# **公TDK**

# **Humidity Sensor Units**

Unit type

# CHS series

Type: CHS-U (For industrial use and measuring equipment) CHS-SS(For consumer and office equipment) CHS-C(For consumer and office equipment)

Issue date: January 2010

• All specifications are subject to change without notice.

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

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# Humidity Sensor Units CHS Series CHS-U, -SS, -C Types

TDK's CHS series humidity sensors are compact and extremely simple to apply. Because they contain the necessary circuitry, there is no need to provide additional control circuitry or perform time-consuming calibration. With simple connection to a power supply, they will output DC at 100% relative humidity. This makes it possible to read RH directly with a voltmeter.

#### **CHS-U TYPE**

#### For industrial use and measuring equipment

#### FEATURES

- These sensors can measure a wide range of humidity from 5(%) to 95(%)RH.
- They are highly accurate. The nominal accuracy for the CHS-UPR and CHR-UPS is within ±3(%) RH.

Туре	CHS-UGS CHS-UGR	CHS-UPS CHS-UPR	
Nominal accuracy(%)RH	±5	±3	
Measuring range(%)RH	5 to 95	5 to 95	

SHAPES AND DIMENSIONS SQUARE TYPE CHS-UGS, -UPS



#### MAXIMUM RATINGS (Ta=25°C)

Power supply voltage Edc	7V max.
Operating conditions	0 to +50°C, power supply voltage 5V, without dewing
Storage conditions	–20 to +60°C, without dewing

- Characteristics are stable over a wide temperature range.
- · Humidity sensing characteristics exhibit virtually no hysteresis.
- Highly cost-effective and compact, requiring extremely little mounting space.
- Low current consumption.

**ROUND TYPE** 

- Outputs DC.1V at 100(%)RH; relative humidity can be read directly with a voltmeter.
- All-in-one construction integrates sensor with support circuitry. The entire module operates off a 5V power supply.
- Generated ripple at low humidity levels will not exceed 2.5mV.



Dimensions in mm Tolerance:  $\pm 0.2$ 

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# CHS-U TYPE ELECTRICAL CHARACTERISTICS

Item		Specifications			Conditions
		Minimum	Standard	Maximum	
Operating voltage E	Edc (V)	4.75	5	5.25	
Operating current(r	nA)			0.6	Edc=5V, 25°C
Output voltage(mV)	)/(%)RH		10		Edc=5V, 25°C, 5 to 95(%)RH
Output impedance(	kΩ)		(200)*		at DC
Accuracy(%)RH	CHS-UPS, -UPR	-3		+3	Edc=5V, 25°C, 5 to 95(%)RH
	CHS-UGS, -UGR	-5		+5	(For details, please refer to typical characteristics)
Hysteresis(%)RH			≈0		Stable time: 20min
Temperature deper	ndency(%)RH	-5		+5	Edc=5V, 25°C standard, +5 to +45°C, 5 to 95(%)RH
Response time(min)			1		Response time to reach 90% of actual humidity as for from 30 to 85(%)RH
Recommended ope	erating temperature(°C)	+5		+45	Edc=5V

\*( ): Reference value

TYPICAL CHARACTERISTICS SENSOR LINEARITY CHARACTERISTICS (Ta=25°C Edc=5V)



#### **TEMPERATURE DEPENDENCY CHARACTERISTICS**



 $\begin{array}{l} \mbox{Specification temperature zone} \\ +5 \mbox{ to } +45\,^{\circ}C(5 \mbox{ to } 95(\%)RH) \\ \mbox{Tolerance of each humidity} \\ \pm5(\%)RH \end{array}$ 



### **CHS-SS TYPE**

# For consumer and office equipment

# FEATURES

- Humidity sensing characteristics exhibit virtually no hysteresis.
- Compact size.
- Low current consumption.
- Outputs DC.1V at 100(%)RH; relative humidity can be read directly with a voltmeter.
- All-in-one construction integrates sensor with support circuitry. The entire module operates off a 5V power supply.

Generated ripple at low humidity levels will not exceed 2.5mV.			
Туре	CHS-MSS		
Nominal accuracy(%)RH	±5		
Measuring range(%)RH	20 to 85		

#### MAXIMUM RATINGS (Ta=25°C)

Power supply voltage Edc	7V max.
Operating conditions	0 to +50°C, power supply voltage 5V, without dewing
Storage conditions	-20 to +60°C, without dewing

#### SHAPES AND DIMENSIONS

#### SQUARE TYPE

2.5



\*2 The three leads are parallel to within 0.2mm.

Weight: 1.1g typ.

Dimensions in mm Tolerance: ±0.2

### **ELECTRICAL CHARACTERISTICS**

Item	Specifications			Conditions	
	Minimum Standard Maximum		Maximum	_	
Operating voltage Edc (V)	4.75	5	5.25		
Operating current(mA)			0.6	Edc=5V, 25°C	
Output voltage(mV)/(%)RH		10		Edc=5V, 25°C	
Output impedance(k $\Omega$ )		(200)*		at DC	
Accuracy(%)RH	-5		+5	Edc=5V, 25°C, 20 to 85(%)RH(For details, please refer to typical characteristics)	
Hysteresis(%)RH		≈0		Stable time: 20min	
Temperature dependency(%)RH	-5		+5	Edc=5V, 25°C standard	
Response time(min)		1		Response time to reach 90% of actual humidity as for from 30 to 85(%)RH	
Recommended operating temperature(°C)	+15		+35	Edc=5V, without dewing(For details, please refer to typical characteristics)	

\*( ): Reference value



### CHS-SS TYPE

TYPICAL CHARACTERISTICS

SENSOR LINEARITY CHARACTERISTICS (Ta=25°C Edc=5V) CHS-MSS TYPE



# TEMPERATURE DEPENDENCY CHARACTERISTICS CHS-MSS TYPE



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#### CHS-C TYPE

## For consumer and office equipment

# FEATURES

- Temperature detection thermistor can be added.
- Humidity sensing characteristics exhibit virtually no hysteresis.
- Low current consumption.
- Absolute humidity can be read directly with DC. 1V voltmeter.
- All-in-one construction incorporates circuits and 5V power supply operation.
- Generated ripple at low humidity levels will not exceed 2.5mV.
   Type CHS-CMC-\_\_

Nominal accuracy(%)RH	±5	
Measuring range(%)RH	30, 50, 80	

# MAXIMUM RATINGS (Ta=25°C)

Power supply voltage Edc	7V max.
Operating conditions	0 to +50°C, power supply voltage 5V, without dewing
Storage conditions	-20 to +60°C, without dewing



### **ELECTRICAL CHARACTERISTICS**

Item		Specifications			Conditions
		Minimum	Standard	Maximum	
Operating voltage Edc (V)		4.75	5	5.25	
Operating current(mA)				0.6	Edc=5V, 25°C
Output impedance(kΩ)			(200)		at DC
	30(%)RH	–5 (0.5V)	(0.6V)	+5 (0.7V)	5-1- 5V 05%0
Accuracy(%)RH	50(%)RH	–5 (0.86V)	(0.96V)	+5 (1.06V)	<ul> <li>Edc=5V, 25°C (For details, please refer to typical characteristics)</li> </ul>
	80(%)RH	–5 (1.5V)	(1.6V)	+5 (1.7V)	_
Hysteresis(%)RH			≈0		Stable time: 20 min
Temperature dependency(%	5)RH	-5		+5	Edc=5V, 25°C standard (For details, please refer to typical characteristics)
Response time(min)			1		Response time to reach 90% of actual humidity as for from 30 to 85(%)RH
Recommended operating temperature(°C)		+15		+35	Edc=5V

# RECOMMENDED CHARACTERISTICS OF TEMPERATURE

# **DETECTION THERMISTOR**

Part No.	NTCCM16084BH103JC
Resistance value(Between TH1 and TH2)	10kΩ±5%
Constant B	4100K±3%
Maximum rated power	230mW

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# CHS-C TYPE TYPICAL CHARACTERISTICS SENSOR LINEARITY CHARACTERISTICS(Ta=25°C, Edc=5V)

# 1.6 1.6 0.4 0.4 0.20 40 60 80 100 Relative humidity(%)RH ----- Typical value • Specification temperatue zone

# TYPICAL APPLICATIONS HUMIDITY MONITOR



### **TEMPERATURE DEPENDENCY CHARACTERISTICS**



### **BATTERY POWERED SYSTEM**



Humidity output signal

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