



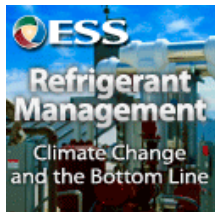
# The HVACR Training Authority

[About RSES](#) | [Membership](#) | [Training](#) | [Conference](#) | [Online Store](#) | [RSES Journal](#) | [Join RSES](#) | [Member Login](#)

Welcome Guest User

[Logout](#)  
[SAM Online](#)  
[SAM PDF Chapters](#)  
[MAL](#)  
[Welcome Page](#)

[About RSES Journal](#)  
[Frequently Asked Questions](#)  
[Subscribe](#)  
[Archives](#)  
[Advertise](#)  
[Contact Us](#)  
[MSAC Hotline](#)  
[RSES News Releases](#)  
[Calendar](#)  
[Columns](#)  
[Associations](#)  
[Media Kit](#)  
[Career Center](#)  
[Search RSES](#)



## Training Facility Finds Success by Combining “Old” and “New” School Learning

**Deep-vacuum, wet-/dry-bulb and gas-pressure readings are sometimes better learned with non-electronic, more traditional methods.**

By [John Parris Frantz](#)

The Sheet Metal Workers Union Local 265 Training Facility in Carol Stream, IL, is one of the nation’s most high-tech-equipped trade schools, but it prefers “old school” mechanical equipment when it comes to teaching students deep vacuums, wet-/dry-bulb temperatures and gas-pressure-measurement fundamentals of HVAC service.

The full five-year HVAC service apprenticeship is conducted at a state-of-the-art learning center—one of the first of its kind when founded nine years ago with over \$2 million in funding from Local 265. The school has the latest hands-on learning equipment, including six commercial rooftop units; 10 electronics training boards; a 15-ton air handler; a 15-ton hermetic chiller; VAV boxes; DDC building-automation systems; and an array of digital testing gear.

“We established the school’s service division because our contractor members were continually finding themselves in the situation of installing mechanical equipment, so why not train their service techs for installation, start-up and service?” asked Craig Krueger, Service Instructor, who handles all of the service division’s education along with Co-instructor Paul Monteith.

### Back to the basics

But even in the midst of the digital age, this 27,000-sq-ft school sometimes forgoes high tech—not because of equipment costs, but because there are still instances where old school, traditional mechanical methodology champions new equipment. “Just because something is digital or new, doesn’t necessarily mean it’s the best method,” added Krueger, who had a total of 17 years of experience with C & D Heating and Cooling, West Chicago, IL; and commercial service work with WestSide Mechanical, Naperville, IL; before joining the 61-year-old sheet metal school.

For example, the technique of evacuating refrigeration systems to a deep vacuum for the purposes of boiling off moisture has become an important part of the school’s extensive one-year-long refrigeration training program. The evacuation training is especially critical today due to the HVAC industry’s conversion to R-410A and POE oil, the latter of which has an affinity to moisture that can lead to system problems. The school teaches evacuation with both electronic and mechanical micron gauges, such as [Cliplight Manufacturing’s](#) Tigar Mic, which uses a conventional mechanical diaphragm technology instead of the thermister, thermocouple or pirani technology common in today’s digital gauges.

“Since a mechanical micron gauge dial takes you from 28.8-in. Hg on your compound gage down to the 20 micron (0) endpoint, it really features the last critical inches of vacuum where most work takes place when removing moisture,” said Krueger. “It creates an overview that’s just an all-around better concept from a student learning standpoint. This also is one of several examples of analog or mechanical technology carrying an advantage in the field too, because batteries or AC power aren’t needed. Plus, we’ve seen digital results on many brands vary day-by-day whereas analog mechanical gauge pressure readings are from a direct source (pressure) and don’t vary.”

Digital gauges use electronic sensors that respond to a drop or increase of heat transfer to give



deep-vacuum pressure readings, according to Cliplight's Director of Research Paul Appler. "Refrigeration oil accumulation on the sensor skews accuracy because it acts as insulation against the heat," Appler noted. "Mechanical pressure gauges work on the direct-acting differential pressure principal, instead."

#### Mixing old and new

Pulling and maintaining deep vacuums of 500 microns to boil off moisture in HFC/POE systems has become a critical industry issue, and is a progressive part of Krueger's teaching. Students are instructed on the school's various **Carrier Corp.** rooftops units, as well as those from other manufacturers. Krueger says some service techs today wrongly attempt deep vacuums with conventional charging gauges. These dials aren't detailed enough to indicate the critical 500-micron threshold where moisture is boiled off to achieve the ultra-critical "dry" system. Therefore, pulling a deep vacuum is just one of many progressive techniques students learn that aren't always taught at all trade schools, according to Krueger.

The training facility goes old school with other equipment too, when teaching students concepts such as the fundamentals of refrigerant charging through superheat on a fixed-metering-device system. Once again, there are digital models available for use in the marketplace. However, Krueger prefers to use a manual model by **Bacharach Inc.** that students actually sling through the air to get web-bulb readings.

"We lined up a lot of digital models and performed wet-bulb readings, but the manual model was the only one that had consistent repeatability," Krueger said.

Likewise, the school also uses a U-tube manometer by **Dwyer Instruments Inc.** for gas-pressure readings.

While old school is the school's norm for deep vacuums, wet-/dry-bulb and gas-pressure readings, Krueger admits an array of other field tests have become simplified and expedited because of cutting-edge digital technology from a host of top brands the school uses such as **UEi**, **Fieldpiece Instruments Inc.**, **Fluke Corp.** and others.

Additionally, digital technology can't be circumvented when teaching modern-day troubleshooting of DDC systems. The school is lucky to have a **Johnson Controls Inc. Metasys** system to use for installation, start-up and diagnosis. That system is interconnected to a host of other equipment such as a cooling tower from **SPX Cooling Technologies' Marley Division** and a 400,000-Btu boiler from **Burnham Hydronics**.

It's a mix of traditional measurement methodology and new technology that gives students the best of both worlds with which to analyze and service HVAC systems, according to Krueger. Proving its program rates highly, Local 265 Training Facility students won the apprenticeship service competition two of the last three years among hundreds of entrants from sheet metal locals nationwide.

John Parris Frantz is a communication specialist in the HVACR industry. For more information, e-mail [john@jpfcomm.com](mailto:john@jpfcomm.com)

**From the October 2009 issue of RSES Journal.**

---

[Home](#) | [Contact RSES](#) | [Contact Webmaster](#) | [Privacy Policy](#) | [Site Map](#) | [Search RSES](#)

© 2008 RSES - all rights reserved | Best viewed at 1024x768 screen resolution | Internet Explorer v. 7