels
Camera resolution	480 x 640 pixel
Operating conditions	-5...50 °C 0...90% RH no condensation
Storage Temperature	-25...65 °C
Materials	ABS, rubber protection band
Degree of protection	IP54
Uncertainty	± 1 digit @ 20 °C
Dimensions and weight	185 x 90 x 40 mm - 500 gr

Reference Rules

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ISO 7726	Ergonomics of the thermal environment — Instruments for measuring physical quantities.
ISO 7730	Ergonomics of the thermal environment — Analytical determination and interpretation of thermal comfort using calculation of the PMV and PPD indices and local thermal comfort criteria.
ISO 7243	Ergonomics of the thermal environment — Assessment of heat stress using the WBGT (wet bulb globe temperature) index.
ISO 9886	Ergonomics — Evaluation of thermal strain by physiological measurements.
ISO 8996	Ergonomics of the thermal environment — Determination of metabolic rate.
ISO 11079	Ergonomics of the thermal environment — Determination and interpretation of cold stress when using required clothing insulation (IREQ) and local cooling effects.
ASHRAE Standard 55	Thermal Environmental Conditions for Human Occupancy.
ASHRAE Standard 62.1-2019	Ventilation for Acceptable Indoor Air Quality.

Visualizations

The colored bar in the PMV/PPD index, heat index, UTCI temperature and TEP temperature screens indicates the evaluation of thermal stress.
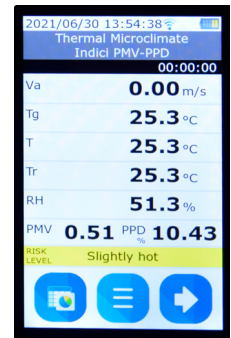

Detection of volatile organic compounds (VOC) - after the time of adaptation to the environment, the state of VOC pollution is expressed as an index variable from 1 to 500 (dimensionless).


Based on the environmental T and RH values, the natural decay time of the SARS-CoV-2 virus on surfaces is estimated, according to the equation published by the "U.S. Homeland Security department".
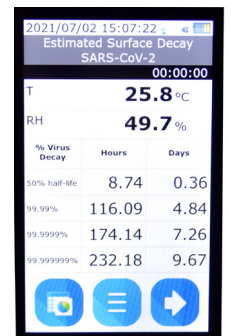
Graph display of 2 quantities in real time - Selectable quantities and time scale values - Setting of reference treshold and possibility to enable visual alarm.
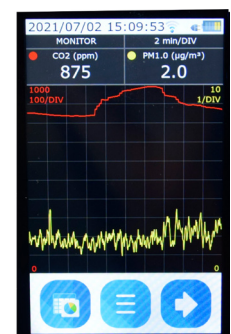
Measurement specifications
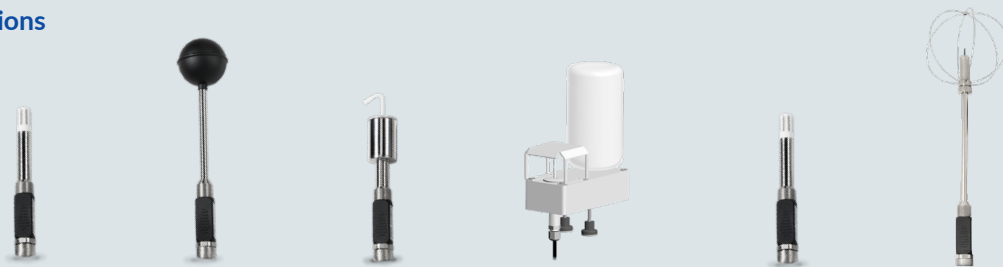
PROBES	TP3207.2 / TP3207*	TP3276.2 / TP3275*	HP3201.2 / HP3201*	TP3204S*	HP3217.2R / HP3217R*	AP3203.2 / AP3203*
Sensor	Pt100	Pt100	Pt100	Pt100	T= Pt100 RH = capacitive	NTC 10 kΩ
Measuring range	-40...100 °C	-30...120 °C	4...80 °C	4...80 °C	T= -40...100 °C RH= 0...100%	0.02...5 m/s 0...80 °C
Resolution	0.1 °C	0.1 °C	0.1 °C	0.1 °C	0.1 °C / 0.1 RH	0.01 m/s
Accuracy	1/3 DIN	1/3 DIN	Class A	Class A	T = 1/3 DIN RH = ±1.5% (0...90% RH) ±2% (90... 100% RH) @ T=15 ...35°C (±1.5 + 1.5% of the measure) % @ T=remaining range	± (0.05 + 5% of the measure) m/s
Temp. drift @20°C	0.003% / °C	0.003% / °C	0.003% / °C	0.003% / °C	0.02 RH/°C	0.06% /°C
Long term stability	0.1 °C / year	0.1 °C / year	0.1 °C / year	0.1 °C / year	0.1% RH/ year	0.12 °C / year
Response time T$_{95}$	15 minutes	15 minutes	15 minutes	15 minutes	15 minutes	
Tank capacity and autonomy			15 cc 96 hours @ RH = 50%, T = 23°C	500 cc 15 days @ T= 40 °C		

* Probes with cable length 2 m.

PROBES	HP3217B4 HP3217BV4	PMsense-P
Sensor	T/RH= CMOS / P$_{atm}$= piezoresistive CO_2 = NDIR VOC= Metal-Oxide film (*only BV4*)	Laser scattering principle
Measuring range	T= -20...80 °C / RH = 0...100% P$_{atm}$ = 300...1250 hPa / CO_2 = 0...5000 ppm VOC Index = 1...500 (dimensionless)	0...1000 µg/m³ (for each pollutant)
Resolution	T= 0.1 °C / RH= 0.1 %RH / P$_{atm}$ = 0.1 hPa CO_2 = 1 ppm / VOC Index = 1	0.1 µg/m³
Accuracy	T= 0.1 °C / RH= ±2% (0...80% RH) P$_{atm}$= ± 0.5 hPa @ T=25 °C CO_2 = ± (50 ppm + 3% della misura) VOC Index = relative qualitative measurement	<5% linearity error <3% repeatability
Temperature drift	P$_{atm}$ = ± 0.75 Pa/°C (0...55 °C / 700...1100 hPa) CO_2 =1 ppm/°C (-20...45 °C)	< 0.01 µg/m³ /°C
Long term stability	T = < 0.03 °C/year RH = < 0.25 %RH/year P$_{atm}$ = < ± 1 hPa/year CO_2 = 5% of the measure/5 years	/
Response time	T / RH = 10 s CO_2= < 120 s	Measurements update rate 1 s

PROBES AND MEASURED PARAMETERS

Which probes do I need to measure following indexes?	TP3207.2 / TP3207 — Air Temp. (T)	TP3276.2 / TP3275 — Globe thermometer temperature (T_g)	HP3201.2 / HP3201 — Natural wet bulb temperature (T_{nw}) *(the 2 probes are interchageable)*	TP3204S	AP3203.2 / AP3203 — Air Speed (V_a)	HP3217.2R / HP3217R — RH + Air Temp. *(also possible with HP3217B[V]4)*	HP3217B4 — Air Temp. - RH - Atmospheric Pressure - CO_2	HP3217BV4 — As HP3217B4 + VOC Index	PMsense-P — PM1.0, PM2.5 and PM10
WBGT	A	B	C	C		A	A	A	
Mean Radiant Temperature T_r		A			B	C	C	C	
PMV		A			B	C	C	C	
PPD		A			B	C	C	C	
TU - DR					A				
HI						A			
UTCI		A			B	C	C	C	
TEP		A			B	C	C	C	
SARS-CoV-2						A	A	A	
CO_2							A	A	
VOC								A	
PM1.0 / PM2.5 / PM10									A
PHS		A			B	C	C	C	
IREQ / DLE / RT / WCI		A			B	C	C	C	

For the measurement of several parameters, a combination of more than one probe is required (e.g. for WBGT => A+B+C).
Probes with the same letter are interchangeable.

Microclimate IAQ + PM measurements.

For long lasting monitoring, the VTRAP tripod and the SP32TC 4-probe holder are available.

Ordering codes

HD32.3TC — Thermal microclimate data logger. Includes DeltaLog10 software downloadable from the website, **carrying case suitable for probes without cable**, Li-ion rechargeable battery, USB cable CP31, power supply SWD05 and instruction manual.

HD32.3TCA — Thermal microclimate data logger. Includes DeltaLog10 software downloadable from the website, **carrying case suitable for probes with cable**, Li-ion rechargeable battery, USB cable CP31, power supply SWD05 and instruction manual.

Probes and accessories have to be ordered separately.