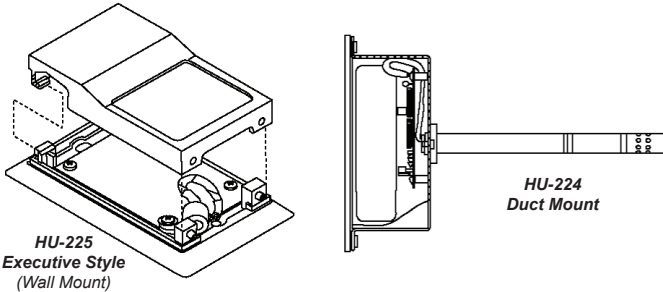


## HUMIDITY SENSOR

For Additional Information See HU-224/225 Data Sheet



## SPECIFICATIONS

**Accuracy\*:**  $\pm 2\%$  /  $\pm 3\%$  RH

**Range:** 0–100% RH

**Hysteresis:**  $\pm 1\%$

**Supply Voltage:** 12–40 VDC  
 12–35 VAC (VDC output units only)

**Supply Current:** VDC Units – 10 mA max.  
 mA Units – 20 mA max.

**Enclosure:** 18 Ga C. R. Steel NEMA 4 (IP-65)  
 or ABS Plastic

**Finish:** Baked on enamel–PMS2GR88B or off-white

**EMC Conformance:** EN 55022, 55024, 61000-3-3,  
 61000-4-2, 3, 4, 5, 6 & 11

**Compensated Temp Range:**  $-30^{\circ}\text{F}$  to  $130^{\circ}\text{F}$  ( $-35^{\circ}\text{C}$  to  $55^{\circ}\text{C}$ )

**Environmental:** 10–90%RH Non-Condensing

**Termination:** Unpluggable screw terminal block

**Wire Size:** 12 Ga max.

**Load Impedance:** 1.5K ohms max. at 40 VDC (mA  
 output units)  
 1K ohms min. (VDC output units)

**Weight:** Duct Mount: 1.0 lbs. (.45 kg)  
 Wall Mount: 0.5 lbs (.25 kg)

*\*Includes non-linearity and non-repeatability*

## ORDERING INFORMATION

PACKAGING	ACCURACY	OUTPUT
HU-224 (Duct Mount)	$\pm 2\%$	mA (4–20 mA 2-wire)
HU-225 (Wall Mount)	$\pm 3\%$	VDC (0–5 VDC/0–10 VDC field selectable)

Ex: HU-224-2-mA – Duct Humidity Transducer,  $\pm 2\%$  RH accuracy with 4–20 mA output.

## INSTALLATION

**Inspection** Inspect the package for damage. If damaged, notify the appropriate carrier immediately. If undamaged, open the package and inspect the device for obvious damage. Return damaged products.

- Requirements**
- Tools (*not provided*)
    - Digital Volt-ohm Meter (DVM)
    - Appropriate screwdriver for mounting screws
    - Appropriate drill and drill bit for mounting screws
  - Appropriate accessories
  - Two #8 self-tapping mounting screws (*not provided*)
  - Training: **Installer must be a qualified, experienced technician**

### Warning:

- Do not use on oxygen service, in an explosive/hazardous environment, or with flammable/combustible media.
- Disconnect power supply before installation to prevent electrical shock and equipment damage.
- Make all connections in accordance with the job wiring diagram and in accordance with national and local electrical codes. Use copper conductors only.



### Caution:

- Use electrostatic discharge precautions (e.g., use of wrist straps) during installation and wiring to prevent equipment damage.
- Avoid locations where severe shock or vibration, excessive moisture or corrosive fumes are present. NEMA Type 4 housings are intended for outdoor use primarily to provide a degree of protection against wind-blown dust, rain, and hose-directed water.
- Do not exceed ratings of the device.

## Mounting

**HU-224 (DUCT)** – The HU-224 must be mounted as referenced by Figure 6.

1. Drill 5/8" hole in appropriate location.
2. Mount transducer on a vertical surface with two #8 self-tapping screws (*not provided*).
3. Pull wires through knockout and make necessary connections (*see wiring drawings*).
4. Replace cover and tighten Philips screws.

**HU-225 (WALL)** – The HU-225 must be mounted as referenced by Figure 6.

1. Turn both allen screws CW on bottom of unit – remove cover.
2. Select the mounting location (*locate away from diffusers, lights, or any external influences*).
3. Mount transducer on a vertical surface with two screws provided.
4. Pull wires through sub base hole and make necessary connections (*see wiring drawings*).
5. Replace plastic cover and turn allen screws CCW.

## Wiring

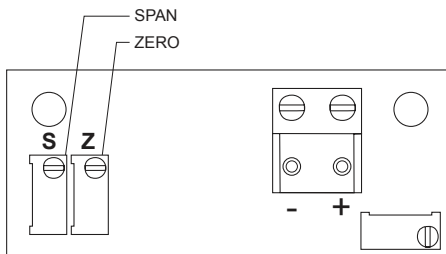
Use maximum 12 AWG wire for wiring terminals. Refer to Figures 1, 2, 3, & 4 for wiring information and Figure 5 for dip switch designations.

(Wiring Instructions continued on Pages 2 & 3.)

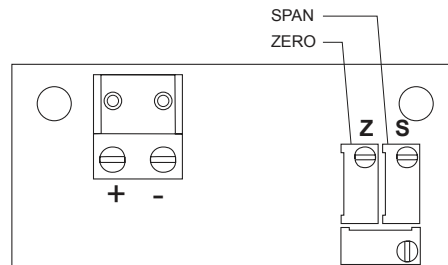
## mA Output

Wiring HU-224/225 Units with mA Output

**HU-224**  
**Duct Mount**



**HU-225**  
**Wall Mount**



HU-224/225 humidity transducers are 4–20 mA output units powered with a 12–40 VDC supply.

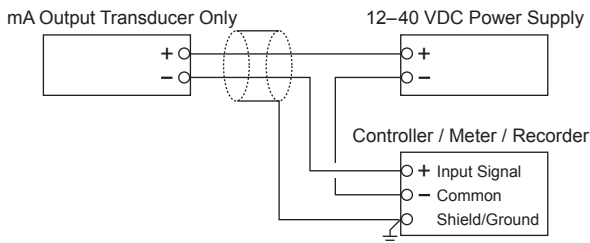
The following describes the proper wiring of these humidity transducers with mA output:

1. Remove the terminal block by carefully pulling it off the circuit board.
2. Locate the [+] and [-] terminal markings on the board.
3. Attach the supply voltage to the [+] lead.
4. Connect the 4–20 mA output ([-] terminal) to the controller's input terminal.
5. Ensure that the power supply common is attached to the common bus of the controller.
6. Re-insert the terminal block to the circuit board and apply power to the unit.
7. Check for the appropriate output signal using a DVM set on DC milliamps connected in series with the [-] terminal.

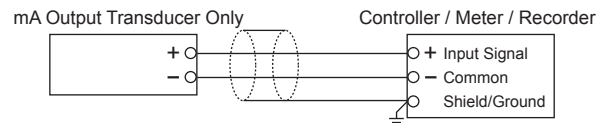
### TYPICAL APPLICATIONS (wiring diagrams)

Figures 1 & 2 illustrate typical wiring diagrams for the HU-224/225, 4–20 mA, two-wire humidity transducers.

**Figure 1 – Wiring for mA Output Humidity Transducers with External DC Power Supply.**



**Figure 2 – Wiring for mA Output Humidity Transducers where Controller or Meter has Internal DC Power Supply.**



If you are using grounded AC, the hot wire must be on the [+] terminal. Also, if you are using a controller without built-in isolation, use an isolation transformer to supply the HU-224/225 transducer.

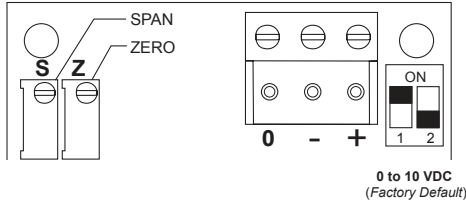
This product contains a half-wave rectifier power supply and must not be powered off transformers used to power other devices utilizing non-isolated full-wave rectifier power supplies.

When multiple HU-224/225 units are powered from the same transformer, damage will result unless all 24G power leads are connected to the same power lead on all devices. It is mandatory that correct phasing be maintained when powering more than one device from a single transformer.

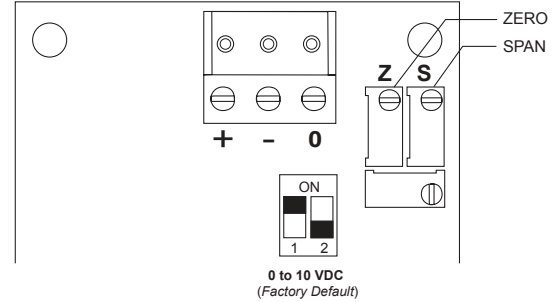
## VDC Output

Wiring HU-224/225 Units with VDC Output

**HU-224 (Duct Mount)  
Board Layout**



**HU-225 (Wall Mount)  
Board Layout**



HU-224/225 humidity transducers with VDC output are field selectable 0–5 VDC or 0–10 VDC output and can be powered with either 12–40 VDC or 12–35 VAC.

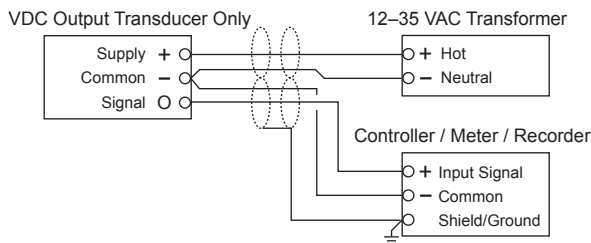
The following describes the proper wiring of these humidity transducers with VDC output:

1. Remove the terminal block by carefully pulling it off the circuit board.
2. Locate the [+], [-] and [O] terminal markings on the board.
3. Attach the power wires to the [+ ] and [-] terminals. The [-] terminal is also the negative output terminal.
4. Connect the [O] terminal, which is the positive VDC output terminal, to the controller's input terminal.
5. Re-insert the terminal block to the circuit board and apply power to the unit.
6. Check the appropriate VDC output using a voltmeter set on DC volts across the [O] and [-] terminals.

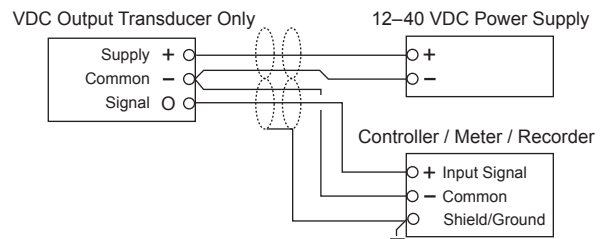
### TYPICAL APPLICATIONS (wiring diagrams)

Figures 3 & 4 illustrate typical wiring diagrams for the HU-224/225, 0–5/0–10 VDC output humidity transducers.

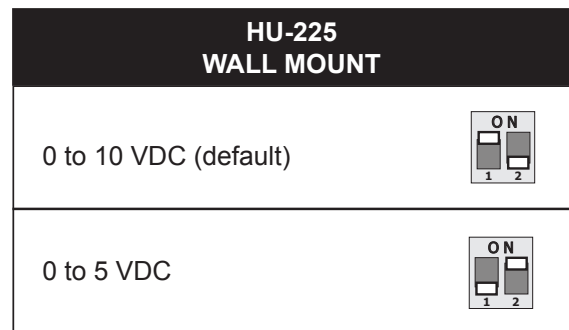
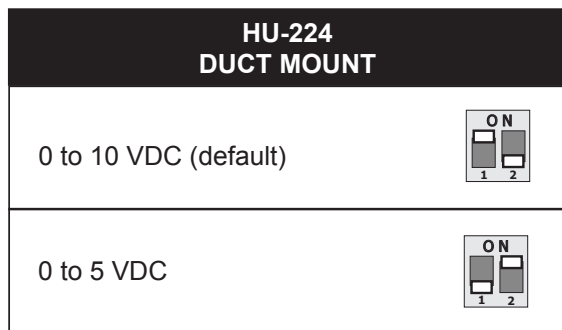
**Figure 3 – Wiring for VDC Output when applied with External AC Supply.**



**Figure 4 – Wiring for VDC Output when applied with External DC Power Supply.**



**Figure 5 – Dip Switch Settings for HU-224/225 VDC Output**





**HUMIDITY SENSOR**

- CHECKOUT**
1. Verify that the unit is mounted in the correct position.
  2. Verify appropriate input signal and supply voltage.



**CAUTION:** Never connect 120 VAC to these transducers. Never connect AC voltage to a unit intended for DC supply.

3. Verify appropriate configuration range.

Transducer Operation

**NOTE:** The HU-224/225 is a highly accurate device. For applications requiring a high degree of accuracy, the use of laboratory-quality meters and gauges are recommended.

**CALIBRATION** All units are factory calibrated to meet or exceed published specifications. If field adjustment is necessary, follow the instructions below.

**Calibration of HU-224/225-2/3-mA/VDC Humidity Transducer**

Field calibration instructions are provided with the following precautions and advice:

1. Do not verify comparative RH with a sling Psychrometer. There are far too many variables which induce errors into this process. New HU-224/225 RH transducers are already supplied with calibration.
2. Recalibration must be done in a controlled environment. Relative humidity must be held stable while making any adjustment.
3. Verify the output from the device directly with calibrated instrumentation and verify the RH with calibrated instrumentation, (NOT A CONTROLLER OUTPUT). With the correct power applied and only a meter connected to the output of the transducer, ensure that the output is proportional to the true RH.

**4. A) SINGLE-POINT CALIBRATION:**

[NOTE: SELECT EITHER OPTION 1 OR OPTION 2, BUT NOT BOTH.]

- Option 1. Select a controlled humidity environment between 10 & 40% RH. Insure humidity is stable and adjust zero trimmer (Z).
- Option 2. Select a controlled humidity environment between 40 & 70% RH. Insure humidity is stable and adjust span trimmer (S).

**B) TWO-POINT CALIBRATION:** Select a controlled humidity environment between 10 & 40% RH. Insure humidity is stable and adjust zero trimmer (Z). Then select a controlled humidity environment between 70 & 75% RH. Insure humidity is stable and then adjust span trimmer (S).

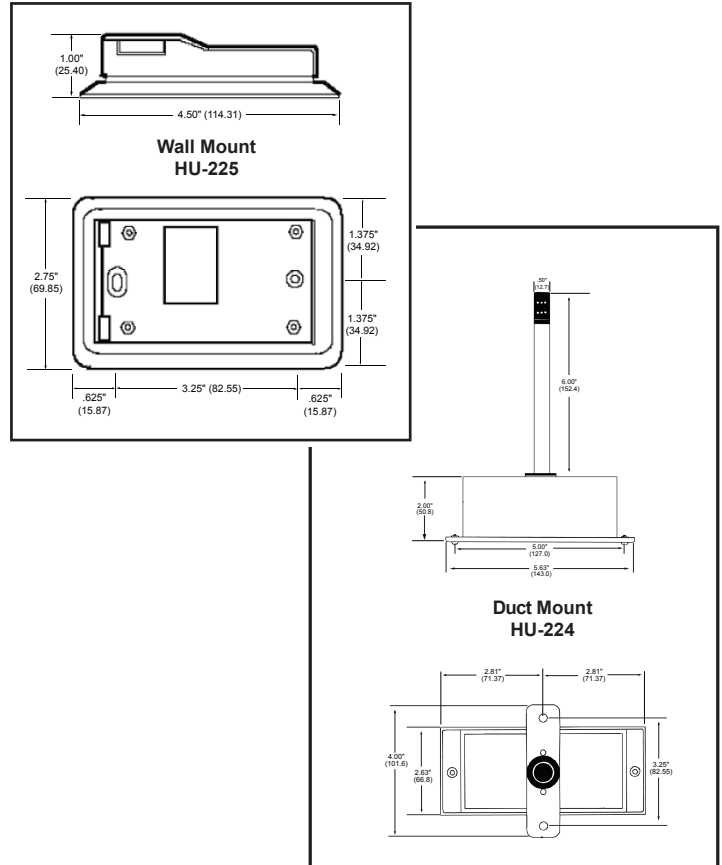
**MAINTENANCE** Regular maintenance of the total system is recommended to assure sustained optimum performance.

**FIELD REPAIR** None. Replace with a functional unit.

**WARRANTY** See Data Sheet for additional information.

**DIMENSIONAL DATA**

**Figure 6 – HU-224/225 Humidity Transducer dimensions shown in inches and millimeters (mm).**



**For Technical / Application Assistance call your nearest office**



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