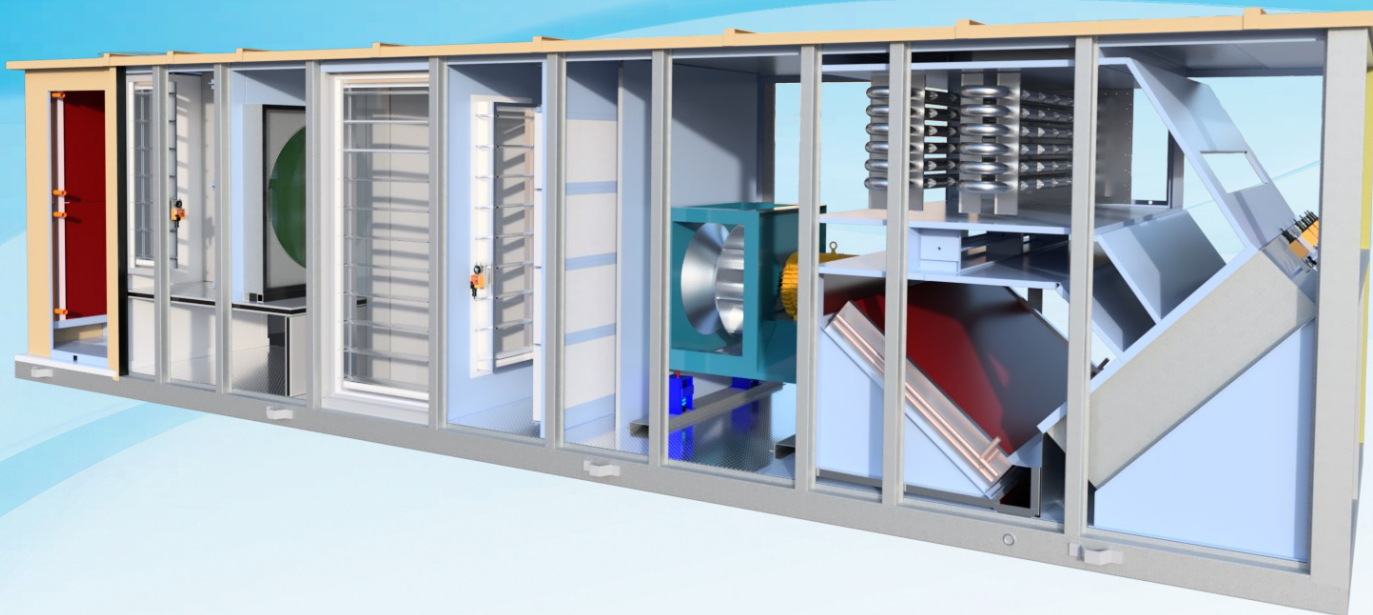




Engineering and Manufacturing
Specialty HVAC Equipment Since 1971

Three deck CV and Three Deck VAV Multizone units



OUR STORY:

Seasons • 4 has been a leader in direct replacement and new multizone units for over 30 years. We've listened to customer complaints of other systems, analyzed these systems, and over the years, we've refined, improved on, or eliminated the shortcomings that users and owners disliked. It's not like triple deck multizone units are new, they've been around for years, even before Seasons • 4 started building them, but with advances in technology, controls, and compressors....

Multizones make sense again!

For the most part, multizone units have always provided acceptable levels of comfort. The problem and the "bad rap" they received, was that they did it at the expense of increased energy consumption by mixing mechanically cooled and heated airstreams. Not so with today's triple deck multizone unit!

Whether it be a school, multi-tenant, multi-story facility, Bank, or Medical office building, Seasons 4 delivers the best balance of all attributes when evaluating building HVAC equipment. Building owners and Property managers fight a constant battle to keep their occupants comfortable while reducing energy costs, maintenance costs, cost of ownership and reliability.



Seasons • 4 recognizes building owners have limited budgets and that they're getting smaller every year. Owners employ people who wear several "hats" from maintenance to janitorial services to IT specialists. Long gone are the days that a building owner employs multiple maintenance personnel. Reducing the amount of equipment to maintain is paramount to staying within budget and our custom new and direct replacement multizone units helps you achieve this goal. The use of our Triple deck multizone units greatly reduces the amount of equipment in your building and pulls it back to the roof where, should maintenance be required, it's out of the way of building occupants. No more working on zone reheat coils and valves, zone reheat boxes, perimeter heating equipment in your tenant's space. It's all pulled back into a package with single source responsibility.

OUR VALUE PROPOSITION—Let us Set the record straight

Much of what is remembered about multizones from years past is:

- Poor cabinet construction
- Lack of staging and modulation
- Poor unit efficiency
- “Old technology”
- Lack of control



Seasons • 4 has addressed all these shortcomings and improved on many aspects of the multizone design such that our offering exceeds the features and options of many other competitors multizone units as well as VAV units.

Poor cabinet construction - Seasons • 4 has one of the best cabinets in the industry, our 2” polyurethane foam, double wall cabinet has superior thermal ratings compared to many other manufacturers, most who only offer single wall construction and fiberglass insulation.

Poor staging - Multizone units of years past had very little if any staging. Seasons • 4 standardizes on units with Digital scroll compressors to match demand to capacity. The inclusion of modulating scroll compressors has propelled our new and replacement multizone units to new part load efficiencies unrivaled by even the largest in the HVAC industry.

Our gas furnaces include greater modulating capability. Again, one of the problems with the older multizones were lack of staging that led to blending of airstreams to keep from overheating or overcooling the zone during off peak demand. Options for Electric heat, hot water, and steam heat are also available.

Our units include DDC controls from OEMCtrl, a leader in HVAC controls. Our system is an open protocol system that can communicate with other BACnet or MOD-BUS systems. Seasons • 4 also provides mounting of controls by others should you have a controls contractor you prefer to work with.

Over the years we’ve perfected our sequence of control for Three deck VAV units, tweaked and adjusted to provide optimal comfort and performance that complies with ASHRAE 90.1 and other local energy codes.

THE TRIPLE DECK ADVANTAGE

The triple deck damper Seasons • 4 uses is the foundation on which efficiency is built. It is what allows us to blend heated or cooled air with bypass air just like a vav induction box and a vav system. With any multizone it's all about the demand on the hot and cold decks. As the load varies in the spaces, it directly affects the cooling or heating required to maintain the deck temperatures.

For example, the unit is maintaining a 55°F cold deck temperature. As the spaces satisfy their conditions, the cold deck zone dampers begin to modulate closed. As a result the airflow through the cold deck is reduced and the discharge temperature begins to drop.

In the past, if you had semi-hermetic compressors with unloaders, they would begin to unload to either maintain deck temperature or suction temperature. Your unit might even have been equipped with hot gas bypass which puts a false load on the equipment to maintain a set suction pressure to a set condition. Once it gets to this point, fully unloaded all the equipment can do is cycle the compressor on and off to meet the load and the deck temperature.

Now, with digital scrolls, the compressor modulates to match demand between 30 to 100% capacity of the digital compressor capacity. On a 30 ton vav multizone unit the capacity can be reduced to almost 15% of the total compressor capacity. With variable capacity scrolls, you can modulate the capacity instead of staging, allowing you to more truly match the demand to meet the building cooling loads, reduce the cycling, and increase human comfort while avoiding temperature swings.

For the heating side, it operates with the same principals. Once a call for heating is initiated the furnaces are staged to maintain a set deck temperature. As the heating loads in the spaces satisfy, the airflow through the deck reduces, temperature goes up and the heaters stage off or modulate down to meet the demand.

Typically older multizone units were equipped with duct type furnaces with two stages of heating. Very little turndown was available. Some units were equipped with modulating furnaces that would provide roughly 4:1 turndown based on the maximum capacity of the burner. Now with furnaces capable of up to 20:1 turndown you can more truly match the demand to meet the loads, reduce the cycling and increase human comfort while avoiding temperature swings.

THE TRIPLE DECK ADVANTAGE

Advantage of a Three deck VAV unit over two deck units:

The two deck units that Seasons • 4 still manufactures offer a dramatic improvement over the equipment manufactured 10,20, 30 and yes, 40 years ago. Let it be known that;

Seasons • 4 does not manufacture the old multizone your old boss warned you about!

The two deck damper and two deck unit; While an improvement over older units, can still allow heated air to be blended with mechanically cooled air to meet space conditions, but the Three deck multizone unit and the Three deck VAV multizone unit far surpass the performance and efficiency of it's two deck cousin.

Quick example; As a space with a cooling load is satisfied the zone damper to that space begins to modulate towards a closed cold deck while at the same time modulates the hot deck towards open, mixing the two air streams. If the furnaces are active the heating demand is increased simply by increasing the airflow across the heater. During some periods of the year this increased heating load is unnoticed, but in other times the furnace must ramp to meet this increased demand and maintain deck temperature.

This is where the benefits of the triple deck begin to be noticed.

As the load on either the hot deck or cold deck diminishes and the zone damper begins to close reducing the demand on the deck, **it does not mix heated air with mechanically cooled air**, it begins to mix the heated air or cooled air with mixed air (Mixed air = % of OA for ventilation and return air).

Sequences for older units, and new units for that matter required that the once a call for heating or cooling was made that the deck temperature was maintained at a suitable heating or cooling temperature. The ability to modulate the source of heat or cooling to lower levels combined with a triple deck damper that only pulls only the minimum amount of cooled or heated air from the appropriate deck, never mixing heated and cooled air gives superior performance and comfort while reducing energy consumption.

THE TRIPLE DECK ADVANTAGE

Three deck VAV – The Gold Standard

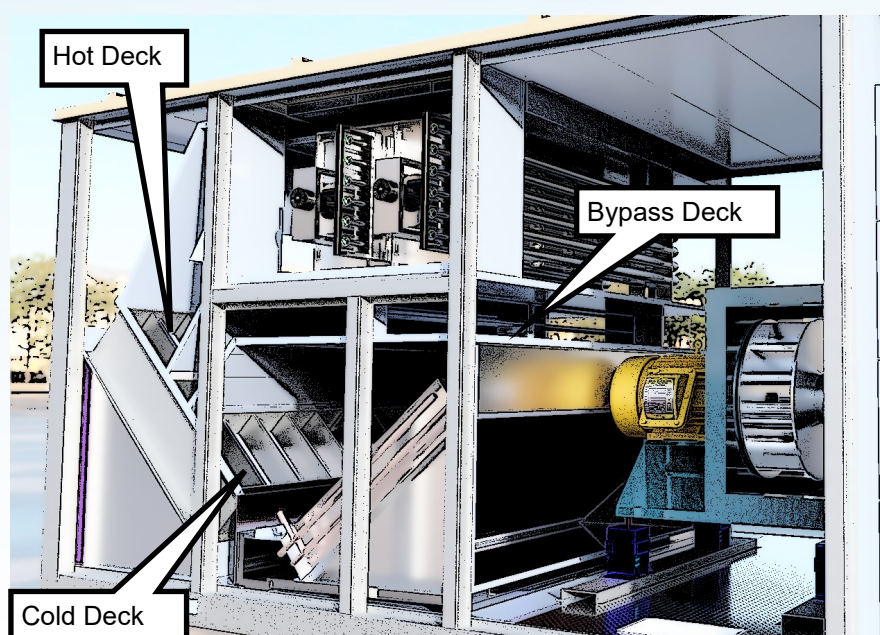
Add a Variable Speed Drive Blower (VSD) to a triple deck unit and the efficiency is increased dramatically!

The blower motor on a HVAC unit is one of the largest consumers of electricity in the whole unit and for that matter, sometimes the whole building. A Three deck VAV multizone unit is equipped with a balancing damper in the bypass deck. As a zone becomes satisfied and the zone damper begins to modulate from the hot or cold deck to the bypass deck, the pressure in the supply blower plenum begins to rise. In response to the rise in pressure, the VSD slows the blower to maintain a set static pressure in the blower plenum.

Slower fan speed equals additional energy savings. Motor energy use is a function of speed and the most commonly used motor in building HVAC systems is the induction motor. The power drawn by the typical HVAC motor varies with the cube of the motor's speed. This means that if the motor can be slowed by 25 percent of its normal operating speed, its energy use is reduced by nearly 60 percent. At a 50 percent reduction in speed, energy use is reduced by nearly 90 percent.

The foundation of this brochure has been much about the design of units and how they must be designed for peak loads even though they rarely see these loads. Although as usual, hard to quantify, it can be seen that because of the variations in demand, space loads, or zone diversity, a multizone unit spends much of its life at off peak conditions making the VFD driven blower invaluable to the user and to energy efficiency.

Only during short periods throughout the year do units operate at full capacity. Building systems are typically sized for peak load conditions and in typical applications, peak load conditions occur between 1 and 5 percent of the annual operating hours. This means that pump and fan motors are using more energy than necessary 95 to 99 percent of their operating hours.



OPTIONS

Additional areas of savings

Hot Gas Reheat:

The hot gas reheat uses the heat of rejection (heat that would normally be rejected to the outdoors) as the first stage of heat in the hot deck as free heat. If the lead compressor with hot gas reheat is operating at full capacity then approximately 25% of the total capacity is available for reheat. By rejecting this heat into the hot deck section, you reduce the required heating capacity because you've raised the air temperature by rejecting heat into the airstream.

Economizer / Demand Control Ventilation (DCV):

Free! Who doesn't like free? Our new units like our old units are equipped (if requested) with fully modulating economizer dampers. When maintained and properly controlled a good economizer sequence can dramatically reduce energy costs. Combine the use of a Carbon Dioxide (CO₂) sensor, modulating outside air dampers and you have the means for Demand Controlled Ventilation.



Much of the load on a unit these days relates to the amount of outside air required by code to satisfy ventilation rates. Newer more stringent codes require even more outside air than what you had 10 to 20 years ago. The use of a CO₂ sensor to measure and monitor levels in the return air and adjust the ventilation can dramatically reduce the energy consumption required to cool or heat the outside air.

Energy Recovery:

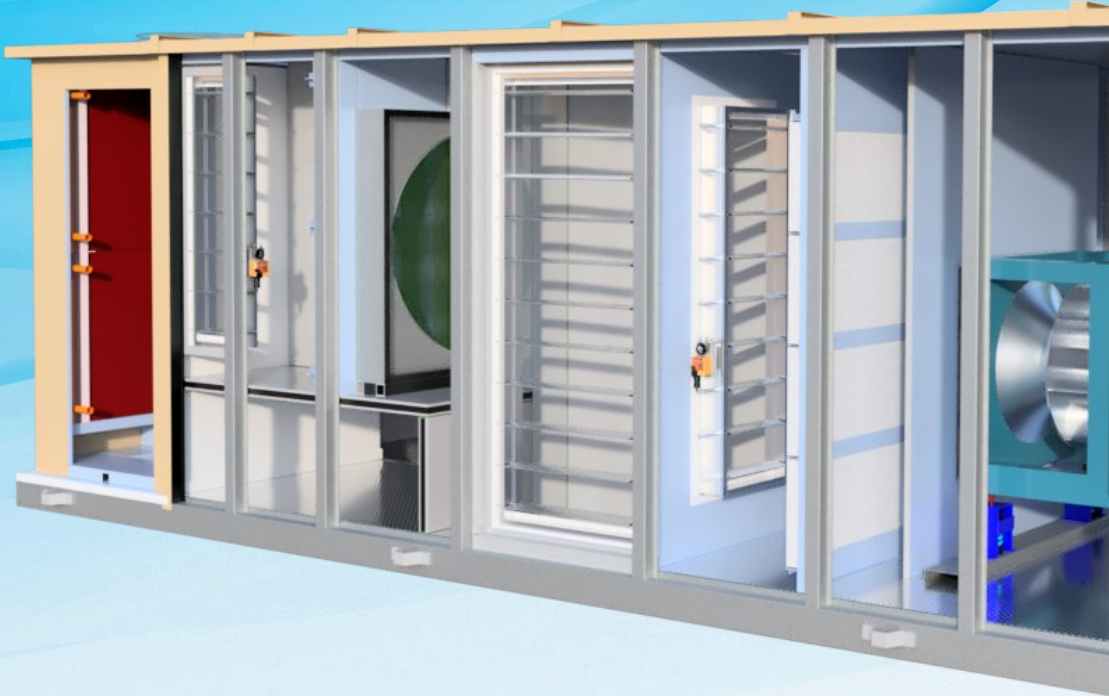
Seasons • 4 units are available with options for energy recovery if required. The addition of an energy recovery wheel or sensible plate heat exchanger can dramatically reduce the energy costs of treating increased outside air requirements.

Condenser Fan Control:

Seasons • 4's standard for head pressure control is the use of VSD driven condenser fans. The use of a VSD to control the condenser fans provides a dramatic improvement over staged condenser fans. It allows for a steady state or near steady state subcooling, and reduces thermal shock to the system while reducing energy usage during off peak conditions. Think about it, most air conditioning systems operate at ambient conditions lower than design 90% of the time, allowing for significant energy savings when the condenser fans operate at lower speeds. A secondary characteristic is that of a reduced noise signature. Slower condenser fans mean lower radiated noise.

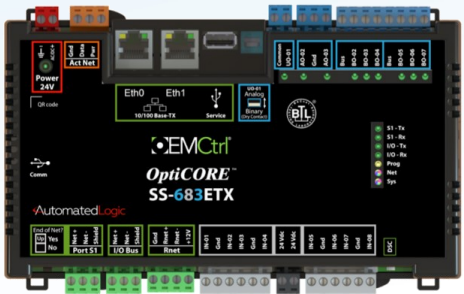
KEY DIFFERETIATORS:

- Replaceable core filter driers on Suction and/or liquid lines.
- Built in service access for major components via hinged and handled doors.
- Highly efficient Plenum Blowers
- Shaft grounding rings standard on SA & RA fans
- Hinged access doors

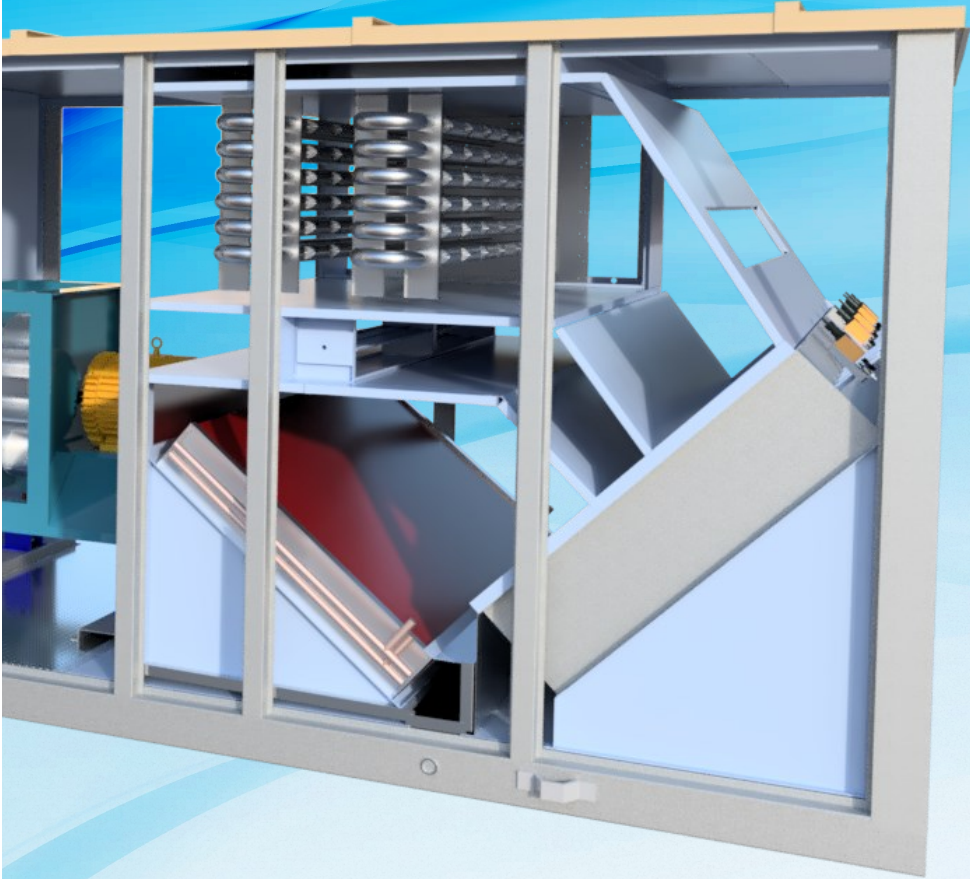


Direct driven SWSI airfoil plenum blowers with Premium efficiency motors are standard in our MES series multizone units

Open Protocol DDC Controls with high efficiency sequences of operation.

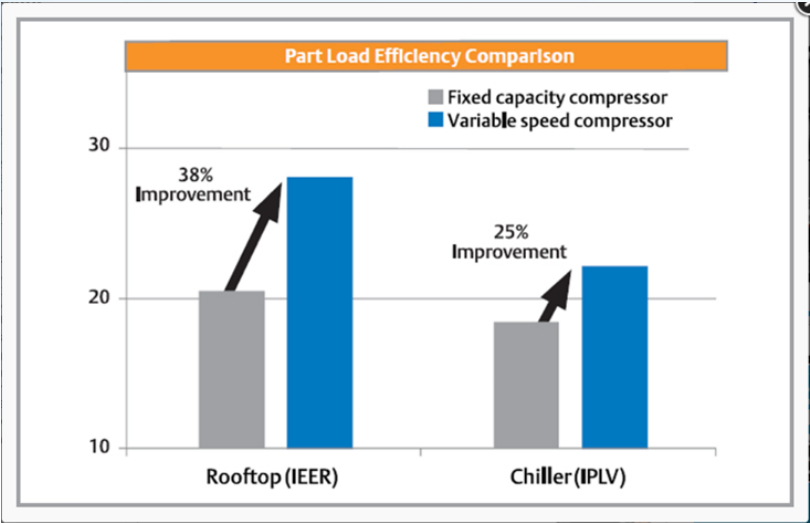


High turndown gas furnaces with long lasting stainless steel tubular heaters closely match heating demand.



Microgroove condenser coils in our units, reducing charge weights and reducing copper consumption without compromising energy efficiency or capacity.

Equipped with Digital scroll compressors, the MES series adapts to changing cooling loads providing lower energy consumption and optimal comfort levels.



TRIPLE DECK VAV vs. VAV

SEASONS • 4 reduces your project management costs by simply being a single source solution!

A Question we're always asked is how does the installation costs compare to that of a standard VAV system? On the surface, it truly sounds cheaper to install a VAV unit, until you begin to include the duct mounted accessories to make it function as a VAV system.

We would like for you to consider the following when making comparisons:

- How much are the zone boxes?
- Did you include the source of reheat at the zone boxes if required?
- Is perimeter heat required? How much? Source? Installation?
- Will you use a boiler or water heater?
- Will your boiler be roof mounted or will it require a mechanical room?
- What about the loop piping and pump? Cost and installation?
- What about the pump and power requirements? What about the additional maintenance required?
- Will you use electric reheat?
- Who will install the power to the reheat boxes?
- Will your tenants be interrupted if the reheat box requires maintenance?
- Can your service technician also service boilers?
- What if you have a water leak?
- Will it require another maintenance contract because of the specialty of the equipment?

It's true that from a simple sheetmetal standpoint, the VAV system is slightly cheaper, but once you begin to bring in the additional trades to power and pipe in the zone boxes, that advantage begins to dwindle. From a simple jobsite coordination standpoint our Triple Deck VAV unit wins hands down. Why coordinate with the boiler manufacturer, the VAV unit manufacturer, and the reheat box manufacturer when you can coordinate with only one manufacturer?

TRIPLE DECK VAV vs. VAV

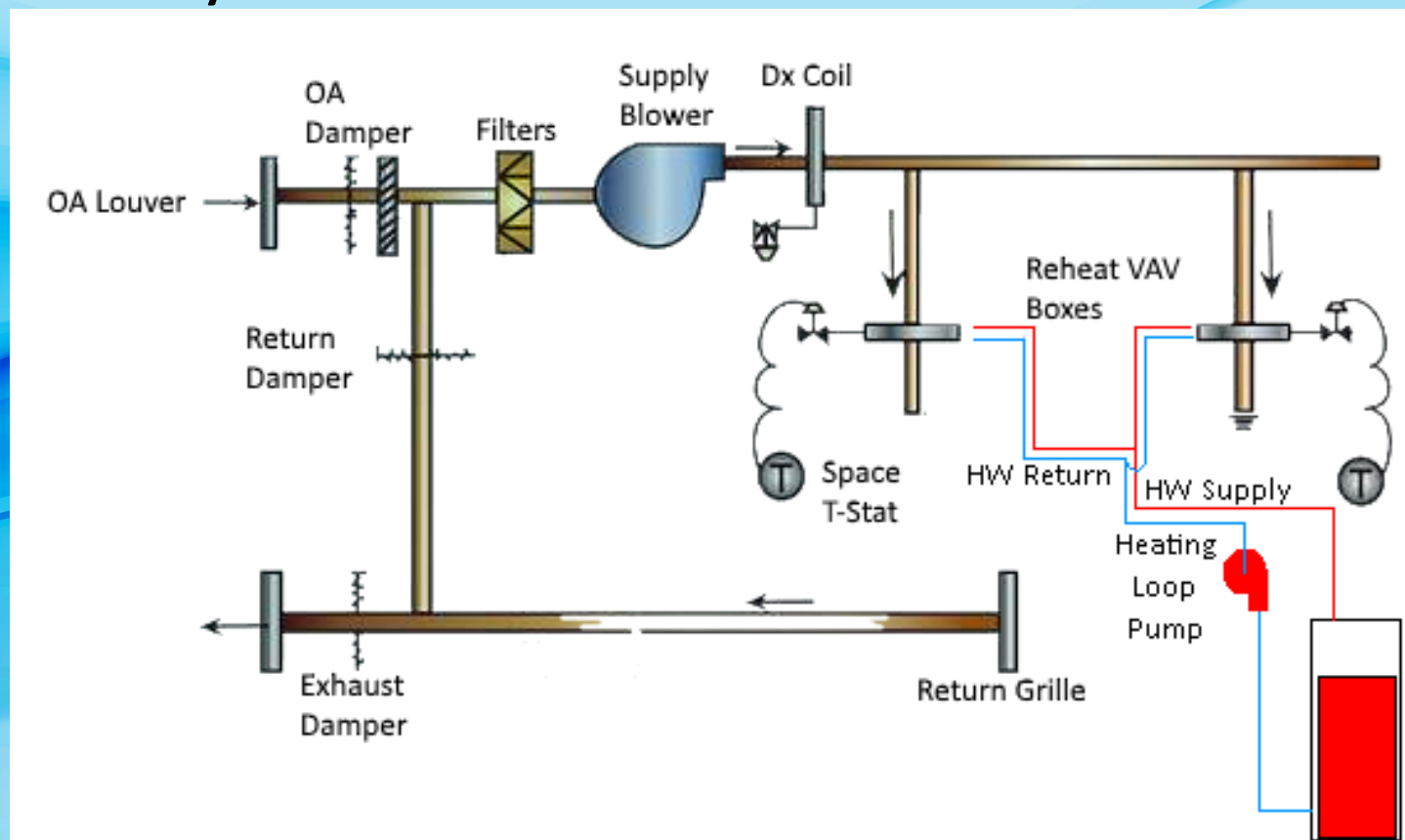
When something is wrong with your VAV system, who do you call? The Boiler manufacturer, The unit manufacturer, or the zone box manufacturer? With our unit, you call one company...Always! No finger pointing, no delaying.

COMPARISON CHECKLIST

Accessories	Triple Deck VAV System	VAV System
Zone reheat boxes	0\$	\$\$\$
Boiler loop if reheat boxes are equipped with HW coils	0\$	\$\$\$
Run power to zone damper actuators	0\$	\$\$\$
Run power to electric reheat boxes (3 Phase)	0\$	\$\$\$
Run gas for boiler loop	0\$	\$\$\$
Run power for the new boiler loop pump	0\$	\$\$\$
Install boiler loop piping	0\$	\$\$\$
Install boiler expansion tank and all associated boiler loop specialties	0\$	\$\$\$
Water treatment for the boiler loop	0\$	\$\$\$
Service technicians required	1 for AC unit	2, 1 for AC unit, 1 for Boiler
Installation trades required	Mechanical, Electrical, Plumbing	Mechanical, Electrical, Plumbing
Insulation	Insulate duct only	Insulate duct and water loop
Perimeter heat	Not Required	Potentially required

TRIPLE DECK VAV vs. VAV

VAV layout Schematic:

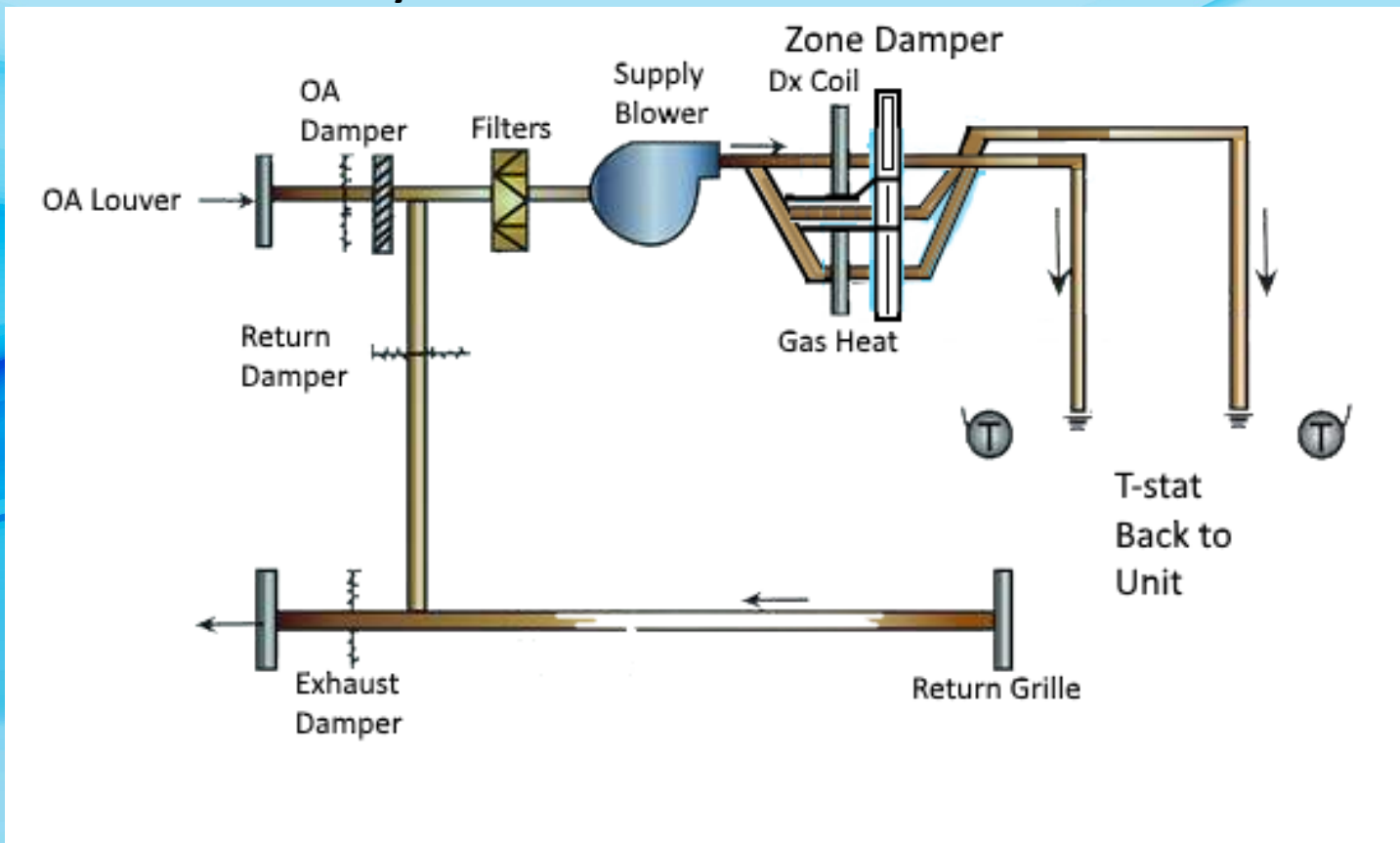


Ancillary items Checklist:

- VAV reheat box with actuator(s)
- Thermostat
- HW source (Water heater)
- Water loop pump
- Expansion tank
- Flow control valves and controls
- Waterside piping and insulation

TRIPLE DECK VAV vs. VAV

TRIPLE DECK VAV layout Schematic:



Ancillary items Checklist:

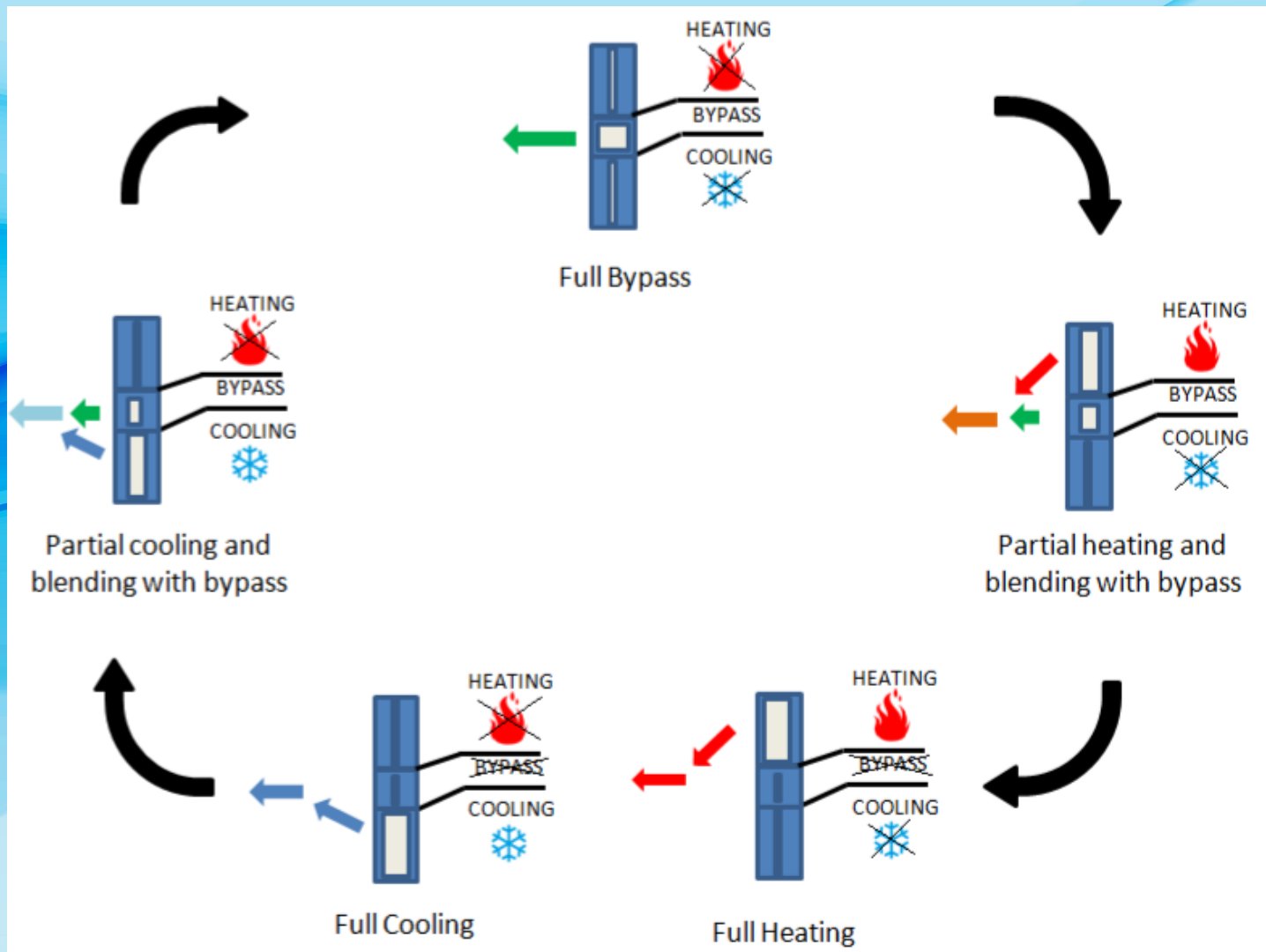
- Thermostat

Don't be fooled! Yes, the initial cost of a Triple Deck multizone UNIT is going to exceed that of the VAV UNIT alone. But, once you begin to include all the ancillary items that are required to make a VAV system function, the cost difference is dramatically decreased if not eliminated all together.

Furthermore, the additional equipment means additional maintenance and possibly specialized maintenance that will be completely eliminated with a Triple Deck VAV multizone unit. Keep in mind that the Seasons 4 unit is built with premium components, double wall construction, replaceable core filter driers and a host of other parts and components to improve the serviceability and increase the life of your investment.

TRIPLE DECK DAMPER OPERATION/SEQUENCE

Heated and Cooled air never mix!



In this day and age when everyone is striving for “High performing” buildings, LEED credits, Higher IEER’s and more energy efficiency, a new Seasons4 Three deck VAV multizone unit will help meet your goals. Consult your local Seasons4 representative listed below if further information is need or you would like to discuss upgrading your existing units or design a new facility around our equipment.

Your local Seasons • 4 representative is:



Made In USA