

# Explosion-Protected Solutions for Pharmaceutical Environments

Safety Beyond Protection



## Vision & Introduction

Pharmaceutical manufacturing safeguards life. Every substance used in production — solvents, excipients, APIs and organic compounds — must be handled under precisely controlled conditions. These materials can form explosive atmospheres, and contamination or equipment failure can halt production, compromise patient safety, and endanger workers.

BARTEC brings more than five decades of expertise in explosion protection to the pharmaceutical sector. We integrate certified technologies into cleanrooms, laboratories, storage facilities, and processing areas — ensuring safety while supporting innovation, digitalization, and GMP compliance.

Just as the Hydrogen value chain requires holistic protection across every step, the pharmaceutical industry demands the same: full transparency, reliable automation, seamless data flow, and strict adherence to GMP and ATEX/IECEx requirements. BARTEC solutions create an environment where compliance, purity, and operational excellence go hand in hand.

# Challenges and Hazards in Pharma Production

In recent years, we have experienced the important role the pharmaceutical industry plays in our lives. It develops, tests and produces medicines and vaccines, e.g. to contain and combat potential disasters such as COVID-19. The pharmaceutical industry processes many unique compounds with hazardous substances and chemicals through a number of processing facilities.

Manufacturing, processing and handling must ensure that the processes — from the correct storage and use of these active pharmaceutical ingredients and excipients to packaging — are both intrinsically safe and consistent. Since these materials can create potentially hazardous working conditions, it is important to ensure that for each specific process and equipment, the specific hazards are taken into account.

The industry must maintain very high safety standards to ensure the purity and quality of the final products and the strength of the active ingredients. Only by taking into account these high requirements can it be ensured that consumers receive safe, effective medicines.

BARTEC understands these requirements and supports full GMP, ATEX and IECEx compliance at every stage.

The stringent tests we perform on our products make them highly capable of withstanding high pressure, extreme temperatures and corrosive atmospheres. Our stainless-steel solutions are ideal for cleanrooms: smooth surfaces make them easy to clean and maintain.

We support both pharmaceutical plants and laboratories with high-standard explosion-proof equipment suitable for the entire production process. With our in-depth knowledge of hazardous area classification, we identify customer-specific requirements and implement solutions that align with regulatory expectations and inspection needs.



## Your partner for safety needs

Keeping the production integrity up and running means allowing the pharmaceutical industry to continue to develop life-saving medicines in a safer and faster way. Our BARTEC explosion proof solutions support you by optimising the plant performance and leaving you to focus only on getting your scientific advances to the market fast and properly. Whether you are a pharmaceutical plant or a research laboratory, you surely require high-standard

explosion-proof electrical equipment suitable for the whole production process, including cleanrooms. The stringent tests we perform on our products made them highly capable of withstanding high pressure, extreme temperature, high corrosive atmospheres. Our stainless steel solutions represent the ideal answer for those areas where cleaning is a must: thanks to their smooth surfaces, they are easy to clean and maintain.

### BARTEC SCOPE OF SUPPLY:



#### **Operating, monitoring systems and automation interfaces:**

HMI and BUS technology solutions for granting signal, data transmission and power necessary for achieving the highest level of plant's efficiency



#### **Electrical systems and components:**

control and monitoring devices, safety switches, Ex d and Ex e enclosures, grounding systems for granting safety wherever you need



#### **IIoT and connectivity:**

antennas and access points for fast and safe data flow processes



#### **Turnkey trace heating solutions:**

explore BARTEC's Ex-protected equipment and electrical trace heating systems designed to safeguard goods and processes across the pharmaceutical value chain



#### **RTLS (Real-Time Location Systems):**

solutions for accurate tracking of people and assets increasing traceability and regulatory compliance



#### **Pressurization:**

robust, reliable pressurized solutions to satisfy the most stringent safety needs



#### **Lighting:**

complete LED lighting solutions for protecting the integrity of sensitive products



#### **Mobile communication and smart data capture:**

our innovative, ultra-rugged mobile devices provide workers in hazardous zones with all the communication convenience of a modern office environment, without compromising safety



# Products overview

## Operating, monitoring systems and automation interfaces

BARTEC offers an integrated portfolio of products and systems for the automation of the entire production workflow. From the goods-receiving area to the finished goods warehouse, our solutions guarantee a perfect integrated automation system without interface problems that enables a high level of productivity in those situations where time is a crucial factor.



When we speak about pharmaceutical industry, flexible and highly available systems are particularly important for the rapid market access. The visualisation concept also plays an important role. BARTEC offers a lean overall automation solution characterized by low investment costs, high reliability and flexibility.

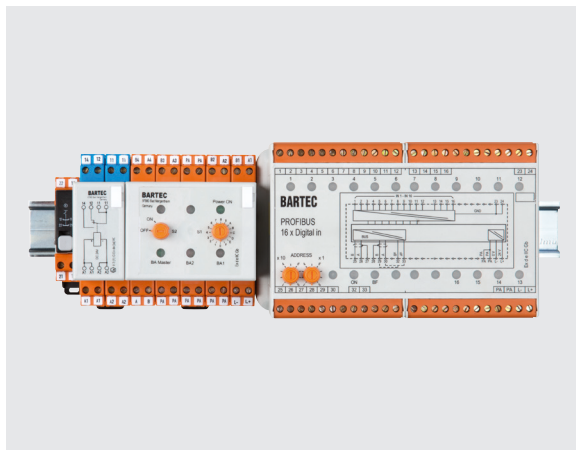
### Human Machine Interface

Our BARTEC POLARIS series includes a remote version as well a panel PC one with different variants for the safe and reliable operation at HMI interfaces. Different screen sizes, display technologies and keyboard and mouse variants with command signalling devices can be combined flexibly and variably to meet the most stringent customers' requirements, even under very harsh conditions. Our BARTEC POLARIS series can also be equipped with a wide range of displays, touchscreen and smart HMI from 7" to 24", according to the application.



BARTEC has also developed a new generation of remote PC with a deep focus on the network safety. Our POLARIS ZeroClient series is the modern safe remote HMI series for the Zone 1 hazardous area. The "virtualization of the visualisation" is the key concept at the base of our ZeroClient solution: it only has to display the data whose control and monitoring runs centrally in a separate server room. POLARIS with its wide range of accessories solution (for example our barcode scanner) combines all the pharmaceutical industry needs in a precisely tailored way and with a slim overall package. Its new display technology full HD guarantees excellent brightness and high contrast even at a wide viewing angle. Our POLARIS solutions include special accessories like the USB smart device or module which allow additional connection interface (Bluetooth, WLAN, Exe USB, Ethernet, Profibus DP...)





#### Key benefits:

- Compliance with Good Manufacturing Practice (GMP) guidelines thanks to our stainless steel enclosure solutions
- Easy installation & integration
- Fully customized solutions thanks to the wide range of accessories, functionality and wide variety of display sizes.
- Widescreen technology in full HD resolution
- Slim solution suitable for smaller space requirements
- Suitable for the most hazardous areas (Zone 1, 21, 2, 22)
- Fully certified solution (ATEX, IECEx, CSA, Inmetro, CCC, KC)
- Proprietary visualization software
- Compliance with Good Manufacturing Practice (GMP) guidelines

#### Bus Technology

BARTEC offers cutting-edge Bus technology for hazardous locations. Infrastructure and simple, modular extensions to existing (remote I/O) systems are becoming increasingly important, even in explosive areas. With the compact design of MODEX (Bus interface and I/O in one module), signals can be easily integrated into the existing control system or used as a data collector for edge-to-cloud applications. Our MODEX solution provides simple and robust applications with fast signal processing for the most challenging environments. The MODEX Bus modules guarantee to conduct standard Bus systems from safe areas to hazardous. The wide variety of our MODEX modules enable flexible solutions suitable for a large number of applications.

#### Key benefits:

- All in one module: Bus interface and inputs/ outputs
- Fiber Coupler for the infrastructure (network and Profibus)
- Relay for switching power
- Suitable for the most hazardous areas (Zone 1, 21, 2, 22)
- Fully certified solution (ATEX, IECEx, CSA, Inmetro)
- Quick and easy installation



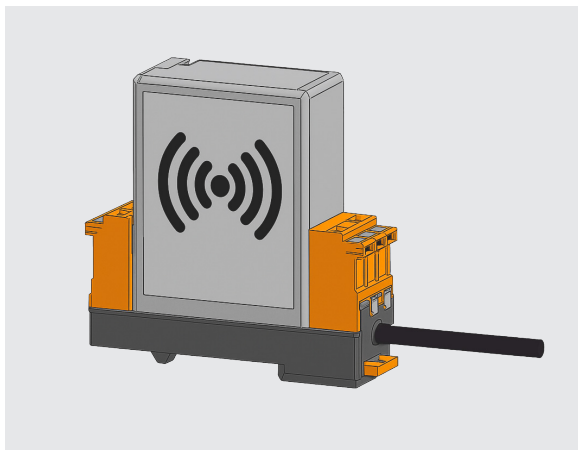
- Significant space savings into the control area
- Able to replace the I/O level, explosion-protection isolation, routing levels, main and field distributors
- Flexibility in planning and engineering
- Significant cost reduction

#### RFID readers in hazardous areas

The BARTEC portfolio for hazardous areas includes a wide range of different product variants to allow maximum flexibility in the choice of material quality, dimensions and connection methods for a wide variety of requirements worldwide. The solutions make it possible to use the same equipment in hazardous areas that users also use in their safe zones.

#### MODEX RFID enclosure

The MODEX RFID enclosure allows for the easy installation of most common RFID modules in potentially explosive atmospheres. Thanks to its plastic housing, radio signals are not disrupted, enabling the use of standard RFID systems even in explosion-proof areas. For GMP-compliant installation, the MODEX RFID enclosure is mounted behind a BARTEC RF front cover. The RF front cover is designed for front panel mounting. For applications within an approved Ex e enclosure, the BARTEC enclosure window is available.







## IloT and connectivity

BARTEC offers a complete range of explosion-proof solutions for all types of wireless networks, antennas, and IloT sensors for use in hazardous areas. Our wireless solutions for Ex areas can be used to set up any wireless network in Zones 1 and 2 as well as for Division 1 and 2, whether it is Wi-Fi, Bluetooth, WirelessHART, or 4G/LTE and 5G.



Wireless networks ensure seamless access to critical data from sensors, devices and systems across different hazardous

locations found throughout the pharmaceutical industry. They also represent the ideal answer to facilitate RTLS (real time location systems) applications and to support plant connectivity.

But our connectivity solutions offering does not stop there. We have a broad portfolio of wireless enclosures systems in different sizes, materials (including stainless steel, which is ideal for areas that see regular industrial cleaning) and designs that allow the use of different access points, radios and gateways (with internal or external antennas) in different Ex areas.

Where compliance and traceability are key, our solutions reduce the risk of errors by enabling access to critical data in Ex areas.

Key benefits:

- Stainless steel options available
- Fully certified (ATEX, IECEx, MET)
- Internal and external antennas are supported
- Fully inspected enclosure for easy maintenance and setup configuration
- Most of the common access points, radios, and gateways on the market are supported
- Suitable for all wireless technologies; WiFi, 4G, 5G, BLE, ISA100 ++
- Flexibility in planning and engineering
- Significant cost reduction









## RTLS (Real-Time Location Systems)

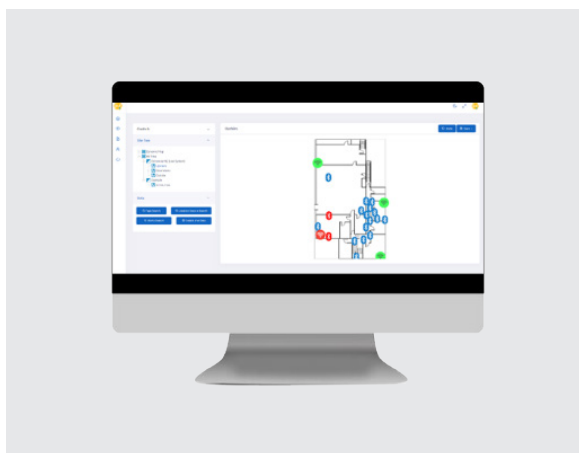
Our RTLS solutions empower our customers to monitor the movement and location of their workers and assets. Designed for use in harsh and hazardous areas, our solutions increase productivity, improve operational efficiency and add a critical layer of worker safety.



Offering a range of solutions to cover a wide variety of hazardous areas uses cases, our RTLS products can be used as a standalone solution or used along other products in the range.

### Hybrid RTLS

Our iTAG X-Range Hybrid RTLS tags adds a critical layer to your worker safety capabilities. It is the only practical solution for site-wide location tracking in the process industries; using two or more location technologies as part of the same solution to deliver wider coverage, greater location accuracy, and reduce the total cost of ownership. Fitted with an emergency call button and man down functionality you can be sure your workforce get the help they need without delay.



### Wirepas

Our Wirepas solution is a low-cost end-to-end location tracking system for both personnel and assets. The battery-powered iTAG XB40 anchors form a self-healing mesh network. iTAG XB asset and personnel tags then send the tags data via the mesh to a Bluetooth gateway and onto the Extronics Location Engine.



### BLE

Our iTAG XB BLE tags provide customers with a battery-powered range of BLE tags and are a perfect solution for customers looking to deploy a low-cost location tracking system in their hazardous area.

Whether it is parts, tools, rented assets or even completed inventory, with our RTLS solutions you can easily find what you need to get the job done with access to data to improve operational efficiency and productivity.



Thanks to our dedicated location engine-software you can locate your personnel and assets from a single highly configurable platform. The comprehensive API means you can also integrate your location data directly with 3rd party front-end applications.

We also offer Mobileview, an out of the box visibility platform that enables you to track, locate, monitor, manage and report on your assets and personnel from a single platform. Enterprise-ready, highly configurable, and scalable, MobileView doesn't need special software to use – just an internet browser.

All our RTLS products are intrinsically safe with options covering ATEX, IECEx and MET approvals across the range. Our products have been designed and tested for use in the harshest industrial environments, with robust enclosures rated to IP65, IP67 and IP68, and an operating temperature range of -20°C to +55°C.

Key benefits:

- Fully certified (ATEX, IECEx, MET)
- Great visibility of people and assets
- Added accountability
- Increased security
- Flexible connectivity options - Wi-Fi, LoRa and BLE options in the range
- Improved operational efficiency and productivity
- Lower cost of ownership



# Lighting

BARTEC offers a wide range of excellent lighting fixtures for hazardous areas and safe industry in LED technology. Sustainability goes hand in hand with our LED lighting fixtures: with our LED solutions, customers can achieve a significant energy savings as LED technology consumes less energy compared to other light sources, in some cases even up to 80% of the energy used by another technology.



Our LED lighting portfolio includes floodlight, linear, tubular, high / low bay and obstruction solutions as well as a recessed LED lamp which represents the right answer to the pharmaceutical industry's needs. Its housing is made of white painted steel sheet, stainless steel AISI304 and AISI316, ideal solution for clean rooms and it is fully compliant with ISO14644-1 for clean areas.

Thanks to the diffuser made of opal glass, clear glass in combination with opal or microprismatic diffuser, opal or microprismatic plastic diffuser and high quality electronic components, this lighting fixture guarantees a great visibility in any situation.



Key benefits:

- **Compliant with ISO14644-1 for clean areas and GMP**
- **Different installation types, suitable for false ceiling M600/625, metal ceiling M598/M623 or plasterboard**
- **High lifetime up to 100.000 h and efficiency up to 158 lm/W**
- **Fully customized solutions thanks to our in-house lighting calculation capability and goniophotometric measurements which indicate in which direction and at which intensity a device will emit light**
- **Minimal heat for protecting sensitive products and reducing risk of contamination**
- **Safety and good visibility: thanks to an excellent wide variety of colors and color temperatures, the LEDs provide a better visibility even in critical conditions**
- **Fully ATEX and IECEx certified solutions**



## Electrical systems and components

BARTEC offers one of industry's most extensive range of explosion-proof components and devices for controlling, switching and connecting in hazardous areas and harsh environments. Our full range of Ex d and Ex e stainless steel enclosures represent the ideal solution for pharmaceutical industry as they fully satisfy the purity requirements according to the GMP guidelines.



Stainless steel surface in fact are very easy to clean and represent the ideal solution for clean rooms applications. In addition the electropolishing process applied on our enclosures can increase the cleanliness of the surface with a shiny, smooth, ultra-clean finishing.

Our ComEx global series is our command and signalling device system. It allows us to realise and market standardised solutions as well as customer-specific solutions. This flexible and modular portfolio includes enclosures, modules, actuators and accessories.



ComEx components can be installed in our Ex e GRP (glass reinforced polyester) aluminium and stainless steel solutions. It can be used as: emergency stop function, control of machines, motors and control systems, components for OEM machine builders and control stations.

A full set of accessories, cable glands and entries, conduit fittings complete the package for a one-stop shop solution.

Key benefits:

- Global certified (ATEX, IECEx, UL and more)
- Modular and flexible systems
- Fully customized and in-house manufacturing solution
- Configured to order and customer needs
- Energy savings solution: our lamp modules have a very reduced power consumption
- stainless steel solutions for clean areas
- one-stop shop service
- fully inspected enclosures for easy maintenance of the internal components



# Pressurization

Our Ex p solutions are designed according to the explosion protection principle of “pressurization”. In this process, the equipment is purged and kept under positive pressure using a protective gas to prevent the ingress of potentially explosive environmental gases. Thus protected, any ignition source can not ignite explosive gas.



## Ex p solutions

BARTEC's portfolio in the field of pressurized equipment helps to create complex electrical solutions for potentially explosive atmospheres.

The BARTEC designed Ex p control and switchgear panel can boast on its high vertical integration, i.e. the use of proprietary Ex components and assemblies. When dealing with pressurized enclosures, in particular, the advantage is to have all the in-house components installed in the enclosure, such as ComEx elements and POLARIS operating and display units.

In this regard, BARTEC can provide the following solutions:

- Automation solutions
- Control and monitoring systems
- Visualizations
- Process water analyzers

Key benefits:

- Ex p solutions customized to your requirements
- Certified according to ATEX and IECEx standards
- Pressurized Cabinet for Zone 1/21 or Zone 2/22 in Ex p technology pxb, pyb or pzc
- From small up to large 17 m³ Ex p cabinets are possible
- High system availability due to feedback on the status, temperature monitoring / cooling and reduced humidity
- Combination of BARTEC products, like HMI (POLARIS) and Operating equipment (ComEx)



## Ex p printers

When it is necessary to provide products with type plates, batch markings or logistics labels, our Ex-p printer solutions are the right answer to optimize the process flow in hazardous areas. Due to operational requirements and constraints, many of the possible Ex protection concepts are not





suitable. Compliant to ATEX / IECEx Zone 1/21 or Zone 2/22, our BARTEC printer is protected by the Ex-pressurization protection type, which provides the most flexible and cost-effective solution. The printer is installed inside a robust Ex-p stainless-steel enclosure. The system is fitted with a purge controller to maintain the purge and pressurization process.

Key benefits:

- Certified according to ATEX IECEx and KC standards
- Suitable for the hazardous areas zone 1/21 or 2/22
- Easy to install and use
- Different connection interfaces (Ethernet, USB, RS232)
- Based to a reliable Zebra printer



### Ex p control units

Ex p control unit – can make the difference to simplify the design and speeds up the approval process as well as the accuracy of delivery times and reliability benefit from it. BARTEC Ex p control units are in a modular design and can be easily adapted to the needs. From standard Ex p control units up to specific OEM Ex p control units. Different units are available in for zone 1/21 or zone 2/22 and globally certified in Ex p technology pxb, pyb and pzc.

Key benefits:

- Wide product portfolio in Ex p controllers
- Suitable for the hazardous areas zone 1/21 or 2/22
- Globally certified
- Modern functions like:
  - WEB based operating system
  - LAN connectivity
  - Wide power input

## Mobile communication and smart data capture

Seamless mobile communication and collaboration, even in hazardous areas: BARTEC moves the smart office into the Ex zone. Our innovative, ultra-rugged mobile devices provide workers in hazardous zones with all the communication convenience of a modern office environment, without compromising safety. They also boast market leading scanning technology from Zebra Technologies to tackle traceability demands across the supply chain of the pharmaceutical industry. Our range of products include intrinsically safe smartphones, mobile computers, tablets, and handheld scanners. With a variety of operating systems, form factors and scan engines to choose from, there's a device for every use case.



### Smartphone and Smartscanner

Built to provide top performance while ensuring safety in hazardous areas: compact, lightweight and high-performing devices with the trusted quality of BARTEC.

The BARTEC SP9<sup>EX1</sup> Smartphone is the world's most compact 5G Zone 1/Div. 1 Android smartphone. It boasts a 48 Megapixel rear camera for imaging and an 8 Megapixel front camera for video calls, two configurable keys, dual loudspeakers for clear audio and a full range of accessories from charging stations to carrying solutions.

BARTEC SC9<sup>EX1</sup> Smartscanner adds unparalleled scanning efficiency and accuracy with its seamless integrated Zebra® SE55 Advance Range scan engine.

Both devices deliver all-day productivity and ergonomic design for one hand use, whilst retaining a large 6.11-inch crystal clear AMOLED display and user changeable battery. The intrinsically safe design and its compliance with the highest standards of EX safety are a result of BARTEC's longstanding expertise and commitment to create world-class digital solutions for hazardous areas.



### Mobile computers and handheld scanners

Developed in partnership with Zebra Technologies, our range of intrinsically safe mobile computers and handheld scanners are designed to excel in the harshest industrial environments.

Our ultra-rugged scanners offer fast data capture of 1D and 2D barcodes (even scratched, dirty, poorly printed, under shrink-wrap, or covered in frost) from up to 21m and can scan up to 20 barcodes in a single press of the trigger. They also scan photos, signatures, OCR data and documents, and can be offered corded or cordless. Most importantly,



they are certified to the strictest Ex safety standards for use in both Zone 1/Div. 1 and Zone 2/Div. 2 hazardous areas.

And for applications that require maximum computing power and flexibility, our Zone 2/Div. 2 Android mobile and touch computers deliver the right solution. These devices enable workers to streamline and error-proof processes by delivering best-in-class processing power, battery performance, advance scanning, and blazing fast cellular and Wi-Fi connections.

### Tablets

The BARTEC Agile series covers high-performance, rugged and versatile Windows tablet PCs for rough environments and hazardous locations of all kinds.

Thanks to its large 10" display and broad range of functions, such as integrated barcode scanners, RFID reader, cameras, and 4G/LTE module, the Agile is the perfect assistant to service technicians, operating staff, engineers and project managers.

Key benefits:

- Innovative, intrinsically safe mobile technology built on years of EX knowledge and commitment to safety
- Internationally recognized certifications for global deployment
- Ultra-rugged, dust and waterproof devices for maximum durability in harsh industrial environments
- Variety of form factors, operating systems, and data input options (touchscreen and/or physical keyboard) to cover a wide range of applications
- Industry leading scanning technology from Zebra Technologies
- Latest cellular and Wi-Fi technology, with support of 5G public and private networks
- Outstanding battery performance and broad range of accessories for seamless operations





# Precise temperature maintenance with electric trace heating

Turnkey Trace Heating Solutions from a single source

Pharmaceuticals must be kept within tight temperature ranges to ensure optimal quality. This not only holds true during production, but starts with the transport and storage of the educts. Too low temperatures can lead to crystallization, while too high temperatures can lead to vaporization or sedimentation, depending on the type of chemical. All of these issues result in a lower quality or outright useless educt for production.

During production, viscosity plays an important role and is directly proportional to temperature. Automated dosing lines must be kept in a precise temperature range ensuring steady viscosity to maintain a constant mixing ratio of components.

**BARTEC trace heating systems** allow precise temperature control with a wide spectrum of products, suitable for the entire value chain of pharmaceuticals.

Our range of **self-regulating heating cables** are especially well suited for the delicate temperature requirements of the pharmaceutical industry. With rising temperatures the power output of the self-regulating heating cables gradually decreases. This leads to an energy saving system that will never exceed certain temperatures. The outer jacket of the cables consists of fluorinated polymers, which are highly resistant to almost all chemicals. The cables can be cut to length allowing easy installation and integration for any existing production.

In addition to heating cables, BARTEC offers a wide selection of **temperature controllers, sensors and limiters**. Our electrical proportional-integral-derivate (PID) controllers combined with accurate Pt-100 thermometers allow for a quick, stable and precise regulation of temperature in any setting. Thus, they are an ideal accessory to heating circuits for pharmaceutical applications.

Our team of trace heating experts provide the best service to customers along every step of implementing trace heating at any site: project management, customized designs, material procurement, installation, start-up, commissioning and maintenance.

Key benefits:

- Fully customized solutions thanks for a wide range of trace heating products
- Heating cables with high chemical resistance
- Precise and stable temperature control
- Easy to install, integrate and maintain
- Suitable and certified for hazardous areas (Zone 1, 21, 2, 22)
- Experts providing service along all steps
- Full heating solution from a single source



## What sets us apart



Decades of experience in designing and manufacturing explosion-proof solutions for the pharmaceutical industry.



Fully integrated and turnkey package based on our state-of-the-art and in-house solutions and components



Fully customized solutions thanks to our engineering knowledge. Each solution is engineered to deliver peak performance in extreme harsh conditions, improving production flexibility, efficiency and system reliability.



Single sole partner for your safety needs from the design and manufacturing to the shipment: we are fully dedicated to provide you with the best support you need.



Our experience at your fully disposal to support your efforts towards a sustainable development: we design and manufacture solutions compliant with the Ecodesign regulation for sustainable products



Comprehensive after sales service and service agreements



Compliance with Good Manufacturing Practice (GMP) guidelines



Compliance with ATEX, IECEx and other international requirements



Solutions suitable for installation in Zones 1, 2, 21, 22



Low maintenance cost solutions



Solutions with high resistance to extreme temperatures



Solutions with high resistance to corrosion



Solutions with robust and reliable design

## **BARTEC**

**BARTEC GmbH**  
Max-Eyth-Str. 16  
97980 Bad Mergentheim  
Germany

[sales@bartec.com](mailto:sales@bartec.com)

**[bartec.com](http://bartec.com)**