



THE NEW TOOLBOX

Since the advent of indoor plumbing, hand tools have been the staples of the plumbing industry. Unique articles like spud wrenches, strap wrenches, basin nut wrenches and even the lowly, yet surprisingly versatile, slip-joint plier were found in every plumber's toolbox.

Now, with the evolution and proliferation of electronics in our working world, what new tools or diagnostic equipment should a contractor own and be proficient with? Here is a look at the basics.

According to David Hughes, head of the piping trades department at the Northern Alberta Institute of Technology, the trio of must have products is:

1. Digital Multi-meter
2. Digital Manometer
3. Digital Thermometer

Bill Evans, head of the piping trades department at the BC Institute of Technology, concurs. While the curriculum content varies from province to province, the use of these tools is taught at various times in plumbing apprenticeship programs, in the gas, hydronic, or HVAC modules. Teaching labs often have controls installed in "mock-ups" to provide hands-on learning opportunities.

Digital Multi-Meter

Many styles of digital multi-meters (DMM) are available to measure volt-

age, current, impedance and capacitance, with bar graph or simple digital displays. Some of these include:

- Basic pen style DMMs
- Clamp-on style DMMs
- Data logging DMMs
- Miniature palm-sized

There is an interesting training site at www.electricttraining.com which bills itself as the "virtual home of the digital multimeter" and offers on-line instruction on how to use a multi-meter.

Digital Manometer

While U-tube manometers are still an inexpensive way to measure differential gas pressures, digital manometers are now very affordable and offer faster, more accurate results.

Digital Thermometer

Digital thermometers are used in a variety of applications including the measurement of floor surface temperature variations in radiant floor heating systems; to measure Delta Ts in the supply and return distribution piping of any hydronic system; and to measure the surface temperature of flue gas vent piping.

EXTERNAL DIAGNOSTICS

Moving beyond these basic tools, what are the "big leagues" of electronic tools for our industry? These include:

Digital Flue Gas Analyzers: test residential furnaces and appliances for carbon monoxide, oxygen and stack temperature, as well as combustion efficiency, CO₂ and CO (air free) and excess air ratios.

Electroacoustic Leak Detectors: detect water leaks in concrete slabs by filtering

out background noise and focusing on a frequency range of 200-2,000 MHz, the range that would emanate from most leaks.

External Digital Flow Meters: allow for measurement in transient locations where in-line flow meters are impractical.

Infra-red Cameras: Measure heat leakage in an HVAC ducts or hydronic system piping; source leaks by determining surface temperature variations in slabs; and determine heat loss from the building envelope.

BUILT-IN DIAGNOSTICS

There is quite a range of new external diagnostic electronic equipment available in our industry. What is lacking at this point are built-in diagnostics for many common appliances and systems.

Compare a typical commercial mechanical system to a passenger automobile. An average car now has multiple computers, each capable of data capture and self-diagnosis. It is probably not very far in the future that all appliances and systems will have embedded "smart chips". These will communicate with each other over WiFi (wireless networks) to fine tune system operations and alert occupants and service technicians to problems via the internet.

■ *Mark Evans is a 20-year veteran of the plumbing and heating industry, with sales and management experience in the wholesale distribution, rep agency and manufacturing sectors of the business. Reach him by e-mail at writemarkevans@hotmail.com.*

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