HX-9100
Dew Sensor

The HX-9100 Dew Sensor is used to prevent condensation on surfaces such as cold water pipes, and windows.

The HX-9100 can be connected to Johnson Controls System 91 controllers to provide override functions when condensation is forming.

HX-9100 Dew Sensor

Features and Benefits	
❑ **Determines precisely the dew point with electronic measurement**	Achieve optimal efficiency for cool ceiling systems. Prevent condensation
❑ **0…10V or open collector output**	Can be used with any DDC regulator managing digital signals

Operation

The principle of the sensor is based on the change in resistance of a conductive polymer in a thin film on a small ceramic substrate. As the sensing polymer becomes wet (90…95% RH), its resistance will increase drastically because the polymer expands and therefore causes a larger distance between the conductive particles.

The HX Sensor is used to sense precisely the dew point and provide the information to the connected controller. A small hysteresis of 1…2% RH is present in order to avoid oscillations of the information but it can't be used to determine, in a reliable way, when the humidity has significantly fallen below the dew point.

Therefore for applications such as **chilled ceilings** it requires a specific function in the controller, i.e. a suitable delay time has to be introduce in the DDC controller (DX-9100, FX, etc) reading the dew point information in order act in a proper way (lock the valve to the off position for a suitable time).

It can be used in conjunction with the TC-9100 and, in general, with other controllers not equipped with the possibility to define a delay interlock time, only for **cold water pipe** applications, where there is usually a small condensation on the pipe and therefore the HX output remains active for a suitable time (the time necessary to the valve to close the flow of cold water and recover from the high humidity situation).

Ordering Data

HX-9100- ☐ **001**

Options

8	Open collector output
9	0/10 VDC output

HX-9100-8001

The sensing element is combined with an open collector output to produce an ON/OFF output used by a digital input of a controller. The output is switched from open to close position when 90-95% RH is sensed.

HX-9100-9001

The sensing element is combined with an electronic circuit to produce an active output to a DDC controller. The output drops from 10 to 0 VDC when 90…95% RH is sensed

Installation

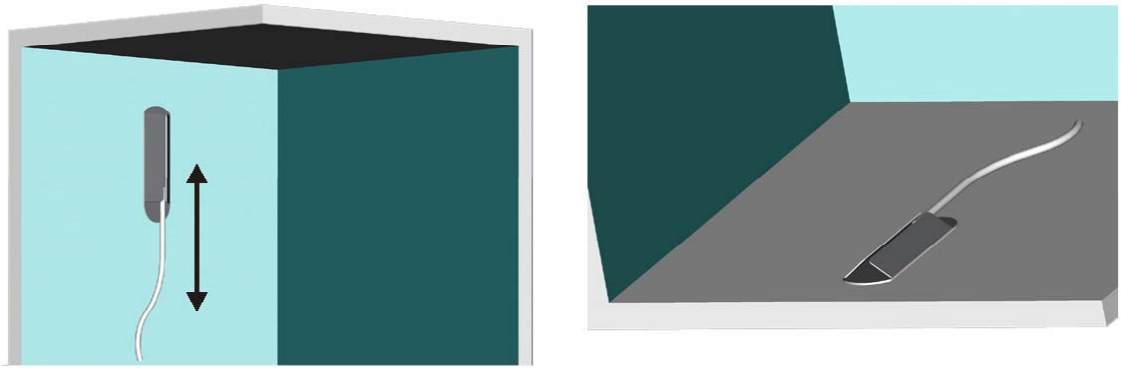

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Figure 1: Suggested Mounting Positions

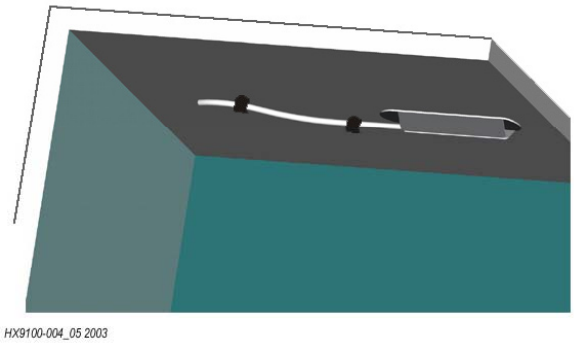

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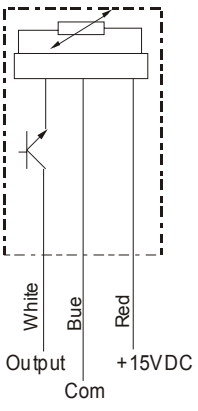
Figure 2

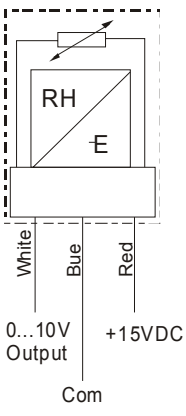
This Mounting Positions is not suggested for the pull that the cable makes on the sensor that tents to weaken the adhesive grip. In case the position is necessary make sure to fix the cable as shown in the figure.

- The HX-9100 Dew Point Sensor can be mounted to plane glass or metal surfaces. For maximum bond strenght, the surface should be thoroughly cleaned and dried. Typical cleaning solvents are heptane or isopropyl alcohol. Clean and dry the surface on which HX-9100 Dew Point Sensor has to be mounted. Use only the special double-sided bonding tape which is packed with the sensor. Using standard bonding tape results in incorrect operation. Remove one side of the protective paper from the tape. Cable the paper to the metal plate and press it to allow a good and uniform contact. Bond strength can also be improved with firm application pressure and moderate heat, from 38°C (100°F) to 54°C (130°F), causing the adhesive to develop intimate contact with the bonding surface. Ideal tape application temperature range is 21°C to 38°C (70°F to 100°F).
- Fix HX-9100 Dew Point Sensor on surface using the double-sided bonding tape). Remove the second side of the protective paper, put the HX-9100 on to the surface and press it for at least 10 sec. To allow a good temperature transfer to the sensing element. The retainer can be used when the sensor has to be clamped to metal pipes.
- The sensor wiring may be lengthened. Shielded cable should be used if transient problems can occur.

Wiring diagrams



HX-9100-8001



HX-9100-9001

Technical Specifications

Product	HX-9100	
Models	**HX-9100-8001**	**HX-9100-9001**
Action	On/Off	0 - 10 Vdc
Supply voltage	15VDC ±10%, nominal	
Threshold	Typically 90% rH	
Output at 90%…100% rH	open collector closed: 0.5Vdc max	≤ +0.5 Vdc
Hysteresis	Typically 1%	
Max Current Consumption	Approximately 7.0 mA	
Open Collector Characteristics	Max 15Vdc, 10 mA	
Ambient Operating Conditions	0…50°C	
Humidity Operating Limits	No permanent moisture condensation; no change of characteristic after 1,000 hours under condensation	
Protection Class	IP44 (EN 60529)	
Storage Conditions	-20 to +80°C, non condensing	
Electrical Connections	1.5 m 3-wire cable with terminal sleeves	
CE **Compliance**	89/336 EEC directive: EN 61000-6-3 (EN 50081-1); EN 61000-6-1 (EN 50082-1)	

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.

JOHNSON CONTROLS

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