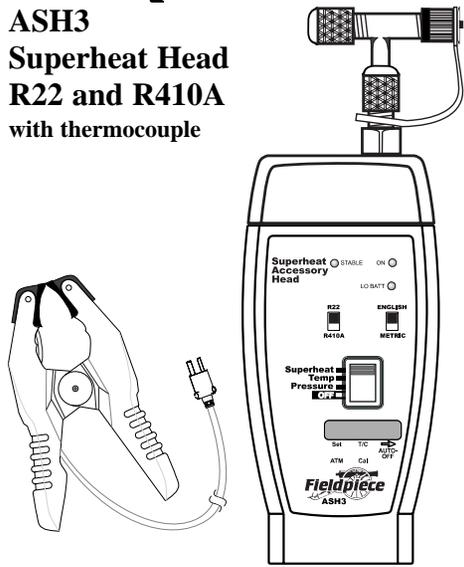


# Fieldpiece

## ASH3 Superheat Head R22 and R410A with thermocouple

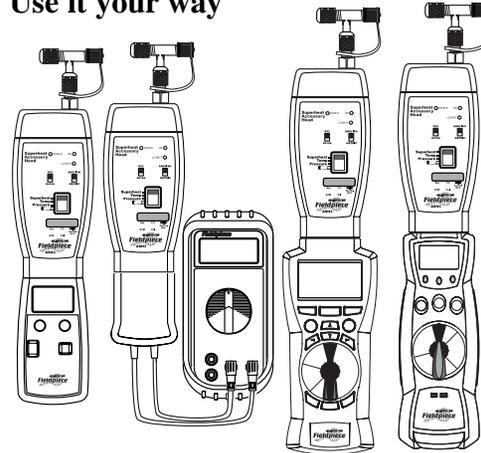


### OPERATOR'S MANUAL

## Description

The model ASH3 superheat accessory head measures refrigerant pressure and temperature simultaneously. It then calculates and displays superheat. It has a 1/4" industry standard fitting for actual pressure. A pipe clamp thermocouple is included for temperature. Select R22 or R410A. Select english or metric units.

## Use it your way



EHDL1 AHDL1 w/ Meter DL2 HS30

## How to use

1. Connect to COM and Volts jack. Slide ASH3 superheat head onto Fieldpiece "stick" meter, data logger, electronic handle or connect to most other meters using Fieldpiece ADLS2 deluxe test leads or AHDL1 handle.
2. Set meter to mVDC range.
3. Calibrate if needed (see Field calibration)
4. Hand tighten 1/4" flare to suction line as close to the evaporator as possible using an EPA approved service hose (not included).
5. Select refrigerant (R22 or R410A) and units (English or metric).
6. Connect the pipe clamp to the suction line at least six inches from the compressor and slide it under the insulation for best accuracy isolating the pipe clamp from the ambient air (pg. 2).
7. Select parameter to display (superheat, pressure, or temperature).
8. You must wait until the system you are testing has stabilized completely before you can take an accurate superheat reading, this usually takes about 10-15 minutes. The STABLE LED lights when superheat is stable.
9. Disable Auto-off to data log any of the above parameters with the DL2 data logger.
10. Once you have the superheat reading follow the manufacturer of the air conditioner's specifications to properly charge or diagnose the system.

## Field calibration

**Temperature:** To calibrate the system (ASH3, pipe clamp thermocouple, meter), adjust the calibration pot underneath the rubber covering while measuring a known temperature. Ice water is very close to 32°F and is readily available.

1. Stabilize a large cup of ice water.
2. Select temperature on ASH3, plug in the pipe clamp thermocouple and then immerse entire clamp into the ice water.
3. Adjust the calibration pot to read 31.3 on the DMM for optimum accuracy at room temp.

**Pressure:** The pressure/vacuum reading prior to connecting to an A/C system should always be zero. If you see that you're getting pressure readings of something other than zero without your service hose attached, you need to set atmospheric pressure before connecting the ASH3 to the system. To set atmospheric pressure, press the button underneath the rubber covering entitled "Set ATM". You usually have to set atmospheric pressure each time you dramatically change elevations. For example, if you "Set ATM" in Denver and take a pressure reading of an A/C system in Los Angeles, the pressure reading in Los Angeles will be lower than it actually is.

## SPECIFICATIONS

**Operating environment:** 32°F to 122°F; 0°C to 50°C at <75%RH

*Allow ~5 min. for ASH3 to come to ambient temp.*

**Storage environment:** -4°F to 140°F; 0°C to 50°C at <80%RH with battery removed from meter.

**Battery life:** 25 hours typical. No measurable current draw when in "off" position.

**Low battery indication:** Red LED lights

**Battery:** 9V

**Auto off:** Approx. 15 minutes

**Overloads:** The ASH3 outputs 3.4V when temperature or pressure is outside of their working range (overloaded). For ranges below 3400mVDC, the normal overload symbol will be displayed on the meter ("OL" or depending in the meter). For ranges above 3400mVDC, reading displayed will be approximately 3.4VDC.

## Pressure and vacuum

**Working range (pressure):**

0 to 500 psi; 0 to 4000 kPa

**Maximum displayed pressure:** 800psi

**Working range (vacuum):**

29"Hg vac. to 0; 74cmHg vac. to 0

*Vacuum will show up as negative value on meter.*

**Resolutions:** 0.1psi, 0.1"Hg vac.

**Accuracy:**

@ 50°F to 115°F ambient, ±1 psi, ±6.9 kPa

@ 32°F to 122°F ambient, ±2 psi, ±13.8 kPa

**Sensor breakdown pressure:** 1300psi

## Temperature

**Range (temperature):** -40°F to 400°F;

-40°C to 204°C

**Resolutions:** 0.1°

**Sensor type:** k-type thermocouple

**Pipe clamp thermocouple accuracy:** ±4°F or

±0.75%, whichever is greater, -30°F to 200°F

**System accuracy:** ±1°F; ±0.06°C @ 73°F ± 5°F after ice water calibration (see Field calibration).

## Superheat

**Range (temperature):** 0°F to 80°F; 0°C to 27°C

**Resolutions:** 0.1°

**System Accuracy:** ±1°F; ±0.06°C @ 73°F ± 5°F after calibration (see Field calibration).

## One year limited warranty

This head is warranted to the original purchaser against defects in material and workmanship for a period of one year from the date of purchase. During the warranty period, Fieldpiece will replace or repair the defective unit, subject to verification of the defect.

Any damage to the sensor from dirt, mechanical abuse, or overexposure to damaging chemicals, including overexposure to carbon monoxide, are not covered under this warranty. Also not covered are defects resulting from abuse, neglect, accident, unauthorized repair, alteration, or unreasonable use.

ANY IMPLIED WARRANTIES ARISING OUT OF THE SALE OF A FIELDPIECE INSTRUMENT 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 OR CLAIMS FOR SUCH DAMAGE, EXPENSES, OR ECONOMIC LOSS.

Local laws vary. Above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary by location.

## Obtaining service

Check the battery, then call Fieldpiece for an RMA# and send freight prepaid to Fieldpiece.

For warranty service, include proof of purchase date. For out of warranty service, include a check or money order for \$65 (ASH3 head), or \$30 (ATC1 pipe clamp thermocouple). We will pay for the shipping to you using the same method (ground, air, next day, etc.) used to ship product to us.



Fieldpiece Instruments, Inc.  
580 West Central Ave. Suite A  
Brea, CA 92821

Phone: (714) 257-9060 Fax: (714) 257-9069

[www.fieldpiece.com](http://www.fieldpiece.com)

## Measuring actual superheat

Superheat is the difference between the boiling point temperature of the refrigerant in the evaporator coil and the actual temperature of the refrigerant (gas) as it leaves the evaporator. After boiling, the refrigerant continues to warm up. The number of degrees it "warmed up" after boiling is called the superheat. Under worst case conditions (low load), the refrigerant in the evaporator boils off near the end of the evaporator coil. To make sure liquid doesn't enter the compressor under the worst case condition (low load), the AC manufacturers publish charts indicating what the superheat should be at a given indoor wet bulb measurement and outdoor air temperature.

Measuring superheat is your best indication on a fixed orifice system of the proper refrigerant charge and operating conditions. If everything else is working properly and the actual superheat is too high, add refrigerant. If it's too low, remove refrigerant.

Using superheat to determine proper charge enables an air conditioner to deliver the maximum cooling power, the best reliability, and the best efficiency.

The ASH3 should only be connected to the low pressure side of an A/C refrigerant circuit.

The hose must have a schraeder depressor on one end to release the refrigerant from the suction line. This is the same type of hose available with most pressure gauge sets. We suggest EPA sanctioned "no leak" hoses.

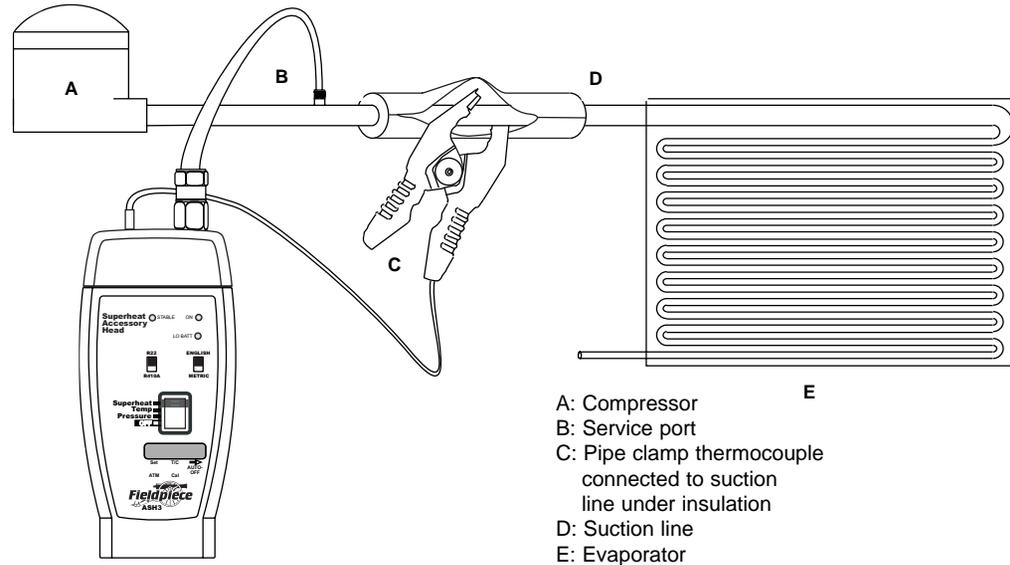
Exercise caution whenever working with any electricity and high pressure liquid or gas. Follow all instructions provided with equipment being serviced or installed.

## Target superheat

To determine the target superheat, you will need three things. Outdoor dry bulb (outdoor air temperature), indoor wet bulb, and the manufacturers target superheat chart.

You can use the ARH4 Fieldpiece accessory head for both indoor wet bulb and outdoor dry bulb. Or you can use any Fieldpiece meter that has a temperature function along with a ATWB1 wet bulb thermocouple.

## Set up for the ASH3 (meter not shown)



- A: Compressor
- B: Service port
- C: Pipe clamp thermocouple connected to suction line under insulation
- D: Suction line
- E: Evaporator

## Generic Target Superheat Chart (for fixed orifice systems) \*

OUTDOOR TEMP (°F)	EVAPORATOR ENTERING AIR TEMPERATURE (°F WB)													
	50	52	54	56	58	60	62	64	66	68	70	72	74	76
55	9	12	14	17	20	23	26	29	32	35	37	40	42	45
60	7	10	12	15	18	21	24	27	30	33	35	38	40	43
65	—	6	10	13	16	19	21	24	27	30	33	36	38	41
70	—	—	7	10	13	16	19	21	24	27	30	33	36	39
75	—	—	—	6	9	12	15	18	21	24	28	31	34	37
80	—	—	—	—	5	8	12	15	18	21	25	28	31	35
85	—	—	—	—	—	—	8	11	15	19	22	26	30	33
90	—	—	—	—	—	—	5	9	13	16	20	24	27	31
95	—	—	—	—	—	—	—	6	10	14	18	22	25	29
100	—	—	—	—	—	—	—	—	8	12	15	20	23	27
105	—	—	—	—	—	—	—	—	5	9	13	17	22	26
110	—	—	—	—	—	—	—	—	—	6	11	15	20	25
115	—	—	—	—	—	—	—	—	—	—	8	14	18	23

— Where a dash appears, do not attempt to charge system under these conditions or refrigerant slugging may occur. Charge must be weighed in.

NOTE: Superheat °F is at low-side service port.

\* This chart is an example of superheat charging charts that are supplied by A/C manufacturers with each fixed orifice air conditioner. Note that you must measure indoor wet bulb and outdoor dry bulb to be able to determine the target superheat. For wet bulb measurements, you can use Fieldpiece ARH4 relative humidity head or the Fieldpiece ATWB1 wet bulb thermocouple.

Although this chart may be similar to many charts supplied by manufacturers, you should use the chart supplied by the manufacturer of the air conditioning equipment. Fieldpiece bears no responsibility of results in using this chart.