THE STRONGEST LINK.

**STAHL**

# LIFE SCIENCE

Explosion-protected products and systems for the
pharmaceutical industry

# INNOVATIVE PRODUCTS FOR SAFE PROCESS FLOWS

Ever tougher competition on the international market calls for constant innovations in new active agents, while permanently optimising existing processes. Increasing production process requirements by regulatory bodies present many enterprises with further challenges. In this environment you need a partner who understands your requirements. R. STAHL is your competent and reliable partner. We ensure that you produce high quality products while optimising production costs – without compromising on safety.

No matter whether your active agents are produced chemically or biotechnologically, your processes are conducted in special pharmaceutical conditions like cleanrooms, or machinery and systems are subject to stringent safety requirements – as a leading supplier of explosion-protected products and systems, we satisfy the special demands of the pharmaceutical industry.

We have worked with well-known pharmaceutical companies worldwide for many years. Our installation material and enclosures fulfil hygiene requirements according to GMP and may be installed in cleanrooms. In order to afford the best possible quality, we adhere to GAMP guidelines in automation projects and also offer FAT or SAT. Implementation of requirements according to FDA 21 CFR Part 11 in the area of operation and monitoring systems completes our service portfolio.

International approvals, certificates and a host of patents underscore R. STAHL's expertise. Internationally approved, our products are ATEX and IECEx-certified for Zone 1 and 2, also to NEC in Class I Division 1 and 2 and can thus be deployed in dust-hazardous areas.

# RISKS? – ASK YOUR EX-EXPERT

Economic pressures have increased our customers' requirements for time-, space- and money-saving solutions. R. STAHL therefore not only offers individual products – but also turnkey systems that guarantee smooth and safe process flows. You can rely on our long-standing explosion-protection expertise. Thanks to our active participation in norming and standardisation committees, you obtain competent advice on all current and future explosion protection issues.

Users in the pharmaceutical industry around the globe trust in R. STAHL's innovative, flexible solutions. The IS1+ Remote I/O system is the perfect interface solution for your system – modernised or new. Both incorporation in your network structures via explosion-protected Ethernet and space-saving integration of intrinsically safe valve islands in the Remote I/O system are possible.

Unique in the world, our operating and monitoring system portfolio offers a wealth of options. Different screen sizes with touchscreen or linking as KVM, Thin Client or Panel PC permit extensive applications. Mobile applications in Zone 1 with smartphones or tablets and wireless communication solutions are also featured in our range.

Modern explosion-protected lighting systems with long-serving LED technology not only increase the safety of your employees, but also reduce operating and maintenance costs.

All set-up requirements of your system can be easily implemented with our wide range of certified installation material, safety switches and stainless steel enclosures.

## Combination of remote I/O with fieldbus

- Integration of weighing systems and solenoid valve islands
- Use of IS1+ with PROFIBUS DP for all discrete I/O signals
- Foundation Fieldbus H1 with R. STAHL Ex i field device couplers on the high-power trunk

## Ex p printer for filling and metering system

- Fully automated pressurisation system (Ex px and pz) with control electronics
- Inspection window for indications and printer status
- Slide-out bottom simplifies exchange of labels and toner
- Monitored access flap for labels

## Virtual networks with RDP/VNC communication

- Thin Client with remote HMI firmware
- Closed system, extremely high safety level
- Requirements according to GAMP and FDA 21 CFR Part 11
- Suitable for worldwide installation
- Cleanroom solution to GMP

# YOU CAN RELY 100% ON OUR PRODUCTS AND SYSTEMS

R. STAHL offers a comprehensive product portfolio for both hazardous areas and industrial applications. You can also benefit from this diversity in your facility.

For more information visit **r-stahl.com/pharma**

**Safety switches and load disconnect switches**

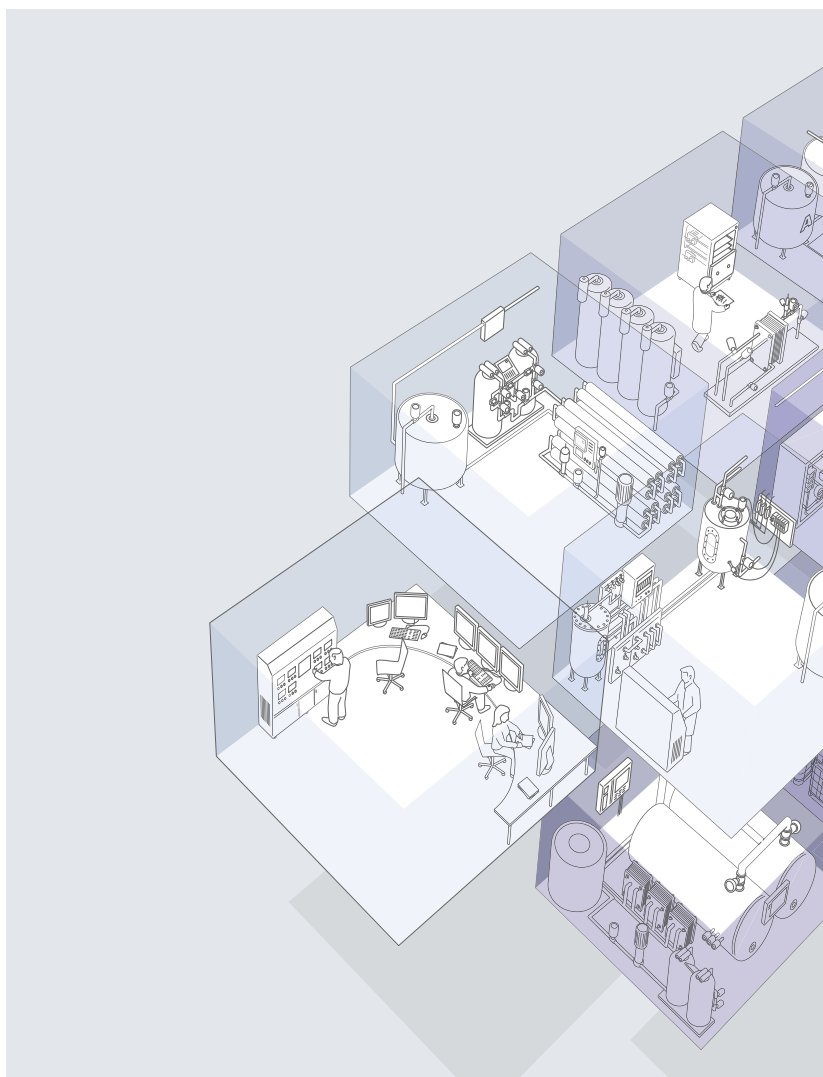**Human Machine Interface systems**

**Socket outlet assemblies for cleanrooms**

**Ex i LED signalling equipment**

**Camera systems**

## Ex p systems

## IS1+ Remote I/O

## Control boxes
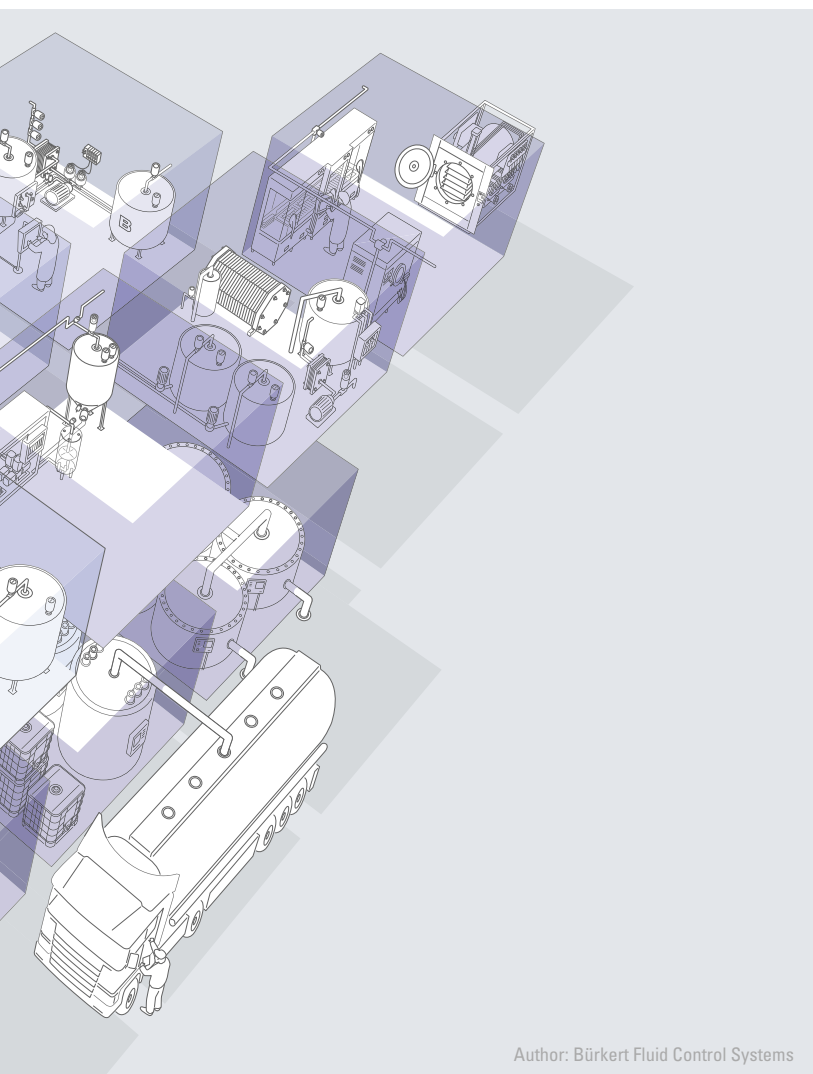
## LED tubular light fittings

## Linear luminaires

Author: Bürkert Fluid Control Systems

**FULL HD**
**1080P**

## Terminal boxes

## Control and monitoring devices
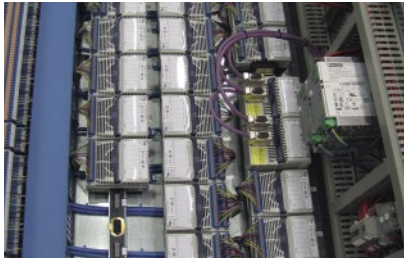
# R. STAHL QUALITY IN WORLDWIDE USE

## WE OFFER CUSTOMISED SOLUTIONS FOR VIRTUALLY EVERY TASK AROUND THE GLOBE.

### EUROPE: MODERNISATION OF AN ISOLATOR INSTALLATION IN A DCS UPDATE

- Replacement of an outdated isolator installation in a very limited amount of space
- Design of a modern remote I/O solution for control station integration
- At the same time an average of 50% space and cost saving compared to the conventional solution
- Up to 960 digital I/O and 480 analogue signals in one control cabinet

### NORTH AMERICA: REDUCED INSTALLATION EFFORT

- Remote I/O with integrated solenoid valve islands
- Hot-swap of all modules in Division 1 permissible
- Link to Allen Bradley PLC via EtherNet/IP
- Control cabinet building by R. STAHL in USA
- Substantial saving on conduit cabling through use of the Remote I/O system in Class 1 Div 1
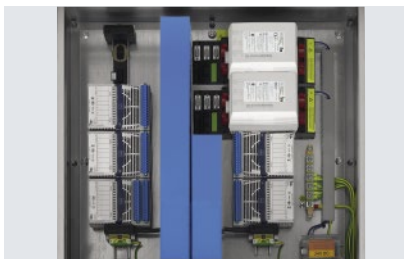
### ASIA: REMOTE I/O IN VARIOUS PROCESS AREAS

- Application in reactor sector, solvent recovery and tank farm of a leading supplier of generic active agents (APIs)
- All discrete signals are transmitted via Remote I/O and redundant Profibus DP
- All other signals via fieldbus FF H1 with Ex i field device couplers and redundant fieldbus power supplies
- Integration in Rockwell automation system
- Installations in Zones 1 and 2
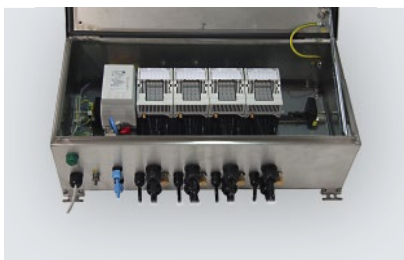
### EUROPE: CONVERSION TO DIGITAL COMMUNICATION

- Compact Remote I/O system with integrated valve islands
- Extensive diagnosis functions help during process optimisation
- Flexible standard design, optimised for use in both Zone 2 and Zone 1
- Integration in Emerson DeltaV automation system via Profibus DP

### EUROPE: LIGHTING SYSTEM INCREASES PRODUCTIVITY

- New R. STAHL lighting concept according to the illumination intensity recommended in standard DIN EN 12464-1 'Lighting of workplaces – indoor workplaces'
- The linear luminaire satisfies all requirements for the different working areas
- Thanks to good illumination production runs smoothly and labels are identified correctly
- Good visibility of stairs and obstacles enhances passive occupational safety

### ASIA: HMI OPERATOR CONTROL AT API MANUFACTURER

- Complete HMI portfolio for all hazardous areas
- For cleanrooms, sugar-coating, centrifuges and formulation processes
- Panel PC ET-436 with 3rd-party SCADA software and printing option
- Customised machine control via 7" widescreen
- 24" widescreens as real KVM system (audit trail, CFR21)

### ASIA: IS1+ SYSTEM WITH INTEGRATED VALVE ISLANDS

- Replacement of old, purely pneumatic solutions by IS1+ Remote I/O
- Space-saving in a field station thanks to integrated valve islands
- Very flexible changes or expansion of signals thanks to modular design of IS1+
- More extensive diagnostics via digital communication increase system availability
- Installation in Zone 1

### NORTH AMERICA: SOCKET OUTLET ASSEMBLIES FOR CLEANROOMS

- Solution made of electropolished stainless steel (1.4404) for use in cleanrooms, co-developed together with the customer
- Circumferential frame for precision-fit wall installation
- Enclosure with mounting rail for rear wall fastening on tiled walls
- Switch with large handle and auxiliary contact for control and monitoring purposes

# MODERN AUTOMATION SOLUTIONS PROTECT AGAINST DOWNTIME
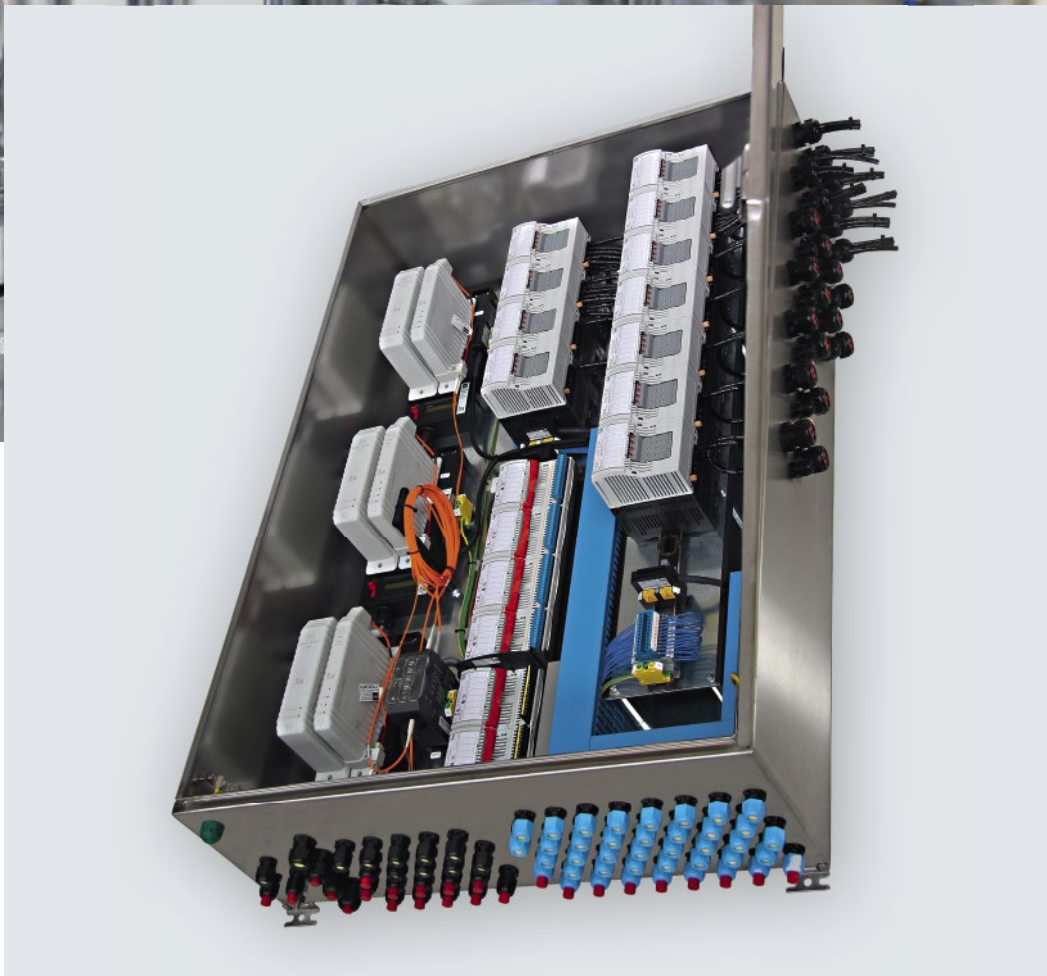


Our explosion-protected high quality automation products are ideally suited to the special requirements in the pharmaceutical industry. After all, production should respond flexibly to market demands in terms of quantity and product type. These aspirations are our motivation for constant innovation.

We repeatedly set new benchmarks with our Remote I/O system. It ensures a high level of flexibility when converting or expanding systems, while at the same time it saves planning and installation costs – by as much as 40% compared to conventional solutions. Thanks to high product quality and life span, the system has been deployed worldwide for many years, for instance in one of the largest production plants for inhalable insulin.

### IS1+ REMOTE I/O FOR ZONE 1 AND 2

Our Remote I/O system is standard in many pharmaceutical plants. Conversions or expansions are possible during operation in Zone 1 and permit easy adaptation to the relevant requirements. IS1+ can communicate with virtually every control system via PROFIBUS DP or various Ethernet protocols. The comprehensive diagnostics functions are ideally adapted to modern production processes.

### INTEGRATED SOLENOID VALVE ISLAND FOR IS1+

The eight-channel module for Zone 1 brings pneumatics into the Remote I/O system. The module in the IS1+ system can be integrated like any other I/O module without additional expenditure on planning, installation or enclosures. Savings of around 20% compared to conventional solutions can be achieved with external solenoid valves or valve islands.

### DIGITAL COMMUNICATION WITH FIELDBUS AND REMOTE I/O

A digital network structure is indispensable in modern plants. Whether communicating via conventional fieldbuses like Foundation fieldbus H1 and PROFIBUS PA or fast Ethernet connections – with ISbus and Remote I/O IS1+ fieldbus products, advanced technology is also available in hazardous areas.

### WIRELESS DOWN TO FIELD LEVEL

The WirelessHART gateway permits communication between WirelessHART field devices and automation systems. It is also suitable for expansions or modifications where no additional wiring is possible. The gateway can be easily adapted to your requirements, for instance with an optional FO converter.

# KEEP EVERYTHING UNDER CONTROL WITH OUR OPERATING AND MONITORING SOLUTIONS



R. STAHL offers you an extensive portfolio of operating and monitoring solutions for both hazardous and safe areas with products ranging from Thin Clients for virtual networks, KVM systems for point-to-point solutions or operator interfaces for machine operation.

The products are also particularly suitable for the special demands of the pharmaceutical industry (e.g. ergonomics, surface quality, cleanroom compliance). Depending on your requirements, choose between various screen and keyboard sizes with various operating options like touchscreen, trackball or joystick. The front frames of the displays are made of plastic, stainless steel or anodised aluminium. Special protective glass panels provide a clear view on the bright displays. The rugged devices can be built into control cabinets or erected on pedestals.

### THIN CLIENTS FOR VIRTUAL NETWORKS

With LED backlights, Thin Clients offer first-rate picture quality with displays in sizes from 15" to 24" WUXGA. Data communication takes place via RDP or VNC and secured by our REMOTE HMI FIRMWARE. Thin Clients meet all requirements according to GAMP and FDA 21 CFR Part 11 and are internationally certified for Zone 1, 2, 21, 22 / Class I Division 2.

### KVM SYSTEMS FOR POINT-TO-POINT SOLUTIONS

The KVM systems are available as 22", 24" and 24" WUXGA. Data communication is performed digitally by the DVI/HDMI and PC USB ports via the KVM box to the field operating systems. These effortlessly satisfy all requirements for cleanrooms, GMP, GAMP and FDA 21 CFR Part 11. The systems can be used worldwide.

### QUICK-RESPONSE OPERATOR INTERFACE
### FOR MACHINE OPERATION

The operator interface offers integrated plug & play visualisation based on Windows Embedded Compact 7 and optionally the PLCPlusRT or Movicon CE Runtime. It has a 7" widescreen touch display behind a front of hardened glass, degree of protection IP69 and thus satisfies GMP requirements. It reacts with extreme speed, and with Movicon CE Runtime, applications according to GAMP and FDA 21 CFR 21 Part 11 can be implemented.

### FASTEST EX-PTZ CAMERA

At 100°/sec and 0.02° recovery, the full HD IP swivel/tilt/zoom camera is ideal for large production facility surveillance by guard tour. With a 30-fold optical zoom and 1080p resolution, even details can be identified at any time.
It satisfies all requirements for cleanrooms, GMP, GAMP and FDA 21 CFR Part 11. Based on AISI 316L with IP66 and deployable in temperature ranges from -40°C to +60°C, it is certified for Zone 1, 2, 21, 22 according to ATEX, IECEx, NEC/CEC.

# NETWORKED SYSTEMS ENSURE FUTURE-PROOF CONCEPTS



Networking is a key issue for modern plants in the pharmaceutical industry. It is the only way to efficiently implement requirements for modular automation and linkage to the 'Industrial Internet of Things'. Productive use of Big Data with integration into plant asset management systems plays a crucial role in optimising processes.

R. STAHL offers you modern, explosion-protected solutions for incorporating your plant and network structure – for example for the deployment of 'mobile workers' via wireless communication solutions with WLAN access points and tablets or smartphones (suitable for use in Zone 1 or 2).

## MOBILE SMARTPHONES

We offer explosion-protected smartphones for Zone 1 and 2 and Division 1 Class 1 for mobile control, maintenance and material tracking in the plant. With a sunlight-readable 4" display, powerful rechargeable battery, LTE and WiFi, they satisfy all key requirements – as well as those of GMP, GAMP, FDA 21 CFR Part 11. With LWP, push-to-talk and FOTA function and Google App Store access, this communication medium can be used variously.

## WIRELESS LAN/WIFI

Rugged and efficient WLAN access points for Zone 1 and 2 form the reliable infrastructure for mobile use of data and monitoring of production processes. Flexible explosion protection concepts allow you to use the industrial WLAN access points of your choice.

## REMOTE I/O WITH ETHERNET CONNECTIVITY

Process automation meets Ethernet – with IS1+, the first explosion-protected remote I/O. The fast 100 Mbits/s interface with interference-immune FO technology ensures a stable and reliable link to common Modbus TCP, EtherNet/IP, PROFINET and FF HSE protocols.

## NETWORK INSTALLATION IN HAZARDOUS AREAS

R. STAHL provides a comprehensive solutions portfolio for a wide variety of installation requirements.
Stable FO installation with the Zone 1 splice box or Ex e terminals for copper Ethernet up to 100 Mbit/s and media converters and switches for explosion-protected 'op is' optical transmission are typical examples.

# OUR LIGHTING SOLUTIONS MAKE YOUR PROCESSES SAFE



In the pharmaceutical industry, processes should supply consistently high quality at the lowest possible cost without interruption. And that also calls for tailored lighting solutions. R. STAHL offers a wide lighting portfolio for the special requirements in your production plants and workplaces.

LED linear luminaires unite all the benefits for reliable low-cost lighting. Offering the same light intensity and low power consumption, they replace luminaires with two 18 or 36 W fluorescent lamps. LED luminaires are maintenance-free and reduce operating costs due to an outstanding energy efficiency. We will be happy to assist you in planning and calculating your lighting system.

### LED TUBULAR LIGHT FITTINGS

The latest generation of outstandingly energy-efficient LED tubular light fittings enables drastic savings in operating costs and guarantees a service life of 80,000 hours.

### LED FLOODLIGHTS

R. STAHL's compact floodlights with ultra-efficient LEDs are distinguished by high performance and flexible installation. They are available in sheet steel or stainless steel with three different versions of light distribution to suit the lighting task. The LED floodlights are also exceptionally low-maintenance thanks to a service life of up to 100,000 operating hours.

### COMPACT LIGHT FITTINGS

The enclosure of the compact sheet steel light fittings is available in powder-coated sheet steel or stainless steel. They are suitable for general and emergency lighting, for wall and ceiling mounting. All-pole power disconnection is ensured by an internal switch when the light fittings are opened.

### LED BEACONS AND HORNS

Our beacons alert people and reliably protect them from hazards. R. STAHL horns also warn of imminent emergencies. Signalling sequences can be freely selected. Easy integration into automation systems is possible.

# RELIABLE CLEANROOM SOLUTIONS FOR YOUR PROCESSES

Pharmaceutical processes are often subject to special purity requirements – on the one hand the quality of products is ensured by the observance of prescribed air purity levels at the workplace, and on the other, in applications involving the processing of hazardous substance, appropriate regulations protect the health of operating personnel.

R. STAHL products have been used successfully in cleanrooms for many years. Our sheet steel and stainless steel luminaires, for instance, have smooth surfaces that are easy to clean. Central locking, all-pole disconnection and hinged opening mechanisms ease and reduce maintenance efforts.

## SOCKET OUTLET ASSEMBLIES

The outer surfaces of the stainless steel enclosure are electropolished. These easy-to-clean surfaces minimize the danger of particle deposits. The stainless steel that is used is particularly abrasion- and media-resistant, while plastic components possess a low specific surface resistance – thus ensuring that static electricity is reliably dissipated.

## SAFETY SWITCHES

Safety switches ensure reliable power disconnection for cleaning and repair work. They have been used successfully in the cleanrooms of pharmaceutical plants for many years. Equipment and components possess excellent properties with regard to particle emission behaviour, cleaning and ESD.

## FULL HD IP AND INFRARED CAMERA

This full HD camera provides brilliant image definition for detailed process and premise monitoring even in adverse lighting conditions. The infrared camera is ideal for monitoring temperature changes of leakages, potentially explosive stock and persons in complete darkness. The ONVIF protocol permits worldwide use – the electropolished AISI 316L enclosure use in cleanrooms.

## STANDARD ENCLOSURE

Our extensive range of ex-stock enclosures made from sheet steel, stainless steel and plastic guarantee short delivery times and flexible solutions. Our modular systems make extensions and modifications easy. Standard enclosures in stainless steel 1.4301 (AISI 304) or 1.4404 (AISI 316L) are available in 54 different sizes, with cover screws or hinges.

# MACHINERY AND EQUIPMENT MANUFACTURERS RELY ON US



Picture source:
A. Junghans GmbH & Co. KG

Machinery and plants in the pharmaceutical industry are subject to stringent safety requirements. In order to comply with these special standards, machinery and equipment manufacturers turn to R. STAHL for long-serving, virtually maintenance-free solutions. In close cooperation with our customers, we have thus designed and built various explosion protection solutions for laboratory dryers, centrifuge systems, inline dispersing machines and mobile filtration systems. Depending on requirements and fringe conditions, various types of protection are used, for instance pressurisation 'Ex p' to permit deployment of standard industrial controls in Zone 1.

## HMI

SERIES 300 operator interfaces are fully configured with operating and visualising systems and ready for use with machine control systems or small-scale automation processes. Our PLCPlus software permits low-cost project planning, recipe management including export/import functions. The 10.4"/15" displays are equipped with many function keys for customised assignment and are internationally certified for Zone 1, 2, 21, 22.

## CONTROL BOXES, CONTROL AND MONITORING DEVICES

Control boxes are used for the operation and monitoring of many different electrical and switching circuits, machinery and system parts.
R. STAHL offers a varied selection of control and monitoring devices to enhance safe on-site handling of production plants and machinery. Customers can also choose from a wide range of installation devices.
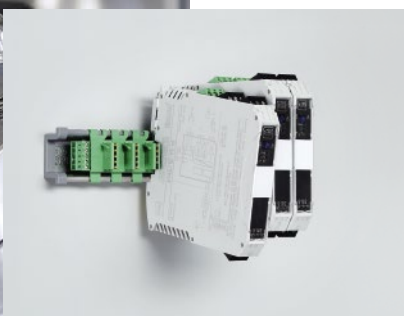
## EX I ISOLATORS

The ISpac Ex i isolator is a proven solution for intrinsically safe signal separation in case additional functional safety (SIL) is required. The unique concept focuses on compactness, long service life and easy installation.

## EX P SYSTEMS

We turn your industrial applications into explosion-protected control systems without impairing their functions, so you benefit from a proven and affordable solution for all machine control systems and other electrical units. Internationally accepted certificates (ATEX, IEC, NEC) guarantee worldwide use.

# FOCUSED LIFE SCIENCE EXPERTISE IN HAZARDOUS AREAS

R. STAHL is a partner you can trust for pharmaceutical, chemical or environmental systems. You, too, can benefit from our many years of experience.

Besides a wide product range, we offer an increasing number of one-stop services, comprehensive documentation and after-sales service:

- consulting & selection of explosion protection concepts

- customised solutions

- lighting solutions

- detailed engineering for your solution

- Factory Acceptance Test (FAT), Site Acceptance Test (SAT)

- production and assembly: fast, reliable and with certified quality according to ATEX, IECEx or NEC

- international customs and shipment handling

- on-site commissioning support

- extensive training programme

- after-sales support for smooth operation throughout your product's service life

# R. STAHL:
# YOUR GLOBAL PARTNER

## FOR THE SAFETY OF YOUR EMPLOYEES AND PROJECTS WORLDWIDE

We are at your service around the globe with seven production sites, subsidiaries in 24 countries and more than 50 agencies. Our international employees understand your needs and offer you R. STAHL quality – no matter where you need it.

Thanks to this global presence, we make international joint projects possible that include clients, planners, installation companies and operators from various countries. And we take care of the needs of everyone involved in the project – directly on-site. At the same time, our international certificates and approvals ensure compliance with the various legal stipulations throughout the world.

### R. STAHL

| STAHL Headquarters | ● Subsidiary |
| ■ Production facility | ● Agency |

OUR PRODUCTION FACILITIES:

Germany
- Waldenburg

Germany
- Weimar

STAHL

Germany
- Cologne

Netherlands
- Hengelo

Norway
- Stavanger

India
- Chennai

USA
- Houston

# R. STAHL CUSTOMERS BENEFIT FROM OUR EXPERIENCE

The pharmaceutical and chemical industry
is one of R. STAHL's major customers.
Our expertise and efficiency in equipping plants has
been proven worldwide.

ABBOTT LABORATORIES

ALCALIBER

BASF SE

BAYER AG

BIOCON LTD

BOEHRINGER INGELHEIM

BRISTOL-MYERS SQUIBB
COMPANY

CIPLA LTD

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LABORATORIES LTD

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MERCK KGAA

MSD MERCK & CO., INC

NOVARTIS

NOVO NORDISK A/S

PFIZER INC

ROCHE

SANDOZ

SANOFI

SANOFI-AVENTIS

SOLVAY

SUN PHARMACEUTICAL
INDUSTRIES LTD

TAKEDA PHARMACEUTICAL
CO., LTD

TEVA PHARMACEUTICAL
INDUSTRIES LTD

THERAPURE BIOPHARMA INC.

UCB

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