



It's time to get comfortable.

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ST-041-10

TO: All York Branch Service Managers
All York Distribution Service Managers
All Regional Managers

SUBJECT: Basic Electrical Checks Required For Proper Furnace Operation

PRODUCT: YP9C, YM9M, YP8C, YPLC, YM8M, YMLM, TM9M-12, TM9V, TM9T, TM9X, TM8V, TMLV, TM8T, TMLT, TM8X, TMLX, TG9S, TG8S, TGLS, GY8S-E and all other furnaces.

Multiple field reports of erratic operation and/or nuisance fault codes have been reported. Most of these are related to compromised electrical service and/or inadequate earth grounding. Please use this letter as a tool on every start up and when troubleshooting.

Dedicated Circuit

All furnaces must be on a dedicated circuit. No appliances, lights, or other devices are to be connected to the furnace Hot, Neutral or Ground wires from the breaker panel. Reports of a shared circuit can cause a backfeed, resulting in nuisance fault codes.

A test to determine if other electrical devices are on the same circuit as the furnace is to turn off the furnace breaker. What else went off? Energizing the furnace from a different source, such as an outlet, works as well, this requires a properly sized extension cord, adapter and is for test proposes only. Caution: Do Not Leave Furnace In This Potentially Unsafe Condition.

Correct Polarity and Proper Grounding

Always use properly sized three conductor electrical services to the furnace. Polarity as well as the integrity of Neutral and Ground can be verified by turning off the power and disconnecting the ground wire from the cabinet. Turn the power back on and check **L1** to **Neutral** and **L1** to the loose **Ground** wire. The readings should be within 2 volts. A larger difference in measurement indicates an issue with the electrical service. A measurement from **Neutral** to the **Ground** wire this result in "0" volts. Any voltage indicates a backfeed. Measurement of **L1**, **Neutral**, and the **Ground** wire to the cabinet should also result in a voltage reading of "0".

Grounding is crucial and sometimes a unit installed with an illegal or false ground will show random fault codes. Connecting the cabinet ground to a water or gas pipe for a ground has never been legal or safe. Using the flexible conduit "BX" surrounding electrical wires as ground will sometimes fail in providing the high quality "earth ground" required, refer to Figure 1.

Incorrect Transformer Phasing - False 'Twinning Error'

Check the transformer wiring against the unit wiring diagram. Line voltage from board terminal "XFMR" should be across from the secondary "R", which goes back to the 12 pin plug, pin 3. The neutral line from board terminal "Neutrals" should be across from the secondary "C" a blue wire in pin 6. If they are reversed, a nuisance "Twinning Error" may occur even though the furnace is in a single, stand alone application. The false "Twinning Error" has also been known to be caused by poor earth grounding. Check pin 8 (ground wire) to verify it is connected securely to the cabinet. Refer to Figure 2.

In a few cases, reversing the leads on the secondary side of the transformer, backwards from the wiring diagram, has corrected the issue. If this makes no difference, move the wires back to their original position before going to next step.

Twinned Furnaces

It is necessary that twinned furnaces are connected to the same leg of the electrical service to prevent a true "Twinning Error". Unless notified otherwise, electricians typically connect the two furnace breakers on separate legs to balance service panel load. Each furnace must be on a dedicated circuit as covered in Section 1, which includes a separate **Neutral** and **Ground** wire from the electrical service center.

Check the line voltage of the twinned furnaces to determine this. "Line" to "Neutral" on both furnaces should read 120 volts AC. A measurement from "L1" on furnace #1 and 'L1 on furnace #2 should read "0 VAC" if on the same leg. If 240 volts AC is measured, each furnace is on a separate leg, which must be corrected. Refer to separate Service Tips letter "Twinning and Staging Gas Furnaces" for details.

Structure Electrical Service

Some utilities use a remote meter reading systems (SMART METERS) which send a signal through the service lines to a device in the electrical meter to read power usage rather than sending a meter reader. This can affect numerous electrical devices, including furnaces. If the above steps have not resolved the issues check with the homeowner to see if this is the case.

You can test to determine if both 'Legs' are affected by running a properly sized extension cord from a wall socket to the furnace, check voltage between 'Line 1' of the furnace and the 'Hot' of the cord.

- If the reading is 0 VAC this would indicate the cord was on the same 'Leg' and you need to try another outlet. If the reading is 200+ VAC this would indicate the cord was on the other 'Leg' and



Figure 1: BX Cable Must Be Adequately Sized and Have Three Conductors

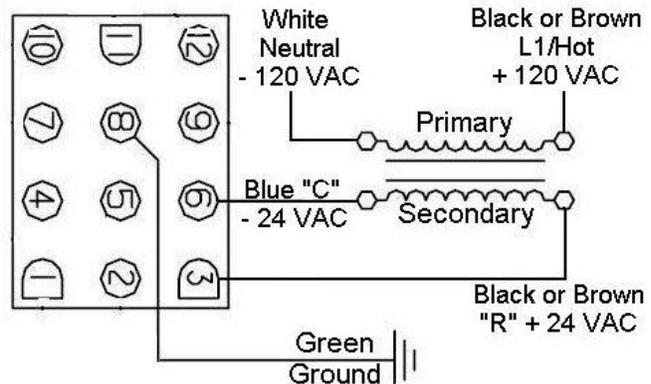


Figure 2: Board 12 Pin Connector Wiring, Basic Single Stage Furnace Shown

you can perform the test. Using a proper cord adapter, plug in the furnace into the extension cord to see if the nuisance issue goes away. If it does; have an electrician move the furnace breaker over to the other leg in the breaker panel.

Caution: Do Not Leave Furnace in This Potentially Unsafe Condition; this is for test purposes only.

If the above test does not make a difference, add 'Power Factor Choke' kit # S1-32435604000. This was developed for ECM motor protection, but has worked for this issue as well. Install the kit between the door safety switch and the control board, refer to Figure 3.

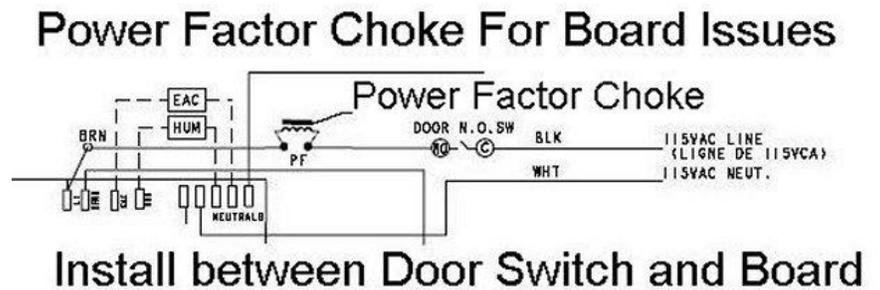


Figure 2: Install Choke between Door Switch and Board

Should the issue continue please contact the local electrical service provider and ask for their 'Power Quality' engineer.

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