NEMA Enclosures For Every Application

You’ve invested time, talent, and money in your control system. Protect it with a quality enclosure.

A quality enclosure in an industrial environment not only maintains a better appearance over time, it also does a better job protecting the components in it.

What is a NEMA enclosure?
NEMA enclosures meet the National Electrical Manufacturers Association standards for performance and protection of the electrical equipment within them. NEMA enclosures range in size from small pushbutton boxes to room-size panels. Enclosures are given a NEMA rating according to the types of applications the enclosure serves.

What are NEMA enclosures used for?
NEMA enclosures house all kinds of electrical components from simple terminal blocks, to industrial automation systems, to high voltage switchgear. In industrial automation systems, NEMA enclosures often house motor controls, drives, PLC/PC control systems, pushbuttons, and terminal systems. Some enclosures are configured to be operator consoles, while others are designed with flanges for mounting disconnects.

Do we have the enclosure you need?
AutomationDirect offers over 6,900 enclosure part numbers across NEMA 1, 3, 3R, 3S, 4, 4X, 5, 6, 6P, 12, and 13 standards. AutomationDirect has teamed up with name brand enclosure manufacturers to offer you quality NEMA enclosures at great prices. Our wide selection of quality Saginaw, Wiegmann, Attaboy, Hammond, Quadritalia, and Integra enclosures should allow you to find the perfect one for your industrial automation application. All brands offer a full line of subpanels and accessories to allow you to tailor the enclosure to your application.

30-day money-back guarantee
Order with the assurance of our unconditional 30-day money-back guarantee on enclosures. See terms and conditions for details.

Attabox is one of the brands of Robroy Enclosures, the original US manufacturer of non-metallic enclosures. The Attabox line includes both fiberglass-reinforced polyester and polycarbonate enclosures. We offer same-day shipping on most enclosures and accessories direct from the Robroy manufacturing facility in Belding, Michigan. Non-stock models can be shipped within 20 business days.

NEMA Enclosures

What Do The NEMA Ratings Mean?
The National Electrical Manufacturers Association (NEMA) is a US Manufacturers Organization which actively promotes standardized product specifications for electrical apparatus. While NEMA does not actually test products, it establishes the performance criteria for enclosures intended for specific environments.

NEMA standards describe each type of enclosure in general and functional terms, and specifically omit reference to construction details. In other words, NEMA specifies what an enclosure must do, not how to manufacture it. This is also true about the En 60.529/IEC 529.

NEMA Classifications

NEMA 1 enclosures are typically used for controlling communications and terminations from objects and personnel. This style of enclosure, while offering a latching door, does not have a gasketed sealing surface. NEMA 1 enclosures are used in applications where sealing out dust, oil, and water is not required.

NEMA 2 enclosures are intended for indoor use primarily to provide a degree of protection against limited amounts of falling water.

NEMA 3 enclosures are intended for outdoor use primarily to provide a degree of protection against windblown dust, rain, sleet, and external ice formation.

NEMA 3R enclosures are typically used in outdoor applications for wiring and junction boxes. This style of enclosure provides protection against falling rain, sleet, snow, and external ice formation. Indoors they protect against dripping water. This style of enclosure does not have a gasketed sealing surface. Some models have hasps for padlocking.

NEMA 3RX enclosures are typically used in outdoor applications for wiring and junction boxes. This style of enclosure provides protection against falling rain, sleet, snow, and external ice formation and provides an additional level of protection against corrosion. Indoors they protect against dripping water. This style of enclosure does not have a gasketed sealing surface. Some models have hasps for padlocking.

NEMA 35 enclosures are intended for outdoor use primarily to provide a degree of protection against windblown dust, rain, sleet, and to provide for operation of external mechanisms when ice laden.

NEMA 4 enclosures are used in many applications where an occasional washdown occurs or where machine tool cutter coolant is used. They also serve in applications where a pressurized stream of water will be used. NEMA 4 enclosures are gasketed and the door is clamped for maximum sealing.

NEMA 4X enclosures are made of stainless steel, aluminum, fiberglass, or polycarbonate. NEMA 4X enclosures are used in harsh environments where corrosive materials and caustic cleaners are used. Applications include food, such as meat/poultry processing facilities, where total washdown with disinfectants occurs repeatedly, and petro-chemical facilities, including offshore petroleum sites.

NEMA 5 enclosures are intended for indoor use primarily to provide a degree of protection against settling airborne dust, falling dirt, and dripping non-corrosive liquids.

NEMA 6 enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against the entry of water during occasional, temporary submersion at a limited depth.

NEMA 6P enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against the entry of water during prolonged submersion at a limited depth.

NEMA 11 enclosures are intended for indoor use primarily to provide, by oil submersion, a degree of protection to enclosed equipment against the corrosive effects of liquids and gases.

NEMA 12 enclosures are intended for indoor use to provide a degree of protection against drips, falling dirt, and dripping non-corrosive liquids. NEMA 12 enclosures are most commonly used for indoor applications of automation control and electronic drives systems, including packaging, material handling, non-corrosive process control, and manufacturing applications. Gasketed doors seal the enclosure contents from airborne contaminants and non-pressurized water and oil.

NEMA 12K enclosures with knock-outs are intended for indoor use primarily to provide a degree of protection against drips, falling dirt, and dripping non-corrosive liquids other than at knock-outs.

NEMA 13 enclosures are intended for indoor use primarily to provide a degree of protection against dust, spraying of water, oil, and non-corrosive coolant.
What Do The NEMA Ratings Mean?

Comparison of Non-Hazardous Applications

<table>
<thead>
<tr>
<th>Environmental Condition</th>
<th>NEMA Type</th>
<th>1</th>
<th>2*</th>
<th>3</th>
<th>3R</th>
<th>3SR</th>
<th>3S</th>
<th>4</th>
<th>4X</th>
<th>5</th>
<th>6</th>
<th>6P</th>
<th>12</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidental contact with the enclosed equipment</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Ingress of solid foreign objects / falling</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Windblown dust</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circulating/dissolving dust, fumes and fumigations</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
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<td>Dripping/light splashing water</td>
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</tr>
<tr>
<td>Rain, sleet, snow, external ice formation</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Operation of external mechanisms when ice laden</td>
<td></td>
<td>X</td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Occasional temporary submersion at limited depth</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Prolonged submersion at limited depth</td>
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<td>Corrosive agents</td>
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<td></td>
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<td></td>
<td>X</td>
<td></td>
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<td></td>
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<tr>
<td>Spraying/splashing/soaking oil and non-corrosive coolant</td>
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<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

*Note: These enclosures may be ventilated. However, Type 1 may not provide protection against small particles of falling dirt when ventilation is provided in the enclosure top.

The European IP Code

European Union members use the EN60.529/IEC 529 standard to classify an enclosure’s protection against various hazards. This system has been adopted by many other countries outside of Europe. The ingress protection (IP) system uses a two-digit code to describe the enclosure’s protection capabilities. The first digit signifies the protection level against solid objects, including dust. The second digit represents the enclosure’s degree of protection against ingress of water. The two-digit code is preceded by the prefix “IP.”

The cross-referenced table on the next pages is an approximate comparison of NEMA and International Electrotechnical Commission (IEC) classifications. It is offered for reference only. Please consult the appropriate standards for a full description of the requirements for each classification.

NEMA to IEC - Enclosure Rating Cross Reference*

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<thead>
<tr>
<th>NEMA Type</th>
<th>IP23</th>
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<th>IP32</th>
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<td>X</td>
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<tr>
<td>3R</td>
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</tr>
</tbody>
</table>

*Note: This cross-reference table is an approximation of NEMA and IEC classifications for reference only. Please consult the appropriate agency’s requirements and test qualifications for complete information.

How to Select Your Enclosure

1. What kind of environment is your enclosure going to be in and what level of protection do you need?

Your enclosure’s primary function is to protect the equipment inside it from the surrounding environment. Therefore, you need to understand the environment where the enclosure will be located and select the appropriate level of protection. An enclosure’s level of protection is defined by its NEMA rating. Refer to “What Do the NEMA Ratings Mean?” later in this section for more information.

Keep in mind that it is just as important not to over-specify the protection level of your enclosure as it is to under-specify, as increasing the protection level typically increases the cost of the enclosure.

2. Determine your security requirements.

Your enclosure may also need to protect its contents from unauthorized access to the components it houses. AUTOMATIONDIRECT has options to meet a wide variety of security needs. For low-risk installations, a screw cover, lift-off cover, or Single Door with clamps may be sufficient. In higher risk installations, an enclosure with keylocking and/or padlocking capabilities may be needed. If you cannot find a stock enclosure with the security features that you need, AUTOMATIONDIRECT offers replacement locks and latches that you can retrofit to your enclosure.

3. Determine the size enclosure you need.

Physical space for your component is not the only requirement. Considerations like heat dissipation and venting must be taken into account. First, determine the height and width for your enclosure by laying out the footprint space needed for your control components on a standard subpanel size. Remember to consider the mounting holes for the subpanel when planning the required footprint space. The size of the enclosure will determine if you need a Single Door, two-door, or wall-mount. The height and width of your enclosure will determine whether it should be a wall-mount, floor-mount, or freestanding enclosure. Next, you’ll need to determine your panel depth. Remember that the subpanel mounting takes up a small portion of the depth. Also, any pushbuttons, operator interfaces, indicators, meters, etc., that you plan to mount on the enclosure door will occupy some enclosure depth. Finally, you must allow for heat dissipation [see step 4]. If you have estimated component sizes or heat generation, it’s always better to oversize the enclosure when you have the available space.

For assistance in finding the enclosure series that meets your needs, refer to the “Enclosure Attributes” chart later in this section.

4. Determine your thermal management needs.

Your enclosure must be able to dissipate the heat generated by the components inside it either alone or by adding a cooling device. You might be able to side-step additional cooling by up sizing your enclosure to increase the surface area through which heat is transferred to the atmosphere. If additional cooling is required, AUTOMATIONDIRECT has many devices to choose from. But always remember that the heat dissipation method you select must be compatible with the enclosure’s NEMA rating.

For some applications, a simple louver plate will provide adequate heat dissipation. A fan kit and louver combination is your next most economical ventilation option. For small enclosures, a vortex cooler using compressed air is another option. A sealed enclosure may require a heat exchanger or an air conditioner controlling the internal temperature without introducing outside air and its contaminants.

If you need help with these calculations, go to: http://support.automationdirect.com/notes/enclosure_environment.html.

An enclosure may also require heating where environmental conditions are conducive to condensation and/or ice formation inside the enclosure. Unfortunately, we cannot make these determinations for you as all control applications are different. Conservative choices increase your margin of safety and allow for future changes.

5. Choose your accessories.

AUTOMATIONDIRECT offers a wide range of accessories for our enclosures.

Subpanels - our enclosures do not come with subpanels unless specified in the product description.

Mounting alternatives - floor stand kits, mounting feet, casters, and pole-mounting kits

Drip shields for outdoor enclosures

Window kits

Folding shelves

Hole seals and hole plugs

Adapter plates for disconnects

Grounding accessories

Replacement locks and latches

Electrical interlocks

Print pockets

Panel-mounting accessories - swing-out panel kits, adjustable depth-mounting kits, panel supports for heavily-loaded panels, and dead front kits

Frames, channels and rails for rack-mounted equipment

Terminal brackets and strips, mounting channels, grid strips, and DIN-rails

Touch-up paint

Replacement gaskets
Who is Wiegmann?

Hubbell Incorporated has been in business since the late 1800s. Like his contemporaries, Edison, Ford, and Westinghouse, Harvey Hubbell II contributed to both spheres of progress: new design and manufacturing innovation. Wiegmann has been building high quality industrial enclosures for over 75 years. In 1994, Hubbell Incorporated purchased the company from the Wiegmann family. The Wiegmann brand is now part of the Hubbell Commercial Construction division. With the resources and backing of Hubbell, millions of dollars have been injected into the Wiegmann manufacturing facility in Freeburg, IL to produce enclosures of consistently high quality. CNC metal cutting, robotic plasma welding, and powder coating are just a few of the innovative steps the Wiegmann facility has taken in producing their enclosures. In addition, these processes also lower the cost for you, the user. Add our highly efficient operation, and you can enjoy “OEM-like” Prices on single-unit purchases. Just look at a few of the features provided by the modernized manufacturing processes.

It’s not just a steel box!

Quality manufacturing processes

At a casual glance, many enclosures look pretty much alike—big gray metal boxes. However, all enclosures are not created equal. A quality enclosure not only maintains a better appearance over time in an industrial environment, it also does a better job of protecting the components within it. The reliability of a control system depends on a quality enclosure properly protecting its electronic control components no matter what the external environment. Following the legacy of Harvey Hubbell II, Wiegmann is constantly modernizing their manufacturing facility in Freeburg, IL to produce enclosures of consistently high quality. CNC metal cutting, robotic plasma welding, and powder coating are just a few of the innovative steps the Wiegmann facility has taken in producing their enclosures. In addition, these processes also lower the cost for you, the user. Add our highly efficient operation, and you can enjoy “OEM-like” Prices on single-unit purchases. Just look at a few of the features provided by the modernized manufacturing processes.

Quadritalia Enclosures Overview

History and Objectives

Quadritalia is a family-owned business, run by founding partners in Brendola, in the Vicenza province in northern Italy.

Quadritalia started producing modular metal products for the electro-technical industry in 1988, and quickly distinguished itself for the high quality and wide range of its products.

Production

Current production operations use the latest completely automated robotic facilities, which are controlled by our technical department through CAD/CAM stations. Our R&D dept. develops the design and performs the research for all new projects.

Our production lines have been improved and customized over a period of more than 20 years to ensure a state-of-the-art level of efficiency. This allows us to offer a wide range of standard products and provide complete technical support for all users.

Quadritalia uses the best automatic production lines available. All welding stations and all the different production stages’ machinery and plants are automatically controlled.

The painting process is carried out on a fully-automatic robotic system, including three spraying booths. The foamed polyurethane gasket is applied to all panels to ensure the ultimate protection against water and dust on all our products.

All our products are inspected by our quality assurance dept. to ensure all are finished with the utmost quality.

Quadritalia Enclosures Overview

1. Removable top panel
2. Inner stiffening door profiles in galvanised steel
3. Reversible door with 4 hinges and 4 locking points
4. Frame elements with innovative symmetrical profile, in galvanised steel, Sendzimir
5. Universal corner joint in Zamak alloy
6. Cable entry compartment with guillotine entry flanges
Hammond Enclosures Overview

Hammond Manufacturing is a global company with customers worldwide. Our 800 plus team members work together to deliver on our promise of quality products and service excellence. High performance manufacturing equipment and continuous improvement management techniques combine to enhance our reputation for quality. Ongoing efforts to differentiate ourselves through high levels of service and customer satisfaction are a key corporate focus. These are the cornerstones to our future success.

Service Excellence

Our difference is industry leading service you can trust. We know there are many enclosures supplier alternatives, but it’s our service that make Hammond different. We've committed our people and resources to ensuring you get exactly what you need, when you need it.

Quality Products

Hammond understands that inconsistent quality can cost you valuable time and money – that’s why quality is a priority for us. When enclosures protect very valuable equipment, or are a key component to an OEM’s finished products, compromising on enclosure quality is not a valid option. Hammond products carry the industry recognized approvals and our facility is ISO9002:2015 certified. Our many years of experience developing and manufacturing enclosure solutions provides a confidence that Hammond will meet and exceed your quality expectations.

Saginaw Enclosures Overview

Saginaw Control & Engineering has been serving the electrical industry since 1963. We specialize in manufacturing top-quality carbon steel, galvanized steel, and stainless steel electrical enclosures built to accurate dimensions. Our 310,000 square foot manufacturing facility, located in Saginaw, Michigan, uses state-of-the-art fabricating equipment, including the newest laser technology. All products are protected with the highest quality powder finish available in today’s market.

Our standard stock electrical enclosures include:
- Freestanding Enclosures
- Floor-mount Enclosures
- Wall-mount Enclosures
- Disconnect Enclosures
- Modular Enclosures
- Operator System Enclosures
- Pushbutton Enclosures
- Junction Enclosures
- Wire Trough

We maintain stock of all of our enclosures and accessories, ready for immediate shipment, at all five of our warehouses:

- Aurora, OH
- Kenosha, WI
- Lenoir City, TN
- Tulsa, OK
- Sparks, NV

With this network of warehouses, we can deliver any in-stock enclosure to 99% of the 48 contiguous United States and parts of Canada within two business days, even those large enough to require freight shipment!

Quality Policy

Saginaw Control & Engineering is committed to understanding and meeting or exceeding the quality needs and expectations of all of our customers, while striving for continual improvement at all times. We, at Saginaw Control and Engineering, affirm this commitment, and have established a comprehensive quality assurance system, which will allow our company to meet all of the requirements of the ISO 9001:2015 quality management system standard.
AttaBox Enclosures Overview

Who is AttaBox?
AttaBox began manufacturing polycarbonate enclosures in 2007, and quickly rose to prominence in the market due to their quality, performance, and innovative design. In 2016, AttaBox joined Robroy Enclosures, a subsidiary of Robroy Industries and the pioneer of non-metallic electrical enclosures. The merger combined AttaBox’s innovation with Robroy’s 70 years of engineering and manufacturing experience under one roof in Belding, Michigan.

Selection
Every enclosure application is different. No single size, shape, or style meets every possible requirement. A range of materials, styles, shapes, and functions is necessary to accommodate the wide range of customer needs. As a result of the merger with Robroy, AttaBox now offers one of the largest available selections of non-metallic enclosures representing the varying benefits of polycarbonate, fiberglass-reinforced polyester, and polyvinyl chloride (PVC), ensuring that customers have the ability to achieve protection for a wide range of applications. AttaBox also offers the most contemporary product designs to meet the changing needs of mounted components, maintaining a balance between appealing aesthetics and stringent physical performance standards.

Capabilities
As a non-metallic enclosure pioneer, Robroy product concepts have led the enclosure industry in design innovation, producing unsurpassed and proven product performance. They mold every enclosure in-house using the highest processing standards, with hands-on control of the manufacturing process from the first step to the last touch assuring quality control in each step of the process. All fiberglass enclosures are manufactured from Robroy’s SolarGuard® fiberglass system for unsurpassed ultraviolet (UV) resistance while meeting UL 94 SV fire retardancy standards. SolarGuard® is also a non-halogenated system (contains no bromine or antimony), reducing the risk of smoke-borne toxicity.

Value
Non-metallic enclosures offer significant economic savings over metallic alternatives such as stainless steel while providing comparable or superior physical properties. AttaBox industrial enclosures from AutomationDirect are competitive with other non-metallic enclosure options while frequently offering better performance value.

Proven protection
Many factors may influence your purchase of an enclosure. But all enclosure purchases ultimately originate with the need for the enclosure to protect whatever you put inside them. Whether your enclosure is intended to house an electrical connection, a control panel, or sensitive measurement systems, the demand for uncompromised protection against diverse forces – moisture, dust and dirt, UV radiation, temperature extremes, and/or impact – is the number one reason you can put your trust in AttaBox enclosures from AutomationDirect.

Integra Polycarbonate Enclosures Overview

Advantages of Polycarbonate
Lighter Weight Than Other Enclosure Materials
The lighter weight makes polycarbonate enclosures easier to carry and install. The lighter weight may also save money on shipping costs.

Eco-friendly
Polycarbonate enclosures at the end of their service life can be recycled, as can all scrap polycarbonate generated during the manufacturing process.

Impact Resistance
Integra enclosures have been tested to UL-746 falling ball impact tests at 73°F. With their high impact resistance, Integra enclosures are rarely damaged from shipping and handling.

UV Light Resistance
Polycarbonate is a strong, durable material with an integral UV inhibitor that withstands the harsh conditions of the outdoors. Polycarbonate enclosures will maintain their shape, color and strength even when exposed to UV light.

Easily Modified
Polycarbonate enclosures are easy to modify because they cut easily and do not create hazardous dust, cause less wear on cutting tools, and leave a clean, attractive surface with no sharp edges.

Watertight and Marine Friendly
All Integra polycarbonate enclosures are NEMA 4X rated, which means that these enclosures are watertight and can withstand direct water spray. Many models are also NEMA 6P rated, which means that they can withstand prolonged submersion at shallow depths. Polycarbonate enclosures are salt water resistant, which means they are marine friendly.

Wide Operating Temperature Range
Polycarbonate is stable and holds its tensile strength over a temperature range from -40°F to 265°F.
Enclosure Thermal Management Overview

Industrial enclosures almost always require air conditioning to protect equipment and components from harsh and hot factory floor environments and heat generated from electrical components housed within the enclosure. In some instances, such as for outdoor installations, enclosures may require heating, or if they are located where temperature fluctuates, such as for outdoor installations, enclosures may require cooling and/or heating are often required to maintain optimal operating temperatures, keep condensation from forming, and prevent components from overheating or freezing.

AutomationDirect offers a wide selection of enclosure thermal management equipment to provide optimal conditions to protect enclosure components and assure continuous and safe operation, while extending the life of equipment and components, which result in operation costs savings. Our lineup of quality thermal management products include air conditioners, coolers, heat exchangers, cooling fans, filter fans, heaters, thermostats, hygrostats, and vents, from top manufacturers.

Learn and Videos Libraries

AutomationDirect provides many educational and informative resources to help you make the best decisions for solutions to your specific needs. Take advantage of all this FREE information we provide. Check out our Library site with thermal management resources at: https://go2adc.com/thermal

Or, our video library with air conditioner information at: https://go2adc.com/VideosACs

Enclosure Cooling

Our offering of enclosure air conditioners, thermoelectric coolers, vortex coolers, and fans, include a wide range of top-quality cooling units designed to maintain the temperature inside an electrical enclosure at or below a safe level to protect enclosed equipment.

There are several questions to answer when selecting the type of device that best suits an enclosure’s cooling requirements.

1. Does the maximum ambient air temperature exceed the maximum allowable enclosure temperature? If it does, devices that exchange air between the interior and exterior of the enclosure (fans and vents) or use the outside air to cool the inside air (heat exchangers) will be ineffective, and will in fact raise the inside temperature of the enclosure instead of lowering it. In this situation, an air conditioner, thermoelectric cooler or vortex cooler is required.

2. To what degree does the interior of the enclosure need to be isolated from the ambient environment? If no outside air can be allowed to enter the enclosure, a closed-loop cooling device, such as an air conditioner, heat exchanger, thermoelectric cooler, or vortex cooler, is required.

Closed-loop cooling is commonly used for:

- Areas where ambient temperature is as high or higher than the desired internal temperature
- When internal components generate excessive heat
- Harsh environments

3. How much cooling capacity is required? Each type of device has a range of cooling capacities. In many cases, the required cooling capacity alone can dictate the type of device needed.

4. Does the overall enclosure cooling system needs to be supplemented to improve the circulation of air within the enclosure or increase the convection rate at “hot spots” within the enclosure? If so, a rack panel fan or a directional cooling fan should be considered.

Saginaw Enviro-Therm® Series Air Conditioners

Saginaw Enviro-Therm series air conditioners are rugged, energy efficient, and reliable closed-loop cooling systems that provide superior cooling capacity and are constructed with heavy gauge carbon steel, 304 or 316 stainless steel.

Saginaw NextGen series is the super energy-efficient version of Saginaw’s Enviro-Therm series. These air conditioners provide reliable closed-loop cooling in a heavy gauge carbon steel housing.

- Multiple frame sizes with various BTU/H choices
- Use with NEMA/UL Type 3R, 4, & 12 enclosures (also 4X for standard Enviro-Therm series)
- 120, 230, 460 VAC models
- Compressor heater (standard Enviro-Therm units)
- High temp alarm
- Hermetically sealed rotary compressor (NextGen series)
- Built-in RS-485 serial modbus control and monitoring (NextGen series)
- Active condensate system (NextGen series)
- Environmentally friendly and chlorine-free R-134a refrigerant
- UL File E498756e (Standard) & E498755e (NextGen series)
Enclosure Thermal Management Overview

Enclosure Cooling (continued)

STRATUS® TA Series Air Conditioners

STRATUS® TA series air conditioners are designed to fit 7-, 8-, 10- and 12-inch-deep enclosures. TA series air conditioners offer smooth/flat sides and provide reliable cooling with high efficiency.

- Multiple frame sizes with cooling capacities up to 7,580 BTU/H
- For use with NEMA/UL Type 4, 4X and 12 enclosures
- 115, 230, 460 VAC and 48 VDC models
- Corrosion resistant condenser system
- Free-standing rigid chassis for easy installation and maintenance
- Anti-short-cycle compressor protection
- Digital programmable controller with visual alarms
- High energy-efficient compressors
- Active condenser system
- Thermal expansion valve
- UL File: S243486, UL 507, Type 4, 4X, and 12 enclosures

Seifert SoliTherm® Thermoelectric Coolers

Seifert SoliTherm thermoelectric coolers use the Peltier Effect for IP66/NEMA 4X closed-loop cooling. The only moving parts for these coolers are axial fans so there is virtually no maintenance.

Their compact design also allows for easy installation in nearly every position (except roof mounting) because there is no compressor or moving parts aside from the fans. These units are available as recessed with internal heat sink and fan inside the enclosure and ambient components on the outside. Frames are also available for easy external mounting.

- Use with NEMA 4, 4X and 12 enclosures
- Stainless steel housing
- 24 VDC and 120 VAC power options

Stratus® Air to Air Heat Exchangers

Stratus air to air heat exchangers use a closed-loop cooling system that employs the heat pipe principle, which has a liquid refrigerant inside the sealed tubes, and exchanges heat from inside the enclosure to the outside.

The design provides a top-to-bottom air flow pattern with maximum separation of the inlet and outlet. This design pulls the hottest air from the top of the enclosure and returns the cooled air from the bottom of the heat pipe to the enclosure. The air flow on the ambient side is bottom in, top out, so that the hotter discharge air moves up and away rather than being recirculated. The aluminum end plates and baffles improve conduction and reduce corrosion for longer life.

- Low operating cost and low maintenance
- Easy to mount on one side of your enclosure
- Energy efficient; uses no more power than a filtered fan system
- Filter-free; no diminished cooling capacity
- Use with NEMA Type 4 and 4X enclosures

Stratus® Vortex Coolers

Stratus vortex coolers create a vortex that reaches speeds of up to 1,000,000 rpm as it is forced down the inner walls of the vortex tube. The air is separated into hot and cold air streams and at the end of the hot tube, a small portion of this air exits through a needle valve as hot air exhaust. The super-cooled air flows through the center of the generator and exits through the cold air exhaust port into the enclosure for cooling.

- Where conventional enclosure cooling by air conditioners or heat exchangers is not possible
- Small physical size
- No fans

- Creates cool air without refrigerants (no CFCs, HCFCs)
- Exceptionally reliable - no moving parts and virtually no maintenance
- Suitable for harsh environments

Filter Fans

- Indoor and outdoor versions available
- Easy filter change
- Weather/UV resistant UL 94V-0 indoor/ UL94-HB outdoor
- No screw installation on indoor models
- Low noise
- 120 VAC and 24 VDC models
- Easy airflow direction switching on most models
- Includes pre-installed gasket
- UL recognized - file: E234324

Filter Fans Plus

- Impact-resistant fan housing polypropylene聚合物
- Flared-in-place polyethylene gasket
- Low noise
- 115 and 230 VAC, 12, 24, and 48 VDC models
- UL light resistant according to UL 746C (F1)
- Flame retardant: UL94 V0
- All models: IP54, VDE, EN, CE, UL Type 12 when using supplied filter
- UL Recognized - file: E234324

Fandis Virdis Series Filter Fans

Virdis series filter fans are a practical solution to remove heat from an enclosure. These fans channel filtered ambient air into the enclosure while expelling warm internal air through an exhaust fan or roof unit to reduce temperatures and protect electronic components from overheating.

- Cover slides open for easy filter change without tools
- No-screw installation
- Size measure units can be used when side mounting is not available
- Available in ANSI 61 gray, RAL 7035 light gray, or black

STEGO StegoJet Directional Fans

StegoJet directional cooling fans provide spot cooling for “hot spots” and high heat load components inside an enclosure. This compact and powerful fan provides maximum cooling range with an air output in almost any direction.

- Dual duct system allows four different DIN rail mount orientations, while a hinge allows the fan housing to tilt up to 45° angle
- Air duct at the air outlet can be directed at a 45° angle to the housing and can be rotated 360° to force the air in any direction

Hammond Rack Panel Fans

Hammond high CFM fan kits for data communication racks extend the life of rack-mounted equipment by increasing airflow within the rack or cabinet. Fan kits include one or two fans, fan grills for added safety, and all essential parts.

- One or two ball bearing type fan kits
- Kits include one cord assembly
- Includes a UL 507 rated nil CSA certified

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