

Industrial Technology

Enclosure and electronic packaging
solutions for industrial systems



Your partner for industrial ap

Strong brands, long term support



PENTAIR TECHNICAL PRODUCTS

Pentair Technical Products, a Pentair global business unit, is the leading provider of worldwide product and service solutions for enclosing, protecting and cooling electrical and electronic systems. With the highest level of quality, performance and aesthetics available in the market today, its industry-leading brands provide a broad variety of standard, modified and engineered solutions to the commercial, communications, energy, electronics, industrial, infrastructure, medical, security and defense markets.



Schroff®

www.schroff.biz

Birtcher®

www.birtcherproducts.com

McLean®
COOLING TECHNOLOGY

www.mcleancoolingtech.com

Hoffman®

www.hoffmanonline.com

CALMARK®

www.calmark.com

Schroff® has been a world leading brand in the electronics packaging industry for over four decades. Schroff® supplies subracks and accessories, instrument cases, 19" cabinets, backplanes, integrated systems and enclosure hardware, complete packaging systems for MicroTCA, AdvancedTCA, CompactPCI, PXI, VME, VME64x, VPX, VXS and customer-specific enclosure systems.

Calmark® and **Birtcher®** are industry leading brands in the design and manufacture of ruggedized components that hold boards in place and transfer heat in demanding and critical applications. Calmark® products include card guides, Card-Lok retainers, PCB retainers, and metal inserters / extractors. Amongst Birtcher® products are Wedge-Lok® retainers and conduction cooled frames.

McLean® with more than 30 years of experience producing everything from fan assemblies to standard air conditioners and heat exchangers to engineered cooling applications for one-of-a-kind systems, the Pentair Technical Products McLean brand has the people and products to deliver the cool.

Hoffman® offers a broad range of enclosure designs and sizes for demanding environments. The range goes beyond electrical enclosures and includes thermal and condensation management products and a wide array of accessories.

Preface

Applications and systems

Enabling and protecting electrical and electronic devices



Electronics in industrial environment

Among many other sectors electronic boards in particular drive industrial applications and solutions to highest performance. Together with - or incorporated into - electrical devices these electronics have become an integral part of the industrial machinery, factory automation and centralized or decentralized control units. They provide machine control, signaling and data transfer, they enable the connection to different machines and to management information systems – finally they have become indispensable in a modern factory.

Regardless of how important you may find electronic boards for your particular needs – they remain sensitive to environmental influences. Not only dust and humidity or corrosive substances, but also heat, shock or vibration will influence the performance of electronics and finally of your machinery and processes.

Partnership and long term support

This is where Pentair enters the scene. For five decades we have been known for Electronic packaging solutions, cooling expertise and robust as well as aesthetic enclosures and cabinets. You can rely on well-thought, first class products paired with configuration and modification services of all types. We provide custom front panels in less than 5 days, we deliver individual cabinet configurations from a variety of combinations in less than 10 days and we are not shy to develop and design your Taylor-made case, system or enclosure. We will listen to understand your particular need and our products and solutions will protect your electronics and enable your success.

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Our products are manufacture

A variety of components, systems and solutions . . .

Modular and wall mount Enclosures

Take a look at your industrial equipment and you will be surprised how often you will detect our products.

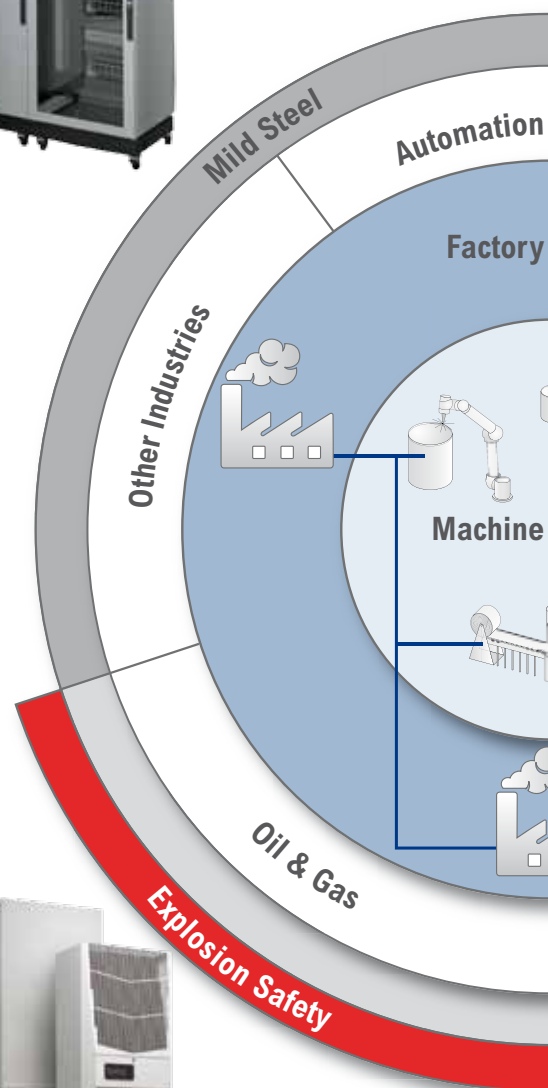
Most obvious is the enclosure product range representing the outer shell of control units, switch gears or other electrical devices. Enclosures are perfectly designed to protect the interior against water, dust or other life-shortening substances. Our Hoffman branded enclosures are certified to international standards like IEC, UL, NEMA, CSA or GOST for the Russian market.

Corrosion resistant or made for hazardous locations

As a result of different environmental circumstances you may need a variety of materials in use: Mild steel for the normal factory shop floor, stainless in food and beverage, pharmaceutical or oil and gas and plastics or composites in waste water and chemical environments or for outdoor applications. In addition our aluminium enclosures and cabinets round up the portfolio to provide a perfect balance of corrosion resistance and light weight. Select your choice from our offering. Hoffman has it all!

Thermal management

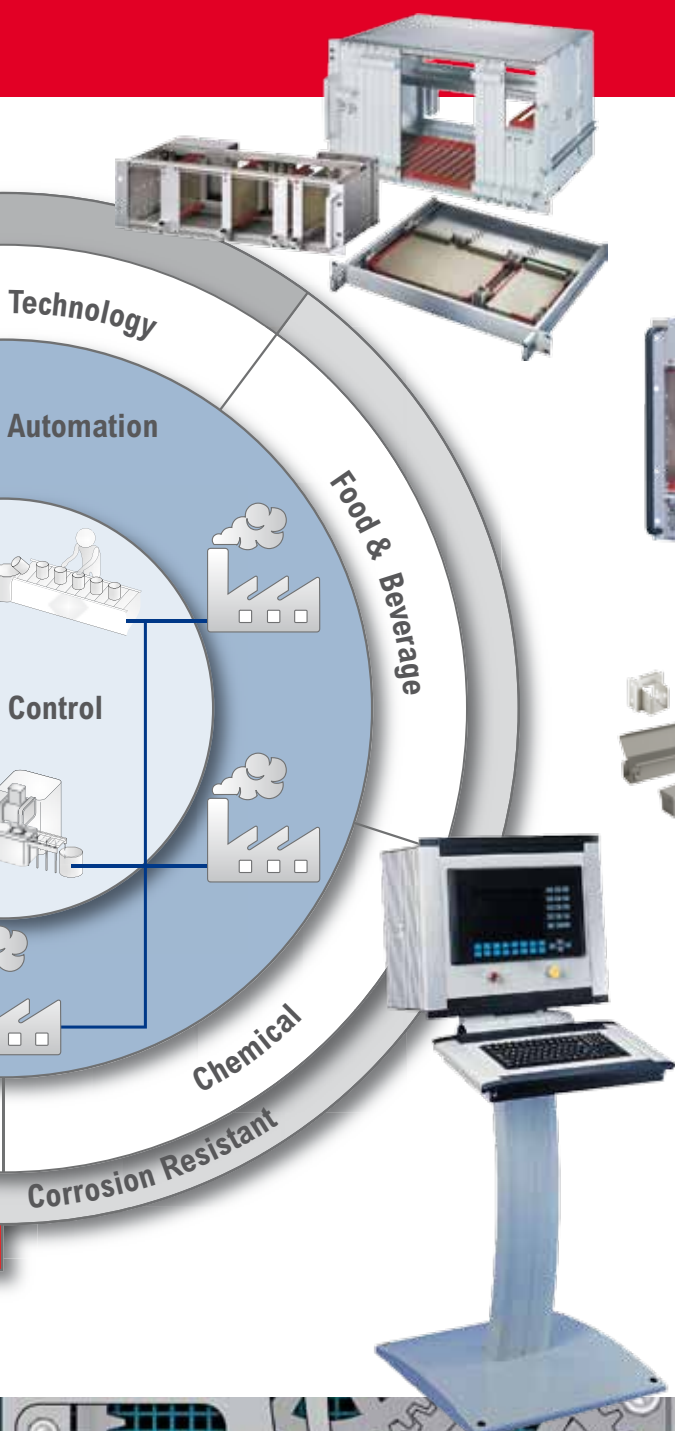
The better you may seal an enclosure, the more likely the interior will suffer from lack of ventilation. Electronic and electrical components nowadays come with more and more processing power, the packaging density is increased as well as their power loss. Pentair can help with decades of experience in cooling and provide you with a solution using our mature filter fans and air conditioners to suit your needs.



Our many options – capable of meeting any design needs

d to suit your applications

... for equipment protection



HMI and Cable & Wire management

Securely bridging the distance between two machines or enclosures must not become a nightmare. Our Hoffman brand offers a basket of trunking and wire ways for professional and secure cabling. We also connect yourself with your machinery by providing Human-Machine-Interface enclosures housing your touch screens and PLCs. Again those are attached to the machinery with pendant arm systems which will separate and guide the data and power cables securely.

Boards and Control Systems

It's the inside of a box, which makes the difference. Your electronics, your control system, and your processes: all that will determine your competitive advantage. With Schroff you can be assured you have a partner who understands and will solve all of your thermal and mechanical issues related to board housing. We conduct thermal simulation as well as shock and vibe tests and have developed a range of products for particular use in industrial environment. With our Calmark & Birtcher card-locks and retainers we have increased our capabilities to secure boards in a buzzing environment.

Standard, modified or customization?

We will not force you to ask that question! Our large standard portfolio provides you with short delivery times and cost advantages. And we have implemented systems to apply pre-defined modifications in a very fast manner to support your particular needs and your time-to-market aspirations at the same time. On top of that we employ a large number of project managers and engineers to develop and deliver your particular solution. Integrating different components mechanically and adding cooling and basic wiring up to integration Level 3 has been our business for many years. Benefit from our experience, we are happy to assist.

Electronic boards in industrial

19" technology adapted to the particular needs . . .

A variety of products

The 19" technology has proven to be the most important standard to allow and secure interoperability of board based systems. While mostly implemented in Test & Measurement it still plays an important role in industrial applications whenever electronics need to be installed, combined and secured. This is where Schroff has been at home for more than five decades, having also developed components and kits for use in industrial environment.

Our europacPRO subracks and ratiopacPRO cases - to only mention the two most important product lines - with their modular construction offer you many profitable advantages, both technical and economic. They allow versatile combinations, letting you implement a range simply, cost-effectively and with no design outlay in varying height, width and depth, and combining all the elements of the outstandingly wide and deep range of standard components.

Shock and vibration resistant, highest RFI-shielding

Use of suitable material strengths and fixing elements, together with TOX-cold welded side panels, ensure resistance to shock and vibration even in most demanding environment. Not good enough for your application? Schroff can help with even more rugged designs up to 25 g shock resistance which have proven to withstand tough requirements in transportation and defense. Some even more sensitive boards may be supported by additional stiffening and secure locking, which can be provided by our Calmark Birtcher retainers, card-locks and clamshells. And if your application needs RFI-shielding, contact-springs or conductive textile gaskets in the front panels of plug-in units provide an easy upgrade.

Optimal cooling

Together with maximum possible shielding and IP protection our systems are designed to ensure optimal cooling of the electronics, irrespective of where they are installed. Often conduction cooled assemblies can do the job without any energy consumption at all - while fan cooling remains state of the art. We will advise you with your choice.

All-round tested and certified.

Safety is guaranteed with testing and certification to many current standards. You can download all the tests from www.schroff.biz/testreports.

YOUR BENEFITS AT A GLANCE:

- **Large selection:** A comprehensive programme with various dimensions, options and finishes for the most diverse applications
- **Meets the standards:** Conformity to IEC 60297-3-100 to IEC 60297-3-105, IEEE 1101.1, 1101.10 and 1101.11
- **Secure:** Tested to BN 411002, NF F 67-012, NF F 60-002, EN 50155 and IEC 61587-2
- **Shielded:** EMC tested to IEC 61587-3, VG 95373 T.15
- **Fast delivery:** Fast delivery service easy-to-order kits, modified or customized items, including 3D drawings download
- **Delivered:** Kits, easy to order. Modified and completely assembled subracks



environment

... of industrial applications

Front-Panels and Plug-in Units

Shielded or unshielded, flat or U-profile - you can stay flexible right down to the front panel. Aluminium anodized, pre-anodized, plain or iridescent green chromated - we carry the best finish for your application, to suit both function and visual look.

Static handles, special handles for embedded systems or heavy-duty insertion and extraction handles for applications with very high insertion and withdrawal forces - our range of handles ensures that functionality does not have to be without convenience.

Power and Backplanes

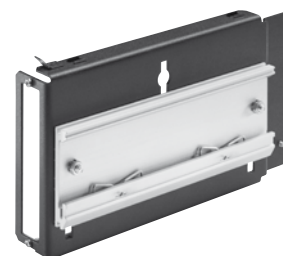
Every board needs power. Our Power supply units will equip your system with 5, 12, 15, 24 or 48VDC on one to three output voltages. Wide range power input devices are available as well as adjustable output voltages. Schroff maxpower 19" Power Supplies are well known for maximum voltage at minimum consumption of space. An adapter facilitates DIN-rail mounting well.

And finally Schroff backplanes stand for high speed and absolute signal integrity. We develop and manufacture for example VME, VME64x, and CompactPCI backplanes at our facilities in Germany, and due to the fact that we have all resources aligned, we of course can offer modified versions to your particular needs.



FRONT PANEL EXPRESS

Cut-outs for connectors, LEDs, handles and switches, and printing – the front panels strongly determine the appearance of a case or subrack. With Front Panel Express you can give your front panels an individual configuration. Schroff does the cut-outs and colours to your specification. With fast delivery from two days on. More information at www.frontpanelexpress.eu



VME, CompactPCI, μ TCA: var

Empowering your automation solution . . .

VME and CPCI as well as MicroTCA

The Schroff Systems are the optimal choice for harsh industrial environment due to their robust built and the proven robustness of the connectors. With our rugged subrack program and our in-house conformal coating we can adapt the systems to each required shock and vibration level and for use in aggressive atmosphere. The modular concept of the system with front and rear removable cards guarantee a fast exchange time of failed components and shortest downtime of the machine or process. The design and choice of electrical components guarantee a long life time.

Our VME systems run typically with real time operating systems as Multi-processor Systems. Therefore they are the right choice for complex automation applications.

The Schroff CompactPCI systems are typically used in process control where a huge amount of data has to be processed. Using components from the commercial market in an industrial format provides a cost optimized solution. The new member of the CompactPCI family, CompactPCI Serial provides even the most modern protocols Ethernet, PCIe, S-ATA and USB3.0 and allows Multi-processor applications.

MicroTCA is the best choice when space is limited but high flexibility, high performance, shelf management, remote control and full redundancy is needed. The boards are only 75 mm high but allow the newest and most powerful processors to be used. With RuggedMTCA (MTCA.1) Shock and Vibration levels according to IEC 61587-1 DL3 can be achieved.



Configuration and modification service

Starting from our standard product portfolio we offer configurations and modifications to fit exactly the customer's needs. If another slot count is needed - choose from the wide range of standard Schroff backplanes, if another power supply or fan is required, individual front panels, cut-outs or your special color...we configure or modify the system for you with a lead time of 2 weeks.

YOUR BENEFITS AT A GLANCE:

- **Large selection:** A comprehensive product portfolio with multiple configuration and modification possibilities based on the broad subrack, case, backplane and power supply product portfolio
- **Superb support:** We assist you choosing the right product and help with our in house simulation and test capabilities like thermal test chamber, signal integrity testing and many more.
- **Plug and play:** Our systems are tested with most of the boards available on the market

Schroff will help to take the right choice

ious standards, one source

... with the best fitting open standard

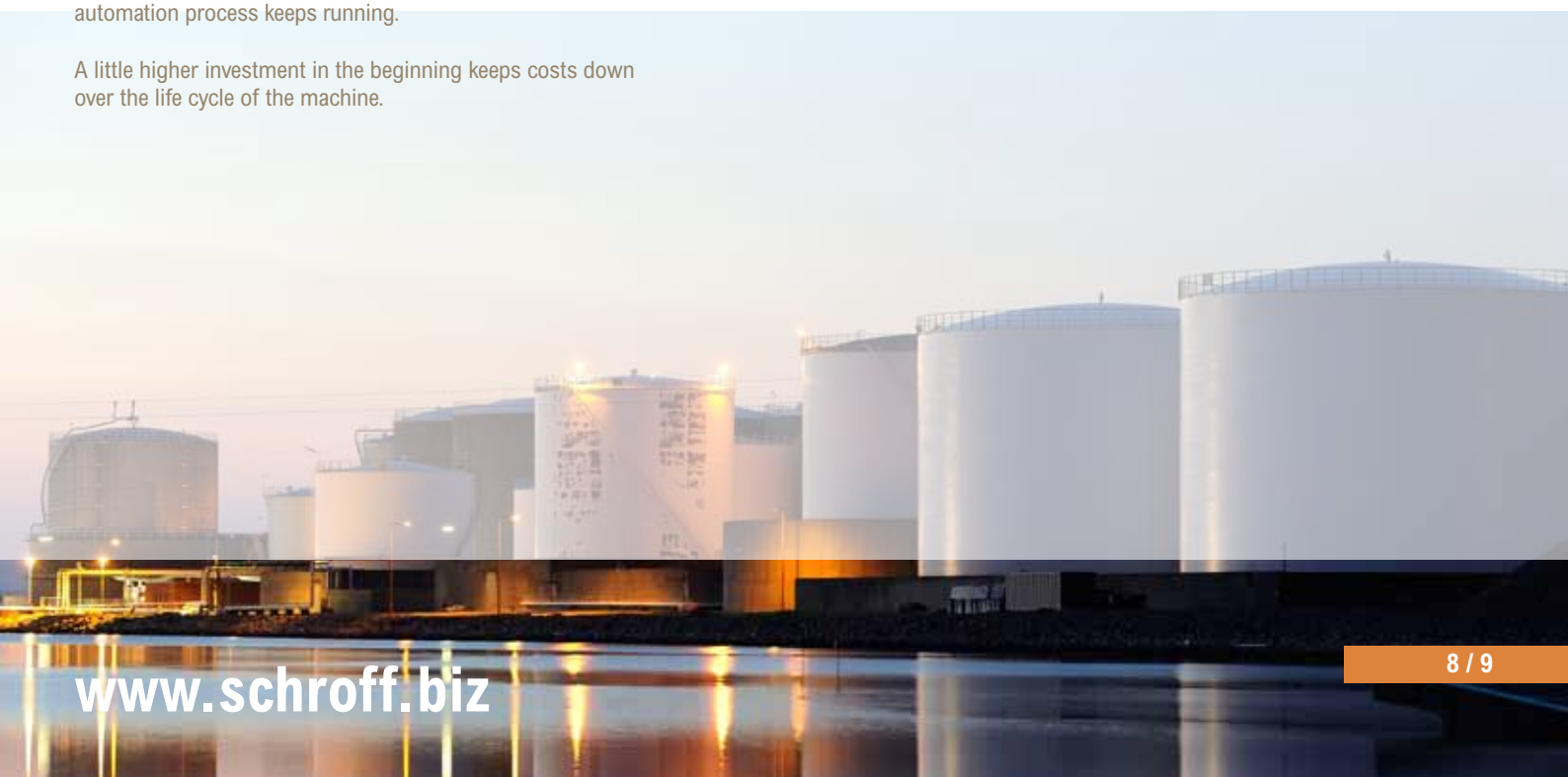
The industrial factory of the future, no downtime and simple to maintain

The service engineer receives an SMS on his mobile: Board xy on control system Z in hall B is getting too hot and will fail in a short time. The engineer immediately responds and takes a unit xy from replacement stock to machine Z in hall B. He pulls the handle of the board xy, extracting it and plugging in the replacement unit. In the meantime nothing has changed; the factory still runs at 100%.

This is not a future vision; this is already possible with the powerful Carrier- and Shelf management from MicroTCA. This new system technology features a management controller on each field replaceable unit like the boards, fan trays and power supplies. With temperature, voltage, current and other sensors, the health of the unit is permanently monitored. If a sensor exceeds the normal operation range, an event message is sent to the Shelf Manager which reacts and forwards the message over Ethernet to a remote computer or even a mobile phone.

As the MicroTCA standard allows in addition to build fully redundant systems that have an availability of 99.999%, even if a board has failed, the system and with that the complete automation process keeps running.

A little higher investment in the beginning keeps costs down over the life cycle of the machine.



Floorstanding enclosures: Sta

Robust with maximum protection for your equipment



PROLINE® Industrial Packages, IP55 / NEMA Type 12

Specifications

PROLINE® enclosures consist of a rugged frame that protects your equipment from the stresses of movement and shipping. Frames are a roll-formed, robotically welded design made of 2.5-mm steel with solid steel, fully welded corners. Integral frame channels support the full weight of the galvanized subpanels. They allow easy insertion and fixing of heavy panels with just one person. Frames accommodate the 25-mm DIN standard and include rectangular holes for clip nuts and through holes for use with thread-forming screws.

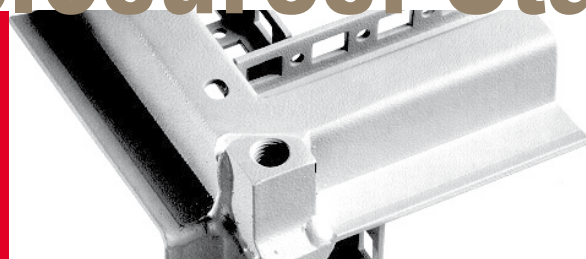
External sides, covers and doors are made of 1.5 or 2.0 mm steel. Solid front doors are equipped with a PROLINE latching system and key-locking flush swing handle. Solutions with overlapping doors are available as well. Standard door bars increase strength and rigidity and allow for an extra mounting surface. Seamless foam-in-place gasket and latching system together provide a water-tight, dust-tight seal against moisture and contaminants up to IP55 / NEMA 12 with low closure force.

Finish

Standard enclosure finish is RAL 7035 textured light-gray polyester powder paint with black accent color of RAL 9005 textured polyester powder paint.

Industry Standards

UL 508A Listed; Type 12; File Number E61997
NEMA/EEMAC Type 12
CSA File Number 42186: Type 12
VDE IP55
IEC 60529, IP55

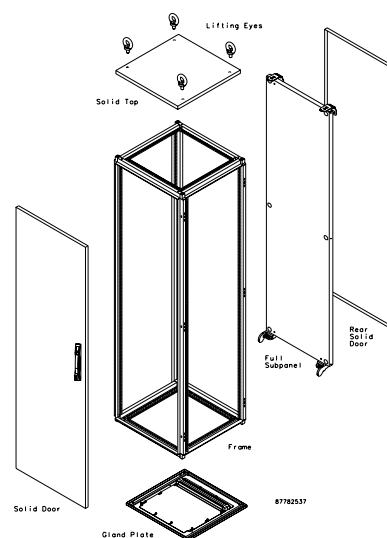


The PROLINE® Modular Enclosure system is designed to protect electrical and electronic equipment with particular focus on industrial applications. Each enclosure provides full protection from dirt, dust, moisture, oil and other contaminants.

PROLINE® Industrial Packages

are full-featured, ready-to-use enclosure solutions that make it unnecessary to order each component separately. For convenience and to save your time, a single part number includes a frame, solid front door, solid rear cover, a solid top, a gland plate, lifting eyes and a full subpanel, so that only the side covers need to be ordered separately. Fully featured PC Cabinets are also available.

The offering is rounded by a large range of accessories off the shelf. PROLINE® parts to complete the assembly yourself, frames and external components are available for shipment from our warehouse or distributor stock.



Standard, configured or modified

Certified to IEC and UL standards

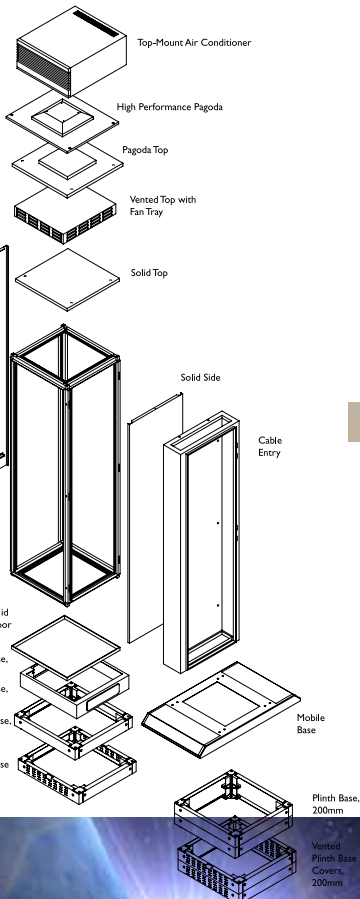


PROLINE® Modular Enclosures Systems

Modular Enclosures Systems support you in building your final individual solution based on a set of given standard components. Starting with the frame you can easily select additional parts from the wide range of available of tops, bases, covers, sides and doors to configure the optimal solution for your particular needs.

After you've selected the external components, the complete PROLINE offering of rack angle, subpanel and grid mounting options allows you to install your equipment securely within the enclosure. Mounting options accommodate rack mount equipment, operator interfaces, industrial control equipment and computer systems, as well as manage wiring and cabling.

A-T-O Assemble-To-Order



MODIFICATIONS & CUSTOMIZATION

Hoffman stands for delivering your best requested solution in appropriate time.

Fast delivery and modifications within standard.

Assemble-To-Order (A-T-O) – in 10 working days cabinet delivery built based on individual components that you decide to use. Solution ready to use from minimum order quantity of one.

Modifications within our standards. By using our engineering and manufacturing experience we offer you a range of available modifications (cut-outs, colour change etc.) delivered within 10 working days as a part of A-T-O program. This proposition is mainly dedicated to small and medium size projects that you need to deliver fast to your customer.

Customization to your needs – PROLINE is an ideal platform to become the base for your particular cabinet. We offer engineering support to develop your own solution and even integrate cooling and cabling. This service is supported by a global organization making your product available in many places of the globe.

YOUR BENEFITS AT A GLANCE:

- Rugged and sealed design, IEC, NEMA and UL approval
- Global product, manufactured around the globe
- Standards off the shelf but also configured, modified and completely customized.



Resistant to corrosion and en

Winners in the most challenging spaces

The right one for every place.

Our wall-mounted and outdoor enclosures offer a tailored solution for any requirement in the smallest space. They provide a basis for all types of industrial applications no matter how harsh the environment may be.

Mild steel for indoor applications.

CONCEPTLINE medium size cases with standard dimensions up to 1200 mm height allow exact matching of the exterior dimensions to the specific installation position. All dimensions are designed for either DIN rail or mounting plate installation. The 600 mm wide version in addition can be fitted with 19" panel/slide mounts and thus accept all 19" components, from subracks to complete systems.

The INLINE small enclosure product range includes terminal and installation cases with heights up to 400 mm. You also retain flexibility on the fixing system, be it DIN rail mounting or mounting-plate applications.

Stainless and ATEX for Oil and Gas or washdown applications.

Hoffman is well known for their corrosion resistant materials from Type 304 to Type 316 stainless steel enclosures for washdown applications in food and beverage or medical as well as for the Oil and Gas Industry. An ATEX explosion resistant enclosure line completes the offering.

Indoor and outdoor applications: Plastic and Aluminum cases.

The A48 case in fibreglass reinforced polyester is particularly suited to highly-corrosive environments, caused by oil, lubricants or salt compounds. Aluminum and further small cases in polycarbonate with transparent or solid cover complete our range of plastic cases.

YOUR BENEFITS AT A GLANCE:

- **Securely protected:** Up to IP class 66, ATEX exproof
- **Flexible expansion options:** Depth-adjustable 19" installation plane or via mounting plates
- **Well-thought-out construction:** Gland plate for cable entry
- **Can be used worldwide:** Certified by IEC, GOST, UL and CSA

Astonishingly adaptable



Environmental challenges

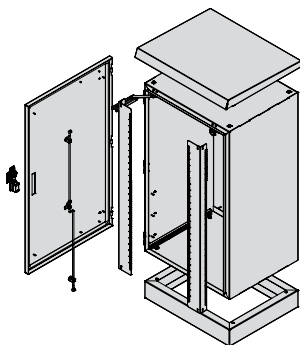
Vibration resistant and vandalism proof

Certified quality.

Schroff outdoor cabinets ensure the smooth and dependable functioning of sensitive electronics in outdoor environments. Their standardized components are based on IEC 61969. They not only fulfill the guidelines and standards for shock, vibration and earthquake resistance but also offer climate protection tested to IEC 68-2-1.

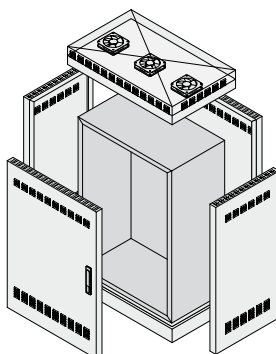
Impressive all around.

Further technical advantages are the weight-saving, corrosion-resistant and robust aluminium construction, the ease of access and special cable entry provision. Newly designed cladding parts, hinges and locks provide enhanced protection from vandalism. And the expansion options are flexible, accepting 19", ETSI or other, even non-standardized, accessories.



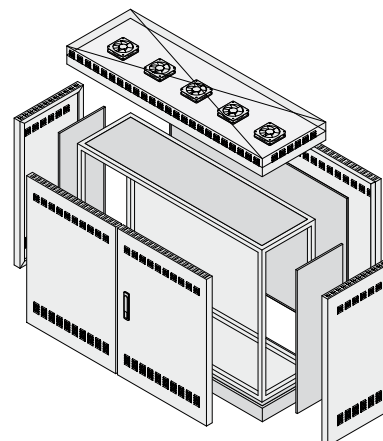
Comline: single-wall

Weight-saving aluminum construction. Single-wall cabinet ready for wall, pole or on the ground installation. Optimal for diverse applications in industry and transportation



Unibody: double-wall and cost-optimized.

Whether wall, pole or ground mounted, the unibody double wall design scores with its cost-optimized inner enclosure and removable outer cladding. It's a perfect mix between cost optimization and optimized heat dissipation.



Modular: flexible and optimized for maintenance.

The modular double-wall version consists of an aluminum profile frame with removable double-wall cladding. Its high flexibility offers significant advantages for larger cabinets and for the case where access is required from all sides.

YOUR BENEFITS AT A GLANCE:

- **Superb climate control:** Energy-saving, low-maintenance and low-noise climate regulation
- **Perfect solutions:** based on three different designs
- **Windproof and weather resistant:** Weight-saving, corrosion-resistant and highly robust aluminum construction
- **Securely protected:** Vandalism-proof, with anti-graffiti coating on request, protection class IP 55



Human-Machine Interface, C

From cable and wire management to power distribution . . .



Human Machine Interfaces

No doubt, it is very important how your machinery performs and how it is protected. And we find it of the same importance how you can interface with it professionally and efficiently. For that purpose Hoffman offers a range of Human-Machine-Interface solutions which have one commonality: Your equipment will be safely stored and protected against mechanical or electrical damage and is of easy use and interaction.

The attractive **CC4000** family of HMI enclosures sets a new standard for visual appeal coupled with design flexibility and ease of use. It's available in two body styles, three configurations and eight sizes. The system's capability for pendant or pedestal mounting, with or without a keyboard provision, offers exceptional design flexibility. Extruded aluminium top and sides provide a quality look while offering superior heat dissipation. Hinged body models provide extra depth and allow rear access. The single- and dual-tilt mechanisms give the operator control over adjustment and ergonomic positioning of the enclosure and/or keyboard, depending on configuration.

A traditional landscape-oriented HMI enclosure made of RAL 7035 light-gray 1.5mm steel, the Concept HMI is unique among HMI enclosure systems when you need the flexibility of customization options. This pendant- or pedestal-mounted system has many possible configurations and modifications, including a removable 3mm aluminium front plate that makes it easy to install flat-screens, pushbuttons and other similar devices and the ability to accommodate cut-outs anywhere on the enclosure. Pre-drilled hole in top allow pendant arm mounting or pedestal mounting when enclosure is inverted. Integral black handle extrusions have a comfort grip that extends the length of the profile.



Compact Series 2 Pendant Arms allow operators to easily move controls into and out of position as needed, and they are easily mounted to a machine, wall or floor. Offering both superior load-bearing capacity and functional reliability, Compact has a maximum load of 45.8 kg) and is recommended for use with CC4000 and CONCEPT HMI enclosures.



Syspend is an RAL 7035, aluminium based integrated keyboard and monitor holder for mounting a flat screen plus keyboard and mouse in industrial environments. It is ideal to directly mount it to the machinery or a control rack. Display and keyboard can be raised and lowered with one hand and the keyboard folds up when not in use. Syspend supports 3 to 7kg load with an internal gas spring counterbalance. The VESA mounting pattern fits most flat screens. Aside cable manager protects cables and cords from pulling or chafing.



Cabling, and Accessories

... no question shall remain open

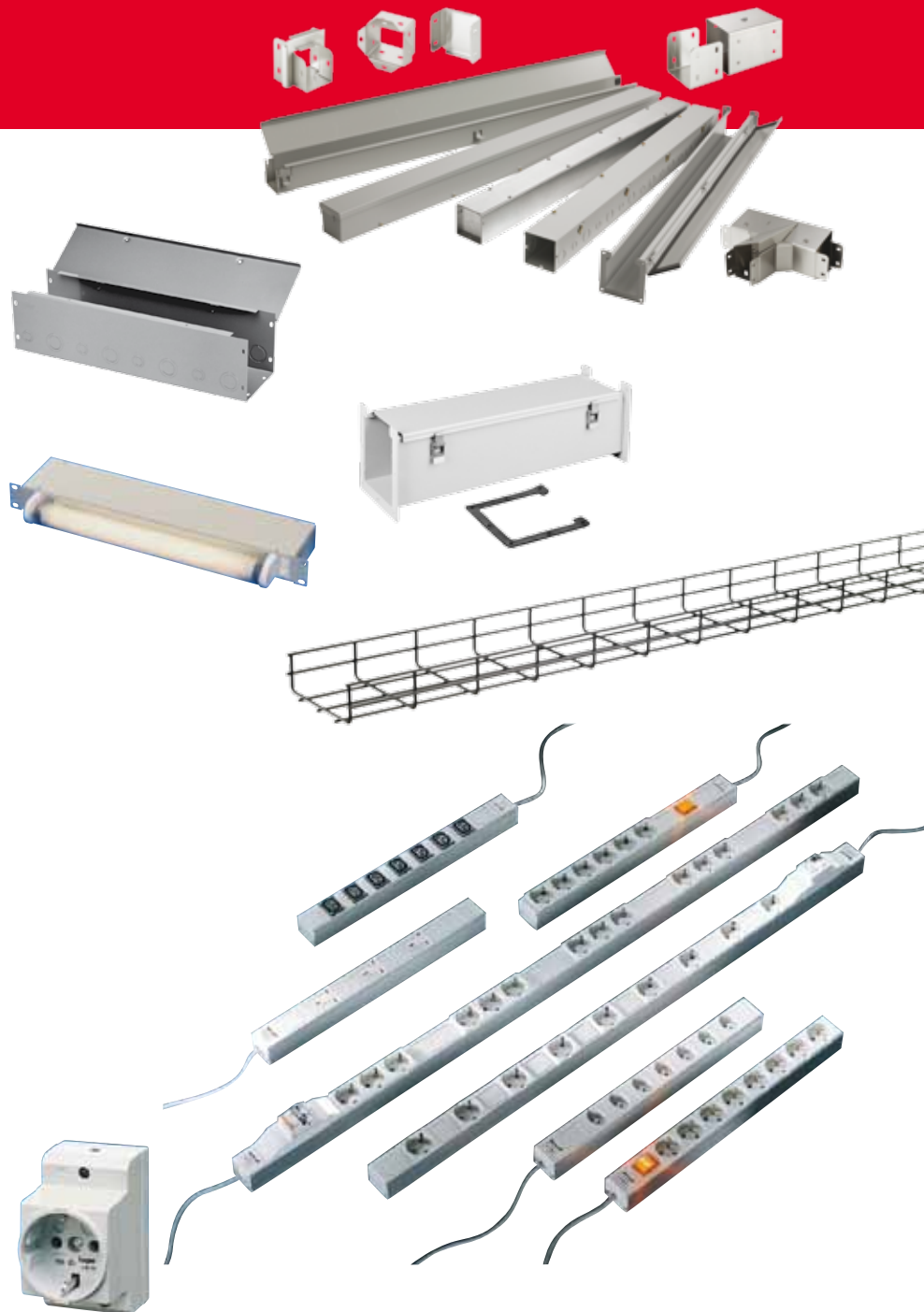
Cable/Wire Management

Hoffman wireway and trough products are used in commercial and industrial environments to provide a fast, flexible method of distributing power and to control wiring. Hoffman has just the products you need to design a flexible and easy to install cable pathway system. In particular the IP66 lay-in type wireways are unique of their kind. No cumbersome fiddling through and still firmly sealed against dust and water.

Mild steel, stainless or plastic versions are available. Use the full line of components and accessories to conveniently organize cable runs. Mount the components to ceilings or walls, drop them under the floor, and even combine components from different systems to build the cable pathway system that exactly fits your application.

Accessories

Select from a comprehensive assortment of accessories that complement your enclosure and provide added features, convenience and security. From locks and latch kits; panels, door and mounting accessories; trays, shelves, lighting kits; and more. They are all here and available to support your system's reliable operation.



Climate Control: Performance

Intelligent and innovative cooling solutions . . .



Consistent temperature for long lasting electronics

Because heat does not play to the favour of electronics, we include temperature management and cooling into our mission of protecting your electronic and electrical devices. With more than 30 years of expertise in industrial and telecom cooling, we offer a full range of state of the art, extremely rugged air conditioners, heat exchangers, filter fans and accessories for profound temperature management.

In addition we are able to tackle specific cooling applications in industrial environment with most innovative solutions such as thermoelectric cooling and the amazing LHX3 water cooling concept.



GENESIS™ Top-Mount Air Conditioner

Ideal for applications that have little or no clearance around the sides of an enclosure. Cooling capacity range up to 2000W with 150 or 230VAC power input.

GENESIS™ is UL/cUL listed and has CE and GOST certifications

V-Series and Spectracool – reliable, rugged and easy-care air conditioners for industrial systems

V-series, with it's cooling capacity range from 300 to 2000 Watt, it's operating temperature from 20°C to 55°C and it's IP56/IP34 rating (internal loop/external loop) is our most recent air conditioner for industrial indoor applications. It comes with a 230VAC power input and CE and GOST certification. V-Series supports filter-less operation in most environments and is most easy to install with built in hooks and a full size print for panel cut out included with every unit.

Spectracool goes way beyond! A cooling capacity up to 5900W, 115 or 230 or 400VAC power input, an extended operating temperature from -40°C to +55°C and still IP56/IP34: Spectracool demonstrates an extraordinary performance. It's dust-resistant, treated coil again supports filter-less operation in most environments. And in addition to CE and GOST, Spectracool units are UL Type 12/3R/4 rated and Telcordia GR-487 capable, providing reliable operation across all geographies.

PROAIR – Your choice for harsh environment

Available in stainless steel and painted galvanized sheet metal options, the PROAIR air conditioner is engineered tough to seal out high pressure hose water and withstand corrosive atmosphere.

Capacity from 400 to 2300 Watt, 115, 230 or 400VAC power input. Type 12/3R/4, Type 4X stainless steel option UL/cUL listed and CE and GOST certifications.



Climate control from McLean – always a suitable solution

e and efficiency

... from more than 30 years of experience



Air/Water Heat Exchanger LHX3

The LHX3 opens up a new dimension of cooling for machines with cold water supply already available. The concept efficiently integrates an air-water heat exchanger with a cooling capacity up to 3000 Watt into a fully sealed IP55 rack. A top mounted ventilator will move the hot air into air ducts – built into the side panels of the rack – and circle it back to the rack bottom, where the heat exchanger will cool it down to the requested operating temperature. The result is a stand alone, room independent cooling concept with an outstanding low noise level of only 45dB(A). CE and GOST certifications are available.



Thermoelectric Coolers

These compact, low-profile coolers using the Peltier effect allow you to cool small indoor and outdoor enclosures. No condensers, compressors or filters are required making it a reliable solution for demanding low-maintenance environments. With no compressor inside, thermoelectric coolers can be mounted in all possible directions. McLean thermoelectric coolers can be ordered with a cooling capacity range from 60 to 200 Watt, 24 and 48VDC power supply. They operate securely at a temperature between -40°C to +55°C. Units are UL recognized and have CE and GOST certifications.



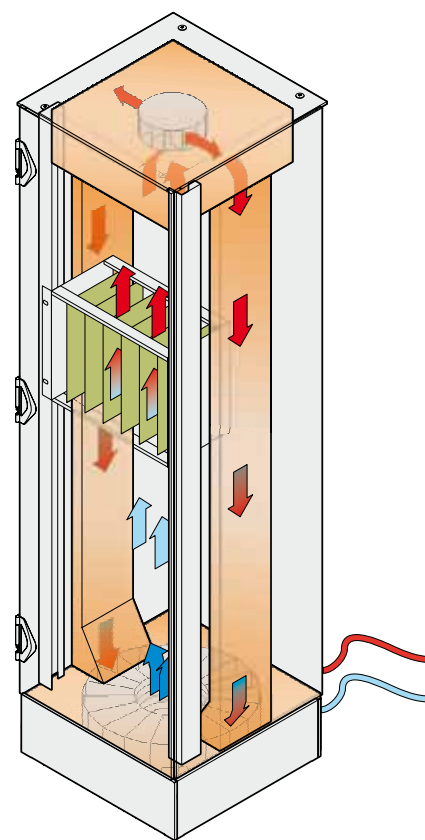
Filter Fans

With an air volume from 23m³/h to 640m³/h, a power input at 115 and 230VAC or 24VDC, 7 performance classes with 6 different assembly dimensions, our filter fan range is almost unlimited. Tool-less, clip on assembly and easy conversion from pressure to suction operation as well as convenient change of filter mats does make installation and maintenance easy. Filter fans are CE and GOST certified.



Accessories

A comprehensive range of cooling accessories like heaters, thermostats, hygrometers, speed controllers and much more are available from stock.



ServicePlus: Assembled to order

We are with you. For the entire product life

What is ServicePLUS?

With **ServicePLUS** we offer a complete array of services which can be individually selected around our products and custom complete solutions. **Valuable. Comprehensive. Concise.**

Ongoing partnership: After the product is delivered and – if requested – installed on your premises our project managers will continue to advise you on any questions and we offer specific after-sales services such as service and maintenance contracts – globally!

Therefore **ServicePLUS** is more than a product related offer. **ServicePLUS** stands for a real partnership and enables a joint future with our customers.

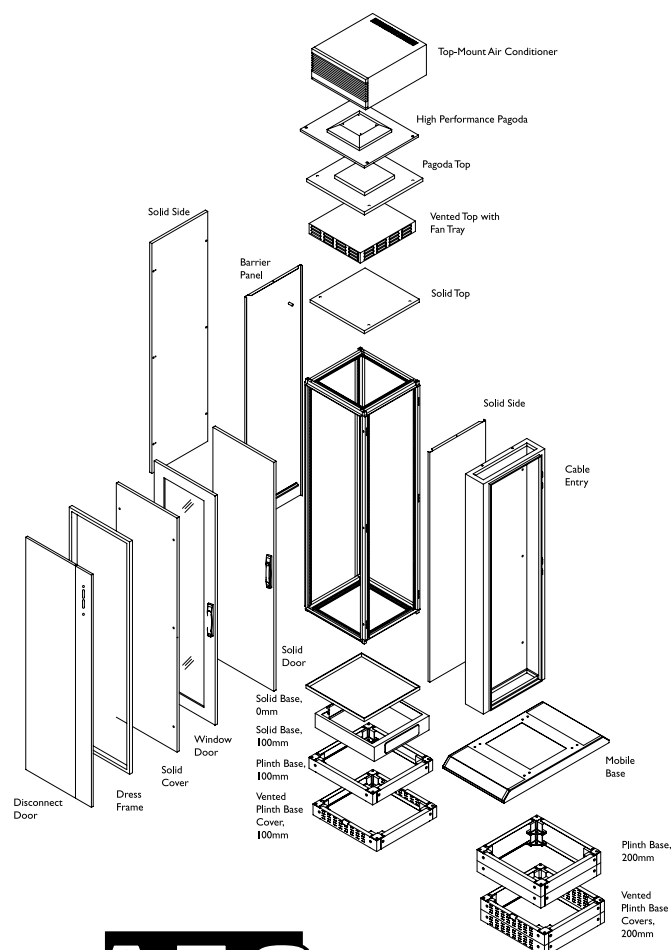
ServicePLUS configuration

There are multiple ways to configure your individual product from spare parts.

- The **industrial catalog** offers you tables to select easily all components to configure a cabinet.
- With the **product selection tool** (<http://tools.mcleancoolingtech.com>) you find within a few minutes the right cooling unit.
- For Schroff products more than **20 configurators** support you to select quick and easy the best product for your application. Just enter **www.schroff.biz/conf**

ServicePLUS assembly

- **Assemble-To-Order (ATO) program:** Products which are usually shipped in spare parts can be assembled in our service centers and be delivered in one piece meeting your precise specifications.
- Five to ten working days is all it takes depending on the product. If it's very urgent we even offer **express service**.
- **Individual Parts:** If you prefer to receive individual PROLINE® parts to complete the assembly yourself, frames and external components are available for shipment from our warehouse or distributor stock.



A-T-O

der and to your satisfaction

Configuration – Assembly – Modification: just as you want it!

ServicePLUS modification

Modified products: Our Service Centers around the globe offer a broad range of Modification Services to suit exactly to your specific requirements. We use the most advanced technology to produce consistent, high quality results. Our modified enclosures are UL/cUL and CSA certified solutions.

- **Select from more than 100 standard paint finishes.**
- **Change dimensions. Easily add holes, cutouts, window kits, louvers and thermal management systems.**
- **To begin:** Find a standard enclosure similar to your intended design by using the search function, browsing the online product catalog, or reviewing a print catalog. Download the appropriate CAD drawing from the online catalog page. Use the requirements outlined on our website to submit a drawing file. Consult your local sales office for additional assistance. Certain restrictions may apply.



ServicePLUS solution

- **Co-Developed and Custom Products:** Where it is not possible to employ off-the-shelf components we take care of customized special solutions – from the development and design of individual components through to a complete and functioning system that meets your requirements. Relying on our standard product platform as the starting point and our manufacturing and testing expertise to minimize your costs, maximize manufacturability, quality and speed to ensure our common solution meets the performance standards our customer expects.
- **From a Single Source:** System integration means the integration of certain elements of electronics packaging, such as cabling, climate control, power supply, or EMC protection, into one cabinet or enclosure. Customers thus obtain a plug-and-play product for their equipment. Our customer care as an electronics packaging specialist thus begins with the specification and design and runs through the purchasing of the prototype, testing and checking, and extends to volume manufacture.



About Pentair Technical Products

Pentair Technical Products, a Pentair global business unit, is the leading provider of worldwide product and service solutions for enclosing, protecting and cooling electrical and electronic systems. Its industry-leading brands – Hoffman®, Schroff®, McLean® Cooling Technology, Calmark®, Birtcher®, Aspen Motion Technologies™ and Taunus™ – provide a broad variety of standard, modified and engineered solutions to the commercial, communications, energy, general electronics, industrial, infrastructure, medical, and security and defense markets.



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