

**H V A C S O L U T I O N S**

JUNE 2006

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**R-410A — CURSE/CURE?****Why R-410A?**

R-22 will soon be phased out for use in new equipment. Manufacturers who wish to continue producing air conditioning equipment and selling it in the U.S. and many other countries must switch to a non-chlorine containing refrigerant.

R-410A appears to be the refrigerant of choice because it contains no ozone destroying chlorine. Known as **Puron** by Carrier/Bryant, **Prozone** by Rheem/Ruud, **AZ-20** by Honeywell/Allied, **SUVA-410A**, **Earthwise** by Trane, and **Environ** by York, it is the same refrigerant. There are lots of other manufacturer names for R-410A as well.

**Can I Switch A System To R-410A?**

No. There are many considerations to take into account when using R-410A in a system. Due to the much higher operating pressures of R-410A vs R-22, a partial list includes thicker tubing in the condenser and evaporator, thicker compressor shell, different compressor, different metering device, different oil, different service instruments, etc.

**Can I Just Replace An R-22 Condensing Unit With A R-410A Condensing Unit?**

No. The existing evaporator coil, and metering device must meet the U.L. requirements for R-410A. When you find a bad compressor in a R-22 unit, you cannot simply replace the condensing unit like many contractors did in the past. You will need to replace the evaporator, metering device, and line set along with the condensing unit.

This will result in a much higher replacement cost than simply replacing the condensing unit. Because of this, more customers will opt for the compressor replacement instead of a new “system”. The new 13 SEER minimum efficiency increases the replacement cost further.

**Why Do I Need To Replace The Line set Too?**

R-22 systems contained mineral oil. R-410A systems contain polyolester oil (POE). The oils are not compatible.

Since the old R-22 system operated with mineral oil for some time, the liquid and suction lines are coated with mineral oil. You will not be able to fully remove this oil from the old line set. Line sets are cheap. If you can replace it, do so.

There are products on the market that claim the ability to rid a line set of mineral oil, however, be certain your manufacturer allows for their use — in writing.

**Are Service Techniques The Same For R-410A and R-22?**

No. You need to attend an RSES, Behler-Young, or manufacturer training seminar to get up to speed on this refrigerant.

*Continued*

777 Education and Consulting, Inc. does 60+ HVAC training seminars per year in Michigan for The Behler-Young Company.

For a complete Behler-Young training schedule, through June 2006, visit:

[www.behler-young.com](http://www.behler-young.com)

Click on “*Dealer Training*”. The July—December 2006 schedule will be available at the end of May.

Their training schedule for Jul.—Dec. 2006 will be available at their website at the end of May 2006.

## New Courses Coming To Behler-Young This Fall

- ▶ *IAQ For HVAC Professionals*
- ▶ *Electric Meter Usage For HVAC Technicians*
- ▶ *Michigan Commercial Energy Code*

- Instructor -  
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## 777

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## 3 NEW COURSES COMING TO BEHLER-YOUNG

*(Tentative dates are shown)*

### ELECTRIC METER USAGE IN HVAC/R WORK

The course will briefly explain the types of meters available including True RMS meters. You will also learn how to use a VOM and an ammeter safely, how the troubleshooting process works using the correct meter, how to check single and 3-phase motors, how to read a wiring diagram, why you should never use an ohmmeter on a circuit board with a microprocessor, how to check motor windings on a GE ECM variable speed motor, what is “good” voltage and “bad” voltage, how to check the electrical integrity of relay and contactor coils, how to multiply current thus improving the precision of your clamp on ammeter, how to check thermistors, and how to measure a flame rectified signal (microamperes). Workbook included. *8:30 a.m. - 12:00 p.m. Saturday, July 15 (GRTC); Saturday, July 22 (NHTC), 12:00 p.m. - 4:00 p.m. Wednesday, August 9 (NHTC); Thursday, August 10 (GRTC), 6:00 p.m. - 9:00 p.m. Tuesday, October 17 (GRTC); Wednesday, October 18 (NHTC), 6:00 p.m. - 9:00 p.m. Tuesday, November 28 (GRTC); Wednesday, November 29 (NHTC)*

### INDOOR AIR QUALITY (IAQ) FOR THE HVAC INDUSTRY

This course offers a comprehensive overview of indoor air quality issues. Persons who attend will gain a broad understanding of the many factors that contribute to poor IAQ. The course teaches how to identify IAQ problems and select the professionals to address remediation plans.

The IAQ For The HVAC Industry serves to help

contractors understand their role, both ethically and legally, in identifying and solving IAQ problems for their customers. The course emphasizes the roles that various professionals play as part of a team effort in maintaining healthy home and building environments. Topics will include: Air contaminants, human pathogens, IAQ related microbiology, environmental factors, controlling humidity, investigations, ventilation issues, filtration systems, ASHRAE standards, sick building syndrome, building related illness, psychometrics, legal issues with MOLD for HVAC contractors. **12:00 p.m. - 4:00 p.m. Wednesday, August 16 (GRTC); Thursday, August 24 (NHTC)**

## MICHIGAN COMMERCIAL ENERGY CODE

Mechanical inspectors in Michigan are getting training on the state adopted energy code. This course will cover the Simplified Approach to compliance for the HVAC systems in buildings of 2 stories or less and less than 25,000 square feet where simple HVAC systems are used. Many states, including Michigan, have adopted ASHRAE 90.1-1999 as their energy "CODE". The Michigan Commercial Energy Code is for all buildings, except low-rise residential buildings, and it includes apartment buildings of 4 or more stories in height. We will cover the requirements of the energy code including equipment minimum efficiencies, systems not to be used, pipe and duct insulation requirements, off hours control, when is optimum start needed, when is energy recovery necessary, how much outside air can I introduce, is reheat allowed for humidity control, and what special attention is required for exhaust systems.

The actual ASHRAE 90.1-1999 standard is NOT included – however, it is available at ASHRAE's website, [www.ashrae.org](http://www.ashrae.org). We will address the Simplified Approach to HVAC code compliance in detail. Includes a booklet and forms for compliance with the standard. **8:30 a.m. - 12:00 p.m. Tuesday, December 5 (GRTC); Wednesday, December 13 (NHTC)**

Go to [www.behler-young.com](http://www.behler-young.com) for more information.

Training Coming This Fall To RSES

## **FLAME RECTIFICATION** **HOT SURFACE & SPARK** **IGNITION SYSTEMS**

Most spark ignition and all hot surface ignition systems used on furnaces, rooftops units, and boilers use flame rectification to prove the presence or absence of flame. This is a highly mysterious concept to many HVAC/R professionals. Flame rectification replaces the thermocouple with a system which responds to flame in less than 1 second while thermocouples are allowed to react to flame/no flame in 180 seconds.

This concept will be explained in detail. RSES attendees will be able to troubleshoot these systems accurately on the first service call. Students will learn the basics of flame rectification and how to correctly measure flame signal (microamperes), which meter is required, the operation and troubleshooting of redundant gas valves, how various flame proving systems function, and troubleshooting practices.

Troubleshooting the following ignition systems will be covered: White Rodgers, Honeywell, Robertshaw, Johnson (Penn/Baso), and Fenwal. Each student will receive a troubleshooting chart covering each of the above systems. A chart containing test voltages and flame signal requirements will be provided for each of the above manufacturers. This course is **NATE** recognized for recertification credit.

Instructor: Marcus "Butch" Metoyer, Jr., CMS, CIE

**Date: October 14, 2006**

**Location: Frankenmuth MI**

For more information call Butch at 517-371-4101 or email him at [info@777educate.com](mailto:info@777educate.com)