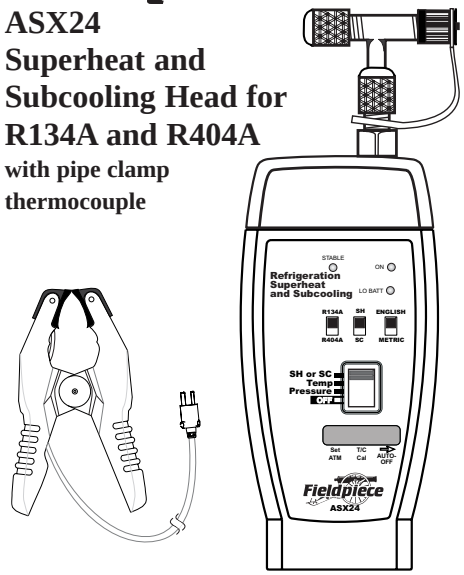
Fieldpiece

ASX24 Superheat and Subcooling Head for R134A and R404A

with pipe clamp thermocouple

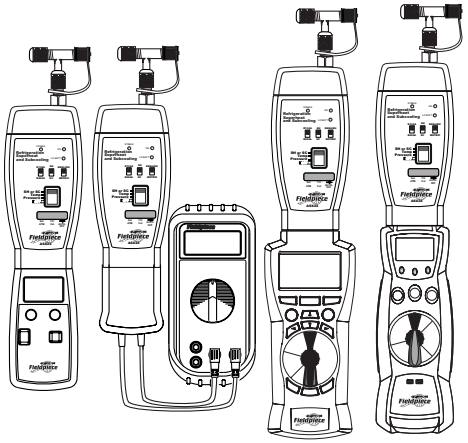


OPERATOR'S MANUAL

Description

The model ASX24 superheat and subcooling accessory head measures refrigerant pressure and temperature simultaneously. It then calculates and displays superheat or subcooling. It has a 1/4" industry standard fitting for actual pressure. A pipe clamp thermocouple is included for temperature. Select R134A or R404A. Select superheat or subcooling.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 ASX24 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 or liquid line as close to the evaporator or condenser as possible using an EPA approved service hose (not included).
5. Select superheat or subcooling, refrigerant (R134A or R404A) and units (English or metric).
6. Connect the pipe clamp to the suction (superheat) or liquid (subcooling) 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, subcooling, pressure, or temperature).
8. You must wait until the system you are testing has stabilized. The STABLE LED lights when the reading 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 or subcooling reading follow the manufacturer of the air conditioner's specifications to properly charge or diagnose the system.

Field calibration

Temperature: To calibrate the system (ASX24, pipe clamp thermocouple, meter), adjust the calibration pot underneath the rubber covering while measuring a known temperature. Ice water is 32°F and is readily available.

1. Stabilize (by repeated stirring) a large cup of ice water.
2. Select temperature on ASX24, plug in the pipe clamp thermocouple and then immerse entire clamp into the ice water (keep stirring).
3. Adjust the calibration pot to read 32.0 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 ASX24 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: 32ºF to 122ºF; 0ºC to 50ºC at <75%RH

Allow ~5 min. for ASX24 to come to ambient temp.

Storage environment: -4ºF to 140ºF; -20ºC to 60ºC at <80%RH with battery removed.

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 ASX24 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"). For ranges above 3400mVDC, reading displayed will be approximately 3.4VDC.

Stated Accuracy: at 73°F ± 9°F, <90% R.H.

Temperature

Range (temperature): -40ºF to 400ºF; -40ºC to 204ºC

Resolutions: 0.1º

Sensor type: k-type thermocouple

Pipe clamp thermocouple accuracy: ±4ºF or ±0.75%, whichever is greater, -30ºF to 200ºF

System accuracy: ±1ºF; ±0.06ºC @ 73ºF ± 5ºF after ice water calibration (see Field calibration).

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:

0 to 200 psig, ±1 psi, ±6.9 kPa

200 to 500 psig, 0.3% ±1 psi/6.9kPa

Sensor breakdown pressure: 800psi

Superheat

Range (temperature): 0ºF to 80ºF; 0ºC to 27ºC

Resolutions: 0.1º

System Accuracy: ±1ºF; ±0.06ºC @ 73ºF ± 5ºF after calibration (see Field calibration).

Subcooling

Range (temperature): 0ºF to 80ºF; 0ºC to 27ºC

Resolutions: 0.1º

System Accuracy: ±1ºF; ±0.06ºC @ 73ºF ± 5ºF 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 $100 (ASX24 head), or $30 (ATC1 pipe clamp thermocouple) On retrurns, Fieldpiece will pay for the shipping back to you using the same method (ground, air, next day, etc.) as you sent it to us.

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Measuring actual superheat and subcooling

Superheat is the difference between the actual temperature of the refrigerant (gas) as it leaves the evaporator and the boiling point temperature of the refrigerant in the evaporator coil. 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 for fixed orifice systems), 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 refrigerator 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.

Subcooling is the difference between the boiling point of the refrigerant in the condenser and the actual temperature of the refrigerant as it leaves the condenser. The degrees that the refrigerant "cools down" below the boiling point is the subcooling. Under worst case scenario (low load for TXV) the subcooling will continue to rise. If the subcooling rises to high, liquid may be backed into the compressor causing damage and catastrophic failure.

On TXV systems, subcooling is the best indication of the state of charge in the refrigerant system since these systems are designed to maintain constant superheat.

Properly charging a system ensures maximum efficiency and longer equipment life.

The hose must have a schraeder valve depresser on one end to release the refrigerant from the suction or liquid 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.

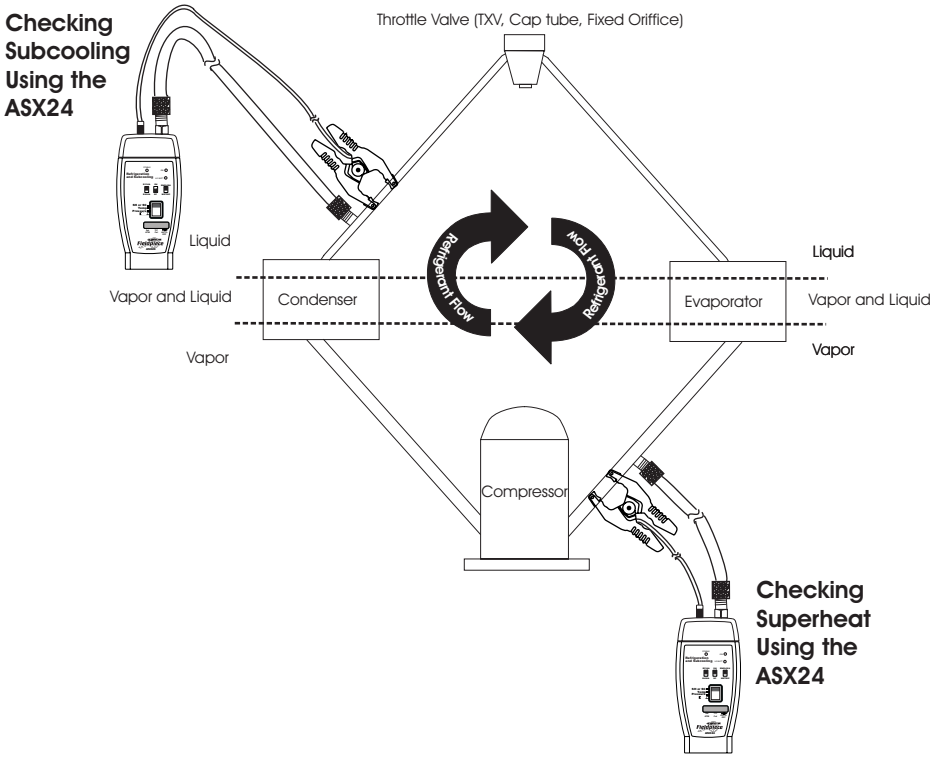
Target superheat and subcooling

Heed all equipment manufacturer's specifications, warnings and suggestions above anything found in this manual.

To determine the target superheat (fixed orifice system) or subcooling (charts vary dramatically from one system to another), you need the manufacturers target superheat chart or subcooling chart.

You can use the ARH4 Fieldpiece acessory head for both wet bulb, dew point and dry bulb measurements.

A diagram of the ASX24 on a refrigerator.



Generic Target Superheat and Subcooling Charts*

Required Superheat °F

Wet Bulb Temperature °F

Dry Bulb Temp. (°F)	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	19	21	24	28	31	34	37
80					5	8	12	15	18	21	25	28	31	35
85							8	12	15	19	22	26	30	33
90							5	8	13	16	20	24	27	31
95								5	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

Required Subcooling °F

Wet Bulb Temperature °F

Dry Bulb Temp. (°F)	57	59	61	63	65	67	69	71	73
75	25	24	23	22	21	20	19	18	17
80	24	23	22	21	20	19	18	17	15
85	23	22	21	20	19	18	17	16	14
90	22	21	20	19	18	16	15	14	12
95	21	20	19	18	17	15	13	12	10
100	20	19	18	17	15	13	12	10	8
105	19	18	17	16	14	12	10	8	6
110	17	16	15	13	12	10	8	6	4
115	15	14	13	12	10	8	6	4	2

*The Required Superheat chart is an example of a generic superheat chart of a typical fixed orifice, split residential A/C system. The Required Subcooling chart is an example of a typical chart for a TXV, split residential A/C system. These charts should not be used for charging. They are only examples to show what the manufacturer's charts may look like. Heed all manufacturer's indications, instructions and warnings above those in this manual.

The wet bulb measurement can be accomplished by a Fieldpiece ARH4 or ATWB1 and should be taken as close to the evaporator coil inlet as possible. The dry bulb reading can be taken with an ARH4, ATB1, ATA1 or any other Fieldpiece air thermocouple and should be taken as close to the condenser air inlet as possible.