

Regulatory Compliance

Safety

This device has been tested and found to be in compliance with the requirements set forth in UL 916, Energy Management Equipment, and is listed by Underwriters Laboratories, Inc., for installations in the United States.

This device has been tested and found to be in compliance with the requirements set forth in C22.2, No. 205-M1983, Signal Equipment, and is Certified by Underwriters Laboratories, Inc., for installations in Canada.

Electromagnetic Compatibility (EMC)

Federal Communications Commission (FCC)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE! This device has been tested and found to comply with the limits established for Class A digital devices. It is intended to be used in a commercial environment. Operation of this equipment in residential environments may cause harmful interference, in which case the user may be required to correct the interference at his own expense.

CAUTION! Any changes or modifications not expressly approved by Novar Controls Corporation could void your authority to operate this equipment.

Industry Canada

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled *Digital Apparatus*, ICES-003, of Industry Canada.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: *Appareils Numériques*, NMB-003, édictée par l'Industrie Canada.

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Description

Electronic Thermostat Modules (ETMs) are Logic One[®] intelligent control modules distributed throughout a building to provide local direct digital control of unitary, packaged, staged HVAC systems. The ETM-3051 is a panel-mount module that controls the fan, two stages of heating, two stages of cooling, the damper, and the night mode damper.

In addition to the typical connections for discharge and return air (or space) temperature sensors, the ETM-3051 provides a connection for a third temperature sensor that controls the space temperature. This sensor, called a switch-over sensor, provides the option of programming a fall-back control mode of operation. The fall-back mode of operation is programmed in Novar Controls' software to switch control to the return air sensor if the signal is lost from the switch-over sensor.

This document provides the installation procedures for mounting the ETM-3051, connecting power, making the appropriate wiring connections, setting the module address, and verifying installation.

ETM-3051 Specifications

Agency Approvals

| | |
|-----------------|---|
| Listed device: | CUL/UL E90949 |
| Standards used: | UL 916, Energy Management Equipment CSA C22.2, No. 205-M1983, Signal Equipment |

Power Requirements

| | |
|--------------------------|---------------------|
| Voltage (Input): | 24 VAC, Class 2 |
| Consumption: | 10 VA |
| Relay Contacts (Output): | 24 VAC, 2A, Class 2 |
| Fuse Rating: | 1 amp, 3 AG |

Operating Environment

| | |
|--------------|----------------------------------|
| Temperature: | −40° to 158°F (−40° to 70°C) |
| Humidity: | 0 to 99% Relative, noncondensing |

Physical Dimensions

| | |
|---------|--------------|
| Height: | 5.9 inches |
| Width: | 7.5 inches |
| Depth: | 1.785 inches |
| Weight: | 1.38 lb |

Precautions

Take the following precautions during installation:

- Observe national and local electrical codes.
 - Observe voltage and current limits marked on the module.
 - Do *not* connect 115 volts to any terminal of the ETM-3051. The ETM-3051 is a Class 2 (low voltage) control device.
 - Do *not* use the ETM-3051 as a final safety device.
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ETM-3051 Installation Instructions

Mounting the ETM-3051

The ETM-3051 should be mounted horizontally with the terminal strip at the bottom of the module. Make sure that the module and the mounting hardware do not interfere with proper operation of the equipment.

Refer to Figure 1 and use the procedure following it to mount the ETM-3051 to the wall of the control panel.

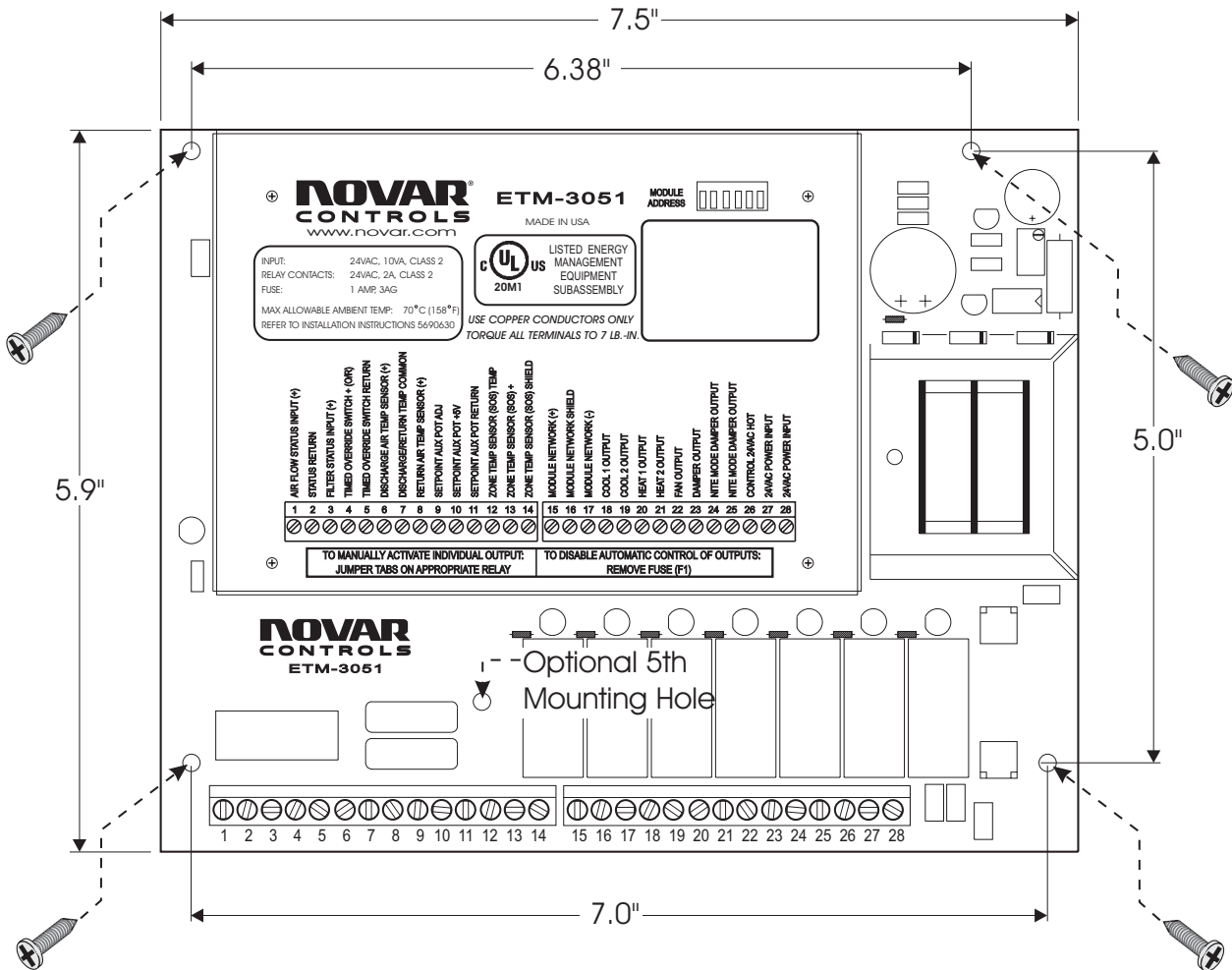


Figure 1. Mounting the ETM-3051

| Step | Procedure |
|-------------|--|
| 1 | Turn off power to the HVAC equipment and the ETM-3051 before installing the unit. |
| 2 | Position the module against the mounting surface and mark the surface to show the location of the four corner mounting holes. <ul style="list-style-type: none">■ Figure 1 shows the location of an optional fifth mounting hole located above Terminals 11 and 12. This hole does not have to be used to secure the module to the wall but can be used if needed. |
| 3 | Drill the holes in the places marked on the mounting surface and, if necessary, install hollow-wall anchors. |
| 4 | Position the module against the mounting surface and insert and tighten screws (not included) to secure the module. |

Supplying the ETM-3051 with Power

The ETM-3051 requires 24-volt AC power, with a consumption rating of 10 VA. Connect the 24-VAC to Terminals 27 and 28, labeled “24 VAC POWER INPUT.”

NOTE! The 24-VAC power connection is isolated. One transformer can be used to power multiple modules within the restrictions of a 10 VA consumption.

Wiring the ETM-3051 Inputs

The ETM-3051 uses removable screw connections. The inputs are Terminals 1 through 14.

Refer to the terminal descriptions on the shield of the ETM-3051 (Figure 2) to ensure proper wiring connections.

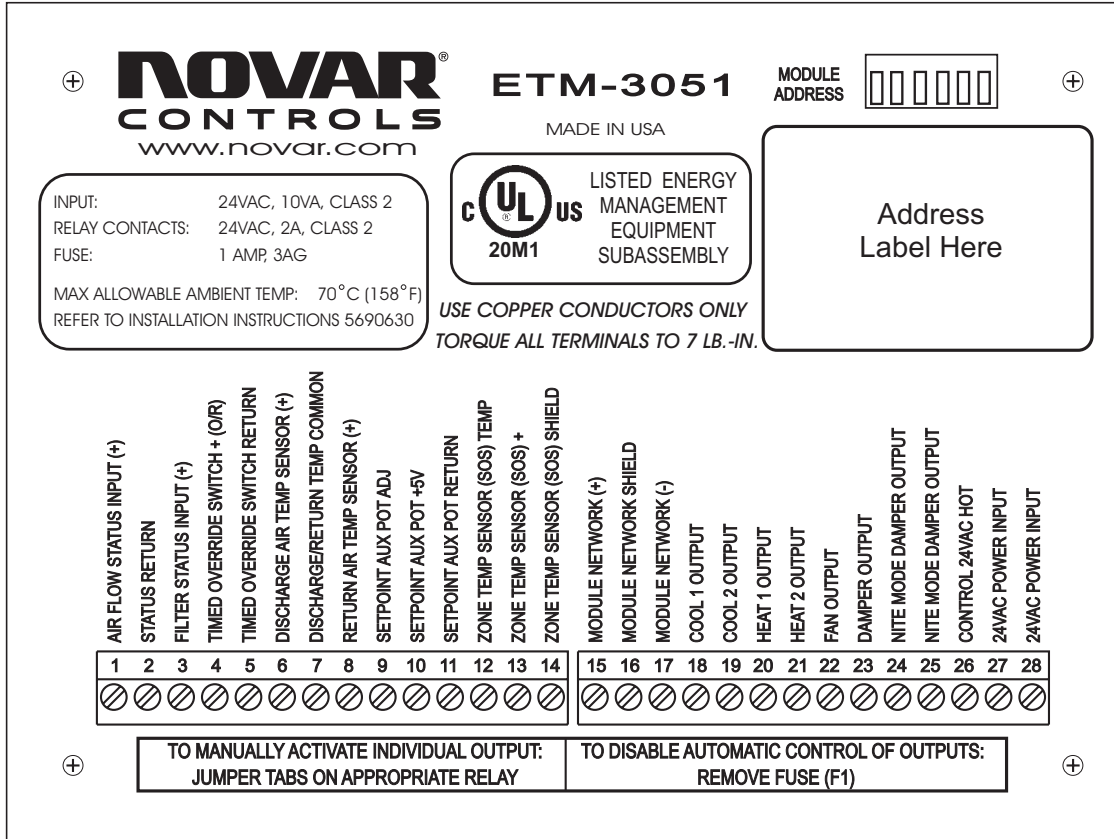


Figure 2. ETM-3051 shield showing wiring connections

Air Flow Status Input

Terminals 1 and 2 are for the Air Flow Status Input. This is a dry contact, digital input and is connected as normally open with the contacts closing when the fan is on. Use the following procedure to connect the Air Flow Status Input.

| Step | Procedure |
|------|--|
| 1 | Connect one wire from the air flow switch to the module at Terminal 1. |
| 2 | Connect the second wire from the air flow switch to Terminal 2. |

Filter Status Input

Terminals 2 and 3 are for the Filter Status Input. This is a dry contact, digital input and is connected as normally open with the contacts closing when the filter is dirty. Use the following procedure to connect the filter status input.

| Step | Procedure |
|-------------|---|
| 1 | Connect one wire from the dirty filter switch to the module at Terminal 2. |
| 2 | Connect the second wire from the dirty filter switch to the module at Terminal 3. |

Timed Override Switch

An optional momentary contact switch can be connected for use as a timed override. Use the following procedure to connect a timed override switch.

| Step | Procedure |
|-------------|---------------------------------------|
| 1 | Connect one wire to Terminal 4. |
| 2 | Connect the other wire to Terminal 5. |

The override switch can have a status light-emitting diode (LED). The time period that the override stays in effect is defined in the software.

The Novar Controls Futura Zone Temperature Sensor (Models FTS-3 or FTS-3A) has a timed override button. Refer to the instructions included with the sensor for information about connecting the timed override input to the ETM-3051.

Zone Temperature Sensor

The Zone Temperature Sensor connection on the ETM-3051 requires the Novar Controls Wall-Mount Temperature Switch-Over Sensor (WTS-SOS). The WTS-SOS is mounted in the space being controlled and provides a fall-back mode of operation for controlling the zone temperature. The fall-back mode is programmed in Novar Controls' software to switch control to the return air sensor if the signal is lost from the WTS-SOS.

Use a two-conductor shielded cable (Belden 8761, Novar Controls WIR-1010, or equivalent) and the following procedure to connect the sensor.

| Step | Procedure |
|-------------|---|
| 1 | Connect a wire from the sensor terminal marked "Temp" to Terminal 12 on the module. |
| 2 | Connect a wire from the sensor terminal marked "+" to Terminal 13 on the module. |
| 3 | Connect the shield wire from the terminal marked "Shld" to Terminal 14 on the module. |

ETM-3051 Installation Instructions

Discharge Air Temperature Sensor

Use the Novar Controls Remote Temperature Sensor (Model RTS-UVC) and the following procedure to connect the Discharge Air Temperature Sensor.

| Step | Procedure |
|------|---|
| 1 | Connect the red wire from the sensor to Terminal 6 (+). |
| 2 | Connect the black wire to Terminal 7 (Common). |

Return Air Temperature Sensor

Wiring connections to the Return Air Temperature Sensor terminals can be made several ways. This connection can be used for a sensor in the return air duct or for a space sensor, depending on the application. Use the Novar Controls Remote Temperature Sensor (Model RTS-UVC) and the following procedure to make a return air temperature sensor connection.

| Step | Procedure |
|------|---|
| 1 | Connect the red wire from the sensor to Terminal 8 (+). |
| 2 | Connect the black wire to Terminal 7 (Common). |

Use *one* of the following sensors to make a space temperature connection:

UVC Wall-Mount Temperature Sensor (WTS-UVC)

| Step | Procedure |
|------|--|
| 1 | Connect the red wire (+) from the sensor to Terminal 8 (+) on the module. |
| 2 | Connect the black wire (-) from the sensor to Terminal 7 (Common) on the module. |

Futura Temperature Sensor (FTS-3 or FTS-3A with temperature setpoint adjustment)

| Step | Procedure |
|------|---|
| 1 | Connect a wire from Terminal 4 (+) on the sensor to Terminal 8 (+) on the module. |
| 2 | Connect a wire from Terminal 3 (Common) on the sensor to Terminal 7 (common) on the module. |

NOTE! Maximum recommended sensor wire length for connecting the temperature sensor to the ETM-3051 is 100 feet. Use 22-gauge wire (Belden 8761, Novar Controls WIR-1010, or equivalent).

Auxiliary Potentiometer

An auxiliary potentiometer can be connected to the ETM-3051 at Terminals 10, 11, and 12 for remote setpoint control adjustment.

NOTE! The Wall-Mount Temperature Switch-Over Sensor (WTS-SOS) can be connected to the ETM-3051 to make use of the module’s fall-back mode of operation. If this is done, an auxiliary potentiometer should not be connected to the ETM-3051. In the fall-back mode configuration, the auxiliary potentiometer connections are inactive and the potentiometer will not function.

Use the following procedure to connect an auxiliary potentiometer.

| Step | Procedure |
|-------------|--|
| 1 | Connect the wiper wire to Terminal 12. |
| 2 | Connect the clockwise wire to Terminal 10. |
| 3 | Connect the counter-clockwise wire to Terminal 11. (This connection allows adjustments to the control setpoint.) |

Wiring the ETM-3051’s Outputs

The ETM-3051 provides seven digital outputs at Terminals 18 through 26 (Figure 3).

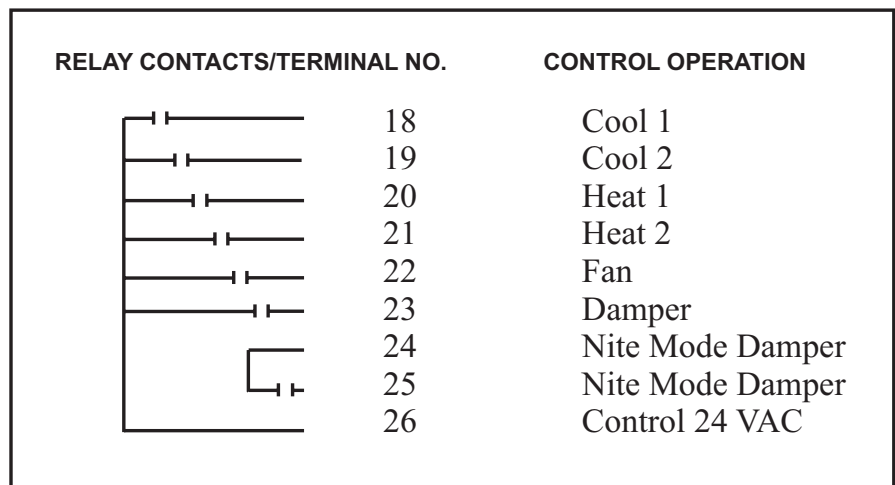


Figure 3. ETM-3051 outputs

Make the appropriate wiring connections from these terminals to the devices being controlled. The status of the digital relay outputs is shown by seven relay output status LEDs located directly above each relay on the ETM-3051. The relay output status LEDs match the status of the relay.

- If the contact is closed, the relay is energized, and the LED is on.
- If the contact is open, the relay is de-energized, and the LED is off.

Terminal 26 is for one side of a 24-VAC source to be regulated (switched) through the relay outputs. The outputs are isolated from the other connections to permit the use of an additional power source. The transformer powering the module can be used if it has enough capacity. Each relay is rated at 24-VAC, 2-A.

NOTE! The Night Mode Damper connections are isolated from the other outputs and do not use the 24-VAC source.

To test or service the ETM-3051, jumper across the relays using the tabs (spade connectors) on the appropriate relay.

NOTE! The ETM-3051 includes a 1-amp, 3-AG fuse that can be removed to disable automatic control of the outputs for testing.

Network Communications

Use a suitable shielded cable (Belden 8761, Novar Controls WIR-1010, or equivalent) to make the communication connections between the ETM-3051 and the module communication terminals of the system's executive module (Executive Processor [EP/2], Executive Controller [EC], Savvy, or Lingo).

On the ETM-3051, the connections are Terminals 15, 16, and 17. Make certain that the positive (+) and minus (–) connections are made to the correct terminals on the ETM-3051 and the executive module.

CAUTION! The shield connection is not a ground. It is dedicated for communications only. Do *not* connect any other grounds to the Shield connection (Terminal 16).

Setting the Module Address Switches

Every Logic One module must have a unique address for the executive module to identify it. Addresses are assigned in the software during system programming. Use the system printout to find the address of the ETM-3051 being installed.

The address switch is located in the upper right corner of the shield (Figure 2). Set the switches to match the address as indicated in Figure 4 and record the settings on the module shield label.

NOTE! The address switches should only be changed while the ETM-3051 is powered down.

Address 00 may not be used by the ETM-3051 when operating on an EC or Savvy. (The IOM section uses address 00.)

| ADDRESS | SWITCH SETTINGS | ADDRESS | SWITCH SETTINGS | ADDRESS | SWITCH SETTINGS | ADDRESS | SWITCH SETTINGS |
|---------|-------------------|---------|-------------------|---------|-------------------|---------|-------------------|
| 00 | ON ↑ T T T T T T | 16 | ON ↑ T T T T T T | 32 | ON ↑ T T T T T T | 48 | ON ↑ T T T T T T |
| 01 | ▲ T T T T T T | 17 | ▲ T T T T T T | 33 | ▲ T T T T T T | 49 | ▲ T T T T T T |
| 02 | T ▲ T T T T T | 18 | T ▲ T T T T T | 34 | T ▲ T T T T T | 50 | T ▲ T T T T T |
| 03 | ▲ T ▲ T T T T | 19 | ▲ T ▲ T T T T | 35 | ▲ T ▲ T T T T | 51 | ▲ T ▲ T T T T |
| 04 | T T ▲ T T T T | 20 | T T ▲ T T T T | 36 | T T ▲ T T T T | 52 | T T ▲ T T T T |
| 05 | ▲ T ▲ T ▲ T T | 21 | ▲ T ▲ T ▲ T T | 37 | ▲ T ▲ T ▲ T T | 53 | ▲ T ▲ T ▲ T T |
| 06 | T T ▲ T ▲ T T | 22 | T T ▲ T ▲ T T | 38 | T T ▲ T ▲ T T | 54 | T T ▲ T ▲ T T |
| 07 | ▲ T ▲ T ▲ T ▲ | 23 | ▲ T ▲ T ▲ T ▲ | 39 | ▲ T ▲ T ▲ T ▲ | 55 | ▲ T ▲ T ▲ T ▲ |
| 08 | T T T ▲ T T T | 24 | T T T ▲ T T T | 40 | T T T ▲ T T T | 56 | T T T ▲ T T T |
| 09 | ▲ T T ▲ T T T | 25 | ▲ T T ▲ T T T | 41 | ▲ T T ▲ T T T | 57 | ▲ T T ▲ T T T |
| 10 | T T ▲ T ▲ T T | 26 | T T ▲ T ▲ T T | 42 | T T ▲ T ▲ T T | 58 | T T ▲ T ▲ T T |
| 11 | ▲ T ▲ T ▲ T ▲ | 27 | ▲ T ▲ T ▲ T ▲ | 43 | ▲ T ▲ T ▲ T ▲ | 59 | ▲ T ▲ T ▲ T ▲ |
| 12 | T T T ▲ T T T | 28 | T T T ▲ T T T | 44 | T T T ▲ T T T | 60 | T T T ▲ T T T |
| 13 | ▲ T T ▲ T T T | 29 | ▲ T T ▲ T T T | 45 | ▲ T T ▲ T T T | 61 | ▲ T T ▲ T T T |
| 14 | T T ▲ T ▲ T T | 30 | T T ▲ T ▲ T T | 46 | T T ▲ T ▲ T T | 62 | T T ▲ T ▲ T T |
| 15 | OFF ↓ ▲ ▲ ▲ ▲ ▲ ▲ | 31 | OFF ↓ ▲ ▲ ▲ ▲ ▲ ▲ | 47 | OFF ↓ ▲ ▲ ▲ ▲ ▲ ▲ | 63 | OFF ↓ ▲ ▲ ▲ ▲ ▲ ▲ |

Figure 4. ETM-3051 address settings

Checking Installation

After the ETM-3051 has been installed, the following items should be checked to ensure proper operation.

- Overall operation

Turn on power to the ETM-3051, the HVAC system, and its control circuitry. If the executive module for the Logic One system is operating properly, the ETM-3051 will perform a self-diagnostic check, establish communications with the executive module, and begin to control the HVAC unit.

- Schedule Status Indicator LED

A schedule status indicator LED is located on the module's circuit board, to the left of the shield. If the module is communicating properly, this LED should be flashing according to the schedule mode.

— When the ETM-3051 is in scheduled off mode, the LED is off and flashes on briefly when communicating.

— When the ETM-3051 is in scheduled on mode, the LED is on and flashes off briefly when communicating.

- Timed Override Switch

If a timed override switch has been installed and programmed, it can be tested for proper operation by pressing it during a scheduled off mode. The LED flashes rapidly until the override period ends.

- Output Status LEDs

The seven relay output status LEDs indicate the status of each active digital output. Verify that the LEDs are lit when the corresponding digital output is on.

- Check the executive module for alarm messages.

If any faults or malfunctions still exist, they are picked up by the executive module and announced by alarm messages. Monitor the executive module display during the test procedures. The ETM-3051's setpoints can be altered from the keypad or touchscreen of those executive modules that have them, and the status display can be monitored for proper equipment response.

To manually activate an individual output for testing or servicing the ETM-3051, jumper across the relays using the tabs (spade connectors) on the appropriate relay.

CAUTION! To prevent possible damage to the controlled equipment when overriding, pull out the fuse (F1) before installing jumpers.

Model and Part Numbers

Use the part numbers listed in Table 1 to order the necessary Novar Controls parts.

| Table 1. Novar Controls Part Numbers | | |
|--|------------------|-----------------|
| PRODUCT NAME | MODEL NO. | PART NO. |
| Electronic Thermostat Module 3051 | ETM-3051 | 736010000 |
| Wall-Mount Temperature Sensor (UVC) | WTS-UVC | 736002000 |
| Wall-Mount Temperature Switch-Over Sensor | WTS-SOS | 736006000 |
| Remote Temperature Sensor (UVC) | RTS-UVC | 736003000 |
| Futura Temperature Sensor | FTS-3 | 732403000 |
| Futura Temperature Sensor w/ temperature setpoint adjustment | FTS-3A | 732401000 |
| Two-Conductor, shielded cable (Belden 8761 equivalent) | WIR-1010 | 709001000 |

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