HD2717T... SERIES

The probes are factory calibrated and ready to use, they are provided with a **SICRAM2** module which stores the calibration data of the probes, allowing their interchangeability.

The instruments measure:
• Temperature in Celsius or Fahrenheit scales
• Relative humidity
and calculate:
• Absolute humidity
• Mixing Ratio
• Dew point
• Wet bulb temperature

All models have both current and voltage outputs.
Some models are fitted with two control relays and one alarm relay, configurable by the user.
All models are fitted with a multistandard RS232/RS485 serial port and an auxiliary RS232C standard serial output. The RS485 serial output allows the management of more than one device in a network.
The models HD2717T... can be with or without LCD. The display shows on the first line the relative humidity or a derived parameter and on the second line the temperature in degrees Celsius or Fahrenheit.
The data logger function allows to store the measures with a selectable storage interval.
The instrument setup remains permanently stored, while the real time clock is protected by an apposite Lithium battery against temporary mains voltage interruptions.
The power supply can be chosen, at the time of placing the order, between 24Vac/dc or universal 90...240Vac.

Instrument versions and available probes

Display	
HD2717Tx.0x	Absent
HD2717Tx.Dx	Custom LCD

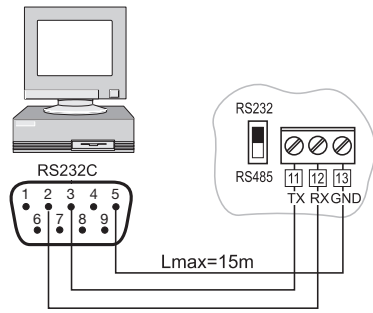| Relay	
HD2717Tx.x0	Absent
HD2717Tx.xR	2 control relays with change-over contact. 1 alarm relay with normally open contact.

Type of probe	
HD2717T.xx	Instrument with vertical probe S.TV or probe with cable S.TC.
HD2717TO.xx	Instrument with horizontal probe S.TO.

HD2717T…SERIES
TRANSMITTER, INDICATOR, ON/OFF REGULATOR, TEMPERATURE AND HUMIDITY DATA LOGGER WITH INTERCHANGEABLE PROBE

The instruments of the **HD2717T...** series are transmitters, indicators, and ON/OFF regulators with data logging functions; they measure temperature and humidity.
The main feature of these instruments is their **interchangeable probe.** The probe can be replaced by the user without process interruption. Thus, the probe can be calibrated or repaired at a later time.
The instrument is available in different versions: with horizontal probe (**S.TO**), vertical probe (**S.TV**) or with remote probe (**S.TC**), having the probe connected to the electronics by means of a cable of various lengths. The S.TO and S.TV probes are made of stainless steel AISI304, the S.TC probes can be of stainless steel AISI304 or Technopolymer PBT (plastic material).
For the measurement of temperature and humidity/dew point in pipes (in particular for compressed air systems) to the HD2717T you can connect the probes S.TC2.480.2 and S.481.2.

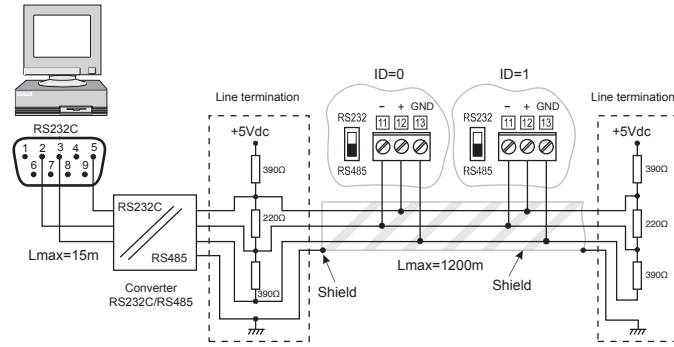| Probes complete with SICRAM2 module for instruments HD2717T.xx	
S.TV	Vertical probe L=130mm. AISI304.
The material of the **S.TC...**probes can be chosen between stainless steel AISI304 or Technopolymer PBT.	
S.TC1.2	Probe L=135mm with cable 2m. AISI304.
S.TC1.2P	Probe L=135mm with cable 2m (PBT probe)
S.TC1.5	Probe L=135mm with cable 5m. AISI304.
S.TC1.5P	Probe L=135mm with cable 5m (PBT probe)
S.TC1.10	Probe L=135mm with cable 10m. AISI304.
S.TC1.10P	Probe L=135mm with cable 10m (PBT probe)
S.TC2.2	Probe L=335mm with cable 2m. AISI304.
S.TC2.2P	Probe L=335mm with cable 2m (PBT probe)
S.TC2.5	Probe L=335mm with cable 5m. AISI304.
S.TC2.5P	Probe L=335mm with cable 5m (PBT probe)
S.TC2.10	Probe L=335mm with cable 10m AISI304.
S.TC2.10P	Probe L=335mm with cable 10m (PBT probe)

Horizontal Probe S.T02

Version without display HD2717TO.0X

Probes with cable for the measurement of humidity and dew point in compressed air systems or pipes:	
S.TC2.480.2	Length of the cable 2m. Measuring range: -40…+60 °C, -40…+60 °C DP ¼" italian standard quick coupling. Working pressure 0 - 16 bar. Measuring chamber made of AISI304.
S.481.2	Lenght of the cable 2m Measuring range: -40…+60 °C, -40…+60 °C DP Connection G ½" Working pressure from -1 > 16 bar

Probes complete with SICRAM2 module for instruments HD2717TO.xx. AISI	
S.TO1	horizontal probe L= 135mm
S.TO2	horizontal probe L= 335mm

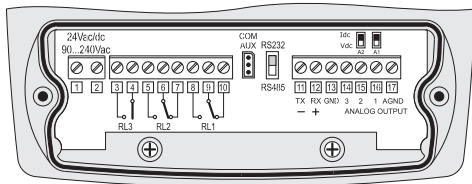PC: connection instrument with serial communication protocol RS232C.

PC connection: instrument with the RS485 communication protocol for distances up to 1200 m using the RS232C/RS485 converter.

On both ends of the network, line termination have to be used. To polarize the line during periods of non transmission, resistors connected between the signal line and power line are used. If you need to connect over 32 instruments, insert a signal repeater between a group and the next one. At the beginning and at the end of each segment you should apply the line terminator. The data line should be kept separate from any power line in order to avoid interferences on the transmitted signal. The cable shield should be connected at both ends of the line. The cable should have the following characteristics:
- Impedance 120 Ohm
- Capacity <50pF/m
- Resistance <100 Ohm/km
- Section > 0.22mm^2, (AVG24)

The maximum cable length depends on the data transmission velocity and on the characteristics of the cable. Typically, the maximum length is 1200m. The data line should be kept separate from any power line in order to avoid interferences on the transmitted signal.

Terminal board

Technical specifications (@ 24Vac and 20 °C)

Inputs

Temperature	Sensor	Pt100 class 1/3 DIN
	Working range of the sensor	-50 ... +200 °C (-58 ...+392°F)
Humidity	Relative humidity %RH	0 ... 100%RH
	Working range of the sensor in temperature	-50 ... +150 °C (Special configurations up to 180 °C available on request)
	Dew point TD	-50 ... +100 °C
	Absolute humidity	0 ... 600g/m^3
	Mixing ratio	0 ... 2000g/kg of dry air
	Wet bulb temperature	-50 ... +100 °C
Accuracy of the measured physical quantities	Temperature Pt100	±0.25°C
	Relative humidity %RH	±1.5%RH (0...90%RH) ±2.0%RH (elsewhere) for T=15…35°C
		±(1.5+1.5% of the measured value)%RH in the remaining temperature range

		Accuracy of the Dew point @ T = 20 °C
Accuracy of the calculated physical quantities	See tables in the following chapter	± 2°C DP (-40…-20 °C DP) ± 1,5°C DP (-20…0 °C DP) ± 1°C DP (0…+20 °C DP)
Response time		3min with grid protection (at 20 °C and 0.5m/s)

Same specifications reported above apply for S.TC2.480.2 and S.481.2 probes (for measuring humidity of the air in pipes), with the following exceptions:

S.TC2.480.2 / S.481.2

Temperature	Measuring range	-40…+60 °C
Dew Point	Measuring range	-40…+60 °C DP
	Accuracy @ T = 20 °C	± 2 °C DP (-40…0 °C DP) ± 1 °C DP (0…+20 °C DP)
Environmental Conditions	Working Temperature	-40...+80 °C
	Working Pressure	0...16 bar (S.TC2.480.2) -1...16 bar (S.481.2)

Outputs

Communications	Type	RS232C and RS485 Multidrop
	Baud Rate	9600 baud 57600 baud non-permanent
Physical quantities	Measured	Temperature, relative humidity
	Calculated	Dew point, absolute humidity, mixing ratio, wet bulb temperature
Analog outputs	Number	2
	Output types	4...20 mA; 0...20 mA 0...10 Vdc; 2…10 Vdc
	Load resistance	Current output: 500Ω max Voltage output: 100kΩ min
	Resolution	16bit
	Accuracy analog outputs	±0.05% f.s. @20 °C
	In case of measuring error (exceeding of the operating limits, faulty or not connected probe,....)	Idc = 22mA Vdc = 11V
Relay	Working relay	2 x 3A/250Vac Load resistance, 1 change-over contact
	Alarm relay	1 x 3A/250Vac Load resistance, 1 with normally open contact

Instrument

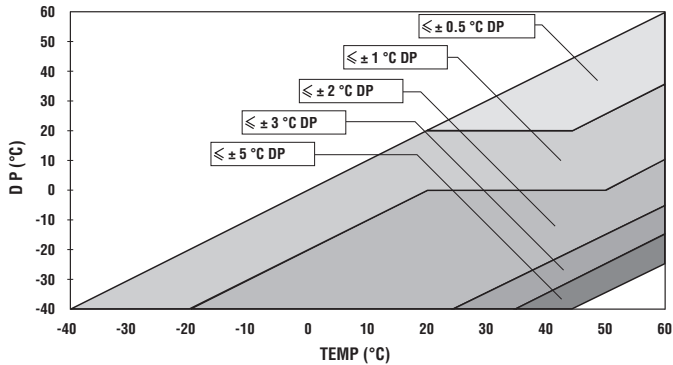|		
Power supply	Versions	24Vdc / 24Vac 50…60Hz, ±10%
		90 ... 240Vac, 50…60Hz
	Average consumption	3W
Data logger	Storage capacity	9000 samples in max. 256 sessions
	Storage type	Circular memory
	Stored parameters	Temperature, relative humidity, dew point, absolute humidity, mixing ratio, wet bulb temperature, analog outputs 1 and 2, relay status 1, 2, 3.
	Storage interval	1, 2, 5, 10, 20, 60 s 2 and 4 min
Real time clock	Type	Real time with Lithium buffer battery
	Accuracy	±1min/month
Software		DeltaLog12 for Windows operative systems, from Windows* 98
Display	LCD	Custom segment LCD
Ambient working conditions of the electronics	Operating temperature	-20…+60 °C
	Relative humidity	0…90%RH - No condensate
	Static working pressure of the sensors	12 bar max.
	Storage temperature	-30…+80 °C
Housing	Lenght x Width x Height	144x154x61
	Weight	600g
	Material	ABS
	Degree of protection	Electronics IP65

Accuracy of the calculated physical quantities

The accuracy of the calculated physical quantities depends on the accuracy of the relative humidity and temperature calibration.

Accuracy of the dew point measurement (DP) as a function of RH

		Relative Humidity (%)					
		10	30	50	70	90	100
Temperature (°C)	-20	0.92	0.49	0.30	0.22	--	--
	0	1.05	0.56	0.35	0.25	0.20	0.18
	20	1.18	0.75	0.45	0.34	0.27	0.23
	50	1.27	0.88	0.56	0.42	0.33	0.30
	100	1.30	1.17	0.76	0.58	0.47	0.42

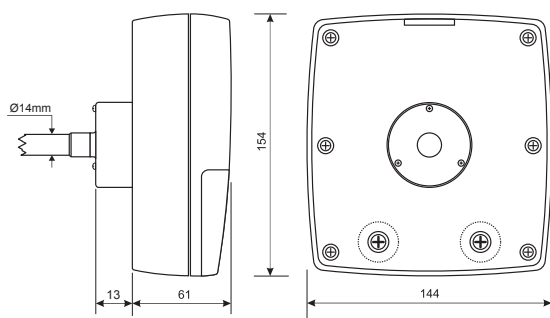### Accuracy of the Dew Point Td (°C) in S.TC2.480.2 and in S.481.2

Accuracy of the absolute humidity (g/m³)

		Relative Humidity (%)					
		10	30	50	70	90	100
Temperature (°C)	-20	0.015	0.020	0.025	0.030	---	---
	0	0.08	0.10	0.11	0.13	0.14	0.15
	20	0.28	0.33	0.40	0.44	0.50	0.55
	50	1.36	1.56	1.74	1.92	2.13	2.19
	100	9.37	10.2	11.3	12.3	13.2	13.5

Accuracy of the mixing ratio (g/kg)

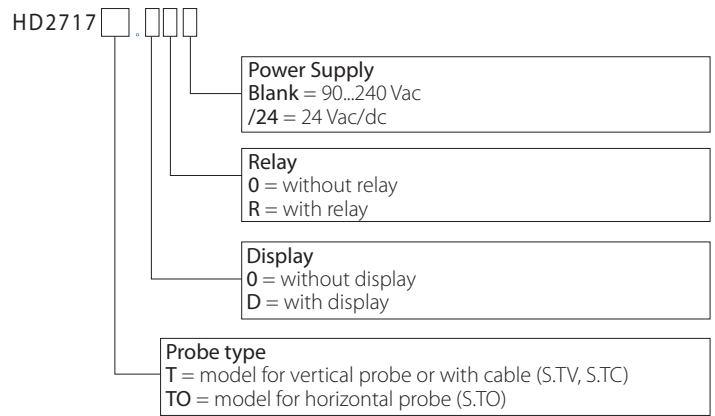|		Relative Humidity (%)					
		10	30	50	70	90	100
Temperature (°C)	-20	0.014	0.017	0.020	0.024	---	---
	0	0.06	0.08	0.09	0.10	0.12	0.13
	20	0.24	0.29	0.34	0.39	0.44	0.45
	50	1.28	1.54	1.85	2.20	2.53	2.66
	100	12.5	23.2	46.2	136.0	---	---

Dimensions

Version HD2717TO... for horizontal probes

ORDERING CODES

HD2717T...: Transmitter, indicator and ON/OFF regulator for temperature and humidity, with data logging functions. Fitted with 2 analogue current outputs (0÷20 mA and 4÷20 mA) or voltage outputs (0÷10 Vdc and 2÷10 Vdc). RS232/RS485 serial outputs for PC connection. It uses interchangeable SICRAM2 probes with microprocessor for the storage of the probe's calibration data. 24Vac/dc or universal 90…240Vac power supply. It includes DeltaLog12 software downloadable from Delta OHM website and instruction manual. RS27 cable is included only for transmitters without display.

Power supply, type of probe and accessories have to be specified when placing the order.

Power Supply Blank = 90...240 Vac /24 = 24 Vac/dc	
Relay 0 = without relay R = with relay	
Display 0 = without display D = with display	
Probe type T = model for vertical probe or with cable (S.TV, S.TC) TO = model for horizontal probe (S.TO)	

Interchangeable temperature and humidity probes with SICRAM 2 module, vertical version S.TV or with cable S.TC

S.TV: Vertical probe. Lenght of stem 130mm. Aisi 304.

Probes with cable:

S.TC1.2: Stem length 135 mm, cable length 2 m. AISI 304
S.TC1.2P: Stem length 135 mm, cable length 2 m. PBT technopolymer
S.TC1.5: Stem length 135 mm, cable length 5 m. AISI 304
S.TC1.5P: Stem length 135 mm, cable length 5 m. PBT technopolymer
S.TC1.10: Stem length 135 mm, cable length 10 m. AISI 304
S.TC1.10P: Stem length 135 mm, cable length 10 m. PBT technopolymer
S.TC2.2: Stem length 335 mm, cable length 2 m. AISI 304
S.TC2.2P: Stem length 335 mm, cable length 2 m. PBT technopolymer
S.TC2.5: Stem length 335 mm, cable length 5 m. AISI 304
S.TC2.5P: Stem length 335 mm, cable length 5 m. PBT technopolymer
S.TC2.10: Stem length 335 mm, cable length 10 m. AISI 304
S.TC2.10P: Stem length 335 mm, cable length 10 m. PBT technopolymer.
S.TC2.480.2: Probe for pipes. Cable length 2m. ¼" quick coupling Italian standard. AISI 304 measuring chamber.
S.481.2: Probe for pipes. G ½" threading. Cable 2 m. 15µ sintered AISI 316 stainless steel filter.

S.TO horizontal interchangeable temperature and humidity probes with SICRAM 2 module

S.TO1: Horizontal probe for instrument HD2717TO.xx. Stem length 135 mm
S.TO2: Horizontal probe for instrument HD2717TO.00. Stem length 335 mm

Accessories:

CP27: USB to COM AUX serial converter.
HD75: 75%RH saturated solution for checking the relative humidity sensor, complete with screw adaptor for probes Ø 14mm and Ø 26mm
HD33: 33%RH saturated solution for checking the relative humidity sensor, complete with screw adaptor for probes Ø 14mm and Ø 26mm
HD11: 11%RH saturated solution for checking the relative humidity sensor, complete with screw adaptor for probes Ø 14mm and Ø 26mm.
HD9008.21.1: Flange with support, hole Ø 26mm for installation of S.TC probes in vertical position, distance from the wall 250mm. The adapter HD9008.26/14 from Ø 26mm to Ø 14mm is requested for S.TC series probes.
HD9008.21.2: Flange with support, hole Ø 26mm for installation of S.TC probes in vertical position, distance from the wall 125mm. The adapter HD9008.26/14 from Ø 26mm to Ø 14mm is requested for S.TC series probes.
HD9008.26/14: Adapter from Ø 26mm to Ø 14mm for supports HD9008.21.1 and HD9008.21.2 for S.TC series probes.
HD9008.31: Wall flange with cable gland to fix the probes Ø 14mm.
PG16: Cable gland made of AISI 304 PG16 for probes Ø 14mm.

Protection for humidity probes Ø 14, thread M12x1

P6: 10µm sintered stainless steel protection. Operating temperature: -40…180 °C.
P7: 20µm PTFE protection. Operating temperature: -40…150 °C.
P8: PBT and 10µm stainless steel grid protection. Operating temperature: -40…120 °C.