Honeywell Home

ERM5220R
Equipment Remote Module
WITH REDLINK™ 2.0 WIRELESS TECHNOLOGY

PRODUCT DATA

⚠ CAUTION

Read these installation instructions completely and follow them carefully.
Installation must be performed by a qualified service technician and must comply with local codes.
Disconnect power to all relevant devices before installing or servicing the ERM.
Failure to connect the device according to these instructions may result in damage to the device, the controls, and/or personal injury.

About the ERM5220R

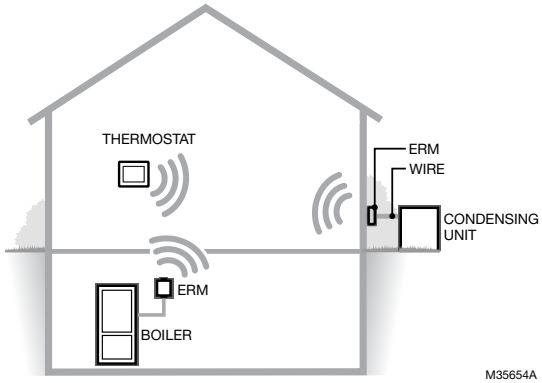


Fig. 1.

FEATURES

- Wireless RedLINK™ communication between condensing unit/compressor or boiler and thermostat.
- Eliminates the need to run additional wires to your outdoor condenser, multistage compressor, heat pump or dual fuel applications, or if original wiring has been damaged, or equipment has been relocated.
- Suitable for outdoor use.
- Temperature sensor terminals for outdoor temp sensors or indoor freeze protection.
- LEDs for easy installation checkout.
- May reduce damage to homes since wiring/drilling is eliminated.

Contents

33-00205-02

SPECIFICATIONS

Operating Ambient Temperature Range:
Compressor: -40 to +155 °F (-40 to +68 °C)
Boiler: 30 to +130 °F (-1 to +54 °C)

Operating Relative Humidity Range: 0 - 99 %

Electrical: 24 VAC, 50/60 Hz.

Dimensions: 175 mm x 168 mm x 38 mm

Wireless capability via RedLINK™ technology.

Frequency: 902 - 928 MHZ (This is a "jumping frequency." It jumps within the bands to reduce interference from other RF devices). Certified under the Federal Communication Commission (FCC) part 15.247.

Cover screw: #10-24 UNC 3/8 Phillips pan head machine screw.

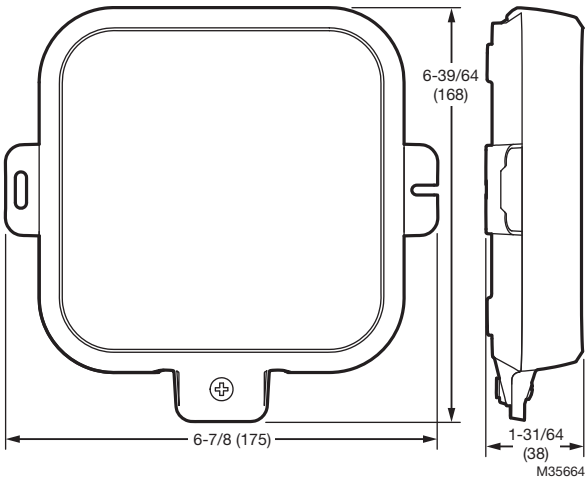


Fig. 2. Dimensions.

FCC REGULATIONS

§ 15.19 (A)(3)
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.

FCC WARNING

§ 15.21 (USA ONLY)
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

IC REGULATIONS

RSS-GEN
This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:
1. This device may not cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

COMPATIBLE PRODUCTS

NOTE: The ERM5220R may only be used with the thermostats listed below. Look for this image on these products.

If you no longer have the thermostat or EIM packaging, verify thermostat model and manufacture date are compatible with ERM. The date code of thermostat (and EIM, if used) must be 1546 or above (more recent). Compatible models of thermostat and EIM are listed in Tables 1 and 2. If your thermostat pre-dates ERM compatibility, see the info on Older Models, below.

Table 1. ERM (equipment remote module) and kits including the ERM.

ERM5220R1018	Equipment Remote Module (ERM)
YERM5220R8321	Kit with THM5220R1018 ERM and RedLINK-enabled TH8321R1001 VisionPRO thermostat
YERM5220RVPEIM	Kit with THM5220R1018 ERM (Equipment Remote Module), RedLINK-enabled TH8321R1001 VisionPRO thermostat and THM5421R1021 EIM (Equipment Interface Module)

Table 2. Compatible models.

VisionPRO RedLINK thermostats numbers	Prestige thermostat and thermostat kit numbers	EIM and EIM kit numbers
TH8110R1008* Thermostat	THX9421R5021* Thermostat	THM5421R1021* EIM
TH8320R1003* Thermostat	YTHX9421R5085* Thermostat + EIM + Delta-T sensors	
TH8321R1001* Thermostat	YTHX9421R5101* Thermostat + EIM + Wireless outdoor sensor + Delta-T sensors	YTHM5421R1010* EIM + Delta-T sensors

* Date code of thermostat (and EIM if used) needs to be 1546 or more recent (larger number).

Older Models

If the EIM/thermostat date code is smaller (older) than 1546:

- 2.0 or later versions of Prestige IAQ and RedLINK Vision-PRO thermostats can be used if you update the software on the thermostat.
- The software update page is https://thermostatsetup.com
  This page has updates for both Prestige IAQ and RedLINK VisionPRO. Prestige is updated via USB stick; VisionPRO is updated via microSD card.
- Prestige 1.0 models can not be updated.
- The EIM (if used) can not be updated and must be replaced.

Table 3. Other accessories.

Model	Note
C7189U1005	10K ohm indoor sensor used as a backup on boiler applications. If the stat fails for more than 30 minutes, it will maintain the system at 55 °F in heating.
C7089U1006	10K ohm outdoor sensor used with outdoor unit ERM5220R installations to display outdoor temperature at thermostat.
C7089R1013	Wireless outdoor sensor
THM6000R7001	RedLINK Internet Gateway (RIG)
REM5000R1001	Portable comfort control

NOTES:

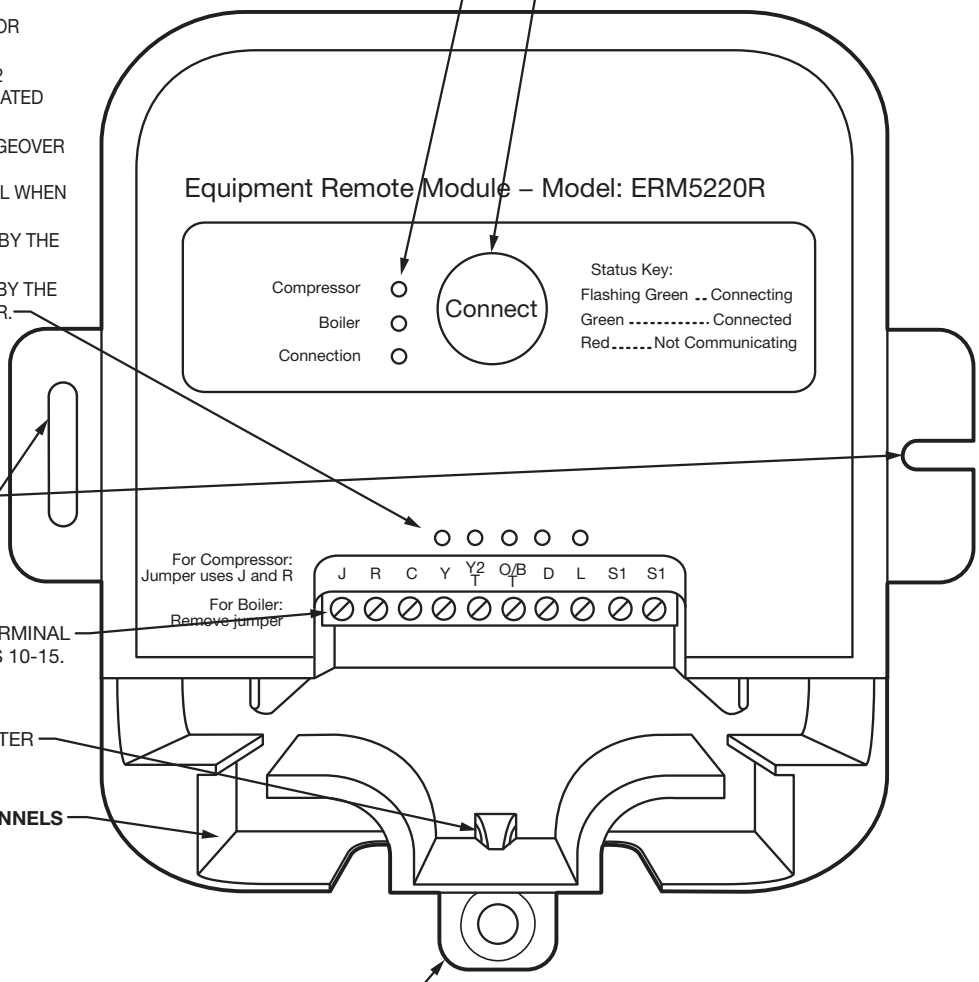
- Only two ERMs can be enrolled in a system at one time – one in Boiler mode and one in Compressor mode.
- ERM is not supported by systems using a forced air zone panel, even if the thermostat is wired to the zone panel or linked to an EIM. (See the FAQ on page 27 for more on this).
- For Boiler applications, the thermostat must be configured for radiant heat.
- ERM will not support series 20 operation in boiler applications unless a relay is used (page 12). When configured for radiant heat the Y relay shall be off at all times.
- Prestige IAQ always requires a THM5421R EIM. The ERM can be used in conjunction with the EIM for forced air systems. The ERM would not be used with a Prestige IAQ on heat only systems without fan.

BUTTONS, LEDS AND TERMINALS

CONNECT BUTTON: PRESS/RELEASE ONE TIME TO LINK TO A COMPATIBLE RedLINK THERMOSTAT WHILE THERMOSTAT IS IN THE "ADD DEVICE" MODE. PRESS/HOLD TO UNLINK THE ERM5220R FROM THE THERMOSTAT IT HAS PREVIOUSLY BEEN LINKED TO. WHILE HOLDING THE BUTTON THE LED SHOULD GO OUT, THEN TURN SOLID RED, THEN GO OUT AGAIN.

LEDS:
COMPRESSOR: LIT WHEN R TO J JUMPER IS CONNECTED FOR CONTROLLING AN OUTDOOR UNIT.
BOILER: LIT WHEN R TO J JUMPER IS REMOVED FOR CONTROLLING A BOILER.
CONNECTION: FLASHING GREEN WHILE CONNECTING TO THERMOSTAT.
SOLID GREEN ONCE SUCCESSFULLY CONNECTED.
SOLID RED FOR UNSUCCESSFUL CONNECTION OR LOSS OF COMMUNICATION TO THERMOSTAT.

LEDS:
- Y LED INDICATES THE ERM IS CALLING FOR STAGE 1 COMPRESSOR
- Y2/T LED INDICATES A CALL FOR STAGE 2 COMPRESSOR (THIS LED IS NOT ILLUMINATED WITH A CALL FOR BOILER HEAT).
- O/B-T LED INDICATES A CALL FOR CHANGEOVER VALVE WHEN ERM IS CONFIGURED FOR COMPRESSOR, IT INDICATES A HEAT CALL WHEN ERM IS CONFIGURED FOR BOILER.
- D LED INDICATES TERMINAL ENERGIZED BY THE HEATPUMP DEFROST BOARD.
- L LED INDICATES TERMINAL ENERGIZED BY THE SYSTEMS COMPRESSOR FAULT MONITOR.



MOUNTING TABS: SCREW ERM TO WALL BY OUTDOOR UNIT OR BY BOILER.
SEE PAGE 6.

WIRING TERMINAL SCREWS: SEE TERMINAL FUNCTIONS ON PAGE 5 AND FIGURES 10-15.

DRAIN HOLES FOR WATER

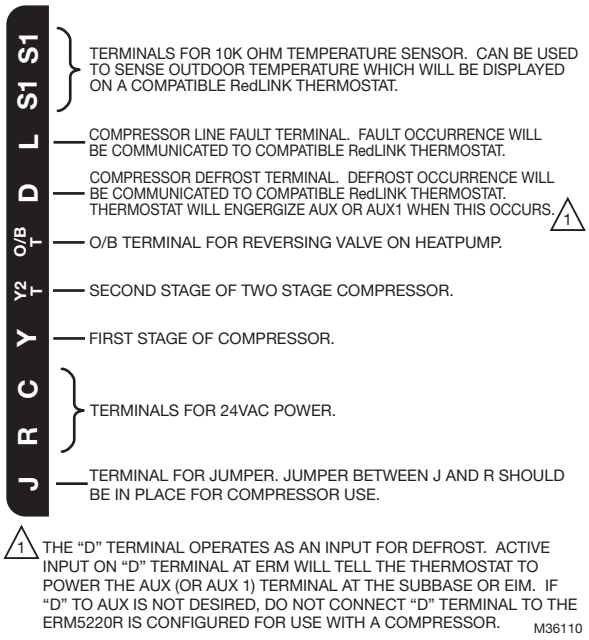
WIRING CHANNELS

TAB FOR COVER SCREW: (#10-24 UNC 3/8 PHILLIPS PAN HEAD MACHINE SCREW.)

M36109

Fig. 3.

TERMINAL DESIGNATIONS FOR COMPRESSOR

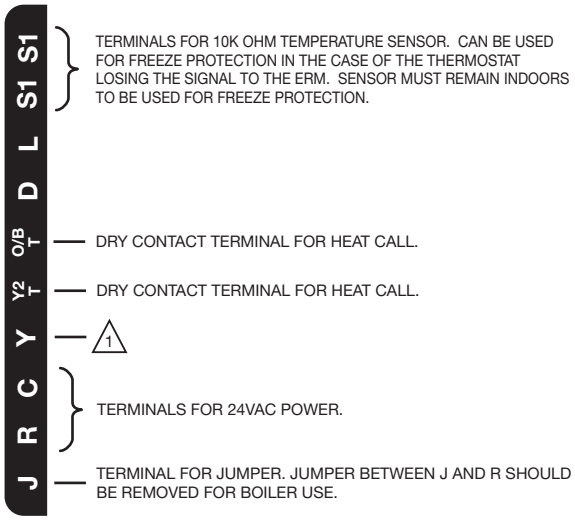


1 THE “D” TERMINAL OPERATES AS AN INPUT FOR DEFROST. ACTIVE INPUT ON “D” TERMINAL AT ERM WILL TELL THE THERMOSTAT TO POWER THE AUX (OR AUX 1) TERMINAL AT THE SUBBASE OR EIM. IF “D” TO AUX IS NOT DESIRED, DO NOT CONNECT “D” TERMINAL TO THE ERM5220R IS CONFIGURED FOR USE WITH A COMPRESSOR.

M36110

Fig. 4. Terminal Designations for Compressor.

TERMINAL DESIGNATIONS FOR BOILER



1 ERM WILL NOT SUPPORT SERIES 20 OPERATION UNLESS A RELAY IS ADDED (SEE FIGURE 14). WHEN CONFIGURED TO A BOILER, THE Y RELAY SHALL BE DE-ENERGIZED AT ALL TIMES.

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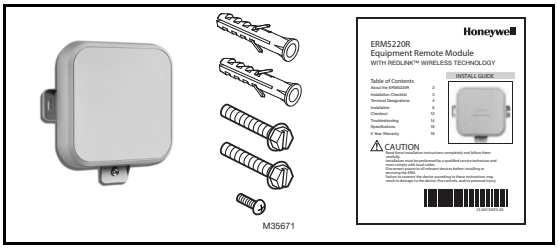
Fig. 5. Terminal Designations for Boiler.

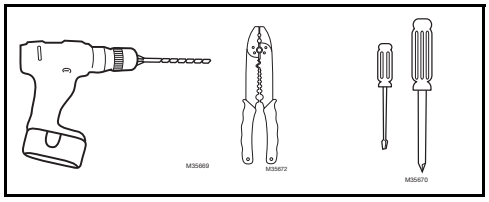
Installation Checklist

MATERIALS SUPPLIED:



- ERM5220R
- Wall Anchors (x2) and Mounting Screws (x2)
- Extra Cover Screw (optional)
- Installation Instructions (33-00135EFS)

TOOLS NEEDED (NOT SUPPLIED):



- Drill
- Nut Driver Attachment for Drill
- Wire Stripper
- Small Flathead Screwdriver
- Phillips Screwdriver
- 120/240 V to 24 V Transformer (Furnace or Air-handler transformer can be used if 2 wires are available to outdoor unit)

Mounting ERM

3. Use two screws and wall anchors to attach the ERM to the exterior wall near the compressor. The location should be **at least 3 feet above ground and oriented with the two wire exits facing downward**. See Figs. 6 and 7.
4. Attach cover and secure with bottom screw (Fig. 8).

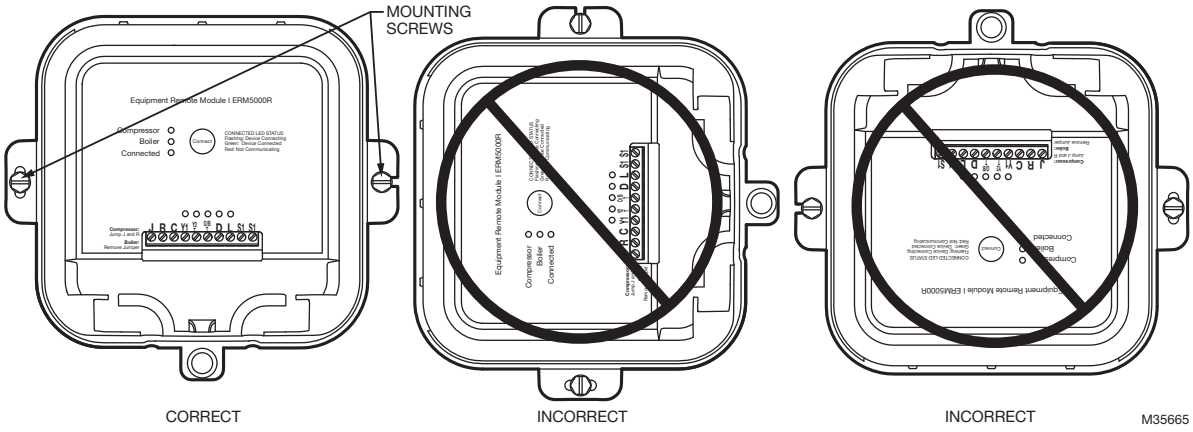


Fig. 6. Mounting orientation.

Fig. 7. If mounting on lap siding, allow space for the cover to be removed.

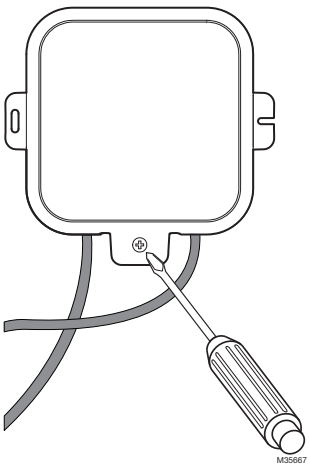


Fig. 8. Secure front cover.

INSTALLATION

IMPORTANT

- *The ERM is not compatible with forced air zone boards (see the FAQ on page 27 for details).*
- *To ensure that the ERM will receive a wireless signal at the desired installation location:*
  (a) Do not mount the ERM in a metal box. This would impede the RedLINK wireless signal.
  (b) If your location has metal siding, the ERM's signal may be affected. If there is no communication or poor signal strength, consider a different location.
  (c) If there is a lot of concrete materials between the ERM and host (thermostat or EIM), the ERM's signal may be affected. If there is no communication or poor signal strength, consider a different location.
- *A Prestige (with EIM) or VisionPRO (with or without EIM) will only allow one of the following configurations:*
  1) Enrolled with a single boiler configured ERM;
  2) Enrolled with a single compressor configured ERM;
  3) Enrolled with a single boiler configured ERM and enrolled with a single compressor configured ERM.

Wiring

1. Make sure power to compressor/boiler is off.
2. Remove the front cover by loosening the cover screw and lifting up from the bottom of the ERM.
3. Remove 3 to 4 inches of the cable's outer sheathing, then remove 3/8 to 1/2 inch of insulation from each wire.
4. See Figures 10–15 for R to J jumper setting and wiring.

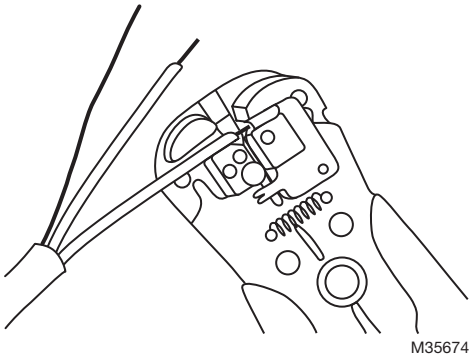
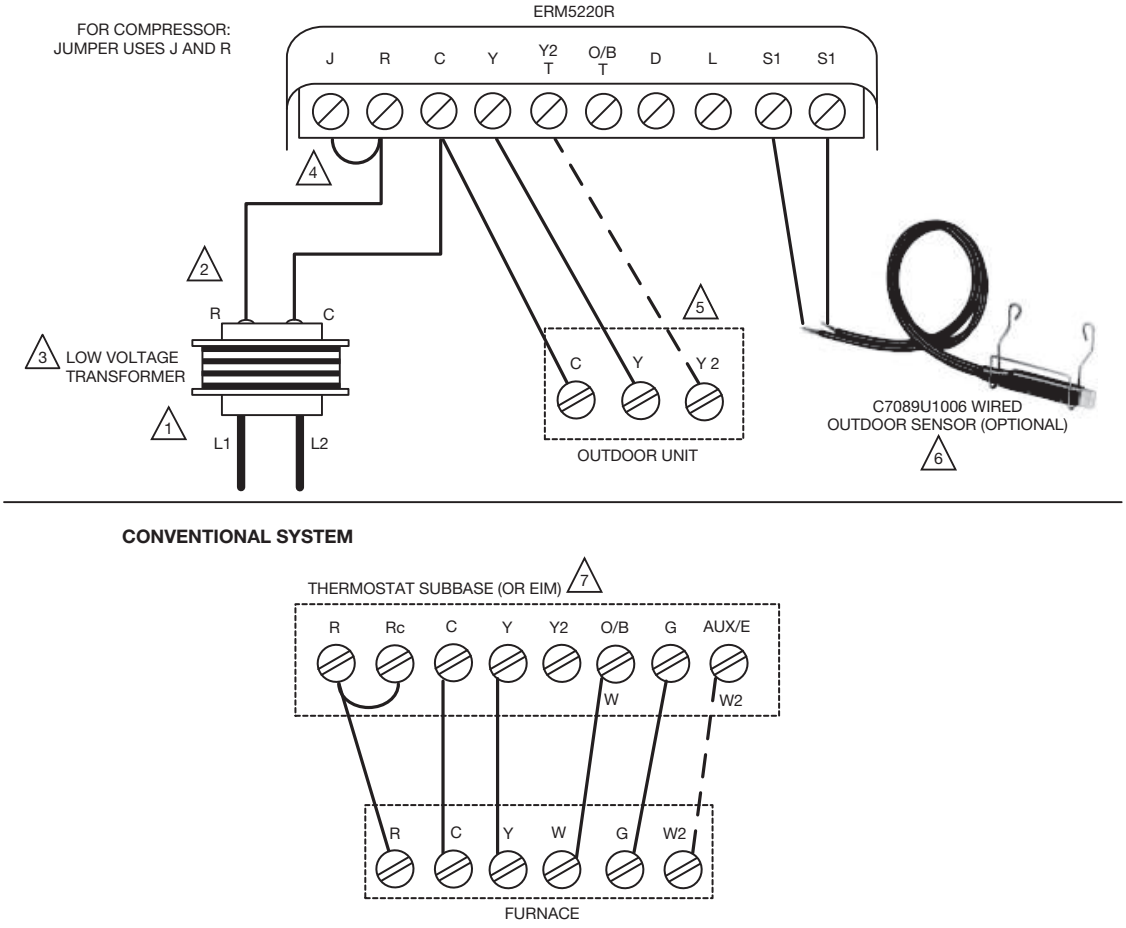


Fig. 9. Cable prepared for wiring.

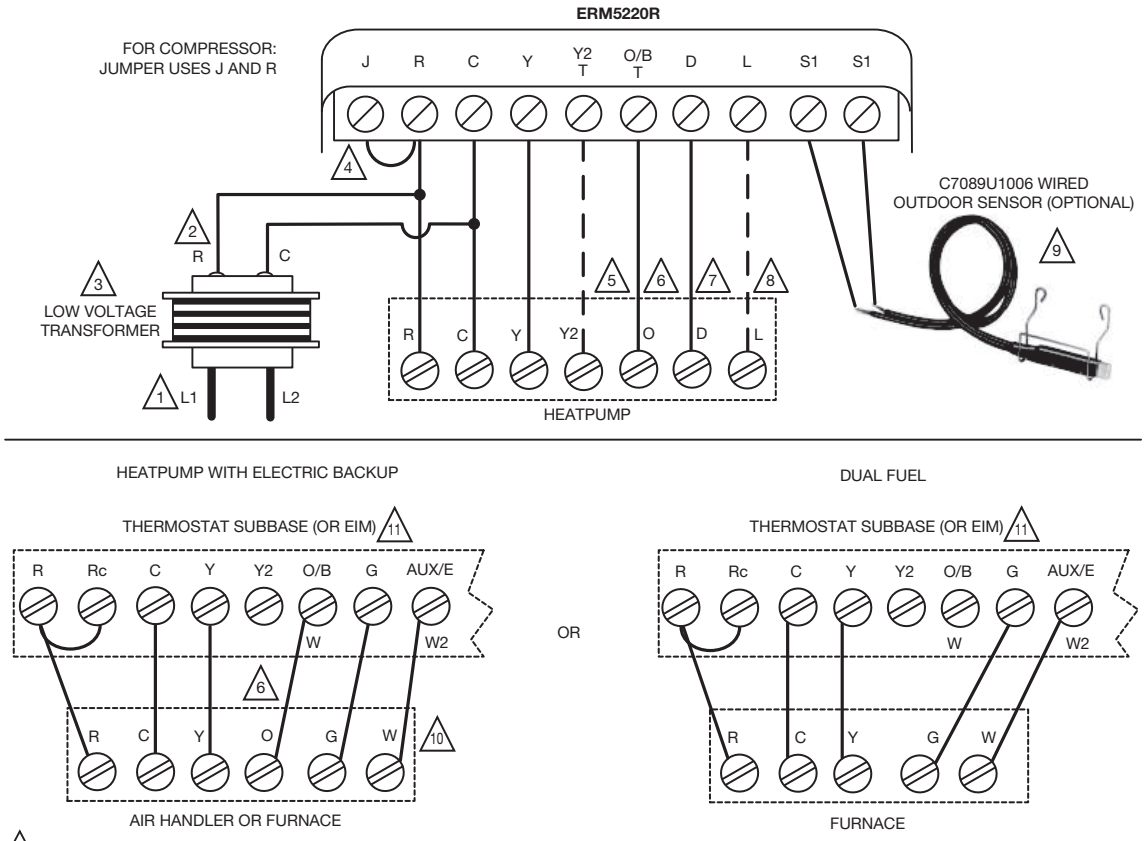
WIRING DIAGRAMS



1. WIRE TRANSFORMER PRIMARY TO APPROPRIATE 120, 208, OR 240 VOLTAGE POWER SUPPLY AT OUTDOOR UNIT. TRANSFORMER NOT NECESSARY IF THERE ARE TWO WIRES AVAILABLE FROM R AND C ON INDOOR UNIT TO R AND C ON ERM. FOLLOW TRANSFORMER INSTALL GUIDE FOR WIRING OF TRANSFORMER PRIMARY.
2. WIRE TRANSFORMER LOW VOLTAGE SECONDARY (R AND C) TO ERM5220R AS SHOWN.
3. VEFIFY TRANSFORMER IS SIZED CORRECTLY TO HANDLE THE LOAD OF THE OUTDOOR UNIT (Y AND Y2).
4. ADD A JUMPER WIRE FROM J TO R.
5. Y2 IS NOT USED ON SINGLE STAGE EQUIPMENT.
6. OUTDOOR SENSOR IS OPTIONAL. IF USED ON THIS APPLICATION IT ALLOWS THE OUTDOOR TEMPERATURE READING TO BE DISPLAYED ON THE THERMOSTAT. ALTERNATELY THE C7089R1013 WIRELESS OUTDOOR SENSOR CAN BE USED.
7. IF A COMPATIBLE TH8000 SERIES RedLINK THERMOSTAT IS USED, AND THE THERMOSTAT IS ALSO WIRELESS TO THE INDOOR UNIT, AN EIM (EQUIPMENT INTERFACE MODULE) IS REQUIRED IN ADDITION TO THE ERM (EQUIPMENT REMOTE MODULE). THE COMPATIBLE PRESTIGE IAQ THERMOSTAT **ALWAYS** NEEDS TO BE PAIRED WITH AN EIM.

M36120

Fig. 10. Compressor for conventional application.



1. WIRE TRANSFORMER PRIMARY TO APPROPRIATE 120, 208, OR 240 VOLTAGE POWER SUPPLY AT OUTDOOR UNIT. TRANSFORMER NOT NECESSARY IF THERE ARE TWO WIRES AVAILABLE FROM R AND C ON INDOOR UNIT TO R AND C ON ERM. FOLLOW TRANSFORMER INSTALL GUIDE FOR WIRING OF TRANSFORMER PRIMARY.

2. WIRE TRANSFORMER LOW VOLTAGE SECONDARY (R AND C) TO ERM5220R AS SHOWN.

3. VEFIFY TRANSFORMER IS SIZED CORRECTLY TO HANDLE THE LOAD OF THE OUTDOOR UNIT (Y AND Y2).

4. ADD A JUMPER WIRE FROM J TO R.

5. Y2 IS NOT USED ON SINGLE STAGE EQUIPMENT.

6. RHEEM AND RUUD HEATPUMPS USE B INSTEAD OF O.

7. DEFROST WIRE CONNECTS TO D AT ERM52220R. CHECK WITH HEATPUMP LITEATURE TO SEE HOW THEY LABEL THIS TERMINAL. THE “D” TERMINAL OPERATES AS AN INPUT FOR DEFROST. ACTIVE INPUT ON “D” TERMINAL AT ERM WILL COMMUNICATE WITH THERMOSTAT TO POWER THE AUX OF (AUX1) TERMINAL AT THE THERMOSTAT SUBBASE OR EIM. IF “D” TO AUX IS NOT DESIRED, DO NOT CONNECT “D” TERMINAL TO THE ERM5220R. THIS FEATURE IS ONLY ACTIVE WHEN THE ERM5220R IS CONFIGURED FOR USE WITH A COMPRESSOR.

8. IF THE HEATPUMP DOES NOT HAVE A CONNECTION FOR A COMPRESSOR MONITOR, DO NOT CONNECT L.

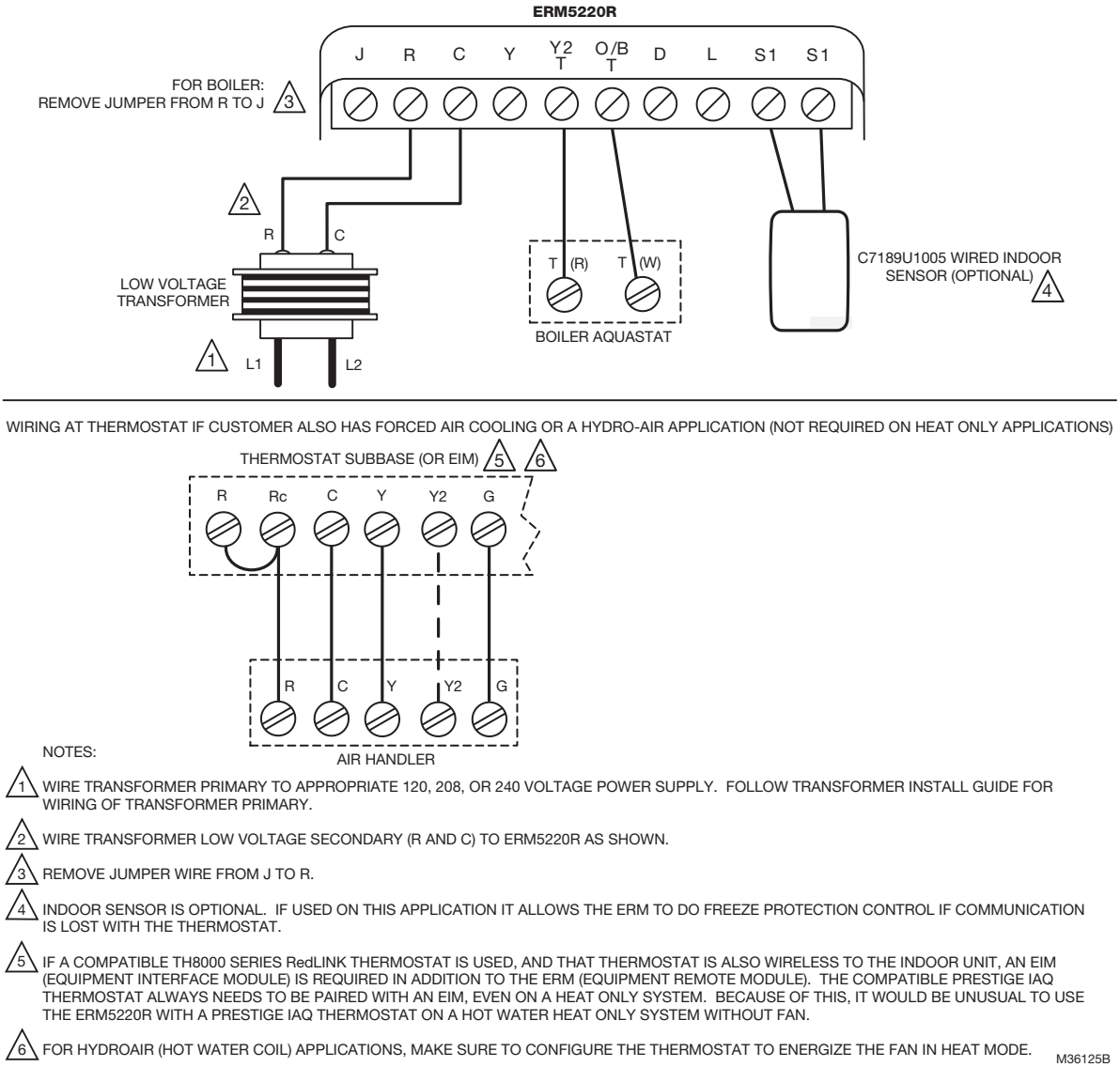
9. OUTDOOR SENSOR IS OPTIONAL ON ELECTRIC BACKUP APPLICATIONS. FOR DUAL FUEL, THE OUTDOOR SENSOR IS REQUIRED. ALTERNATELY THE C7089R1013 WIRELESS OUTDOOR SENSOR CAN BE USED.

10. THE AUXILIARY/EMERGENCY HEAT TERMINAL LABELING VARIES BY AIR-HANDLER OEM.

11. IF A COMPATIBLE TH8000 SERIES RedLINK THERMOSTAT IS USED, AND THAT THERMOSTAT IS ALSO WIRELESS TO THE INDOOR UNIT, AN EIM (EQUIPMENT INTERFACE MODULE) IS REQUIRED IN ADDITION TO THE ERM (EQUIPMENT REMOTE MODULE). THE COMPATIBLE PRESTIGE IAQ THERMOSTAT ALWAYS NEEDS TO BE PAIRED WITH AN EIM.

M36121

Fig. 11. Heatpump.

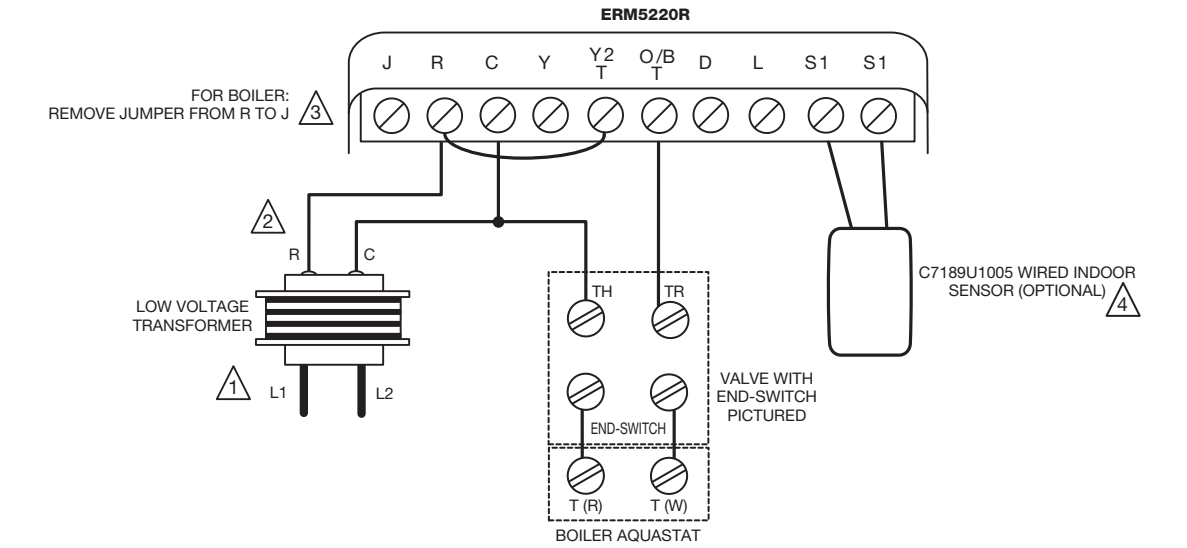


NOTES:

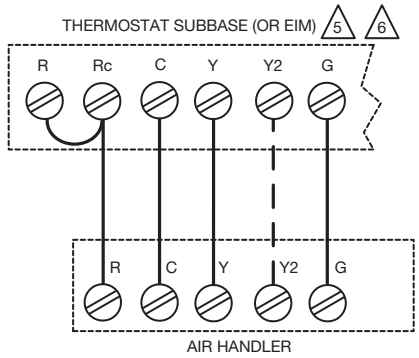
1. WIRE TRANSFORMER PRIMARY TO APPROPRIATE 120, 208, OR 240 VOLTAGE POWER SUPPLY. FOLLOW TRANSFORMER INSTALL GUIDE FOR WIRING OF TRANSFORMER PRIMARY.
2. WIRE TRANSFORMER LOW VOLTAGE SECONDARY (R AND C) TO ERM5220R AS SHOWN.
3. REMOVE JUMPER WIRE FROM J TO R.
4. INDOOR SENSOR IS OPTIONAL. IF USED ON THIS APPLICATION IT ALLOWS THE ERM TO DO FREEZE PROTECTION CONTROL IF COMMUNICATION IS LOST WITH THE THERMOSTAT.
5. IF A COMPATIBLE TH8000 SERIES RedLINK THERMOSTAT IS USED, AND THAT THERMOSTAT IS ALSO WIRELESS TO THE INDOOR UNIT, AN EIM (EQUIPMENT INTERFACE MODULE) IS REQUIRED IN ADDITION TO THE ERM (EQUIPMENT REMOTE MODULE). THE COMPATIBLE PRESTIGE IAQ THERMOSTAT ALWAYS NEEDS TO BE PAIRED WITH AN EIM, EVEN ON A HEAT ONLY SYSTEM. BECAUSE OF THIS, IT WOULD BE UNUSUAL TO USE THE ERM5220R WITH A PRESTIGE IAQ THERMOSTAT ON A HOT WATER HEAT ONLY SYSTEM WITHOUT FAN.
6. FOR HYDROAIR (HOT WATER COIL) APPLICATIONS, MAKE SURE TO CONFIGURE THE THERMOSTAT TO ENERGIZE THE FAN IN HEAT MODE.

M36125B

Fig. 12. Boiler with a single zone.



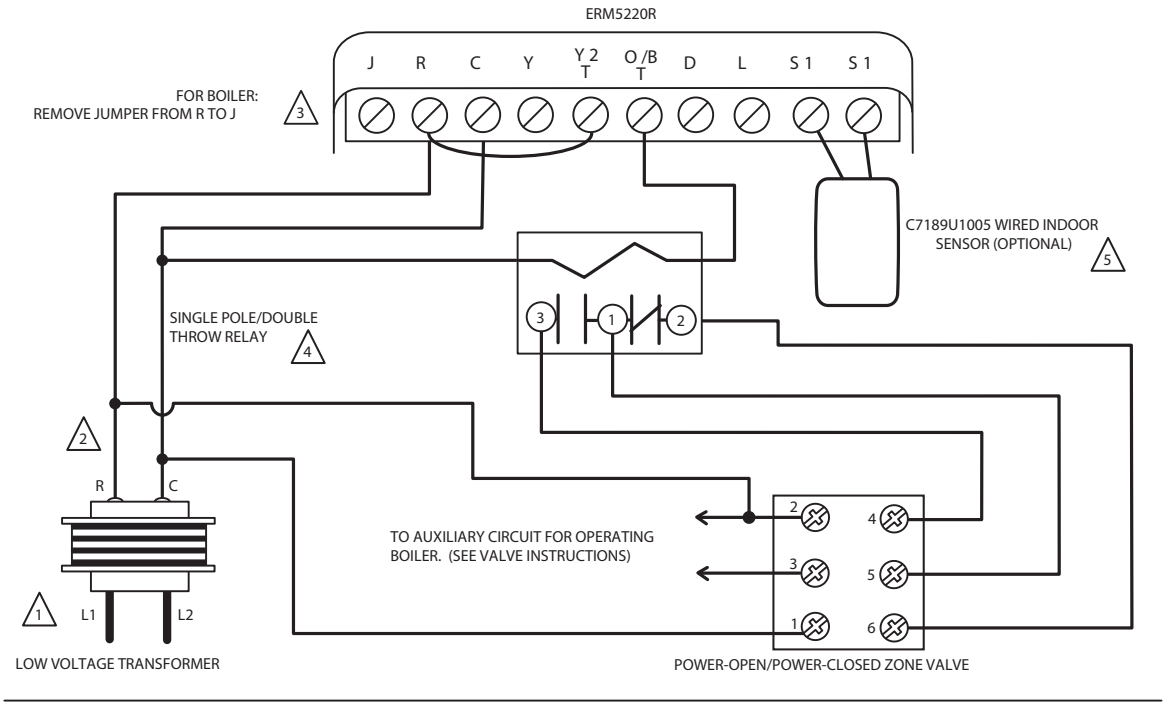
WIRING AT THERMOSTAT IF CUSTOMER ALSO HAS FORCED AIR COOLING OR A HYDRO-AIR APPLICATION (NOT REQUIRED ON HEAT ONLY APPLICATIONS)

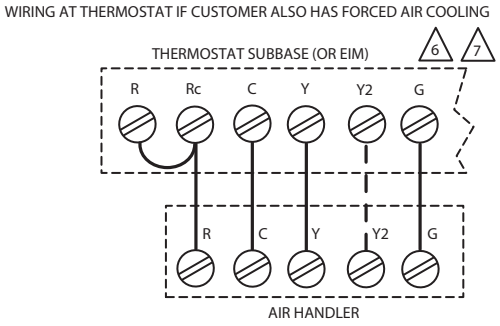


1. WIRE TRANSFORMER PRIMARY TO APPROPRIATE 120, 208, OR 240 VOLTAGE POWER SUPPLY. FOLLOW TRANSFORMER INSTALL GUIDE FOR WIRING OF TRANSFORMER PRIMARY.
2. WIRE TRANSFORMER LOW VOLTAGE SECONDARY (R AND C) TO ERM5220R AS SHOWN.
3. REMOVE JUMPER WIRE FROM J TO R. ADD JUMPER FROM R TO ONE OF THE T TERMINALS ON ERM AS SHOWN.
4. INDOOR SENSOR IS OPTIONAL. IF USED ON THIS APPLICATION IT ALLOWS THE ERM TO DO FREEZE PROTECTION CONTROL IF COMMUNICATION IS LOST WITH THE THERMOSTAT.
5. IF A COMPATIBLE TH8000 SERIES RedLINK THERMOSTAT IS USED, AND THAT THERMOSTAT IS ALSO WIRELESS TO THE INDOOR UNIT, AN EIM (EQUIPMENT INTERFACE MODULE) IS REQUIRED IN ADDITION TO THE ERM (EQUIPMENT REMOTE MODULE). THE COMPATIBLE PRESTIGE IAQ THERMOSTAT ALWAYS NEEDS TO BE PAIRED WITH AN EIM, EVEN ON A HEAT ONLY SYSTEM. BECAUSE OF THIS, IT WOULD BE UNUSUAL TO USE THE ERM5220R WITH A PRESTIGE IAQ THERMOSTAT ON A HOT WATER HEAT ONLY SYSTEM WITHOUT FAN.
6. FOR HYDROAIR (HOT WATER COIL) APPLICATIONS, MAKE SURE TO CONFIGURE THE THERMOSTAT TO ENERGIZE THE FAN IN HEAT MODE.

M36126B

Fig. 13. Power-open/spring closed zone valve.

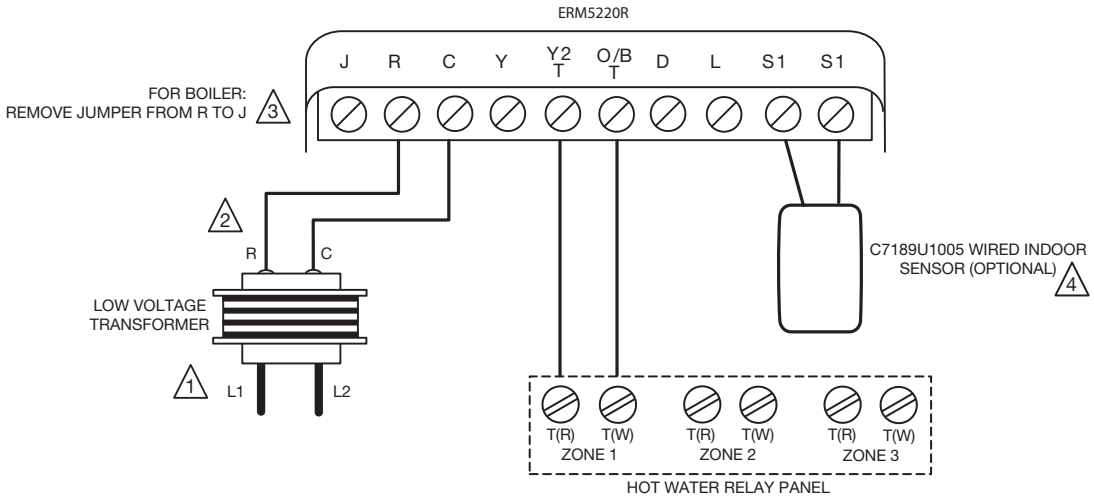




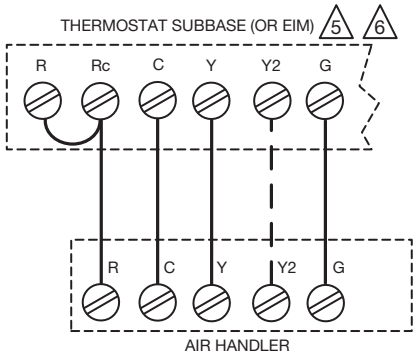
1. WIRE TRANSFORMER PRIMARY TO APPROPRIATE 120, 208, OR 240 VOLTAGE POWER SUPPLY. FOLLOW TRANSFORMER INSTALL GUIDE FOR WIRING OF TRANSFORMER PRIMARY.
2. WIRE TRANSFORMER LOW VOLTAGE SECONDARY (R AND C) TO ERM5220R AS SHOWN.
3. REMOVE JUMPER WIRE FROM J TO R. ADD JUMPER FROM R TO ONE OF THE T TERMINALS ON ERM AS SHOWN.
4. ERM DOES NOT USE Y FOR HOT WATER VALVE. R8222B1067 OR EQUIVALENT ISOLATION RELAY REQUIRED.
5. INDOOR SENSOR IS OPTIONAL. IF USED ON THIS APPLICATION IT ALLOWS THE ERM TO DO FREEZE PROTECTION CONTROL IF COMMUNICATION IS LOST WITH THE THERMOSTAT.
6. IF A COMPATIBLE TH8000 SERIES RedLINK THERMOSTAT IS USED, AND THAT THERMOSTAT IS ALSO WIRELESS TO THE INDOOR UNIT, AN EIM (EQUIPMENT INTERFACE MODULE) IS REQUIRED IN ADDITION TO THE ERM (EQUIPMENT REMOTE MODULE). THE COMPATIBLE PRESTIGE IAQ THERMOSTAT ALWAYS NEEDS TO BE PAIRED WITH AN EIM, EVEN ON A HEAT ONLY SYSTEM. BECAUSE OF THIS, IT WOULD BE UNUSUAL TO USE THE ERM5220R WITH A PRESTIGE IAQ THERMOSTAT ON A HOT WATER HEAT ONLY SYSTEM WITHOUT FAN.
7. FOR HYDROAIR (HOT WATER COIL) APPLICATIONS, MAKE SURE TO CONFIGURE THE THERMOSTAT TO ENERGIZE THE FAN IN HEAT MODE.

M36127A

Fig. 14. Series 20, Power-open/power closed zone valve.



WIRING AT THERMOSTAT IF CUSTOMER ALSO HAS FORCED AIR COOLING OR A HYDRO-AIR APPLICATION (NOT REQUIRED ON HEAT ONLY APPLICATIONS)



1. WIRE TRANSFORMER PRIMARY TO APPROPRIATE 120, 208, OR 240 VOLTAGE POWER SUPPLY. FOLLOW TRANSFORMER INSTALL GUIDE FOR WIRING OF TRANSFORMER PRIMARY.
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4. INDOOR SENSOR IS OPTIONAL. IF USED ON THIS APPLICATION IT ALLOWS THE ERM TO DO FREEZE PROTECTION CONTROL IF COMMUNICATION IS LOST WITH THE THERMOSTAT.
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6. FOR HYDROAIR (HOT WATER COIL) APPLICATIONS, MAKE SURE TO CONFIGURE THE THERMOSTAT TO ENERGIZE THE FAN IN HEAT MODE.

M36128A

Fig. 15. Hot water relay panel.

LINKING ERM5220R TO A NEW COMPATIBLE THERMOSTAT.

NOTE: If thermostat setup had already been done but ERM5220R had not been linked to the thermostat, see page 16.

1. Verify thermostat model and manufacture date are compatible with ERM (should say compatible with ERM on packaging). Information about compatible models of thermostat and EIM is on page 3.
2. Turn on power. Once power is connected, the "Compressor" (or "Boiler") LED should illuminate green.

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OR

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3. When the thermostat is powered it will prompt you to select whether the system is residential or commercial. After setting residential or commercial and choosing the thermostat name, the display shows the below screen (setup 110).

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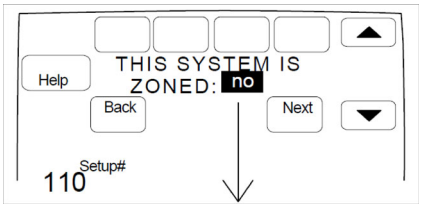
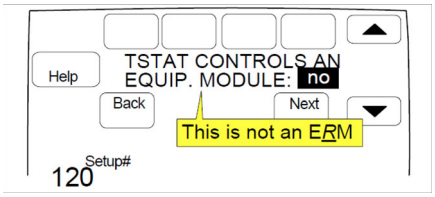
4. The ERM5220R does not work on a forced air system zoned with dampers. Select "no" if the system is either a single zone forced air unit, or a zoned hot water system. A zoned hot water system would require a separate ERM5220R for each wireless thermostat).

NOTE: For questions about why the ERM cannot be used on a forced air zone system, see the FAQ section.



5. Equip. module (EIM) THM5421R is separate from remote module ERM. See notes below for when an EIM is used.
   - If not using an Equipment Interface Module, select "no" at the thermostat with arrow button, then press "next". Skip to step 10.
   - If using an Equipment Interface Module, select "yes" at the thermostat with arrow button, then press "next". Proceed with step 6.



EQUIPMENT INTERFACE MODULE (EIM) THM5421R. WHEN IS IT USED?

- The Prestige IAQ always requires an EIM even if it is hot water heat only. For this reason it would be unusual to use the ERM5220R with a Prestige IAQ on a hot water heat only application.
- The TH8110R, TH8320R, and TH8321R models do not require an EIM for hot water heat only applications with no fan control.
- The TH8110R, TH8320R, and TH8321R models do not require an EIM if the furnace/air-handler is wired to the thermostat subbase.
- The TH8110R, TH8320R, and TH8321R models do require an EIM if the thermostat controls cooling or fan, and there are not wires from the thermostat to the furnace/air-handler.

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6. Thermostat display says "Press Connect at Equipment Module". Go to the Equipment Interface Module and press the connect button.
7. Verify the connected LED starts flashing.
8. Go back to the thermostat and press "Next".
9. Thermostat display should show "Thermostat connected". Press "Next".

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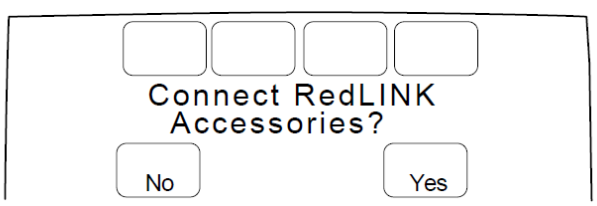
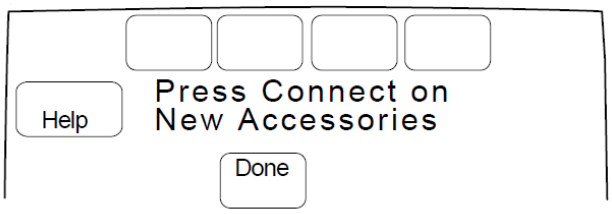
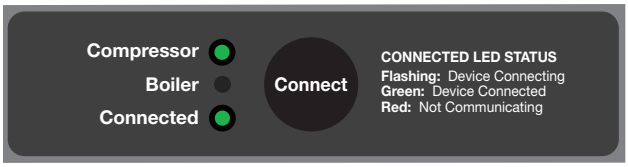
10. Select "Yes" to connect RedLINK accessories (Including ERM5220R Equipment Remote Module).



11. The thermostat display says "Press Connect on New Accessories".



12. Press/release the “Connect” button on the ERM5220R. After releasing the button, the Connected LED should flash green and then turn solid green.



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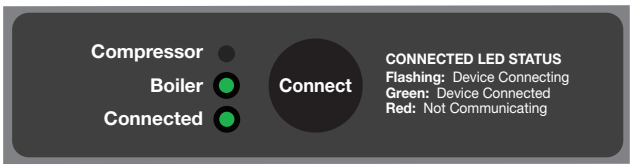
OR



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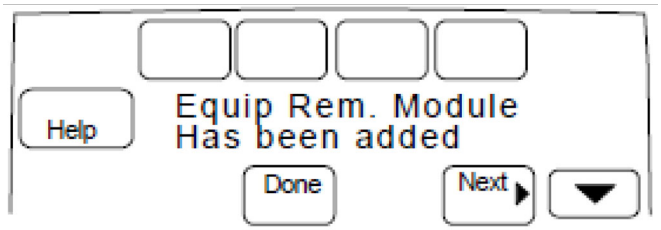
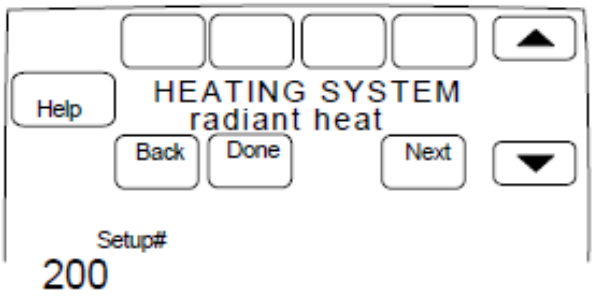
13. Back at thermostat, display will indicate that the Equipment Remote Module has been added. Press “Next” to continue with the installer setup options.



14. Go through the rest of the ISU settings. For boiler systems make sure to designate “Radiant Heat” for Heating System Type (ISU 200) in your thermostat.



15. If you do not have an EIM, you are done. If you are using an EIM, (this is a separate item from the ERM) go to the EIM. If the connected LED is still flashing, press/release the connect button on EIM. If the connect LED was already solid green you are done.

LINKING ERM5220R TO AN EXISTING COMPATIBLE THERMOSTAT.

Verify thermostat model and manufacture date are compatible with ERM. Information about compatible models of thermostat and EIM is on page 3.

1. Turn on power. Once power is connected, the “Compressor” (or “Boiler”) LED should illuminate green.

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2. **Reset procedure at ERM: (Skip to step 3 if ERM is new)**
   If you want to unlink the ERM from any RedLINK devices it is currently paired with, hold down the “Connect” button on the ERM for at least 15 seconds. The “Connection” LED should appear red for a few seconds and go out. This indicates the unit is reset.
3. **Existing installation of thermostat**
   This is for when the installer setup options have already been saved but the ERM5220R was not added at that time. Note: If thermostat setup has not already been done, use the instructions for new thermostats on page 14.
4. Install the R to J jumper when using ERM on outdoor unit. Remove the R to J jumper when using ERM on boiler.
5. Verify thermostat is configured correctly for system. Designate “Radiant Heat” for Heating System Type (ISU 200) at your thermostat if ERM controls boiler.

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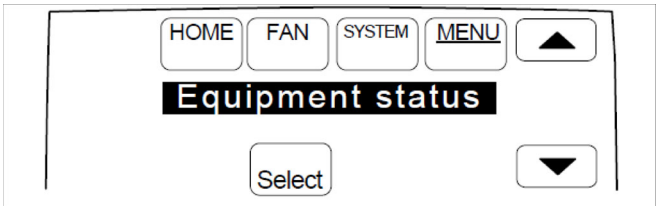
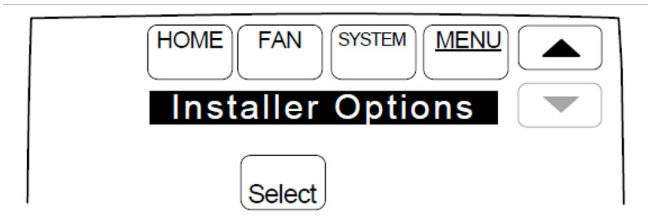
6. At thermostat, press “Menu”. Scroll down to “Equipment status”. Press select. Then scroll down until date code is highlighted. Write this down. Then press “Done”.



7. Scroll down until “Installer Options” is shown. Then press “Select”.



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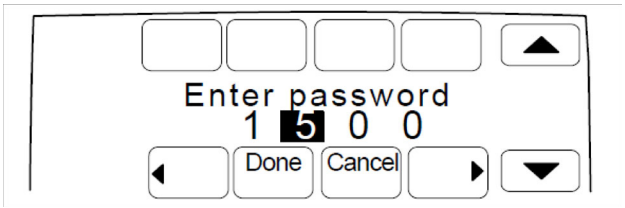
8. Enter the date code and press “Done”.

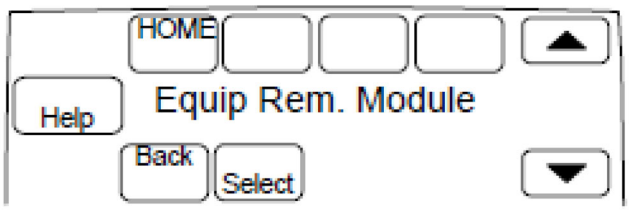


9. Scroll down until “Wireless Manager” is highlighted. Then press “Select”.

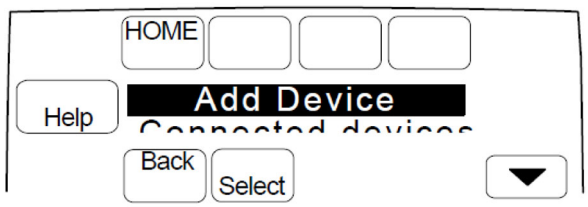
- If the thermostat had previously been linked to an ERM that is being replaced, proceed to step 10.
- If you are not replacing an existing ERM with a new one, skip to step 12.

10. Scroll down until “Remove Device” is highlighted. Press “Select”.

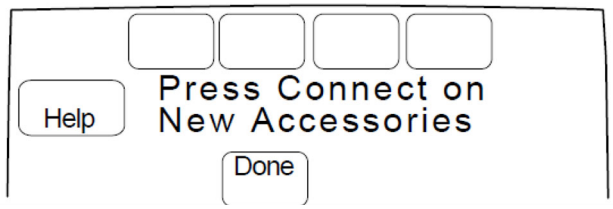
11. Scroll down until “Equip Rem. Module” is selected. And press “Select”. Display says “Remove Equip. Rem. Module?” Select “Yes”.



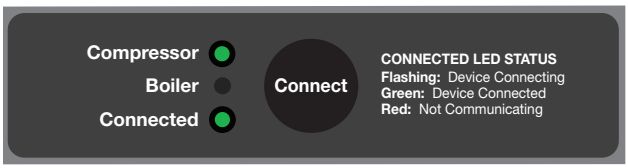
12. Scroll up or down until “Add Device” is highlighted in screen. Then press “Select”.



13. The thermostat display says “Press Connect on New Accessories”.



14. Press/release the “Connect” button on the ERM5220R. After releasing the button, the connected” LED should flash green and then turn solid green.



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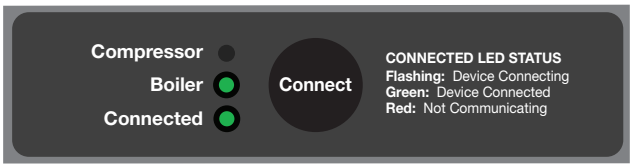

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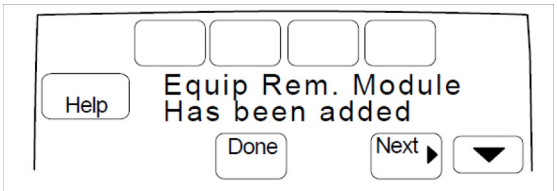
15. Back at thermostat, display will indicate that the Equipment Remote Module has been added. Press “Done”.



Checkout

1. Verify power is on to the compressor or boiler as well as your RedLINK thermostat and ERM.
2. If testing ERM for heat, switch thermostat to heat and raise set-point above room temperature. If testing ERM for cooling, switch thermostat to cool and lower set-point below room temperature.
3. The thermostat may say “waiting for equipment” for up to 5 minutes when controlling the outdoor unit. This is a safety feature for the outdoor unit to prevent short cycling.
4. When thermostat shows “heat on” or “cool on” go to ERM and verify the boiler or outdoor unit is running. If the LED above Y is flashing, the ERM is doing a compressor lockout. The ERM will do this when first powered up, even if the compressor lockout has been removed from the thermostat..
5. If outdoor temperature sensor is used (only when ERM is controlling outdoor unit), check thermostat to see the outdoor temperature display is active and accurate.
6. Be sure to set thermostat to the desired settings when checkout is complete.

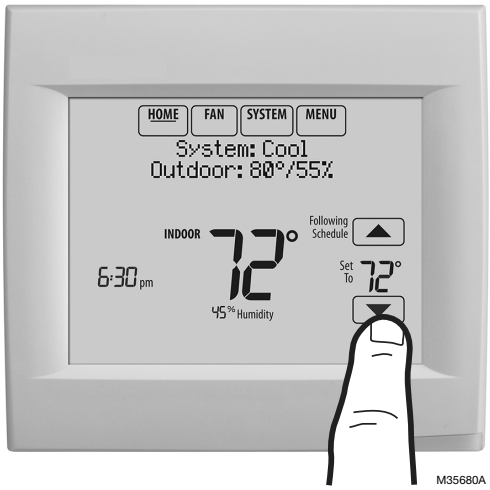


Fig. 16.

OPERATION

ERM USED FOR OUTDOOR UNIT: CALL FOR COOLING

1. Thermostat is set to cool or auto mode. Cool set-point is below room temperature.
2. Thermostat will show "cool on" in the display. (the display may show "waiting for equipment" if the minimum compressor off delay has not expired prior to the call for cool. Typically this is up to 5 minutes).
   - If thermostat is set for either conventional system or heatpump with heat changeover, the LED will be lit green over the Y at the ERM. The switch will close from J to Y at the ERM. If an EIM is wired to the air-handler/furnace, the EIM will close a switch from Rc to Y and Rc to G. If no EIM is used, the thermostat will close from Rc to Y and Rc to G at the subbase.
   - If thermostat is set for heatpump with cool changeover, the LEDs will be lit green over the Y and O/B at the ERM. The switch will close from J to Y and J to O/B at the ERM. If an EIM is wired to the air-handler/furnace, the EIM will close a switch from Rc to Y, Rc to G, and Rh to O/B. If no EIM is used, the thermostat will close from Rc to Y, Rc to G, and R to O/B at the subbase.
   - If the thermostat is configured for 2 stage compressor, then in addition to the operation listed above, with a call for stage 2 cooling the LED over Y2 will be lit green on ERM. If an EIM is wired to the air-handler or furnace, the EIM will close an additional switch from Rc to Y2. If no EIM is used, the thermostat will close an additional switch from Rc to Y2 at the subbase. The Y2 at EIM or subbase is not connected to some furnace and air-handler models.

ERM USED FOR OUTDOOR UNIT: CALL FOR HEATING (HEATPUMP ONLY)

1. Thermostat is set to heat or auto mode. Heat set-point is above room temperature.
2. Thermostat will show "Heat on" in the display. (the display may show "waiting for equipment" if the minimum compressor off delay has not expired prior to the call for heat. Typically this is up to 5 minutes).
   - If thermostat is set for heatpump with *cool* changeover valve, the LED will be lit green over the Y at the ERM. The switch will close from J to Y at the ERM. If an EIM is wired to the air-handler/furnace, the EIM will close a switch from Rc to Y and Rc to G. If no EIM is used, the thermostat will close from Rc to Y and Rc to G at the subbase.
   - If thermostat is set for heatpump with *heat* changeover valve, the LEDs will be lit green over the Y and O/B at the ERM. The switch will close from J to Y and J to O/B at the ERM. If an EIM is wired to the air-handler/furnace, the EIM will close a switch from Rc to Y, Rc to G, and Rh to O/B. If no EIM is used, the thermostat will close from Rc to Y, Rc to G, and R to O/B at the subbase.
   - If the thermostat is configured for 2 stage compressor, then in addition to the operation listed above, with a call for stage 2 heating the LED over Y2 will be lit green on ERM. If an EIM is wired to the air-handler/furnace, the EIM will close an additional switch from Rc Y2. If no EIM is used, the thermostat will close an additional switch from Rc to Y2 at the subbase.

ERM USED FOR BOILER: CALL FOR HEATING

1. Thermostat is set to heat or auto mode. Heat set-point is above room temperature.
2. Thermostat will show "Heat on" in the display.
   - The LED will be lit green over the second T at the ERM. (The LED over the first T does not light when ERM is used for a boiler). The dry contact switch will close from T to T at the ERM*. If an EIM is also used, the EIM will close a switch from Rh to W. If no EIM is used, the thermostat will close from R to W at the subbase. If the thermostat is set to energize the fan in heat (hydro-coil) the thermostat *or* EIM will also close from Rc to G.

* you may not be able to measure continuity across this closed switch. See Fig. 18 for troubleshooting heat.

HEATPUMP GOES INTO DEFROST

NOTE: This feature is intended for heatpumps with electric auxiliary heat only. If the thermostat is set for dual fuel, the D terminal on ERM should not be used, and would have no function other than to light the D LED when the defrost board is engaged.

1. The heatpump controls when defrost is engaged, not the zone panel.
2. The thermostat subbase or EIM closes from Rc to Y and Rc to G at air-handler with a call for heat. This operation does not change when the defrost terminal is energized by the ERM.
3. If the heat pump defrost board sends the signal for defrost on the D wire, ERM5220 shows the D LED solid green.
4. Assuming the thermostat is calling for heat, ERM is still closing from the J to the Y. The LED for Y should remain lit.
5. ERM does not change operation of changeover valve when heatpump is in defrost.
6. ERM communicates to thermostat or EIM when the defrost terminal (D) is energized. Thermostat subbase or EIM (if used) closes additional switch from R (Rh) to AUX to run the electric heat strips. There is not any indication on the thermostat that it is energizing the AUX contact when the ERM is driving this operation. The thermostat might show "auxiliary heat on" in the display, but that is due to a demand for auxiliary heat from the thermostat, independent of what the ERM is doing.

COMPRESSOR FAULT MONITOR ENERGIZES L ON ERM

1. The heatpump compressor fault monitor energizes the L terminal on the ERM. The LED above L is lit green on ERM5220R.
2. ERM communicates fault to thermostat. Thermostat display shows 1 active alert and says to "press here for more info". When the customer presses "here", the thermostat says "heat pump needs service".
   This does not change the outputs of the thermostat or ERM.

TROUBLESHOOTING

Symptom	Possible Cause	Action
Connected LED is red	Loss of communication to thermostat. Check thermostat display to see if it is blank or shows error codes. If there had been a loss of power to the thermostat it could take up to 6 minutes before communication is restored.	If thermostat display is blank, check power at thermostat subbase. R and C on THX9421R models. Rc and C at TH8000R series models. If display is normal, reset the ERM and then link it to the thermostat. This process is on page 16.
Connected LED is off	If no LEDs are lit, see "No LEDs are on" below. If compressor or boiler is lit, this indicates the ERM is not linked to a compatible RedLINK thermostat.	See the appropriate linkup process on pages 14 or 16.
No LEDs are on	Insufficient power to R and C at ERM.	Verify nominal voltage (24 VAC) at R and C on ERM. Verify wires are stripped back and making good connections.
Wrong LED lit (boiler or compressor)	Either jumper is installed incorrectly or ERM had been previously linked for boiler or compressor and needs to be reset. If previously linked connect LED is typically red or green rather than unlit.	Verify the R to J jumper is set correctly (remove jumper for boiler, add jumper for compressor). Reset the ERM by pressing/holding the "Connect" button for 30 seconds.
No outdoor temperature shown on thermostat display.	If configured for outdoor sensor, the thermostat should show an outdoor temperature reading or error code about outdoor sensor not connected. If a wired sensor is used but there is an issue it may show two dashes (see below). If neither an outdoor temperature reading nor an error code is shown, verify the thermostat configuration settings.	
Thermostat shows dashes "--" for outdoor temperature	NOTE: The thermostat can display outdoor temperature in one of four ways. Find the way you have connected the outdoor sensor from the list below and follow the instructions). **1.** Wired outdoor sensor connected to ERM and ERM configured for compressor application. You cannot wire an outdoor sensor to the ERM if it is set for boiler. (see R to J jumper on wiring section). If an outdoor sensor is wired to the ERM, verify the compressor and connected LEDs are solid green at the ERM. If so, disconnect the wires and take a resistance reading at the ends of the wires. Check the outdoor sensor chart (Table 4 on page 28). **2.** An outdoor sensor is wired to the EIM. If an EIM is used, and the sensor is wired to EIM, verify the thermostat is configured for outdoor sensor to the terminals it connects to. Disconnect the wires and take a resistance reading at the ends of the wires. Check the outdoor sensor chart (Table 4 on page 28). **3.** A wired outdoor sensor connected to the sensor terminals on one of the TH8000R series compatible thermostats. (Note: This should only be done if an EIM is not used. The EIM is different than the ERM. If an EIM is used, the outdoor sensor must wire to the EIM or ERM). Disconnect the wires and take a resistance reading at the ends of the wires. Check the outdoor sensor chart (Table 4 on page 28). **4.** A C7089R wireless outdoor sensor linked to the thermostat. See if the outdoor sensor shows up in the thermostat installer options under wireless manager-connected devices. If not, go to "add device" and then press the button on the outdoor sensor and verify the thermostat display indicates it has been added.	
Outdoor temperature reading is too high	Verify outdoor temperature sensor is not in direct sunlight. See the outdoor sensor install instructions on page 29.	
Emergency backup control doesn't function correctly.	If a C7189U1005 (or equivalent) 10K ohm indoor sensor is wired to the S1 terminals on the ERM *AND* the ERM is configured for boiler control, the ERM uses that sensor to maintain an indoor temperature of 55 °F in heating in case there is loss of communication from thermostat to ERM that exceeds 30 minutes. **1.** Verify the sensor is wired to ERM and wire connections are good. **2.** Verify that the sensor is not wired in series to parallel to any other thermostat, module or device. **3.** Remove wires from ERM and ohm out the wires. Compare that reading with outdoor sensor chart, Table 4 on page 28 (indoor and outdoor sensor resistance chart is the same). Temperature must be below 55 °F for ERM to run boiler in emergency backup mode. **4.** Verify that the loss of communication between thermostat and ERM has exceeded 30 minutes. **5.** If temp at sensor has been below 55 °F for longer than 30 minutes, see if the LED above the O/B/T is green. If yes, boiler should be running. If no, verify boiler LED is solid green and connection LED is solid green for over 30 minutes.	

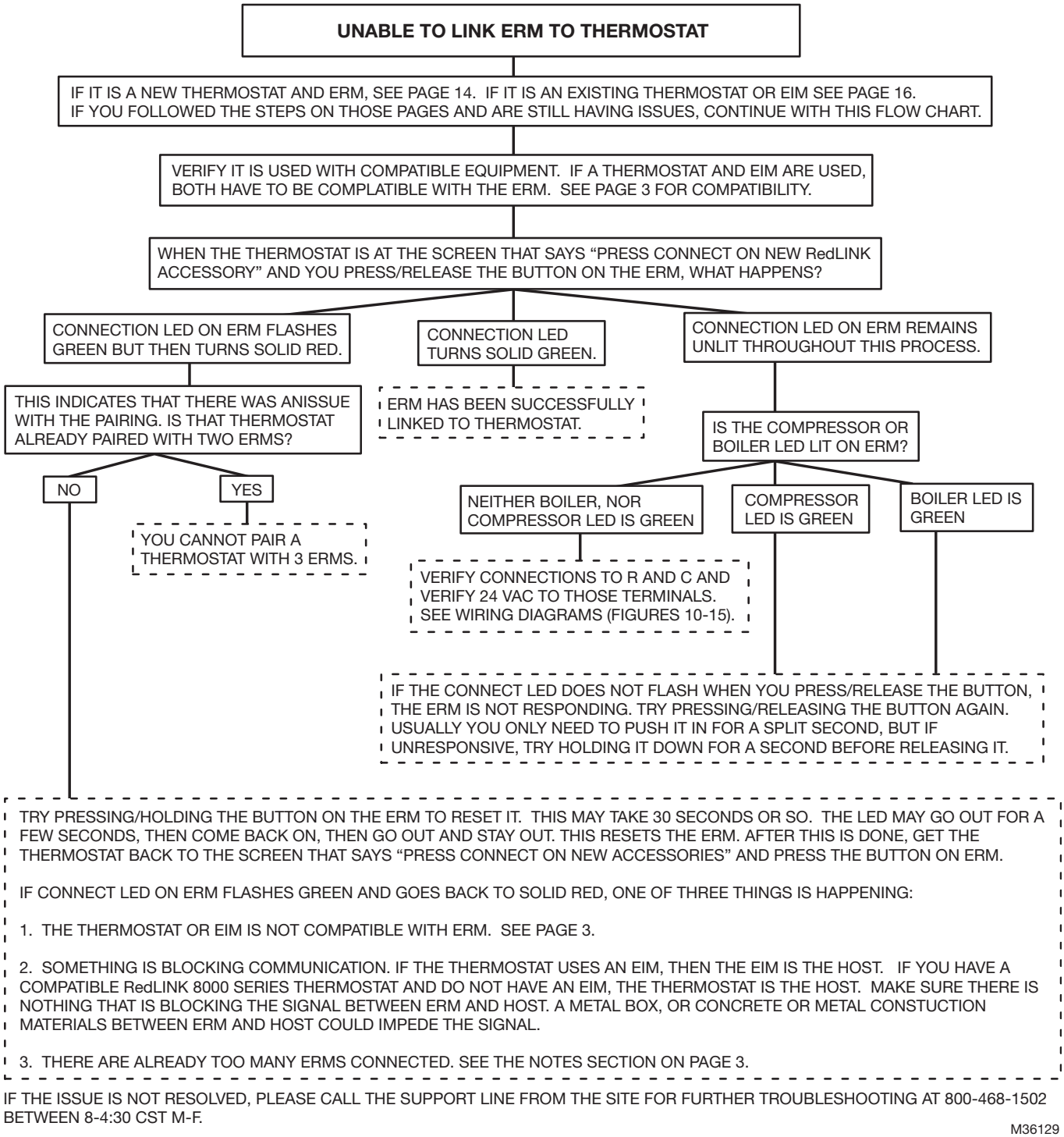

UNABLE TO LINK ERM TO THERMOSTAT
IF IT IS A NEW THERMOSTAT AND ERM, SEE PAGE 14. IF IT IS AN EXISTING THERMOSTAT OR EIM SEE PAGE 16. IF YOU FOLLOWED THE STEPS ON THOSE PAGES AND ARE STILL HAVING ISSUES, CONTINUE WITH THIS FLOW CHART.
VERIFY IT IS USED WITH COMPATIBLE EQUIPMENT. IF A THERMOSTAT AND EIM ARE USED, BOTH HAVE TO BE COMPLATIBLE WITH THE ERM. SEE PAGE 3 FOR COMPATIBILITY.
WHEN THE THERMOSTAT IS AT THE SCREEN THAT SAYS "PRESS CONNECT ON NEW RedLINK ACCESSORY" AND YOU PRESS/RELEASE THE BUTTON ON THE ERM, WHAT HAPPENS?
CONNECTION LED ON ERM FLASHES GREEN BUT THEN TURNS SOLID RED.
CONNECTION LED TURNS SOLID GREEN.
CONNECTION LED ON ERM REMAINS UNLIT THROUGHOUT THIS PROCESS.
THIS INDICATES THAT THERE WAS ANISSUE WITH THE PAIRING. IS THAT THERMOSTAT ALREADY PAIRED WITH TWO ERMS?
ERM HAS BEEN SUCCESSFULLY LINKED TO THERMOSTAT.
IS THE COMPRESSOR OR BOILER LED LIT ON ERM?
NO
YES
YOU CANNOT PAIR A THERMOSTAT WITH 3 ERMS.
NEITHER BOILER, NOR COMPRESSOR LED IS GREEN
COMPRESSOR LED IS GREEN
BOILER LED IS GREEN
VERIFY CONNECTIONS TO R AND C AND VERIFY 24 VAC TO THOSE TERMINALS. SEE WIRING DIAGRAMS (FIGURES 10-15).
IF THE CONNECT LED DOES NOT FLASH WHEN YOU PRESS/RELEASE THE BUTTON, THE ERM IS NOT RESPONDING. TRY PRESSING/RELEASING THE BUTTON AGAIN. USUALLY YOU ONLY NEED TO PUSH IT IN FOR A SPLIT SECOND, BUT IF UNRESPONSIVE, TRY HOLDING IT DOWN FOR A SECOND BEFORE RELEASING IT.
TRY PRESSING/HOLDING THE BUTTON ON THE ERM TO RESET IT. THIS MAY TAKE 30 SECONDS OR SO. THE LED MAY GO OUT FOR A FEW SECONDS, THEN COME BACK ON, THEN GO OUT AND STAY OUT. THIS RESETS THE ERM. AFTER THIS IS DONE, GET THE THERMOSTAT BACK TO THE SCREEN THAT SAYS "PRESS CONNECT ON NEW ACCESSORIES" AND PRESS THE BUTTON ON ERM.
IF CONNECT LED ON ERM FLASHES GREEN AND GOES BACK TO SOLID RED, ONE OF THREE THINGS IS HAPPENING:
1. THE THERMOSTAT OR EIM IS NOT COMPATIBLE WITH ERM. SEE PAGE 3.
2. SOMETHING IS BLOCKING COMMUNICATION. IF THE THERMOSTAT USES AN EIM, THEN THE EIM IS THE HOST. IF YOU HAVE A COMPATIBLE RedLINK 8000 SERIES THERMOSTAT AND DO NOT HAVE AN EIM, THE THERMOSTAT IS THE HOST. MAKE SURE THERE IS NOTHING THAT IS BLOCKING THE SIGNAL BETWEEN ERM AND HOST. A METAL BOX, OR CONCRETE OR METAL CONSTUCTION MATERIALS BETWEEN ERM AND HOST COULD IMPEDE THE SIGNAL.
3. THERE ARE ALREADY TOO MANY ERMS CONNECTED. SEE THE NOTES SECTION ON PAGE 3.
IF THE ISSUE IS NOT RESOLVED, PLEASE CALL THE SUPPORT LINE FROM THE SITE FOR FURTHER TROUBLESHOOTING AT 800-468-1502 BETWEEN 8-4:30 CST M-F.
M36129

Fig. 17.

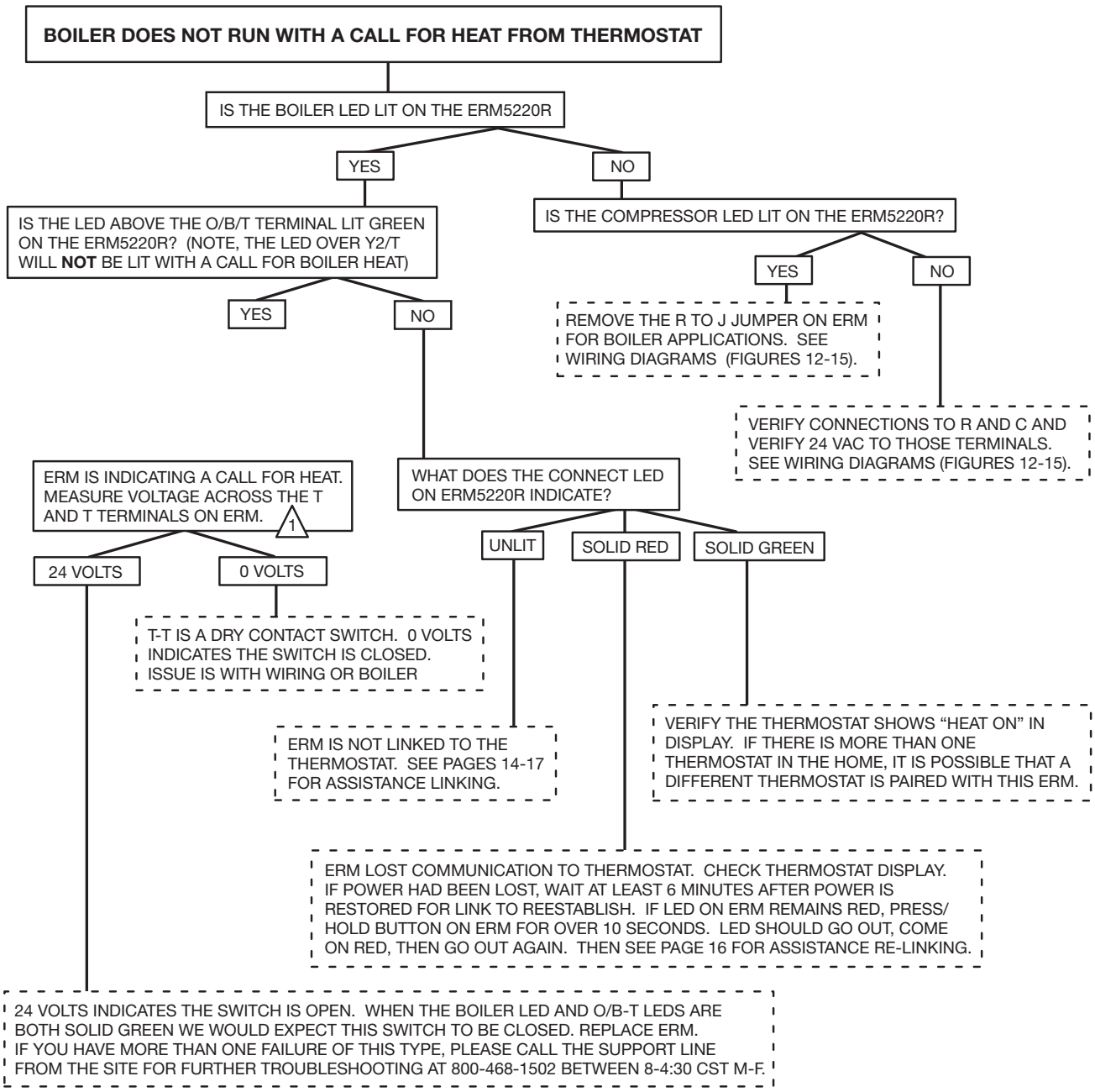

BOILER DOES NOT RUN WITH A CALL FOR HEAT FROM THERMOSTAT
IS THE BOILER LED LIT ON THE ERM5220R
YES
NO
IS THE LED ABOVE THE O/B/T TERMINAL LIT GREEN ON THE ERM5220R? (NOTE, THE LED OVER Y2/T WILL **NOT** BE LIT WITH A CALL FOR BOILER HEAT)
IS THE COMPRESSOR LED LIT ON THE ERM5220R?
YES
NO
YES
NO
REMOVE THE R TO J JUMPER ON ERM FOR BOILER APPLICATIONS. SEE WIRING DIAGRAMS (FIGURES 12-15).
VERIFY CONNECTIONS TO R AND C AND VERIFY 24 VAC TO THOSE TERMINALS. SEE WIRING DIAGRAMS (FIGURES 12-15).
ERM IS INDICATING A CALL FOR HEAT. MEASURE VOLTAGE ACROSS THE T AND T TERMINALS ON ERM. 1
WHAT DOES THE CONNECT LED ON ERM5220R INDICATE?
24 VOLTS
0 VOLTS
UNLIT
SOLID RED
SOLID GREEN
T-T IS A DRY CONTACT SWITCH. 0 VOLTS INDICATES THE SWITCH IS CLOSED. ISSUE IS WITH WIRING OR BOILER
ERM IS NOT LINKED TO THE THERMOSTAT. SEE PAGES 14-17 FOR ASSISTANCE LINKING.
VERIFY THE THERMOSTAT SHOWS “HEAT ON” IN DISPLAY. IF THERE IS MORE THAN ONE THERMOSTAT IN THE HOME, IT IS POSSIBLE THAT A DIFFERENT THERMOSTAT IS PAIRED WITH THIS ERM.
ERM LOST COMMUNICATION TO THERMOSTAT. CHECK THERMOSTAT DISPLAY. IF POWER HAD BEEN LOST, WAIT AT LEAST 6 MINUTES AFTER POWER IS RESTORED FOR LINK TO REESTABLISH. IF LED ON ERM REMAINS RED, PRESS/ HOLD BUTTON ON ERM FOR OVER 10 SECONDS. LED SHOULD GO OUT, COME ON RED, THEN GO OUT AGAIN. THEN SEE PAGE 16 FOR ASSISTANCE RE-LINKING.
24 VOLTS INDICATES THE SWITCH IS OPEN. WHEN THE BOILER LED AND O/B-T LEDS ARE BOTH SOLID GREEN WE WOULD EXPECT THIS SWITCH TO BE CLOSED. REPLACE ERM. IF YOU HAVE MORE THAN ONE FAILURE OF THIS TYPE, PLEASE CALL THE SUPPORT LINE FROM THE SITE FOR FURTHER TROUBLESHOOTING AT 800-468-1502 BETWEEN 8-4:30 CST M-F.
1 YOU CANNOT TEST THESE TERMINALS WITH A CONTINUITY METER. WHEN WIRES ARE NOT CONNECTED TO THESE TERMINALS, THERE WILL BE INFINITE RESISTANCE ACROSS THE TERMINALS WHETHER THE DRY CONTACT SWITCH IN THE ERM IS OPEN OR CLOSED. ONLY TEST WITH THE WIRES CONNECTED.
IF THE ISSUE IS NOT RESOLVED, PLEASE CALL THE SUPPORT LINE FROM THE SITE FOR FURTHER TROUBLESHOOTING AT 800-468-1502 BETWEEN 8-4:30 CST M-F.
M36130

Fig. 18.

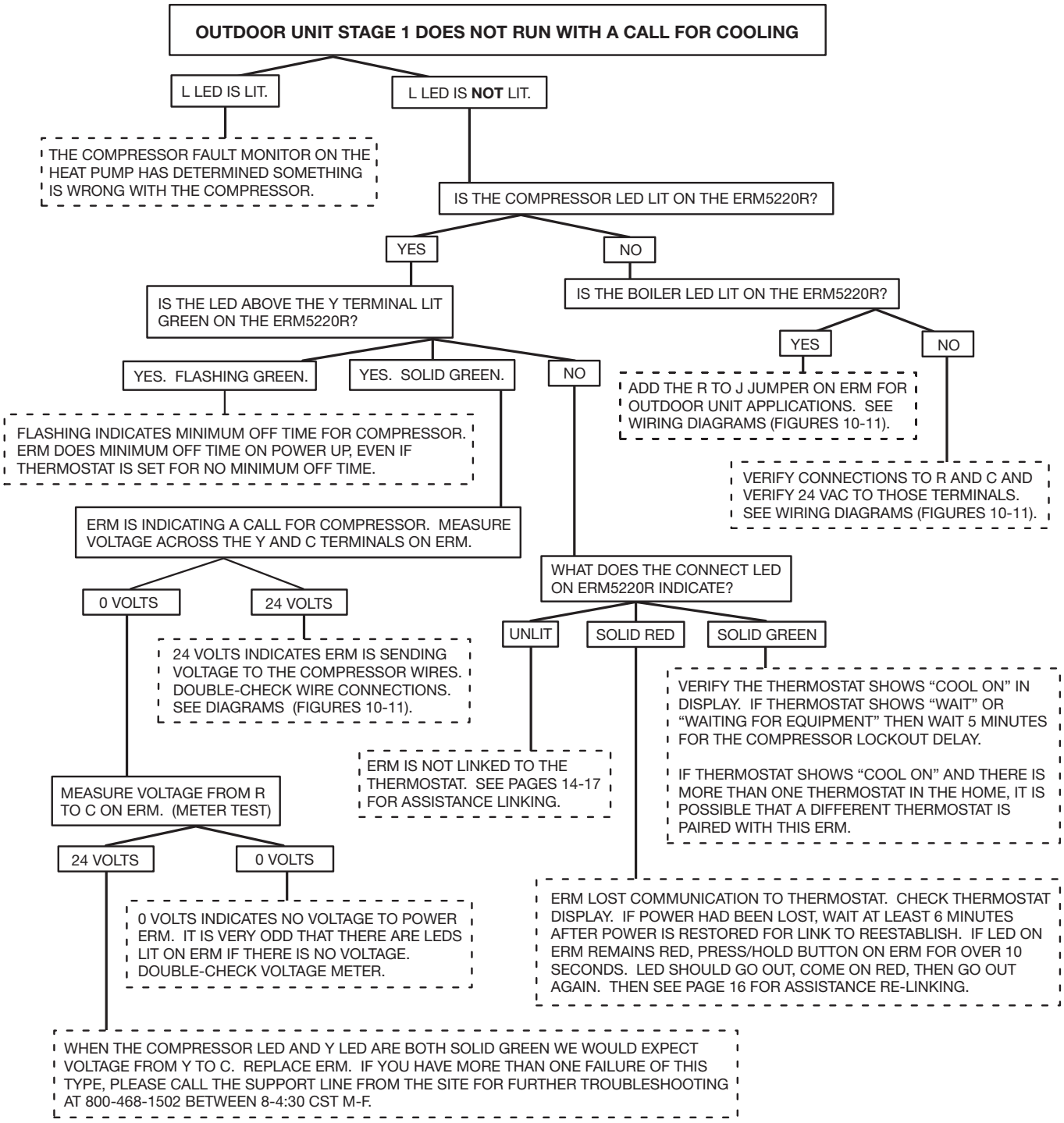

OUTDOOR UNIT STAGE 1 DOES NOT RUN WITH A CALL FOR COOLING
L LED IS LIT.
L LED IS **NOT** LIT.
THE COMPRESSOR FAULT MONITOR ON THE HEAT PUMP HAS DETERMINED SOMETHING IS WRONG WITH THE COMPRESSOR.
IS THE COMPRESSOR LED LIT ON THE ERM5220R?
YES
NO
IS THE LED ABOVE THE Y TERMINAL LIT GREEN ON THE ERM5220R?
IS THE BOILER LED LIT ON THE ERM5220R?
YES
NO
YES. FLASHING GREEN.
YES. SOLID GREEN.
NO
ADD THE R TO J JUMPER ON ERM FOR OUTDOOR UNIT APPLICATIONS. SEE WIRING DIAGRAMS (FIGURES 10-11).
FLASHING INDICATES MINIMUM OFF TIME FOR COMPRESSOR. ERM DOES MINIMUM OFF TIME ON POWER UP, EVEN IF THERMOSTAT IS SET FOR NO MINIMUM OFF TIME.
VERIFY CONNECTIONS TO R AND C AND VERIFY 24 VAC TO THOSE TERMINALS. SEE WIRING DIAGRAMS (FIGURES 10-11).
ERM IS INDICATING A CALL FOR COMPRESSOR. MEASURE VOLTAGE ACROSS THE Y AND C TERMINALS ON ERM.
WHAT DOES THE CONNECT LED ON ERM5220R INDICATE?
0 VOLTS
24 VOLTS
UNLIT
SOLID RED
SOLID GREEN
24 VOLTS INDICATES ERM IS SENDING VOLTAGE TO THE COMPRESSOR WIRES. DOUBLE-CHECK WIRE CONNECTIONS. SEE DIAGRAMS (FIGURES 10-11).
ERM IS NOT LINKED TO THE THERMOSTAT. SEE PAGES 14-17 FOR ASSISTANCE LINKING.
VERIFY THE THERMOSTAT SHOWS “COOL ON” IN DISPLAY. IF THERMOSTAT SHOWS “WAIT” OR “WAITING FOR EQUIPMENT” THEN WAIT 5 MINUTES FOR THE COMPRESSOR LOCKOUT DELAY.
IF THERMOSTAT SHOWS “COOL ON” AND THERE IS MORE THAN ONE THERMOSTAT IN THE HOME, IT IS POSSIBLE THAT A DIFFERENT THERMOSTAT IS PAIRED WITH THIS ERM.
MEASURE VOLTAGE FROM R TO C ON ERM. (METER TEST)
24 VOLTS
0 VOLTS
0 VOLTS INDICATES NO VOLTAGE TO POWER ERM. IT IS VERY ODD THAT THERE ARE LEDS LIT ON ERM IF THERE IS NO VOLTAGE. DOUBLE-CHECK VOLTAGE METER.
ERM LOST COMMUNICATION TO THERMOSTAT. CHECK THERMOSTAT DISPLAY. IF POWER HAD BEEN LOST, WAIT AT LEAST 6 MINUTES AFTER POWER IS RESTORED FOR LINK TO REESTABLISH. IF LED ON ERM REMAINS RED, PRESS/HOLD BUTTON ON ERM FOR OVER 10 SECONDS. LED SHOULD GO OUT, COME ON RED, THEN GO OUT AGAIN. THEN SEE PAGE 16 FOR ASSISTANCE RE-LINKING.
WHEN THE COMPRESSOR LED AND Y LED ARE BOTH SOLID GREEN WE WOULD EXPECT VOLTAGE FROM Y TO C. REPLACE ERM. IF YOU HAVE MORE THAN ONE FAILURE OF THIS TYPE, PLEASE CALL THE SUPPORT LINE FROM THE SITE FOR FURTHER TROUBLESHOOTING AT 800-468-1502 BETWEEN 8-4:30 CST M-F.
IF THE ISSUE IS NOT RESOLVED, PLEASE CALL THE SUPPORT LINE FROM THE SITE FOR FURTHER TROUBLESHOOTING AT 800-468-1502 BETWEEN 8-4:30 CST M-F.
M36131

Fig. 19.

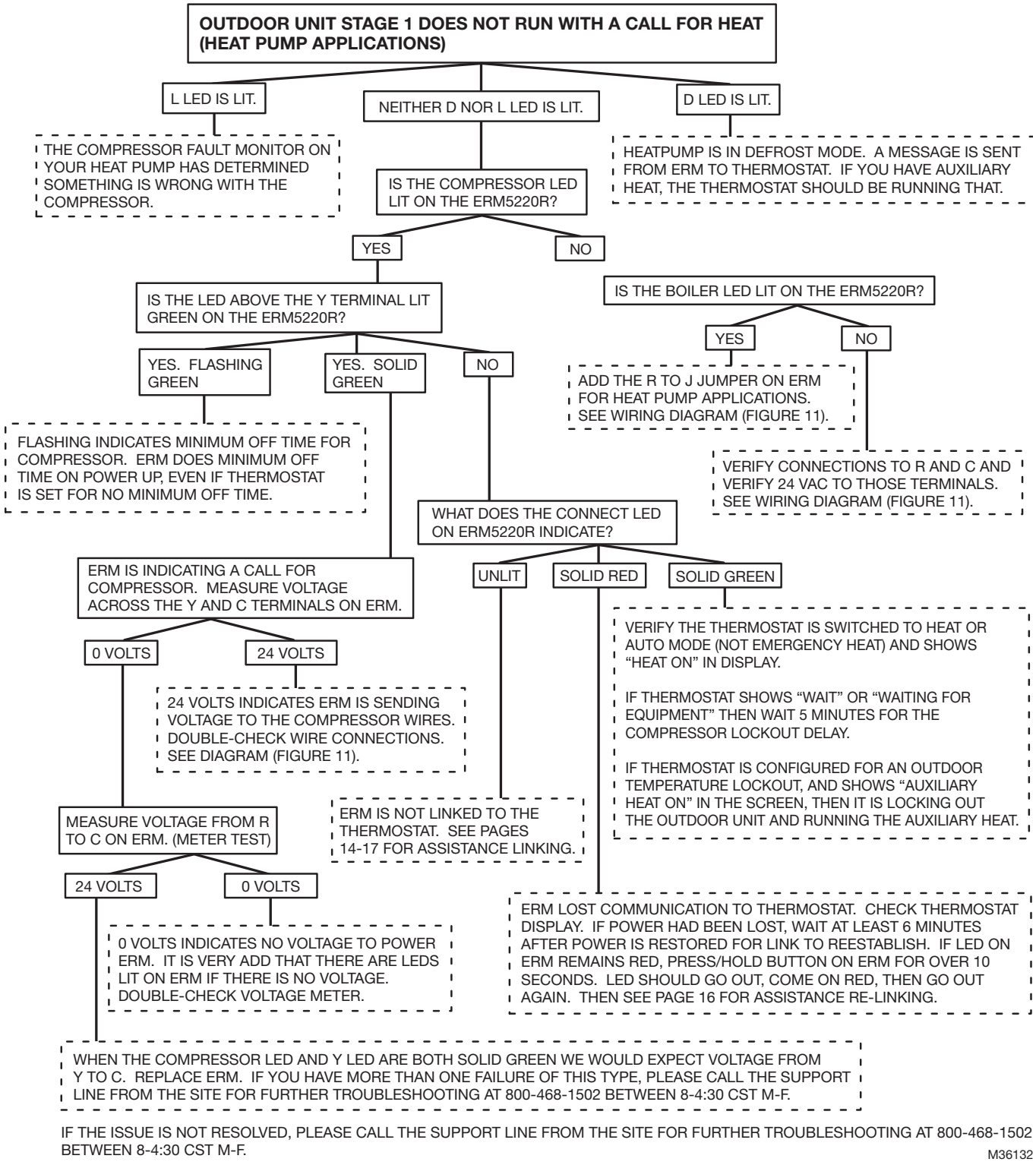

OUTDOOR UNIT STAGE 1 DOES NOT RUN WITH A CALL FOR HEAT (HEAT PUMP APPLICATIONS)
L LED IS LIT.
NEITHER D NOR L LED IS LIT.
D LED IS LIT.
THE COMPRESSOR FAULT MONITOR ON YOUR HEAT PUMP HAS DETERMINED SOMETHING IS WRONG WITH THE COMPRESSOR.
IS THE COMPRESSOR LED LIT ON THE ERM5220R?
HEATPUMP IS IN DEFROST MODE. A MESSAGE IS SENT FROM ERM TO THERMOSTAT. IF YOU HAVE AUXILIARY HEAT, THE THERMOSTAT SHOULD BE RUNNING THAT.
YES
NO
IS THE LED ABOVE THE Y TERMINAL LIT GREEN ON THE ERM5220R?
IS THE BOILER LED LIT ON THE ERM5220R?
YES. FLASHING GREEN
YES. SOLID GREEN
NO
YES
NO
ADD THE R TO J JUMPER ON ERM FOR HEAT PUMP APPLICATIONS. SEE WIRING DIAGRAM (FIGURE 11).
FLASHING INDICATES MINIMUM OFF TIME FOR COMPRESSOR. ERM DOES MINIMUM OFF TIME ON POWER UP, EVEN IF THERMOSTAT IS SET FOR NO MINIMUM OFF TIME.
VERIFY CONNECTIONS TO R AND C AND VERIFY 24 VAC TO THOSE TERMINALS. SEE WIRING DIAGRAM (FIGURE 11).
WHAT DOES THE CONNECT LED ON ERM5220R INDICATE?
ERM IS INDICATING A CALL FOR COMPRESSOR. MEASURE VOLTAGE ACROSS THE Y AND C TERMINALS ON ERM.
UNLIT
SOLID RED
SOLID GREEN
0 VOLTS
24 VOLTS
VERIFY THE THERMOSTAT IS SWITCHED TO HEAT OR AUTO MODE (NOT EMERGENCY HEAT) AND SHOWS "HEAT ON" IN DISPLAY.
IF THERMOSTAT SHOWS "WAIT" OR "WAITING FOR EQUIPMENT" THEN WAIT 5 MINUTES FOR THE COMPRESSOR LOCKOUT DELAY.
IF THERMOSTAT IS CONFIGURED FOR AN OUTDOOR TEMPERATURE LOCKOUT, AND SHOWS "AUXILIARY HEAT ON" IN THE SCREEN, THEN IT IS LOCKING OUT THE OUTDOOR UNIT AND RUNNING THE AUXILIARY HEAT.
24 VOLTS INDICATES ERM IS SENDING VOLTAGE TO THE COMPRESSOR WIRES. DOUBLE-CHECK WIRE CONNECTIONS. SEE DIAGRAM (FIGURE 11).
ERM IS NOT LINKED TO THE THERMOSTAT. SEE PAGES 14-17 FOR ASSISTANCE LINKING.
MEASURE VOLTAGE FROM R TO C ON ERM. (METER TEST)
24 VOLTS
0 VOLTS
0 VOLTS INDICATES NO VOLTAGE TO POWER ERM. IT IS VERY ADD THAT THERE ARE LEDS LIT ON ERM IF THERE IS NO VOLTAGE. DOUBLE-CHECK VOLTAGE METER.
ERM LOST COMMUNICATION TO THERMOSTAT. CHECK THERMOSTAT DISPLAY. IF POWER HAD BEEN LOST, WAIT AT LEAST 6 MINUTES AFTER POWER IS RESTORED FOR LINK TO REESTABLISH. IF LED ON ERM REMAINS RED, PRESS/HOLD BUTTON ON ERM FOR OVER 10 SECONDS. LED SHOULD GO OUT, COME ON RED, THEN GO OUT AGAIN. THEN SEE PAGE 16 FOR ASSISTANCE RE-LINKING.
WHEN THE COMPRESSOR LED AND Y LED ARE BOTH SOLID GREEN WE WOULD EXPECT VOLTAGE FROM Y TO C. REPLACE ERM. IF YOU HAVE MORE THAN ONE FAILURE OF THIS TYPE, PLEASE CALL THE SUPPORT LINE FROM THE SITE FOR FURTHER TROUBLESHOOTING AT 800-468-1502 BETWEEN 8-4:30 CST M-F.
IF THE ISSUE IS NOT RESOLVED, PLEASE CALL THE SUPPORT LINE FROM THE SITE FOR FURTHER TROUBLESHOOTING AT 800-468-1502 BETWEEN 8-4:30 CST M-F.
M36132

Fig. 20.

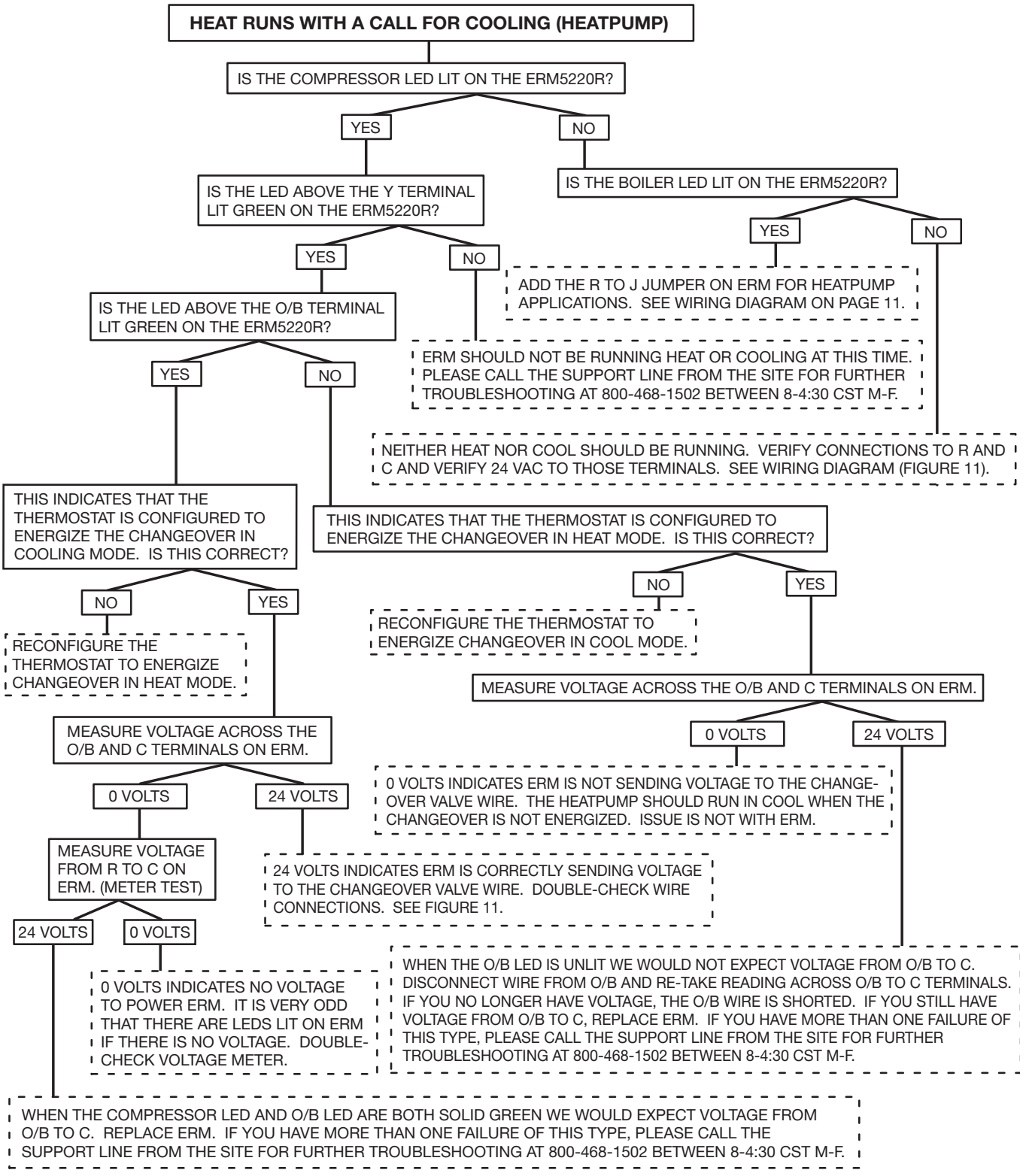

HEAT RUNS WITH A CALL FOR COOLING (HEATPUMP)
IS THE COMPRESSOR LED LIT ON THE ERM5220R?
YES
NO
IS THE LED ABOVE THE Y TERMINAL LIT GREEN ON THE ERM5220R?
IS THE BOILER LED LIT ON THE ERM5220R?
YES
NO
YES
NO
ADD THE R TO J JUMPER ON ERM FOR HEATPUMP APPLICATIONS. SEE WIRING DIAGRAM ON PAGE 11.
IS THE LED ABOVE THE O/B TERMINAL LIT GREEN ON THE ERM5220R?
ERM SHOULD NOT BE RUNNING HEAT OR COOLING AT THIS TIME. PLEASE CALL THE SUPPORT LINE FROM THE SITE FOR FURTHER TROUBLESHOOTING AT 800-468-1502 BETWEEN 8-4:30 CST M-F.
YES
NO
NEITHER HEAT NOR COOL SHOULD BE RUNNING. VERIFY CONNECTIONS TO R AND C AND VERIFY 24 VAC TO THOSE TERMINALS. SEE WIRING DIAGRAM (FIGURE 11).
THIS INDICATES THAT THE THERMOSTAT IS CONFIGURED TO ENERGIZE THE CHANGEOVER IN COOLING MODE. IS THIS CORRECT?
THIS INDICATES THAT THE THERMOSTAT IS CONFIGURED TO ENERGIZE THE CHANGEOVER IN HEAT MODE. IS THIS CORRECT?
NO
YES
NO
YES
RECONFIGURE THE THERMOSTAT TO ENERGIZE CHANGEOVER IN HEAT MODE.
RECONFIGURE THE THERMOSTAT TO ENERGIZE CHANGEOVER IN COOL MODE.
MEASURE VOLTAGE ACROSS THE O/B AND C TERMINALS ON ERM.
0 VOLTS
24 VOLTS
MEASURE VOLTAGE ACROSS THE O/B AND C TERMINALS ON ERM.
0 VOLTS
24 VOLTS
0 VOLTS INDICATES ERM IS NOT SENDING VOLTAGE TO THE CHANGE-OVER VALVE WIRE. THE HEATPUMP SHOULD RUN IN COOL WHEN THE CHANGEOVER IS NOT ENERGIZED. ISSUE IS NOT WITH ERM.
MEASURE VOLTAGE FROM R TO C ON ERM. (METER TEST)
24 VOLTS INDICATES ERM IS CORRECTLY SENDING VOLTAGE TO THE CHANGEOVER VALVE WIRE. DOUBLE-CHECK WIRE CONNECTIONS. SEE FIGURE 11.
24 VOLTS
0 VOLTS
0 VOLTS INDICATES NO VOLTAGE TO POWER ERM. IT IS VERY ODD THAT THERE ARE LEDS LIT ON ERM IF THERE IS NO VOLTAGE. DOUBLE-CHECK VOLTAGE METER.
WHEN THE O/B LED IS UNLIT WE WOULD NOT EXPECT VOLTAGE FROM O/B TO C. DISCONNECT WIRE FROM O/B AND RE-TAKE READING ACROSS O/B TO C TERMINALS. IF YOU NO LONGER HAVE VOLTAGE, THE O/B WIRE IS SHORTED. IF YOU STILL HAVE VOLTAGE FROM O/B TO C, REPLACE ERM. IF YOU HAVE MORE THAN ONE FAILURE OF THIS TYPE, PLEASE CALL THE SUPPORT LINE FROM THE SITE FOR FURTHER TROUBLESHOOTING AT 800-468-1502 BETWEEN 8-4:30 CST M-F.
WHEN THE COMPRESSOR LED AND O/B LED ARE BOTH SOLID GREEN WE WOULD EXPECT VOLTAGE FROM O/B TO C. REPLACE ERM. IF YOU HAVE MORE THAN ONE FAILURE OF THIS TYPE, PLEASE CALL THE SUPPORT LINE FROM THE SITE FOR FURTHER TROUBLESHOOTING AT 800-468-1502 BETWEEN 8-4:30 CST M-F.
IF THE ISSUE IS NOT RESOLVED, PLEASE CALL THE SUPPORT LINE FROM THE SITE FOR FURTHER TROUBLESHOOTING AT 800-468-1502 BETWEEN 8-4:30 CST M-F.
M36133

Fig. 21.

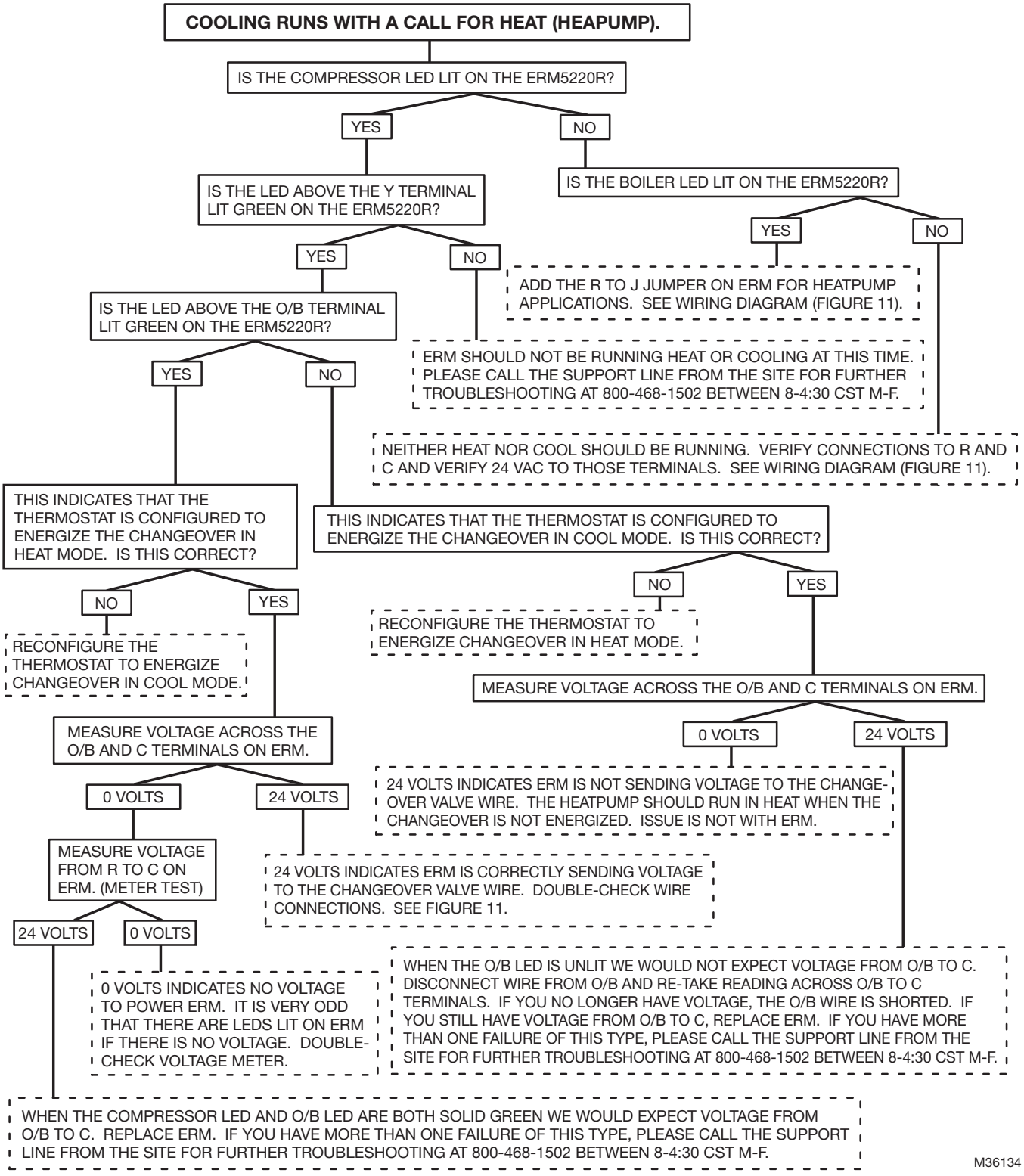

COOLING RUNS WITH A CALL FOR HEAT (HEAPUMP).
IS THE COMPRESSOR LED LIT ON THE ERM5220R?
YES
NO
IS THE LED ABOVE THE Y TERMINAL LIT GREEN ON THE ERM5220R?
IS THE BOILER LED LIT ON THE ERM5220R?
YES
NO
YES
NO
ADD THE R TO J JUMPER ON ERM FOR HEATPUMP APPLICATIONS. SEE WIRING DIAGRAM (FIGURE 11).
IS THE LED ABOVE THE O/B TERMINAL LIT GREEN ON THE ERM5220R?
ERM SHOULD NOT BE RUNNING HEAT OR COOLING AT THIS TIME. PLEASE CALL THE SUPPORT LINE FROM THE SITE FOR FURTHER TROUBLESHOOTING AT 800-468-1502 BETWEEN 8-4:30 CST M-F.
YES
NO
NEITHER HEAT NOR COOL SHOULD BE RUNNING. VERIFY CONNECTIONS TO R AND C AND VERIFY 24 VAC TO THOSE TERMINALS. SEE WIRING DIAGRAM (FIGURE 11).
THIS INDICATES THAT THE THERMOSTAT IS CONFIGURED TO ENERGIZE THE CHANGEOVER IN HEAT MODE. IS THIS CORRECT?
THIS INDICATES THAT THE THERMOSTAT IS CONFIGURED TO ENERGIZE THE CHANGEOVER IN COOL MODE. IS THIS CORRECT?
NO
YES
NO
YES
RECONFIGURE THE THERMOSTAT TO ENERGIZE CHANGEOVER IN COOL MODE.
RECONFIGURE THE THERMOSTAT TO ENERGIZE CHANGEOVER IN HEAT MODE.
MEASURE VOLTAGE ACROSS THE O/B AND C TERMINALS ON ERM.
MEASURE VOLTAGE ACROSS THE O/B AND C TERMINALS ON ERM.
0 VOLTS
24 VOLTS
0 VOLTS
24 VOLTS
24 VOLTS INDICATES ERM IS NOT SENDING VOLTAGE TO THE CHANGE-OVER VALVE WIRE. THE HEATPUMP SHOULD RUN IN HEAT WHEN THE CHANGEOVER IS NOT ENERGIZED. ISSUE IS NOT WITH ERM.
MEASURE VOLTAGE FROM R TO C ON ERM. (METER TEST)
24 VOLTS INDICATES ERM IS CORRECTLY SENDING VOLTAGE TO THE CHANGEOVER VALVE WIRE. DOUBLE-CHECK WIRE CONNECTIONS. SEE FIGURE 11.
24 VOLTS
0 VOLTS
0 VOLTS INDICATES NO VOLTAGE TO POWER ERM. IT IS VERY ODD THAT THERE ARE LEDS LIT ON ERM IF THERE IS NO VOLTAGE. DOUBLE-CHECK VOLTAGE METER.
WHEN THE O/B LED IS UNLIT WE WOULD NOT EXPECT VOLTAGE FROM O/B TO C. DISCONNECT WIRE FROM O/B AND RE-TAKE READING ACROSS O/B TO C TERMINALS. IF YOU NO LONGER HAVE VOLTAGE, THE O/B WIRE IS SHORTED. IF YOU STILL HAVE VOLTAGE FROM O/B TO C, REPLACE ERM. IF YOU HAVE MORE THAN ONE FAILURE OF THIS TYPE, PLEASE CALL THE SUPPORT LINE FROM THE SITE FOR FURTHER TROUBLESHOOTING AT 800-468-1502 BETWEEN 8-4:30 CST M-F.
WHEN THE COMPRESSOR LED AND O/B LED ARE BOTH SOLID GREEN WE WOULD EXPECT VOLTAGE FROM O/B TO C. REPLACE ERM. IF YOU HAVE MORE THAN ONE FAILURE OF THIS TYPE, PLEASE CALL THE SUPPORT LINE FROM THE SITE FOR FURTHER TROUBLESHOOTING AT 800-468-1502 BETWEEN 8-4:30 CST M-F.
M36134

Fig. 22.

FREQUENTLY ASKED QUESTIONS

#1 **Q:** Do I need an EIM (equipment Interface module) when using an ERM (Equipment remote module)?

A: It depends-
- If you are using a Prestige IAQ with ERM, the EIM is always required. For a heat-only application, use the EIM only (no ERM).
- If using one of the 8000 RedLINK models (TH8110R, TH8320R, TH8321R) with a boiler for heat only, you can use an ERM and do not need an EIM. (Thermostat needs 24 volts at Rc and C when EIM is not used).
- If using one of the 8000 RedLINK models (TH8110R, TH8320R, TH8321R) for outdoor unit AND you have wires from air-handler to thermostat subbase you do not need an EIM. (Thermostat needs 24 volts at Rc and C when EIM is not used)
- If you need to be wireless to outdoor unit AND indoor unit you need an EIM.

#2 **Q:** How many ERMs can I link to a single thermostat?

A: up to 2 ERMs can be linked per compatible thermostat. One for boiler and one for outdoor unit.

#3 **Q:** Can I link more than one thermostat to the same ERM?

A: No.

#4 **Q:** How do I verify compatibility?

A: See page 3.

#5 **Q:** What happens if communication is lost between ERM and thermostat?

A: If there is still power at the thermostat and it has not been removed from the wall, the thermostat will indicate that signal was lost.
- If controlling a boiler with ERM and there is an indoor sensor wired to ERM, 30 minutes after communication is lost "Freeze control" is enabled, the ERM controls to 55 from the sensor reading.
- If controlling a boiler with ERM and there is not a sensor linked to ERM the boiler will not run, regardless of temperature until communication is restored.
- If controlling an outdoor unit the outdoor unit will not run until communication is restored.

#6 **Q:** Do I need to wire a sensor to the S1 terminals on ERM?

A: No. If you do not use the indoor sensor when controlling a boiler, you would not have the "Freeze control" (described in answer 5). If you do not use a wired sensor for the outdoor unit, the thermostat will not display outdoor temperature unless the wireless outdoor sensor is used instead. Sensor are listed in Table 3 on page 3.

#7 **Q:** Are the terminals on the thermostat subbase or EIM (equipment Interface module) also energized when using the ERM?

A: Yes.
- If linked to EIM and ERM, (and ERM set for boiler) they both get energized with a call for heat. So we close from Rh to W at EIM and we close from T to T at ERM.
- When ERM is used for outdoor unit (ERM closes from R to Y and EIM closes from Rc to Y and G).
- With the TH8110R, TH8320R, or TH8321R series stat, if there is no EIM used, subbase of the stat closes the switches in addition to ERM.
- EIM is *always* required with PIAQ (THX9421R) even when used with ERM to boiler for heat only. So an ERM would not make sense for those applications. Use EIM instead.

#8 **Q:** Can I use the ERM with a forced air zone panel?

A: No. The ERM is designed to link to a single thermostat (or thermostat + EIM). It cannot link to a zone panel. Do not attempt a work-around (such as linking a separate ERM to each thermostat and wiring them in parallel). If this were done we would have one or more of the following issues:
- We eliminate the purge delay on the panel. This is a minimum off time at the end of each cool cycle before it attempts to run cooling again. If each thermostat is by-passing the zone panel and directly controlling outdoor unit we could cycle off from one zone, and then 5 seconds later a different zone could call for cooling.
- The zone panel has logic to prevent heat and cooling from running at the same time. If each thermostat is by-passing the zone panel and directly controlling outdoor unit we could be running the heat and AC at the same time.
- For heat-pump operation, when configured for cool changeover, the ERM keeps the O/B changeover energized continually after the cooling call until it sees a heat call. When configured for heat changeover, the ERM keeps the O/B changeover energized continually after the heat call until it sees a cooling call. So there could be a thermostat trying to call for heat, but the cool changeover is being energized by a different ERM or vise-versa.

C7089U1006 WIRED OUTDOOR SENSOR

Resistance scale

(Used with C7089U outdoor sensor and C7189U indoor sensor)

Table 4. Sensor Resistance at Outdoor Temperature.

Outdoor Temperature		Ohms of Resistance
°F	°C	
-40	-40	195652
-38.2	-39	184917
-36.4	-38	174845
-34.6	-37	165391
-32.8	-36	156512
-31	-35	148171
-29.2	-34	140330
-27.4	-33	132957
-25.6	-32	126021
-23.8	-31	119493
-22	-30	113347
-20	-28.9	106926
-18	-27.8	100923
-16	-26.7	95310
-14	-25.6	90058
-12	-24.4	85124
-10	-23.3	80485
-8	-22.2	76137
-6	-21.1	72060
-4	-20.0	68237
-2	-18.9	64631
0	-17.8	61246
2	-16.7	58066
4	-15.6	55077
6	-14.4	53358
8	-13.3	49598
10	-12.2	47092
12	-11.1	44732
14	-10.0	42506
16	-8.9	40394
18	-7.8	38400
20	-6.7	36519
22	-5.6	34743
24	-4.4	33063
26	-3.3	31475
28	-2.2	29975
30	-1.1	28558
32	0.0	27219
34	1.1	25949
36	2.2	24749

Table 4. Sensor Resistance at Outdoor Temperature.

Outdoor Temperature		Ohms of Resistance
°F	°C	
38	3.3	23613
40	4.4	22537
42	5.6	21516
44	6.7	20546
46	7.8	19626
48	8.9	18754
50	10.0	17926
52	11.1	17136
54	12.2	16387
56	13.3	15675
58	14.4	14999
60	15.6	14356
62	16.7	13743
64	17.8	13161
66	18.9	12607
68	20.0	12081
70	21.1	11578
72	22.2	11100
74	23.3	10644
76	24.4	10210
78	25.6	9795
80	26.7	9398
82	27.8	9020
84	28.9	8659
86	30.0	8315
88	31.1	7986
90	32.2	7672
92	33.3	7372
94	34.4	7086
96	35.6	6813
98	36.7	6551
100	37.8	6301
102	38.9	6062
104	40.0	5834
106	41.1	5614
108	42.2	5404
110	43.3	5203
112	44.4	5010
114	45.6	4826
116	46.7	4649
118	47.8	4479
120	48.9	4317
122	50	4160
123.8	51	4026
125.6	52	3896
127.4	53	3771

⚠ CAUTION

Electrical Interference (Noise) Hazard.
Can cause erratic system operation.Keep wiring at least one foot away from large inductive loads such as motors, line starters, lighting ballasts and large power distribution panels.

Use shielded cable to reduce interference when rerouting is not possible.

IMPORTANT

Erratic temperature readings from a sensor can occur as a result of any of the wiring practices described below. Avoid these practices to assure correct operation. Use shielded cable to reduce interference if rerouting of sensor wiring is not possible.

- *Be sure wires have a cable separate from the thermostat cable.*
- *Do not route temperature sensor wiring with building power wiring, next to control contactors or near light dimming circuits, electric motors or welding equipment.*
- *Avoid poor wiring connections.*
- *Avoid intermittent or missing building earth ground.*

Wiring the C7089U outdoor sensor

In most cases, shielded cable is not required and 18 gauge copper wire can be used. Wire the sensor to the two S1 terminals on the ERM5220R.

NOTE: Never wire the same sensor in parallel to two devices. If there are two units with separate ERM5220R modules, each would need a separate sensor.

Location and Mounting

Mount the sensor where:

- People cannot tamper with settings.
- There is good air circulation.
- It can measure true outdoor ambient temperature.
- The surface is flat.
- The wire distance between C7089 and thermostat is less than 200 feet.

Do not mount the sensor:

- In direct sunlight.
- Where hot or cold air blows on the sensor.
- Discharge line from an outdoor compressor unit, vent or fan causes inaccurate temperature readings.
- Where snow, ice or debris can cover it.

Use the following steps to mount the sensor:

1. Remove the sensor from the mounting clip.
2. Mark the area on the location selected for mounting the sensor mounting clip.
3. Mount the clip.

5 YEAR WARRANTY

Resideo warrants this product to be free from defects in workmanship or materials, under normal use and service, for a period of five (5) years from the date of first purchase by the original purchaser. If at any time during the warranty period the product is determined to be defective due to workmanship or materials, Resideo shall repair or replace it (at Resideo's option).

If the product is defective,
(i) return it, with a bill of sale or other dated proof of purchase, to the place from which you purchased it; or
(ii) call Resideo Customer Care at 1-800-468-1502. Customer Care will make the determination whether the product should be returned to the following address: Resideo Return Goods, 1985 Douglas Dr. N., Golden Valley, MN 55422, or whether a replacement product can be sent to you.

This warranty does not cover removal or reinstallation costs. This warranty shall not apply if it is shown by Resideo that the defect was caused by damage which occurred while the product was in the possession of a consumer.

Resideo's sole responsibility shall be to repair or replace the product within the terms stated above. RESIDEO SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE OF ANY KIND, INCLUDING ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING, DIRECTLY OR INDIRECTLY, FROM ANY BREACH OF ANY WARRANTY, EXPRESS OR IMPLIED, OR ANY OTHER FAILURE OF THIS PRODUCT.

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1985 Douglas Drive North, Golden Valley, MN 55422
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