RELATIVE HUMIDITY AND AIR TEMPERATURE

Psychrometer sensor

- Wet&Dry forced ventilation temperatures sensor. Design made according to ISO7726 standard
- Direct calculation of the Relative Humidity and Dew Point using LSI-LASTEM's data logger according to ISO7726 standard
- 2% accuracy assured over the whole range (0-100%) and wide operative temperature (0...60 °C)
- High accuracy Pt100 1/3 DIN B sensitive elements
- Forced ventilation on the sensitive elements: >2 m/s
- Long term stability and robust principle. Applications in polluted/salty air even near the saturation with high temperatures
- Internal ISO17025 accreditated calibration laboratory

Psychrometer sensor with wet&dry bulbs and forced ventilation. Wet bulb is closed inside a wet cotton sock from a distilled water tank. This sensor has a very good stability because it is based on a direct measurement of temperature using 1/3 DIN element and it is not sensitive to the time drift of commonly used capacitive hygrometer elements. LSI-LASTEM data loggers can calculate Relative Humidity starting from wet&dry temperatures.

Technical Specifications

PN	ESU102A	
Temperature	Principle	Wet & dry bulb temperature Pt100 Class AA IEC60751 (DIN 1/3 class B) with forced ventilation
	Measuring range	-5...60 °C
	Accuracy	±0,1 K @ 0 °C
	Output	2 x Pt100 DIN-IEC 751 table (EN 60751)
	Response time (T90 Air)	1.5 min
Relative Humidity %	Principle	Psychrometric
	Measuring range	0...100%
	Accuracy	2% (5...45 °C)
	Resolution	1%
	Response time (T90 Air)	1.5 min
General Information	Protection grade	IP54
	Ventilation on the sensitive elements	> 2 m/s
	Power consumption	30 mA (forced ventilation on)
	Operative temperature	0...60 °C
	Cable	L=1 m
	Connector	Double min-din
	Input type on E/M-Log	N. 2 analog
	E/M-Log derived quantities obtained	• Pyshrometric Relative humidity • Dew point
	Mounting	On BVA315-320 stands

Accessories

	SVICA1102	Calibration certificate. ISO9001 type (Relative Humidity)
	SVACA1105	Calibration certificate. ISO17025-ACCREDIA type (Relative Humidity)
	MM3101.R	Spare cotton sock

There are several reasons to select psychrometer (wet&dry bulbs) or capacitive sensors to measure Relative Humidity. Here above the list of advantage and disadvantage for both technologies:

		
	Capacitive	**Wet&dry bulb**
Water consumption	No water	Water must always be inside the water tank
Measurement below 0 °C	Can be used below 0 °C	Cannot be used below 0 °C (because of the water presence in the tank)
Measurement at high temperature and RH values	Cannot discriminate when RH is above 95%	Can discriminate even above RH 95%
Temperature accuracy and response time	Good temperature accuracy (0.15 °C)	Very good temperature accuracy (0.1 °C). The forced ventilation across the element facilitate the convective exchanges reducing the response time
Measurements in severe conditions (polluted, salty, corrosive air)	More fragile. When corrupted, sensor needs to be fully replaced	Even in severe conditions the wet&dry bulb is very rugged. Simple maintenance is required when the cotton sock becomes dirty
Sensor life time (stand alone applications)	In fix applications, life time is about 2-3 years	In fix applications the sensor life time is only depending by the mechanical conditions. Sensitive elements are very rugged
Power comsumption	Low power consumption	High power consumption because of presence of the forced ventilation by the fan
Application	Can be used indoor and outdoor (using a radiant screen)	Can be used indoor. Outdoor, only in above freezing temperatures. In outdoor, it needs to be closed in a Stevenson screen

M-Log (ELO009) reads wet & dry bulb temperatures and produces Relative Humidity and Dew Point values according to the ISO7726 standard formulas.

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Thermohygrometer

- Small dimensions and outstanding performances allow this sensor to be used in a wide range of environmental applications
- Measurement of both air temperature and Relative Humidity
- Fast return after saturation
- Standard dust filter to ensure good protection against pollutants

Air temperature and RH% sensor with Pt100 output for temperature and 0...1 V DC output for RH%.
It is a precise and reliable sensor, suitable for a continuous measurement even in severe environments, in presence of pollutants, deep thermal and hygrometric ranges in long-term monitoring.

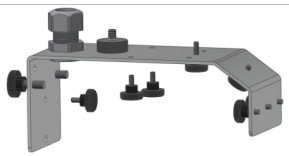
Technical Specifications

PN	DMA672.1	ESU403.1	ESU403.2
Output	RH%: 0...1 V DC °C: Pt100 DIN-IEC 751 table		
Power supply	5...24 V DC / 5...16 V AC		
Connector	L= 3 m free wires (8 wires)	L= 1 m + N.2 Mini-Din connectors	L= 10 m + N.2 Mini-Din connectors
Data logger compatibility	E-Log, Alpha-Log	M-Log	

Common Technical Specifications

Temperature	Principle	Pt100 Class A IEC60751 (DIN Class A)
	Measuring range	-50...100 °C
	Accuracy	±0.15 K @ 0 °C
	Output	Pt100 DIN-IEC 751 table (EN 60751)
	Resolution	0.01 °C
	Response time (T90)	4 s (1 m/s air flow)
	Long term stability	<0.1 °C/year
Relative humidity	Principle	Capacitive
	Measuring range	0...100%
	Accuracy	±1% RH (5-95%)
	Long term stability	<±1%/year
	Response time (T90)	10 s (1 m/s air flow)
	Hysteresis	<1%
	Resolution	0.1%
General Information	Protection grade	IP66
	Operative temperature	-50...100 °C

Accessories

	SVICA0003	Calibration certificate ISO9001 (Temperature)
	SVACA0006	Calibration certificate ISO17025-ACCREDIA (Temperature)
	SVICA1003	Calibration certificate ISO9001 (Relative Humidity)
	SVACA1005.1	Calibration certificate ISO17025-ACCREDIA (Relative Humidity)
	**BVA315**	Arm for fixing sensors on BVA304 tripod
	**BVA320**	Arm for fixing sensors on BVA304 tripod or wall
	**MM6102.R**	Spare part filter for T/HR sensor

Monitoring solution, tripod mounting using BVA305 stand

Hand-held solution

ESU403.1 thermo-hygrometric sensor is connected to M-Log data logger/reader system (ELO009) which reads Temperature and Relative Humidity and produces Dew Point values according to the ISO7726 standard formula.

This system can be used as portable hand-held solution or for middle term portable monitoring solutions, in this case ESU403.1 can be fixed on the tripod by means of the BVA305 stand.

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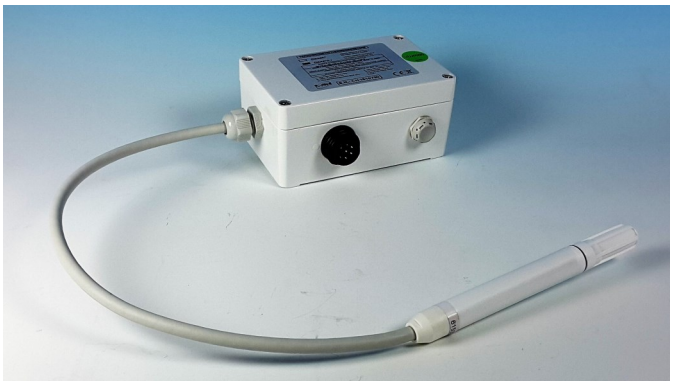
Thermohygrometer
(analogue, digital and radio outputs)



- 4...20 mA, RS485-Modbus RTU and Radio outputs version
- Easy installation of the sensitive part, even in small spaces or pipes
- Cable lenght from 5 to 100 m
- Dew Point calculation and output (replace RH% output)
- Simple replacement of the sensitive element
- Outstanding accuracy (1.5%) for RH%

Sensor for measuring the air temperature and relative humidity in indoor environments or inside pipes.
In applications with dirty air, it is possible to mount the sensor inside the DYA225 shelter in order to prevent dirt from accumulating directly on the sensitive element.

Technical Specifications

PN	EXP815.1	DMA975.1	DMA875.1
Measurements	°C/RH%	°C/RH%	°C/RH%
Output	Radio	RS485	2x0-4...20 mA
Frequency	868 MHz	-	-
Radio transmission power	25 ± 3 mW	-	-
Radio transmission distance (line-of-sight)	600 m	-	-
Transmission rate	10’	-	-
Battery life	>2 years	-	-
Protocol	-	Modbus RTU®, TTY-ASCII	-
Configuration	-	Hyperterminal	-
RS485 protection	-	Galvanic insulation (3 kV, UL1577)	-
RS485 speed	-	1200...115 kbps	-

PN	EXP815.1	DMA975.1	DMA875.1
Power supply	Battery (AA 3.6 V)	10...30 V AC/DC	10...30 V AC/DC
Power consumption	<10 µW stand-by 120 mW in trasmissione	1 W	1 W
Electric protections	NO (electrically insulated system)	Tranzorb and Emifilter	Tranzorb and Emifilter

Common Technical Specifications

Temperature	Principle	RTD Pt100 1/3 DIN B (Class AA EN60751)
	Measuring range	Programmable: -40...60 °C, -50...60 °C, -50...70 °C, -30...100 °C
	Accuracy	0.1 °C (@0 °C)
	Resolution	0.01 °C
	Response time (T90)	Typical 4 s (1 m/sec air flow)
	Long term stability	<0.1 °C/year
Relative Humidity	Principle	Capacitive
	Measuring range	0...100 %
	Accuracy	±1 % (@5...95 %)
	Output	Programmable: RH% or Dew Point
	Long term stability	<±1% / year
	Response time (T90)	Typical 10 s (1m/s air flow)
	Hysteresis	<1%
	Resolution	0.1%
General Information	Protection rate	IP65
	Operative temperature	-50...100 °C

Accessories

	SVICA0003	ISO9001 type calibration certificate (Temperature)
	SVACA0006	ISO17025-ACCREDIA type calibration certificate (Temperature)
	SVICA1003	ISO9001 type calibration certificate (Relartive Humidity)
	SVACA1005.1	ISO17025-ACCREDIA type calibration certificate (Relative Humidity)
	**DWA505A**	Cable L= 5 m
	DWA510A	Cable L= 10 m
	DWA525A	Cable L= 25 m
	DWA526A	Cable L= 50 m
	DWA527A	Cable L= 100 m
	**MG2251.R**	7 pin free female connector
	**ML3015.R**	Sensitive element (spare part) for DMA815.1-875.1. EXP815.1
	**EXP301**	Radio signal receiver from EXP815.1 radio sensor. Output compatible with data loggers (M/E-Log) Maximum number of receivable sensors: 200 Battery: NiCd 9 V Power supply: 12 Vdc Connection cable to data logger: DWA601
	**DYA225**	Open well for T+RH% sensors when mounted in ducts in presence of dirty air flow. Material: Iron Dimensions: L= 200 mm Ø 92 mm Support plate: 120x120 mm

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