

# Low-Temperature, Cut-Out Capillary Thermostats

NTF

## DESCRIPTION

Electro-mechanical, low-temperature limit/cut-out thermostat with a 20 ft, 10 ft or 6 ft capillary sensing element, auto- or manual reset, and 1-SPDT or 2-SPDT switched output.

## APPLICATION

The thermostat and its capillary sensing element provide an antifreeze function. It detects temperature drops below a fixed safety value (setpoint), i.e. heaters in A/C units, exchangers in cooling systems, etc.

## FEATURES

- Vapor-filled 20 ft, 10 ft or 6 ft copper capillary sensing element
- Joint spring protector at capillary-bellow connection
- Airtight single-stage switch, 1-SPDT or 2-SPDT contacts, 250 VAC, 15A
- Auto- or manual reset
- Wide range, 14 to 54°F, fits water w/glycol added applications
- Setpoint safety-lock protection and simple adjustment
- Visual setpoint scale
- Easy installation and wiring
- Maintenance-free
- Two-year warranty



"Bulb on 6-ft capillary stores excess vapor (gas); still responds to the lowest temperature along any 1 ft. section of the entire capillary length."

## SPECIFICATIONS

|                                |  |
|--------------------------------|--|
| <b>Thermostat Type Sensing</b> | Self-contained, electromechanical  |
| - element                      | Vapor-filled capillary   |
| - media                        | Temperature in air   |
| - operating range              | 14°F to 54°F (-10°C to 12°C)   |
| - response                     | To lowest temperature sensed by any 1 ft section of the capillary element    |
| <b>Type of Control</b>         |  |
| General                        | On/off, low-level single-stage or cut-out control, w/ (1) microswitch output |
| Low-level setpoint             |  |
| - factory set                  | At 39°F (4°C), and safety-lock secured                                       |
| - adjustment                   | Over full operating range, via screwdriver slot                              |
| - visual scale                 | 14°F to 54°F   |
| Switch output                  | 1-SPDT or 2-SPDT, airtight   |
| - contact rating               | 24...250 VAC, 15 (8)A  |
| - switching differential       | 1.8°F (1°K), auto- or manual reset   |
| <b>Environmental</b>           |  |
| Permissible ambient            |  |
| - working temperature          | 14°F to 54°F (-10°C to 12°C)   |
| - enclosure temperature        | 14°F to 131°F (-10°C to 55°C)  |
| - capillary overload           | temperature 392°F (200°C), max. 60 min.                                      |
| - storage temperature          | 14°F to 158°F (-10°C to 70°C)  |
| - humidity                     | 0 to 95% rH (rF), non-condensing   |

## Physical

|   |   |
|---|---|
| <b>Enclosure (base and cover)</b>       |   |
| - base material                         | Steel, galvanized   |
| - cover material                        | ABS, fire retardant   |
| - color                                 | Silver / light gray   |
| - protection                            | NEMA 1 (IP40)   |
| <b>Capillary</b>                        |   |
| - material                              | Copper  |
| <b>Installation</b>                     |   |
| - enclosure                             | Surface mounted   |
| - capillary                             | Duct and across coil mounted  |
| <b>Dimensions (H x W x D)</b>           |   |
| - enclosure                             | 3.3 x 4.1 x 2.1 in. (83 x 105 x 53 mm)  |
| - capillary sensing element             | Ø 0.08 in. (2 mm), various lengths: 20 ft (6 m), 10 ft (3 m), or 6 ft (1.8 m) |
| <b>Cable entry</b>                      | (1) M20 compression fitting, removable, hole fits 1/2 in. conduit connector   |
| <b>Wire connection</b>                  | Terminal with wire-retaining screws   |
| <b>Wire size</b>                        | Max. 14 AWG (2.5 mm <sup>2</sup> )  |
| <b>Weight</b>                           | 1.6 lbs. (0.7 kg)   |
| <b>Manufacturing Approvals/Listings</b> |   |
| ISO 9001 certified                      |   |
| CE                                      |   |
| <b>Warranty</b>                         |   |
| Two-year material and workmanship       |   |

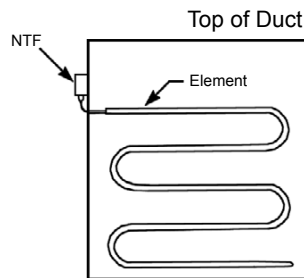
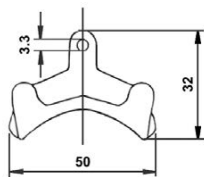
**ORDERING INFORMATION**

| Part Numbers            | SPDT 15(8)A                          | Capillary Length ft (m) | Reset          |
|-------------------------|--------------------------------------|-------------------------|----------------|
| NTF-3-US<br>NTF-3R-US   | 1<br>1                               | 6 (1.8)<br>6 (1.8)      | Auto<br>Manual |
| NTF-5-US<br>NTF-5R-US   | 1<br>1                               | 10 (3)<br>10 (3)        | Auto<br>Manual |
| NTF-1-US<br>NTF-1R-US   | 1<br>1                               | 20 (6)<br>20 (6)        | Auto<br>Manual |
| NTF-32-US<br>NTF-3R2-US | 2<br>2                               | 6 (1.8)<br>6 (1.8)      | Auto<br>Manual |
| NTF-52-US<br>NTF-5R2-US | 2<br>2                               | 10 (3)<br>10 (3)        | Auto<br>Manual |
| NTF-12-US<br>NTF-1R2-US | 2<br>2                               | 20 (6)<br>20 (6)        | Auto<br>Manual |
| DBZ-05/0                | Capillary mntg. clips, metal (6 pcs) |                         |                |

**INSTALLATION**

- Thermostat enclosure to be surface mounted; avoid location subject to excessive vibration.
- Allow unrestricted access to the manual reset button (NTF-.R series).
- Mount to flat surface using oval holes only (see diagram). Mounting with round holes in middle of freezestat may damage the instrument and cause improper operation.
- Capillary sensing element to be located down the stream-side of a coil, exposed to all areas that encounter low temperature.
- Install capillary sensing element across the face of the coil, horizontally serpentine only.

DBZ-05/0 Accessory Capillary Mounting Clip Dimensions (mm)



- Do not kink or apply excessive force to the capillary sensing element.
- Tie up the capillary element at appropriate points to prevent damage from air movement or vibration.

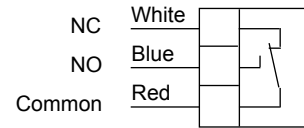


Thermostat enclosure **must not** be exposed to temperatures lower than the capillary element's sensing ability.

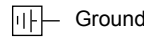
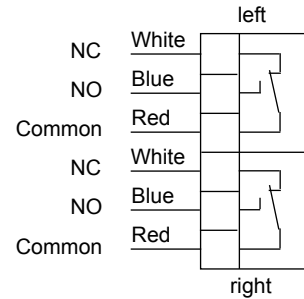
**WIRING CONFIGURATION**

**NTF and NTF-2**

Falling temperature and attained low cut-out setpoint, contact connection: Red to Blue



Vapor-filled capillary; control responds to the lowest temperature along any 1ft section of the capillary length.



- All wiring should comply with national and electrical codes.
- All operations performed on the units, whether wiring, testing, or maintenance, must be done with neither power supply on the unit nor external load.
- For protection, enclosure cover must be installed, all screws to be fastened and cable entry secured.

**OPERATION**

- The low cut-out setpoint is factory set and can be adjusted by turning the slotted screw on top of the enclosure.
- Auto-reset types will automatically switch back to the normal position if the temperature returns to normal conditions. Manual-reset types will switch back only if both the temperature returns to normal conditions and the reset button (at the enclosure's front) is manually pushed.

**DIMENSIONS (mm)**

