Explanation of Cooling and Air Conditioning Terminology for IT Professionals

White Paper 11

Revision 3

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> Executive summary

As power densities continue to increase in today's data centers, heat removal is becoming a greater concern for the IT professional. Unfortunately, air conditioning terminology routinely used in the cooling industry is unnecessarily complicated. This complexity makes it difficult and frustrating for IT professionals to specify cooling requirements and even makes it difficult to discuss current cooling system performance with contractors, engineers, and maintenance personnel. This paper explains cooling terms in common language, providing an essential reference for IT professionals and data center operators.

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Introduction

Rising power densities in today's IT environment have driven the need for IT managers to understand the planning, purchasing, operation and maintenance of cooling solutions. Unfortunately the Heating/Ventilation/Air Conditioning (HVAC) industry routinely uses complicated and highly redundant terminology. Apart from the terms related to mainframe-driven cooling methodologies, there is an influx of new terms related to the server and rack enclosure architectures common in today's IT environment. This unnecessarily complex terminology makes it difficult for IT managers to effectively communicate requirements to cooling professionals, which may lead to suboptimal cooling solutions.

The complex jargon used to describe cooling systems can be easily explained in simple terms of heat, humidity, temperature, pressure, and flow. Cooling-related units of measurement are also a source of confusion for IT personnel when assessing cooling needs. It's important to note that IT managers can understand and specify cooling requirements without knowing these complex HVAC terms. A simple method for assessing and specifying cooling capacity is described in White Paper 25, *Calculating Total Cooling Requirements for Data Centers*.

Related resource
White Paper 25
Calculating Total Cooling Requirements for Data Centers

This document provides explanations of cooling terms common to IT rooms and data centers as well as useful conversion factors.

HVAC terms

Air-cooled system

A type of precision cooling system widely used in IT environments of all sizes. In an air-cooled system the condensing coil (see condensing coil below) is exposed directly to the outside atmosphere. All other refrigeration cycle components are contained within the air conditioner. This sometimes requires refrigerant lines to be run long distances to the building's roof or external perimeter.

Air economizer

(From from ASHRAE/IESNA Standard 90.1-2007) A duct and damper arrangement and automatic control system that together allow a cooling system to supply outdoor air to reduce or eliminate the need for mechanical cooling during mild or cold weather.

ANSI

The abbreviation for American National Standards Institute.

ASHRAE

The abbreviation for American Society of Heating, Refrigerating, and Air-Conditioning Engineers

ASHRAE 52.1

ASHRAE Standard 52.1 is a document describing the evaluation and performance of air filters used in data centers and equipment rooms.

ASHRAE TC9.9

Technical Committee for Facility and Equipment Thermal Guidelines for Data Center and other Data Processing Environments. This is a consortium of IT users and manufacturers creating common guidelines for the standardization, layout, testing and reporting of IT rooms and data centers.

BTU

The abbreviation for British Thermal Unit. A measurement of heat energy commonly used to measure heat loads in data centers and IT rooms in North America. A BTU is defined as the amount of heat energy required to raise the temperature of one pound of water by one degree Fahrenheit in one hour. This is an archaic term typically used to specify heat output when expressed in BTU/Hr, where the use of the term Watts is the simpler and more universal measure. Conversions from BTU to Watts are provided at the end of this paper.

Ceiling mount

A small precision air conditioner hung from, or suspended above, a ceiling. This type of air conditioner comes in many designs, but usually is connected to a heat rejection unit on an outdoor pad or rooftop via refrigerant or water lines.

CFM

The abbreviation for cubic feet per minute. CFM is used to measure the flow of air through a delivery system or space.

Chilled water system

A type of precision cooling system widely used in mid-sized to large IT environments. A chilled water system uses water as a cooling medium. Cold water is pumped from a chiller to computer room air handlers designed to cool the space. A chilled water air conditioner can be thought of as similar to a car radiator with a fan, with hot air being cooled by being blown through a cool radiator. In a chilled water system cooling an IT facility, the chilled water may be provided as a utility in the building, or special dedicated water chillers may be installed.

Chiller

A device used to continuously refrigerate large volumes of water. A chiller uses the refrigeration cycle to produce large volumes of chilled water (typically at 45-48°F / 7-9°C) that is distributed to Computer Room Air Handlers (CRAH) units designed to remove heat from the IT environment.

Clean room

A room that is virtually free of dust or bacteria; used in laboratory work and in assembly or repair of precision equipment. Clean rooms usually use precision air conditioning.

Comfort air conditioning

Common air conditioning systems designed for the comfort of people. When compared to computer room air conditioning systems, comfort systems typically remove an unacceptable

amount of moisture from the space and generally do not have the capability to maintain the temperature and humidity parameters specified for IT rooms and data centers.

Compressor

The compressor is an essential component in the refrigeration cycle that uses mechanical energy to compress or squeeze gaseous refrigerant. This compression process is what allows an air conditioner to absorb heat at one temperature (like 70°F / 21°C) and exhaust it outdoors at a potentially higher temperature (like 100°F / 38°C).

Condensate

The water that results as a by-product of dehumidification. Condensate is usually pumped out of the IT room or data center (via a condensate pipe) into the building drainage system. Since maintaining humidity is a desired goal of a computer room air conditioning system, dehumidification is typically not a desired function. However, dehumidification and the resultant production of condensate commonly occur as a result of sub-optimal design.

Condenser coil

A condenser coil is one means of heat rejection commonly used in an air conditioning system. It is typically located on an outdoor pad or on a rooftop and looks like an automobile radiator in a cabinet. It is usually hot to the touch (120°F / 49°C) during normal use. Its function is to transfer heat energy from the refrigerant to the cooler surrounding (usually outdoor) environment. The related Dry Cooler or Fluid Cooler serves the same purpose of heat rejection and physically appears similar, with the difference that the condenser coil uses hot refrigerant which changes from a gas to liquid as it move through the coil, whereas the Fluid Cooler uses hot liquid such as water or a water-glycol mix.

Conduction

A mode of heat transfer in which heat energy is transferred within an object itself or between objects in contact. When a cold spoon is left in a pot of boiling water, the spoon eventually becomes hot. This is an example of conduction. Conduction is one of the three forms of heat transfer, which also include Convection and Radiation.

Convection

A mode of heat transfer in which heat energy is transferred from an object to moving fluid such as air, water, or refrigerant. The heat sink of a computer processor is an example of heat transfer by convection. Convection is one of the three forms of heat transfer, which also include Conduction and Radiation.

Cooling tower

A heat rejection method that transfers heat energy from a data center or IT room to the outside atmosphere via the evaporation of water. In a cooling tower, water is sprayed onto a high surface-area packing material as large volumes of air are drawn across through the structure. The net effect of this process is that a small portion of the water circulated through the cooling tower evaporates into the outside atmosphere. The remaining water (now cooler) is collected at the bottom of the cooling tower.

CRAC

The abbreviation for Computer Room Air Conditioning unit. A device usually installed in the data center that uses a self-contained refrigeration cycle to remove heat from the room and send it away from the data center through some kind of cooling medium via piping. Must be used with a heat rejection system which then transfers the heat from the data center into the environment. The heat rejection system typically takes one of the following forms: condensing unit, fluid cooler, or cooling tower to discharge heat to the outdoor atmosphere.

CRAH

The abbreviation for Computer Room Air Handling unit. A device usually installed in the data center or IT room that uses circulating chilled water to remove heat. Must be used in conjunction with a chiller.

CHR

The abbreviation for chilled water return, the term used for all piping intended to return chilled water from the computer room air handlers to the chiller.

CHS

The abbreviation for chilled water supply, the term used for all piping intended to deliver chilled water from the chiller to the computer room air handlers.

CWR

The abbreviation for condenser water return, the term used for all piping intended to return condenser water from the chiller to the cooling tower.

CWS

The abbreviation for condenser water supply, the term used for all piping intended to deliver condenser water from the cooling tower to the chiller.

Dehumidification

The process of removing moisture from air. In the data center or IT room, most dehumidification occurs as moisture-laden air flows across the cold evaporator coil. I basic example of the dehumidification process is when a cold soda can is left outdoors. The water moisture in the air is removed by condensing on the surface of the can as water droplets.

Design condition

The desired properties for an environment expressed in dry bulb temperature, wet bulb temperature and relative humidity. Design conditions are commonly used during the planning stages of a data center or IT room as a basis to aid in the specification of air conditioning systems. Cooling equipment manufacturers normally published performance data of air conditioning systems at several design conditions.

Dew point (DP)

The temperature at which water vapor begins to condense. On a hot summer day, a cold soda can is below the dew point which causes condensation on the surface of the can.

Direct expansion systems (DX)

A general term applied to computer room air conditioning systems that have a self-contained refrigeration system and are air, glycol, or water-cooled.

Downflow

A term applied to computer room air conditioners and air handlers that discharge air in a downward direction. Typically used to feed air to a raised floor, but also can distribute air at floor level if the air conditioner is placed on an elevating stand.

Dry bulb temperature (DB)

The temperature of air shown on a standard thermometer.

Dry cooler

See “Fluid Cooler”.

Economizer coil

The term applied to an additional cooling coil installed into glycol-cooled computer room air conditioning units to provide free cooling in cold climates. The economizer coil contains cold glycol circulating directly from the fluid cooler when atmospheric conditions allow.

EER

Abbreviation for energy efficiency ratio, a measurement quantifying the performance of a compressor relative to its energy consumption. A higher number is generally better.

Enthalpy

The total quantity of energy used to heat or cool a substance between two temperatures including the energy used to change the state of the substance if applicable. For example, if we heat a sample of water at normal atmospheric pressure from 33°F to 275°F (1°C to 135°C), the enthalpy is the sum of the sensible heat energy added (from 33°F / 1°C to 212°F / 100°C and from 212°F / 100°C to 275°F / 135°C) and the latent heat energy added (state change from liquid to vapor at 212°F / 100°C).

Evaporation

The process of a liquid becoming a vapor. If a cup of water were boiled for long enough, all the water would be gone. By adding heat, all the water becomes a vapor and mixes with the air.

Evaporator coil

The evaporator coil is an essential component used in the refrigeration cycle. It looks like an automobile radiator. This is the part of the system that gets cold to the touch (about 45°F / 7°C for air conditioning systems) during normal use. Its usually found inside the space we need to remove heat from. Cold-feeling air that exits an air conditioner has just transferred some heat energy to the flashing refrigerant as it passed through the evaporator coil.

Expansion valve

The expansion valve is an essential component used in the refrigeration cycle. It regulates the flow of high-pressure liquid refrigerant into the evaporator coil. It is designed to open just enough to let refrigerant flow while maintaining a high pressure differential from its inlet to its outlet. The pressure at the exit of the expansion valve is low enough that it initiates a phase change in the liquid refrigerant to a vapor. A pressurized spray can is an example of how an expansion value works. If you spray a can of butane fuel for a few seconds, the can will become colder as the pressure inside decreases.

Firestat

A device located in the air conditioner that warns of a fire and initiates unit shutdown when return air temperatures exceed a pre-set threshold.

Flash

A term used to describe the change in state of refrigerant from a liquid to a vapor inside the expansion valve and evaporator coil of a computer room air conditioning unit.

Flooded distribution

An air distribution or return methodology in which the computer room cooling system and IT equipment eject or draw in bulk air from the room without any special ductwork between them.

Floorstand

A device used to raise the height of the computer room air conditioner or air handler to match the height of the raised floor and manage the flow of air exiting the unit.

Fluid cooler

A device consisting of coils and fans to transfer heat energy from a flowing glycol stream to the outside atmosphere.

Fluid regulating valve

A device, often controlled by an electric motor, to regulate the flow of water or glycol through the coil and / or heat exchanger in a computer room air conditioner or air handler.

Free cooling

A practice where the outside atmosphere is used to directly cool the IT room or data center. There are two common types of free cooling. Airside free cooling introduces cold outside air directly into the IT room or data center when atmospheric conditions allow. Waterside free cooling uses an additional cooling coil containing cold glycol circulating directly from the fluid cooler when atmospheric conditions allow. There are building codes for areas in the Pacific Northwest that mandate free cooling for all data centers.

Fully ducted distribution

An air distribution or return methodology in which air is directly ducted into or out of the loads.

Glycol

A common term for a mixture of ethylene glycol and water (similar to the antifreeze/water combination used in many automobiles) used as a heat removal medium in computer room air conditioners. The glycol mixture is resistant to freezing in cold climates. See “Glycol-Cooled System”.

Glycol-cooled system

A type of precision cooling system widely used in IT environments of all sizes. In a glycol system the air conditioner absorbs heat from the IT room and removes it from the room in the form of heated liquid water/glycol solution. The heated liquid then flows via pumps to an outdoor radiator with a fan where the heat is expelled.

HVAC

An abbreviation for Heating, Ventilation and Air Conditioning. Sometimes an “R” is shown at the end to represent refrigeration.

Heat

Heat is simply a form of energy. It exists in all matter on earth, in varied quantities and intensities. Heat energy can be measured relative to any reference temperature, body or environment.

Heat exchanger

A heat exchanger allows different fluids to transfer heat energy without mixing. It achieves this by keeping the flowing fluids separated by thin tubes or thin metal plates. Heat exchangers are commonly used in the place of condenser coils in water or glycol cooled air conditioning systems.

Heat transfer

Heat transfer is the process of an object or fluid losing heat energy while another object or fluid gains heat energy. Heat energy always flows from a higher temperature substance to a lower temperature substance. For example, a cold object placed in a hot room cannot drop in temperature it can only gain heat energy and rise in temperature. The amount of heat transferred can always be measured over a period of time to establish a rate of heat transfer.

Hot gas line

A refrigerant line connecting the compressor to the condensing coil in an air conditioning system. In air-cooled systems the hot gas line may be hundreds of feet in length.

Humidification

The process of adding moisture to air. A simple example of the humidification process is when water is boiled and the water vapor produced mixes with the air.

Humidifier

The device used to provide humidification in the data center or IT room. Humidifiers either use heat or rapid vibrations to create water vapor. The moisture is usually added to the air stream exiting the air conditioner or air handler.

Latent cooling capacity

The fraction of total capacity a computer room air conditioner or air handler uses to condense liquid water from the air stream being cooled. Latent cooling capacity does not contribute to data center or IT room cooling.

Latent heat

Heat energy that must be transferred to or removed from a substance to change its state. For example, energy used to boil water (latent heat energy) cannot raise the temperature of the water beyond 212°F / 100°C. Adding more heat will accelerate the boiling (phase change) but will not raise the temperature of the water.

Latent heat of vaporization

A term describing the amount of latent heat transferred during a liquid / vapor phase change for a particular substance.

Liquid line

A refrigerant pipe carrying liquid refrigerant connecting the output side of the condensing coil to the input side of the expansion valve. In air-cooled systems the liquid line may be hundreds of feet in length.

Lps

The abbreviation for liters per second. Lps is used to measure the flow of air through a delivery system or space. Lps is the metric equivalent to CFM.

Locally ducted distribution

An air distribution or return methodology in which air is provided or returned via ducts which have vents located near the loads.

Make-up air

Outside air introduced into the IT room or data center. Make-up air is mandated by building codes primarily to ensure the space is fit for human occupancy.

Microprocessor controller

A computer logic based system found in precision cooling systems that monitors, controls and reports data on temperature, humidity, component performance, maintenance requirements and component failure.

Multicool

A precision cooling system that combines a chilled water coil and an evaporation coil in the same chassis. Either system can be used. Multicool systems can provide high levels of versatility and redundancy.

Plenum

Any dedicated space that is used for the distribution or return of cooling air. The space under a raised floor is an example of a plenum.

Plenum rating

A special characteristic of electrical and communication wiring that is used in spaces used to transport conditioned supply or return air. Plenum rated cables have lower flammability and heat release characteristics than standard cables.

Power density

Electrical power used in a space divided by the area of the space expressed as watts/ft^2. Alternatively power density can be expressed as the average power per rack in a data center expressed as kW/rack.

Precision air conditioning

A term describing air conditioning or air handling systems specifically designed to cool IT equipment in a data center or IT room. Precision air conditioning systems maintain temperature (+/- 1°F) (+/- 0.56 °C) and humidity (+/-4%) within much tighter tolerances than regular air conditioning systems. These systems provide high airflow rates (170+ CFM/kW or 4.8+ Lps/kW), are designed for continuous usage, and provide high levels of air filtration. Precision air conditioners are also engineered to minimize the amount of moisture removed from the air during the cooling process.

Psychometric chart

The properties of air and the water contained in it at different temperatures arranged in the form of a chart. In particular it shows the quantitative interdependence between temperature and humidity. It is useful in the planning, specification and monitoring of cooling systems.

Pump package

A pump and enclosure used to circulate condenser water or glycol on applicable systems. Pump packages are specified based on desired flow rate and piping losses for each application.

Radiation

A mode of heat transfer in which heat energy is transferred via electromagnetic waves. An item warmed by sunlight is an example of radiant heating. Radiation is one of the three forms of heat transfer, which also include Convection and Conduction.

Refrigerant

The working fluid used in the refrigeration cycle is known as the refrigerant. Modern systems primarily use fluorinated hydrocarbons that are nonflammable, non-corrosive, nontoxic, and non-explosive. Refrigerants are commonly referred to by their ASHRAE numerical designation. The most commonly used refrigerant in the IT environment is R-22. Environmental concerns of ozone depletion may lead to legislation increasing or requiring the use of alternate refrigerants like R-134a.

Refrigeration cycle

Closed cycle of evaporation, compression and condensation that has the net effect of moving heat energy away from an environment and into another environment. Refrigerant changes its physical state from liquid to gas and back to liquid again each time it traverses the various components. As the refrigerant changes state from liquid to gas, heat energy flows into the refrigerant from area to be cooled (the IT environment for example). Conversely, as the refrigerant changes state from gas to liquid heat energy flows away from the refrigerant to a different environment (outdoors or to a water source).

Reheat

A heating coil installed in a computer room air conditioner or air handler to assist in dehumidification of the discharge air stream.

Relative humidity

The amount of water vapor contained in air relative to the maximum amount the air is capable of holding. Expressed in %.

Return air

Air entering an air conditioning system.

Sensible cooling capacity

The amount of heat energy the air conditioner can be expected to remove from the IT room or data center. Depending on the operating conditions, this may be less than the air conditioner rating because some of the air conditioner cooling capacity may be used up dehumidifying the air. Dehumidification is typically not desired in a data center but occurs anyway when the return air is low enough in temperature so that the dew point is reached as the air passes

through the air conditioner. The resultant condensation of the humidity onto the air conditioner coils represents a loss of cooling capacity. Ideally, the air returning to the air conditioner is a high enough temperature so that the dew point is not reached during cooling, in which case no dehumidification occurs and the full air conditioner rating is used to cool the IT room heat load.

Sensible heat

Sensible heat is defined as the heat energy that causes a change in temperature of a substance but does not contribute to a change in state (for example, steam to liquid water) for the substance. The only type of heat energy produced by computers and IT equipment.

Sensible heat ratio

The ratio between an air conditioner's sensible heat removal capacity and its total heat removal capacity. In an IT environment, higher sensible heat ratios contribute to lower operating costs and more effective equipment cooling. Ideally, this ratio is 1, meaning the entire air conditioner capacity is available to cool the IT loads. When this number is less than 1, it means that undesirable dehumidification is occurring in the air conditioner.

Setpoint

User-set or automatic thresholds for heating, cooling, humidification, and dehumidification usually measured in the return air stream of the computer room air conditioner or air handler.

Specific heat

A term used to describe the relative capabilities of refrigerants and other fluids to transport heat energy. Defined as the quantity of heat required to raise the temperature of a defined amount of a substance one degree.

Split system

A computer room air conditioning system (floor, ceiling, or wall mount) where refrigerant is piped to another location for heat to be expelled. The system is said to be split because it consists of two parts: 1) The unit that absorbs the heat from the room (the evaporator) which is connected by refrigerant piping to part 2) The unit that rejects the heat outdoors (the condenser). Most typical built-in air conditioners in a residence are of the Split System configuration, with the evaporator indoors and the condenser outdoors on a ground pad or rooftop.

State change

Any change in the properties of a substance among solid, liquid, or vapor.

Supply air

Air entering a space from an air conditioner

Temperature

The measurement of heat energy within a body or substance. There are two common scales used to measure temperature, Centigrade and Fahrenheit. The Centigrade scale (also commonly referred to as Celsius) is widely used internationally while the Fahrenheit scale is commonly used in the United States.

Ton (cooling)

A measurement of heat energy commonly used historically to measure heat loads in data centers and IT rooms in North America. A ton is equal to 12,000 BTUs and is the amount of heat energy required to melt 2000 pounds (907kg) of ice in one day (24 hours). This is an archaic term typically used to specify heat output when expressed in Tons / day, where the use of the more modern term Watts is the simpler and more universal measure that should be used. Conversions from Tons to Watts are provided at the end of this paper.

Turning vane

An air management device installed in many floorstands to assist in redirecting the flow of cooling air from vertical to horizontal as it exits the computer room air conditioner or air handler.

Uninterruptible cooling

The process of continued heat removal from the IT room or data center during equipment failure or power failure to preclude thermal damage and data loss due to equipment overheating.

Upflow

A term applied to computer room air conditioners and air handlers that discharge air in an upward direction.

Vapor barrier

Paint, plastic sheeting, floor or ceiling material specifically designed to minimize the migration of humidity into or out of an IT room or data center.

Water-cooled system

A type of precision cooling system widely used in mid-sized to large IT environments. A water-cooled system uses water instead of air as a condensing medium. Condensation takes place in a refrigerant/water heat exchanger typically located within the computer room air conditioner. The water flows in a continuous loop to an outdoor cooling tower where heat is rejected to the outside atmosphere.

Water detector

A device used within IT rooms and data centers to sense the abnormal presence of liquid water due to a leak or condensation.

Water economizer

(From from ASHRAE/IESNA Standard 90.1-2007) A system by which the supply air of the cooling system is cooled indirectly with water that is itself cooled by heat or mass transfer to the environment without the use of mechanical cooling.

Watt

A measurement of energy commonly used to measure electrical and heat loads in data centers and IT rooms. The wattage consumed by the IT equipment, lights, etc. is the amount of heat energy to be removed from the room by the air conditioning system. This term is becoming more common when specifying cooling systems.

Wet bulb temperature (WB)

The temperature of air shown on a wet thermometer as water vapor evaporates from it. The difference between Wet Bulb and Dry Bulb temperatures is a way historically used to determine humidity. Today direct measurement of humidity using electrical sensors causes this terminology to be obsolete.

Working fluid

A gas or liquid used to transport heat. In an air conditioning system the working fluid is the refrigerant. In the data center or IT room itself, air is the working fluid used to transport heat energy away from the IT equipment.

Conversion tables

Converting cooling-related units of measurement are often a source of confusion for IT personnel when assessing cooling needs. Useful English-to-Metric and Metric-to-English conversion factors and formulas are provided in the tables below.

As an example, to convert Tons (refrigeration) to Kilowatts: 2 Tons x 3.517 = 7.034 Kilowatts

Table 1a

English to Metric cooling related conversion factors

Quantity	From English units	To Metric units	Multiply by
Cooling	Ton (refrigeration)	Kilowatts	3.517
	BTU/Second	Kilowatts	1.054
	BTU/Hour	Kilowatts	0.000293
Length	Foot	Meter	0.3048
Room Area	Square Foot	Square Meter	0.09290
Mass	Pound	Kilogram	0.4536
Floor Loading	Pounds / Square Foot	Kilograms / Square Meter	4.882
Volume	Cubic Feet	Cubic Meter	0.02832
	Gallon	Liter	3.785
Pipe Flow Rate	Gallons / Minute	Liters / Second	0.06364
Air Flow Rate	Cubic Feet / Minute	Cubic Meters / Second	0.000471
Air Flow Velocity	Feet / Second	Meters / Second	0.3048
Temperature	Degree Fahrenheit	Degree Celsius	0.5555x(Fahrenheit-32)

As an example, to convert Kilowatts to Tons (refrigeration): 2 Kilowatts x 0.2843 = 0.5686 Tons

Table 1b

Metric to English cooling related conversion factors

Quantity	From Metric units	To English Units	Multiply by
Cooling	Kilowatts	Ton (refrigeration)	0.2843
	Kilowatts	BTU/Second	0.9488
	Kilowatts	BTU/Hour	3413.
Length	Meter	Foot	3.281
Room Area	Square Meter	Square Foot	10.764
Mass	Kilogram	Pound	2.2046
Floor Loading	Kilograms / Square Meter	Pounds / Square Foot	0.2048
Volume	Cubic Meter	Cubic Feet	35.311
	Liter	Gallon	0.2642
Pipe Flow Rate	Liters / Second	Gallons / Minute	0.06364
Air Flow Rate	Cubic Meters / Second	Cubic Feet / Minute	15.713
Air Flow Velocity	Meters / Second	Feet / Second	3.281
Temperature	Degree Celsius	Degree Fahrenheit	1.8xCelsius+32

Conclusion

A general understanding of the common terms and conversions facilitates more precise communication and fewer mistakes among individuals responsible for planning, managing, servicing and working in IT rooms and data centers.

About the author

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