

# Moving Toward the Fully Automated Technician

Smart systems deserve smart maintenance—so do the technicians who service them.

BY JAMES BOWMAN

*Images courtesy of NAVAC Inc.*

In the HVACR landscape, automation is generally associated with Building Automation Systems (BAS), the automatic centralized control of a building's heating, ventilation, air conditioning, lighting and other systems through a building management system. BAS can improve occupant comfort, make the operation of building systems more efficient, and reduce energy consumption and operating costs, as well as raise the effectiveness and lifespan of certain utilities or hardware.

In contrast, nearly everything the typical technician does on a daily basis would not be considered automated. So it seems only natural that automation's next step is extending into servicing technologically driven systems. Smart systems deserve smart maintenance. So do inundated service technicians.

## Examples of processes that can now be at least partially automated

Typically, when we think about automation, handheld tools and field processes do not come to mind. However, as technology advances, many of the same philosophies behind manufacturing and building automation controls have led to innovative field use tools yielding improved technician efficiency, streamlining service calls while reducing errors.

Traditionally, checking or adjusting refrigerant levels on an operating system has been a laborious, less-than-exact chore. Here, manual maintenance protocols require technicians to traverse varying sectors of a structure, measuring and recording temperatures and air flow, refrigerant pressures and performing calculations along the way to determine how much refrigerant is needed.

The technological answer is like a magic wand: an automated process employs probes and sensors connected to a technician's smart phone, and...voila! The information is displayed on the screen through a dashboard that dictates decision making. Entire steps are spared—and with it, valuable time saved.

Creating flares is another commonly onerous manual task



Automation opens doors for many technicians, filling jobs that can help spur HVAC company growth without sacrificing quality.

that got a big boost from technology. However, smart flare guns that resemble handheld power drills drastically reduce flaring time while also drastically increasing flaring accuracy.

System evacuation has been streamlined as well. Large-diameter hoses, valve-core tools and even smart connected micron gauges have made the evacuation process considerably faster than it used to be. However, even these helpful tools generally are not automated. To pull a vacuum properly, technicians need to discern if the entire system is tight and dry. However, due to various system and building constraints, the micron gauge generally isn't attached at the farthest (and therefore most accurate) point in the system.

Instead, the gauge is usually placed at a more convenient spot, such as the service port near the vacuum pump. As a result, the process requires frequent checking of the gauge readout. This allows the system to equalize, and then—as more time ticks by—monitors for vacuum rise.

A fully modernized approach places the micron gauge inside the pump itself. While the value of this location deserves further debate on another day, it can be stated with certainty

# smart tools

» Innovative field tools yield improved technician efficiency, which can streamline service calls and reduce errors.



that this placement helps automate the process, eliminating the step of installing a micron gauge (and whatever additional connections are needed), and ensures that a micron gauge is used each and every time a vacuum is pulled.

Of course, the process of equalization and vacuum rise tests are still required, but these are simplified, as well. Most recently, technicians are even privy to portable automatic charging stations, reminiscent of the large, wheeled, cart-based systems used in automotive shops. With just three hoses and a wireless digital scale included, technicians can evacuate, perform rise tests, weigh in the charge, and even monitor system pressures without disconnecting any hoses.

For technicians, even paperwork can now be automated, with handheld tablets and laptops, which allow techs to simply find the correct repair codes, add a few notes, swipe the credit card and finalize the service visit. Back in the office, the invoice is automatically synced with bookkeeping software, with receipts emailed to clients.

At first glance, it is understandable to assume that process automation, as it does in many industries, will lead directly to reduction of workers. On the contrary, its primary impact is changing the level of expertise needed, which, in the current HVACR climate, will mean more filled jobs. Not less.

It is simple supply and demand: In HVACR—and skilled trades in general—there is a significant shortage of qualified labor. With fewer technicians available and industry workload only increasing, there's a need not only for more efficient service calls, but also for attractive job opportunities. Considering this, smart tools make the prospect of a career in HVACR more attractive to a younger, more tech-savvy labor pool.

Automated tools also can lead to improved overall quality of work. For example, some of these processes, such as the incorporation of large hoses and core removal tools, can obviously cut hours from an evacuation job. But more importantly, the accuracy of service also is increased, because the machine is simply more precise, on average, than a human could ever hope to be.

What's more, when they use conventional tools, many techs balk at measuring airflow and humidity readings when they test refrigerant levels because the process takes so long. However, now they can get more accurate readings for an optimized charge in less time. Meanwhile, technicians can work faster with better accuracy, which permits them to take more calls in the same amount of time. There is also a decreased need for supervision, which in turn can reduce job costs.

In addition, pulling a vacuum and assuming that all technicians are taking the time to attach and monitor a micron gauge frequently leads to callbacks due to leaks or other refrigerant-related issues. Having the micron sensor integrated into the pump ensures its usage each and every evacuation, making it simpler for technicians to follow proper procedures that ensure a tight, dry system. In this instance, the reduction of warranty calls alone improves overall efficiency.

On a typical residential service call, when it comes time to pull a vacuum and charge the system, the technician has to hook up the vacuum pump and micron gage, monitor it, then disconnect and attach a refrigerant drum and manually weigh in the charge. All this busywork prevents him from accomplishing additional tasks. In contrast, with an automated charging apparatus, the tech can simply hook hoses between the machine, tank and system, program the charge, push start, and go about handling another task while the automated process handles the rest.

As our field examples show, automated tools carry the promise of increased tech efficiency, tighter job accuracy parameters, and the reduced likelihood of callbacks due to technician error or oversight. These simplifying tools also open doors to less highly trained technicians, filling jobs that can help spur HVAC company growth through increased job capacity without sacrificing quality of service.

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