What in the Truck Do
HVACR Techs Carry?

Preview some of the latest tools/test instruments on the road and heading to jobsites everywhere.

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With a plethora of tools and test instruments available to HVACR technicians—and an equally astounding number of ways to receive and look up information about such products—HVACR professionals can easily become inundated by the seemingly simple task of needing, finding and then purchasing a new tool. Relying on purchasing history and what has always been used is a safe and dependable way to continue selecting tools. But that could prevent technicians from obtaining some of the latest, more advanced instruments hitting the market that could potentially save time and money on the jobsite.

However, before diving right into the latest HVACR tools, considering the risk for personal injury that technicians are regularly exposed to—be it from simply opening a unit, charging a system or merely handing a customer the bill—basic safety and personal protective equipment are important components to consider.

SAFETY FIRST

Personal protective equipment, which should be priority one for any technician, often depends upon the HVACR segment a tech is in—commercial, light-commercial, industrial, residential, etc.—and the type of equipment and systems a tech works on—A/C, heating, refrigeration, ventilation, chillers, ice machines, electrical, etc. With so many considerations available, the following resources will help guide techs into the right clothing and safety gear for their jobs.

There are several websites that offer good sources for the latest in job safety. An eTool from OSHA helps technicians determine the proper PPE needed by assessing the hazards a worker will potentially face on a specific jobsite. NIOSH also has similar resources online to help techs determine what to bring with them.

Another option is *RSES' Safety for the HVACR Service Technician* handbook, which offers 165 pages of full-color guidance on: jobsite safety; PPE; fan safety; cylinder handling; soldering, brazing and welding; fire safety; material handling; and first aid.

Being safe also means being prepared for potential accidents. Several first-aid kits are on the market that are small enough to fit into the tech's service truck without taking away space for parts and equipment.
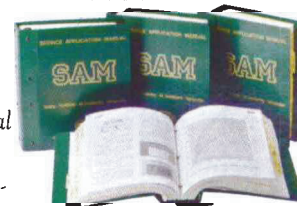
North by Honeywell offers a variety of general-purpose first-aid kits that are ANSI-compliant. The company also features an array of category-specific catalogs, filled with products related to: fall protection; lockout/tagout; hearing protection; footwear; hand protection; eye/face protection; chemical resistance protection; and more.

Klein Tools also offers PPE and safety products for a wide variety of occupational hazards—from protective glasses to head and hand protection.

A wealth of information on these subjects also is available in RSES' *Service Application Manual* chapters. In addition to personal safety and first aid essentials, several chapters are strictly devoted to

tools and test instruments. (*SAM Chapters are available free to all RSES Members. Visit www.rses.org/sam.*)

Safety should not be considered job specific, but rather a part of the basic foundation that comes with servicing equipment. Shortcutting to save time or a walk back to the truck is simply not worth the personal injury that could result.

PARADE OF TOOLS

Like safety, the tools and test instruments a technician uses often depends upon the job. In addition to the general menagerie of basic tools, technicians also require a myriad of items for troubleshooting, analyzing and repairing systems. Following is a modest list of some of the more recent take-along tools that have been introduced.

HVAC starter kit

Malco offers an HVAC deluxe starter kit that contains 27 of the most-used HVAC tools, all delivered in a soft-sided tool bag. A few of the tools included are: 5-blade pipe crimper; snap-lock punch; hand notcher and seamer; folding tool; divider; left-/right-cut/bulldog/pattern aviation snips; several screwdrivers; scratch awls; setting hammer; magnetic tape measure; hex key set; dead blow hammer; offset duct stretcher; magnetic hex chuck/nut drivers; torpedo level; and tie tool and zip-ins.

Air-flow meters

Testo offers a full range of air-flow measurement meters—from routine HVAC to complex manufacturing and cleanroom applications. The Testo 435 meter offers three different models for flow calculations of 4,000–8,000 fpm using either pitot tube, hot-wire anemometer or rotating vane, depending upon the application. A wireless temperature/humidity probe also is available for performing measurements in two locations at once.

Superheat kit

The *Robinair* 43150 superheat kit allows the technician to take a direct temperature reading through the access port, providing the most accurate and reliable way to calculate superheat. The kit connects directly to a standard ¼-in. flare access fitting and can handle temperatures of –58°F–302°F. The kit also includes a valve-core removal tool, digital thermometer, blow-molded protective case and instructions.

Inspection scope

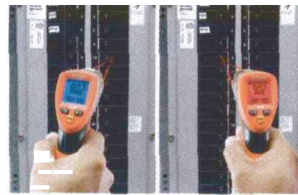*Goodway's* flexible fiber scopes can be used to inspect the interior walls of boiler, condenser and chiller tubes. Its flexible, fiber image-probe has a 55-degree field of view and a 90-degree right-angle view adapter, which enables the probe to snake through bends and around corners. Its probe and optics are waterproof, so it can be used for wet applications, and its stainless-steel construction ensures a long life. An optional still/video camera adapter can help maintain a visual inspection record. Circle 7 on the reader service card.

Fork meter

Milwaukee Electric Tool Corp.'s M12 cordless fork meter provides current and voltage measurements; voltage detection; and task lighting. The 2207-21 is a four-in-one true-RMS electrical tester equipped with a 0.63-in. jaw opening; 200 A; a voltage range to 1,000 V (ac/dc); and Lo-Z measurement, which eliminates ghost voltage. The meter comes with an M12 lithium-ion battery pack, 30-minute charger, electrical test-lead set, magnetic meter holder, an accessory pouch and carrying case. Circle 8 on the reader service card
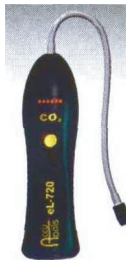
IR thermometer

The 42509 infrared thermometer from *Extech Instruments* measures temperatures up to 950°F (510°C); has dual laser pointers to identify the 12-in. convergence distance; and a 150-millisecond response time. When a temperature exceeds a custom high or low set point, an audible alarm is complemented by an illuminated display that changes from blue (normal conditions) to bright red (alarm conditions). It also has adjustable emissivity to increase the measurement accuracy for a variety of surfaces, and a MAX mode and HOLD feature. Circle 9 on the reader service card.

Refrigerant-gas leak detector

The AccuTools eL-520 fully automatic refrigerant-gas leak detector from *Core Enterprises Inc.* offers simple, one-button operation in a lightweight, ergonomic design. Two sensitivity modes and a visual and audible leak-detection signal locates large and small leaks—down to 0.1 oz/yr—in R-12, R-22, R-134a and other halogen refrigerant systems. An automatic power-off function conserves battery life. Circle 10 on the reader service card

Multi-function IAQ tester

The AMI 300 multi-functional IAQ analyzer from *E Instruments* has interchangeable measurement modules—manometer, thermo-hygrometer, IAQ, current/voltage, and thermometer—and the ability to store up to 12,000 measurement points or 50 datasets. Additional features include: customized report printing; instruments-management pool with follow-up of calibration periods; intervention planning; and a wired or wireless interface. Circle 11 on the reader service card.

Wireless temperature-monitor system

Cooper-Atkins Corp.'s TempTrak wireless temperature-monitoring system version 4.4 offers support for several Microsoft Windows operating systems. The Alert Notification Tree and Remote Pop-ups features allow for standard operating procedures to be included in e-mail and remote notifications for all transmitters. Multiple speed enhancements are available for commonly accessed pages, such as Current Sensor Readings, Sensor Attributes and QA Report pages. Circle 12 on the reader service card.

Manifold pressure gauge sets

Vision and Firefly refrigeration manifold (pressure) gauge sets from *Cliplight Manufacturing* feature a deep-well, see-through sight glass with an illuminating ambient backlight for quick and easy refrigerant/oil inspection. Conical piston manifold valves allow even-flow throttle adjustment and minimize refrigerant surges. Additional features include: steel case construction, and bronze tube and brass socket; ratchet hanger; and heavy-duty handles with calibration rings that display valve position. Gauge sets can be used with all CFC, HCFC and HFC refrigerants.

Hand-held specialty instruments

General Tools & Instruments features several specialty instruments in its Seeker series. An infrared thermometer can measure temperatures of −4°F–604°F with a distance-to-spot ratio of 8:1. The thermo-hygrometer pen measures ambient conditions at 32°F and 122°F, and relative humidity between 20% and 100%. The digital air-flow meter measures air-flow efficiency; and the moisture meter tests the moisture content of wood, concrete, plaster, drywall, flooring and other building materials. The combustible-gas detector pen can detect leaks in appliances and piping.

Temperature/humidity data logger

TP125 multi-purpose temperature/humidity data logger from *Dickson* adapts to a variety of applications via user-defined sampling rates, and offers USB-enabled triple-speed downloading and 32 kb of storage. The data logger records data in configurable 1-second to 24-hour intervals, in 1-second increments in a temperature range of −10°F–176°F and between 0%–95% RH.

Calculating shortcuts

The Formulator application series from *MultiEducator Inc.* offers hundreds of formulas, graphic calculations, federal/state regulatory codes, and industrial-code requirements into iPhone/iPod applications. The HVAC Professional Formulator includes 200 formulas—everything from Btu conversions to heating design calculations and additional formulas added over time—18 charts, and the complete International Mechanical Code. A future upgrade will add the International Energy Code. Circle 16 on the reader service card.

Air-quality measurement software

WolfSense 2010 from *GrayWolf Sensing Solutions* transforms Windows platforms into sophisticated air-quality measurement instruments. Features include: real-time display of trend graphs during data-logging; unlimited, appended audio notes (that can be translated into text for field documentation); on-board video "help" files, such as "how to perform a user calibration;" color drawing notes; and auto-start logging that initiates trend logs at a pre-assigned time and date. Circle 17 on the reader service

Multi-gas leak detector

The Trace100 from *nuvoTrace Technologies* detects R-22, R-134a, R-410A and hydrogen simply by changing the hand probe. This small, lightweight, battery-operated unit uses the more naturally occurring resource hydrogen as the tracer gas (instead of helium). A safe, non-toxic, non-flammable mixture of 5% in nitrogen can be readily obtained, and the ISO Standard 10156 has proven its safety factor. Circle 18 on the reader service card

Leak-detection kit

Spectronics Corp.'s Spectroline EZ-Ject A/C leak-detection kit contains the OPTIMAX 3000 cordless, rechargeable LED leak-detection flashlight; dye-injector assembly; hose assembly with check valve and low-loss fitting; two 0.5 oz universal/POE dye cartridges; 8-oz spray bottle of GLO-AWAY dye cleaner; ac/dc battery chargers and fluorescence-enhancing glasses; and a rugged carrying case. The flashlight—comparable to super-high-intensity 150-W lamps—has an inspection range up to 20 ft or more and a bulb life of 50,000 hours. Circle the reader service