How an Air Conditioner Works

A clever machine that simply moves the room's heat outside

A plain-language explainer (a sample technical document)

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※ Best viewed on a desktop — slides may be hard to read on mobile.

1. What is it actually doing?

- An air conditioner doesn't really "make cold" — it **moves the room's heat outside**.
- The heat is carried by a **refrigerant**, a substance that switches between liquid and gas.
- It keeps repeating: **absorb the room's heat → release it outside**.
- That's why the outdoor unit blows out **warm air**.

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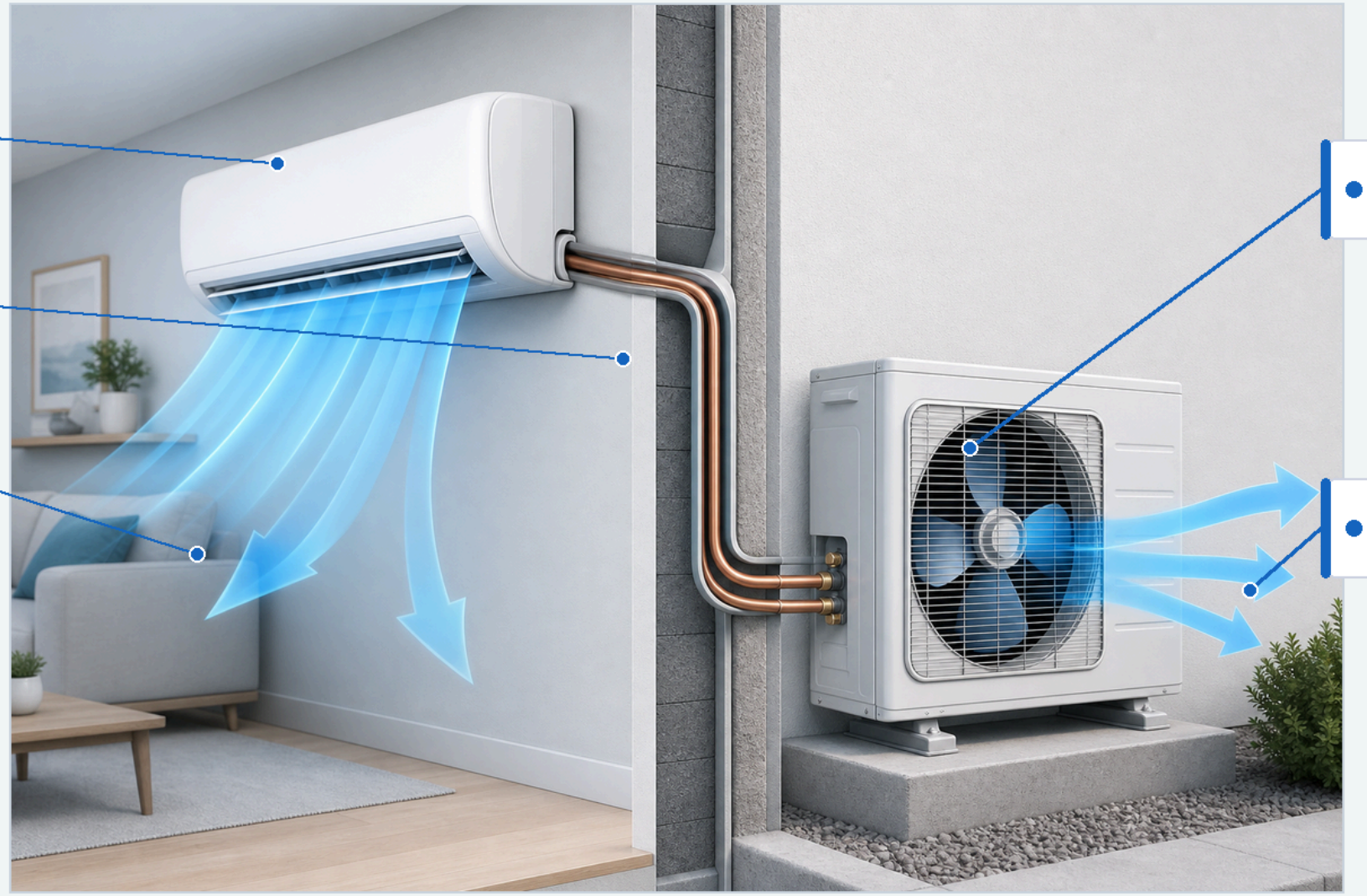
The indoor unit passes the room's heat to the refrigerant; pipes carry it to the outdoor unit, which releases it outside.



Indoor unit
Picks up the room's heat

Refrigerant pipes
Link the two units

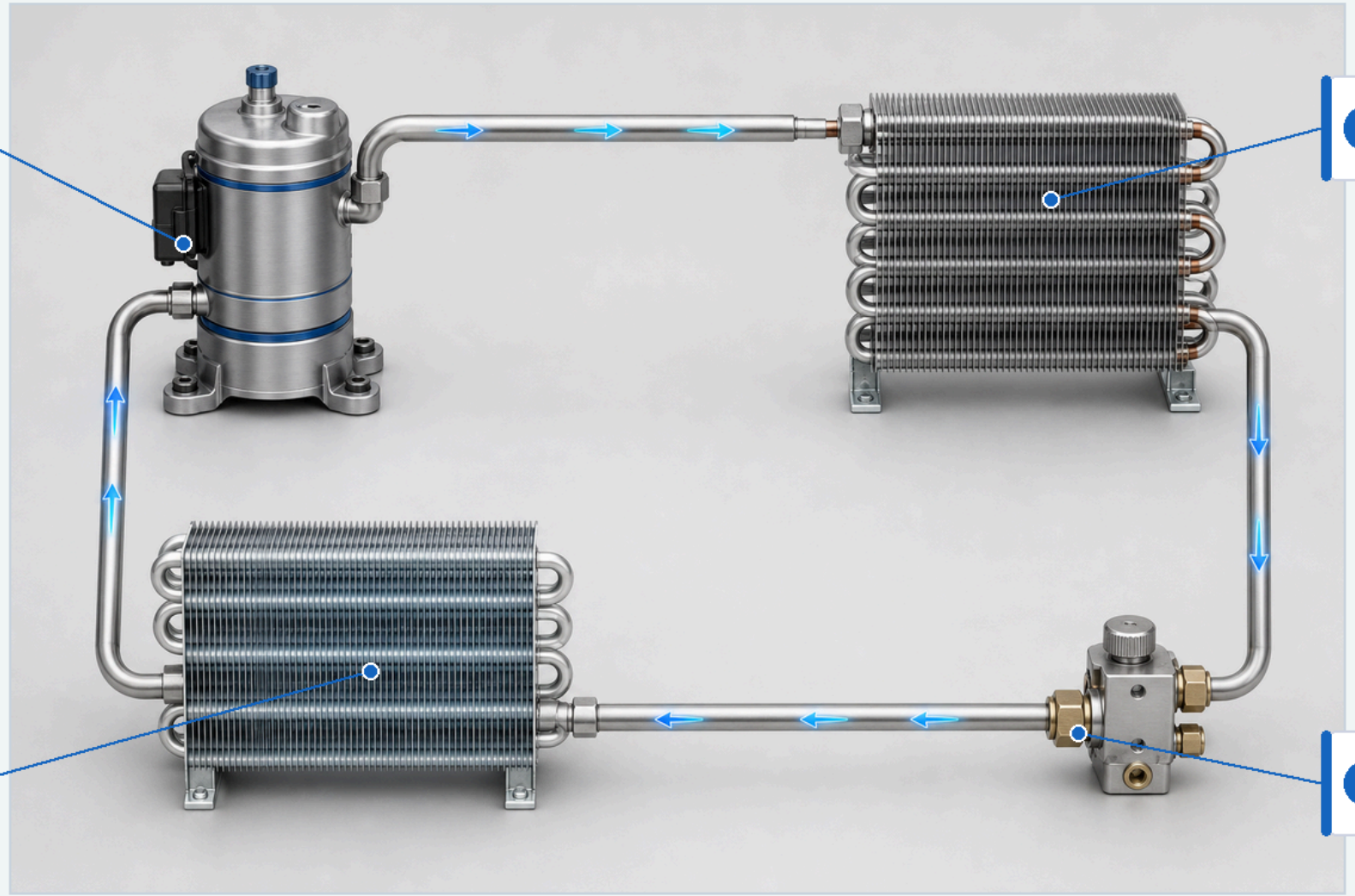
Cool air
Chilled air into the room

Outdoor unit
Dumps the heat outside

Hot air
Blown out by the fan

The Cooling Cycle (Refrigerant Loop)

The refrigerant circles the loop, carrying the room's heat outside. Steps 1 to 4 repeat.



1 Compressor
Gas to hot, high pressure

2 Outdoor coil
Releases heat; turns liquid

3 Expansion valve
Pressure drops; gets cold

4 Indoor coil
Absorbs heat; turns to gas

4. Main parts and their roles

Part	Role (in plain terms)
Compressor	A pump that squeezes the refrigerant to keep it circulating — the "heart" (inside the outdoor unit)
Outdoor coil (condenser)	Releases the heat the refrigerant carried into the outside air
Expansion valve	Drops the pressure sharply, making the refrigerant cold
Indoor coil (evaporator)	Lets the refrigerant absorb the room's heat and blows out cool air
Fan	Moves air across the coils to help heat flow in and out

5. Good to know

Point	Why it matters
It heats, too	Reverse the refrigerant flow and it carries outside heat into the room (a heat pump)
Key to efficiency	An inverter fine-tunes the compressor's speed to cut wasted electricity
Clean the filter	Dust clogs the airflow, weakening performance and raising your bill
Don't overshoot	Setting the temperature too low or too high uses far more power

6. Mini glossary

- **Refrigerant** — a substance that switches between liquid and gas to carry heat
- **Compressor** — a pump that squeezes the refrigerant to circulate it
- **Heat exchanger** — a part where the refrigerant and air trade heat (in both units)
- **Condenser / Evaporator** — the heat exchanger that releases heat / the one that absorbs it
- **Expansion valve** — a valve that lowers pressure to cool the refrigerant
- **Heat pump** — a mechanism that "pumps" heat from one place to another (used for heating)

In short

An air conditioner simply **moves the room's heat outside**.

Compress → release → expand → absorb, on repeat —
cool in summer, and reverse it for warmth in winter.