

# METROPOLITAN NY CHAPTER Refrigeration Service Engineers Society

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## Troubleshooting Current Relays

One type of starting relay used on fractional-horsepower compressors is the current relay. This type of starting relay uses the initial high inrush current draw of a compressor's run winding to energize its coil and bring in its additional starting circuit.

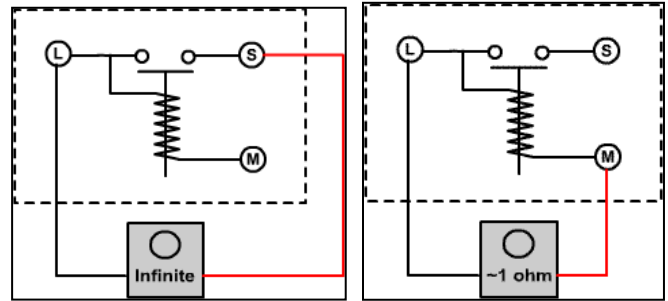
The coil of this relay is wired in series with the run winding so as the compressor starts it draws the same initial inrush current as the run winding. The contacts of this relay are normally open and are wired in series with the starting circuit. As the compressor attempts to start, the higher current draw causes the relay's coil to be sufficiently energized, closing its contacts and bring in the starting circuit. This gives the compressor the initial torque required to start. As the compressor's rotor approaches its normal operating speed, the current draw drops causing the relay's contacts to open and remove the starting circuit.

A defective current relay can cause a compressor not to start. If the relay has an open coil or its contacts are stuck open, the starting circuit will not be energized during the starting of the compressor. This will cause the compressor not to have the required starting torque. If its contacts are stuck closed, the starting components of the motor will not be removed from the circuit and the compressor will cycle off on its overload.

One popular method of troubleshooting this type of starting relay is with an ohmmeter. To use this method, disconnect the circuit's voltage source and remove the relay from the circuit. Using the ohmmeter, check its coil's resistance, it should be approximately one ohm. “L” and “M” are normally used to identify the coil's terminals on the relay. If the relay does not have an “L” or “M” terminal, use the system's wiring diagram to properly identify its coil terminals. An infinite resistance reading will indicate an open coil and the relay needing to be replaced.



Next, check the relay's contacts by holding the relay in its upright position and placing the ohmmeter leads across its contact's terminals. “M” and “S” are normally used to identify these terminals. Again, if the relay does not have an “M” or “S” terminal use the system's wiring diagram to properly identify its contact terminals. If the ohmmeter reads an infinite resistance, the contacts are open as they should be. If the meter reads no resistance or a resistance, the contacts are stuck closed. The relay will need to be replaced.



Acceptable ohm reading for a good current relay

Next try turning the relay upside down and shaking it; the contacts should close (zero resistance) and open (infinite resistance) as the relay is shaken.

The operation of a current relay can sometimes be checked using a clamp-on ammeter. An analog style meter works best for this test. If possible, clamp the ammeter around the wire leading to the starting circuit. Apply voltage to the compressor circuit while observing the ammeter. On a properly operating current relay, an amperage draw should be read momentarily then drop to zero. If there is no amperage draw or it does not drop to zero before the compressor cycles off on its overload, there is a problem with the starting of the compressor. To determine if it is the current relay, disconnect the voltage applied to the compressor circuit; remove the relay from the circuit, and using an ohmmeter check the relay's coil and contacts as described above.

Before condemning any single-phase compressor which fails to start, check its starting relay and verify it is not the cause. Replacing a compressor as the result of a defective starting relay is not good for your customer or your service reputation.

## Questions to Ponder

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>* Do Lipton Tea employees take coffee breaks?</li> <li>* What hair color do they put on the driver's licenses of bald men?</li> <li>* Can fat people go skinny-dipping?</li> <li>* Can you be a closet claustrophobic?</li> <li>* Is it possible to be totally partial?</li> <li>* If a book about failures doesn't sell, is it a success?</li> <li>* If a funeral procession is at night, do folks drive with their lights off?</li> <li>* When companies ship styrofoam, what do they pack it in?</li> <li>* If you're cross-eyed and have dyslexia, can you read all right?</li> <li>* Do cemetery workers prefer the graveyard shift?</li> <li>* Why is bra singular and panties plural?</li> <li>* Instead of talking to your plants, if you yelled at them would they still grow, only to be troubled and insecure?</li> <li>* Why do they report power outages on TV?</li> </ul> | <ul style="list-style-type: none"> <li>* If the insurance companies are going to set guidelines before approving Viagra coverage, what are they going to use? A growth chart?</li> <li>* If a light sleeper sleeps with a light on, what does a hard sleeper sleep with?</li> <li>* Why are hemorrhoids called "hemorrhoids" — instead of "asteroids"?</li> <li>* If swimming is so good for your figure, how do you explain whales?</li> <li>* Why is it that when you're driving and looking for an address, you turn down the volume on the radio?</li> <li>* You know that little indestructible black box that is used on planes, why can't they make the whole plane out of the same substance?</li> <li>* If you're in a vehicle going the speed of light, what happens when you turn on the headlights?</li> <li>* Do you need a silencer if you are going to shoot a mime?</li> </ul> |
|--|--|

### *To Achieve Your Dreams, Remember Your ABC's*

Avoid negative sources, people, places, things and habits.  
**B**elieve in yourself.  
**C**onsider things from every angle.  
**D**on't give up, and don't give in.  
**E**njoy life today; yesterday is gone, and tomorrow may never come.  
**F**amily and friends are hidden treasure. Seek them and enjoy their riches.  
**G**ive more than you planned to give.  
**H**ang onto your dreams.  
**I**gnore those who try to discourage you.  
**J**ust do it!  
**K**eep on trying. No matter how hard it seems, it will get easier.  
**L**ove yourself first and most.  
**M**ake it happen.  
**N**ever lie, cheat, or steal. Always strike a fair deal.  
**O**pen your eyes and see things as they really are.  
**P**ractice makes perfect.  
**Q**uitters never win, and winners never quit.  
**R**ead, study & learn about everything important in your life.  
**S**top procrastinating.  
**T**ake control of your own destiny.  
**U**nderstand yourself in order to better understand others.  
**V**isualize it.  
**W**ant it more than anything.  
**X**ccelerate your efforts.  
**Y**ou are a unique creation of God. Nothing can replace you.  
**Z**ero in on your target and go for it!

### *WATER, WATER EVERYWHERE*

We all know that water is important, but you may learn something new from these statistics:

- ◆ 75% of Americans are chronically dehydrated. (Likely applies to half world population.)
- ◆ In 37% of Americans, the thirst mechanism is so weak that it is often mistaken for hunger.
- ◆ Even MILD dehydration will slow down one's metabolism as much as 3%.
- ◆ One glass of water shut down midnight hunger pangs for almost 100% of dieters studied in a University of Washington study.
- ◆ Lack of water is the #1 trigger of daytime fatigue.
- ◆ Preliminary research indicates that 8-10 glasses of water a day could significantly ease back and joint pain for up to 80% of sufferers.
- ◆ A mere 2% drop in body water can trigger fuzzy short-term memory, trouble with basic math, and difficulty focusing on the computer screen or on a printed page.
- ◆ Drinking 5 glasses of water daily decreases the risk of colon cancer by 45%, plus it can slash the risk of breast cancer by 79%; and one is 50% less likely to develop bladder cancer.
- ◆ *Are you drinking the amount of water you need to every day?*

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**In the unlikely event of meeting cancellations due to weather,  
announcement will be posted on our web site**

**All Day Seminar in Late April or Early May**

**Watch for Details to Follow**

**(We're planning to cover a lot of topics—Something for everyone)**

**Wednesday February 13th, 2013  
at 7:30pm**

at

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By

Bill Gluckin—Noritz America, Inc.

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**EDUCATIONAL PROGRAM**  
**Wednesday February 13th, 2013**  
**at 7:30pm**  
**SEE DETAILS—THIS PAGE**

