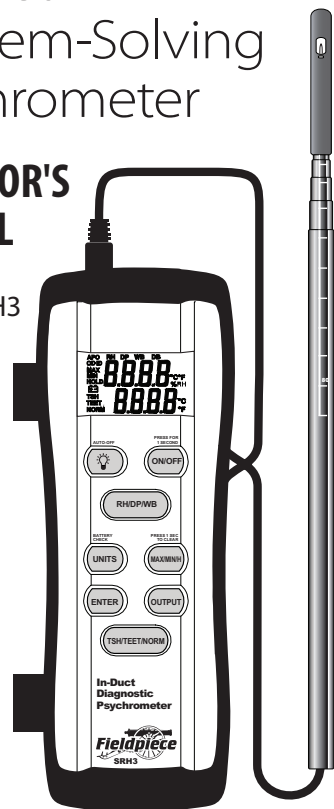


# Fieldpiece

## In-Duct Problem-Solving Psychrometer

### OPERATOR'S MANUAL

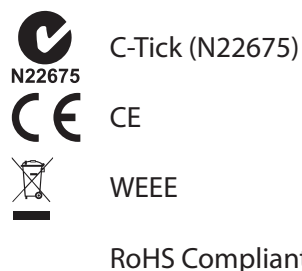
Model SRH3



## Quick Start

1. Power on your SRH3 by holding the ON/OFF button for 1 second.
2. Use the TSH/TEET/NORM button to select NORMAL mode.
3. Press the RH/DP/WB button to cycle between relative humidity, dew point, and wet bulb temperatures.
4. The air temperature will always be shown in the lower display and the relative humidity, dew point, or wet bulb measurement will be displayed in the upper display in real-time.
5. Insert sensor probe into duct for in-duct measurements.

## Certifications



## Description

With your purchase of the SRH3 you now have the ability to take supply/return temperature, %RH, wet bulb and dew point measurements from inside the duct or plenum.

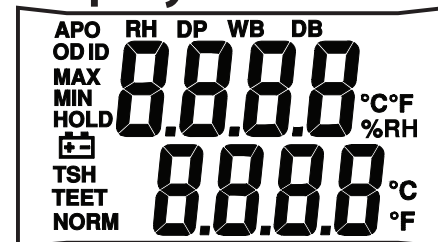
Your SRH3 is a portable, hand held, diagnostic psychrometer, designed for the HVAC/R technician.

SRH3 helps you properly charge a fixed restrictor system by quickly determining the Target Superheat (TSH). Your SRH3 can also help determine optimum airflow across the evaporator by easily performing a Target Evaporator Exit Temperature (TEET) test.

The 38"(96cm) telescoping probe with laser etched ruling and flattened edges allows you to locate proper measurement points within a duct and ensures that your probe is properly aligned.

The dual display with a bright backlight, rugged rubber boot with probe clips, make sure the SRH3 is ready for any job.

## Display



APO	Auto Power Off Enabled
☹	Low Battery Indicator
RH	Relative Humidity
DP	Dew Point
WB	Wet Bulb
DB	Dry Bulb
%RH	%Relative Humidity
OD	Outdoor
ID	Indoor
TSH	Target Superheat
TEET	Target Evaporator Exit Temperature
NORM	Normal Range
°F	Temperature (Fahrenheit)
°C	Temperature (Celsius)
HOLD	Hold Display
MAX	Maximum Display
MIN	Minimum Display

## Controls

- ON/OFF** Hold 1 second to toggle power on/off.
- Lightbulb icon** Toggle Backlight. (Hold while powering your SRH3 on to disable APO.)
- RH/DP/WB** Toggle display to show relative humidity, dew point and wet bulb temperatures
- BATTERY CHECK** Toggle between Fahrenheit and Celsius. Hold for 2 seconds to display battery percentage.
- PRESS 1 SEC TO CLEAR** Toggles to display Maximum, Minimum, or Hold the current reading. Hold for 1 second to exit and clear stored values.
- ENTER** Confirm Selection
- OUTPUT** Outputs calculations for Target Superheat or Target Evaporator Exit Temperature
- TSH/TEET/NORM** Toggle to enter Target Superheat, Target Evaporator Exit Temp, or Normal modes.

## Functions

### Backlight

1. Press the backlight button to toggle the backlight on/off at any time during the SRH3's use. Note: The back light will automatically shut off after 1 minute to conserve battery life.

### Maximum/Minimum/Hold

1. Pressing the MAX/MIN/H button activates the Max-Min-Hold function, holding the maximum and minimum measured values until cleared.
2. Once the Max-Min-Hold function has been enabled, pressing MAX/MIN/H cycles between displaying maximum (MAX), minimum (MIN) and freezing the current value.
3. Press and hold the MAX/MIN/H button for 2 seconds to erase all stored maximum and minimum values and return to real-time measurements.

### Units

1. Press the units button to switch between degrees Fahrenheit and Celsius.

### Battery Check

1. Press and hold the UNIT button for 2 seconds to display the battery life in percentage.

### Output

1. Press the OUTPUT button to perform calculations of Target Superheat and Target Evaporator Exit Temperature after necessary measurements have been entered.

## How to Use

### Normal Mode

Normal mode allows you quickly and easily take real-time dry bulb, wet bulb, dew point, and relative humidity measurements.

1. Press TSH/TEET/NORM button until NORM is displayed in lower left corner.
2. For upper display measurements, press the RH/DP/WB button to toggle relative humidity, dew point, or wet bulb temperature measurements. Note: Dry bulb (air temperature) will always show in the lower display.

### Target Superheat Mode

Perform a simple Target Superheat test to determine what the superheat should be on a fixed restrictor system. Use the target superheat to compare to the actual superheat to determine if a system is properly charged.

1. Press TSH/TEET/NORM button until TSH is displayed in the lower left of the LCD.
2. Take a wet bulb measurement at the inlet of the evaporator. Generally right before the filter is a good location. Drill or punch a 3/8" hole into the return plenum for a measurement depth of up to 24 inches. See Figure 1 for recommended return

plenum placement of probe. Insert SRH3 probe into the plenum to take the wet bulb measurement. Press ENTER to lock in the reading.

3. Take a dry bulb (air temperature) measurement going into the condenser. Press ENTER to lock in the reading.
4. Press OUTPUT to calculate the target superheat. Compare the target superheat to the actual superheat of the system.
5. Seal any holes before leaving the jobsite.

### Target Evaporator Exit Temperature Mode

Target Evaporator Exit Temperature (TEET), aka temperature drop or delta T, is used to determine if the evaporator is getting the optimum airflow. A TEET test can be quickly performed by taking two easy temperature measurements at the return side of the evaporator.

1. Press the TSH/TEET/NORM button until TEET is displayed in the lower left of the LCD.
2. Take a wet bulb measurement inside the return plenum. Drill or punch a 3/8" hole into the return plenum. See Figure 1 for recommended return plenum placement of probe. Insert SRH3 probe into the plenum to take the wet bulb measurement. Press ENTER to lock in the reading.

3. Take a dry bulb measurement at the same place the previous wet bulb measurement was taken. Press ENTER to lock in the reading.
4. Press OUTPUT to calculate the target evaporator exit temperature. Compare this calculated target to the actual evaporator exit temperature.
5. Take a dry bulb measurement inside the supply plenum to check the actual Evaporator Exit Temperature. See Figure 1 for recommended supply plenum placement of probe. Drill or punch a 3/8" hole into the supply plenum. Press TSH/TEET/NORM until NORM is displayed. Insert SRH3 probe into the plenum and read the temperature in the lower display.
6. Seal any holes before leaving the jobsite.

Note: For both Target Superheat and Target Evaporator Exit Temperature modes, you can adjust any temperature measurement after calculations have been performed by pressing ENTER. This prompts you to re-take the measurements.

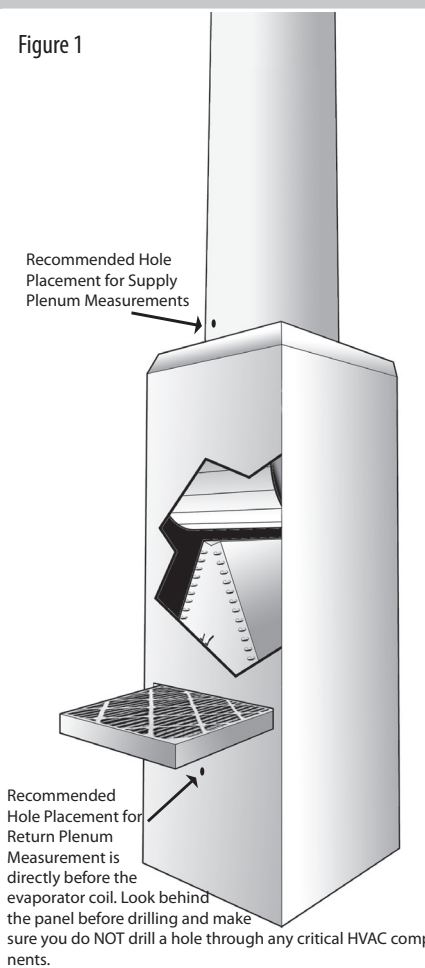
### RCONE1 Probe Lock

Use the RCONE1 to lock your sensor probe in place inside the duct. Using the RCONE1 and magnet on the SRH3 allows you hands-free in-duct testing. See Figure 2.

### WARNING

Do not retract the sensor probe by pulling on the cord. Doing so may sever the cord from the sensors.

Figure 1



## Specifications

Telescoping Probe Length: Up to 38 inches (97cm)  
Probe Tip Diameter: 0.35 inch (9mm)  
Storage temperature: -4°F to 140°F (-20°C to 60°C), 0 to 80% RH (with battery removed)  
Temperature Coefficient: 0.1 x (specified accuracy)/°C (<18°C or >28°C)  
Over range: "OL" or "-OL" is displayed  
Power: Single standard 9-volt battery, NEDA 1604, JIS 006P, IEC 6F22  
Auto Power off: after 15 minutes of inactivity if APO is active.  
Battery life: 150 hours typical (alkaline)  
Low Battery Indication: ☹ is displayed when the battery voltage drops below the operating level.  
Dimensions: 7.9 in (H) x 2.6 in (W) x 1.4 in (D), [200mm (H) x 66mm (W) x 36mm (D)]  
Weight: Approx. 400g, including battery

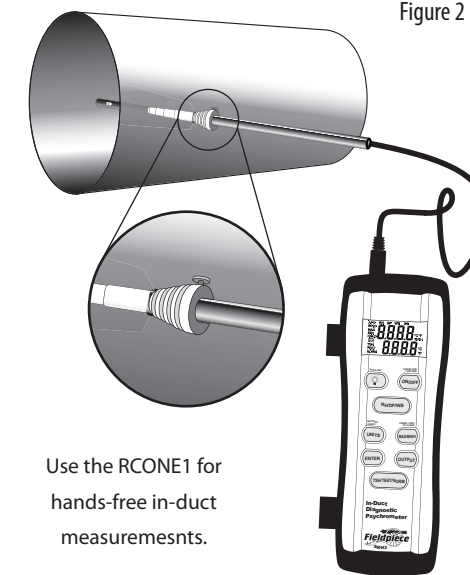
### Temperature:

Sensor type: Precision thermistor  
Operating environment: -4°F to 140°F (-20°C to 60°C)  
Range: -4°F to 140°F (-20°C to 60°C)  
Resolution: 0.1°F / 0.1°C  
Accuracy: ±(1°F) 32°F to 113°F  
±(2°F) -4°F to 32°F, 113°F to 140°F  
±(0.5°C) 0°C to 45°C  
±(1°C) -20°C to 0°C, 45°C to 60°C

### Relative Humidity:

Sensor Type: Capacitance polymer film  
Operating environment: 32°F to 131°F (0°C to 55°C)  
Range: 0% to 100%RH  
Accuracy: ±(2.5%) 10% to 90%RH  
±(5%) <10%RH and >90%RH  
Note: Above accuracies stated at 73.4°F (23°C).  
Sensor Response Time: 60 seconds typical for 90% of total range.  
Sensor Hysteresis: ±1%RH typical (Excursion of 10% to 90% to 10%RH)

Figure 2



Use the RCONE1 for hands-free in-duct measurements.

## A/C Basics

The Evaporator, Condenser, Restrictor (Throttling valve) and Compressor are the four basic components of an air conditioner. Following one pound of refrigerant through the system shows the function of each component.

Subcooled liquid refrigerant at high pressure enters the restrictor and is throttled to saturated refrigerant at a lower pressure. The restrictor can be of either a fixed or TXV/EXV type. The fixed type must be charged to a target superheat that varies with indoor and outdoor conditions. TXV/EXV systems must be charged to subcooling.

The evaporator capacity varies with the indoor heat load on a fixed restrictor. The TXV/EXV regulates the size of the restriction to maintain a constant superheat. This essentially adjusts the capacity of the evaporator responding to the indoor heat load.

After the restrictor, refrigerant enters the evaporator at a low temperature and pressure and boils (evaporates)

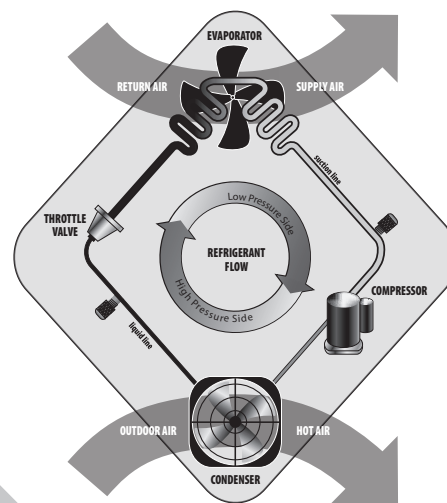
into a gas by absorbing heat from the indoor air. The refrigerant stays at the same temperature and pressure until all the refrigerant evaporates into a gas. After the refrigerant becomes a gas, it will continue to absorb heat and become superheated at which point its temperature will change. The Superheat measurement is the best indication of refrigerant charge level in a fixed restrictor system. A TXV/EXV system will keep the superheat constant. There must be superheat present to ensure liquid does not flood the compressor.

Superheat measurements are taken on the suction line between the evaporator and compressor.

The compressor takes this low temperature, low pressure, slightly superheated refrigerant and compresses it to a much higher temperature and pressure.

The highly superheated gas enters the condenser and rejects heat into the outside air. The refrigerant

condenses back into a liquid. Once all of the gas is condensed into a liquid, additional removal of heat causes a temperature drop that is known as subcooling. TXV/EXV systems are charged to subcooling since superheat is controlled by the throttle valve. Subcooling measurements are taken on the liquid line between the condenser and TXV/EXV. Finally, the subcooled liquid enters the restrictor and the cycle starts again.



## Maintenance

Clean the exterior with a dry cloth. Do not use liquid.

### Sensor Care

When not in use it is best to protect this sensors with the vinyl slip cover included with the SRH3.

Extreme conditions or exposure to solvent vapors may offset the RH% sensor. If this happens, place the sensor in a controlled environment of 75%RH and between 68°F - 86°F for a period of 24 hours.

To create a 75%RH environment moisten a small amount of table salt, in an open container such as a clean 2 liter bottle cap.

Place the container with the salt solution and the SRH3 probe in a sealable plastic bag, and leave the bag in a room temperature location where it will not be disturbed for 24 hours.

Note: It is important that the salt solution does not come in direct contact with the sensor, as this may permanently damage the sensor.

## Battery Replacement

When the meter displays the battery should be replaced. Turn your SRH3 off and replace with 9V battery.

### Auto Power Off

Your SRH3 powers off automatically after approximately 15 minutes to lengthen battery life. To disable "Auto Off," hold the button while powering on your SRH3. When disabled, APO will not display in upper left of LCD.

## Limited Warranty

This meter is warranted against defects in material or workmanship for one year from date of purchase. Fieldpiece will replace or repair the defective unit, at its option, subject to verification of the defect.

This warranty does not apply to defects resulting from abuse, neglect, accident, unauthorized repair, alteration, or unreasonable use of the instrument.

Any implied warranties arising from the sale of a Fieldpiece product, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the above. Fieldpiece shall not be liable for loss of use of the instrument or other incidental or consequential damages, expenses, or economic loss, or for any claim of such damage, expenses, or economic loss.

State laws vary. The above limitations or exclusions may not apply to you.

## For Service

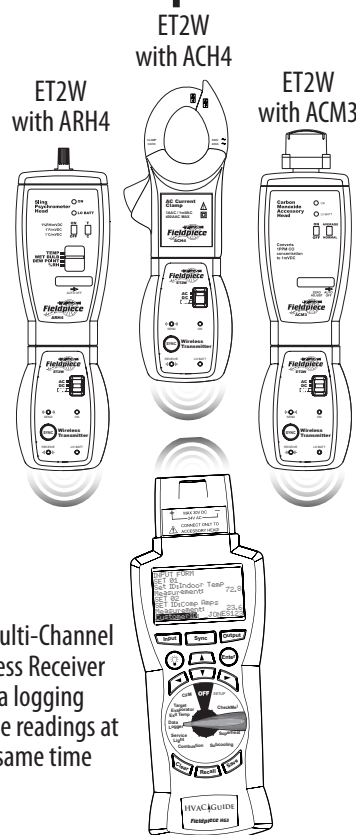
In the USA, call Fieldpiece Instruments for one-price-fix-all out of warranty service pricing. Send check or money order for the amount quoted. Send the meter freight prepaid to Fieldpiece Instruments. Send proof of date and location of purchase for in-warranty service. The meter will be repaired or replaced, at the option of Fieldpiece, and returned via least cost transportation. Outside of the USA, please visit [www.fieldpiece.com](http://www.fieldpiece.com) for service contact information.

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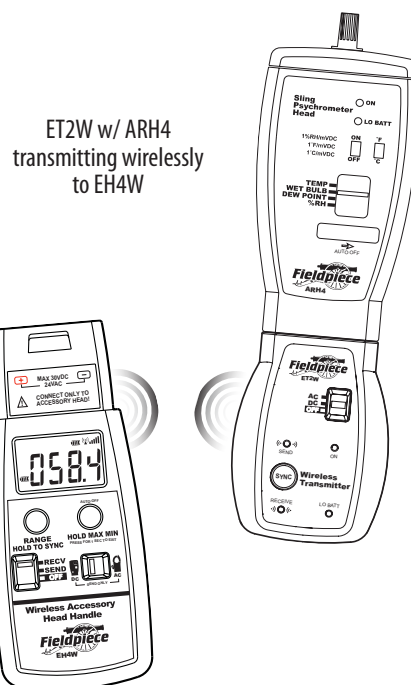
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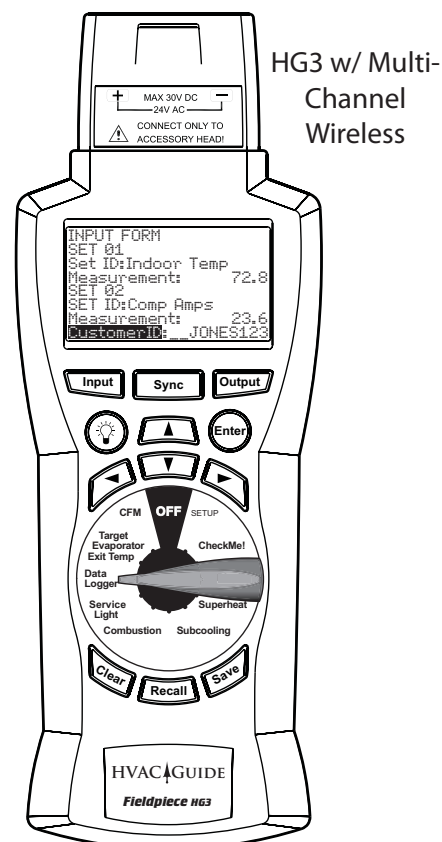
## Wireless Solutions from Fieldpiece



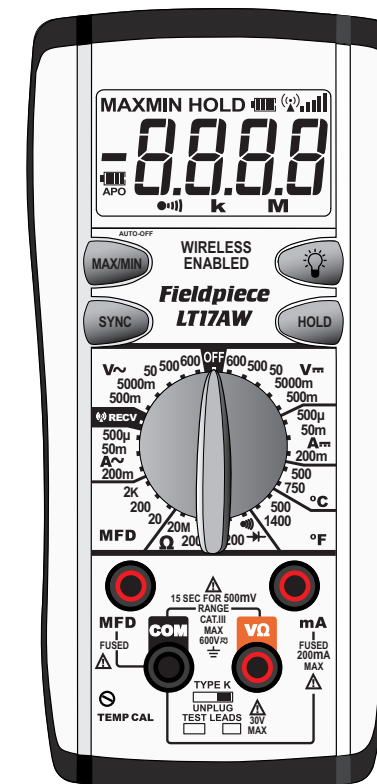
HG3 Multi-Channel  
Wireless Receiver  
data logging  
multiple readings at  
the same time



ET2W w/ ARH4  
transmitting wirelessly  
to EH4W



HG3 w/ Multi-  
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