AIR TEMPERATURE
RELATIVE HUMIDITY
ATMOSPHERIC PRESSURE

Thermo-Hygro-Barometer





- Thermo-hygrometric sensor family with optional integrated pressure measurement
- Interchangeable measuring head
- Fast return after moisture saturation situation thanks to self-heating algorithm
- Derived quantities calculated on board the sensor
- Configuration of outputs through modifiable parameters
- High efficiency anti-radiant shield
- Forced ventilation screen available
- Traceable ISO/IEC 17025:2017

Precise and reliable sensors for measuring air temperature, RH%, and, according to model, barometric pressure. Designed for continuous operation even in harsh climates, they feature an interchangeable measuring head for high reliability. Available with configurable analogue or digital outputs, they can compute additional parameters on board. Outdoor use requires a radiation shield. LSI LASTEM is an accredited laboratory according to ISO/IEC 17025:2017 for air temperature and RH%.

Thermo-Hygrometer

	Models			
Cable free wire*	**PRTHL1000**	**PRTHL1100**	**PRTHL1300**	**PRTHL1200**
Cable with connector**	**PRTHL1001**	**PRTHL1101**	**PRTHL1301**	**PRTHL1201**
Output (available quantities in Tab at Pag 3)	3 x 0... 1/2.5 V DC	3 x 4... 20 mA	UART	RS-232 / RS-485 / SDI-12
Cable	*Cable L = 3 m **Cable L = 3 m with connector for CCDCA4*01 extension cables (see Accessories)			
Power supply	9… 30 V DC			
Consumption @ 12 V DC	• 1.2 mA • Heated: 23 mA	• 8.5…43 mA • Heated: 30…62 mA	• 665 uA • Heated: 20 mA	RS-232: 13 mA • Heated: 34 mA RS-485, SDI-12: 7.3 mA • Heated: 28 mA
LSI LASTEM data logger compatibility	E-Log, Alpha-Log + ALIEM Module	E-Log, Alpha-Log + ALIEM Module	Alpha-Log	E-Log, Alpha-Log

Thermo-Hygro-Barometer

	Models			
Cable free wire*	**PRTHL1010**	**PRTHL1110**	**PRTHL1310**	**PRTHL1210**
Cable with connector**	**PRTHL1011**	**PRTHL1111**	**PRTHL1311**	**PRTHL1211**
Output (available quantities in Tab at Pag 3)	3 x 0... 1/2.5 V DC	3 x 4... 20 mA	UART	RS-232 / RS-485 / SDI-12
Cable	*Cable L = 3 m **Cable L = 3 m with connector for CCDCA4*01 extension cables (see Accessories)			
Power supply	9… 30 V DC			
Consumption @ 12 V DC	• 1.2 mA • Heated: 23 mA	• 8.5…43 mA • Heated: 30…62 mA	• 665 uA • Heated: 20 mA	RS-232: 13 mA • Heated: 34 mA RS-485, SDI-12: 7.3 mA • Heated: 28 mA
LSI LASTEM data logger compatibility	E-Log, Alpha-Log + ALIEM Module	E-Log, Alpha-Log + ALIEM Module	Alpha-Log	E-Log, Alpha-Log

Technical features

Temperature	Principle	Semiconductor sensor
	Range	-30...70 °C, max. -40…80 °C
	Accuracy	Typ. ±0.1 °C (@ 5...60 °C), ±0.2 °C (@ <5 and >60 °C) Max. ±0.3 °C (@ -40...80 °C)
	Long-term stability	<0.03 °C / year
	Resolution	0.01 °C
Relative humidity	Principle	Capacitive with hygroscopic polymer
	Measuring range	0…100%
	RH% accuracy Long-term stability	@ 25 °C: Typ. ±1% (@ 20...70%), ±1.5% (@ <20 and >70%) Max. ±2% (@ 0...90%), ±3% (@ >90%) <0.25% / year
	Response time (T63)	• Cell: 4 s • Sensor: 10 s @ Vair=1 m/s, isotherme (without digital filter)
	Hysteresis Resolution	±0.5% 0.01%
Atmospheric pressure	Principle	MEMS piezo-resistive
	Measuring range	850...1050 hPa, max. 260…1260 hPa
	Accuracy	±0.2 hPa @ -20...65 °C
	Long-term stability	0.1 hPa / year
	Response time (T63)	1 s
	Thermal drift	0.0045 hPa / °C
	Resolution	0.01 hPa
General information	Degree of protection	IP66
	Operating temperature	-40…80 °C
	Recommended recalibration frequency	2 years, less for conditions of use in heavily polluted environments

Available quantities

The Thermo-Hygrometer and the Thermo-Hygro-Barometer enable the calculation of derived parameters directly on the sensor itself, without the need for connection to a data logger.
This innovative feature allows a wide range of parameters to be obtained, both those measured directly (temperature, relative humidity and atmospheric pressure in certain models) and those calculated.
The sensor's outputs can be configured via hyper-terminal: there are 3 analogue outputs; in the model with Temperature and Humidity, it is possible to select which derived parameter to include in addition to the two measured ones; as regards the digital outputs, it is possible to include the entire set of derived parameters. Some parameters are calculated directly from the measured values alone, whilst others require parameters to be configured via hyper-terminal.
The table below lists the available parameters.

Available quantities	Parameters to be configured through SW	Sensor model
Temperature	-	All
Relative Humidity	-	All
Atmospheric Pressure	-	Thermo-hygro-barometer only
Absolute Humidity (VDI 3786 Part 4)	-	All
Dew Point (ISO 7726)	-	All
Vapour Pressure (ISO 7726: Table D.1 Humidity conversion equations)	-	All
Barometric Pressure (QNH, ref. ICAO) (Table 3.10 from "International Meteorological Tables – WMO No. 188 TP. 94 – 1966")	• Coeff. A • Coeff. B	Thermo-hygro-barometer only
Barometric Pressure (QNH, ref. ICAO) (ISA Eq. 7, CIMO, "CIMO/ET-Stand-1/Doc. 10 (20 November 2012)")	Altitude (m)	Thermo-hygro-barometer only
Barometric Pressure (QNH, ICAO ref.) (ICAO Equations 28/29, "CIMO/ET-Stand-1/Doc. 10 (20 November 2012); ICAO documents 7488/9837")	Altitude (m)	Thermo-hygro-barometer only
Atmospheric Pressure at Sea Level with Actual Atmospheric Temperature Gradient (QFF, WMO ref.)	Altitude (m)	Thermo-hygro-barometer only
Heat Index (National Oceanic and Atmospheric Administration (NOAA))	-	All
Wet-Bulb Temperature from Relative Humidity and Air Temperature (ROLAND STULL, University of British Columbia)	-	All



As well as having a range of analogue and digital outputs, the sensors are available in two versions: with a 3-m cable with free wires, or with a 3-m cable fitted with a connector for extension cables ranging from 5 to 100 m (see Accessories)

Accessories

	**DYA230**	Luran naturally ventilated anti-radiant screen consisting of 7 plates painted black on the lower face to increase natural ventilation inside the screen. Includes side arm to be combined with DYA049 collar for its fixing to poles Ø 45...65 mm Dimensions: H.156 mm Ø 124 mm Weight: 0.67 kg
	**TYA300**	Luran naturally ventilated anti-radiant screen consisting of 7 black painted plates on the underside to increase natural ventilation inside the screen. Includes arm to be combined with TYA050 or TYA100 bars for its fixing to poles Ø 45...65 mm Dimensions: H.156 mm Ø 124 mm Weight: 0.67 kg
	**DYA231.1**	Multi-plate Luran anti-radiant screen with forced ventilation. Power supply: 8... 15 V DC Operating range: -20... 85 °C (fan operating range) Extension cables: MN1013.*R not included
	DYA049	Pole mounting collar Ø 45-65 mm
	CCDCA4301	Extension cable for PRTHL1**1, L=5 m
	CCDCA4401	Extension cable for PRTHL1**1, L=10 m
	CCDCA4501	Extension cable for PRTHL1**1, L=25 m
	CCDCA4601	Extension cable for PRTHL1**1, L=50 m
	CCDCA4701	Extension cable for PRTHL1**1, L=100 m
	SVICA0003	Calibration Report according to ISO 9001 (Temperature)
	SVACA0006	Calibration Certificate according to ISO/IEC 17025 (Temperature)
	SVICA1003	Calibration Report according to ISO 9001 (RH%)
	SVACA1005.1	Calibration Certificate according to ISO/IEC 17025 (RH%)
	**SPMCA1006**	Interchangeable T/RH%/Press measuring head
	TXMPA1730	Interface for sensor configuration from PC
	MN1013.5R	Extension cable for anti-radiant shield DYA231.1, L= 5 m
	MN1013.10R	Extension cable for anti-radiant shield DYA231.1, L= 10 m
	MN1013.25R	Extension cable for anti-radiant shield DYA231.1, L= 25 m
	MN1013.50R	Extension cable for anti-radiant shield DYA231.1, L= 50 m
	MN1013.100R	Extension cable for anti-radiant shield DYA231.1, L= 100 m
	CCCOA0001	Pair of plug/socket connectors for MN1013.*R extension cable for DYA231.1 anti-radiant shield

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