

TRUERH™ HL-67N5-8N00P Multi-Function Humidity Device with Temperature Sensor

The Johnson Controls TRUERH™ HL-67N5-8N00P is a multi-function device that can function as a high limit or proportional override humidity controller, as stand-alone proportional controller, or a stand-alone two-position controller.

As a high limit or proportional override controller, it limits duct humidity by comparing a controller's request for humidification with the humidity present in a duct. The HL-67N5 proportionately reduces its output signal to the humidification equipment as duct Relative Humidity (RH) approaches a user-defined setpoint. As a result, the HL-67N5 provides more accurate control of duct humidity and reduces condensation. As a stand-alone controller, it can provide a proportional 0 to 10 VDC or 0 to 20 mA output based on its own setpoint, or two-position Single-Pole, Single-Throw (SPST) Normally Open (N.O.) output. The HL-67N5 also includes an integral temperature sensor, which adds to the product's versatility.

The American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Standard 62-1999 describes how duct humidity greater than 70% can lead to the growth of fungal contaminants. The HL-67N5-8N00P can help control duct humidity within the limits required by state, local, or ASHRAE guidelines.



Figure 1: HL-67N5-8N00P Multi-Function Humidity Device

Features and Benefits	
<input type="checkbox"/> TRUERH Technology	Offers patented circuitry and calibration
<input type="checkbox"/> Multi-Functional Device	Provides several humidity control applications: high limit or proportional override, stand-alone proportional, or stand-alone two-position
<input type="checkbox"/> All-Plastic Material for Duct Probe	Improves thermal performance and complies with Underwriters Laboratories® Inc (UL) flammability ratings for plenum use; complies with Blue Angel (Germany) and TCO'95 (Sweden) environmental regulations
<input type="checkbox"/> All-Polymer™ Humidity Sensor	Provides patented sensing element for accurate and reliable humidity sensing with improved resistance to chemical corrosion
<input type="checkbox"/> Humidity and Temperature Sensors in One Unit	Eliminates the need for separate sensors and reduces installation time and cost
<input type="checkbox"/> Adjustable RH Setpoint and Proportional Band	Enables the user to define the maximum humidity level allowed in the duct and reduces excessive humidification equipment cycling

Product Overview

IMPORTANT: The HL-67N5 Multi-function Humidity Device is intended to provide input to equipment under normal operating conditions. Where failure or malfunction of an HL-67N5 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 HL-67N5 must be incorporated into and maintained as part of the control system.

When it functions as an override device, the HL-67N5 generates a 0 to 10 VDC or 0 to 20 mA output signal based on both setpoint and sensed humidity. The HL-67N5 regulates duct humidity by overriding a system controller's demand for humidification when humidity exceeds a user-defined setpoint. When used as a stand-alone device, the HL-67N5 delivers a proportional or On/Off relay output to a humidifier as humidity approaches the preset setpoint. Power the HL-67N5 from either a separate 24 VAC transformer or directly from the controller.

The Johnson Controls TRUERH sensor offers an all-plastic enclosure, which reduces thermal biasing. This feature lowers energy consumption, reduces condensation, and eliminates the need for thermal compensation.

The temperature sensor's thin-film nickel material provides 1,000 ohms of resistance at 70°F (21°C). The temperature sensor operates independently of the humidity control function. See Figure 2 for the resistance vs. temperature relationship for a nickel sensor.

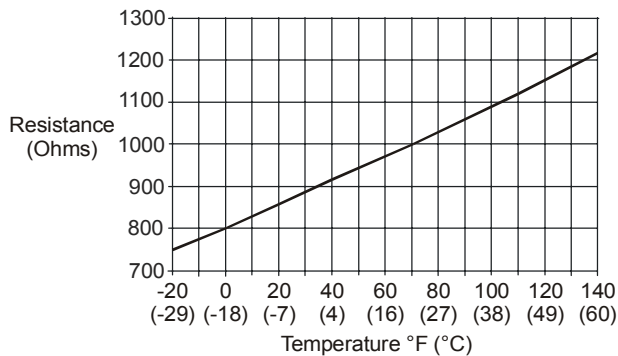


Figure 2: Resistance vs. Temperature

Dimensions

See Figure 3 for humidity device dimensions.

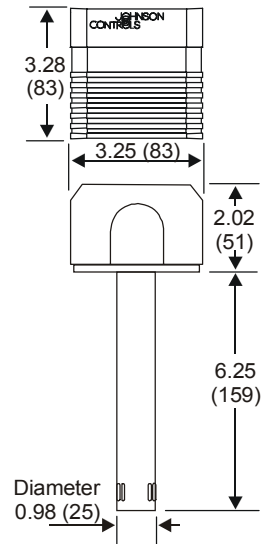


Figure 3: HL-67N5 Dimensions, in. (mm)

Applications

Proportional Override Device

Operation

When used as a proportional override device with a system controller, the HL-67N5 operates as follows:

1. The HL-67N5 accepts a 0 to 10 VDC or 0 to 20 mA input from a system controller. (See Figure 4.)

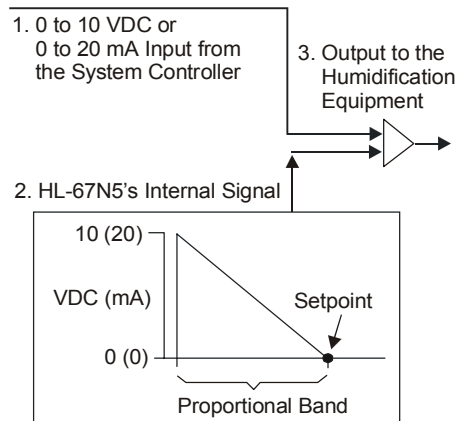


Figure 4: HL-67N5 Internal Calculation and Output Selection

2. The HL-67N5 calculates an internal 0 to 10 VDC (0 to 20 mA) signal as shown in Figure 4, which is a function of the following:
 - a. the setpoint or maximum humidity allowed in the supply air duct (user adjustable from 60 to 95% RH)
 - b. the proportional band or the range of humidity below the setpoint over which the control signal is modified (user adjustable from 5 to 30%)
 - c. the sensed humidity in the duct
3. The HL-67N5 compares the two signals (from Step 1 and Step 2), and outputs the lower of the two signals to the humidification equipment.

Example: If the setpoint is 90%, the proportional band 20%, duct humidity 80%, and the controller input 7 VDC, the HL-67N5 outputs 5 VDC to the humidification equipment (since 5 VDC is lower than the system controller's signal).

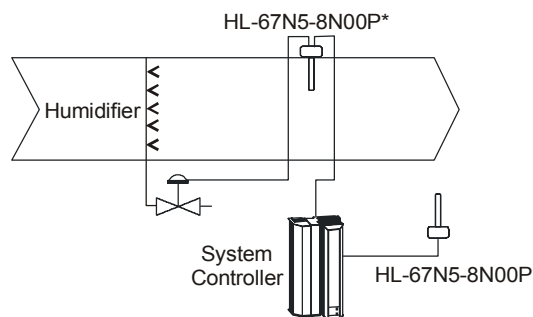
IMPORTANT: The relay output cannot be used when an analog input signal is used.

Sample Configurations

The HL-67N5 will provide proportional override control when linked with a system controller or another HL-67N5. (See Figure 5 and Figure 6.)

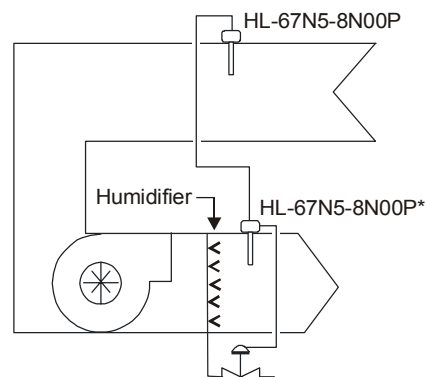
Note: When used as a proportional override device, the HL-67N5 can be configured for the following Johnson Controls controllers:

- Air Handling Unit (AHU)
- Unitary (UNT) Controller
- Variable Air Volume (VAV) Controller
- VAV Modular Assembly (VMA)
- Digital Control Module (DCM) with a Function Module-Output Analog Electrical (FM-OAE)
- DX-9xxx or AS-LCPx00-0
- System 350™ control such as a W351P Humidity Control



* Mounted at least 8 ft (2.4 m) downstream from the humidification equipment.

Figure 5: HL-67N5 Linked with a System Controller



* Mounted at least 8 ft (2.4 m) downstream from the humidification equipment.

Figure 6: HL-67N5 Linked with Another HL-67N5

Stand-alone Proportional Device

Operation

When stand-alone proportional duct humidity control is desired, the HL-67N5 input jumper is set to no input. When duct humidity approaches the user-defined setpoint, the HL-67N5 will proportionately reduce its output to the humidification equipment. (See Figure 7.) A sample configuration is shown in Figure 8.

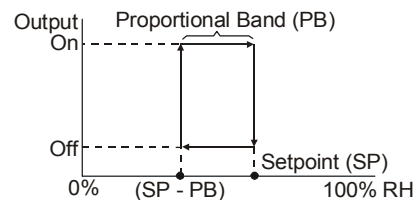


Figure 7: HL-67N5 Operating as a Stand-alone Device

Sample Configuration

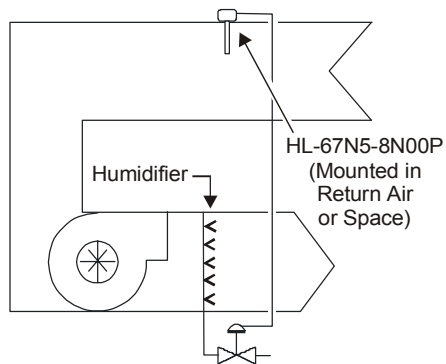


Figure 8: HL-67N5 Operating as a Stand-alone Proportional or Two-Position Device

Stand-alone Two-Position Device

The HL-67N5 8N00P also provides an SPST relay output that can be used with On/Off equipment. The input jumper must be set to no input. The relay contacts open when RH reaches setpoint, and close when RH reaches setpoint minus the proportional band as shown in Figure 9.

Repair and Replacement

The multi-function humidity device is not field repairable. Refer to the *Ordering Information* section to order a replacement.

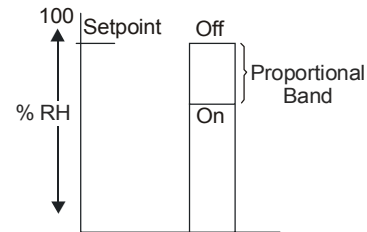


Figure 9: HL-67N5 Relay Operation

Ordering Information

Contact the nearest Johnson Controls representative to order a humidity device, and specify product code number HL-67N5 8N00P.

Technical Specifications

Product	HL-67N5-8N00P Multi-function Humidity Device with Temperature Sensor		
Power Requirements(Class 2)	Proportional Output:	20 to 30 VAC, 1.1 VA at 50/60 Hz or 14 to 30 VDC at 22 mA	
	Relay Output:	20 to 30 VAC, 1.1 VA at 50/60 Hz or 20 to 30 VDC at 22 mA	
Wire Gauge	16 to 24 AWG (18 AWG recommended)		
Humidity	Element:	All-Polymer	
	Setpoint:	Adjustable from 60 to 95% RH	
	Proportional Band:	Adjustable from 5 to 30% RH	
Temperature Sensor	Type:	Thin-film nickel	
	Resistance:	1,000 ohm at 70°F (21°C)	
	Accuracy:	±0.34°F (0.18°C) at 70°F (21°C)	
	Coefficient:	Approximately +3 ohms/°F; 5 ohms/°C	
Control Signal	Input and Output:	0 to 10 VDC or 0 to 20 mA	
Input Impedance	Voltage: 20,000 ohms	Current: 500 ohms	
Output Load	Voltage: ≥ 1,000 ohm	Current: ≤ 500 ohms	
Relay Contact	SPST, NO — Open at setpoint and closed at setpoint minus proportional band, stand-alone operation only		
Relay Contact Rating	Maximum:	4A, 24 VAC, Class 2; Pilot Duty 42.4 VA at 24 VAC	
	Minimum:	100 mA at 5 VDC	
Ambient Operating Conditions	32 to 149°F (0 to 65°C); 0 to 100% RH non-condensing; 90°F (32°C) maximum dew point		
Ambient Storage Conditions	-40 to 150°F (-40 to 66°C); 0 to 100% RH; 90°F (32°C) maximum dew point		
Materials	Light gray plastic cover with dark gray housing and probe		
Dimensions (H x L x W)	3.28 x 3.25 x 8.27 in. (83 x 83 x 210 mm)		Probe (L x D): 6.25 x 0.98 in. (159 x 25 mm)
Shipping Weight	0.7 lb (0.03 kg)		
Agency Compliance	UL File E107041, CCN PAZX		
	CSA File LR68965, Class 4812 05		
	Duct Probe Material:	94-5V flammability rated per UL 94	

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.



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