

Solving the 3 Biggest HVAC Challenges of Modern Day Grow Rooms

By Geoff Brown, Director of Agronomic IQ

Designing, building, and operating the ideal cannabis growing facility and getting every aspect right is no small task. Growing at scale is a new frontier for most licensed producers and it’s been referred to by many as the Wild West because of hectic pace of growth and perpetual innovation in a hyper-competitive landscape.

There are countless vendors and consultants vying for your business, but do they really have all the answers? Are they truly experts? It’s not easy to know. There are no cookie-cutter answers and new and better solutions are evolving constantly for virtually every aspect of the industry.

Creating the optimal indoor climate is a mission-critical aspect of your business that has a huge impact on your bottom line. Capital costs, installation costs, operating costs, and maintenance costs are significant, but so are the costs of reduced yield, failed crops, mold, and other environment-related issues caused by underperforming HVAC equipment.

The ROI of Smart HVAC Decisions

The following spreadsheet illustrates some of the ROI calculations to be considered when evaluating smart equipment decisions. The additional cost of superior equipment can often be recovered in the first year (the examples to the right illustrate just over a year).

Here are the 3 major challenges owners face in getting grow room HVAC right.

Challenge #1 – Understanding the HVAC Design, Specification, Selection, and Installation Process.

Typically, procurement follows a chain. The owner hires an architect, who hires an engineer, who hires a general contractor, who hires an HVAC

sub-contractor. The process is usually price-sensitive and the winning HVAC sub-contractor is hired at a fixed price to supply and install HVAC equipment that “meets the specifications” set out by the engineer. (Of note, there can be several vendors and several levels of quality that will technically meet specifications; the sub-contractor may be motivated to choose the lowest cost in order to maximize their profits).

Low Cost is Usually Very Expensive

This is one of the biggest challenges owners face in getting a premium quality solution to their HVAC needs. Lowest “first cost” is typically not the smartest money or the best way to ensure best long-term value and performance.

Solution

It’s recommended that owners have a clear understanding of the entire HVAC decision process from design to installation. Ask lots of questions, understand what the options are and why specific recommendations have been made. Get all the facts.

A well-informed owner, architect, or engineer can pre-determine the brand of HVAC

equipment they prefer or the type of HVAC design they feel strongly about. It makes no sense that the final decision should come down to the lowest cost without consideration of the bigger picture equipment value factors.

Challenge #2 – Getting the HVAC Design Parameters Right

As mentioned in the introduction, designing commercial-scale cannabis grow rooms is still a new frontier, and technologies are changing constantly. There’s also a considerable level of secrecy and competitive confidentiality relating to what works best.

Clearly, there’s a lot of pioneering work being done that is not setting industry standards. That means that even the technically qualified firms have to guess at a considerable amount of the science and mechanics behind creating optimal grow environments. Their jobs are extremely complex and involve dozens more variables than designing traditional HVAC systems for commercial buildings.

Solution

The HVAC design team and owner need to work closely to discuss and incorporate all factors that will affect temperature and humidity loads into your ideal specifications. Be certain that they have the expertise to properly model the dozens of load factors and variations that your plants and your grow cycles will require.

Model those conditions and the equipment capacities required to meet them on the most extreme design days. You may find that allowing a few degrees of latitude in temperature and humidity on those extreme days can save a lot of money and not have much impact on your yield or quality.

Inferior Low Budget Equipment					
	\$	1-Yr Impact	5-Yr Impact	10-Yr Impact	15-Yr Impact
Initial Purchase	62,500	(62,500)	-	-	-
Installation	25,625	(25,625)	-	-	-
Energy Consumption	25,465	(25,465)	(127,327)	(254,653)	(381,980)
Annual Maintenance	4,500	(4,500)	(22,500)	(45,000)	(67,500)
0% Yield / Quality Improvement	987,500	987,500	4,937,500	9,875,000	14,812,500
Repurchase	78,125	-	-	(78,125)	-
Reinstall	32,031	-	-	(32,031)	-
Net Rev Less HVAC Costs		869,410	4,787,673	9,465,191	14,363,020

Superior Equipment - Smart Money					
	\$	1-Yr Impact	5-Yr Impact	10-Yr Impact	15-Yr Impact
Initial Purchase	90,625	(90,625)	-	-	-
Installation	25,625	(25,625)	-	-	-
Energy Consumption	20,045	(20,045)	(100,225)	(200,450)	(300,676)
Annual Maintenance	-	(3,000)	(15,000)	(30,000)	(45,000)
2% Yield / Quality Improvement	-	1,007,250	5,036,250	10,072,500	15,108,750
Repurchase	-	-	-	-	-
Reinstall	-	-	-	-	-
Net Rev Less HVAC Costs	-	867,955	4,921,025	9,842,049	14,763,074
Superior Equipment Profit Increase	-	(1,455)	133,351	376,859	400,054

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Challenge #3 – Getting the Right HVAC Solution Design

There is considerable “solution bias” in the engineering community towards traditional HVAC solutions (namely, central plants) that are not necessarily suited to this unique space.

Most projects requiring a thousand or more tons of installed refrigeration capacity (roughly 80,000 to 100,000 sq. ft. of facility), use a central plant for heating and cooling. For these facilities, it would be unfathomable to use smaller unitary air conditioners.

Because a large grow room can require a similar amount of “refrigeration”, many engineers naturally want to apply the same central plant approach. And they do so because they are familiar with that approach.

Doing so forgets the unique requirements of grow rooms, where humidity is the issue. To dehumidify, you need to cool the air down significantly, which turns out to be very

inefficient when using the typical chilled water air handlers and chillers mentioned. Furthermore, in lights-out mode, you need to be able to dry the air then reheat it, so as to not over-cool the grow room. That re-heating could use free energy captured from the dehumidification process, if you have the right system. If you don’t, it’s an added energy cost.

So, with chillers, the system you end up with is inefficient, not scalable (central plants are not easily expanded), and not redundant, because there’s a single point of failure.

But a unitary, purpose-built grow room dehumidification system can cool and dehumidify very effectively, while intelligently rejecting heat out of your building when needed. You can easily size the equipment to match the room and create built-in redundancy. Expansion is easy with relatively short equipment lead times. Installation is straightforward and heat rejection even simpler

with low-risk, scalable, redundant dry coolers. Additional rooms can easily be added at will -- entirely independent of the rest of the facility.

Solution

It’s essential to have a solid understanding of your HVAC options as well as the costs, limitations, and advantages of different design scenarios. You want to also weigh the advantages of a more modular, scalable and redundant approach to HVAC control for your facility. Good vendors will be happy to have an open and honest conversation about the options available to you and which might be most suitable for any given facility. 🌱

Geoff Brown, Director of the Agronomic IQ, is a keynote speaker across North America on the issues of HVAC for grow rooms and is a contributing member to the American Society of Agricultural and Biological Engineers (ASABE) X653 guideline. To learn more, check out AgronomicIQ.com.

Rising Above

How the Storz & Bickel Volcano vaporizer is elevating the vaping experience

Vaping has become a new standard in the cannabis industry. Many cannabis users appreciate the departure from inhaling the combusted particles from lit herbs in a joint or pipe, preferring the smoother, more pleasant experience of inhaling vapor.

What’s more, a laboratory study cited in a report from the National Center for Biotechnology Information suggests that vaporizers extract more active cannabinoids with fewer carcinogenic byproducts than smoking. In other words, vaping can be a more potent and less harmful way to consume cannabis.

Many marijuana users are drawn to desktop vaporizers as their vaping device of choice. Desktop vaporizers offer higher quality and more reliable solutions for those who prefer to vape at home. For one, their consistent energy source (plugging into an electrical outlet) ensures that there are no interruptions to airflow or heat, creating more efficient herbal ingredient activation and more potent, high-quality vapor. The best vaporizers also offer increased precision when it comes to temperature and potency control, which results in a more pleasant and potent vaping experience.

When looking for a top-of-the-line vaporizer, cannabis aficionados and medical marijuana patients might consider the Volcano Classic or Volcano Digit from German manufacturer Storz & Bickel. Storz & Bickel established the first vaporizer-related patent and have since worked to perfect the forced-air system for a revolutionary vaporization experience.

This use of forced air is the key innovation in Volcano vaporizers. The convection heating system disperses air evenly amid the plant matter for a better and more consistent inhalation experience. Unlike other vaping devices, the Volcano is designed with an aluminum heating block and stainless steel chamber for consistent, pure vapor production.

The Volcano Classic model has been one of the

most popular forced-air desktop vaporizers on the market since its launch in 2000. Winner of the 2013 Cannabis Cup for “Best Product of the Year,” this product has a detachable balloon chamber, which separates the vaporization and inhalation processes. This makes for a simple and effective portable vaping experience. In fact, the portable nature of the balloon makes it the perfect companion piece for large groups of people, and the balloons can be prepared ahead of time for ultimate convenience.

For medical marijuana users, the lightweight balloon makes it extremely easy to use, even if the inhalation dose is being administered by a second party — a nurse or caretaker, for instance. The balloon is food-safe, heat-proof, odor-free and practically maintenance-free. The design makes inhalation easy and comfortable, perfect for medical or recreational use.

The Volcano Digit is another popular desktop vaporizer from Storz & Bickel. Similar to the Classic, its signature cone-shaped design houses a powerful convection heating system that enhances the benefits of dry herb without the toxins and harmful byproducts of smoking. It also features a removable balloon bag which can be completely detached and separated from the device for pure, clean-tasting, and portable vapor (best if inhaled within 15 minutes). As an upgrade to the Volcano Classic, the Volcano Digit features a digital control interface with an LED temperature reading.

Each Volcano vaporizer is manufactured in the Storz & Bickel factory with fine materials and precision craftsmanship for long-lasting quality and reliability. What’s more, the investment is protected by the Storz & Bickel warranty.

When it comes to vapor, the Volcano’s latest innovations in design and technology clearly rise above the competition. ❖

To learn more about the latest in innovative desktop vaporizing technology, visit <https://www.storz-bickel.com>.

