



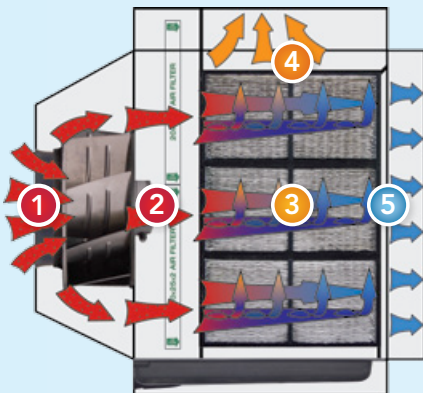
M30 AIR CONDITIONER

COMPACT AND EFFICIENT

Meet the smallest of our cooling giants. Its modular design makes it super versatile—and stackable side-by-side to increase your cooling power when needed. This modest powerhouse can help reduce your energy bill (and carbon footprint) for a quick return on your investment.



HOW DOES IT WORK?



- 1 FRESH AIR** Outside air is drawn into the air conditioner by a fan.
- 2 FILTERED** The air is then cleaned by an array of air filters.
- 3 HEAT AND MASS EXCHANGE (HMX)** The air enters an array of HMXs that use a new patented technology.
- 4 WORKING AIR AND WATER** About half of the air that enters the HMX is saturated with water and returns to the atmosphere, carrying heat energy removed from the conditioned air.
- 5 CONDITIONED AIR** The other half of the air that enters the HMX is cooled without adding humidity.

COOLERADO IS GREEN³

Green for your pocketbook



Coolerado Air Conditioners use up to 90% less energy than conventional systems, saving you a lot of green on your energy bill.

Green for the planet



Coolerado Air Conditioners are an environmentally responsible choice, because 90% less energy means 90% less carbon emissions.

Green for you



Coolerado Air Conditioners provide 100% fresh, filtered air, dramatically improving indoor air quality while removing dust, pollens and allergens.

DOE | U.S. Department of Energy verified Coolerado has an energy efficiency ratio (EER) of 40+.

CEC | California Energy Commission listed Coolerado as an energy efficient appliance.

PG&E | Pacific Gas & Electric's evaluation concluded that Coolerado qualified for the highest rebate tier.

SMUD | Sacramento Municipal Utility District customer advanced technologies program participant since 2004.

Refreshingly Efficient

M30 FEATURES AND SPECIFICATIONS

EER 40+ (Energy Efficiency Ratio), COP 24+ (Coefficient of Performance). Cooling capacity and efficiency increases as temperature increases. No chemical refrigerants. Low maintenance. Low water use. No moisture added to conditioned air. New, patented thermodynamic cycle. Limited Warranty.



- 1 ABS plastic drain pan, frame and internal components that directly contact water. Powder coated electrogalvanized steel housing.
- 2 Front access integrated electrical panel and control system.
- 3 Tapered intake plenum increases fan efficiency and evens air distribution.
- 4 Uses standard size 1" (25,4 mm), or 2" (50,8 mm) thick filters.
- 5 Discharge plenum provided for easy ducting by cutting any size or shape hole into the plenum face.
- 6 Side panel can be used for ducting exhaust or optional louver.
- 7 High efficient, variable speed, electronically commutated motorized (ECM) fan.
- 8 Zero side clearance - modular, multiple unit configurations.



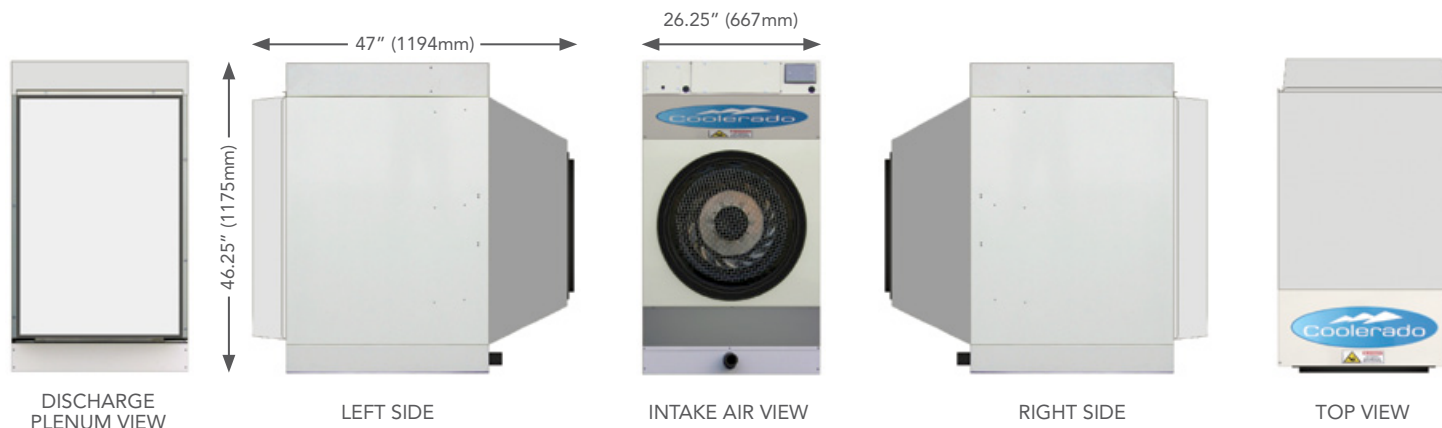
CONDITIONED AIR

Conditioned air flow at 900 CFM (1.530 m³/h) [420 L/s] without ducting losses. Intake airflow at 1,680 CFM (2.800 m³/h) [790 L/s], and working airflow at 780 CFM (1.270 m³/h) [370 L/s]. Conditioned air is cooled to approximately 95 to 120% of intake air's wet bulb temperature without changing moisture content.



OPTIONS

- A Thermostat auto-variable motor speed control
- B Manual-variable motor speed control
- C Exhaust louver



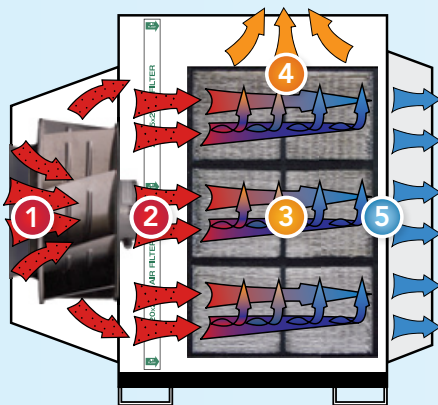


POWERFUL AND LOW PROFILE

Meet the cooling muscle of our low profile powerhouse. Its low profile design gives it a less obtrusive appearance, but don't underestimate its power. This cooling warrior can help reduce your energy bill (and carbon footprint) for a quick return on your investment.



HOW DOES IT WORK?



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- 4 WORKING AIR AND WATER** About half of the air that enters the HMX is saturated with water and returns to the atmosphere, carrying heat energy removed from the conditioned air.
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C60 FEATURES AND SPECIFICATIONS

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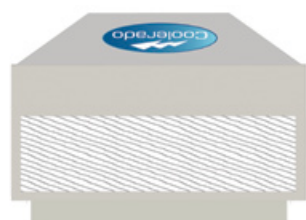


- 1 ABS plastic drain pan, frame and internal components that directly contact water. Powder coated electrogalvanized steel housing.
- 2 Front access integrated electrical panel and control system.
- 3 Tapered intake plenum increases fan efficiency and evens air distribution.
- 4 Uses standard size 1" (25,4 mm), or 2" (50,8 mm) thick filters.
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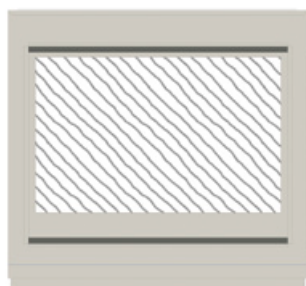


CONDITIONED AIR

Conditioned air flow at 1,670 CFM (2.700 m³/h) [760 L/s] without ducting losses. Intake airflow at 2,900 CFM (4.900 m³/h) [1370 L/s], and working airflow at 1,300 CFM (2.200 m³/h) [610 L/s]. Conditioned air is cooled to approximately 94 to 120% of intake air's wet bulb temperature without changing moisture content.

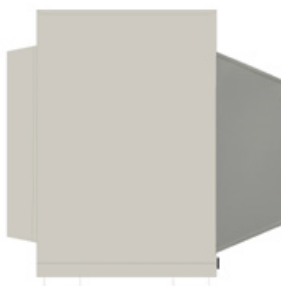


TOP VIEW



DISCHARGE PLENUM VIEW

47" (1194mm)



6" (153mm) 6" (153mm)

LEFT SIDE

50" (1270mm)



INTAKE AIR VIEW



15.5" (394mm)

RIGHT SIDE

OPTIONS

- A Thermostat with auto-variable motor speed control
- B Manual-variable motor speed control
- C Exhaust louver
- D Insulated Plenum



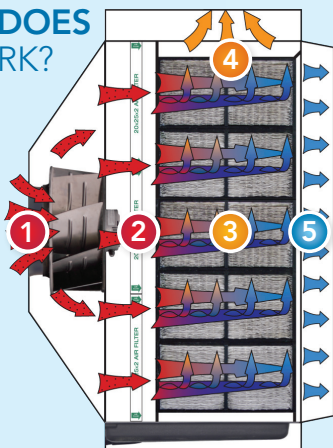
M50 AIR CONDITIONER

MODULAR AND MIGHTY

Meet the new and improved design of our popular M50. This cooling dynamo delivers our patented heat and mass exchange (HMX) technology in a super versatile casing that's stackable side-by-side, should you need to increase your cooling power. It's more durable, easier to install and maintain, and can help significantly reduce your energy bill (and carbon footprint) for a quick return on your investment.



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Refreshingly Efficient

coolerado.com 1.855.854.COOL

M50 FEATURES AND SPECIFICATIONS

EER 40+ (Energy Efficiency Ratio), COP 24+ (Coefficient of Performance). Cooling capacity and efficiency increases as temperature increases. No chemical refrigerants. Low maintenance. Low water use. No moisture added to conditioned air. New, patented thermodynamic cycle. Limited Warranty.

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- 8 Zero side clearance - modular, multiple unit configurations.

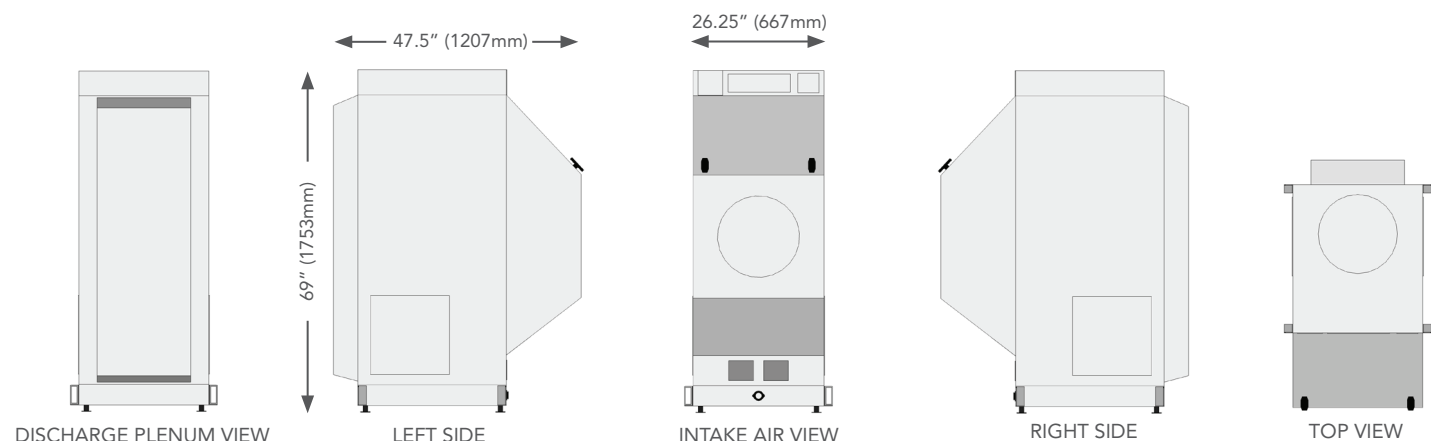


CONDITIONED AIR

Conditioned air flow at 1,450 CFM (2.460 m³/h) [680 L/s] without ducting losses. Intake airflow at 2,700 CFM (4.500 m³/h) [1270 L/s], and working airflow at 1,250 CFM (2.040 m³/h) [590 L/s]. Conditioned air is cooled to approximately 95 to 120% of intake air's wet bulb temperature without changing moisture content.

OPTIONS

- A Thermostat auto-variable motor speed control
- B Manual-variable motor speed control
- C Exhaust louver





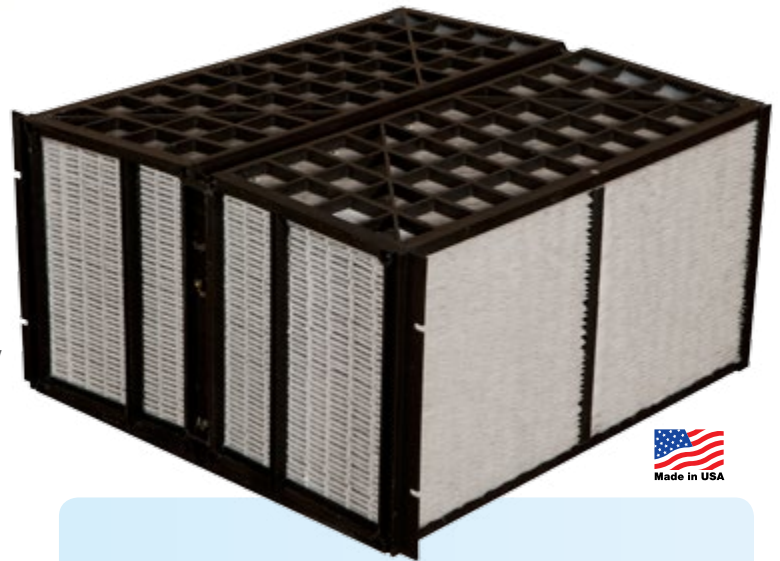
THE COOLERADO HMX DIFFERENCE

Coolerado air conditioners offer customers dramatic reductions in their cooling consumption, energy spend and carbon footprint – all without the use of refrigerants and compressors. At the core of these innovative and award-winning products is an ingenious cooling technology, called the Coolerado HMX (Heat and Mass Exchanger). The Coolerado HMX uses a thermodynamic cycle – known as the Maisotsenko Cycle – to produce unprecedented air temperature reductions.

The Coolerado HMX employs an indirect evaporative cooling technology, which separates the incoming airstream into two outgoing airstreams. Heat is transferred between these two airstreams inside the HMX to effectively cool the air, using up to 95% less energy than traditional cooling systems and increasing capacity as ambient temperatures rise.

SMALL, MEDIUM OR LARGE – WE CAN COOL YOUR SPACE

Whether cooling a small server room or a large manufacturing facility, Coolerado HMX's are capable of delivering cool, fresh air in the most efficient way possible. Their modular design allows them to be stacked next to each other to increase cooling capacity. The HMX is mounted in a polypropylene, reinforced cassette and can be set on top of one another and snapped together to form a stable, self-supporting unit.



WHAT MAKES COOLERADO PATENTED HMX TECHNOLOGY SO SPECIAL

- Exceptional cooling energy savings – up to 95% (depending on application)
- Provide healthier indoor atmosphere by incorporating 100% fresh air
- Ideal for customers with high heat loads
- Cool without the use of refrigerants or energy-gorging compressors
- Capacity increases along with ambient temperature
- Require minimal maintenance
- 120% wet bulb effectiveness

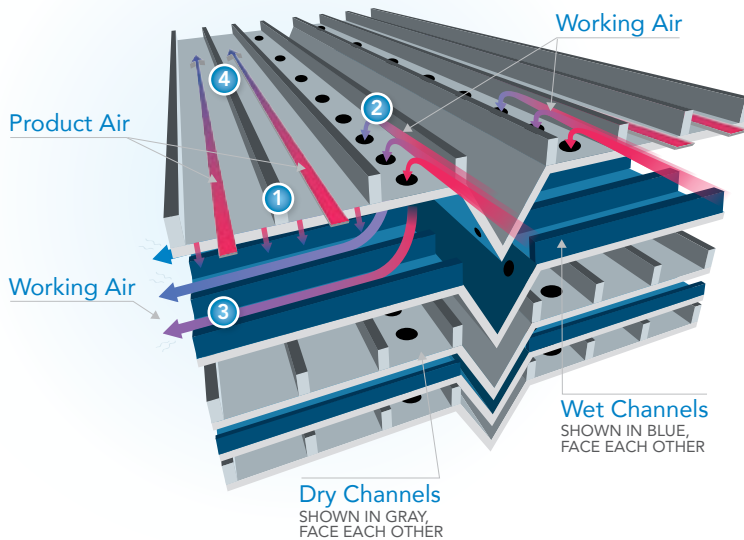
HMX SPECIFICATIONS

- Polyethylene, infused with a biocide
- Integrated watering system
- Modular, easy-to-install cassette
- Class 2, UL 900, smoke and fire rating
- 20.223" x 21.189" x 11.375" contains half-mile of channels

A GUIDELINE OF HMX PER CFM NEEDS

Supply CFM	6,500	15,000	20,000	30,000	65,000
Coolerado HMXs	25	55	75	110	240

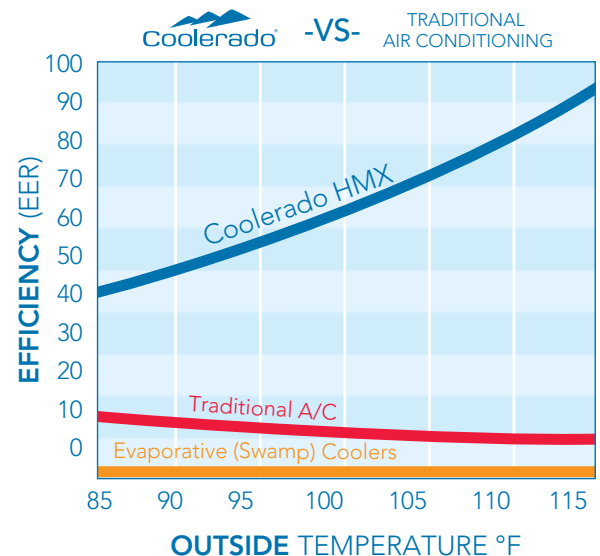
COOLERADO HMX



- 1** Product air and working air enter the dry side of the HMX.
- 2** Cooled working air is fractionated off into wet channels throughout the exchanger.
- 3** Heat from the product air is transferred into the working air through evaporation and is rejected as exhaust.
- 4** The product air travels the length of the dry channels, while transferring its heat to the working air in the wet channels above and below. As a result, the product air cools down and remains dry as it enters the building.

CASE STUDIES OF COOLERADO HMX COOLING

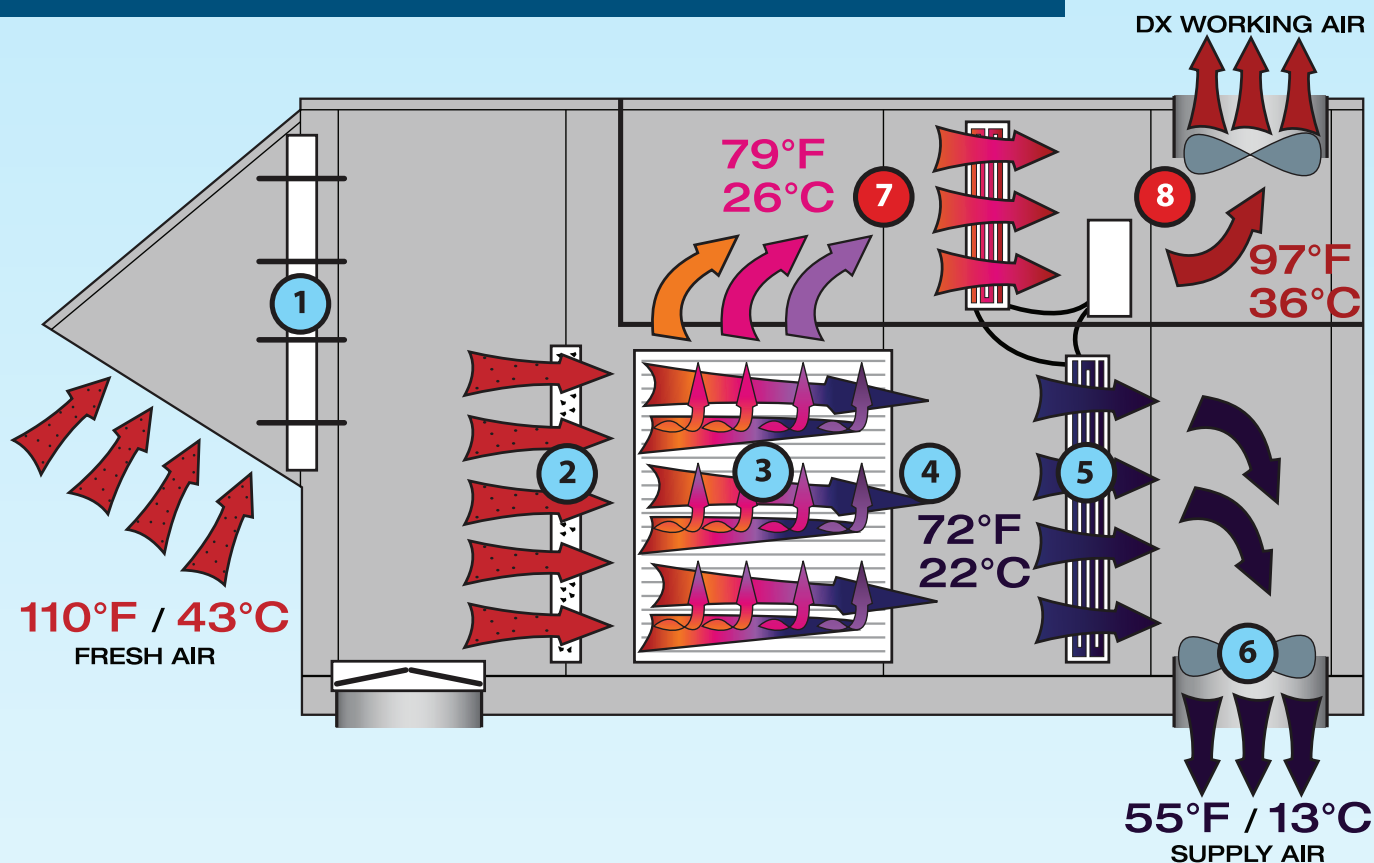
Application	Customer	Location	Performance
Data Center	NSIDC	Colorado	95% annual energy savings
Industrial	Ram Grinding	Colorado	90% peak consumption reduction
Food Processing/Compressor Room	Kellogg's	Mexico	Energy reduction of 88% during peak cooling
Commercial	Office Supply Retailer	California	53% reductions in compressor run time.



To learn more about Coolerado HMX technology and how it can solve your cooling needs, log on to Coolerado.com/hmx.

How It Works: Coolerado Hybrid H80 - Fresh Air Example

Dedicated Outdoor Air System (DOAS)



- 1 Fresh air is drawn into the air conditioner through an outside air damper. For example, outside summer air may be at 110°F (43°C).
- 2 The air is then filtered before it enters Coolerado's patented heat and mass exchange process.
- 3 The air that enters the heat and mass exchangers, or HMXs, is cooled without adding or removing humidity.
- 4 The example air will be cooled more than 35°F (20°C) with no change in humidity, and will leave the HMXs at 72°F (22°C).
- 5 The air then enters the cold refrigerant coils, where additional cooling and dehumidification can occur if needed.
- 6 The example air is cooled to 55°F (13°C). A high efficiency fan moves the conditioned air through the process and into the building where it is distributed via the building duct system.
- 7 The vast majority of cooling is performed by the HMXs by using about half of the entering air as working air. Water is evaporated into the working air, which pulls heat away from heat exchangers that in turn pull heat away from the conditioned air. At 79°F (26°C) the working air example is over 30°F (17°C) cooler than the 110°F (43°C) ambient air. The saturated and cool working air is used to remove heat from the hot refrigerant condenser coils more efficiently.
- 8 The working air leaves the hot coils at 97°F (36°C) and then goes on to cool the 2-stage refrigerant compressor and working air fan, saving more power.

How It Works: Coolerado Hybrid H80 - Fresh Air Example

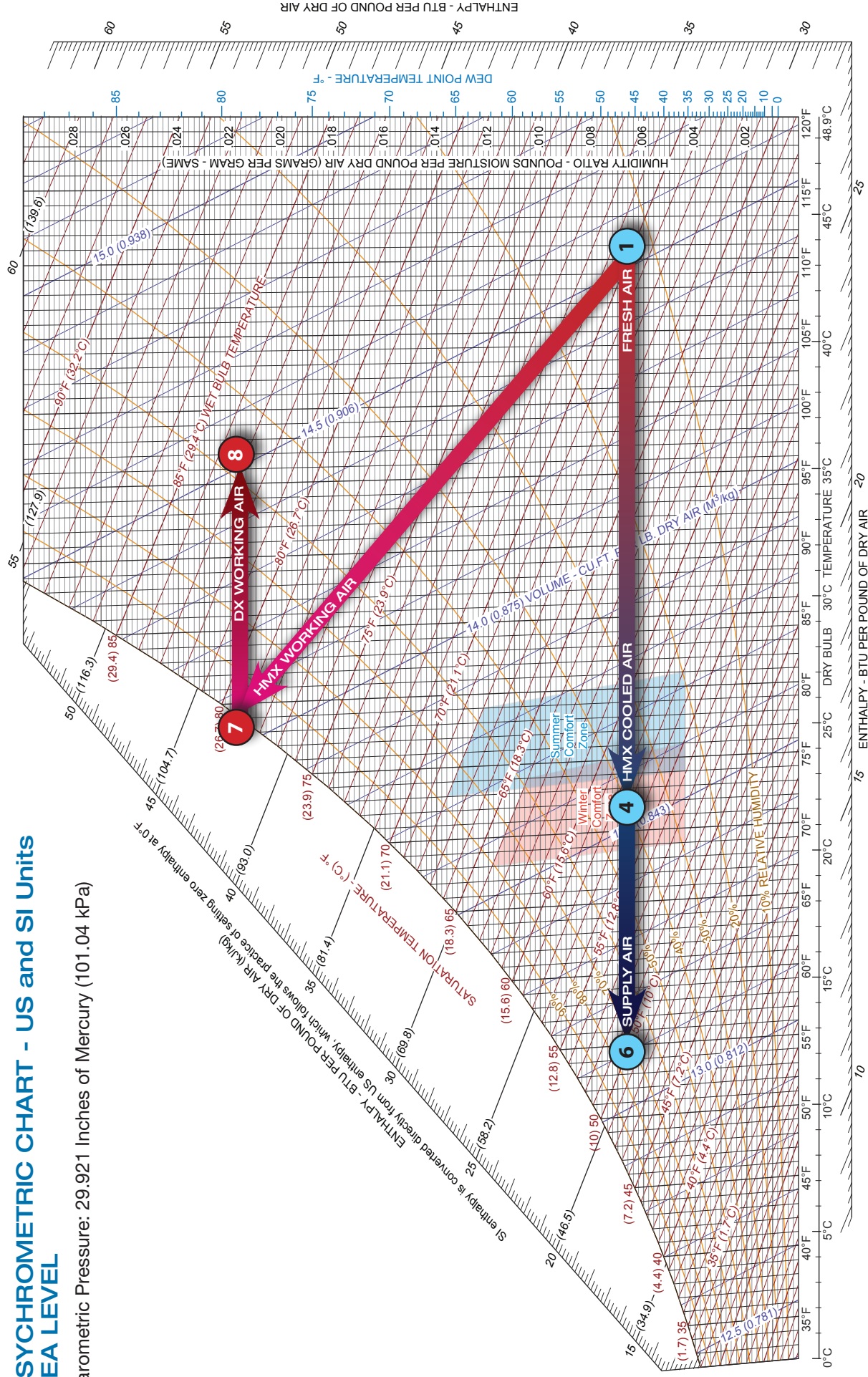
Dedicated Outdoor Air System (DOAS)



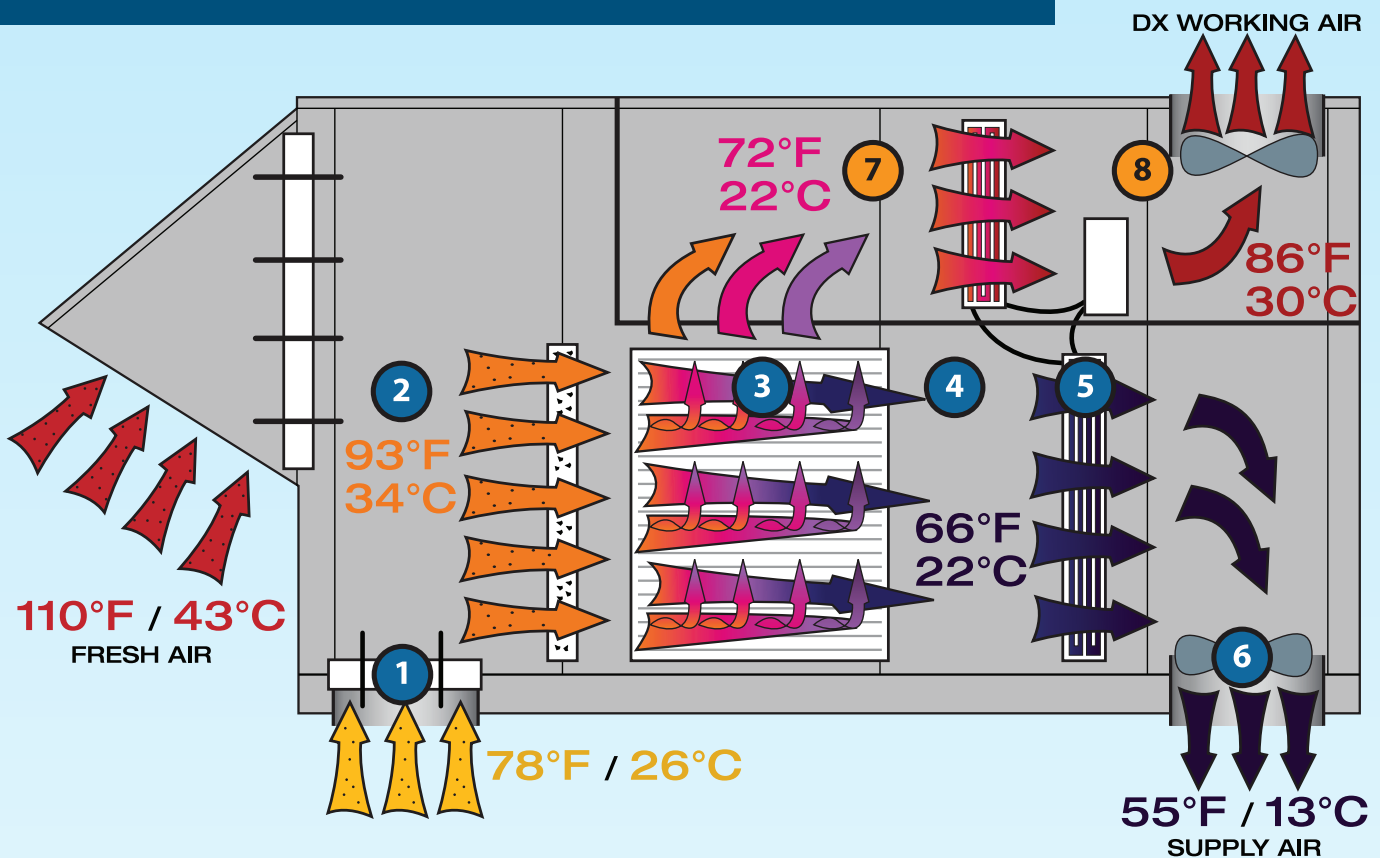
PSYCHROMETRIC CHART - US and SI Units

SEA LEVEL

Barometric Pressure: 29.921 Inches of Mercury (101.04 kPa)



How It Works: Coolerado Hybrid H80 - Mixed Air Example

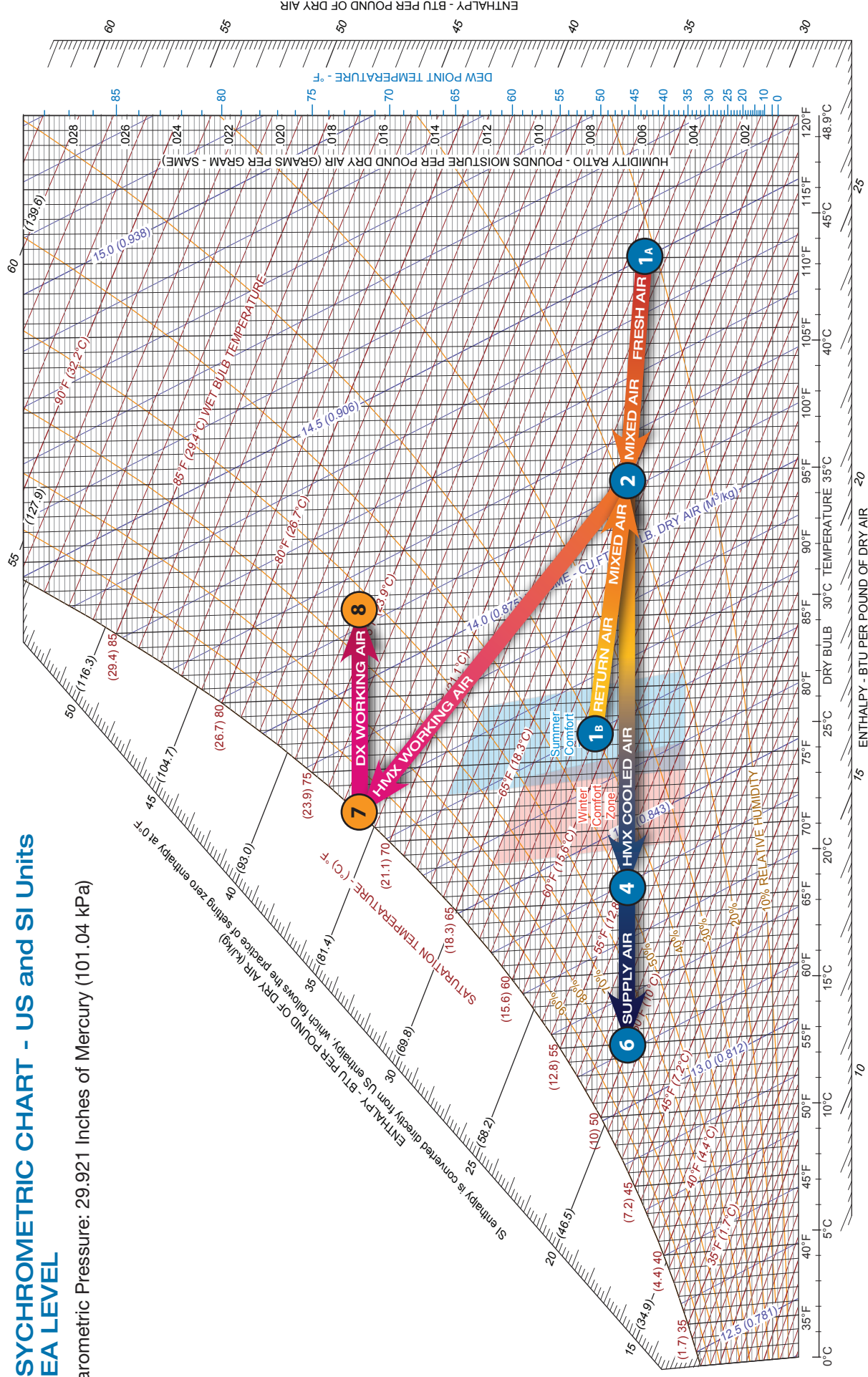


- 1 If 100 percent fresh air is not needed, automatic dampers are used to mix return air from the building with outside air.
- 2 This mixed air will enter the filter at approximately 93°F (34°C). The air is then filtered before it enters Coolerado's patented heat and mass exchange process.
- 3 The air that enters the heat and mass exchangers, or HMXs, is cooled without adding or removing humidity. The mixed air goes through the air conditioner at cooler temperatures.
- 4 The example air will be cooled with no change in humidity, and will leave the HMXs at 66°F (26°C).
- 5 The air then enters the cold refrigerant coils, where additional cooling and dehumidification can occur if needed. In this example, only the first stage of the refrigerant system is needed; so the air conditioner requires less power and operates more efficiently.
- 6 The example air is cooled to 55°F (13°C). A high efficiency fan moves the conditioned air through the process and into the building where it is distributed via the building duct system.
- 7 The vast majority of cooling is performed by the HMXs by using about half of the entering air as working air. Water is evaporated into the working air, which pulls heat away from heat exchangers that in turn pull heat away from the conditioned air. At 72°F (22°C) the working air example is over 35°F (20°C) cooler than the 110°F (43°C) ambient air. The saturated and cool working air is used to remove heat from the hot refrigerant condenser coils more efficiently.
- 8 The working air leaves the hot coils at 86°F (30°C) and then goes on to cool the 2-stage refrigerant compressor and working air fan, saving more power.

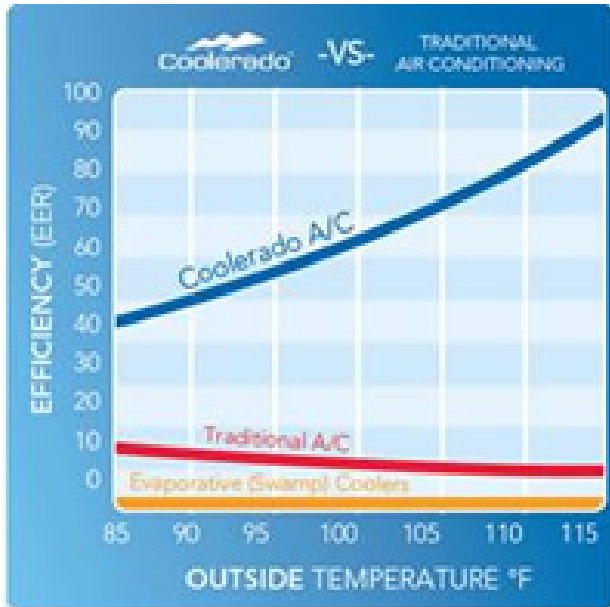


PSYCHROMETRIC CHART - US and SI Units SEA LEVEL

Barometric Pressure: 29.921 Inches of Mercury (101.04 kPa)



ALL OF THE BENEFITS OF SWAMP COOLER, WITHOUT THE “SWAMP”



If your first reaction to our products is that they are swamp coolers, you aren't alone. Many other happy Coolerado customers had that same first impression. They were happy to learn that our proprietary technology was unlike anything they had seen before. Since we don't add any humidity to the air entering your building, you don't have to worry about all the swamp cooler problems (mold and mildew, musky smells, warping wood and paper and biologicals entering the air stream) – and you will use less energy. The Coolerado air conditioner uses a thermodynamic cycle called the Maisotsenko Cycle (M-Cycle) that capitalizes on natural, clean energy found in our atmosphere. [Click here to learn more about how our products work.](#)

HOW COOLERADO COMPARES

 **Best**
 **Moderate**
 **Poor**

		CONVENTIONAL AIR CONDITIONERS	SWAMP COOLERS
Energy Efficiency	 Highly Efficient	 Poor	 Moderate High
Operating Cost/Season	 Low	 Very High	 Low/Moderate
Air Quality	 Excellent	 Stale	 Very Poor
Air Flow	 Low/Comfortable	 Low	 High/Windy
Comfort	 Comfortable– 100% Fresh Air	 Comfortable– Recycled Air	 Moderate/Poor Very Humid
Moving Parts	 2	 10+	 4+
Maintenance Costs	 Low	 High	 Moderate
Environmental Impact	 Low Carbon Footprint	 High Carbon Footprint	 Low Carbon Footprint
Water Use	 Low – Net Water Neutral	 Low – Use at Power Plant to generate	 Medium
Solar Capable	 Solar Capable	 Too Much Power to Operate thru Solar	 Solar Capable



TECHNICAL BULLETIN

Date: 9/23/13

Coolerado Water Quality Requirements

Water quality can be difficult to quantify as there are different factors that must be considered. To ensure proper performance of the Heat and Mass Exchangers (HMXs), prolong the life of equipment components and to avoid increased maintenance, the below water criteria must be considered and evaluated before installation.

Solids: All water supplies have the potential to have un-dissolved solids from water line repairs, additions and maintenance. Solids in the water supply must be filtered out when above 30 microns to prevent plugging of the water distribution system or Heat and Mass Exchangers (HMXs). Coolerado supplies 30 micron water filters with each unit. Installation of the Coolerado supplied 30 micron filter or equivalent is required on all installations to filter un-dissolved solids.

Organics: Coolerado's HMX plate material is manufactured with polypropylene that is not a food source for molds; the plate material also has a biocide impregnated into it to prevent organics from growing. Typically the biocide supplied from a potable water supply district will be enough to prevent any mold growth. However, if supply water that does not contain biocides is being used, like well water, both the air and maybe the water will have organics that can sustain molds, generally in the form of a slime that can grow in the water distribution system and on the wet portion of the HMX plate surface. In these cases a biocide such as chlorine may be required.

Dissolved minerals: There are a lot of dissolved minerals in water, however we are most concerned with the hardness of water made up generally mostly of calcium but can include magnesium. Hard water causes two problems, the first it prevents soap from creating suds and leaves soap scum on sinks etc. The second and maybe the bigger problem for any evaporative equipment is the formation of scaling most generally in the form of calcium carbonate; (the magnesium will stay in solution under much higher concentrations). Calcium carbonate can close off water lines, collapse cooling towers from the weight of scale build up and in general cause many problems. The key here is the amount of calcium water hardness. In low quantities of hard water is not a problem.

How hard water is generally defined as:

Classification	Hardness in mg/L or PPM
Soft	0 - 60
Moderately Hard	61 – 120
Hard	121 – 180
Very Hard	> 180

Water that is Moderately Hard or greater should be treated with a sodium based water softener.

Coolerado cannot know the details of your water supply and therefore how the water will react with our water delivery system. The water should be tested to properly address any water quality concerns, contact your local water utility to determine the total hardness of your water or have the water tested at a water laboratory.

Please consult with your Coolerado Sales Manager, should you have any questions.