
 <b>TI8120en</b>	<b>Technical Information</b>	
<b>CDI9- Series (H&amp;T)</b>	<b>Duct Humidity and Temperature Sensor with BACnet / Modbus RTU communication</b>	

The CDI9- Series (H&T) is designed to measure temperature, relative humidity,

absolute humidity, enthalpy or dew point in rooms or areas

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



<b>Use</b>	<p>In Building Automation System where BACnet MSTP or MODBUS RTU communication protocols are used</p> <p>Relative humidity, absolute humidity, enthalpy or dew point and temperature measurement in air ducts</p> <p>Used in harsh environments due to IP67 protected sensor element, without impact on the accuracy or measuring time</p> <p>Used in all common HVAC applications</p> <p>Used in Commercial and Industrial Buildings</p>
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<b>Features</b>	<p>Sensor output via BACnet MSTP / Modbus RTU communication</p> <p>Selectable communication protocol</p> <p>High Humidity accuracy</p> <p>Modern and practical product design</p> <p>Easy to use, install and maintain</p>
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<b>Product Range</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th data-bbox="169 1469 300 1599">Order Codes</th> <th data-bbox="300 1469 430 1599">Immersion Lengths</th> <th data-bbox="430 1469 561 1599">Power Supply</th> <th data-bbox="561 1469 730 1599">Communication system</th> <th data-bbox="730 1469 906 1599">Measuring Variable</th> <th data-bbox="906 1469 1075 1599">Measuring Units</th> <th data-bbox="1075 1469 1251 1599">Accuracy</th> <th data-bbox="1251 1469 1420 1599">Protection</th> </tr> </thead> <tbody> <tr> <td data-bbox="169 1599 300 1729">CDI9.AA</td> <td data-bbox="300 1599 430 1729">140mm</td> <td data-bbox="430 1599 561 2116" rowspan="4" style="text-align: center; vertical-align: middle;">AC/DC 24V (±10%)</td> <td data-bbox="561 1599 730 1859" rowspan="2" style="text-align: center; vertical-align: middle;">BACnet MSTP</td> <td data-bbox="730 1599 906 1729">rel. humidity</td> <td data-bbox="906 1599 1075 1729">0...100%</td> <td data-bbox="1075 1599 1251 2116" rowspan="4" style="text-align: center; vertical-align: middle;">± 2%, Full Scale</td> <td data-bbox="1251 1599 1420 2116" rowspan="4" style="text-align: center; vertical-align: middle;">Housing IP65 Sensing Element IP67</td> </tr> <tr> <td data-bbox="169 1729 300 1859">CDI9.BA</td> <td data-bbox="300 1729 430 1859">270mm</td> <td data-bbox="730 1729 906 1859">absolute humidity</td> <td data-bbox="906 1729 1075 1859">0...50gr/m3</td> </tr> <tr> <td data-bbox="169 1859 300 1989">CDI9.AG</td> <td data-bbox="300 1859 430 1989">140mm</td> <td data-bbox="561 1859 730 2116" rowspan="2" style="text-align: center; vertical-align: middle;">Modbus RTU</td> <td data-bbox="730 1859 906 1989">dew point</td> <td data-bbox="906 1859 1075 1989">-20...80°C</td> </tr> <tr> <td data-bbox="169 1989 300 2116">CDI9.BG</td> <td data-bbox="300 1989 430 2116">270mm</td> <td data-bbox="730 1989 906 2116">enthalpy</td> <td data-bbox="906 1989 1075 2116">0...85kJ/Kg</td> </tr> </tbody> </table>	Order Codes	Immersion Lengths	Power Supply	Communication system	Measuring Variable	Measuring Units	Accuracy	Protection	CDI9.AA	140mm	AC/DC 24V (±10%)	BACnet MSTP	rel. humidity	0...100%	± 2%, Full Scale	Housing IP65 Sensing Element IP67	CDI9.BA	270mm	absolute humidity	0...50gr/m3	CDI9.AG	140mm	Modbus RTU	dew point	-20...80°C	CDI9.BG	270mm	enthalpy	0...85kJ/Kg
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<b>Sensor Specification</b>	Sensor Specification	Measured	Temperature & Humidity
		Sensor Characteristics H/T	Active
		Outputs	BACnet MSTP or Modbus RTU communication, RS485
		Accuracy	relative humidity absolute humidity enthalpy dew point Temperature
		IP- Rating sensor element	± 2% over measuring range ± 2% over measuring range ± 2% over measuring range ± 2% over measuring range see chart, page 4
		Repeatability (H)	IP67 to IEC60529
		Long Term Drift (H)	±0.1°C ; ±0.1% r.h.
		Measuring Range (H)	< 0.04°C / year ; < 0.5% r.h. / year
		Measuring Range (T) (default)	see charts page 4
<b>Technical Information</b>	Electrical Information	Power Supply	AC/DC 24V (±10%)
		Frequency	50 / 60 Hz at AC 24V
		Terminal Clamp	Screw terminal, max. 1.5mm <sup>2</sup>
		Power Consumption	≤ 1W @ AC 24V / DC 24V
	Mechanical Information	Immersion Rod Diameter	Ø19mm
		Immersion Rod Length	140mm / 270mm
		Cable Entry	M16, Ø6...Ø8mm cables
		Sensing Element Position	external, top of the immersion rod
	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
		Cable Gland	Red ABS, RAL2002 (Vermilion)
		Gland Rubber Seal	White TBS, RAL9010 (Pure White)
		Protection Caps	Red ABS, RAL2002 (Vermilion)
		Immersion Rod	Black PVC, RAL 9017 (Traffic Black)
	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	IP65 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	
<b>Miscellaneous</b>		Accessories	Duct Mounting Kit, HDK0.A
	Shipping & Handling	1 box with 2 piece Rigid Cardboards Packaging	
	Order Notes	See Product Range, Page 1, e.g. CDI9.AA	

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 <sup>3</sup> )	
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**

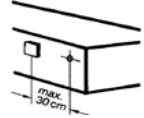
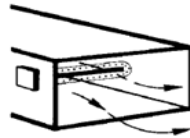
Observe the following general regulation for engineering and implementation:



- 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**



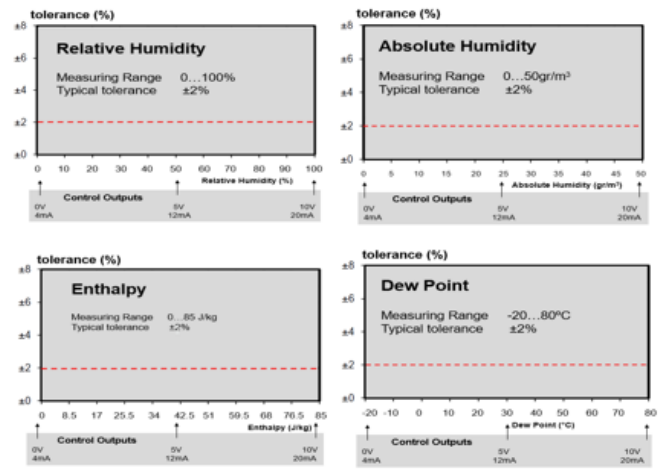
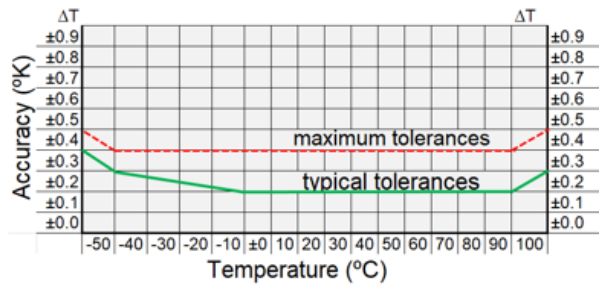
**Disposal Notes**

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

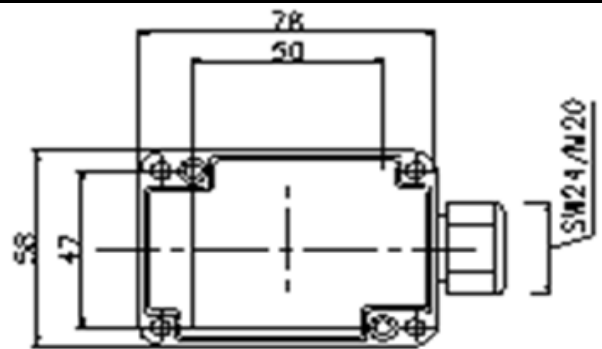
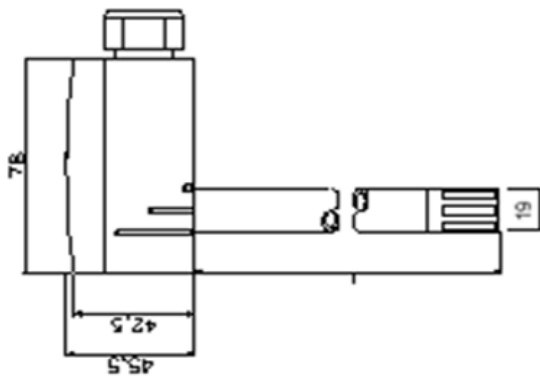


- The device may not be disposed as domestic garbage.
- The device must be disposed through channels provided for this purpose.
- It is mandatory to comply with local currently applying laws and regulations.

**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.