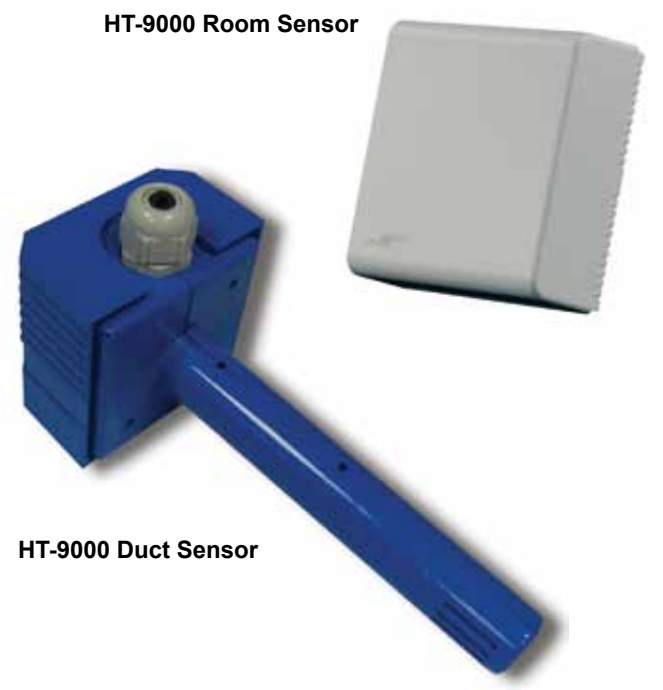
HT-9000 Series
Humidity Sensors

Product Bulletin

The HT-9000 Series room humidity sensors provide active sensing of relative humidity and, on specific models, also active/passive sensing of temperature in HVAC applications.

It features a polymer capacitance humidity sensing element and provides ±4% accuracy a voltage output signal proportional 0 to 100% relative humidity.

HT-9000 Room Sensor

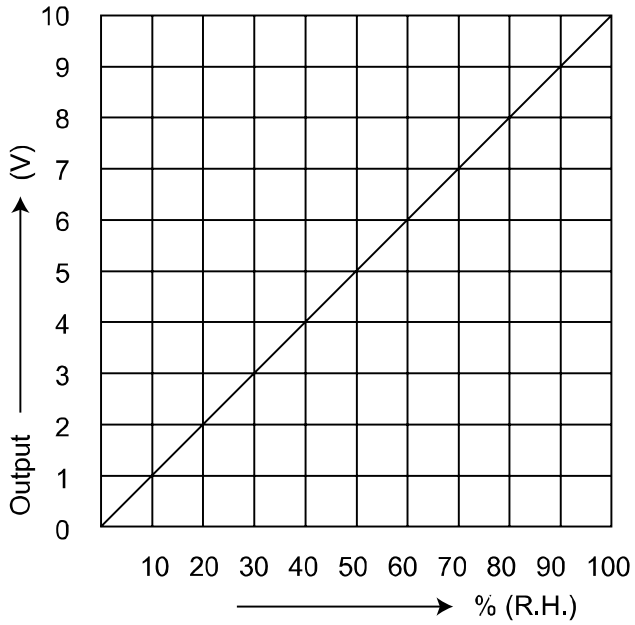


HT-9000 Duct Sensor

- **Power Supply 12...30 VDC / 24 VAC**
- **Humidity Range 0...100% (non condensing)**
- **Humidity Output 0...10 VDC**
- **Humidity Accuracy 4% RH from 10 to 90% RH**
- **Temperature Outputs 0...10 VDC, NTC K2, Pt 100, Pt 1000, A99**
- **HT-9000 Room Sensor**
  - Room enclosures 80 x 80 mm
  - IP30
- **HT-9000 Duct Sensor**
  - Duct probes lengths 153 mm and 230 mm

Johnson Controls

Humidity output curve



Humidity output voltage curve

Temperature vs. resistance table for HT-9000

Temp. (°C)	Resistance (Ω)			
	A99	Pt100	Pt1000	NTC K2
0	854	100.0	1000	7352.8
5	888	102.0	1020	5717.8
10	924	103.9	1039	4481.5
15	960	105.8	1058	3537.9
20	997	107.8	1078	2812.8
25	1035	109.7	1097	2252.0
30	1074	111.7	1117	1814.4
35	1113	113.6	1136	1470.6
40	1154	115.5	1155	1199.6
45	1195	117.5	1175	---
50	1238	119.4	1194	---
55	1281	121.3	1213	---
60	1325	123.2	1232	---

Installation

The installation of electrical wiring must conform to local codes and should be carried out by authorized personnel only. Users should ensure that all Johnson Controls products are used safely and without risk to health or property.

The HT-9000 series room humidity sensors are intended to provide input to equipment under normal operating conditions. Where failure or malfunction of an HT-9000 series room humidity sensors could lead to an abnormal operating condition that could cause personal injury or damage to the equipment or other property, other devices (limit or safety controls) or systems (alarm or supervisory) intended to warn of, or protect against, failure or malfunction of the HT-9000 sensors must be incorporated into and maintained as part of the control system.

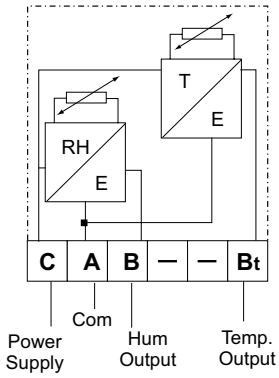
To avoid damage to the HT-9000 sensors, do not mount the unit in a location where high concentrations of corrosive vapours are present.

A short description of the effects on sensing element due to exposure to chemicals' vapour, aggressive substances and environment is reported in the table below.

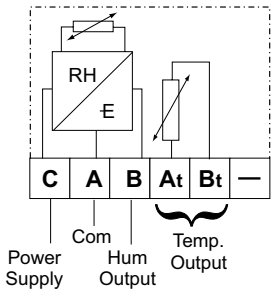
Chemical	Effect
Ethilic alcohol	Unrecoverable damage after long exposure
Oxygen peroxide	No effect
Silicone	Wrong output during exposure; recovered when not exposed
Ammonia	Unrecoverable damage also after short exposure
Cigarette smoke	Output shift during exposure, recovered when not exposed
Cheese	Output shift during exposure, recovered when not exposed
Swimming pool water	No sensible effect (minimum shift during exposure)
Sodium chloride	No effect
Chlorexidine + cetrimide 1%	No sensible effect (minimum shift during exposure)
Chlorexidine + cetrimide 3.3%	Unrecoverable damage after long exposure
Glutaraldehyde 2%	Output shift during and after exposure
Sodium hypochlorite	No sensible effect (minimum shift during exposure)
Quaternary ammonium salt	Unrecoverable damage after long exposure

Wiring Diagrams

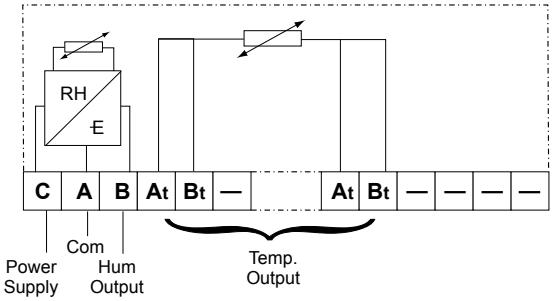
HT-90xx-URW (Room Sensors)



0...10 V DC Temperature Output
HT-9002-URW (range 0...60°)

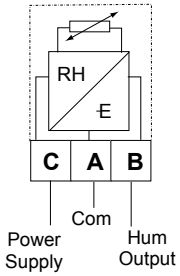


A99, Passive Temperature Output
(HT-9009-URW)

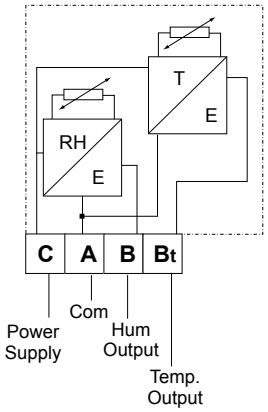


Pt100 Passive Temperature Output
HT-9005-URW

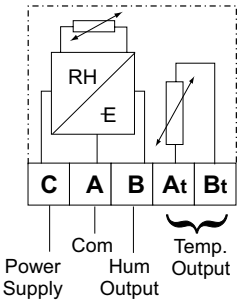
HT-90xx-UDx (Duct mounting)



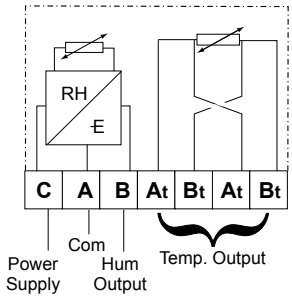
No Temperature Output
HT-9000-UDx



0...10 V DC Temperature Output
HT-9001-UDx (range 0...40°)
HT-9002-UDx (range 0...60°)

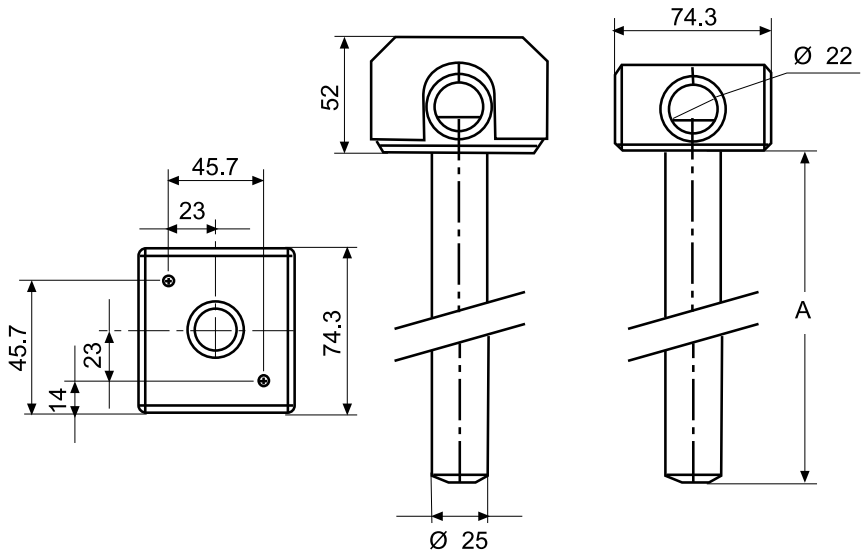


NTC K2, A99, Pt 1000
Passive Temperature Output
(HT-9003-UDx, HT-9006-UDx, HT-9009-UDx)

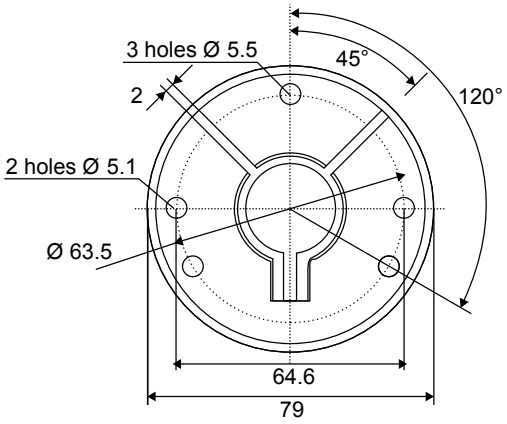


Pt100 Passive Temperature Output
HT-9005-UDx

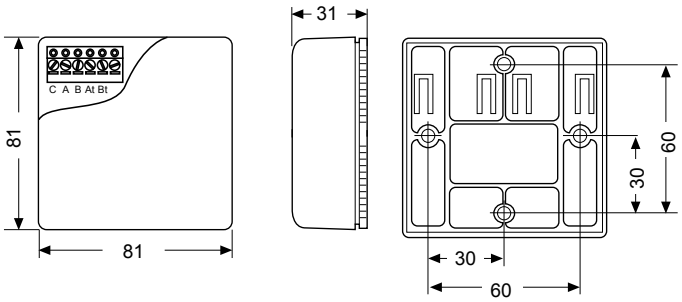
Dimensions (in mm)



HT-90xx-UD1 A = 153 mm
HT-90xx-UD2 A = 230 mm



HT-9000-8950



HT-90xx-URW

Ordering Codes

Codes	Temperature Output
Duct Sensor	
HT-9000-UDx	---
HT-9001-UDx	0 to 10 VDC (range 0 to 40°C)
HT-9002-UDx	0 to 10 VDC (range 0 to 60°C)
HT-9003-UDx	NTC K2
HT-9005-UDx	Pt100
HT-9006-UDx	Pt1000
HT-9009-UDx	A99
Room Sensor (RW = Room White - RAL 9010)	
HT-9002-URW	0 to 10 VDC (range 0 to 60°C)
HT-9005-URW	Pt100
HT-9009-URW	A99

Note:
x = 1 Rod lenght 153 mm
x = 2 Rod lenght 230 mm (with flange for duct insertion adjustment HT-9000-8950)

Technical Specifications

Humidity Range	0 to 100% RH
Humidity Output Signal	0 to 10 VDC linear
Supply Voltage	12 to 30 VDC, 24 VAC ± 15%
Accuracy	± 4% R.H. from 10 to 90% R.H.
Humidity Transmitter	± 6% R.H. from 0 to 10% R.H. and 90 to 100% R.H.
Accuracy Temperature Sensor	
A99 type	± 0.5 K (between 0 and 60 °C)
NTC K2	± 0.2 K (between 0 and 40 °C)
Pt 100/Pt 1000	As specified in IEC751 Class A
0 to 10 VDC	± 0.7 K (between 0 and 40 °C)
Power Consumption at 24 VAC nominal (no load)	
Only RH Transmitter	0.3 W
With Temp. Transmitter	0.5 W
Output Load	≥ 5 kΩ
Humidity Response Time	
Room Sensor	40 sec. in still air
Duct Sensor	20 sec. in 3 m/s moving air
Ambient Operating Conditions	0...60 °C non condensing in any part of the sensor HT-90xx-1D1: minimum air flow 3 m/s
Enclosure Protection Class	
Room Sensor	IP30 (EN60529)
Duct Sensor	IP30 (EN60529)
Materials	
Room Enclosure	self extinguishing ABS + PC
Duct Enclosure	self extinguishing PC/ABS blend
Flange	self extinguishing PC/ABS blend
Weight	
Room Sensor	0.12 kg
Duct Sensor (153 mm)	0.20 kg
Duct Sensor (230 mm)	0.27 kg
Terminal Blocks	
Room Sensors	Plug in connectors accepting 1.5 mm^2 wires
Duct Sensors	Fixed connectors accepting 2.5 mm^2 wires
CE Compliance	Johnson Controls, Inc., declares that these products are in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC.

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.