

SCALABILITY FOR EFFICIENT INSTALLATION

There's a lot of preparation that goes into building a successful project and enterprise, from laying out building design schematics to devising effective business plans, and everything in between. Carefully measuring and evaluating the scalability of these factors is the essence of ensuring maximum efficiency during the installation process.



From the initial development stage, if one has an idea to build an indoor agricultural facility, and finances have been secured (either from investors or via bootstrapping), the next issue to contemplate is whether to build a new a building or retrofit an existing building. Finalizing this decision involves putting together several logistical puzzle pieces, the largest of which is the overseeing the installation.

The vast majority of people undertake this challenge from one of two very opposing approaches – they either take almost no control at all over the actual installation and hire contractors to look after it, or they set out with the mentality of doing it all themselves, acting as the site foreman.

However, when setting up a cannabis operation, aside from construction of the building itself, there are several key components within each section of the facility that can prove quite challenging. These factors include electrical elements, plumbing (the necessity for lots of water, drains, etc.), lighting, air conditioning, and other mechanical aspects.



For those not equipped with the adequate knowledge and experience, this can result in the overwhelming feeling of biting off more than one can chew, especially in attempting to utilize environmental control technology to its full potential. That's where Excel Air Systems comes in.

CHOOSING THE BEST METHOD

On our side of things, we're always looking at ways to improve those deep, challenging situations, through an easily scaled installation process, to aid those who don't consider all the factors or are unsure of what it's going to entail. There are two main design methods, both of which have their respective advantages and drawbacks.

The first is to start small and build a facility one room at a time, which is a lot more manageable, in terms of both spreading out the cost and adapting and tweaking the vision. The second is to ambitiously construct an entire full-scale facility, which is then launched with higher potential for immediate production and profitability.



In the first method, operations begin a little at a time, but progress is incremental. At this basic stage, all that's technically necessary is a grow room (though already partially-grown plants could be procured), perhaps supplemented by a mother clone room. From there comes the built-in redundancy, where the facility may initially have two systems in one room, and then, later, a dividing wall is erected. Perhaps even that room still has another 3000 square feet, which can be utilized in the second phase.

As construction expands, design modifications can be made to the facility and supplementary rooms can be added. Most fundamentally important would first be a dry room, so that harvested product can be dried and cured, potentially followed by additional grow rooms and dry rooms, veg rooms, trimming areas, and increased office space. The most challenging factor of this incremental method is that, a lot of the time, set-up costs are still very large regardless, even for small installations, because of the infrastructure (including people) required to do that.

Conversely, the second method – full installation, which most people are choosing on the grand scale – requires extensive financing and a multitude of resources. For these installations, ranging from \$5 million to \$100 million, with such a large amount of money at stake, nothing is more important than speed and accuracy.



While turning these projects into complete realities could potentially take a couple of years, the minimum production time needed is 2 to 3 months from the first day that plants are put in. Therefore, anything that brings Day 1 closer helps to commence the three-month cycle period necessary to start to recoup some of the costs.

Despite the benefits, choosing a massive installation is not required – the incremental approach is perfectly acceptable. Excel Air Systems is here to make it convenient and easy, no matter the method.

We look at scalability for efficiency of installation by utilizing basic principles. In preparing for installations, we're thoughtful to consider placement accessibility in our room designs, in order to keep them as symmetrical as possible.

RESILIENCE IN REDUNDANCY

With that in mind, we also have redundancy in all the multiple systems. For example, instead of installing one (or several) 10-ton systems, or even one 40-ton system, in a facility, we would split those needs into 8 5-ton systems. While large rooftop systems require a crane and roofing load management, our approach allows us to use much smaller equipment (due to our systems' sleek, compact nature) in any room with a very limited amount of weight distribution required.

We've known individuals who have literally used only a rope and two people on the edge of a building to hoist the units up. More commonly, many installations of our systems (especially of our air handlers) have utilized a hand-cranked drywall lift. This is a noteworthy difference as it allows one person to install an entire system on their own, which, with most HVAC systems, is simply not an option.

If, for example, someone wanted 100 systems put in all at once, as opposed to incrementally, mechanical contractors could install them approximately 2 to 4 times faster, while eliminating 90% of the potential headaches that come from repeated pressure checking, touch-ups, and running the system each time to test it. That way, if there are 3 or 4 mechanical contractors on site, they can each be installing a system at the same time, rather than traditionally, where there would be two people working together on one system for an entire day or two, then moving on to the next.

Keeping each room fairly identical also proves extremely beneficial to making up time in the installation process, as the layout is just a replica of a replica. If you're an installer, and rooms 1 through 10 are all very similar – if not identical – you're able to improve your speed and efficiency every time you effectively repeat the task. Whether you're installing one system or hundreds, every subsequent installation will become easier and easier the more frequently you do it.

THE GRIPES ABOUT PIPES

As for the system itself, previously, installations entailed placing the indoor air handler and outdoor condenser where you wanted them, then tediously connecting them with hard pipes.

As pipes are generally only available in 10-foot lengths, this does not offer as much adaptability.

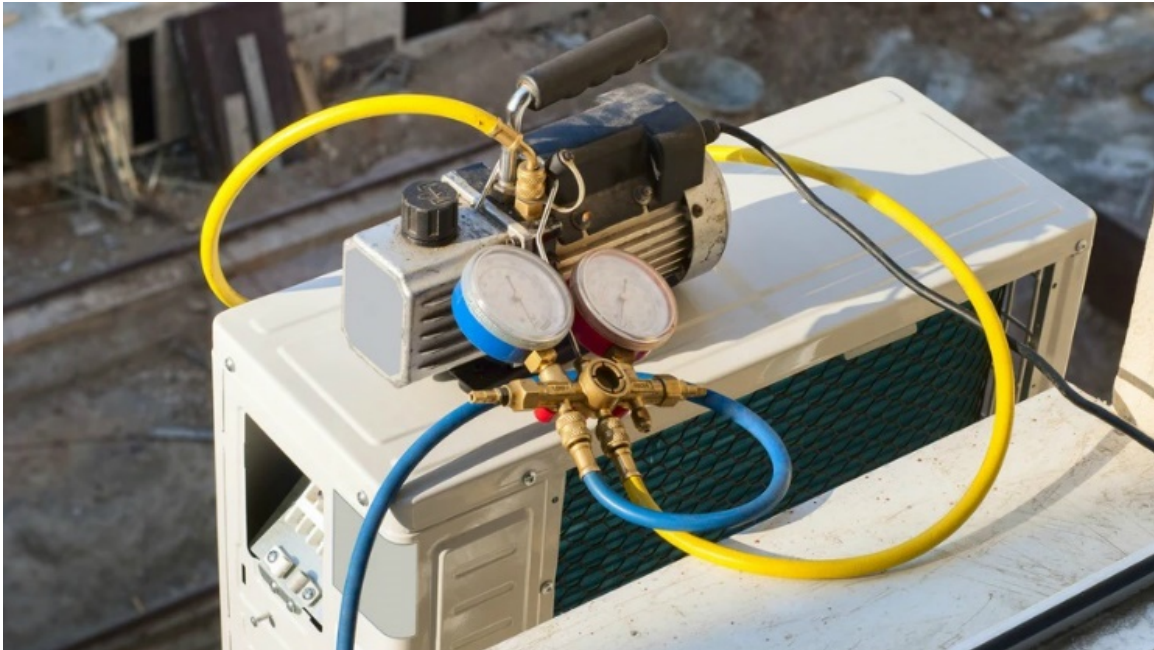
For example, connecting a 50-foot run would require a minimum of five lengths of pipe, plus whatever 90-degree tees, elbows, and couplers were needed, all of which were then required to be brazed to the system.

Altogether, this process of doing the run, piping it, and making it look right could take several hours, if not days.



SYSTEM EVACUATION REALLY SUCKS

After completing that, the system would then still have to be evacuated, to ensure the total absence of any moisture or non-condensable matter in the piping. Otherwise, if even the smallest amount of water – or a piece of lint or shard of metal that wasn't caught by the inline filter – were to reach the hermetically-sealed compressor, with the tolerances being so tight, it would attempt to grind it or push it back, breaking it.



Furthermore, the technician carrying out the installation is often someone who is still learning, and may not be the most skilled or experienced, with the more knowledgeable supervisor only briefly surveying it afterwards to verify it. Not having the adequate skill set in such a time-consuming, high-risk scenario could prove catastrophic.

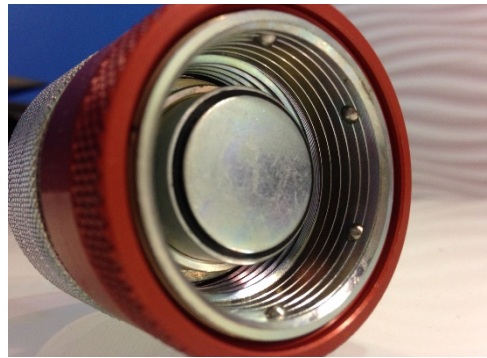
Excel Air Systems reduces the duration of the evacuation stage by increasing security and efficiency with a system that's already been test-run in our facility. While many installers use a vacuum pump and check the brazes for leaks, which can take several hours, we do a pressure check, bumping the pressure and observing it for 15 to 30 minutes to ensure that it's holding steadily without decreasing. This informs us that the first step is good, but doesn't guarantee it at a molecular level.

To test this, we then bring it into a vacuum state, completely voiding it of any air. As even the most microscopic leaks would render a vacuum state impossible, we know after achieving this that the closed-loop system is 100% leak-free. With this assurance, the system is then charged with the exact amount of refrigerant in our controlled environment, because we know it's much more difficult and challenging to do this on site. Only after this process, as the charge can now be accurately weighed and the system can be started, do we ship the system to our customers.

A VERY FITTING CONNECTION

Once the shipment has been received, making the connection is easily done by hand with our second-generation [Plug & Play Fittings](#). When integrated with our [Flexible Linesets](#), these resealable fittings are a total game-changer in contrast to traditional components.

Whereas first-generation fittings required two wrenches (one on each end) to tighten and seal, second-generation fittings require no tools due to their unique design.



Featuring a ball bearing that pops into a track after only about 3 or 4 turns to signify the connection, the fittings can also be disconnected and reconnected in this manner without any loss of charge.

FLEX WITHOUT BEING BRAZEN

Together with the [Plug & Play Fittings](#), pre-done [Flexible Linesets](#) remove the need for brazing. Standing out as one of Excel Air Systems' most innovative upgrades, this in-demand technology has revolutionized the ease of installation.

To put it simply, if you know how to use a garden hose, you can install one of our [Flexible Linesets](#). The lineset coils up around your arm, and you can effortlessly run it from Point A to Point B. In locations with set-ups requiring 90-degree angles, linesets bend wherever you need them to.



With the outdoor condenser and the indoor air handler in place, as long as the appropriate pre-planning measures have been taken, you're literally just connecting a hose with quick-connect fittings – the same thing inside and outside – then flipping the switch. It's really that simple, meaning there is no need for concern about how experienced the installer is.

With this technology, we've also removed the opportunity for any foreign contaminants to enter the system, because it's all been done in-house, so anything that's potentially in there would be from Excel Air Systems, not the customer's facility. That assurance greatly alleviates the stress of problems relating to air pollutants, as the system has already been tested and is closed off to any of these potential issues.

TIME IS MONEY

Most large HVAC products are installed by a third party. The larger the project, the longer it takes to complete, so these costs have to be factored in for facility owners. Even once construction has finished, everything still needs to be paid for to get through the first round, so anything that can be done to limit the amount of time is highly beneficial.

Overall, from the point of view of a mechanical contractor installer, by greatly increasing your installation speed, eliminating the tasks of brazing and evacuation testing, and mitigating the need for multiple skilled, intermediate-level technicians, Excel Air Systems saves you a huge amount of time, money, and resources throughout the entire process. Then, in the event that a part needs replacement, you can swap components much faster, thereby minimizing, if not eliminating, down time. Altogether, coupling the convenience of the physical installation with the benefits of our predesigned layouts results in a streamlined process that is highly repeatable.

The number one priority is getting the installation completed, so – as you're still going to charge the same amount per installation regardless – the faster, the better. In comparison to when working with our competitors' offerings, you will be able to save a lot of money on the installation side, which will contribute to your bottom line, and the facility owner will be pleased, as you were able to install it in a much shorter amount of time.

BIG PICTURE BENEFITS

From that perspective, we believe strongly in helping our customers facilitate innovation through the value of our products. That mentality plays a major part in what we do at Excel Air Systems. While everything appears simple, effortless, and approachable, a lot of energy and time has been invested behind the scenes to achieve that. Those components, coupled with our precise, strategic planning, make it not only so much easier, but substantially more profitable. While comprising only one aspect of a total project, the HVAC component is usually somewhere in the 15% range of time and budget for the average facility. With that in mind, our systems are quite significant, and could be the most critical part of the entire project. After all, they provide the opportunity to achieve total environmental control – the underlying determination of product quality and yield, on which the business' foundation is based.

In its essence, Excel Air Systems is mitigating the risks, reducing the setbacks, and making the process cleaner, smarter, and more sustainable, so that you can operate faster and more efficiently.

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