



PROGRAMMABLE HUMIDITY PROBE – PHP01 WITH USB PROGRAMMING KIT PHP01-PKIT-2



1. Description

The Sixth Sense PHP is a Programmable Humidity Probe designed for the measurement of relative humidity. Humidity measurement is based on the capacitive thin film polymer sensor which is located at the tip of the probe and protected by a membrane filter. The PHP measures the relative humidity and provides a linear 2-wire (loop) 4-20 mA output signal directly proportional to the 0...100% RH. The PHP uses the same wires for power and output signal. A third wire is provided for calibration. The PHP can be re-calibrated with the PHP software and the PHP-Config module provided separately, P/N for the USB version : PHP01-PKit-2.

2. Note

Prior to unpacking and installation, please read the operating instructions and follow them carefully. These units are to be used, serviced, and repaired only by individuals who are familiar with the operating instructions and the applicable regulations for operational safety and accident prevention.

3. Control of Units

The units are calibrated and checked before shipment and shipped in good conditions. If you detect a visible defect on the unit, we recommend that you carefully check the packing material. In the event of a defect, please immediately notify the mail service / freight forwarder, as they are responsible for shipping damage.



4. Dimensions

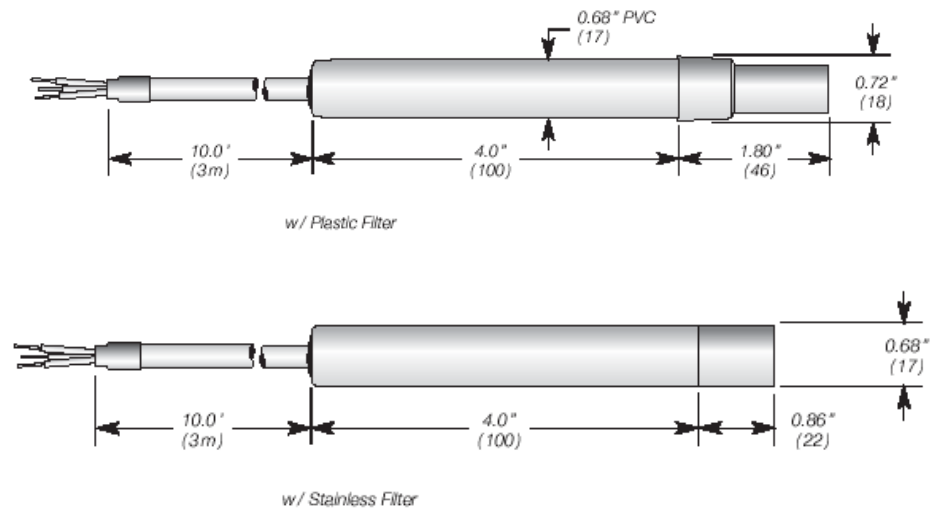


Figure #1

5. Wiring

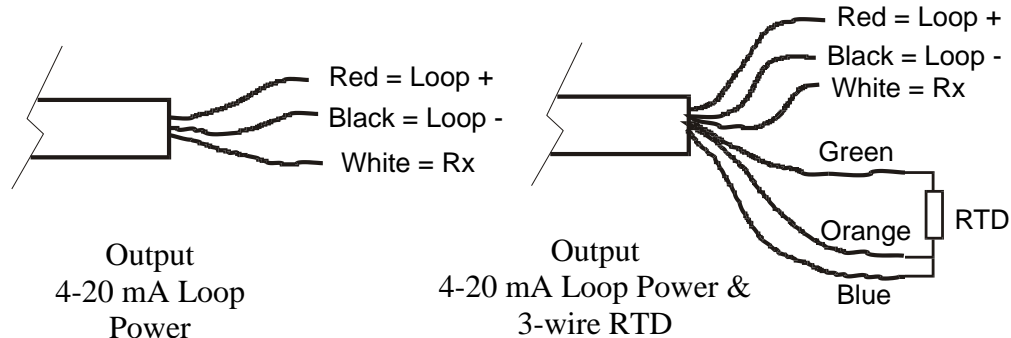


Figure #2

The PHP can be connected in stand-alone mode for normal operation or in communication mode for calibration.

Stand-Alone mode (see Figure #3):

- Ensure that the power is disconnected before proceeding with the electrical installation.
- Connect the RED wire of the PHP to the positive side of the power supply.
- Connect the BLACK wire of the PHP to the positive side of the current indicator.
- Connect the negative side of the loop indicator to the negative side of the power supply to close the loop.
- Turn ON the power supply.

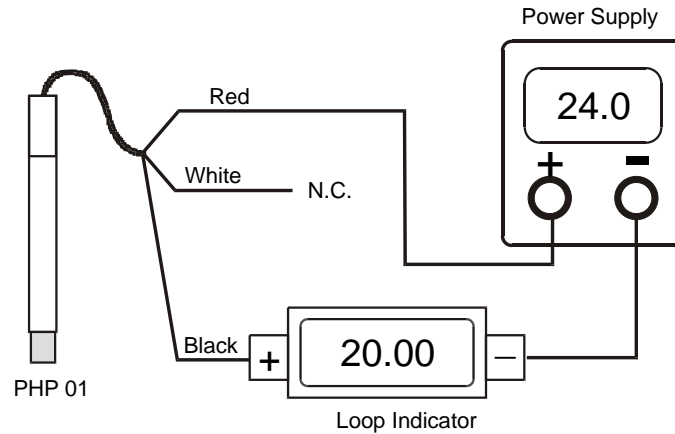


Figure #3

Communication mode (See Figure #4):

- Ensure that the communication module is disconnected from the host computer before proceeding with the electrical installation.
- Connect the RED wire of the PHP to **V+** terminal on the PHP-Config module.
- Connect the BLACK wire of the PHP to the positive side of the current indicator.
- Connect the negative side of the current indicator to **V-** terminal on the PHP-Config module.
- Connect the WHITE wire of the PHP to the **Rx** terminal on the PHP-Config module.
- Connect the PHP-Config module to the computer via the USB port.
- The PHP and the communication module are powered by the USB port.

***** Important: When the PHP probe is powered by the PHP-Config module the impedance of the loop indicator must be very low (<10 ohms). If a loop indicator with a higher impedance is used, an external power supply must be used to power the probe.**

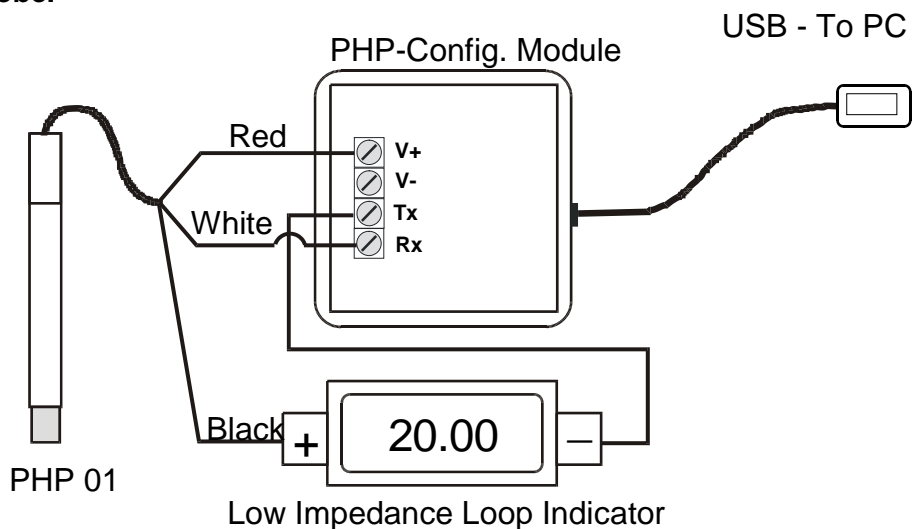


Figure #4



NOTE: In the communication mode, the PHP probe can also be powered by an external power supply. In this case, the V- terminal on the PHP-Config module needs to be connected to the positive side of the Loop Indicator and black wire of the PHP probe. The RED wire, from the PHP, needs to be connected to the positive side of the power supply. The V+ on the PHP-Config module must not be connected. The negative side of the Loop Indicator must connect to the negative terminal of the power supply (see Figure #5).

Note: In this configuration, to ensure proper reading on the loop indicator, make sure the negative side of the power supply is well isolated from the ground of the host computer (ground of the USB input).

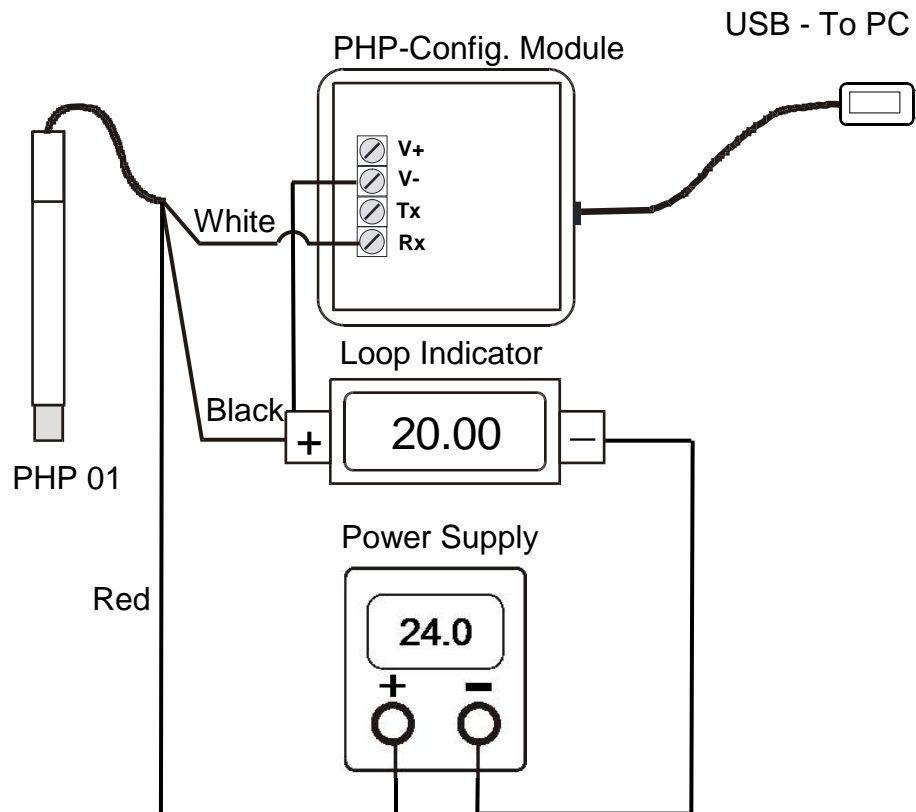


Figure #5

6. Calibration

Calibration and maintenance of the probes should be performed at regular intervals, depending on the conditions of use and desired accuracy. The recommended calibration interval is one year.

To proceed with the PHP calibration you first have to connect the probe to the communication module (please refer to section 5 of this manual). You will then need to install the PHP software on a computer having a USB port available.



If a previous version of the PHP calibration software was installed on the computer you must first uninstall it. To do so, use the Windows *Add/Remove Software* utility located in the control panel.

The USB driver must be installed by running the “CP210xVCPInstaller” program located in the root directory of the CD. Once the USB driver is properly installed you can proceed with the PHP-CAL installation by simply inserting the CD in your drive and launching the self-extracting PHP-CAL program. The PHP-CAL software will be installed by default in the Program Files\PHP-CAL subdirectory. To launch the PHP-CAL software, simply click on the shortcut appearing in the Windows menu.

The USB driver creates a virtual COM port when the communication module is connected. The virtual COM port number can be seen in the Device Manager of Windows. By default, the PHP-CAL Software is configured to read on the virtual COM port #1. If the communication module is connected to another virtual COM port, a communication error will be generated during the startup. Once the main window appears (see Figure #6), you can then select the virtual COM port on which the device is connected (COM1 to COM8). Make sure that the port selected is available and no other software is using it.

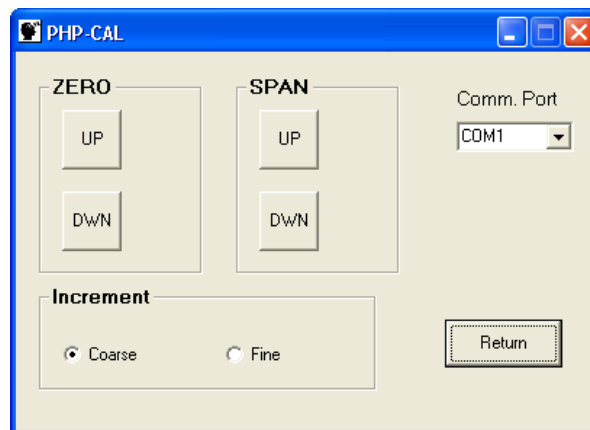


Figure #6

The “ZERO” section of the main window contains the UP and DWN buttons that will be used to adjust the zero reading. The “SPAN” section contains the UP and DWN buttons that will be used to adjust the span of the PHP output.

The “Increment” section allows you to select the rate of change of the output signal per click on the UP and DWN buttons. The coarse increment causes a change of about 0.20 mA (1.25% RH) and the fine increment causes a change of about 0.02 mA (0.125% RH).

For a better calibration, carefully remove the filter cap from the extremity of the probe.
DO NOT TOUCH THE SENSOR.



1-Point Calibration

The PHP can be calibrated at one point (ex: 50%). To do so, you will require a reference probe or saturated salt solutions, the PHP connected to the PHP-Config module and the PHP-CAL software to do the adjustment.

If you are using a reference probe, leave the reference probe and the PHP probe in the same space for at least an hour so that their temperatures have time to equalize. When the output from the reference probe and the PHP probe are stabilized, apply the correction to the PHP output by clicking on the Zero UP or Zero DOWN button in the PHP-CAL software.

If you are using saturated salt solution, leave the probe in the saturated solution for at least an hour. When the output signal from the PHP probe is stabilized, apply the correction to the PHP output by clicking on the Zero UP or Zero DOWN button in the PHP-CAL software.

2-Point Calibration

For a better accuracy along its entire range, the PHP probe can be calibrated at two different points. To do so, you will require a reference probe or saturated salt solutions, the PHP connected to the PHP-Config module and the PHP-CAL software to do the adjustment.

A dry point calibration should be performed first. The dry point needs to be at an RH below 50% (ideally 30% or lower). Leave the PHP probe at the low RH for at least an hour to stabilize. Adjust the output of the PHP probe by clicking on the ZERO UP or ZERO DWN buttons in the PHP-CAL software.

A wet point calibration should then be performed after. The wet point needs to be at an RH above 50% (ideally 70% or higher). Leave the PHP probe at the high RH for at least an hour to stabilize. Adjust the output of the PHP probe by clicking on the SPAN UP or SPAN DWN buttons in the PHP-CAL software.

The PHP probe does not have interaction between the ZERO and SPAN adjustment if the calibration was performed in the right sequence; zero adjustment first, followed by the span adjustment. So, it is not necessary to re-do the ZERO adjustment after changing the SPAN.



Specifications

| | |
|---------------------------------|---|
| Sensing Element: | Thermoset polymer thin film capacitive RH sensor |
| Calibrated Range: | 5% to 95% RH |
| System Accuracy: | ±2%, ±3 %, or ±5% RH (5% to 95 % RH range) |
| Supply Voltage: | 12-30 VDC, polarity protected |
| Power Requirement: | 40mA max @ 24 VDC |
| Supply Voltage Effect: | ±0.002 RH/volt (negligible) from 12-30 VDC |
| Output: | 4–20 mA, loop powered 2-wire, 0 to 100% RH 4–20 mA, loop powered 2-wire, 0 to 100% RH and 3-wire RTD. |
| Repeatability: | ±0.5% RH |
| Linearity: | ±1% RH |
| Hysteresis: | ±1% RH of operating humidity span |
| Sensor Stability: | ±1% RH typical at 50% RH in 1 year |
| Temperature Effect: | ±0.03% RH/0 °C ±1% RH at +10 °C to +85 °C (-40°F to +185 °F) |
| Temperature Comp.: | - 23 °C to +85 °C (-10°F to +185 °F) |
| Operating Environment: | - 40 °C to +85 °C (-40°F to +185 °F) non-condensing (0% to 95% RH) |
| Storage Environment: | - 50 °C to +85 °C (-58°F to +185 °F) non-condensing |
| Zero and Span Adjust.: | Digital recalibration via PHP-Config1 Module and PC |
| Sensor Break Indication: | Upscale to 23mA |
| Polarity Protection: | Diode reverse polarity protected |
| Sensor Protection: | HPDE dust cover 60 micron or sintered SS dust cover 60 micron (optional) |
| Sensor Housing: | PVC or SS316 (optional) |
| Mounting: | Flange, 1/ 2” NPT fitting, 3/ 4” NPT fitting |
| Pressure Ratings: | 50 psig for PVC housing and 100 psig for SS housing |
| Probe Connections: | Various extension cables, molded connectors with extension cable and connector with screws |
| Protection: | Electronics IP67 (NEMA 6X), sensor IP20 and with dust filter IP50 |