METROPOLITAN NY CHAPTER
Refrigeration Service Engineers Society

Continued Education for the HVAC/R Industry

"Better Service Through Knowledge"

****

October 2013

WWW.METRONYRSES.ORG

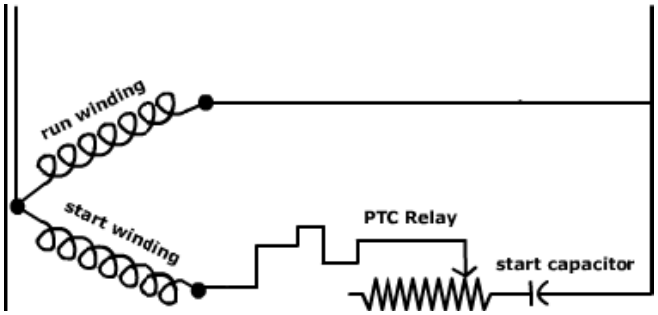
RSES® The HVACR Training Authority
Metropolitan New York Chapter

EMPIRE KEYSTONE ASSOCIATION – BETTER SERVICE THROUGH KNOWLEDGE

PTC (Solid State) Starting Relays

One type of starting relay used on fractional horsepower compressors is the PTC relay. It performs the same function as a current relay or potential relay but in a much different manner. A PTC relay uses a positive temperature coefficient (PTC) thermistor to remove the start winding and/or start capacitor from the circuit.

A PTC thermistor is basically a resistor whose resistance increases on an increase in temperature. As shown, the circuit is wired so that the PTC thermistor is wired in series with the start winding of the motor.



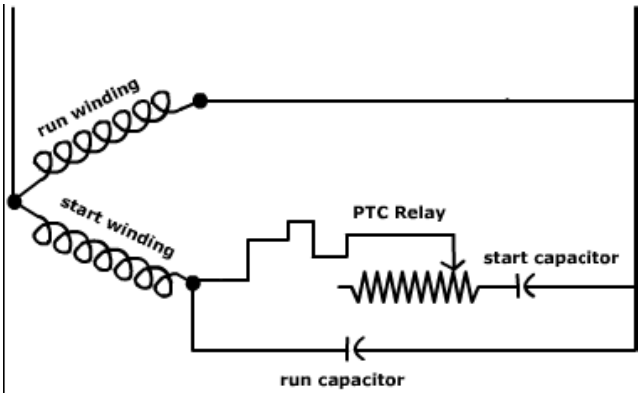
If the motor requires a start capacitor it will also be wired in series with the start winding and PTC relay.

When the motor starts, the resistance of the thermistor will initially be very low and sufficient current will flow through the PTC thermistor, the start winding and/or start capacitor to allow the motor to start normally. As the current flows through the PTC thermistor, it will quickly heat up and its resistance will quickly increase to a point where the current flow will be dramatically reduced, essentially removing the start winding and/or start capacitor from the circuit.

Another use for a PTC relay is with a permanent split capacitor (PSC) style compressor. These compressors are designed to operate with a run capacitor in the motor circuit to give them better running efficiency.

Sometimes these compressors will require the addition of a start capacitor to assist the starting of the compressor. Normally a potential relay will be used to disconnect the start capacitor from the circuit. However a PTC relay can also be used for the same purpose. There are two ways in which a PTC relay can be used to assist in starting a PSC style compressor. A PTC relay can simply be wired in parallel with a run capacitor. During starting the PTC relay causes a short across the run capacitor. This will allow full-line voltage to the start winding during start-up, giving the motor a stronger phase shift to get started. Once the thermistor warms up the short across the run capacitor is removed and the motor runs normally.

Another method is to use the PTC relay with a run & start capacitor. The PTC relay is wired in series with a start capacitor and both the PTC relay and start capacitor are wired in parallel with the run capacitor. During the starting of the motor both the start and run capacitors are in the circuit to assist in starting the motor. Once the thermistor heats up the start capacitor is essentially removed from the circuit and the motor runs with only the run capacitor.



The one disadvantage to using this type of relay is once the motor circuit is shut down, it takes about 2 to 5 minutes for it to cool down to a point that its resistance reaches a point where the motor could be started again.

If the motor tries to start before the PTC relay has cooled enough, the motor's overload protector will trip the motor circuit. Once the motor's protector has reset and thermistor cools down sufficiently, the motor should start normally.

Troubleshooting these relays is normally simple. Remove the relay from the circuit and allow it to cool to room temperature. Place an ohmmeter across the terminals of the relay. At room temperature the measured resistance should be very low. If a high resistance is measured when cooled, the relay needs to be replaced.

COMING EVENTS

A/C Line-Set Contamination & Cleaning

Ice Machines

Roof Blowers

Identifying and Sizing Fans & Blowers

Soldering & Brazing

If you have any suggestions or requests for Future programs, please let us know!

Metro NY Chapter RSES HVAC Training Courses

The Metropolitan New York Chapter RSES will offer the RSES Technical Institute Courses – 1, 2 & 3 on Tuesday & Thursday evenings, *STARTING OCTOBER 8th, 2013* in Long Island City, NY

Dates*: For 12 weeks on Tuesdays & Thursdays*

10/8 & 10/10	10/15 & 10/17	10/22
10/29 & 10/31	11/5 & 11/7	11/12 & 11/14
11/19 & 11/21	11/26	12/3 & 12/5
12/10 & 12/12	12/17 & 12/19	1/7/14 & 1/9/14

Dates Tentative – Subject to Change

Time: 6:00 PM – 10:00 PM

Location: Long Island City High School
14-30 Broadway
Long Island City, NY 11106

Cost for Course *1*, *2* or *3*:
$849.00 for RSES members
$949.00 non-RSES members (also includes 1 year membership in RSES)

Includes: Technical Institute course manual, course tuition, Certificate of Completion after passing final exam, 72 hours toward NATE Recertification, for those eligible.

Register by calling, mailing or Emailing the form below

FOR ADDITIONAL INFORMATION VISIT:
http://www.metronyrses.org
or Email: school@metronyrses.org
or Phone Stan Hollander: 718 232-6679
by Mail: Metro NY Chapter RSES
Attn: Stan Hollander, 1837 61st Street, Brooklyn, NY 11204
--Checks and Charges Welcome --
Please make checks payable to "Metro NY RSES"

TRAINING COURSE OVERVIEWS

TECHNICAL INSTITUTE COURSE *1*

This course begins with a comprehensive introduction to refrigeration and air conditioning. Topics covered include: basic physics, major system components including hermetic, semi-hermetic and open compressors, condensers, evaporators and refrigerant metering devices. It also covers the fundamental concepts of electricity and magnetism as they pertain to resistors, resistance, conductors, power supplies, circuit protection devices and transformers. Detailed information on lessons and content for Course 1 can be found at:
http://metronyrses.org/ti1.html

TECHNICAL INSTITUTE COURSE *2*

Beginning with tools-of-the-trade this course covers refrigeration system accessories, desiccants and driers, defrosting methods, refrigeration system controls and piping. It also includes instruction on compressor replacement and system evacuation, electric motors in refrigeration systems, motor capacitors and protectors, thermostats, relays, contactors and starters, test equipment and troubleshooting, pressure and enthalpy diagrams, psychrometrics, heat transfer and estimating heat loads, residential air conditioning, humidification and a review of safety codes. Detailed information on lessons and content for Course 2 can be found at:
http://metronyrses.org/ti2.html

TECHNICAL INSTITUTE COURSE *3*

Begins with comprehensive introduction to heat pump theory, including watersource heat pumps. Topics covered include computer-room environmental control, economizers, fans and blowers, air filtration and distribution evaporative condensers and cooling towers, water treatment, multiple-rack systems, hydronics, troubleshooting, controls and controls components, pneumatic relays, typical control applications, and control maintenance. Detailed information on lessons and content for Course 3 can be found at:
http://metronyrses.org/ti3.pdf

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REGISTRATION FORM

Name:_____ Company:_____
Address:_____ City: _____ State:____ Zip:_____
Email: _____ Phone: _____
Check / Credit Card Number: _____ Exp:_____
Name on Credit Card: _____
Which course are you registering for? Technical Institute Course *1*, *2* or *3*. Choose ONLY ONE _____
Are you a *current* RSES Member: If Yes, RSES Membership Number: _____

Please register early - space is limited.
Check or Credit Card Accepted for Payment
Make check to "Metro NY RSES" and mail w/ registration to: Metro NY RSES, Attn: Stan Hollander, 1837 61st Street, Brooklyn, NY 11204
To register by Email submit this form with Credit Card information to school@metronyrses.org

METROPOLITAN NEW YORK CHAPTER, RSES

For Information Call: Stan Hollander, CMS (718) 232-6679

Election of Officers

At the January meeting we will have Election of Officers and Board Members. If any member in good standing wishes to hold an office or be on the Board of Directors and/or would like to nominate another member for any of these important positions, please advise any current officer.

The Nominating committee is recommending the following slate:

Officers	Members-Board of Directors	Appointed Positions
President: Drew Garda	Herb Meyer	Educational Director: Stan Hollander, CMS
Vice President: Vacant	Stan Hollander, CMS	Newsletter Editors:
Treasurer: Steven Aiello	Rich Bruno	Stan Hollander, CMS & Herb Meyer
Secretary: Nito Mehra	Howard DaCosta	Publicity: Available
Sergeant-at-Arms: Kurt Eggert		

Wednesday October 9th, 2013
at 7:30pm

at

RICCARDO'S
21-01 24th Avenue, Astoria NY 11102

A/C Line-Set Contamination & Cleaning

(Rescheduled from Previous Meeting)

How line sets become contaminated, Compressor burn out, Refrigerant change out, R22 to R410a conversion, Equipment changes, Immiscibility of Mineral Oil and POE Oil, How to flush a line set.

by

Robert Renshaw, Rectorseal, Inc.

PLACE LABEL HERE

EDUCATIONAL PROGRAM
Wednesday October 9, 2013
at 7:30pm
SEE DETAILS — THIS PAGE

RSES
The HVACR Training Authority
Metropolitan New York Chapter
Refrigeration Service Engineers Society
241 Halsey Street
Brooklyn, NY 11216