Compressor Diagnosis Checklist

Did it fail, or was it killed? Prove it before you change it.

1. Check Power First

- **Voltage:** Measure at the compressor terminals with it trying to run. Within +/-10% of the nameplate, or the motor will overheat.
- **Contactor & wiring:** Pitted or burnt contacts, loose or melted lugs, blown fuses. A bad contactor can single-phase or chatter a compressor to death.
- **3-phase:** Voltage imbalance over 2% means find the cause before you start. A scroll running backward is loud, draws low amps and shows no pressure difference. Swap two legs.

2. Check the Run Capacitor (single-phase)

- **Test under load:** uF = (2,652 x start-winding amps) / voltage across the capacitor. It must be within the tolerance on the label.
- **Look it over:** A swollen top or leaking oil means replace it, then ask why it failed (heat, high voltage, wrong part).

3. Check the Windings (power off, capacitor discharged, wires off)

Reading	What you should see
C to R (run)	Lowest reading
C to S (start)	Middle reading
R to S	Highest reading, about equal to C-R plus C-S
Any terminal to ground	No continuity on an ohmmeter. Any reading = grounded compressor

- **Open overload:** Hot shell, C-R and C-S read open but R-S reads fine? The internal overload is open. Let it cool (it can take hours) before you condemn it.
- **Megger readings:** Low readings can come from liquid refrigerant in the shell. Run the crankcase heater and retest before you call it.

4. Check It Mechanically

- **Locked rotor:** Pulls locked-rotor amps and won't start. With good voltage and a good capacitor, try a hard-start kit once before condemning.
- **Not pumping:** Runs at low amps with suction and discharge pressures close together. Check that the reversing valve isn't stuck mid-position first.

5. Find the Root Cause: the Compressor Is Usually the Victim

What killed it	What to look for
Floodback	Low superheat at the compressor, frosted or sweating shell. Low airflow, overcharge, TXV stuck open
Flooded starts	Refrigerant moving to the shell in the off cycle. Bad or missing crankcase heater
Overheating	Discharge line over 225 F, 6 in. from the compressor. Low charge, dirty condenser, high head
Lost oil	Low charge, short cycling, oil trapped in long or poorly sloped lines
Electrical	Low or unbalanced voltage, bad contactor, failed capacitor
Contamination	Moisture, acid, air. Acid-test the oil after any burnout

Change the compressor without fixing the cause, and you'll be back for the next one. Fix the cause, replace driers, pull a deep vacuum, and record your readings.

Always follow the equipment manufacturer's instructions and local codes. This guide is a field reference, not a substitute for them.