

Protection Solutions for Outdoor
Plant and System Technology

INTERTEC offers more than you can see.



The iceberg symbolizes that many of our benefits go beyond the protective enclosure that you can see on the surface. Certified quality engineering, easy integration, long service life and a low TCO are only some of the "hidden" benefits you receive with a comprehensive INTERTEC solution.

Pioneering protective solutions

INTERTEC is the global market leader in providing unique solutions for the reliable protection of highly sensitive field instrumentation. The company was founded in 1965 by Dr.-Ing. Joachim Hess, who recognized the problem of insufficient protection for electronic devices in engineering. Both plant safety and the operation of the overall system can be seriously impaired by negligent or even missing protection. In addition, proper protection solutions offer considerable savings in operating and maintenance costs.

This is why today, more than one million different INTERTEC protection systems worldwide contribute to the smooth operation of instruments, analyzers, wireless and radar equipment, signaling systems or transmitters, and much more. Thanks to its extensive expertise in engineering and through constant innovation and improvement of its products, INTERTEC has become the world's leading manufacturer in this segment. Our know-how is reflected in over 20 patents on our products and solutions - with new patents being added every year.



Now in its third generation, our company stands for first-class quality and the best service.

Proven quality worldwide

Among our customers are almost all major companies in the energy, chemical, electrical and mechanical engineering sectors. They place their complete trust in us when it comes to protecting their highly sensitive instruments and control devices against extreme stress – with high-tech enclosures, cabinets or protective shelters and with heating, cooling and air conditioning systems from INTERTEC.

Our product range has been growing steadily for more than 50 years. As a result, we can offer the most comprehensive portfolio of solutions for the protection of instruments and analyzers for any location. INTERTEC's products can handle any extreme environmental condition, from freezing temperatures in the Arctic to extremely hot desert climates - and everything in between. No matter which protection is required for your equipment; INTERTEC already has the right solution for you.

And you can be sure that your products are fit-for-purpose. Our specialists are highly experienced in the development, creation of concepts as well as in the planning and realization of protection solutions for almost every application. With production sites worldwide as well as many other representatives and field service staff, INTERTEC ensures fast and professional service. You too can benefit from our know-how!

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50 years of experience protecting field-based equipment in harsh conditions!

INTERTEC started with the idea of employing superior structural materials in enclosures to avoid corrosion and optimize thermal performance - and to extend the lifecycles of business-critical process control equipment. This philosophy recognizes that the purchase and installation costs of owning and operating a control and instrumentation network are only a fraction of total lifecycle costs - especially for instrumentation located in hazardous areas.

We offer enclosure, cabinet and shelter products - including the relevant accessories to complement the protection solution. INTERTEC has developed many specialized and patented manufacturing techniques to optimize the performance and durability of its housings. Our custom design and assembly service [SAFE LINK \(pg. 16\)](#) rounds off our product and service portfolio.

This high-level involvement in the application means that INTERTEC has developed an enormous degree of design and engineering know-how in protecting field instrumentation. That's why INTERTEC turnkey solutions are truly fit-for-purpose. Trouble-free instrument operation is the most important thing we deliver to clients. Today our field protection enclosures can be found all over the world - from conventional industrial and manufacturing environments, to the most remote locations regions, and the harsh and corrosive environmental conditions found offshore.

Efficient field instrumentation is critical to the operation of automated processes, plants, utility and transportation systems. INTERTEC's composite glass reinforced structural materials, customization capability, and application design expertise assure a long and trouble-free service life in harsh operating conditions.



The penguins in our logo symbolize INTERTEC's most important brand value: enclosure technology that takes care of your instrumentation, even in the harshest of conditions.

They also represent our high customer service standards. Our experts accompany you throughout the entire production process of your solution; from planning and design all the way to the installation on site.

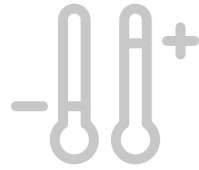
Reliability

Downtimes can be expensive; unplanned downtimes even more so. Naturally, you want to avoid downtimes as much as possible. However, depending on the environment, instruments and systems may be exposed to increased stress, wear or corrosion. Our core competency is providing the best operating conditions with protective solution fit for the application.



Heat and UV radiation

Heat generation by direct sunlight exposure or other external heat sources, such as a refinery flare, can be problematic. Materials with good thermal conductivity, like aluminum or steel, offer insufficient protection, as heat transfers between the canopy and the instrument. Our protective [Shades & Canopies \(pg. 28\)](#) and enclosures solve this issue, as they hardly transfer heat.



Extreme temperatures

Electronic equipment must be kept within a certain temperature range. For installation under extreme environmental conditions, proper insulation without thermal shortcuts and heating and/or cooling are a must. All INTERTEC [Enclosures \(pg. 32\)](#) are suitable for -65°C to +65°C ambient temperature.

Protection against condensation and crystallization

Especially in chemical or petrochemical plants, as well as in the sample preparation systems of analyzers, maintaining a high temperature is often a prerequisite for preventing condensation and/or crystallization of the media in the measuring instruments. A heater fit for the application can prevent these issues. And in special cases, our [HOT BOX \(pg. 18\)](#) is the optimal solution – a coordinated complete system consisting of an enclosure equipped for high internal temperatures.



Frost protection

It is absolutely essential to scale frost protection to cover the coldest point in your system. Even the smallest amount of water in the media may block pipes or valves when it freezes. Our insulated enclosures and [Heaters \(pg. 44\)](#) are individually selected and adapted for this purpose.



Ingress protection

Considering factors such as dew points and condensation, INTERTEC shelters are provided with exhaust or drain openings. At the same time, they maintain the required ingress protection class to prevent dust, sand or moisture from being reintroduced into the enclosure.



Corrosive atmospheres or media

Chemical, oil and gas plants, as well as proximity to the sea usually have very corrosive atmospheres, which cause corrosion of surfaces, fittings, windows and electrical contacts, among other things. The glass fiber reinforced plastic (GRP), used in INTERTEC enclosures is resistant to many chemical media.

Safety & Security

Explosive mixtures, highly flammable materials, high wind loads, heavy storms and vibrations ranging up to earthquakes are just some of the hazards in industrial environments to which not only sensitive equipment but also personnel are exposed. We help you to reduce these hazards and their effects to a minimum.



Explosion protection

To prevent explosions, all installations in hazardous areas must meet certain requirements, like antistatic materials, ingress protection classes, mechanical or impact protection. Whether certified for a type of protection or as general equipment, INTERTEC heaters and enclosures meet European, North American and/or international requirements. Currently our products are certified according to IECEx, ATEX, CSA, EACEx, CCC, INMETRO, KC, PESO and others.



Fire protection

INTERTEC only uses flame resistant [Glass Fiber Reinforced Polyester \(pg. 11\)](#) with so-called self-extinguishing properties that counteract the spread of flames and protect the equipment below the ignition temperature (i.e. 180° C) for up to 120 minutes. Our FIRE SHELTERS in particular provide excellent fire resistance against cellulosic and hydrocarbon fires.

Storm, blast and earthquake protection

The highly durable composite material used for our enclosures can be designed so that our solutions can withstand extreme forces. They can, for example, withstand storms of up to 240 km/h, the shock wave of a nearby explosion or high-magnitude earthquakes. Despite its high static strength, GRP is flexible enough to act like a built-in shock absorber!



Unauthorized access

Enclosures and protective cabinets can be fitted with locks if required, either with a universal key or a locking system. And due to its natural strength and flexibility, GRP offers excellent mechanical protection against impacts or vandalism.



Sustainability

INTERTEC places great importance on environmental protection through sustainable production. The basis for this is our proprietary GRP material for the production of all our protective equipment. In addition to its structural and thermal advantages, it has superior durability and longevity, which significantly reduces the resources required for its maintenance. When its life cycle eventually reaches its end, it can be easily recycled or disposed of, as it is free from harmful or toxic substances.



Glass Fiber Reinforced Polyester

GRP out-performs other materials for environment protection

For decades, our Glass Fiber Reinforced Polyester (GRP) material has proven to be a highly superior structural material for building enclosures to protect field-based instrumentation and equipment. Even after 50 years, INTERTEC enclosures, cabinets and shelters are proven to retain up to 90% of their mechanical strength.

The main competitive material used in this application sector is sheet metal. INTERTEC's GRP is produced using long-fiber glass strands which make it almost as strong as stainless steel, yet some 75% lighter. In its basic form GRP is a superb material for manufacturing robust outdoor enclosures - allowing maintenance-free lifecycles of about 30 years.

INTERTEC has developed many processes to extend GRP's natural protective advantages, combining special grades of high-quality GRP with composite layers to achieve extra degrees of protection. The most common forms provide embedded insulation to optimize energy consumption and the efficiency of heating or cooling, anti-static properties, and protection against ultraviolet exposure and abrasion. Further composite techniques are used to meet more specialized application demands, including fire safety and EMC shielding. Different grades of GRP may also be used at different layers of a composite, to optimize the protective properties of interior and exterior faces.

Strong, yet flexible and light

Due to its light weight, GRP is very well suited for applications where the weight of corresponding structures plays a decisive role, such as on offshore platforms or urban roofs. In addition, transport and installation in remote locations is also made much easier. Thanks to the reinforced sandwich construction with an inner and outer skin enclosing a core of light, insulating PU foam, our enclosures offer excellent stability against storm, blast, seismic and other impact forces.

The performance of the base material is further enhanced by INTERTEC depending on the application. Increased wall thickness or double sandwich design and optimized fiber alignment allow the production of protective housings for measurement and analysis equipment with reinforcements at the edges/corners to withstand particularly heavy loads.

At the same time, our GRP composite material fulfils relevant frangibility guidelines: If intended, the enclosure can be designed to yield or break on impact due to its low mass.

Glass fiber reinforced polyester is a thermosetting polymer material with exceptional strength and stability. It retains its high structural integrity even when exposed to extremely high or low temperatures, which would put cause serious difficulties with commercial thermoplastics.



Glass Fiber Reinforced Polyester

Processing

INTERTEC produces glass fiber reinforced polyester in a variety of ways, including hot compression molding of sheet molding compounds (SMC), vacuum assisted resin transfer molding (VARTM), flat sheet processing, pultrusion or hand lamination to meet the demands of the application. Advanced insulation, coatings and other options can be used to meet challenges such as corrosive, abrasive or wet operating environments, fire protection and vandalism.

SMC compression moulding

In this process, the GRP material (sheet molding compound), which is pre-impregnated with reactive resins and made of long fibers and 2-component polyester, is pressed in a mold at 140°C. The heat activates the hardener contained in the material, causing the resin to cure and fuse with the glass fibers.



SMC moulding press.

Vacuum assisted resin transfer moulding

In VARTM, two molds are first coated with a layer of resin. After curing, several layers of glass fiber fabric and PU foam are placed between the two layers and saturated with resin. The part is then completely cured in a vacuum within a closed steel mould, which ensures optimum and uniform distribution of the polyester resin.



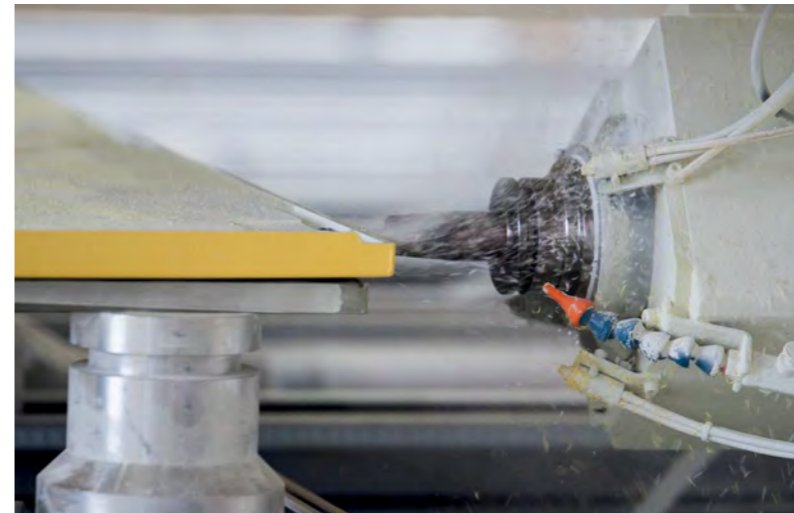
Vacuum casting workshop.

Sandwich construction

Here, depending on the application, GRP sheets are bonded and pressed with one or more insulating layers - for example, polyurethane foam for temperature-critical solutions or rock wool for fire protection. The area moment of inertia of this construction method also ensures high stability and rigidity.



Sheet press.



CNC machining of GRP parts.



Stability in extreme temperatures

While the structural integrity of conventional materials suffers under very low or very high temperatures, GRP can provide excellent stability. Unlike steel, properties like impact resistance improve at ultra-low temperatures like -200°C, thus making it suitable for technologies like LNG and liquid hydrogen. All INTERTEC materials are suitable for +100°C, with special materials available for higher temperatures.

Energy saving insulation

Compared to metal, the thermal conductivity of INTERTEC's GRP composites is about three powers of 10 lower. The low thermal conductivity and the additional insulation of the walls also reduce the energy required for heating or cooling systems. The resulting stable climatic conditions ensure that the integrated devices can function without any problems even under extreme weather conditions – and without any heat sinks.

Environmentally friendly, low carbon footprint

Our GRP sandwich design is 4 times lighter than steel and 10 times lighter than concrete at the same strength. It saves material and energy during production while lasting several decades.

Corrosion resistance

Unlike metal housings, INTERTEC's GRP composite material does not degrade in any significant way, guaranteeing a maintenance-free life of over 30 years. Modern gel coats with a thickness of 600-800 micrometers (compared to 100 micrometers for vehicles) also give it excellent protection against UV radiation and abrasion. Even under extreme corrosive conditions, where the housing is exposed to sulfur, chlorine, sea water, petrochemicals or air pollutants, the material offers outstanding resistance.

Fire and explosion protection

Special designs of our GRP enclosures offer antistatic protection, blast overpressure protection and fire resistance. By embedding mineral wool between GRP panels, the enclosures can resist fire for up to 120 minutes.

Electromagnetic transparency

The composite material is electromagnetically transparent to radio waves, which are used, for example, in the mobile phone standards LTE or 5G. A housing made of GRP is therefore very well suited for antennas and systems in communication technology.

Individual Solutions

Tried and tested complete solutions

We understand that there cannot be a standard solution for everything. But thanks to the many years of experience in the development of protection solutions, we can offer a range of concepts that can be adapted to any specific application with minimal effort, regardless of its size or complexity.


Our custom solutions range from simple protective canopies to pre-equipped plug-and-produce enclosures to unique shelter designs and space-saving soft jackets for instruments of any size.

A major advantage of INTERTEC's unparalleled applications experience is that our design teams are always at the leading edge of solving emerging problems, like extended longevity, increased energy efficiency, blast proofing, corrosion resistance, surviving ultra-low temperatures, fugitive emissions control, and wireless friendly operation.


For larger-scale installations, INTERTEC will also create a site standard for end users - standardizing components such as manifolds, valves and fittings - to simplify maintenance and spare parts holdings.




These custom shelters for the Arctic were designed to maintain a stable operating temperature for the instruments inside and to serve as protective rooms for maintenance personnel in the event of polar bear attacks.




SAFE LINK
Our service for turnkey protection solutions.
Page 16




HOT BOX
Enclosures for high temperature applications
Page 18



Active, Passive & Hybrid Cooling
Highly efficient and off-grid capable cooling solutions.
Page 20



PERI SHELTER
Cabinets and shelters for hazardous areas.
Page 22

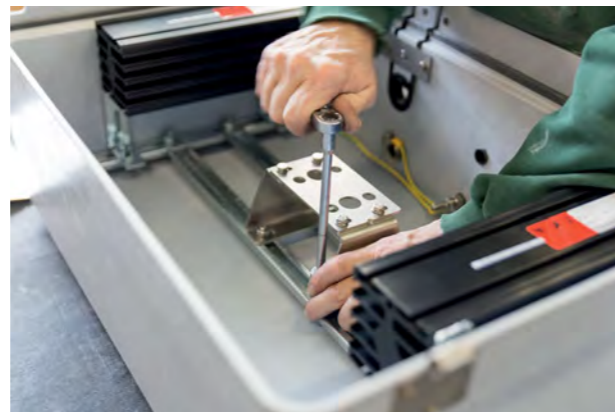


THERMOTEX Custom Solutions
Textile protection solutions tailored to the application.
Page 24

Turnkey enclosure solutions

Designing your own environmental protection system is a difficult task. To ensure a stable and safe operating environment for your equipment requires a complex system of inner and outer protection - with carefully selected structural materials, layout and heating/cooling processes. Many different regulations (such as [explosion protection \(pg. 9\)](#) or the Pressure Equipment Directive) and material characteristics must be considered and documented. It is easy to make mistakes due to the many small details involved, such as correctly specifying interfaces, threads, cable gland diameters, nuts and bolts, etc. At a remote site, any oversight can lead to major costs and delay!

SAFE LINK enclosure solutions are available for a wide spectrum of applications with several thousand field-proven design templates that can either be applied directly or adapted for specific applications.



Designed and outfitted according to specifications.



SAFE LINK covers all our enclosure sizes.

Your benefits

- Turnkey solutions
- Short implementation times
- Low investment costs
- Modular design with uniform layouts
- Standardization
- Easy maintenance
- Simple stock keeping
- Quality of workmanship

Specifying a turnkey solution is made simple using dedicated software, or a questionnaire. Users are provided with a proposal including CAD drawings and a bill of materials. Once approved, INTERTEC starts production of the system.

Adaptability holds the key to optimized protection

INTERTEC's design and materials technology recognizes that the initial costs of a field-based processed instrumentation network are only a small fraction of total lifecycle costs. This is especially true for safety-critical installations. Investing in a comprehensive protection solution significantly improves the reliability and thus reduces maintenance hours and extending the system's life time.

Our service covers the entire process from development, production, pre-assembly and acceptance by an inspector to delivery and final assembly on site. INTERTEC's experts allow engineering companies and users to focus on their core competence. Our turnkey solutions substantially reduce front-end engineering, procurement and installation expenditures of process instrumentation, thus providing immediate cost savings. SAFE LINK also significantly reduces the overall total cost of ownership (TCO). It provides payback throughout the plant's lifecycle through increased reliability, reduced field visits, expert application know-how, and reduced maintenance due to accessibility and ergonomics of layout.



All wiring is done in-house by qualified electricians.



Convenient for large-scale projects.



INTERTEC's unique enclosure manufacturing capability provides optimal solutions, even for the most complex of shapes. Window cut outs, holes, transitions, cable glands etc. can all be CNC machined with superb quality and precision - using composite GRP structural materials that are optimized for the on-site environment.



High temperature enclosures

In order to prevent oversaturation, condensation or crystallization of the media in analyzers, measuring stations or sample conditioning systems, a constantly high temperature is crucial.

Our HOT BOX concept offers customized solutions consisting of a well-insulated enclosure, fitted with [Heaters \(pg. 44\)](#) and an accurate digital temperature controller. The design of the enclosure, thermal insulation and heating requirements are engineered by the INTERTEC team and optimized to the particular application and the equipment in question.



Your benefits

- Custom design adapted to application requirements
- GRP materials with superior thermal conditions and corrosion resistance
- Uniform insulation for minimal heat loss
- Design requires less heating outputs
- Optimized heater solutions designed to ensure the electrical area classification, including gas group, and surface temperature (T rating) requirements are maintained
- Remote temperature monitoring using high accuracy digital controller
- Calculated, simulated and factory tested heating before delivery

Design features

The choice of construction material used for a high temperature application is critical in order to minimize heat loss and thus maintain a stable thermal environment. We use polyurethane foam because of its very low heat conductivity.

The sandwich construction of polyurethane foam insulation between an inner and outer layer of glass fiber reinforced polyester sheeting provides superior means of constructing a HOT BOX. It combines very low thermal conductivity with great strength and a high resistance to wear and corrosion. In comparison, conventional steel enclosures suffer from heat shortcuts despite thick insulation where fastenings and screw connections connect to the outer layer. These shortcuts can cause up to 90% of heat loss. Due to the low thermal conductivity of [GRP \(pg. 11\)](#) and lack of screw connections, this is no problem for the HOT BOX.



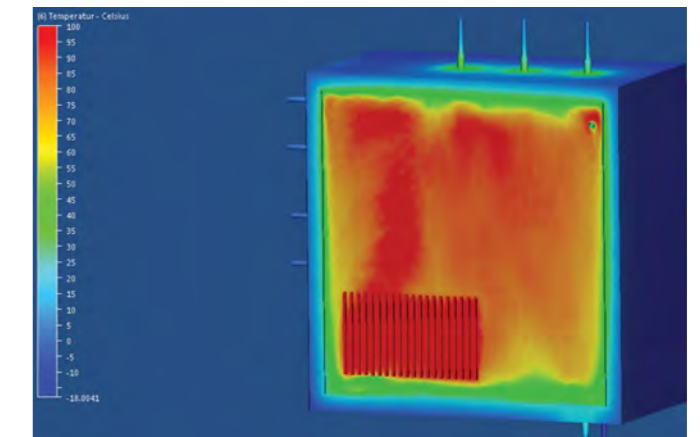
Polyurethane foam insulation.



Example HOT BOX system

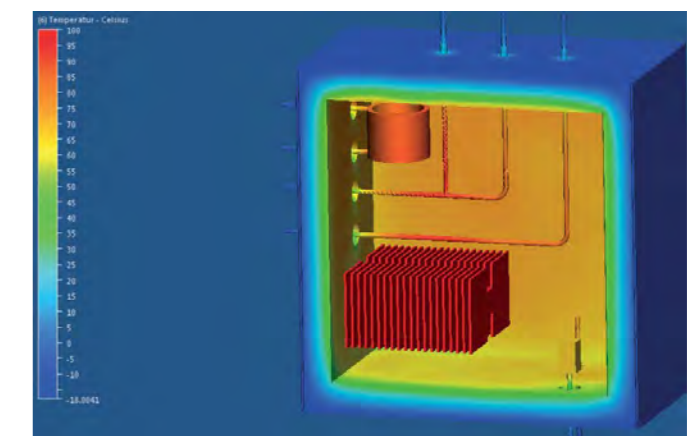
- Stable 140°C internal temperature at -20°C ambient temperature
- Multi layer insulation
- Heat-reflecting Aluminium foil as thermal radiation mirror
- Using all three ways of heat transfer to dissipate the heating power and equalize the temperature: conduction, convection and radiation
- Self-limiting heaters mounted directly on thick aluminum mounting plates
- Very precise SMART HEATER temperature control
- Result: the temperature difference between the different components is less than 2K

Steel enclosures have a very high thermal conductivity, which leads to the formation of cold spots, especially at wall transitions of tubing and around the door frame. These cold spots result in a higher heat transfer to the outside and temperature gradients. The coldest spot is what defines the inside temperature.



Cold spots and heat loss to the outside in steel enclosure.

All parts of the HOT BOX construction work together to create a uniform internal temperature distribution. Insulating parts are connected using adhesives, rather than screws and inlets/outlets are outfitted with special grommets to minimize heat loss.



Even distribution of heat in well-insulated GRP enclosure.

 HOT BOX High Temperature Enclosure
<https://www.intertec.info/en/hot-box>

Active, Passive and Hybrid Cooling

Individual cooling solutions for hot climates

Extremely hot climate conditions are a great challenge for plant designers and constructors. In addition to the required protection (mechanical protection, explosion protection, etc.), instrumentation may or can only be operated within a certain temperature range. INTERTEC Shelters with integrated cooling solutions provide a remedy.



Active Cooled Shelters (ACS)

We offer a variety of active cooling units for applications where electronics and instrumentation are exposed to high temperatures. An INTERTEC GRP (pg. 11) enclosure with very good thermal insulation combined with a cooling system achieves the optimum of efficiency and protection for your application, even in hazardous areas. The solution may include commercially available air conditioners, as well as special INTERTEC Cooling Units (pg. 56).

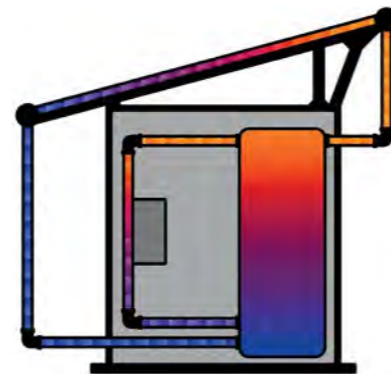


Passive Cooled Enclosures (PCE), Cabinets (PCC) and Shelters (PCS)

Passive Cooling is cooling without any moving parts and energy supply. It works like a solar water heater, just other way around: When you have a solar hot water supply at home, the sun heats the water in a collector on the roof and a stratified water tank serves to store the heat. Since hot water is lighter than cold water, you can draw hot water from the top of the tank for use even at night or in the morning.

In our Passive Cooling concept, we take the cold water from the bottom of a stratified water tank to absorb the heat dissipated by the equipment in the shelter. During the day, the water in the exterior heat exchanger installed above the roof is hot, though it will not circulate throughout the system, as it is lighter than cold water.

As soon as the ambient temperature drops below the temperature in the top of the tank, a natural thermosyphon circulation begins, which draws cold water from the bottom. In the morning, the tank is filled with water of night temperature.



The equipment inside a Passive Cooled Enclosure, Cabinet or Shelter can be kept at night temperature plus a margin for circulation and heat transfer. Passive Cooling is very common in arid desert applications, as it needs no energy supply and has proven to be highly reliable.

Passive Cooling is also well-suited for moderate and cold climates. The lower the night temperature, the lower the possible equipment temperature. In central Europe, nights with more than 20°C are considered "tropical" and, while rare, might still pose a challenge for instruments optimized for the climate.

If the ambient can be low 0 °C in winter, an anti-freeze agent can be added.

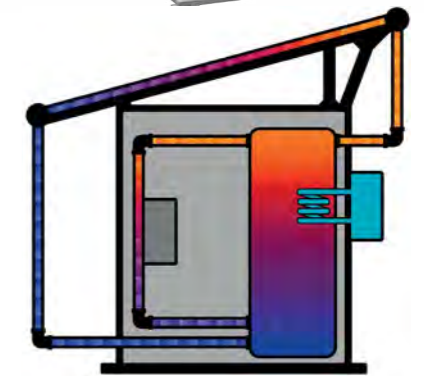
Advantages

- No energy required
- Very environmentally friendly
- No moving parts
- Very reliable cooling
- Pure thermodynamics, fail safe
- Heat exchangers double as sun shade
- Intrinsic explosion protection, no electrical or mechanical hazard
- Self-regulating cooling due to the negative thermal expansion of water below 4°C

Hybrid Cooled Shelters (HCS)

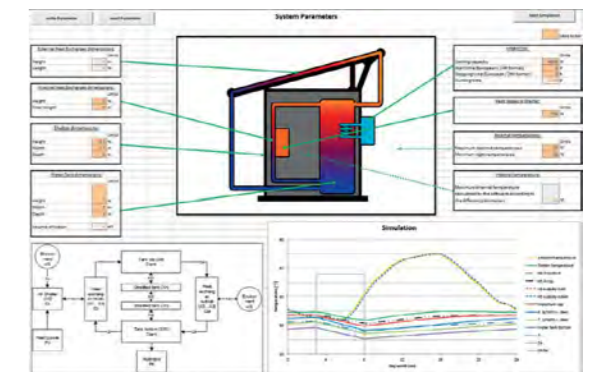
Our Hybrid Cooled Shelters combine the best of both worlds. In principle, they function like passively cooled shelters, but if required, they can be supplemented by an active cooling unit to cope with extreme temperature peaks.

If the temperature is below a certain threshold temperature, the passive cooling circuit alone provides the necessary cooling. At higher temperatures, the electrically operated water cooler HYBRICOOOL (pg. 56) is activated to cool the water tank/energy buffer. Should the active cooler fail, the passive cooling can still keep the temperature of the electronic equipment below a specified maximum value.



Dynamic temperature simulation with INTERSIM

INTERTEC has decades of experience with passive cooling thanks to hundreds of completed projects. Based on the data of these projects, we have developed a layout and dynamic temperature simulation tool called INTERSIM, which simulates temperature developments for any given application using Passive or Hybrid Cooling. If necessary, a CFD computational fluid dynamics study can be performed as well.



Efficiently dimensioned cabinets with easy operation from the outside

A variety of factors determine whether a protective solution is profitable and, above all, efficient: the available space, proximity to heat sources, building regulations for free-standing buildings or implementation in hazardous areas. These sources of problems can be easily eliminated with PERI SHELTERS. The proven inside-out approach facilitates the implementation of many design requirements with a minimum of space.



Design features

Advanced protection solutions for complex automation systems often present a major challenge - from strict space requirements to effective cooling solutions; especially under hot climatic conditions.

For this purpose, INTERTEC has designed the complete solution PERI SHELTER. It is an unmanned outdoor cabinet that houses field instrumentation and process control systems, such as Satellite Instrument Houses (SIH) or Remote Instrument Enclosures (RIE). All system components, controls, I/O connections and active parts of the cooling system required for normal operation are accessible from the outside of a PERI SHELTER. This inside-out approach effectively eliminates desks, control panels, door opening areas, corridors and escape routes, which not only reduces space requirements, but also massively reduces planning and design costs.

The lower interior requirements facilitate internal atmospheric control. For safe operation in hazardous areas, the interior of the IP65-certified cabinet is slightly pressurized to ensure that no corrosive chemicals are present in the atmosphere.



External user interface.

Cooling principle

The PERI SHELTER system is designed for sensible electronics in a hostile environment. Cooling is required to absorb the dissipated heat, but without ventilation to avoid corrosive, hazardous and dusty air inside the enclosure.

Liquid cooling media are recommended for the heat transfer from the inside to the outside, but no air flow. This can be achieved with [Passive or Hybrid Cooling \(pg. 20\)](#) concepts or the use of [Cooling Units \(pg. 56\)](#).

The main advantage of this multi-layered cooling approach is the reduced size of the protective solution - an important factor for systems installed close to the process. If passive cooling were the only option, an appropriate enclosure would have to be scaled for the hottest days of the year, which would require a very large water tank for such locations. By incorporating active water cooling, both the size of the cooling components and the costs can be reduced as the systems work hand in hand to cope with occasional temperature extremes.





Protective Soft Cover Solutions

THERMOTEX bespoke soft cover solutions allow for the insulation and protection of equipment where weight, space, access or high temperature concerns are of premium consideration.

Our experienced engineers design the soft cover solution to fulfill any requirement, regardless of size and complexity of your equipment.

By default, THERMOTEX jackets consist of a mineral wool or elastomeric foam core insulation between layers of silicone coated glass cloth. However the choice of materials may be flexibly adapted for different climates and applications like frost, corrosion and fire protection, or personnel protection.



Custom design for acoustic deadening mats



Custom valve jackets

Features & advantages

- Quick and unrestricted access to insulated items thanks to tool-free removability & re-installation
- Ability to cover simple or complex shapes
- Wide range of operating temperatures (-60°C to 1.000°C)
- No maximum size limitations
- Self-supporting construction - no auxiliary elements required
- Shorter installation time than traditional installation
- Resistant to frost, weather, chemicals and UV radiation
- Ideal for retro-fitting
- Anti-static, explosion-proof option available
- Non-stick surface

Fit-for-Purpose Design

Both our standard and custom THERMOTEX solutions are designed to precisely meet application requirements. Fabrics, insulation materials, thread, heating cables and other features are specifically selected for each project and according to customer wishes.

Purpose	Applications	Design temp.	Stack design	Options
Acoustic protection	<ul style="list-style-type: none"> • Sound reductiuon • PPE 	-60°C - 260°C		<ul style="list-style-type: none"> • Anti-static design • Chemical/UV resistant material • Equipment number tag
Thermal protection	<ul style="list-style-type: none"> • Winterization • Frost protection • Temperature maintenance 	-60°C - 260°C		<ul style="list-style-type: none"> • Anti-static design • Chemical/UV resistant material • CUI resistant material • Equipment number tag • Ex proof heater • Plug and socket connection
High temp. thermal protection	<ul style="list-style-type: none"> • Flare • Temperature maintenance 	260°C - 700°C		<ul style="list-style-type: none"> • Anti-static design • Chemical/UV resistant material • Equipment number tag • Ex proof heater • Plug and socket connection
High temp. system thermal protection	<ul style="list-style-type: none"> • PPE • Fluid solidification protection • Temperature maintenance 	up to 1000°C		<ul style="list-style-type: none"> • Anti-static design • Chemical/UV resistant material • Equipment number tag • Ex proof heater • Plug and socket connection
Passive fire protection	<ul style="list-style-type: none"> • Passive fire protection 	over 400°C		<ul style="list-style-type: none"> • Equipment number tag

Standard solutions

For small-scale applications like transmitters and gauges, we offer [THERMOTEX Soft Covers for Instrumentation \(pg. 37\)](#) in several proven designs.

Our portfolio for comprehensive protection solutions

Our product range has been growing steadily for over 50 years. Today, we can undoubtedly offer the most comprehensive portfolio of solutions for the protection of instruments and analyzers for any location. Whichever protection your equipment requires, INTERTEC can provide the solution that suits your needs.



Shades & Canopies

Basic protection from the sun, wind and weather.

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Enclosures

Protective housing for instruments and electronics.

Page 32



THERMOTEX Soft Covers

Textile protective jackets for field instrumentation.

Page 37



Cabinets & Shelters

Large solutions for analyzers, hydraulics and electric systems.

Page 38



Heaters

Temperature maintenance to prevent condensation and frost.

Page 44



Control Units & Switches

Precise temperature control for optimal operating conditions.

Page 51



Ventilation Units

Safe ambient conditions in hazardous areas.

Page 54



Cooling Units

Ensures the functionality of electronics in hot environments.

Page 56

INTERTEC enclosures, cabinets and shelters use GRP as their main construction material because it has many advantages over materials like sheet metal or concrete. It is incredibly light, resistant to corrosion and has very beneficial insulating properties.

Protection of instruments, housings and switches against sun, weather and dirt

INTERTEC protective canopies and sunshades made from GRP (pg. 11) offer effective protection for your instrumentation. With various designs and sizes, we offer the right solution for every application. By mounting protective covers to your transmitters, you protect your sensitive equipment from environmental influences. The thermally insulating material also ensures that the heat from solar radiation is not transmitted. Due to a variety of brackets, our protective covers and canopies can also be mounted directly on fittings from various manufacturers.



Protection from

- Solar radiation (overheating)
- Other heat sources
- Weather influences (rain, snow, etc.)
- Dirt and dust
- Mechanical damage (e.g. by falling parts).



Features & advantages

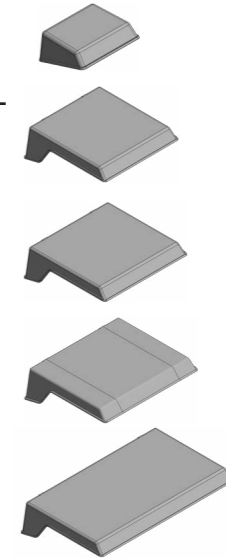
- Made from glass fiber reinforced polyester
- Heat-insulating material preventing the heat generated by solar radiation to be transferred to the instrumentation
- UV-resistant
- Low flammability and self-extinguishing
- Optionally antistatic

SD Series Shades

The simplest and most cost-effective design. It offers environmental protection and optimum access to the instrument.

Additionally, we offer mounting material for direct mounting on the transmitter housing. Various mounting brackets are available for the respective device types, which can be adapted to the instrument.

Type	Width (mm)	Depth (mm)	Height (mm)
SD 40	410	320	170
SD 50	570	570	175
SD 100	630		
SD 150	690		
SD 150Q	990		



SD 22 Transmitter Shade

The SD 22 shade is a special variant of our SD shade series, as its construction allows it to be fastened to transmitter heads directly in a multitude of ways.

Features & advantages

- Reinforced edges
- The drip lip design allows rain and melt water to run off easily
- A variety of fastening options for direct mounting to a transmitter head, pipe stand or other
- No need for separate pipe stand
- Various mounting brackets available for the respective device types

Color	gray
Dimensions (WxDxH)	210 x 365 x 111 mm



SD 17 Switch Protection Canopy

Switch protection canopies of the SD 17 series offer mainly mechanical protection of emergency stop buttons or control switches against accidental impacts or falling objects. The optional front bracket offers protection against accidental misuse or impacts from the front, but does not impair manual operation.

Features & advantages

- Fits single and multiple switches
- Reinforced edges and switch mounting area
- High wall thickness.
- Passed 'resistance to impact' test according to DIN EN IEC 60079-0 at the highest level.
- The optional front bar can be either glued or screwed to the canopy.
- Flat space for a tag at the front bar
- As standard, also available in red



Color	gray or red
Dimensions (WxDxH)	178 x 194 x 320 mm

SD 18 Cascading Shade

The SD 18 shade is resistant to the heat generated by direct sunlight and UV radiation. It is particularly space-saving and can be extended horizontally without transitions. Fittings can be mounted directly to the rear wall. Otherwise, the shade can be mounted to a transmitter using a bracket.

Features & advantages

- Horizontally linked pieces without transitions
- Back wall designed as flat mounting plate
- Minimal space requirements
- Optional mounting material for attachment to:
 - Transmitter (all vendors)
 - C mounting rails
 - Pipe stands



Color	gray
Dimensions (WxDxH)	242 x 225 x 320 mm

DIASHADE™

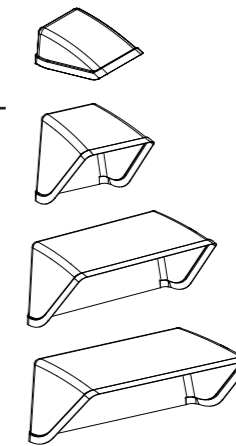
DIASHADE™ canopies provide greater coverage diagonal protection on the sides.

Features & advantages

- The drip lip and cone shaped design allow rain and melt water to run off easily.
- Lateral surfaces provide excellent protection from the sun, especially in case of low sun angles.
- Various mounting possibilities are available, especially for the protection of transmitters.
- Stackable for space-saving transport and storage due to tapered side walls.



Type	Width (mm)	Depth (mm)	Height (mm)
DIASHADE SD 37	240	350	150
DIASHADE SD 67	365	455	370
DIASHADE SD 127	765		
DIASHADE SD 187	1170		



CUBESHADE

Canopies of this series are ideal for protecting larger or more complex units. The larger side surfaces offer better protection when the sun is low or against driving rain. Canopies of this series offer exceptional stability.

Features & advantages

- The drip lip all around and cone shaped design allow rain and melt water to run off easily.
- Large lateral surfaces provide excellent protection from the sun, especially in case of low sun angles.
- Stackable for space-saving transport and storage due to tapered side walls.
- Increased stability by reinforced ribs in the back wall.



Color	gray
Dimensions (WxDxH)	550 x 500 x 600 mm

Protective solutions for measuring and analysis equipment

INTERTEC offers various standard and custom enclosures to protect field-mounted process equipment. Having the broadest range on the market - in sizes and designs - allows us to offer the right enclosure to provide optimal and cost-effective solutions for each application.

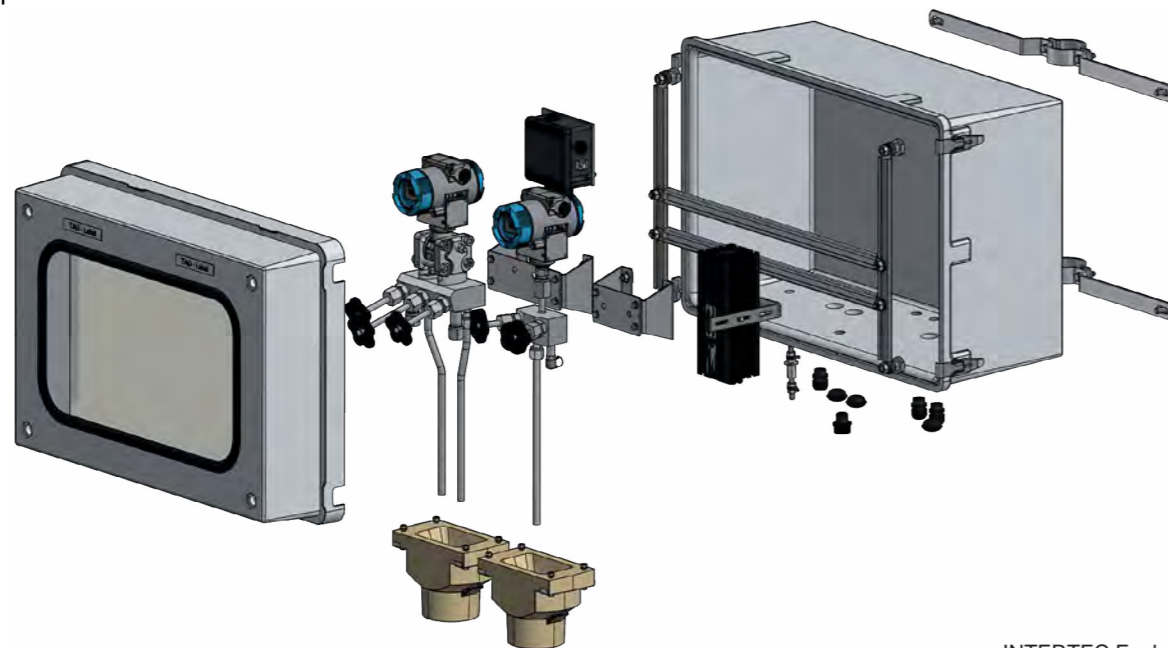
The enclosures are made of a specific high-performance grade of **Glass Fiber Reinforced Polyester** (pg. 11). Alternatively, the same degree of protection can be achieved with our **THERMOTEX Soft Covers** (pg. 27). Whether the choice falls on GRP enclosures or soft jackets boils down to the specific installation conditions and customer preference.



Customization is key

Even our standard solutions are highly customizable with an array of optional features and accessories:

- Various latch and hinge designs
- Windows and doors
- Vents and drains
- Additional insulation
- Mounting rails and plate designs for instrumentation
- Pipe stands or wall-mounting brackets
- GO option for **explosion protection** (pg. 9) (all requirements of IEC 60079-0 and -9 for ATEX and IECEx)
- Optional: CSA Type 4X
- Ex-proof heaters



INTERTEC Enclosures
<https://www.intertec.info/en/enclosures>

MULTIBOX

MULTIBOX is an extremely versatile two-part enclosure system: it can be installed vertically or horizontally. Either section, deep or shallow, can be used as the base or lid for improved maintenance access. Instruments are typically mounted on C-rails in the base section or a mounting plate that is installed on 4 mounting elements in the edges. So heavy loads can be transferred to the pipe stand or wall bracket without compromising the stability of the enclosure. Several standard sizes provide volumes from 20 liters up to 250 liters.

If none of these types match the application, the custom made MULTIBOX VARIO may be the solution.

Features, advantages & options

- Made of hot-pressed glass fiber reinforced polyester (GRP)
- Stackable design for space saving storage and transport
- Low flammability and self-extinguishing
- Stainless steel mounting elements
- Color: gray or custom
- Lightweight (5.2 - 14 kg)
- EPDM or silicone gasket
- Protection class up to IP68
- GO option for **explosion protection** (pg. 9): fulfills all demands for ATEX and IECEx
- Ex p option: Ex p pressurization
- Arctic GRP option: sandwich design with additional PU insulation and interior GRP lining
- Optional: Lid with window, hinged door or hinged door with window



	W (mm)	H (mm)	D (mm)
MULTIBOX 20	377	477	150
MULTIBOX 40			289
MULTIBOX 25	385	485	240
MULTIBOX 48			380
MULTIBOX 60	440	640	250
MULTIBOX 70			340
MULTIBOX 100	520	750	430
MULTIBOX 80			250
MULTIBOX 150	600	800	430
MULTIBOX 170			480
MULTIBOX 250	600	800	485
VARIO	custom dimensions		



DIABOX™

This two-part enclosure is split diagonally, offering clear and easy access to installed equipment for maintenance. There are six sizes from approx. 27 to 277 liters, each of which may be installed vertically or horizontally.

For individual volumes and requirements, the variant DIABOX VARIO can be flexibly adapted.

Features & advantages

- Made of hot-pressed glass fiber reinforced polyester (GRP)
- Stackable design for space saving storage and transport
- Low flammability and self-extinguishing
- Color: gray or custom
- Lightweight (8.5 - 18 kg)
- UV-resistant
- Continuous double seal (mechanical and EPDM)
- Protection class up to IP68
- Arctic GRP option: sandwich design with additional PU insulation
- Optional: Lid with window

Type (vertical)	Enclosure		
	W (mm)	D (mm)	H (mm)
DIABOX 27	162	380	380
DIABOX 87	460	390	490
DIABOX 107	585		
DIABOX 137	710		
DIABOX 187	960	600	600
DIABOX 277	750		
VARIO	custom dimensions		



Type (horizontal)	Enclosure		
	W (mm)	D (mm)	H (mm)
DIABOX 87	460	490	390
DIABOX 107	585		
DIABOX 137	710		
DIABOX 187	960		
VARIO	custom dimensions		



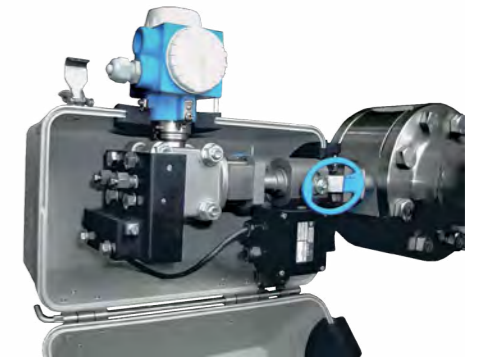
MINIBOX 21

This enclosure was specifically designed for compact instrument hook-ups and direct (close-coupled) mounting of transmitters. The enclosure can be installed vertically or horizontally. Its hinges allow clear access to the installed equipment from all sides.

Features & advantages

- Made of hot-pressed glass fiber reinforced polyester (GRP)
- Two-part construction: horizontal or vertical mounting possible
- Stackable design for space saving storage and transport
- Low flammability and self-extinguishing
- Stainless steel mounting elements
- Color: gray or custom
- Lightweight (3 kg)
- UV-resistant
- Protection class IP44

Mounted	Width (mm)	Depth (mm)	Height (mm)
vertically	388	218	300
horizontally	218	300	388



UNIBOX

The UNIBOX is a two-part enclosure with a large top half that folds away to provide full access to the top and sides of installed equipment. Alternatively, it is available as a variant that can be completely removed. Ideal for applications with base entry for tubes and cables. The UNIBOX is available in four sizes from 43 to 63 liters, weighing only between 5.2 and 6.8 kg.

Type	Width (mm)	Depth (mm)	Height (mm)
Type J 1	380	310	380
Type J 2			420
Type J 3			480
Type J 4			520





Body Only Enclosure (BOE)

The two-part enclosure for protecting field instrumentation has removable side flaps for access to the manifold. The BOE covers only the wet part of the transmitter and the manifold, thus keeping the electronics in open air. Designed and produced to meet Shell's MESC standard.

ISOBOX

This is an insulating protective enclosure made of PU integral foam and an acrylic glass front panel for pressure gauges. It consists of two components, which are connected with three clamps, allowing easy assembly and disassembly. The enclosure can optionally be equipped with a heater to prevent condensation.



Type	Diameter (mm)	Depth (mm)
100	134	115
1613	200	170



MINICAB

Made of hot-pressed glass fiber reinforced polyester, the MINICAB is UV-resistant, flame-retardant and self-extinguishing. The door is locked with a 1-point locking device and maintains protection class IP54 by means of an EPDM seal around the door opening. Can be customized with a window, mounting equipment and antistatic coating and a variety of locking types to choose from.

Type	Width (mm)	Depth (mm)	Height (mm)
MINICAB 44	355	256	505

THERMOTEX Soft Covers for Instrumentation

These THERMOTEX Instrumentation Protective Soft Cover Solutions are an efficient protective solution for transmitters, gauges and similar instrumentation. The outer layer of silicone coated glass fabric offers excellent resistance to corrosion, UV rays as well as cold and frost protection. Thanks to reliable insulation and optional heater cables, the jackets are well suited for cold climates – even as low as -60°C. The covers are lightweight, space-saving, easily removable and reusable when necessary.



Features & advantages

- Tailored fit
- Lightweight
- UV resistant
- Flame retardant
- Low installation costs
- Easily removable for full maintenance access
- Ideal for retrofitting or limited space installation

The basic design of THERMOTEX Flexible Instrument Covers is comprised of a layer of insulation between layers of silicone-impregnated fiberglass cloth and fasteners, depending on the application. They can be used for ambient temperatures ranging from -60°C up to 250°C. Other temperature ranges are also available as custom designs.

Options

- GO option for [explosion protection \(pg. 9\)](#) (Antistatic design for ATEX and IECEx)
- Different insulation and acousting deadening materials
- Self-regulating heating cable
- Thermostats
- different sizes of viewing windows
- Fire protection up to 1000°C



Fit-for-purpose standard designs, like cuboid or cylindrical. New standard designs are in development.

Comprehensive protection solutions that exceed conventional protective cabinets

INTERTEC protective cabinets and shelters are built using a modular system of walls, doors, floor and roof elements made of polyester composites and a polyurethane foam core. Solutions made from these components combine strength and rigidity with above-average protection and are able to withstand any extreme climatic conditions.

Our cabinets and shelters are manufactured as complete solutions with a full range of accessories, such as [Heaters \(pg. 44\)](#), [Cooling Units \(pg. 56\)](#), [Ventilation Units \(pg. 54\)](#), electric installation, lighting equipment, pipe and cable seals, mounting systems, etc.

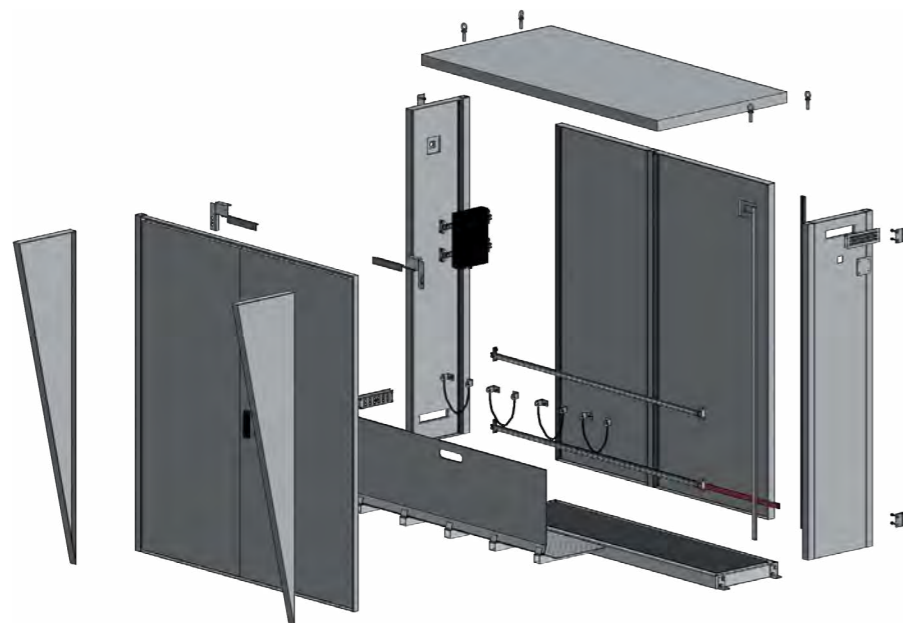


Advantages of all types

- Corrosion resistance
- Maintenance-free materials
- Decades of service life
- UV- and scratch-resistant gelcoat
- Electrical insulation
- High strength, low weight
- Easy machining
- Thermal insulation
- High quality
- Certified production
- Transparent to radio waves
- Easy removal of graffiti
- Custom colors

Protection and safety

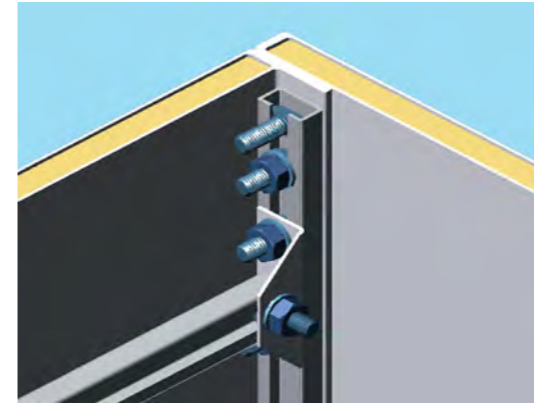
- Ingress protection up to IP68
- Optional: CSA Type 4X/Type 3RX for cabinets
- GO option for [explosion protection \(pg. 9\)](#) (all requirements of IEC 60079-0 for ATEX and IECE x)
- B1 fire rating, F30 fire resistance rating
- Fire resistance class up to 120 minutes (FIRE SHELTER)
- Active, passive or hybrid cooling
- Heat resistance (up to 160°C)
- Extreme thermal insulation for Arctic or tropical climate
- Protection against storm (up to 240 km/h)
- Earthquake/Seismic-proof
- Leakproof floor (German Water Resources Law §19)
- Optional: Ex p pressurization



Protective Cabinet and Shelter Designs
<https://www.intertec.info/en/cabinets-shelters>

BASIC Construction

This light-duty construction for small to medium-sized cabinets provides enough stability for the cabinet itself and the mounted instruments within using only walls made from a polyurethane foam core sandwiched between two glass fiber reinforced polyester sheets.



Features & advantages

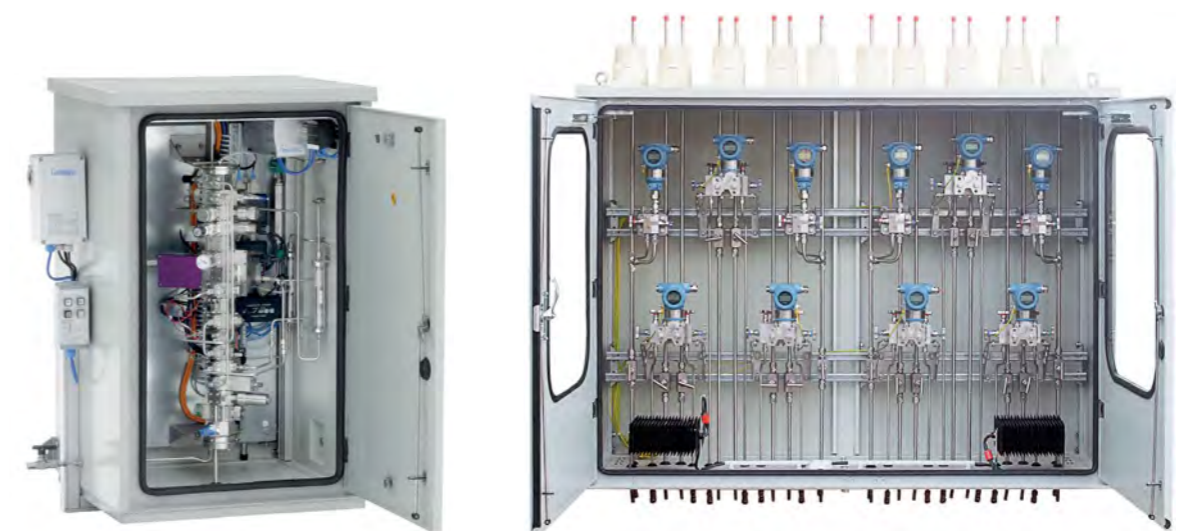
- Free-standing or wall-mounted
- Protection class IP65 (single door) or IP54 (double door)
- Vertical C-rails provided on the rear wall
- Door lock: Double-bit lock insert in stainless steel for cabinet series 100 with single doors; otherwise with additional three-point locking device and swing handle

Type	Height (mm)
100.xxx.xxx	1045
125.xxx.xxx	1295
150.xxx.xxx	1545
175.xxx.xxx	1795
200.xxx.xxx	2045

Type	Width (mm)
xxx.040.xxx	440
xxx.060.xxx	640
xxx.080.xxx	840
xxx.100.xxx	1040
xxx.129.xxx	1290

Type	Depth (mm)
xxx.xxx.030	300
xxx.xxx.040	400
xxx.xxx.060	600
xxx.xxx.080	800
xxx.xxx.100	1000

For individual specifications, the BASIC VARIO variant can be flexibly adapted.





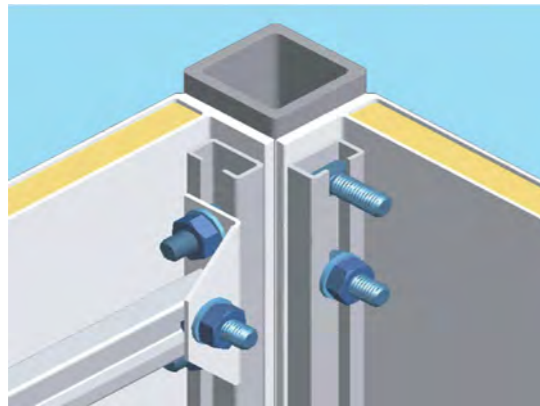
CLASSIC Construction

The CLASSIC construction is a proven system with a unique C-rail concept. Here, the weight of the fixtures is transferred to the corner posts made of high-strength pulltruded profiles. Thanks to the proven sandwich construction of GRP (pg. 11) and rigid polyurethane foam core, this series also features very good thermal insulation.

CLASSIC solutions are individually scalable - from non-walk-in cabinets to manned shelters. Each wall element can also be designed as a door.

Features & advantages

- Reinforced glass fiber reinforced polyester parts
- Pulltruded GRP corner posts for improved stability
- Textured gray or custom colored surface
- Protection Class IP65: single door
- Protection Class IP54: double door
- Vertical c-rails provided on the side walls and rear wall
- 3-point locking device and burglary-resistant swing handle with profile cylinder according to DIN 18252 (lockable)
- Roof overhang all around (25mm, 50mm or custom)
- Optional: F30 fire protection



For individual specifications, the width and depth can be flexibly extended in 200 mm increments thanks to our modular system approach.



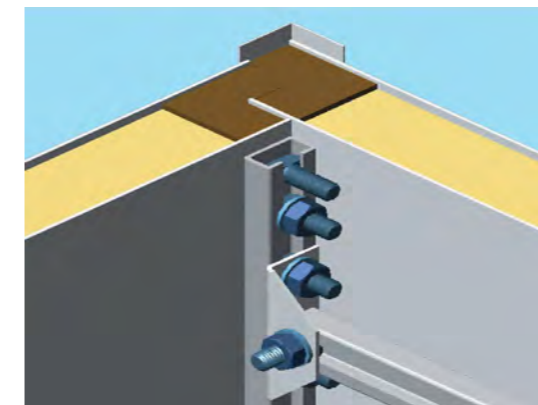
Type	Clear height (mm)	Total height (mm)
110.xxx.xxx	1000	1140
135.xxx.xxx	1250	1390
160.xxx.xxx	1500	1640
185.xxx.xxx	1750	1890
210.xxx.xxx	2000	2140
235.xxx.xxx	2250	2390
250.xxx.xxx	2400	2540
260.xxx.xxx	2500	2640
285.xxx.xxx	2750	2890
310.xxx.xxx	3000	3140

ARCTIC SHELTER

The sandwich elements of the ARCTIC series are manufactured on modern CNC machines with millimeter precision and are suitable for use in moderate climate as well as in extreme temperatures.

Most aspects of an ARCTIC SHELTER solution are fully customizable. All dimensions as well as the thickness of the insulation can be chosen individually. The possibilities for individual designs are almost unlimited.

ARCTIC SHELTERS are constructed of sandwich style elements with excellent insulation properties which are assembled to form a self-supporting shelter with high mechanical strength.



Features & advantages

- Protection class IP65 (single door) or IP54 (double door)
- Heat insulation U-value from 0.43 W/m²K / R13 to 0.2 W/m²K / R28
- Variable wall thicknesses according to the client's specific requirements, e.g. with regards to fire protection, heat and cold insulation, sound protection, etc.
- Variable wall materials (GRP, stainless steel, aluminium, special surfaces) and customer-specific colors.
- High static strength
- Low total weight enables installation in and on buildings and steel structures.
- Fully transportable, can be equipped in the workshop and moved to site.



FIRE SHELTER

In case of a fire, it is necessary to keep safety devices in operation. INTERTEC FIRE SHELTERS ensure a comparatively low internal temperature in the event of fire - even up to and beyond 120 minutes of exposure. FIRE SHELTERS are made of a special multi-layer sandwich construction of GRP (pg. 11) and mineral wool.

FIRE SHELTERS are available in various forms - from retrofit kits to fully equipped and accessible houses. They are individually designed and sized for each application to ensure a proper fit.



Fire rating

A protective solutions's fire rating can be categorized by two types:

- Combustibility describes how fire retardant the solution is
- Fire resistance is determined by thermal insulation materials and describes the enclosure's ability to structurally withstand high temperatures and prevent heat from passing through, i.e. keep inside temperatures under a certain threshold

Our FIRE SHELTERS are specially designed to meet the requirements of both these types in accordance with international fire protection standards:

- EN 13501: E, EI, REI30, REI60, REI90, REI120
- Solas: A30, A60, A90, A120
- DIN4102: F30, F60, F90, F120
- BS476, ISO 834, ASTM E119, CAN4-S101



Hydrocarbon fires

Our FIRE SHELTER 1709 meets standards for the hydrocarbon time-temperature curve. The challenge is that usual fire insulation materials like glass and mineral wool melt at extremely high temperatures and materials that can withstand these temperatures usually lack insulation properties. We solved this problem by combining layers of ceramic material with layers of mineral wool.

The construction was tested and certified by MPA-Dresden. The test simulated a hydrocarbon fire by exposing our FIRE SHELTER 1709 to a temperature of 1100°C. The temperature of the equipment inside did not exceed 60°C.

Features & advantages

- Corrosion resistant using GRP materials externally and internally
- Lightweight, yet rigid
- Maintenance-free
- Antistatic materials
- Ingress protection up to IP66
- Optional Ex p pressurization
- Custom designed and sized to fit around instruments
- Extreme thermal insulation can be configured to maintain a predefined interior operating temperature
- Complete shelter removal allows full access to repair or replace instruments
- Optional access doors for service and maintenance without disassembly
- Full fire protection for doors, windows and vent openings
- Standard details for tubing and electrical penetrations

Application

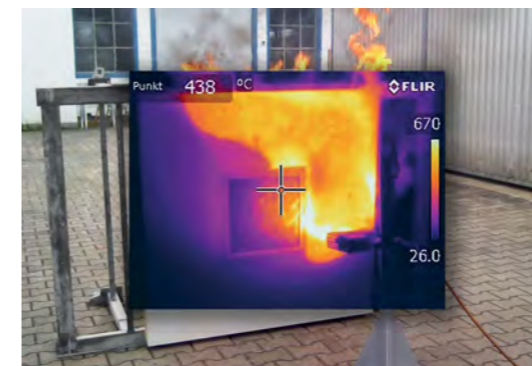
One of the most common applications is the protection of control tools, safety equipment or emergency shutdown (ESD) valves. In the event of a fire, ESD valves and their actuators must be protected against heat exposure in chemical and petrochemical plants. They must remain operable for a minimum of 15 minutes after the outbreak of a fire. More stringent requirements such as 30, 60 min. or higher are also possible.



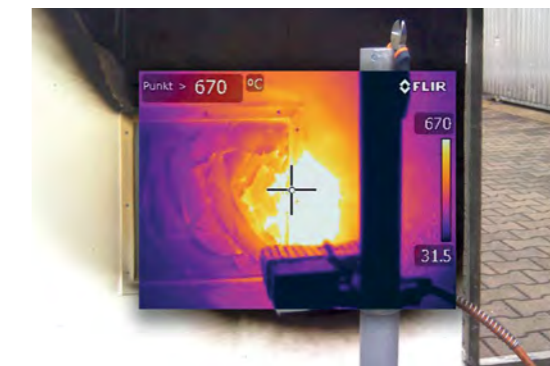
In-house tests

INTERTEC conducts regular fire tests to validate the protective properties of all FIRE SHELTER components. The test below was done to check the integrity of an intrumescent safety glass window, as well as its frame through direct, punctual exposure to a flame for 120 minutes. While conventional tests work with a heat output of 250 kW/m², we used a heat source with an output of 1.000 kW/m².

During the test, the safety glass expanded to release a heat insulating foam. After 120 minutes, the structural integrity of the window and frame remained intact, as the fire did not manage to burn through the construction. A maximum temperature of 175°C was recorded on the far side of the construction, directly opposite the exposure point, which was considerably lower than the threshold temperature.



Temperatures after 5 minutes of exposure.



Temperatures after 50 minutes of exposure.

Explosion-proof heating systems

INTERTEC offers the world's largest selection of explosion-proof enclosure heaters, certified for almost all regions of the world: IECEx, ATEX (EU), CSA, UL (USA, Canada) EAC (GUS), CCC (China), KC (Korea), PESO (India), INMETRO (Brazil). The solution to a heating task is the interplay of thermal insulation, mounting position, heater type and the [Controllers and Temperature Switches \(pg. 51\)](#). And the heating tasks have very different requirements. Only the wide spectrum and our heaters' modular design make it possible to configure the perfect solution with optimum heat transfer, significant energy savings, the best mounting, etc.



Properties of INTERTEC heaters

- Approved for Gas-Ex and Dust-Ex zones 1, 2, 21 and 22
- Operating temperature between -60°C and 180°C
- Protection class IP66/IP68; completely waterproof encapsulated
- Made of seawater-resistant, black anodized aluminum resulting in high heat output
- All explosion-proof heating systems are also available as non explosion-proof versions

Bi-Standard for explosion proof heaters

- There are two different paradigms for electrical installations in hazardous areas worldwide:
- The CEC/NEC in North America (Canada and USA) only permits the installation of electrical leads inside rigid conduits, with the exception of electrical leads inside flame-proof and CSA 4X rated enclosures
 - In almost all other countries, IECEx, ATEX (EU), EAC (GUS), CCC (China) etc allows cables to be used, if they are installed mechanically protected.

INTERTEC heaters for hazardous areas are build in a modular system. Many modules of these systems are the same for heaters with IEC certificate and American certificate (CSA C/US). Therefore bi-standard heaters, that comply to both standards are possible. These heaters can be practically used world-wide.



Connection type	Ex d cable gland	Ex d cable gland and 1/2" NPT adapter	1/2" NPT thread in the heater block
IECEx/ATEX	Standard	Special	Not certified
CSA C/US	Special	Special	Standard
BI-Standard	Special	Standard	Not certified

Conduction or Convection

Conduction

Conduction heaters are defined by their flat surface and are fixed to the instrument or device they need to heat, which in turn must also have a good flat surface for proper heat transfer. These heaters require significantly less energy than convection heaters because heat is transferred through direct contact rather than through the heating of air.



Convection

With this application the air inside the enclosure is used as a medium for transferring heat to the equipment. Convection heaters feature ribbed fins for maximum surface area.

The advantage of these heaters is that any application or design can be heated. But the enclosure must be well insulated to keep heat loss to a minimum.



Constant Power (CP) or Self-Limiting (SL)

Constant Power (or Fixed Resistance) Heaters

CP heaters are manufactured with a constant resistance heater cartridge. They need to be operated with a thermostat or controller to control their heating output.

In case of overheating, for example during an emergency, a temperature fuse within the cartridges will safely shut down the heater.

Heaters with fixed resistance are especially suitable for frost protection and Arctic conditions.

Self-Limiting Heaters

SL heaters use a PTC heater cartridge: PTC-elements (Positive Temperature Coefficient) increase their resistance when the temperature rises. The higher the resistance, the lower the output. The heat output at high temperatures becomes very little so that the limit temperature of the respective temperature class cannot be exceeded.

Self-limiting heaters in general are best suited for conduction, anti-condensation or high temperature applications.

CP MICROTHERM

MICROTHERM is the right choice of heater if the available space is not sufficient to install a larger model.

Application

Heating of instrument enclosures in hazardous areas, designed for freeze and condensation protection.

Features & advantages

- very slim heater body design
- vertical design allows for optimum installation adjacent to the instruments to be heated in the enclosure



Heating method	Convection
Ingress protection	IP66/68
Nominal voltage	230 V AC (220-240 V AC)
Operating temp. range	-60°C to 180°C
Dimensions	50 x 50 x 155 mm

CP MULTITHERM

The MULTITHERM is bigger and more powerful. With enough space, this heater offers unparalleled efficiency.

Application

Heating of instrument enclosures in hazardous areas, designed for freeze and condensation protection, as well as temperature maintenance.

Features & advantages

- vertical design allows for optimum installation adjacent to the instruments to be heated in the enclosure
- freeze-protection thermostat (TAE) integrated as standard or protective thermostat (TS) for temperature maintenance



Heating method	Convection
Ingress protection	IP66/68
Nominal voltage	230 V AC (220-240 V AC)
Operating temp. range	-60°C to 180°C
Dimensions	80 x 80 x 155 or 225 mm

CP HORIZOTHERM

HORIZOTHERM heaters heat the air in the enclosure by convection. Preferably, the heater is installed in horizontal position at the bottom of the enclosure.

Application

Heating of instrument enclosures in hazardous areas, designed for freeze and condensation protection, as well as temperature maintenance.

Features & advantages

- horizontal design allows for optimum installation underneath the instruments in the enclosure
- vertical installation also possible
- freeze-protection thermostat (TAE) as standard or optionally with protective thermostat (TS) for temperature maintenance



Heating method	Convection
Ingress protection	IP66/68
Nominal voltage	230 V AC (220-240 V AC)
Operating temp. range	-60°C to 180°C
Dimensions	152 x 155 x 40 mm

CP VARITHERM

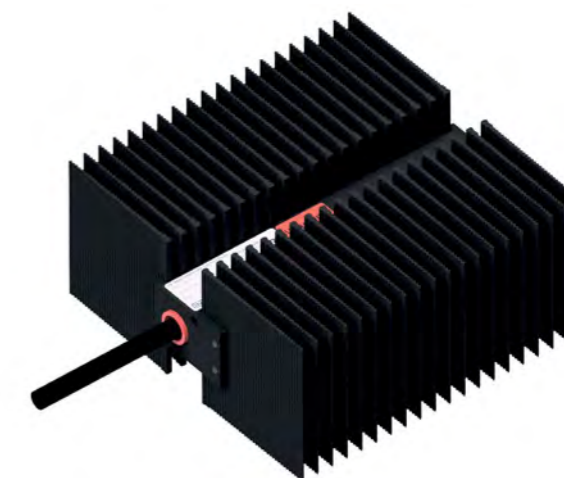
These heaters are characterized by a high heat emission due to their relative area. They are optimally installed below the devices in the housing.

Application

Heating of instrument enclosures in hazardous areas, designed for freeze and condensation protection.

Features & advantages

- horizontal design allows for optimum installation of the heater underneath the instruments in the enclosure
- vertical installation possible
- Heater fins can be removed and modified by INTERTEC, if necessary for installation purposes



Heating method	Convection
Ingress protection	IP66/68
Nominal voltage	230 V AC (220-240 V AC)
Operating temp. range	-60°C to 180°C
Dimensions	220 x 213 x 40/60/80/100/120 mm

CP/SL MEGATHERM

This electric finned heater is designed for both fixed resistance and self-limiting operation and is used in small enclosures or cabinets where measuring instruments, control valves or similar equipment in hazardous areas must be heated.

Application

Heating of instrument enclosures in hazardous areas, designed for freeze and condensation protection, as well as temperature maintenance.

Features & advantages

- vertical design allows for optimum installation adjacent to the instruments to be heated in the enclosure

	CP MEGATHERM	SL MEGATHERM
Heating method	Convection	
Ingress protection	IP66/68	IP66/68
Nominal voltage	230 V AC	110 V to 265 V
Operating temp. range	-60°C to 180°C	-60°C to 180°C
Dimensions	229 x 60 x 225 or 325 mm	



SL VARITHERM

The SL VARITHERM is heated by a self-limiting PTC-cartridge. It has a high heat emission due to their relative area and are optimally installed below the devices in the housing.

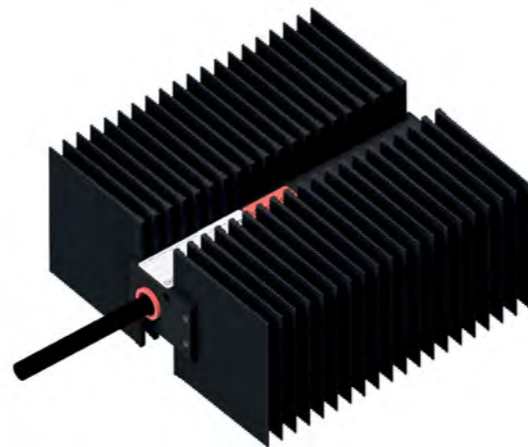
Application

Heating of instrument enclosures in hazardous areas, designed for high temperature maintenance.

Features & advantages

- horizontal design allows for optimum installation of the heater underneath the instruments in the enclosure
- vertical installation possible
- Heater fins can be removed and modified by INTERTEC, if necessary for installation purposes

Heating method	Convection
Ingress protection	IP66/68
Nominal voltage	110 V - 265 V
Operating temp. range	-60°C to 180°C
Dimensions	220 x 213 x 120 mm



SL QUADRATHERM

The self-limiting electric heater is flat on one side and finned on the other. The flat side works through conduction and should be firmly attached to the manifolds, measuring instruments, control valves and similar equipment. The finned side works through convection and heats the air inside the enclosure.

Application

Heating of instrument enclosures in hazardous areas, designed for freeze and condensation protection, as well as temperature maintenance.

Features & advantages

- energy saving
- self limiting, no fusable link or limiter
- requires very little space
- adjusts automatically to the voltage



Heating method	Conduction
Ingress protection	IP66/68
Nominal voltage	110 V to 265 V
Operating temp. range	-60°C to 180°C
Dimensions	95 x 30 x 90-105 mm

SL BLOCKTHERM

The self-limiting electric heater is designed to be attached directly to manifolds, measuring instruments, control valves and similar equipment installed in hazardous areas. It heats the device by direct conduction. This is the easiest, safest and most economical method of freeze protection or temperature maintenance.

Application

Heating of instruments in hazardous areas, designed for freeze and condensation protection, as well as temperature maintenance.

Features & advantages

- energy saving
- self limiting, no limiter required
- requires very little space
- adjusts automatically to the voltage
- ADA option: Adapter plates



Heating method	Conduction
Ingress protection	IP66/68
Nominal voltage	110 V to 265 V
Operating temp. range	-60°C to 180°C
Dimensions	90/105 x 50 x 45 mm 225 x 50 x 45 mm

SL FLAT THERM

The SL FLAT THERM is a heater block that is flat on all sides. This direct heater works through conduction and should be firmly attached to the equipment at a flat metal surface.

Application

Heating of instruments in hazardous areas, designed for freeze and condensation protection, as well as temperature maintenance.

Features & advantages

- energy saving, high output
- self-limiting, no fusible link or limiter
- compact, requires very little space
- adjusts automatically to the voltage
- areas for custom drill holes to facilitate mounting



Heating method	Conduction
Ingress protection	IP66/68
Nominal voltage	110 V to 265 V
Operating temp. range	-60°C to 180°C
Dimensions	30 x 220 x 200 mm

CP SMART BLOCK THERM

The SMART BLOCK THERM heating system consists of the explosion-proof electrical heater BLOCK THERM HI and the digital SMART controller. The SMART BLOCK THERM configuration allows conduction heating at constant power.

Application

The SMART BLOCK THERM System is especially suited for demanding heating applications in areas with explosive atmospheres. For example: to keep analyzers at high temperatures.

Features & advantages

- energy and space saving
- precise temperature control using a digital PID controller
- set point temperature can be adjusted at any time
- extensive error monitoring
- The maximum temperature is managed electronically and a built-in temperature sensitive fuse ensures that the maximum allowed temperature never is exceeded. This principle protected by Intertec patent is very reliable and ensures a high safety in terms of explosive protection.



Heating method	Conduction
Ingress protection	IP66/68
Nominal voltage	230 V AC (220-240 V AC)
Operating temp. range	-60°C to 180°C
Dimensions	225 x 45 x 50 mm 105 x 30 x 40 mm

Controllers and Temperature Switches

Optimal temperature control for all applications

INTERTEC offers a wide range of temperature control options - from simple thermostats to digital PID controllers that complete the range of Ex and Non-Ex heaters.

Precise temperature control can optimize application performance, effectively reducing operating and maintenance costs - whether for freeze protection solutions or when precise temperature control is required for analytical or process purposes.

For use in hazardous environments, INTERTEC offers an exceptionally wide range of explosion- and seawater-proof temperature control solutions and has numerous Zone 1 and Division 1 approvals worldwide from organizations such as IEC, ATEX, TRCU and CSA. Options include Bi-Standard (IEC/CSA) heating systems.

TS Thermostat

The TS is an explosion-proof thermostat integrated in the connection cable. When connected to an electric heater as a two-point controller, it can regulate the temperature in a small housing to the pre-set, nominal set-point.

Application

The TS is used as a temperature switch. It switches on when the temperature is below the set point and switches off above the set point.

Features & advantages

- Completely encapsulated with silicone



Ingress protection	IP66/68 1bar/30min
Nominal voltage	Max. 230 V
Rated current	Max. 10 A
Operating temp. range	-60°C to 80°C
Dimensions	22 x 30 x 22mm

TAE Thermostat

The TAE is an external explosion-proof thermostat. Designed as a two-point controller, and when connected to an electric heater, it can regulate the temperature in a housing to the pre-set, nominal setpoint as a thermostat. It is used in areas where explosive gas/air or dust/air mixtures are to be expected on occasion.

Application

The TAE controller switches on when the temperature is below the set point and switches off above the set point. Its alternative version, the TAE AM, doubles as an alarm/fault indicator.

Features & advantages

- Very solid design with aluminium housing
- Completely encapsulated with silicone
- Relatively accurate control if the thermostat with thermal feedback is installed on the heater

Ingress protection	IP66/68 1bar/30min
Nominal voltage	Max. 275 V
Rated current	Max. 10 A
Operating temp. range	-60 °C to 180 °C
Dimensions	90 x 24 mm

	Switch on	Switch off
TAE -15	-15 °C	-5 °C
TAE -10	-10 °C	0 °C
TAE 10	10 °C	18 °C
TAE 20	20 °C	28 °C
TAE 30	30 °C	38 °C
TAE 40	40 °C	48 °C
TAE 50	50 °C	58 °C
TAE 60	60 °C	68 °C
TAE 70	65 °C	75 °C



TAEK Temperature Contact/Switch

The TAEK is an explosion-proof temperature switch for signaling only, designed for high and low temperature alarm for PLC/control systems.

Application

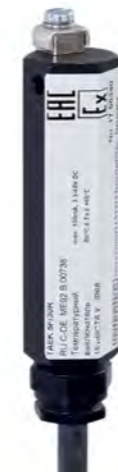
The TAEK temperature contact/switch has two contacts that respond to different lower and upper temperatures.

Features & advantages

- Very solid design with aluminium housing
- Completely encapsulated with silicone
- Relatively accurate control if the contact with thermal feedback is installed on the monitoring device/equipment

Ingress protection	IP66/68 1bar/30min
Nominal voltage	Max. 250 V AC 3,3 - 48 V DC
Rated current	1 mA - 100 mA
Operating temp. range	-60 °C to 180 °C
Dimensions	115 x 24 mm

	Set point	1 st contact	2 nd contact
5F/30R	Open	5 °C	30 °C
	Close	8 °C	27 °C
20F/50R	Open	20 °C	50 °C
	Close	23 °C	47 °C
30F/60R	Open	30 °C	60 °C
	Close	33 °C	57 °C
50F/80R	Open	50 °C	80 °C
	Close	53 °C	77 °C



TC D Digital Temperature Controller

The digital electronic temperature controller TC D was designed to regulate the temperature of instruments or the air temperature in instrument enclosures and protective cabinets. It electronically limits the surface temperature of the heater. It can be used with all our explosion-proof electric heaters, heater cables and especially INTERTEC HI series heaters.

Application

The TC D temperature controller is particularly well suited for demanding heating applications in potentially explosive atmospheres and has been specifically designed for high temperature maintenance of analysing equipment.

Features & advantages

- Highly accurate
- Long life solid state controller with no mechanical switching elements
- RS 485 interface allows networking in fieldbus networks and setting parameters at the PC via the Modbus RTU protocol
- Extensive fault monitoring
- External status display via a green/red LED
- Integrated junction terminal with 2 M20 glands (optional 3rd gland possible)



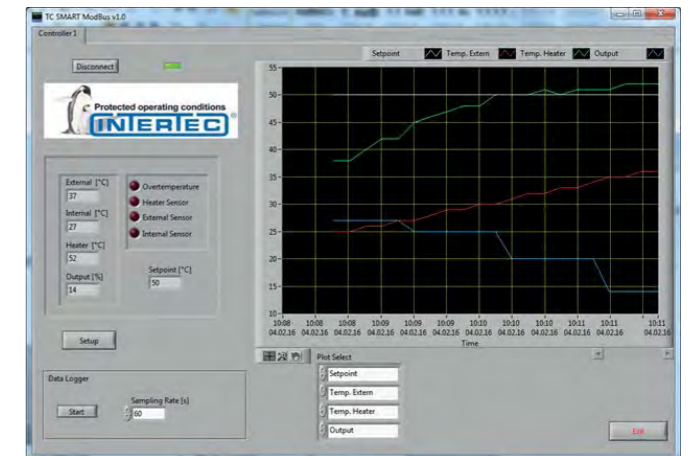
Ingress protection	IP66
Nominal voltage	Max. 230 V
Operating temp. range	-50 °C to 80 °C
Dimensions	57 x 125 x 80 mm

Test and adjustment software

The "SMART HEATER Software Set" consists of:

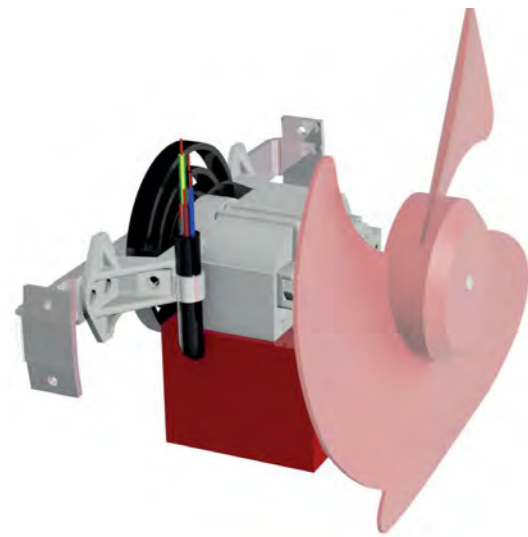
- Interface converter USB to RS-485
- TC SMART ModBus Software

With your PC or laptop, the actual states and values of the TC D can be shown and some parameters can be changed: Up to 31 TC D controllers can be connected to the RS485 interface. All controllers can be operated and monitored from a PC.



Ventilators for explosion-proof areas

For safe and efficient ventilation of enclosures, INTERTEC offers tried and tested, explosion-proof ventilation units for small enclosures up to large shelter constructions. They are used to disperse explosive gas mixtures and prevent condensation within our protective solutions.



ExVENT

The ExVENT is an encapsulated shaded-pole motor used to power fans, pumps or gearboxes.

A temperature limiter is integrated, which disconnects the motor from the mains supply in the event of external heating above the limit temperature or if the motor is blocked for explosion protection reasons.

Features & advantages

- 230 V AC
- mounting possible in all positions
- operating temperature range from -60 °C to +60 °C
- Optional: Fan (152 mm or 175 mm)
- When using a fan, mounting for air intake and exhaust possible

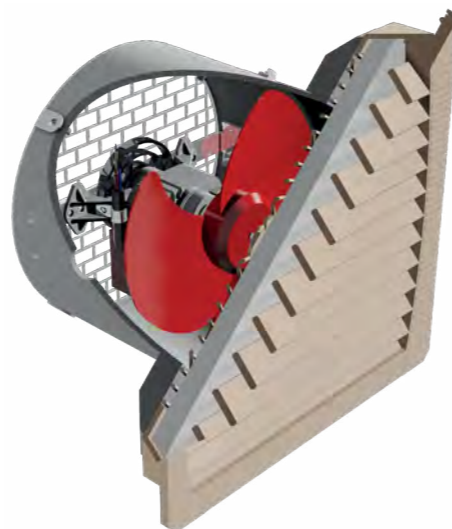
FL-ExVENT

The explosion-proof FL-ExVent filter ventilator is used for the ventilation of housings. It consists of the encapsulated shaded-pole motor ExVENT 3025, a housing made of stainless steel or GRP (pg. 11), and an outlet or inlet filter. The intake air is cleaned to prevent the introduction of dirt into the enclosure.

The FL-ExVENT is equipped with a temperature limiter, which separates the fan from the mains in case of danger.

Features & advantages

- compact dimensions
- operating temperature range from -40 °C to +60 °C



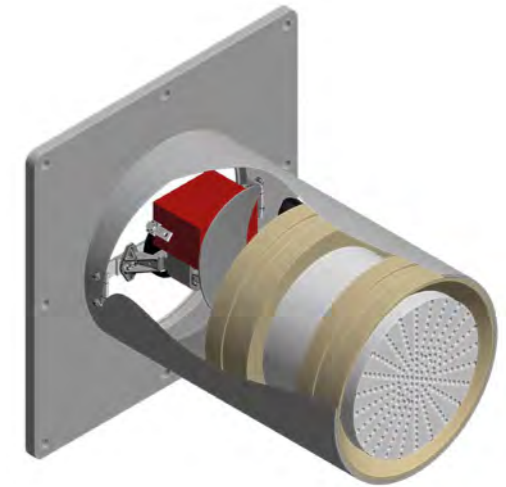
ExVENT Reco

If flammable gases or liquids are released inside a housing, a technical ventilation system must dilute them with clean air to such an extent that the lower explosion limit is not exceeded. However, if there are large temperature differences between the inside of the enclosure and the environment, the air exchange causes a high energy loss. ExVENT Reco reduces the energy consumption for heating or cooling the inside of the enclosure by means of heat recovery while providing explosion-proof ventilation.

The system consists of a control unit and two ExVENT Reco units, which are installed in the walls on opposite sides to ensure better flushing. A recuperator in each unit keeps the temperature inside the enclosure largely constant despite a 10-fold air exchange, resulting in an energy recovery of up to 80%.

Features & advantages

- compact dimensions
- operating temperature range from -40 °C to +60 °C



Installation example with one ExVent Reco unit on either side to provide proper air circulation.

Reliable cooling solutions - tailored to your application

The proper cooling of crucial field instrumentation, meters and control units is essential to ensure their functionality and longevity – especially in hot climatic conditions. Our tried and tested cooling and air conditioning units are dimensioned by our experts specifically for your application and matched to the appropriate protective solution. Thanks to our many years of experience in this field, the economy and efficiency of this overall solution is unsurpassed.



HYBRICOOL Cooling Unit

HYBRICOOL is an active cooling unit for high industrial requirements and extreme environmental conditions. It is used to increase the overall cooling capacity of passive cooling systems by actively cooling their heat buffer. Alternatively, HYBRICOOL can be used as a backup for passive cooling systems.

The HYBRICOOL cooling unit was designed for low maintenance and constant performance with low wear and tear: The housing is made of our corrosion-resistant glass fiber reinforced polyester. The cyclonic sand separator in the air inlet minimizes the introduction of sand and spray water into the housing. The air outlet is equipped with flaps, so that no dust can penetrate the unit when the cooler is not in operation.

Benefits

- Available for 230/400 V AC and 24/48 V DC
- Corrosion resistant
- No condensation or ice formation
- Low maintenance
- Low energy consumption in combination with passive cooling system

Cooling capacity	5.500 W (35°C/35°C)
Ingress protection	IP65
Operating temperature range	-20°C to 55°C
Dimensions	800 x 600 x 520 mm
Suitable for	Cabinets, shelters

ATEXCOOL

In chemical and petrochemical plants, analyses devices or sensitive measuring and control units must be operated in hazardous areas. Often, certain temperature limits are required for the installation, which are usually located in protective cabinets or shelters. These constant temperature conditions require cooling of the interior in hot regions and potentially heating in winter. ATEXCOOL offers both technologies in explosion-proof design combined in one device. It is usually mounted on the outside wall of the protective cabinet or shelter.

Benefits

- Corrosion resistant
- Certified according to ATEX directive II 2G Ex px mb e IIC T3

Cooling capacity	2.000 W / 4.000 W (35°C/35°C)
Ingress protection	IP54 (inside), IP55 (outside)
Operating temperature range	-25°C to 55°C
Dimensions	750 x 520 x 250 mm
Suitable for	Cabinets, shelters



INTEGRICOOL

INTEGRICOOL is a complete solution for the protection and precise temperature control of temperature-sensitive equipment, like [Process Analysis \(pg. 72\)](#) systems and CEMS in hazardous areas.

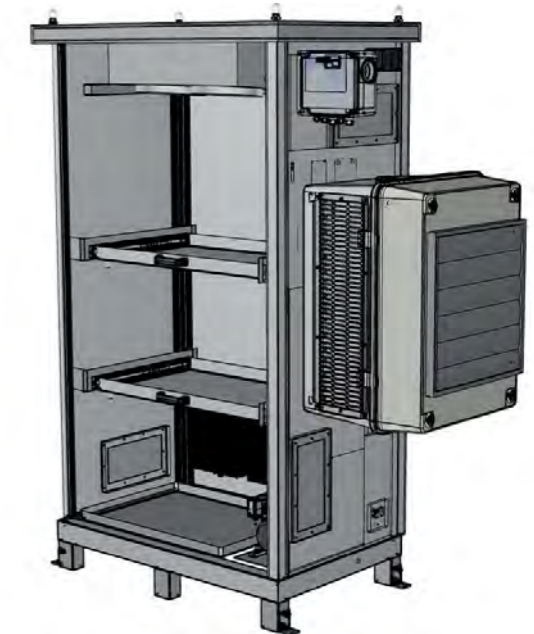
It consists of an insulated INTERTEC cabinet with an Ex p pressurization system, a heating and cooling system, and a high-precision temperature controller.

This solution has been entirely developed by INTERTEC to provide the ideal protection for analytical systems without having to integrate an external HVAC system. The assembly of the various elements takes place during the manufacture of the cabinet.

Benefits

- High precision temperature control
- Corrosion resistant
- Cost-effective due to use of standard equipment
- Modular and adaptable system for a wide range of applications

Cooling capacity	Depending on the size of the cabinet Max. 1.200 W for a 1000x1000x2000 mm cabinet
Ingress protection	IP65
Operating temperature range	-20°C to 45°C
Dimensions	Min. 1000x1000x2000 mm
Suitable for	Cabinets, shelters



VARICOOL

The VARICOOL was designed as a standard cooling unit consisting of a compressor, an external and an internal heat exchanger mounted to a steel plate which serves as a heat buffer. With its low operating voltage it is the perfect solution for heat compensation in remote locations with little to no power supply using photovoltaic modules, for instance, or as an inexpensive on-grid solution. Can be used for protection solutions of any size: from small [Enclosures \(pg. 32\)](#) to large [Cabinets & Shelters \(pg. 38\)](#).

Should the need arise, an existing INTERTEC [Passive Cooled Shelter \(pg. 20\)](#) can be retrofitted with one or more VARICOOL units to transform it into a [Hybrid Cooled Shelter \(pg. 21\)](#) to further improve its cooling capacity. The streamlined design allows easy installations without compromising the integrity of the solution.

Benefits

- Low operating voltage
- Available as a complete SAFE LINK solution
- Retrofittable into existing INTERTEC cabinets and shelters
- Cascading operation possible for more cooling capacity in larger systems
- Optionally available with solar panels and battery
- Ingress protection of the protective solution is not affected



Cooling capacity	200 W (35°C/35°C)
Ingress protection	IP20
Operating temperature	Max. 50°C
Dimensions interior	516 x 540 x 2 mm
Dimensions exterior	330 x 200 x 150 mm
Suitable for	Enclosures, cabinets, shelters

Passive Sample Cooler

Samples of fluids and gases in industrial plants are often very hot, especially close to the process. This can pose dangers to personnel and equipment. Flammable substances in particular must not come into contact with oxygen above their auto-ignition temperature.

INTERTEC's passive sample cooler ensures a specific sample temperature when it is extracted. It works on the principle of passive cooling: the sample passes through a stainless steel spiral inside a water tank. The thermal energy is transferred to the water. Since the heat capacity of water is comparatively high, the water warms up only slowly.

Benefits

- Low maintenance
- Modification to factory standard possible (materials, valves, connections)
- Flexible design of the process engineering layout according to the application
- Self-sufficient system: no supply of media like cooling water or process air necessary
- Explosion proof for Zone 1 or Class I Div.1



HVAC

Other than the cooling methods on the previous pages, HVAC means additional, forced ventilation.

In refineries, chemical and petrochemical plants in particular, there are often instrumentation and control systems for measuring and analysis purposes in hazardous areas which are operated in large walk-in shelters. These analysis equipment rooms are designed for the safe operation of facilities with [Process Analyzers \(pg. 72\)](#) and must be sealed against the environment, well ventilated with clean air from a safe area and pressurized to ensure safe operation even in case of a leakage of hazardous gases inside. The exchange rate of safe air has to be high enough to dilute the dangerous gases below their lower explosive limit. The demands for such systems are described in IEC 61 285 or NFPA 496.

This is where INTERTEC's complete protection solutions with HVAC equipment come into play.

There are two options for the HVAC function

- A separate HVAC unit next to the shelter and connected by air ducts
- An integrated HVAC: [Heaters \(pg. 44\)](#), air pre-heating, [Ventilation Units \(pg. 54\)](#) and [Cooling Units \(pg. 56\)](#) are installed inside the shelter



Damper for exhaust air.



Redundant ventilation fans with pre-warming system.

Find the exact solution for your requirements

INTERTEC's solutions are designed and built specifically for your application so that your instrumentation can enjoy the best possible protection. You receive a complete protection package with enclosure and, if required, matching HVAC with heater, cooling unit and ventilation for smooth operation in the defined environment.



Extremely Hot Climate

Basic protection from the sun, wind and weather.

Page 62



Extremely Cold Climate

Protective housing for instruments and electronics.

Page 64



Field Instrumentation

Textile protective jackets for field instrumentation.

Page 66



Airport Equipment

Large solutions for analyzers, hydraulics and electric systems.

Page 68



Materials Handling

Temperature maintenance and explosion protection.

Page 70



Communications Technology

Precise temperature control for optimal operating conditions.

Page 71



Process Analysis Technology

Stable and safe process conditions in hazardous areas.

Page 72



Process Control Technology

Protecting control equipment in processing areas.

Page 73



Safety Technology

Safe ambient conditions in hazardous areas.

Page 74



Traffic Technology

Extending lifecycles of outdoor traffic and utility systems.

Page 75

There is no one-size-fits-all for protective enclosures. Each solution needs to meet the respective application requirements to be truly effective, efficient and durable. This investment pays off later down the line with much lower maintenance costs.

Extremely Hot Climate

The challenge

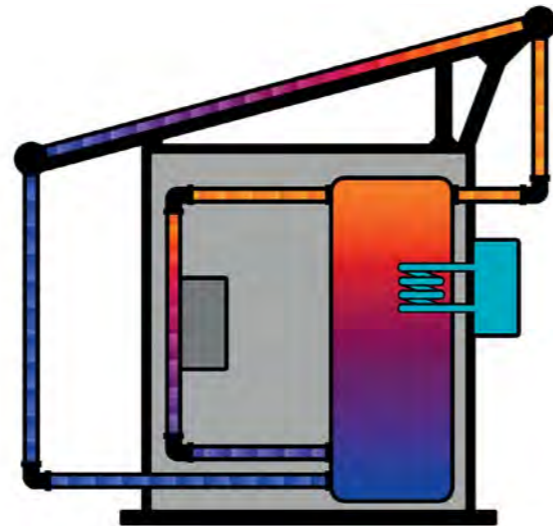
Regions with extremely hot climates, like in the deserts of the Middle East or in offshore applications in equatorial regions often pose severe environmental protection challenges, which can increase project costs dramatically. Equipment needs to be protected from high UV levels and abrasion from dust and sand, however the most significant challenge is usually cooling. This problem is often more difficult to handle in remote locations and when lacking a reliable power supply.



The INTERTEC solution

To combat UV exposure and abrasion for small-scale applications, simple protective GRP Shades & Canopies (pg. 28) can already have a significant impact on the functionality and life cycle of field instruments. Shades provide a high degree of protection at very low cost, and offer all the environmental protection required in some applications. INTERTEC's broad range and custom options ensure optimal solutions.

For more complex applications, INTERTEC has designed innovative [Passive Cooling Technology](#) (pg. 20). Our shelter solutions can operate entirely without power, or with the assistance of only small amounts of electricity from solar panels, or local electricity - even if the power supply is poor. This technology usually uses water in a closed circuit as a medium to store and release differences in day/night temperatures to reduce shelter temperatures. In addition, INTERTEC can supply hybrid cooling systems which employ additional active water chillers, to enhance cooling performance - techniques which extend the application's potential to exceedingly hot regions. Our cooling technology is designed to work without the need for electrical fans, which would otherwise be a problem in dry regions, as they may introduce sand and dust into the enclosure.



Thermal siphoning of water through external and internal heat exchangers makes passive cooling possible.



Applications in deserts require a specific set of protective features to ensure a safe and uninterrupted operation.

Unlike conventional AC, our purpose-designed air conditioning systems for hazardous areas introduce no air flow interface between conditioned and unconditioned sections, so that it can be integrated into a housing that is explosion protected by pressurization. Together with the excellent insulation characteristics of INTERTEC's composite [GRP](#) (pg. 11), these cooling applications greatly benefit from reduced energy requirements.

INTERTEC's advanced design capability - and library of field-proven passively cooled cabinet/shelter designs - can quickly quantify the performance and cost savings of proposed protection solutions.



This passively cooled shelter for the Middle East reduces interior temperatures by some 20°C - to enable instrumentation to operate in a remote location.



Advanced insulation is a key aspect of these shelters for the instrumentation/SCADA stations on a Middle East water pipeline, allowing totally passive cooling to limit the extremes of day and night temperatures.



Passively-cooled cabinets can be combined with a water chiller to create a [Hybrid Cooled System](#) (pg. 21) and extend the range of the technology from arid regions to many other parts of the world.

Extremely Cold Climate

The challenge

Thermal efficiency and heating are of paramount consideration when choosing enclosures to protect outdoor instrumentation and control equipment in extremely cold and Arctic locations. Further challenges are the prevention of condensation, frost and cold spots inside the protective enclosure, as well as its structural integrity when exposed to permanent sub-zero temperatures, snow loads or even wild animals.

The INTERTEC solution

Compared with metal, the very high thermal resistance and the ease of embedding thick high-performance insulation of INTERTEC's composite GRP (pg. 11) construction materials means that housings can be configured to cope with temperature extremes. GRP also remains stable down to -100°C , i.e. the shape or dimensions hardly change even at these extremely cold temperatures, which means that no gaps occur in doors or lids. Moreover, unlike thermoplastics and metals, the strength and modulus of GRP improves at very low temperatures.

INTERTEC simplifies the design of enclosure solutions by verifying the performance of its explosion-proof Heaters (pg. 44) and controllers up to an ambient temperature of -60°C , in addition to certifying them based on global standards. We provide enclosures fitted with optimal heating solutions for your specific application.

A key aspect of GRP's suitability for Arctic environments is the elimination of thermal 'short cuts' between interior and exterior - because of the embedded and uniform nature of the

insulation, and purpose-made accessories to insulate connections. This ensures there are no 'cold spots' to start condensation or heat loss, and simplifies the regulation of the internal operating environment.



INTERTEC has been making Arctic-grade enclosure solutions since 1984. The very first project provided a highly-insulated cabinet for a Greenland research station - with an integrated shovel to remove snow and a polar bear shelter seat.



Enclosures are often one of the last things to be thought about. INTERTEC's processes will ensure the optimal solution - even if that means special shapes, openings, etc. 'Normal' Ex-certified equipment has an ambient temperature range of -20 to -40°C . If temperatures are not mentioned on the type certificate, INTERTEC can produce enclosures to allow it to be used anywhere: down to -60°C (or $+80^{\circ}\text{C}$) ambient temperatures.

The superb thermal insulation properties of layered composite GRP makes it easy to design 'hot boxes' - to maintain elevated temperatures and prevent condensation or crystallization. INTERTEC can deliver optimized solutions with the right insulation, best form of heat transfer, equipment layout and control algorithm to ensure accurate, reliable performance.



INTERTEC's advanced insulation performance greatly reduces heat losses, allowing much smaller heating elements to be used. This saves energy, and delivers a slow-changing and stable internal operating environment - with no 'cold spots'.



For outside temperatures less than -20°C , equipment that would normally be installed in the open often has to be protected with a highly insulated and heated enclosure.



The excellent thermal insulation of INTERTEC cabinets and shelters - plus custom sizes and shapes - provided optimized solutions for this remote radio tower.

Field Instrumentation

The challenge

Chemical and petrochemical plants pose a number of difficulties for field equipment. Instruments close to the process are often exposed to wind, weather and corrosion by humidity, dust or chemical agents. More often than not, these instruments also require temperature maintenance, especially when outdoor temperatures fluctuate.



Temperature controlled transmitter enclosure for LNG terminal.

The INTERTEC solution

INTERTEC's business started by employing superior materials in outdoor process enclosures to avoid corrosion, optimize thermal performance and extend the lifecycles of business-critical instrumentation. Our philosophy recognizes that purchase and installation costs of control and instrumentation are a fraction of total lifecycle costs - especially for hazardous areas.

The advantages of our high-performance grade composite [GRP \(pg. 11\)](#) make it a highly superior material for enclosures in the field. It is very stable, almost immune to damage from chemical media including salts, naturally fire resistant, and does not rust or degrade in any significant way. It is an excellent insulator and is intrinsically flexible. Even when exposed to the elements, its properties can guarantee maintenance-free lifecycles of more than 30 years.



For over 50 years, INTERTEC has designed and manufactured protection enclosures for field equipment. Our products protect sensitive industrial instrumentation and electronic/electrical equipment in almost every sphere, from the utility infrastructure that underpins our daily lives, to equipment operating in Earth's most challenging environments. Our experience allows us to develop comprehensive protection for remote and outdoor-based equipment including: all-weather enclosures, cabinets and shelters, as well as a wide range of accessories like [Heaters \(pg. 44\)](#), [Ventilation Units \(pg. 54\)](#) or mounting options, among others.



INTERTEC's manufacturing processes also provide many other degrees of flexibility: standard shapes can be adapted in size easily, internal space can be subdivided to segregate equipment, access points and openings may be installed almost anywhere, etc. The breadth of our modular range, and our systems building support, means that choosing INTERTEC as your partner will ensure that you get the precise protection solution you need. You can choose from standard enclosures and configure them yourself with heating, cooling, vents, locks, etc. Or, INTERTEC will configure and customise as required to meet your needs.



This petrochemical application required compact instrument [Enclosures \(pg. 32\)](#) able to withstand wear by sand, dust, as well as high ambient temperatures.



These transmitters at an oil refinery need to be kept at an optimum operating temperature in a freezing outdoor environment, using coordinated heaters and insulation.



The inherent, low thermal conductivity of our composite GRP prevents outside temperature fluctuations from affecting the instrumentation within the enclosure.

Airport Equipment

The challenge

Protecting electronics equipment used in airport radar installations for traffic control, surveillance etc. needs to follow certain frangibility guidelines as to not pose a danger to an aircraft and its passengers in case of a collision.

The INTERTEC solution

INTERTEC produces specialized, custom-colored **Cabinets & Shelters** (pg. 38) for protecting outdoor equipment at airports - including frangible shelters, cabinets and enclosures for navigational systems, radar and runway lighting/electrical equipment.

In addition to meeting special requirements such as frangibility for passive safety, INTERTEC enclosures offer airport infrastructure designers advanced protection and lifecycle attributes thanks to construction from unique composite GRP materials.

INTERTEC's high-performance **GRP** (pg. 11) is ideal for protecting equipment and meeting frangibility guidelines: the 100% metal free construction is designed to yield or break on impact, given its low mass. It offers exceptional resistance to corrosion, as GRP does not rust or degrade in any significant way. This allows maintenance-free lifecycles of up to 30 years. Advanced coatings protect against extreme levels of UV and abrasion - for longevity in dusty or sandy locations. GRP has yet another advantage for communications systems, given the prominent use of radar and radio equipment at airports. Due to its structural makeup, it is transparent to radio waves thus allowing relevant equipment to be protected from the elements without impeding their function.



Frangible shelters

The composite material's low mass and light weight makes it ideal for equipment protection applications close to runways - meeting ICAO's passive safety frangibility design guidelines. It folds easily in the event of an impact, collapsing and disintegrating without generating sparks, and is also naturally fire retardant with so-called 'self extinguishing' properties that limit flame spread. The composite material can be constructed with embedded EMC shielding if required. Applications include ILS systems, marker beacon stations, distance measuring equipment, VOR/DVOR and tactical air navigation systems, among others.

Radar shelters and cabinets

INTERTEC offers all the housing styles required for protecting electronics equipment used in airport radar installations for traffic control, surveillance etc. These include walk-in shelters for the main radar electronics, cabinets for power/UPS systems, and enclosures for drives and other equipment located in the tower - close to the antenna. The light weight of composite GRP makes it particularly suitable for protecting any delicate equipment mounted on towers. INTERTEC is also able to manufacture ground-based shelters and cabinets to virtually any size and shape - helping to minimize the footprint of stations sited in sensitive locations.



Electrical/electronics cabinets

The exceptional durability of protection enclosures fabricated from INTERTEC's composite GRP provides a major advantage for airports, especially for sensitive safety related applications close to runways, taxiways and aprons such as cabinets for lighting switchgear. The material ensures that cabinets combine environmental protection with highly extended and maintenance free lifecycles. And inside the enclosures, the exceptional degree of insulation and dry temperature stability delivers an optimal operating environment - minimising the possibility of disruptive and expensive maintenance visits.



INTERTEC's custom manufacturing service also gives infrastructure designers new possibilities. It allows passive safety capability to be complemented with shape and size optimization - to further reduce the risks of an impact.

Materials Handling

The challenge

Bulk handling applications are commonly situated within hazardous environments with heightened safety standards, like potentially explosive dust zones. If the electronics in these areas are not certified for Ex-zones, there are two options: either invest in costly Ex certified electronics (if they are available at all), or in a pressurized protective shelter. Other challenges involve the noise exposure of operators in these areas, as well as the structural integrity and weight of protective solutions for portal scrapers and cranes.



Explosive dust zones, especially interiors, require Ex-certified equipment or Ex-p protection solutions.

The INTERTEC solution

INTERTEC supplies GRP [Cabinets & Shelters \(pg. 38\)](#) as Ex p constructions (pressurized enclosures) for potentially explosive dust zones (Ex zone 21). The high impermeability of GRP ensures that very little air is lost. This means that the compressed air supply is significantly lower than that of other solutions. Ex p also allows the use of more cost-effective non-Ex products, especially when the required components are only available as non-Ex versions.

Cabinets and shelters for pressurized applications utilize special bonded joints providing mechanical strength without penetrating fittings, thus creating impermeable gas-tight seals. Combined with airlocks, this enables INTERTEC shelters to substantially reduce the air or gas supply and compressor requirements.

The insulation embedded between two [GRP \(pg. 11\)](#) sheets provides excellent noise reduction, typically between 22 and 35 dB. Higher values can be achieved with appropriate wall constructions. The same reduction qualities apply to equipment inside shelters - such as compressors - which can be sited in separate compartments.

If required, INTERTEC's design services can provide optimized [HVAC \(pg. 59\)](#) solutions for difficult applications involving explosive dust with many available filtering systems.

Lastly, due to its strength and low weight, GRP has a similar strength to stainless steel, but it weighs some 75% less. This can be important in offshore platforms/vessels and mobile applications – such as control rooms for portal style scrapers.



Communications Technology

The challenge

Communications systems are among the most widespread applications which hardly ever pose the same set of requirements across the board. Every protective solution must be tailored to the environment and the necessary operating conditions for the respective electronics, using [Heaters \(pg. 44\)](#), [Cooling Units \(pg. 56\)](#) and/or [Ventilation Units \(pg. 54\)](#). The goal is to extend the Mean Time Between Failures and the life cycle of the communications systems. This is especially crucial for remote locations where maintenance calls may prove difficult.



Remote radio station.

The INTERTEC solution

INTERTEC's deep knowledge of outdoor equipment protection embraces shelters for communications equipment in harsh climates and environments. We have designed hundreds of shelters with communications systems; also in remote and difficult locations from deserts to high mountains.

The superb environmental protection characteristics of composite GRP is key for communications technology applications – especially in remote or hazardous environments. The efficiency of INTERTEC's embedded insulation, and our advanced cooling options are then the catalyst to design innovative protection solutions.

INTERTEC's GRP is almost as strong as stainless steel yet much lighter. This can make it easy to mount equipment on urban rooftops for instance or allow deployment by helicopter to ultra-remote locations. A key advantage of GRP over metal is its transparency to radio waves. While metal enclosures encapsulate radio waves so that antenna technology has to be placed outside enclosures, the use of GRP allows everything to remain inside the enclosure - thus protecting it from adverse environmental conditions. This can benefit applications ranging from picocells to wireless mesh networks.

If shielding is required, this can also be realized with GRP. INTERTEC has the appropriate production technologies to provide adequate solutions for this problem as well.

In deserts, exemplary cooling must be provided - sometimes without permanent access to an electricity grid. Sand or dust may preclude use of vented enclosures or conventional through-flow cooling. INTERTEC's passive and hybrid cooling options - and the ability to include conductive cooling - delivers reliable solutions.



Cellular phone station.



Continuous Emission Monitoring System shelter for a flare stack at a chemical processing plant.

The challenge

Analyzers are often installed in tight spaces and crowded environments where operator access can be difficult, and the instruments can be very sensitive, like retrofitted Continuous Emission Monitoring Systems (CEMS). Maintaining stable sample temperatures and operating environments in these cases is critical for measurement quality. Achieving proper temperature control with metal enclosures and metal shades can be difficult; even if good insulation is applied.

The INTERTEC solution

Protective [Enclosures \(pg. 32\)](#), [Shades & Canopies \(pg. 28\)](#) are key for many process analyzers. Our glass fiber reinforced plastic has a thermal performance that is about three orders of magnitude lower than that of steel, which means that our enclosures and shades do not conduct heat as well as steel would. The exceptional insulation of INTERTEC's composite GRP delivers stable internal environments and thus low energy consumption for cooling or heating units. And minimal interference with neighboring equipment, which is useful for tightly packed analyzer shelters.

GRP does not rust or degrade in any significant way, allowing maintenance-free lifecycles of up to 30 years.



GRP is also around 25% of the weight of steel, making it easier to mount analyzers directly onto piping or process columns. INTERTEC's construction techniques even make it possible to create custom shapes for your application.



The challenge

Distributed control system architectures are generating demands for tougher enclosures. Many remote I/O applications as well as applications for supervisory control and data acquisition (SCADA) use sensitive electronic devices that call for protective plant buildings like satellite instrument houses or remote instrument enclosures. Such buildings need to be air conditioned and support human access - which can then necessitate features such as blast- or fire-resistance.

The INTERTEC solution

By specifying rugged dust- and water-proof enclosures to protect control equipment located deep inside processing areas, engineers can realise more versatile architectures. For software-configured I/O, this allows enclosures to be assembled and sealed in the factory - so equipment never needs to be exposed to dangerous site conditions.

Our composite [GRP \(pg. 11\)](#) construction materials ensure reliability and extend the mean time between failures (MTBF) by being highly stable and virtually immune to the effects of salt, common petrochemicals and airborne pollutants.

GRP's efficient insulation protects against temperature extremes, which would otherwise drastically reduce the reliabilities of sensitive electronic devices used in remote I/O applications. In some cases, cooling may also be required. The superb temperature stability of insulated GRP also makes it possible to efficiently employ passive or hybrid cooling with little to no additional resources or power required.

To support moves towards highly distributed control, INTERTEC designed 'inside-out' [PERI SHELTER \(pg. 22\)](#) layouts. This allows sensitive electronics to be sealed within a safe and stable operating atmosphere, and operators to access I/O connections via exterior-mounted enclosures and panels.



The challenge

Safety applications deal with both protection in the event of an emergency, as well as preventing emergencies in the first place. This means anti-static surfaces and proper ventilation in hazardous environments, high structural integrity and/or flexibility or fire resistance. These precautions not only protect critical process and safety equipment but most importantly maintenance and operation personnel.



Fire fighting equipment.

The INTERTEC solution

INTERTEC's adaptable [Glass Fiber Reinforced Polyester \(pg. 11\)](#) material makes it possible to add advanced safety features to enclosures - such as anti-static protection, to fire resistance, blast-proofing and earthquake protection.

Composite GRP enclosures employ versatile 'sandwich' construction techniques. GRP sheets combined with additional layers provide the required protection.

INTERTEC has complete control over fabrication processes. We use this to create shelters to survive specific blast forces - from pressure waves to shock waves - for threats ranging from high wind loads to earthquakes to vapor cloud explosions.

Advanced passive fire resistance is another option. By embedding mineral wool between GRP sheets, enclosures like our proven FIRE SHELTER 1709 can resist fire and degrade slowly and predictably for up to 120 minutes. Thus, the [FIRE SHELTER \(pg. 42\)](#) meets the 120 minute fire test defined in ANSI/UL 1709 - a standard that uses the rapidly increasing time/temperature curves of hydrocarbon fires.



FIRE SHELTERS protecting emergency shut-down valve actuators.

GRP provides major advantages over many traditional protection products. Enclosures are rigid, so they can incorporate easy-open access for maintenance. They are light and can be directly mounted on existing piping. These capabilities are widely used to add passive fire protection to ESD systems - protecting assets ranging from actuated valves, or communications-, control- and firefighting-systems.

INTERTEC also offers numerous safety-related products including eye wash stations, safety showers, protectors for emergency stop switches, and passive sample coolers.

The challenge

Weather is becoming unpredictable, leading to significant changes in terms of increased rain, snow, wind, extremes of temperature, etc. Traffic equipment in particular is exposed to additional wear through its proximity to roads, railway tracks or waterways and thus temperature changes, dirt, dust, moisture, salt or vibration.

Depending on the application, operations may also be extended into remote areas, which requires innovative solutions for long-lifecycle field protection.



Cabinet housing railway control equipment.

The INTERTEC solution

The intrinsic adaptability of INTERTEC's composite GRP material allows enclosures to meet individual or multiple application-specific protection challenges. Advanced insulation, coatings and grades of GRP can be employed to meet challenges such as corrosive, abrasive and damp operating environments, fire safety, vandalism and extended life cycles.

Another key aspect for utility applications is INTERTEC's ability to produce [Cabinets & Shelters \(pg. 38\)](#) with compartments providing differing levels of protection for different sorts of equipment - from temperature regulated areas for computer equipment to compartments that might house water or hydraulic equipment.

INTERTEC's long experience in processing applications - and the huge challenges of operations in remote areas - has led to innovative solutions for long-life field protection. Our turnkey solutions are particularly relevant for 'smart city' applications. Using our extensive design and assembly resources, INTERTEC will design and build cabinets rapidly to individual specifications.



Multi-compartment cabinet for electronics and hydraulic systems controlling a waterway lock.












We offer features such as custom sizes and shapes, individual or shared power, networking, cooling, heating, passive safety, and more. Our team will handle the design issues like the integration of shared resources or operator access. Moreover, modular designs mean that enclosures can continue being extended/modified to add facilities - with the same look and feel.

INTERTEC Certifications

Company Certifications

	ISO 9001 Neustadt St. Petersburg Sarnia & Houston		ISO 14001 Neustadt		ISO 45001 Neustadt
	QAN Neustadt		QAR Neustadt		UL Neustadt

Product Certifications

	ATEX European Union		IECEX International		EAC Eurasian Economic Union
	EAC Ex Eurasian Economic Union		CSA Canada United States		UL Canada United States
	INMETRO Brazil		KC Korea		CCC China
	PESO India		UA Ukraine		

Throughout the years, INTERTEC's history has been defined by steady expansion. The emergence of new technologies enabled us to develop pioneering protective solutions that solidified our leading position in the global market.

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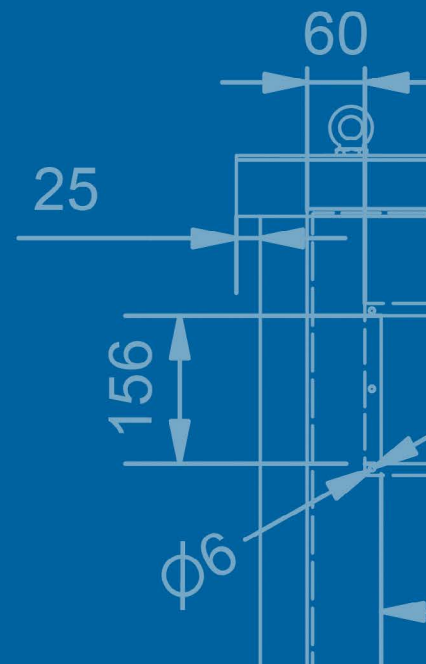
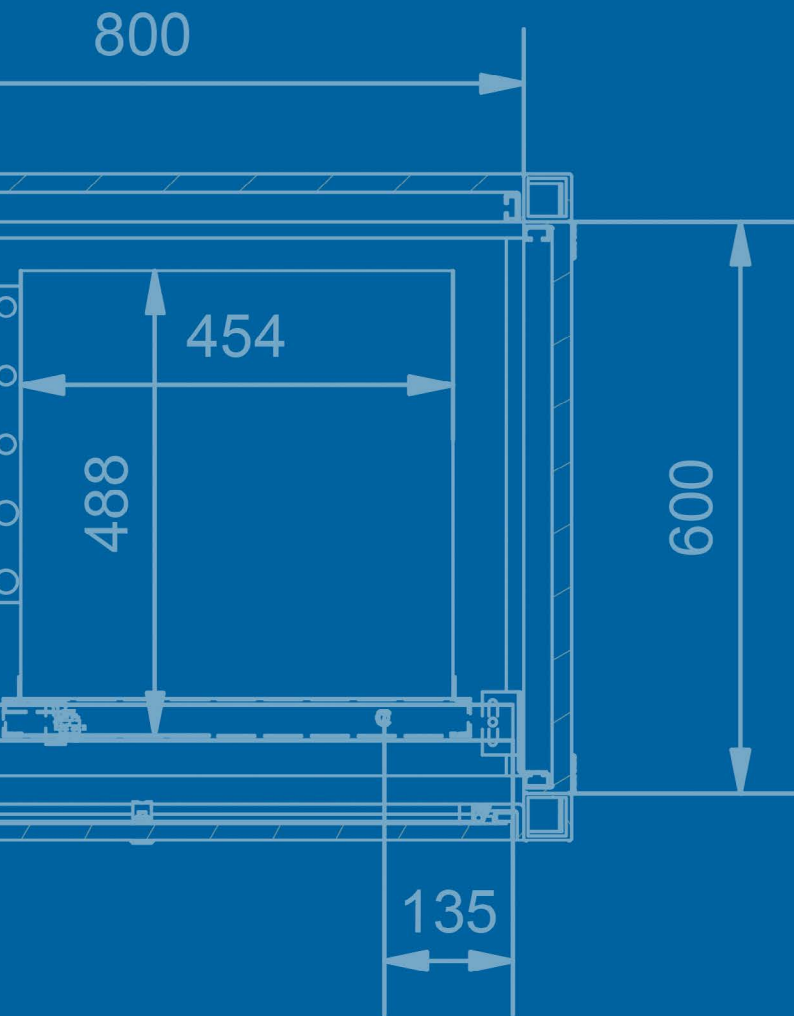


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August 2022

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