

***HCRH-21Ka/V, HCRH-22Ka/XV, HCRH-  
23Ka/VV***

***„Temperature and Humidity  
Transducer with 0-10V Voltage  
Outputs”***



Developed by:

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2020-12-07

# 1. Introduction

The subject of this elaboration is the functional characteristic of the HCRH-2xKa Temperature and Humidity Transducer, based on the SHT Series Sensor by Sensirion, with 0-10V voltage outputs.

ATTENTION: Before activating the module, you must familiarize with this document.

## 1.1. Device Functions

- **Relative Humidity** measurement
- Analog voltage output 0-10 [V] (proportional to RH within 0-100% range)
- **Temperature** measurement
- Analog voltage output 0-10 [V] (proportional to T within the following ranges available as options: 0-50°C, -30-70°C, -30-50°C, 0-100°C or other ( full list in section 2.5 )

## 1.2. Device Characteristic

The primary function of the HCRH-2xKa Temperature and Humidity Transducers is to provide readings of momentary temperature compensated humidity values, and concurrently, readings of just momentary temperature values. The Device presents both of the values as analog signals, via two independent 0-10 [V] voltage outputs.

# 2. Technical Data

## 2.1. Transducer Parameters

<b>Typical Power Supply</b>	
- Direct Current	24V +/-10% DC
- Alternating Current	24V +/-10% AC
<b>Maximum Power Supply</b>	
- Direct Current	<45 V DC
- Alternating Current	<31,5 V AC
<b>Power Consumption</b>	
- Minimum <sup>1)</sup>	DC14,0 mA; AC20 mA
- Typical <sup>2)</sup>	DC 16,5 mA; AC 25 mA
- Maximum <sup>3)</sup>	DC 42,0 mA; AC 55 mA
<b>Sensor Protection Means</b>	Stainless Mesh Filter
<b>Electric Connector</b>	Terminal Screw Connector with 5.00mm Pitch (≤ 2,5mm <sup>2</sup> )
<b>Cable Gland</b>	PG9
<b>Dimensions</b>	112x62x32 mm (L x H x W)
<b>Probe</b>	Diameter 16 mm, Length 38 mm
<b>Weight</b>	85 g
<b>Housing Material</b>	ABS
<b>Installation <sup>4)</sup></b>	Underfloor
<b>Protection Rating</b>	IP65
<b>Operating Environment</b>	Dust-free, Air, Neutral Gas
<b>Operating Temperature</b>	-20°C ÷ 80°C
<b>Storage Temperature</b>	-40...85°C
<b>EMC</b>	EN61326-1; EN61326-2-3

1) Mean power consumption under the following conditions: no load on the Analog Out, 24V DC;

2) Mean power consumption under the following conditions: Analog Out load resistance of 10kΩ; 24V DC;

3) Mean power consumption under the following conditions: Analog Outs load resistance of 1kΩ; under maximum power supply < 45V DC;

4) This device should be installed by qualified personnel;

## 2.2. Humidity Measurement Parameters

<b>Sensor Type</b>	SHT Series
<b>Measurement Range</b>	0 ÷ 100 %RH
<b>Resolution</b>	12 Bit (0,04 %RH)
<b>Accuracy for T=25°C</b>	for 20...80%RH ±1,8 %RH <sup>1)</sup> for 0...20% and 80...100%RH ±3 %RH
<b>Temperature Dependency for 45%RH</b>	Typically 0,05%RH/°C
<b>Hysteresis</b>	±1 %RH
<b>Sampling Frequency</b>	1 Hz
<b>Sampling Period <sup>2)</sup></b>	8 s

- 1) Optional, with the possibility to achieve Accuracy of ±1% through calibration;
- 2) The condition for achieving the listed Sampling Period is airflow greater than 1m/s in the temperature of 25°C; the Sampling Period provided corresponds to one time constant equal to 63% of set value;

## 2.3. Temperature Measurement Parameters

<b>Sensor Type</b>	SHT Series or RTD Sensor
<b>Measurement Range</b>	-30°C ÷ 100°C
<b>Resolution</b>	14 Bits (0,01 °C)
<b>Accuracy</b>	0...65°C ±0,2 °C 65...90°C ±0,25°C
<b>Sampling Frequency</b>	1 Hz
<b>Sampling Period <sup>1)</sup></b>	> 2 s

- 1) The condition for achieving the listed Sampling Period is airflow greater than 1m/s; the listed Sampling Period is corresponds to one time constant equal to 63% of the set value;

## 2.4. Analog Out Parameters

<b>Type</b>	Voltage
<b>Voltage Output Range</b>	0 ÷ 10 V
<b>Resolution</b>	12 Bit (5 mV)
<b>Output Load</b>	R <sub>L</sub> > 1 kΩ
<b>Refresh Rate</b>	1 Hz

## 2.5 HCRH-2xKa Series Sensors Description

**HCRH-21Ka/V** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH)

**HCRH-22Ka/PT100/V** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Measurement action using RTD Sensor PT100

**HCRH-22Ka/PT1000/V** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Measurement action using RTD Sensor PT100

**HCRH-22Ka/NTC10KCareI/V** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Measurement action using RTD Sensor PT100

**HCRH-22Ka/NTC10K3A1/V** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Measurement action using RTD Sensor PT100

**HCRH-22Ka/NTC10K4A1/V** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Measurement action using RTD Sensor PT100

**HCRH-22Ka/NTC1,8KTAC/V** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Measurement action using RTD Sensor PT100

**HCRH-22Ka/NTC20KHoneywell/V** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Measurement action using RTD Sensor PT100

**HCRH-23Ka/VV/-10...50** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Transducer with 0-10 V Voltage Output ; range -10-50°C

**HCRH-23Ka/VV/-20...50** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Transducer with 0-10 V Voltage Output ; range -20-50°C

**HCRH-23Ka/VV/-20...60** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Transducer with 0-10 V Voltage Output ; range -20-60°C

**HCRH-23Ka/VV/-20...80** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Transducer with 0-10 V Voltage Output ; range -20-80°C

**HCRH-23Ka/VV/-30...40** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Transducer with 0-10 V Voltage Output ; range -30-40°C

**HCRH-23Ka/VV/-30...50** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Transducer with 0-10 V Voltage Output ; range -30-50°C

**HCRH-23Ka/VV/-30...60** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Transducer with 0-10 V Voltage Output ; range -30-60°C

**HCRH-23Ka/VV/-30...70** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Transducer with 0-10 V Voltage Output ; range -30-70°C

**HCRH-23Ka/VV/-30...80** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Transducer with 0-10 V Voltage Output ; range -30-80°C

**HCRH-23Ka/VV/-40...60** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Transducer with 0-10 V Voltage Output ; range -40-60°C

**HCRH-23Ka/VV/-40...80** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Transducer with 0-10 V Voltage Output ; range -40-80°C

**HCRH-23Ka/VV/-50...50** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Transducer with 0-10 V Voltage Output ; range -50-50°C

**HCRH-23Ka/VV/0...40** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Transducer with 0-10 V Voltage Output ; range 0-40°C

**HCRH-23Ka/VV/0...50** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Transducer with 0-10 V Voltage Output ; range 0-50°C

**HCRH-23Ka/VV/0...100** – Humidity Transducer with 0-10 V Voltage Output (0-100% RH) and Temperature Transducer with 0-10 V Voltage Output ; range 0-100°C

### 3. Safety Information

*It is required, under the pain of nullity of warranty for humidity and temperature transducers, to observe the following terms of conduct.*

*Installation, electric connection, maintenance and commissioning of the sensor may be performed only by a trained service personnel.*

*All contents of the documents provided by the Developer or a distributor should be strictly followed.*

*For the sake of the safety and fault-free operation of the Sensor, this Device may operate only with its housing closed, and in conditions providing for non-condensation of water steam inside it (appropriately selected wiring for PG9 cable glands, the gasket – supplied together with the device - installed in the housing, and proper atmospheric conditions ensured).*

The Sensor must be used solely for the purposes set out and confirmed in the catalog sheet. Other uses, which are inconsistent with the ones provided, or which deviate from the description, will be treated as unauthorized ones and will not hold the Developer liable, leaving all the responsibility resulting from them to the User.

#### 4. Transport and Storage

Transportation of the Device must take place with the Device protected against mechanical damage and external atmosphere by means of a packaging.

Particular attention must be paid to the condition of the packaging or the Device, when received.

Device storage should be in a dry room, free from the influence of external conditions, while in other situations involving the Device, provide for dirt protection and external atmosphere protection till the final installation. During transport, storage, as well as operation of the device, do mind to avoid exposing it to very low or very high temperatures.

#### Outs Description

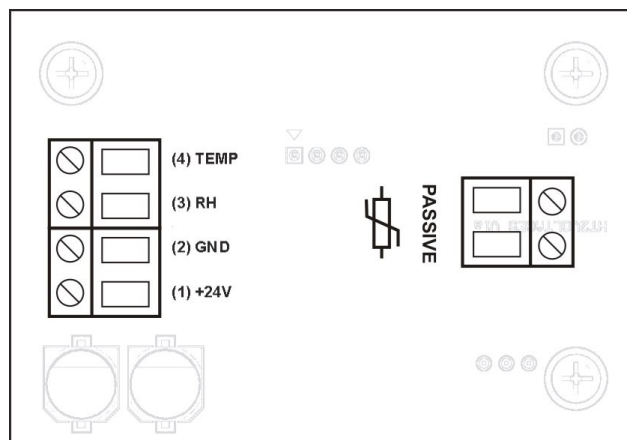


Figure 1. Outs Description of the HCRH2xKa Series Sensor

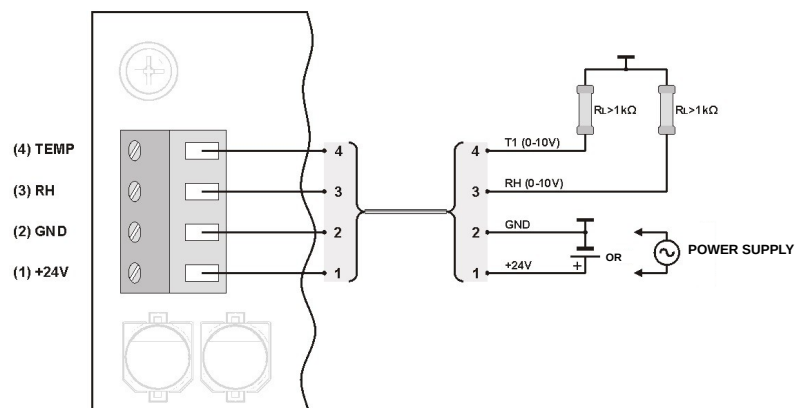


Figure 3. Outs Description of the HCRH2xKa Series Sensor

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