	TI1412en	**Technical Information**	thermokon® asia pacific
COW4- Series (H&T)		**Outdoor Humidity and Temperature Sensor with Active Outputs**	

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

dew point or enthalpy in outdoor areas, plant rooms, factories, cold stores, greenhouses and warehouses

The sensor operates with low power supply

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

Available with passive sensors

The Humidity and Temperature sensor outputs are active, passive Temperature sensor optional

Use	Compatible to all common HVAC DDC and Analog Controls systems, with/without Building Automation System
	Relative humidity, absolute humidity, enthalpy or dew point and temperature measurement in outdoor / plant areas
	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

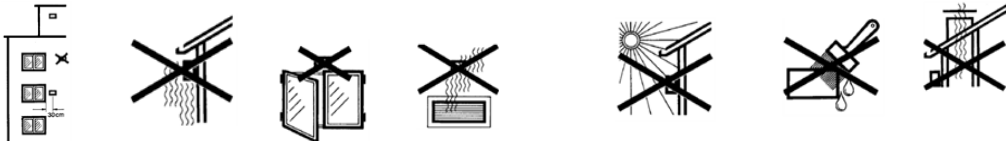| **Features**	Sensor outputs are active
	Sensor outputs 0…10V or 4…20mA, available with PT, NTC and NI passive sensors
	Multiple Temperature sensor measuring ranges
	High Humidity sensor accuracy
	Humidity and Temperature Field calibration potentiometer
	Professional and practical product design, withstanding harsh environmental conditions
	Easy to use, install and maintain
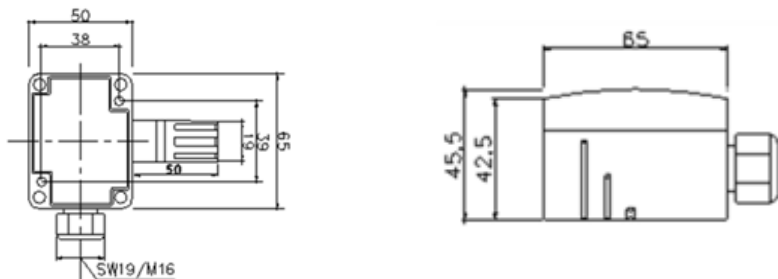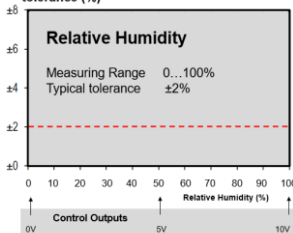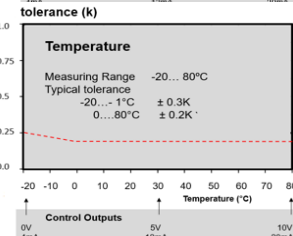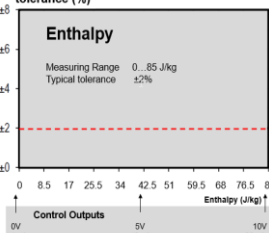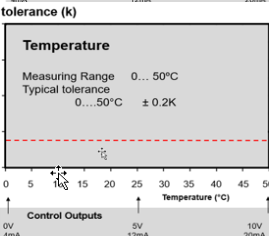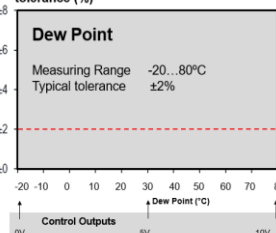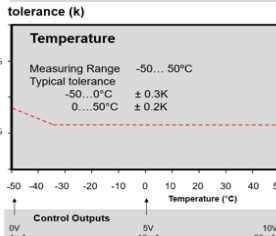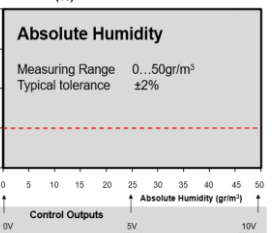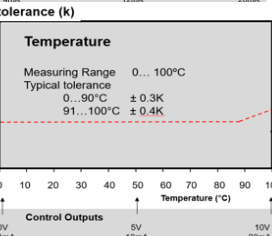
Product Range

Order Codes	Pocket length	Power Supply	Humidity / Temperature Output	Temperature Passive Outputs	Temp. Ranges	Humidity	Measuring Units	**Humidity Accuracy**
COW4.AE				n.a.				
COW4.AJa			0…10V* or 4…20mA	PT100	-50…50°C*	rel. humidity*	0…100%	
COW4.AKa		AC/DC 24V (±10%)		PT1000	0...50°C	absolute humidity	0…50gr/m3	± 2%, Full Scale
COW4.AMa	50mm			NTC10k	-20…80°C	dew point	-20….80°C	
COW4.AOa				NTC10 Pre	0…100°C	enthalpy	0…85kJ/Kg	
COW4.ANa				NTC20k				
COW4.ALa				NI1000				

* default setting

Sensor Specification	Sensor Specification	Measured	Temperature & Humidity
		Sensor Characteristics	Active
		Outputs	0…10V ; 0…10V or 4…20mA ; 4…20mA
		Temperature OFF-set Potentiometer (R1)	± 3k
		Humidity OFF-set Potentiometer (R2)	± 5%
		Output Load	
		0…10V	Min. load 10kΩ @ AC/DC 24V
		4…20mA	Max. load 500Ω @ DC 24V
		Measuring Current	<1mA
		Accuracy	
		relative humidity	± 2% within 0…100% r.h.
		absolute humidity	± 2% within 0…100% r.h.
		enthalpy	± 2% within 0…100% r.h.
		dew point	± 2% within 0…100% r.h.
		Temperature, active	see temperature chart, page 3
		Temperature PT100/1000	± 0.3K @ 0ºC DIN EN 60751, class B
		Temperature NTC10k /10k Pre / 20k	±0.3K @ 25ºC
		Temperature NI1000	± 0.4K @ 0ºC DIN EN 43760, class B
		IP- Rating sensor element	IP67 to IEC60529
		Repeatability (H)	±0.1℃ ; ±0.1% r.h.
		Long Term Drift (H)	< 0.04℃ / year ; < 0.5% r.h. / year
		Measuring Range (H)	0…100%
		Measuring Range (T) (default)	-50ºC…50ºC
		Measuring Ranges (T) (optional, on board)	0ºC…50ºC ; -20ºC…+80ºC ; 0ºC…+100ºC
Technical Information	Electrical Information	Power Supply	AC/DC 24V (±10%)
		Frequency	50 / 60 Hz at AC 24V
		Terminal Clamp	Screw terminal, max. 1.5mm²
		Power Consumption	
		0…10V	≤ 0.4W / AC 24V; ≤ 0.85VA / DC 24V
		4…20mA	≤ 20mA / DC 24V
	Mechanical Information	Measuring Pocket Diameter	Ø19mm
		Measuring Pocket Length	50mm
		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	White ABS, RAL9001 (Cream White)
	Environmental Conditions	Operation Temperature	-25ºC...+70ºC
		Operation Humidity	<85% r.h., no condensation
		Transport Temperature	-35ºC...+70ºC
		Transport Humidity	< 90% r.h.
		Storage Temperature	-10ºC...+70ºC
		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 2011/65/EC
		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	Accessory not included in delivery	none
	Shipping & Handling	Minimum Order	1 box with 2 piece
		Product Dimension (L x W x H) / ~Weight	46mm x 100mm x 65mm / 80gr.
		Transport and Storage dimension (L x W x H) / ~Weight	245mm x 90mm x 65mm / 175gr.
		Package Material	Rigid Cardboards Packaging
	Order Notes	Order Code	e.g. COW4.AE

Advices

Installation Notes

Caution

Observe the following general regulation for engineering and implementation:

All relevant national and heavy power regulations

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

Mounting Advices

Caution

Under normal environmental conditions we recommend a recalibration interval of 2 year to maintain the indicated accuracy.

Refrain from touching the sensitive sensor. Any touch of the same will result in an expiration of the warranty.

At high ambient temperatures and high humidity, or when use the sensor in aggressive gases,

an early recalibration or a change of the sensor can become necessary.

Such a recalibration or a probable sensor change may not come under the general warranty

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.

Connections & Settings

T1	T2	T3	T4	T5	T6
UB+	24V AC/DC	GND	Temperature	Humidity	S+	T passive	S-	T passive

Temperature Setting (DIP1 & DIP 2)

DIP1 DIP2	DIP1 DIP2	DIP1 DIP2	DIP1 DIP2
-20…80C°	0…100C°	-50…50C°	0…50C°

Humidity Setting (DIP3 & DIP 4)

DIP3 DIP4	DIP3 DIP4	DIP3 DIP4	DIP3 DIP4
rel. H	abs. H	enthalpy	dew point

DIP5

DIP5	DIP5
0…10V	4…20mA

R1- Off-set potentiometer (TE)   0 K   -3 K / +3 K

R2- Off-set potentiometer (HU)   0%   -5% / +5%

Dimensional Drawing

Accuracy Curves

Relative Humidity
Measuring Range 0…100%
Typical tolerance ±2%

Enthalpy
Measuring Range 0…85 J/kg
Typical tolerance ±2%

Dew Point
Measuring Range -20…80°C
Typical tolerance ±2%

Absolute Humidity
Measuring Range 0…50gr/m³
Typical tolerance ±2%

Temperature
Measuring Range -20… 80°C
Typical tolerance
-20…- 1°C   ± 0.3K
0…80°C   ± 0.2K

Temperature
Measuring Range 0… 50°C
Typical tolerance
0…50°C   ± 0.2K

Temperature
Measuring Range -50… 50°C
Typical tolerance
-50…0°C   ± 0.3K
0…50°C   ± 0.2K

Temperature
Measuring Range 0… 100°C
Typical tolerance
0…90°C   ± 0.3K
91…100°C   ± 0.4K