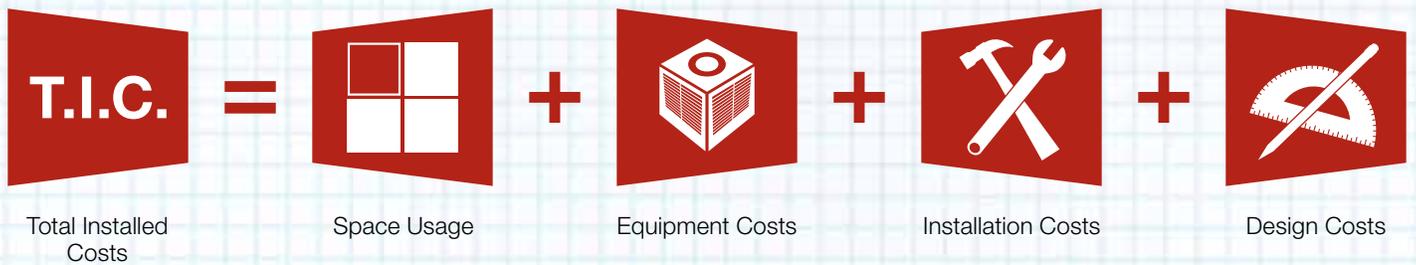


How Using Total Installed Costs Gives You a More Complete Picture When Comparing HVAC Systems



Brought to you by:



COOLING & HEATING
Live Better

What Are Total Installed Costs?

They include all the costs required to get an HVAC system up and running.



Why Are Total Installed Costs Important?

When specifying and designing a commercial HVAC system, equipment is often considered the most important cost factor. And costs certainly vary from technology to technology. While some manufacturers present chillers or VAV as the lowest-cost option, there are often hidden factors that can be very expensive in the end.

A truly comprehensive comparison of upfront HVAC costs includes more than equipment. It is important to keep in mind potential hidden costs, such as consulting/engineering design costs, installation tooling, rigging and labor, potential electrical and/or structural modifications in a building, complexity of connecting outdoor and indoor equipment, and controls integration.

For example, chillers, VAV and even Ground-Source Heat Pump options seem affordable based on equipment costs alone. Yet, their weight, number of required air-handlers, water and/or ductwork piping, secondary water-tower or boiler equipment, water loop or ground-loop considerations, plus power upsizing and rigging/labor costs, can significantly increase bottom-line costs to the customer. Conversely, Mitsubishi Electric's 2-pipe Variable Refrigerant Flow (VRF) systems are unlikely to need rigging, are easier to install, require fewer connections, often result in lower electrical loads, and eliminate the building tear-down/build-up encountered in traditional options, thus saving the customer upfront and delivering higher efficiency and ease-of-maintenance for years to come.

Although every project is different, many cost considerations are the same each time. We invite you to explore the information on the following pages to learn about all the relevant factors when comparing HVAC systems. Then give us a call so we can show you how to apply these factors in the design you are working on, the specification you are writing, or the job you are bidding.



Space Usage Considerations

Mitsubishi Electric systems give you more options to design your space the way you want it. With features like 3" piping instead of 4", compact units, lightweight piping, and more, you can configure our systems to fit your aesthetic, rather than designing your space around your HVAC. For details on product specifications, click [here](http://catalog.mitsubishipro.com) or visit <http://catalog.mitsubishipro.com>.

Variety of air handlers	Multiple options for placement including on or in the ceiling, on the floor, high on walls or even in a closet
Compact units	Free up more usable indoor and outdoor space
Refrigerant lines	Small lines take up less space in mechanical chases and rooms and reduce clearances (interstitials and utility rooms) – you can reduce or repurpose the space.
Ductless systems	Ceiling heights are limited by code, not based on ductwork or HVAC requirements. Increase your ceiling height or fit more floors in the same building envelope.



Equipment Costs

Every HVAC system is unique in design. When comparing systems, make sure not only to include all necessary equipment, but to account for equipment that is not needed. Less equipment also generally means lower installation costs.

	Mitsubishi VRF	4-Pipe Chiller	Unitary	VAV	Ground-Source Heat Pump
Condensing unit	x	x	x	x	x
Indoor air handler	x	x	x	x	x
Refrigerant loop piping and insulation	x	x	x	x	x
Energy/heat recovery ventilation	x	x	x	x	x
Controllers and automation	x	x	x	x	x
Refrigerant	x		x	x	x
Refrigerant branch controller	x				
Heat exchanger loop		x			x
Trunk/branch ductwork		x	x	x	x
Ductwork insulation		x	x	x	x
Pumps		x			x
Water storage/expansion		x			x
Supplemental boiler/chiller		x			
Water piping (chiller/condensed)		x			
Dampers and accessories for airflow		x	x	x	x
Well-field land area					x
Test and balance procedure (\$\$\$)		x		x	
Environmental studies (\$\$)		x			x



Installation Costs and Considerations

All HVAC equipment has associated tooling, labor hours, and rigging costs that can vary widely from one type to another. Mitsubishi Electric VRF systems are engineered to be compact and to simplify the workload to get them up and running.

Required piping and insulation	Our VRF products require only one type of copper pipe, reducing weight-based cost and standardizing insulation requirements. Diamondback™ ball valves simplify connecting pipes to equipment and eliminate brazing costs; 2-pipe design outclasses unnecessarily complicated multi-pipe and 3-pipe systems.
Required wiring and electrical	Our communication, power and controls wiring are based on standardized wire types. Unlike chillers, scrolls and VAV and PTACs that require upsizing the main and secondary breaker load centers to handle amps and wattage loads, our VRF equipment can often be designed to save costs related to the overall power supply.
Labor hours and costs	Mitsubishi Electric systems are designed to minimize required labor for installation, reduce the amount of equipment needed to function, and eliminate the need for tear-down/build-up of walls, roofs, ceilings, back rooms, etc.
Rigging (cranes and lifts)	Our lightweight indoor and outdoor units can be transported in standard elevators, saving the cost of expensive rigs and lifts and their operators.
Building and structural considerations	Many traditional HVAC systems (chillers, scroll compressors, VAV) are heavy, often requiring roof reinforcement to pass code and prevent damage to the buildings. Our systems are lightweight and scalable and rarely require reinforcement of roofs or other structures.
Building controls integration	We give you several options: VRF and P-Series equipment easily stand alone with independent DIDO-based controllers for dozens to hundreds of zones in a building. Or easily integrate controls into existing or newly upgraded LONworks or BACnet systems for centralized control.
Drilling and environmental	Some technologies, like ground-source heat pumps, require bore-hole drilling and environmental impact studies. VRF is essentially plug-and-play, once sized for the proper design and zoning needs of the building.



Design Costs and Considerations

A variety of costs can impact a system design, including design software and materials; labor costs for initial designs and modifications; labor costs to spec and price equipment; the quantity of piping, ductwork, welding wire, and more.

In addition, there are a number of other design considerations that Mitsubishi Electric can help you solve:

Ductless indoor units	Less time to design placement and routing of ductwork; do not need to design soffits, etc. to conceal ductwork
Flexible placement	Indoor and outdoor units are compact and quiet, providing more flexibility with placement of units
Mechanical chases and rooms	Small refrigerant lines take up less space in mechanical chases and rooms, meaning the chases can be smaller
System scaling to building density	Can easily and efficiently add more units as the building needs grow and change - only install what is needed on initial build
Ceiling height	With no ductwork needed, your buildings can have finished ceilings, higher ceilings and more natural ambient light

Other Considerations

Financing	Less time on the project means shorter duration for borrowing/less interest paid
Building uptime	Less time to renovate and install means less disruption to building occupants - get back to business faster

The Mitsubishi Electric Advantage

When you research HVAC systems, be sure to talk to Mitsubishi Electric, the leader in split zoning and VRF solutions in the United States. We'll show you how our zoning solutions can save you money on a total installed costs basis. And when you consider the many other advantages of a Mitsubishi Electric system – precise comfort zoning, energy efficiency, scalability, simultaneous heating and cooling, low service requirements, and more – you'll soon discover why we are the smart choice for just about any application.

Want to know more about how our smart solutions can help you save money on total installed costs? Just visit www.totalinstalledcosts.com or call **1-800-433-4822**.



DESIGNING FOR WHAT'S NEXT™

Mitsubishi Electric Corporation
3400 Lawrenceville Suwanee Road, Suwanee, GA 30024
Phone: 800-433-4822

© 2011 Mitsubishi Electric and Electronics USA, Inc.



Certificate Number EC97J1227



Certificate Number FM33568

