

Application Note: 3056

Enabling Backup Heat on Ductless M-Series

Introduction

The purpose of this application note is to illustrate the steps required for enabling and disabling the Backup Heat function on select M-Series ductless indoor units.

This function is intended to have the heat pump operate as the first-stage of heat, and to have the backup heater operate as a supplemental second-stage of heat. Once enabled, the indoor unit will output 12 VDC from the CN24 connector to energize and de-energize the backup heater whenever the conditions listed in the Sequence of Operations has been met.

Table of Contents

- 1) [Sequence of Operations](#)
- 2) [Connecting to CN24](#)
- 3) [Enabling & Configuring Backup Heat](#)

Compatibility Chart

Use the following chart to determine if your indoor and outdoor unit combination is compatible.

Indoor Units Outdoor Units	MSZ-FS	MSZ-FH	MLZ	MFZ
MUZ-FS	✓	✓	✗	✗
MUZ-FH	✓	✓	✗	✗
SUZ	✗	✗	✓	✗
MUFZ	✗	✗	✗	✓
MXZ-C	✓	✓	✓	✓

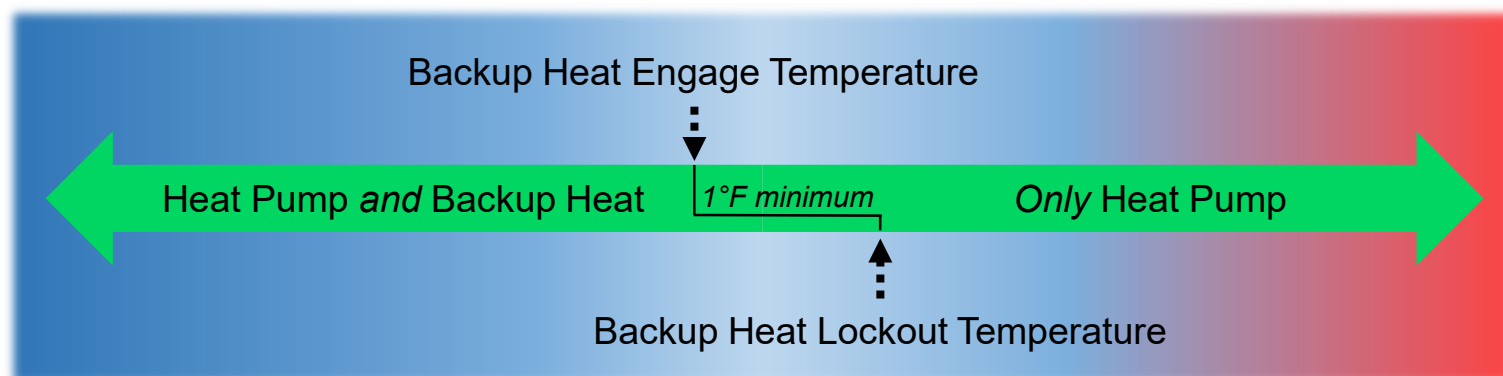
Sequence of Operations

Backup Heat Engage & Lockout

Backup Heat Engage

The backup heater will only be energized when **all** of the following conditions have been met:

- The indoor unit is operating in Heat mode, or Auto Heat mode.
- The outdoor air temperature has fallen below the Backup Heat Engage Temperature.
(Selectable range is between -4°F and 99°F)
- The room temperature has fallen 3°F or more below the set point.
(E.g. if the set point is 70°F and the room temperature falls to 67°F or below)



Backup Heat Lockout

The backup heater will be de-energized when **any** of the following conditions have been met:

- The indoor unit has been set to another mode, or has switched over to Auto Cool mode.
- The outdoor air temperature has risen above the Backup Heat Lockout Temperature.
(Selectable range is between -4°F and 99°F)
- The room temperature rises to 1°F or less than the set point.
(E.g. if the set point is 70°F and the room temperature rises to 69°F or above)

Important Notes

- The heat pump will continue to operate when Backup Heat is engaged.
- The minimum deadband between the Engage and Lockout temperature is 1°F.
- The Engage temperature cannot be set above the Lockout temperature and vice versa.
- The outdoor air temperature is sensed by the outdoor unit's ambient temperature sensor.
 - Only the default ambient temperature sensor can be used to perform this task.

Indoor Unit

Connecting to CN24

Overview

The CN24 connector will output 12 VDC whenever the outdoor air temperature falls below the Backup Heat Lockout Temperature, *and* the room temperature falls 3°F or more below the set point. It will stop when the outdoor air temperature rises above the desired setting *or* when the room temperature rises to 1°F or less than the set point.

Instructions

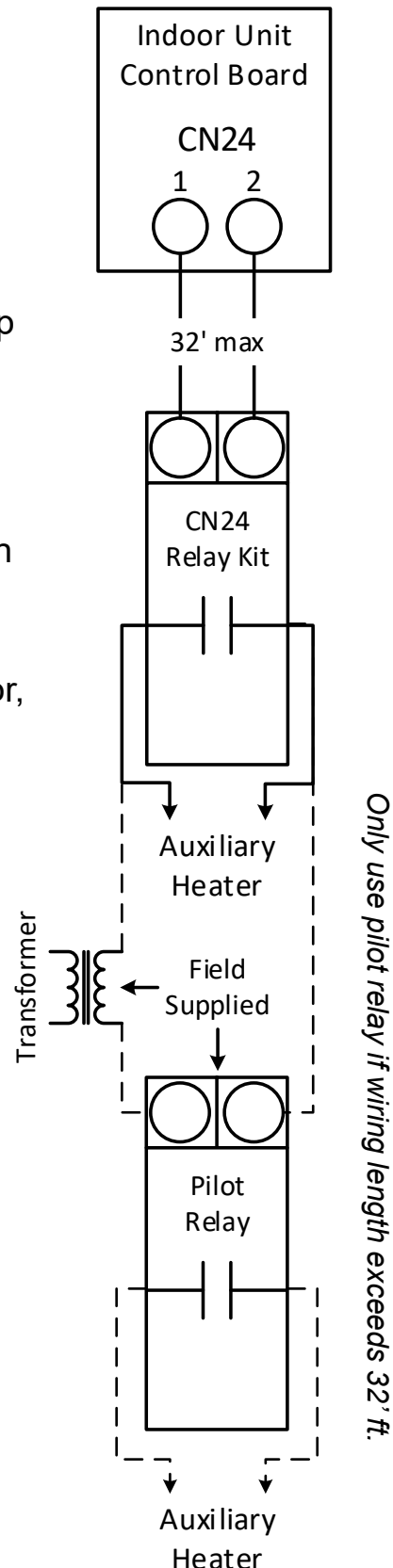
- 1) Use a [CN24 Relay Kit](#) to connect to the CN24 connector as shown in the diagram on the right.
 - The CN24 connector is sometimes labeled as CN104 on some control boards, so if you're unable to locate the CN24 connector, then try looking for the CN104 label instead.
- 2) If the wire length between the CN24 connector and the relay exceeds 32' ft, then you will need to add a pilot relay.
 - See the dashed lines in the diagram to the right for reference.



CN24 Relay Kit

Notes

- The CN24 connector will not work if the CN3D connector on the outdoor unit is being used for Demand Capacity control.
 - This only applies when connected to an MXZ outdoor unit.
 - See Chapter 8-5 of this [Service Manual](#) for more information.



Handheld Controller

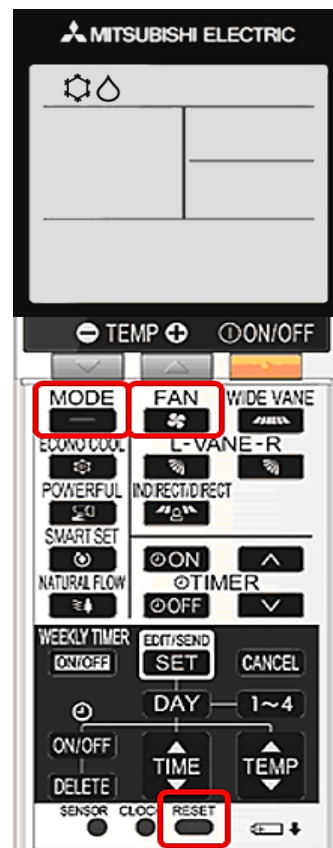
Enabling & Configuring Backup Heat

Instructions

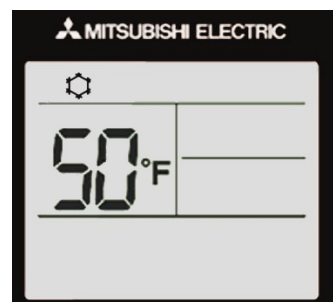
- 1) Press and hold the  +  buttons simultaneously, then press and release the  button while continuing to hold down the other two buttons for approximately three more seconds.
 - The  icons will appear as shown in the first picture.
- 2) Press the  button to access the Backup Heat **Engage** settings.
 - The  icon will remain at the top by itself, and the default Backup Heat Engage Temperature of 50°F will appear beneath it.
- 3) Press the  buttons to select the Backup Heat **Engage** Temperature, and then press  to save the settings when finished.
 - The unit will beep (1x) to let you know that the settings were saved.
- 4) Press the  button to access the Backup Heat **Lockout** settings.
 - The  icon will appear at the top by itself, and the default Backup Heat Lockout Temperature of 68°F will appear beneath it.
- 5) Press the  buttons to select the Backup Heat **Lockout** Temperature, and then press  to save the settings when finished.
 - The unit will beep (1x) to let you know that the settings were saved.
- 6) Press the  button to save all settings and exit (or press the  button again to reconfigure either setting).
 - The unit will beep (3x) to let you know that the settings were saved.

Note

- The MSZ-FS controller will display the word “Cool” instead of the  icon, and the word “Dry” instead of the  icon.



Heater ON at...



Heater OFF at...

