WHICH METHOD

TXV OR EEV

Charge to subcooling

Target **8–12°F**, aim for 10. Then sanity check superheat: it should land **8–15°F**.

FIXED ORIFICE

Charge to superheat

Off the **target superheat chart**: indoor wet bulb plus outdoor dry bulb. Never one fixed number.

READ IT OFF THE RIGHT COLUMN

Superheat = suction line temp **minus** sat temp at suction pressure. Read the **vapour (dew)** column.

Subcooling = sat temp at liquid pressure **minus** liquid line temp. Read the **liquid (bubble)** column.

AIR

400	16–22°F	−1°F
CFM PER TON 350 TO 425	SUPPLY TO RETURN AT 75°F, 50% RH	PER +10% RH ABOVE 50%

WHAT THE SPLIT IS TELLING YOU

under 14°F	**Low charge, too much airflow, or a tired compressor.** Check charge before you touch the blower.
16–22°F	**Where it should be** at 75°F and 50% RH. Slide it down about 1°F for every 10% of humidity above that.
over 24°F	**Restricted air.** Filter, then the coil, then the return, then the blower. In that order.

MATH

CFM × 1.08 × ΔT	BTU/h ÷ (1.08 × ΔT)	BTU/h ÷ 12,000
SENSIBLE BTU/H	CFM	TONS

Ranges from **ACCA Manual T** and manufacturer service data. A2L class per **ASHRAE 34**, leak detection per **UL 60335-2-40**, unbalance per **NEMA MG-1**, evacuation per **ANSI/ACCA 5 QI**. **The nameplate and the maker's chart always win.**

R-454B, WHAT IS ACTUALLY DIFFERENT

- **Pull liquid from the cylinder.** It's a blend, so drawing vapour changes the mix.
- **Cylinder threads are left hand**, double ring on the knurl. System side stays right hand.
- **A2L rated tools and recovery tank.** No ignition sources anywhere near the work.
- **New equipment only.** Never a retrofit, never mixed with another refrigerant.

A2L	466	78%
ASHRAE 34 CLASS	GWP	LOWER GWP THAN R-410A

Run capacitor passes at ±6%

A **40 µF** cap is good anywhere from **37.6 to 42.4**. Outside that, replace it. Read it with the power off and the cap discharged.

Voltage unbalance

Biggest deviation from the average, divided by the average.

1%	2%	5%	5%+
derate starts	run at 95%	run at 76%	don't run it

Evacuation

Pull below **500 microns**. Then **isolate the pump** and watch it: holding under **1,000 microns for 10 minutes** is what proves the system is dry and tight. Hitting 500 with the pump still running proves nothing.

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Above the room volume limit, **UL 60335-2-40** wants a leak detection system that trips at 25% of the lower flammability limit.