Heat Pump Emergency Decision Tree

Ice on the coil. Won't heat. Won't cool. A real flowchart for diagnosing a heat-pump emergency in the Birmingham metro before the tech arrives.

WHO IT IS FOR

Anyone in Leeds, Moody, Pinson, Clay, or Springville with a heat pump that just quit doing what it's supposed to.

WHAT IS INSIDE

The 4-symptom decision tree (ice / no heat / no cool / weird sounds), defrost-cycle troubleshooting, reversing-valve symptoms, the 3 questions to answer before the tech arrives.

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Read online: https://emergencyacrepairservice.com/downloads/heat-pump-emergency-decision-tree/

Why heat pumps are different

A heat pump is an AC running in reverse during heat mode. Same refrigerant cycle, same compressor, but a reversing valve flips the flow so the outdoor unit pulls heat from outside air and the indoor coil rejects it inside. That means a heat pump that's "broken" can be broken in two completely different modes. Heat failures look nothing like cool failures. This tree handles both.

Symptom 1 -- Ice on the outdoor coil

Heat pumps build frost in winter heat mode. That's normal. The system runs a defrost cycle every 30-90 minutes to clear it. A LIGHT coating of frost is fine. A solid block of ice covering the entire coil is not.

* Light frost, system runs normally, goes through defrost cycles -- NORMAL
* Solid ice covering the coil entirely, no defrost cycles happening -- DEFROST FAILURE
* Ice + system blowing cool air in heat mode -- DEFROST SENSOR or REVERSING VALVE issue
* Action: turn the system to OFF, set thermostat to "Emergency Heat" or "Aux Heat" if available. Call a tech.
* Do NOT chip ice off the coil -- bends fins, damages refrigerant lines, voids warranty

Symptom 2 -- System won't heat

In heat mode, no warm air comes out of registers. Steps:

* 1. Check thermostat -- is it set to "Heat" mode? Set point above current temp?
* 2. Listen at outdoor unit -- fan running? Compressor humming?
* 3. Walk to a supply register -- any air? Cold air? Lukewarm?
* 4. If outdoor unit silent + indoor blower running = reversing valve stuck OR compressor failure. Tech
* 5. If outdoor unit running + indoor air is cool = reversing valve not switching to heat. Tech
* 6. If outdoor unit running + indoor air is lukewarm + outdoor temp under 25 deg F = system is at design-temp limit. Switch to Emergency Heat or Aux Heat to engage backup heat strips

Symptom 3 -- System won't cool

In cool mode, no cold air comes out. Steps:

* 1. Check thermostat -- "Cool" mode? Set point below current temp?
* 2. Check breakers -- outdoor and indoor units. Flip fully OFF then ON
* 3. Check air filter -- pulled and inspected? Replace if matted
* 4. Listen -- both outdoor and indoor units running? If only indoor blower, outdoor unit is the problem
* 5. If outdoor unit silent + indoor running = could be capacitor (humming with no fan start), contactor, or compressor. Tech
* 6. If outdoor fan running + compressor silent = compressor or capacitor failure. Tech immediately
* 7. If outdoor unit running + indoor air is room temp = refrigerant charge issue or reversing valve. Tech

Symptom 4 -- Weird sounds

Heat pumps make a specific set of normal sounds. Anything outside that range is a flag:

* Normal -- outdoor fan whoosh, compressor hum, brief "whoosh" at startup of defrost cycle
* Normal -- brief click when reversing valve shifts between modes
* NOT NORMAL -- loud hammering at defrost transition = failing reversing valve
* NOT NORMAL -- screeching = blower bearing failure (indoor) or fan motor failure (outdoor)
* NOT NORMAL -- clicking that never starts = control board or relay issue
* NOT NORMAL -- buzzing at startup that stops = failing capacitor about to die
* NOT NORMAL -- banging or grinding from outdoor unit = loose part, fan blade strike. Shut down immediately

The defrost cycle in plain English

A heat pump in heat mode builds frost on the outdoor coil because the coil is COLDER than outside air (it's absorbing heat from outside). When frost builds enough to restrict airflow, the unit's defrost board triggers a cycle:

* Reversing valve flips to cool mode briefly
* Outdoor fan turns OFF
* Indoor blower keeps running but indoor coil is now cold (you'll feel cool air for 5-15 minutes -- this is normal)
* Hot refrigerant warms the outdoor coil and melts the frost
* Defrost timer or sensor ends the cycle
* System returns to normal heat mode
* If defrost never triggers and coil ices over = defrost sensor or board issue

Reversing valve symptoms

The reversing valve is the part that lets a heat pump switch between heat and cool. When it fails or sticks:

* Loud hammering or banging at mode transition
* System "cools" instead of heating (or vice versa)
* System stuck in one mode regardless of thermostat
* Loud refrigerant rushing sound that doesn't stop
* Reversing valve failure usually requires component replacement. Tech only

Auxiliary heat / Emergency heat -- what's the difference?

Most Birmingham heat pumps have electric heat strips as backup:

* Auxiliary heat -- strips kick on automatically when the heat pump can't keep up (typically below 25-30 deg F outside)
* Emergency heat -- manual mode where you tell the thermostat to use ONLY the heat strips and lock out the heat pump
* Use Emergency Heat when: heat pump is making bad noises, ice problems, refrigerant issues -- keeps the house warm while you wait for a tech
* Emergency Heat is expensive to run (resistance heat strips), so don't leave it on long

Three questions to answer before the tech arrives

* 1. What MODE is the system in (heat, cool, emergency)? What is the outdoor temperature?
* 2. What does the OUTDOOR unit do -- fan runs? compressor runs? silent? makes noises?
* 3. What does the INDOOR unit do -- blower runs? what does the air feel like?
* These three answers shave 30+ minutes off the diagnostic

When to call vs wait until morning

Honest framework:

* No heat + outdoor temp under 25 deg F + anyone vulnerable in the home -- CALL NOW
* No cool + indoor temp over 88 deg F + summer night -- CALL NOW
* No cool + indoor temp 78-86 deg F + no medical risk -- wait for morning, call early
* Weird noises but system is running and temperature is comfortable -- wait for morning
* Any electrical smell, smoke, or sparking -- CALL NOW (and consider 911 if active fire risk)

Sources

* U.S. Department of Energy -- Heat Pump Systems -- energy.gov/energysaver/heat-pump-systems
* Energy Star -- Heat Pump Maintenance -- energystar.gov
* ACCA -- Heat Pump Design and Maintenance -- acca.org
* EPA -- Refrigerant handling -- epa.gov/section608
* Trane, Carrier, Lennox technical bulletins on defrost cycle behavior

Disclaimer

This guide is informational. It is not a substitute for licensed HVAC inspection, diagnosis, or service. Conditions vary by home and equipment. Refrigerant work, gas-line work, and high-voltage electrical work require an EPA Section 608 certified technician and a licensed HVAC contractor under Alabama law. When in doubt, call.

No pricing on this site is a quote. No response time is a guarantee. All ranges shown are observed market data, not promises.

About the author

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John has been turning wrenches on Birmingham HVAC systems for 25 years. Alabama HVAC contractor licensed, bonded, and insured. EPA Section 608 Universal certified. He has walked roofs, attics, crawlspaces, and condenser pads across every neighborhood in this metro and has written every guide on this site from the working tech's perspective -- not the salesman's.

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