



TI8104en

Technical Information



CRC9- Series (H&T)

**Ceiling Humidity and Temperature Sensor
with BACnet / Modbus RTU communication**

The CRC9- Series (H&T) is designed to measure temperature, relative humidity, absolute humidity, enthalpy or dew point in rooms or areas

The Sensor is field replaceable

The sensor operates with low power supply

The sensor withstands harsh environmental conditions due to high protected sensor element

BACnet MSTP and Modbus RTU on Board

The sensor output is via BACnet MSTP / Modbus RTU communication



Use

- In Building Automation System where BACnet MSTP or MODBUS RTU communication protocols are used
- Relative humidity, absolute humidity, enthalpy or dew point and temperature measurement in air ducts
- Used in harsh environments due to IP67 protected sensor element, without impact on the accuracy or measuring time
- Used in all common HVAC applications
- Used in Commercial and Industrial Buildings

Features

- Sensor output via BACnet MSTP / Modbus RTU communication
- Selectable communication protocol
- Field Replaceable sensor
- High Humidity accuracy
- Modern and practical product design
- Easy to use, install and maintain

Product Range

Order Codes	Cable Length	Communication system	Power Supply	Measuring Variable	Measuring Units	Accuracy	Protection
CRC9.BA	2m	BACnet MSTP	AC/DC 24V (±10%)	rel. humidity	0...100%	± 2%, Full Scale	IP20
				absolute humidity	0...50gr/m3		
				absolute humidity	-20...80°C		
CRC9.BG	2m	Modbus RTU		enthalpy	0...85kJ/Kg		

Sensor Specification	Sensor Specification	Measured	Temperature & Humidity
		Sensor Characteristics H/T	Active
		Outputs	BACnet MSTP or Modbus RTU communication, RS485
		Accuracy	relative humidity ± 2% over measuring range
			absolute humidity ± 2% over measuring range
			enthalpy ± 2% over measuring range
			dew point ± 2% over measuring range
			Temperature see chart, page 4
		IP- Rating sensor element	IP67 to IEC60529
		Repeatability (H)	±0.1C ; ±0.1% r.h.
	Long Term Drift (H)	< 0.04C / year ; < 0.5% r.h. / year	
	Measuring Range (H)	see charts page 4	
	Measuring Range (T) (default)	-40°C...120°C	
Technical Information	Electrical Information	Power Supply	AC/DC 24V (±10%)
		Frequency	50 / 60 Hz at AC 24V
		Terminal Clamp	Screw terminal, max. 1.5mm ²
		Power Consumption	≤ 1W @ AC 24V / DC 24V
	Mechanical Information	Cable Length	2m
		Cable Lead Diameter	Ø0.25mm
		Cable Diameter	4.6mm
		Sensing Element Position	external, top of the sensor pocket
		Sensor Housing	Ø30mmx37mm
		Sensor / Housing connection	M12 screw-on connection
	Color and Materials	Housing Cover	White ABS, RAL9001 (Cream White)
		Housing Bottom	White ABS, RAL9001 (Cream White)
		Lock Screws	US:AISI 304; EU: EN X 6 CrNi 18 10; GER: W.N. 1.301
		Lock Nuts	Brass
		Sensor / Housing connection	Zink alloy - Nickel plated
		Cable Gland	White ABS, RAL2002 (Vermilion)
		Gland Rubber Seal	White TBS, RAL9010 (Pure White)
		Protection Caps	White ABS, RAL2002 (Vermilion)
	Environmental Conditions	Operation Temperature	-25°C...+70°C
		Operation Humidity	<85% r.h., no condensation
		Transport Temperature	-35°C...+70°C
		Transport Humidity	< 90% r.h.
		Storage Temperature	-10°C...+70°C
		Storage Humidity	< 85% r.h., no condensation
	Norms and Directives	IP- Rating	IP20 to IEC60529
		Safety Class	III to EN 60 730
		Product Standard 1	Automatic Electric. Controls for household and similar use
		Product Standard 2	2009/EN 60 730-1
		CE Conformities to	2004/108/EG Electromagnetic Compatibility EMV
		CE Electromagnetic Compatibility Emitted Interference	2000/EN60730-1 Emitted Interference
		CE Electromagnetic Compatibility Interference resistance	2000/EN60730-1 Interference Resistance
		RoHS Compatibility	RoHS 3, Directive 2015/863
	Operation Climatic Condition	IEC 60 721-3-3	
	Operation Mechanical Condition	IEC 60 721-3-2 to class2M2	
	Transport to Climatic Condition	IEC 60 721-3-2	
	Transport Mechanical Condition	IEC 60 721-3-2 to class2M2	
	Storage Climatic Condition	IEC 60 721-3-1	
	Storage Mechanical Condition	IEC 60 721-3-1 to class2M2	
Miscellaneous	Accessories	n/a	n/a
	Shipping & Handling	Minimum Order	1 box with 1 piece
		Packaging	Rigid Cardboards
	Order Notes	Order Code	See Product Range, Page 1, e.g. CRC9.BA

Modbus Parameters	Address Number	Register Description	
	0...3	Serial Number	actual version
	4	Software Version	actual version
	6	Modbus Address	Default 254, selectable 1...254
	8	Hardware Version	actual version
	11	Baud Rate autodetection	0= OFF ; 1= On
	15	Baud Rate, (if autodetection is OFF)	0= 9600 ; 1= 19.200 ; 2= 38.400 ; 3= 57.600 ; 4= 115.200
	34	Temperature, digital	actual value
	35	Rel. Humidity	actual value
	41	Dew Point Value, actual	actual value
	42	Enthalpy Value, actual	actual value
	44	Absolute Humidity, actual	actual value
	45	Temperature, passive	actual value

BACnet Parameters	Supported BACnet Objects Types		
		analog-value	
		device	
	Supported BACnet Services		
		who-is	
		i-am	
	object-identifier, object-name, object-type, present-value, units, object-list, vendor-id, vendor-name, system-status, confirmed-service, unconfirmed-services		
	MSTP Objects		
		analog-value	
		BACnet Address	Default 127, selectable 0...127
AV0	Baud rate autodetection	default 0, 0= OFF ; 1= ON	
AV1	Baud Rate, (if autodetection is OFF)	0= 9600 ; 1= 19.200 ; 2= 38.400 ; 3= 57.600 ; 4= 115.200	
AV2	Humidity Mode	0= Dew Point ; 1= Enthalpy ; 2= Absolute Humidity ; 3= relative humidity	
AV3	Protocol	0= Modbus ; 1= BACnet	
AV4	Temperature	actual value (-40...120°C)	
AV6	Relative Humidity	actual value (0...100% rel. Humidity)	
AV7	Absolute Humidity	actual value (0...50gr/m ³)	
AV8	Dew Point	actual value (-20...80°C)	
AV9	Enthalpy	actual value (0...85kJ/kg)	
	Device		
	device-identifier		
	device-name		

The function "Baud Rate autodetection" can only be used during the product is been setup. When the product is working with the BAS, the "Baud Rate autodetection" has to be set to 0= OFF and the actual Baud Rate has to be set.

Installation Notes



Observe the following general regulation for engineering and implementation:

All relevant national and heavy power regulation

Other country specific regulations

Country-specific regulations

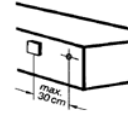
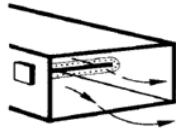
Local electrical supply authority regulation

Schematics, cable listings, dispositions, specification and arrangements from the customer or engineering office in charge

Third party specifications, e.g. general contractors or constructors

Advices

Mounting Advices



Disposal Notes



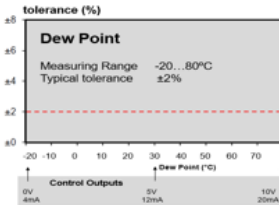
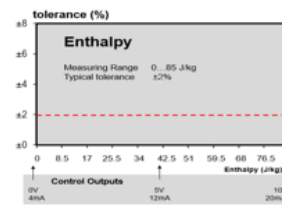
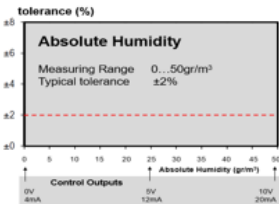
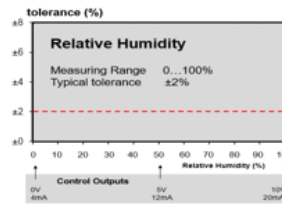
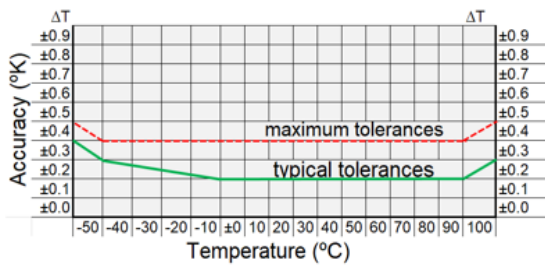
The device is considered an electronic device for disposal in terms of the EUROPEAN DIRECTIVE 2012/19/EU.

The device may not be disposed as domestic garbage.

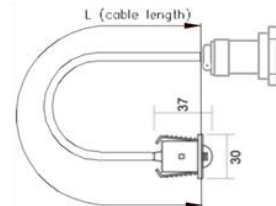
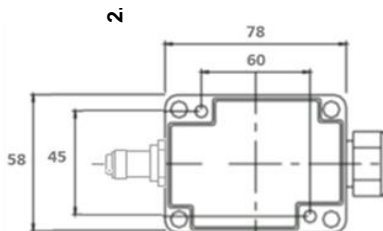
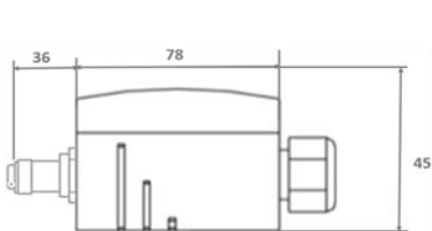
The device must be disposed through channels provided for this purpose.

It is mandatory to comply with local currently applying laws and regulations.

Accuracy Curves



Dimensional Drawing



Connections & Settings

Terminals Connection					
T1	T2	T3	T4	T5	T6
UB+	24V AC/DC	GND	RS485 - C-	RS485 - C+	n.A.
				n.A.	n.A.