Advanced Scroll Temperature Protection (ASTP)
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Goals

- Discharge temperature (overheat) protection that is:
  
  **INTERNAL**
  - In-direct contact with key components
  - Unable to be bypassed
  
  **AUTOMATIC**
  - No wires, relays, or circuitry to manage
  
  **RELIABLE**
  - Protects against all typical causes of scroll overheating
Advanced Scroll Temperature Protection (ASTP)
Cause of Scroll Overheating

- Typical causes of scroll overheating:

<table>
<thead>
<tr>
<th>System malfunctions</th>
<th>Fan failures, loss of charge, blocked expansion devices</th>
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</table>
| Low suction pressures (no gas flow; heat not carried away) | Improper system charging (see page 8)  
Out of envelope operation  
Bypassed low pressure controls |
| Missing, bypassed, or poorly placed external protection devices | External devices inaccurate, internal temps; often much higher  
Temporarily bypassing devices leads to damage (initial damage results in failures later) |
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Internal View
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Bi-metal Disk Positions
Advanced Scroll Temperature Protection (ASTP) Operation

Bi-metal disk opens when critical internal temperature is reached (around 300°F/150°C)

Compressor “unloads” but continues to run
- “Balanced pressure” operation
- Motor heat builds inside compressor
- No refrigerant flow to carry motor heat away

Motor protector opens
- Compressor turns off, cools

Motor protector resets, compressor restarts
- Bi-metal disk resets before motor protector
- Cycle will continue until cause of overheat is fixed
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What To Do?

• If a protected compressor is identified:

1. STOP THE COMPRESSOR

2. ALLOW TO COOL THOROUGHLY

3. RESTART PUMP AND CHECK FOR NORMAL OPERATION
Advanced Scroll Temperature Protection (ASTP) Recommended Cool-Down Time

• The longer the compressor runs unloaded, the longer it must cool before the bi-metal disk resets.

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**Recommended Minimum Cool Down Time**
(After Compressor Is Stopped)

*Times Are Approximate.

Various factors, including high humidity, high ambient temperature, and the presence of a sound blanket will increase cool-down times.
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Possible Field Scenarios

• Likely situations where protection may activate:

1. Initial system charging (or recharging after servicing)
   • Compressor is run with too little system charge
     ➢ Very common on split systems
     ➢ Will result in very low suction pressures (< 25 PSIG)
     ➢ Do not disable low pressure cutouts while charging

2. Field servicing (system problem causes overheating)
   ➢ Technician will observe “balanced pressures”
   ➢ Risk of misdiagnosis as failed compressor
   ➢ Must stop pump, cool thoroughly and reset
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Availability

• ASTP is in various commercial scroll models that will be identified with a label on the compressor

Compressor may stop pumping with motor running. Turn off and wait until cool. May need more than one hour to reset.

El compresor puede dejar de comprimir, aun con el motor funcionando. Apáгуelo y espere a que se enfríe. Puede requerir más de una hora para restablecerse.

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