

Hermetic Compressor Diagnostics

There are 3 basic conditions that a defective compressor might have:

1. Does not run, hum or anything.
2. Hums, but does not pump.
3. Runs and pumps but has other operational problems.

Symptom	Possible Cause	Check:
Does not start, run, hum or anything	1. Control system not supplying power to compressor	1. Check power to the compressor. If none, check fuse, breaker, ice machine control system & contactor.
	2. Motor overload is open, because the compressor motor overheated.	2. Check temperature of compressor dome and check for open circuit in the compressor. If hot, see "overheats".
	3. Motor overload is open, possibly because starting components have failed.	3. If there is power, is there power to the start winding? If not, check the start capacitor and start relay.
	4. Overload has failed open	4. Check temperature of compressor dome and check for open circuit in the compressor. If hot, see "overheats".
	5. Compressor motor has open winding(s)	5. If there is power, check the windings of the compressor for an open circuit.
Hums, but does not pump	1. Starting components have failed	1. Check the start capacitor and start relay
	2. Locked rotor	2. Check the starting components and compressor windings
	3. Motor may be running, but the valves do not seal or the pistons do not move	3. Check amp draw and system pressures.
	4. Wired wrong	4. Check wiring of capacitor(s) and relay.
	5. Low voltage at compressor	5. Check voltage at compressor before and during attempted start.

Runs and pumps, but has other problems		
Symptom	Possible Cause	Check
Noise	1. Internal parts are worn	Compare to new system
	2. Internal mounting springs/supports have failed	
High amps	1. Bearings are worn	1. Check amp draw, high amps may indicate worn bearings.
	2. Winding partially shorted	2. Check resistance of motor
	3. Run capacitor inoperative	3. Check run capacitor
Low capacity	Valves leak	Check amp draw, low amps may indicate leaking valves or low charge.
Overheats	1. Lack of refrigerant/too much superheat	1. Check system, check TXV bulb mounting.
	2. Worn internal parts	2. Check amp draw, high amp draw may indicate worn parts.
	3. Start system problem	3. Check starting components, voltage and wiring.
	4. Winding partially shorted	4. Check resistance of motor
	5. Discharging gas into dome of compressor	5. Check system pressures, if discharge is over 450 PSIG, internal relief valve may have opened. Check system. Check high pressure cut out.
Too quiet, too cold	Not enough superheat, overcharged	Check system, check TXV bulb mounting.

Repairs:

Hermetic compressors must be replaced when it is confirmed that they have an internal problem.

1. Confirm the diagnosis.
2. Order/obtain the correct compressor and starting components. Note: If the starting components are not included with the compressor and the ice machine is out of parts warranty, the starting components are not covered by warranty.
3. Recover the refrigerant.
4. Check electrical characteristics of new compressor vs. what's required (single vs. 3 phase, etc.).
5. Disconnect electrical power.
6. Disconnect electrical wires and starting components from ice machine.
7. Cut out old compressor and filter/dryer.
8. Pinch tubes of old compressor shut.
9. Place new compressor in system (must not be open more than 15 minutes).
10. Place new filter/dryer in system. Note: If old compressor is a burn-out, use a suction line filter dryer to clean up the system.
11. Attach dry nitrogen source to system.

12. While purging with nitrogen, sweat-in compressor and dryer, then braze the old compressor ports shut. Check for visible problems with joints, touch up if needed.

13. Remove nitrogen source, attach micron gauge and vacuum pump to system.
14. Evacuate system to 300 microns. If there is a leak, 300 microns will not be achievable or will rise when pump is valved off.
15. Remove micron gauge and vacuum pump.
16. Weigh in nameplate charge. Liquid charge R-404A into high side completely. Check for leaks.
17. Connect electrical wires, check against wiring diagram.
18. Be sure terminal cover is in place. Reconnect electrical power.
19. Start system and check for proper operation.
20. Tag and box all in warranty parts.