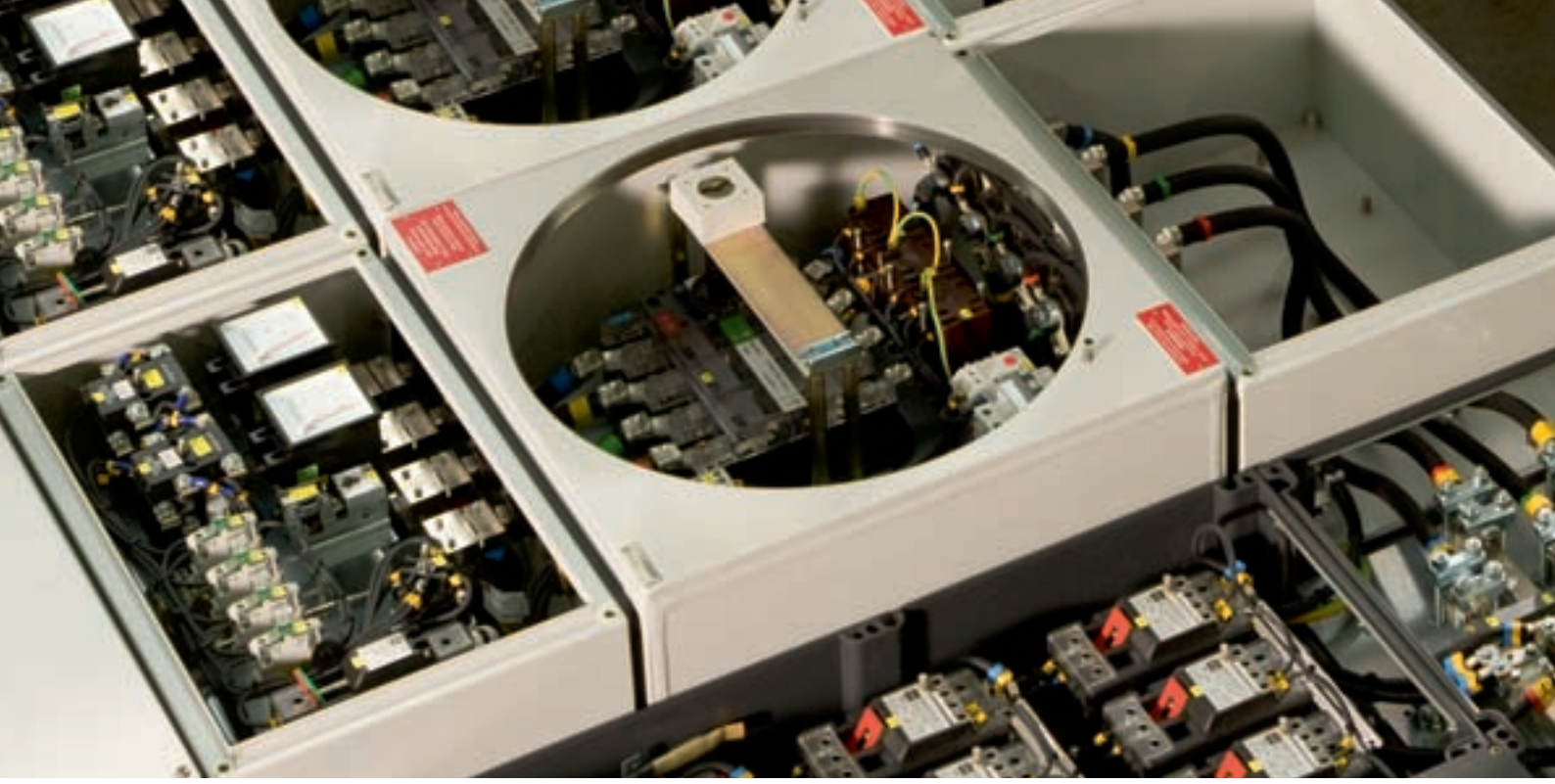

distributing & controlling

system solutions

STAHL

your safety our reality

In many sectors of industry, inflammable substances such as gases, vapours or mists escape during manufacture, processing, transport and storage. Inflammable dusts are produced in some processes. These inflammable gases, vapours, mists and dusts can form a potentially explosive atmosphere with the oxygen in the air. If this atmosphere ignites, explosions occur that can cause serious injuries and damage. We are uncompromising in the effective prevention of this situation occurring, as your safety is what we do best. Components and systems from R. STAHL are based on decades of experience and our comprehensive know-how. Without problems they ensure work processes in potentially explosive atmospheres are one hundred percent safe. We provide custom, technically advanced solutions for every application in potentially explosive atmospheres, as well as comprehensive services related to the explosion protection sector.
From oil platforms to chemical plant, from grain silo to pharmaceutical, environmental and foodstuff installations, R. STAHL is your partner on who you can rely without reservation.

Users

- Oil and gas industry
  - production
  - storage
  - transport
- Petrochemical industry
- Chemical industry
- Pharmaceutical industry
- Food industry
- Ship building and offshore industry
- Wood processing

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hundred percent _ quality tested 10

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from identifying the solution to the finished product 13

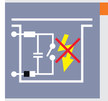
certified _ worldwide approvals 18

safety guaranteed _ with label and manual 20

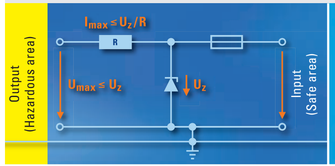
without borders _ for every application 22


CE
FM
NFPA
Dust-Ex
COST
IECEx
PTB
UL
ATEX
nec
1867

Ex i intrinsic safety



The equipment used in the potentially explosive atmosphere contains only intrinsically safe circuits. A circuit is intrinsically safe if no sparks and no thermal effect can cause the ignition of a potentially explosive atmosphere. For this purpose the energy in the circuit is limited via the parameters current, voltage, inductance and capacitance.



Typical marking examples

EN	II (1/2) GD [Ex ia/ib] IIC/IIB / II 3G Ex IC II
IECEx	[Ex ia/ib] IIC/IIB / Ex IC II
NEC	Class I, Zone 1, AEx [ia] IIC T4

Advantages

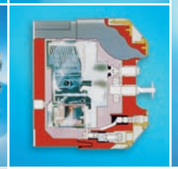
- Cables and wires are included in the protection
- Can also be used for applications in zone 0
- Installations can be undertaken live and in the potentially explosive atmosphere
- Ideally suited to fieldbus solutions and automation solutions
- Simple, cost-effective installation and expansion of electrical equipment in potentially explosive atmospheres
- Possible to use industrial components in certain special conditions

Applications

- Integration of field devices
- Connection of components for automation technology
- Safety barriers
- Isolators
- Remote I/O systems
- Combination of HMI with machine control system

Ex d flameproof enclosure

Parts that could ignite a potentially explosive atmosphere are fitted in an enclosure that will withstand the pressure of an explosion inside it and prevent the transfer of the explosion to the exterior. In this sector R.STAHL offers numerous, innovative enclosure series made from aluminium, stainless steel, painted sheet steel or plastic. Whether customer-specific solution or standard application, the modular system design provides safe and cost-effective solutions.



Typical marking examples

EN	Zone 1: II 2 G; Ex d II T4 Zone 2: II 3 G; Ex nC II T4
IECEx	Zone 1: Ex d IIC T4 Zone 2: Ex nC IIC T4
NEC	Class I, Zone 1, AEx d IIC T4

Advantages

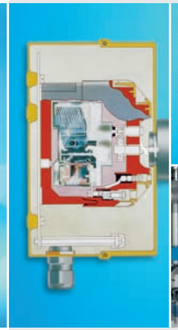
- Possible to easily adapt to the latest technologies
- Easy to assemble switchgear combinations
- Optimal integration in machines due to rectangular enclosure
- Type of protection usable without additional infrastructure
- Easy installation due to indirect cable entry
- Proven technology

Applications

- Machine control systems
- Power distribution systems
- Terminal boxes
- Motors
- Switch gear
- Motor switches

Ex e increased safety

The type of protection >increased safety< is mostly used together with Ex d which is the most important type of protection for switchgear. In the case of increased safety, additional measures are taken that prevent the possibility of unacceptably high temperatures as well as the production of sparks or arcs in or on electrical equipment. Using special, proprietary test methods and careful material tests, R. STAHL guarantees safe systems of premium quality.



Typical marking examples

EN	Zone 1: II 2 G; Ex e IIC T4 Zone 2: II 3 G; Ex nA T4
IECEx	Zone 1: Ex e IIC T4 Zone 2: Ex nA T4
NEC	Class I, Zone 1 AEx e IIC T4

Advantages

- Easy to expand
- Low weight
- Corrosion-resistant
- Low maintenance effort
- Easy cable entry
- Modular enclosure systems
- Easy to combine
- Extensive product range

Applications

- Terminal boxes and connection boxes
- Control boxes for the installation of explosion protected components
- Squirrel cage motors
- Luminaires

Ex p pressurised enclosure

With this type of protection, potentially explosive gases are purged out of a sealed enclosure. Then an overpressure is established and maintained inside the enclosure with the aid of a inert gas. Potentially explosive gases can no longer enter the housing and are therefore kept away from thermal and electrical sources of ignition. An explosion-free area is created in which electrical components capable of causing ignition can be installed and operated.

Typical marking examples

EN	Zone 1: II 2 G; Ex px IIC T4 Zone 2: II 3 G; Ex pz IIC T4, Zone 2
IECEx	Zone 1: Ex px IIC T4 Zone 2: II 3 G; Ex pz IIC T4
NEC	Class I, Zone 1, AEx px/py Class I, Zone 2, AEx pz

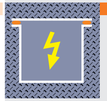
Advantages

- High flexibility, not bound to existing enclosure shapes
- Ex p enclosures in different materials
- Installation of explosion protected controls and indicators in the front panel
- Supplement with HMI

Applications

- Large control systems
- Encapsulation of special equipment (camera, printer)
- Applications with critical temperature behaviour

Ex tD protection by enclosure



The type of protection Ex tD is used in areas with an inflammable dust. The entry of the dust is prevented by the sealing of the enclosure or the entry of dust is limited to a level that is not hazardous. As a result dust cannot be ignited by the electrical equipment installed. The maximum surface temperature on the external enclosure is limited such that the temperature of dust deposits on the enclosure or surrounding dust-air mixtures cannot ignite.

Typical marking examples

EN	Zone 21: II 2 D Ex tD A21 IP6X T100 °C Zone 22: II 3 D Ex tD A21 IP5 T100 °C
IECEx	Zone 21: ExtD A21 IP6X T100 °C Zone 22: ExtD A21 IP5 T100 °C
NEC	Class II, Zone 1 AExtD IP6x

Advantages

- Simple principle
- Economic and flexible solutions
- Wide range of applications
- Light-weight
- Easy requirements on components installed

Applications

- Switchgear and switching systems
- Control-, connection- and terminal-boxes
- Junction boxes
- Motors
- Luminaires

competence
where safety is uncompromising

- All types of protection covered
- Over 3000 certifications for explosion protection worldwide
- Over 70 active patents
- Numerous publications in the international technical press
- Member of many inter-national standardisation committees, technical committees and working groups (Profibus, HART Foundation fieldbus, etc.)
- Ex-Magazine
- Brochures on basic principles (explosion protection, dust Ex, obligations and tasks)
- Contributions to various specialist books
- Product-neutral seminars

Worldwide R. STAHL is a pioneer in the explosion protection sector. The development and production of electrical components and systems for potentially explosive atmospheres is rigorously advanced.Spectacular new developments and innovative products are the consequence. In parallel, the specialists at R. STAHL work together with national and international committees to define new principles and continually improve safety regulations. For us safety standards are not barriers, but challenges. We not only comply with all standards, we are involved in their definition and we set new standards. We are the only organisation worldwide to cover all types of protection. We are therefore able to design and implement for every market in exact accordance with local regulations and requirements. Our know-how also covers related areas of safety technology such as SIL and FDA.

hundred percent
quality inspected

Systems and plants for potentially explosive atmospheres are subject to strict safety regulations. R. STAHL provides custom, technically advanced solutions including all the related advice and service. In our laboratory, accredited by independent test centres and continually checked by the Physikalisch-Technische Bundesanstalt (the national standards laboratory of Germany), all the important tests can be performed directly at any time. During the entire development and production phase, the quality management at R. STAHL safeguards the high quality of the products. Function tests, endurance and safety tests in accordance with the latest directives and standards are a matter of course. The competent staff at R. STAHL are conscious of their responsibility and of quality at every stage of production. More than 3500 regularly calibrated, mechanical and electrical instruments, computer-based 3D measuring methods as well as modern workplaces safeguard and guarantee the accuracy of the tests.

1 **Dynamic pressure test**

2 **Function test**
> Computer aided function test
> 100 % routine test of the functional components
> 100 % routine wiring test

3 **3D measuring methods**
> Optical and tactile

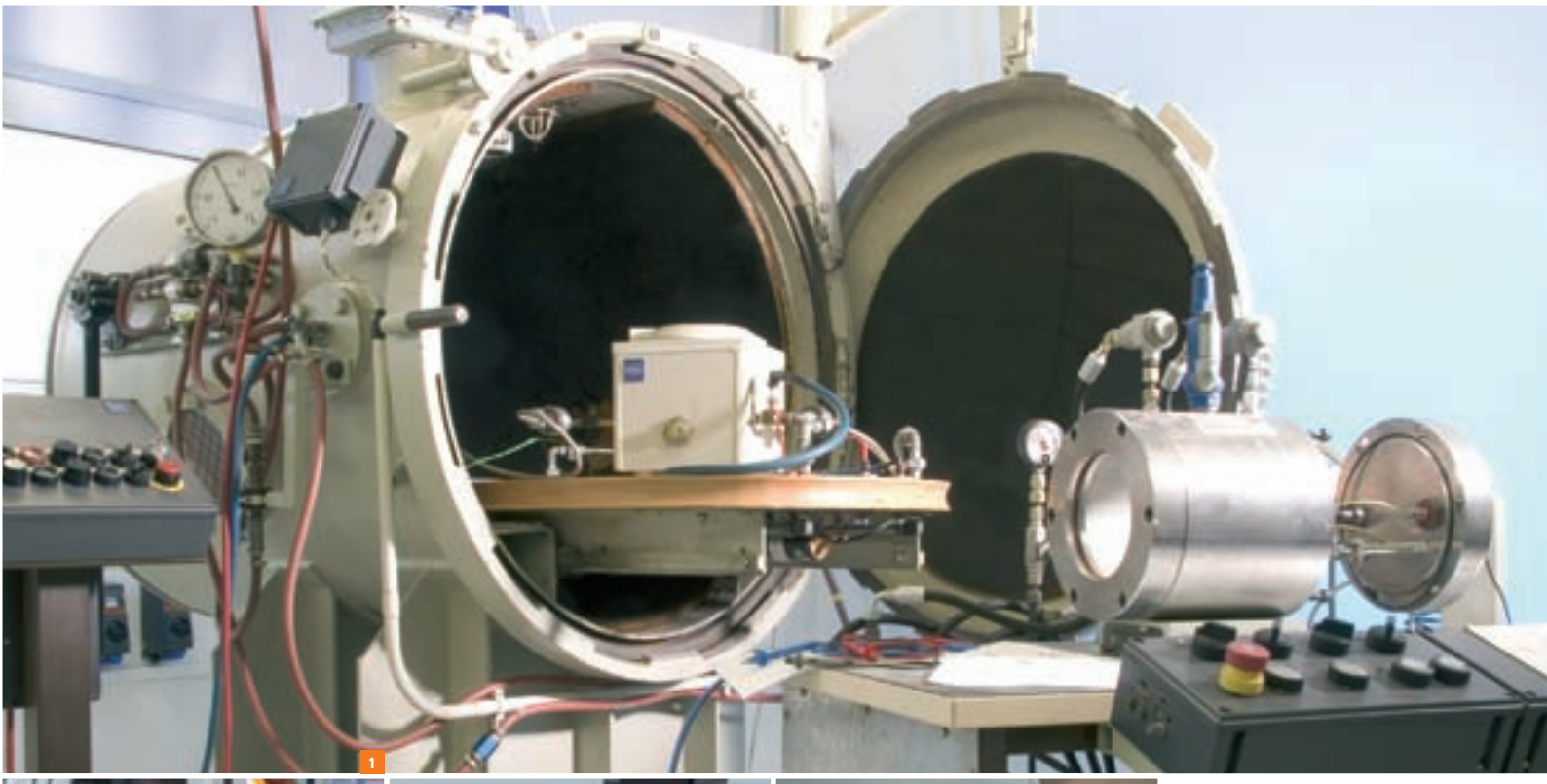
4 **Insulation and high voltage test**
> 1500 V AC for control panels up to 500 V
> 2500 V AC for bus bar systems and distribution panels
> 5000 V AC for applications with rated voltage higher than 500 V

5 **Test equipment**
> More than 3500 regularly tested and calibrated mechanical tools
> More than 700 regularly tested and calibrated electrical measuring equipments
> Own calibration devices

6 **Type of protection**
> Water ingress and dust ingress

7 **Pressure test**
> Hydrostatic


5



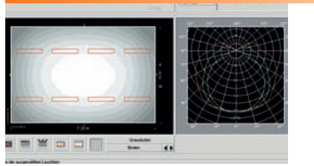
together

customer-specific system solutions

The rapid rate of change in research, development and the regulatory framework, as well as the continuous structural change of recent years require versatile, committed customer support. R. STAHL is tackling this challenge. We offer our customers constructive advice and support. It is not always easy to find the right, economic solutions in the explosion protection sector. With our many years of experience and our international contacts, we are able to develop a safe, tailor-made system solution together with the customer. Here our knowledge and support range beyond our own productportfolio and also include the organisation of the necessary services from other specialist areas. During this collaboration we are in continuous contact. Project management and production work together closely in modern competence centres. Whenever our customers want to know something about their project, experienced contacts of R. STAHL will provide information at any time.

solution identification

- Preparation and development of individual solutions together with the customer
- Analysis of customer-specific production processes and requirements
- Engineers and software specialists with international experience
- Comprehensive reference database



technical implementation

- Complex computer-based technical calculations, preparation of documentation and plans
- Large component portfolio for exactly matched, safe and cost-effective solutions
- Cross-product, company-wide system solutions and services
- One fixed, experienced contact is available at any time for customer queries and requests

production

- Several production sites worldwide that are always state-of-the-art
- Experienced craftsmen, supervisors and engineers
- Quality management from goods receipt to final acceptance
- ATEX recognition of the quality management system by the PTB
- ISO 9001:2000 certified
- Direct channels, flexible production organisation
- Project management and production work together closely in modern competence centres
- Information on the state of the project can be obtained by the customer at any time
- External products can also be integrated to suit specific customer requirements
- Requests for changes are resolved quickly and un-bureaucratically

Control equipment
Controls and indicators, equipment for installation in control boxes

Installation equipment
Connections SolConeX, connectors

Automation products
Safety barriers INTRINSPAK, remote I/O IS1, Ex i isolators ISpac, fieldbus technology ISbus

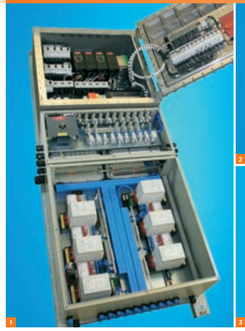
HMI (Human Machine Interfaces)
Open HMI panels to work directly on a PLC

acceptance

- FAT in accordance with customer requirements
- Modern inspection and test equipment
- Intensive, specialist support
- Personnel regularly trained

use

- Provision of the extensive project documentation
- Modern local logistics centres worldwide
- Comprehensive after-sales service
- International training courses



1 Control and distribution system solution

- Combination of enclosures in types of protection Ex e and Ex d
- Remote I/O System integrated
- Process-orientated implementation
- Parts for the power distribution integrated

2 Machine control system with motor starter

3 Power distribution

4 CUBEx control panel

- Combination of a connection chamber with HMI
- 3 mounting levels inside the flameproof housing
- Mounting of electrical equipment in the cover
- The power circuits and the controls, including IS components
- Integration or installation equipment
- Most compact design

2 Machine control system with motor starter

3 Power distribution

4 CUBEx control panel

- Combination of a connection chamber with HMI
- 3 mounting levels inside the flameproof housing
- Mounting of electrical equipment in the cover
- The power circuits and the controls, including IS components
- Integration or installation equipment
- Most compact design


Technical implementation
Production
Solution identification
Use
Acceptance


Physikalisch-Technische Bundesanstalt
PTB
Production Quality Assessment Notification
(Translation)


CERTIFICATE
IQNet
CERTIFICATE
CERTIFICATE

certified
worldwide approvals

R. STAHL is a world leading manufacturer of explosion protected components and systems. We provide our customers all over the world with specific, technically advanced solutions including all the related advice and service. This situation requires international collaboration during the planning, installation and operation of these system solutions. The necessary components must be matched to all conditions approved worldwide and the conditions in the specific case. The specialists at R. STAHL also work together with national and international committees and with their many years of experience are actively involved in the preparation and further development of improved safety regulations. We are therefore able to design, plan and manufacture for every market in exact accordance with local regulations and requirements. International certificates, approvals and patents underline our competence and make it possible to use all R. STAHL products safely and anywhere in the world, even in the harshest conditions. You can rely on us!

Certified manufacturing skills

- Quality management system according to ATEX
- Switch gear, control gear and control equipment
- Control and distribution switch gear
- Plugs and sockets
- Installation equipment, terminal boxes
- Signalling and monitoring equipment
- Components for field bus systems
- Luminaries
- Decisive types of protection (flameproof enclosure, increased safety, intrinsically safety, encapsulation, powderfilling, pressurised apparatus)

Certified components and systems

- IECEx, NEC, CENELEC and many others

Certified according to ISO 9001-2000 in regards to design, manufacture and sale

- Equipment and systems for measurement, control, operating and monitoring, powerdistribution, protection and illumination in hazardous areas
- Explosion proof and industrial control and distribution systems for (petro) chemical industries

safety guaranteed
with label and manual

Safety in potentially explosive atmospheres can only be ensured by good, close collaboration between all involved. The operating organisation is responsible for the safety of its plant. R. STAHL does everything to support the customer with this responsibility. From the start, from the evaluation of the risks of explosion to initial placing in operation, competent staff are available to help our customers. With our many years of experience and our wide-ranging knowledge, we are able to develop and produce a one hundred percent safe solution for potentially explosive atmospheres that is also simple and economic. As a certified manufacturer of explosion protected components and systems, we ensure that every device matches the tested design. All devices from R. STAHL are marked with type plates that contain the most important technical data. Comprehensive operating instructions are supplied as a standard; detailed documentation for system solutions is provided additionally. This enables the operating organization to set up maintenance schedules for cost effective regular inspections and maintenance. With seminars and information material we help our customers keep up to date in the area of explosion protection.

Certified production

- World leader in explosion protection
- Development of economical solutions
- Certified manufacturer
- Operating instructions for every device 1
- Marking of all products with label 2
- Comprehensive, detailed documentation for every system solution 3
- Training courses and seminars available


Typen / Types 8125/S, 8125/B, 8146/S
8220, 8225, CUBEx 8264
BETRIEBSANLEITUNG
OPERATING INSTRUCTIONS
INSTRUCTIONS DE SERVICE
1


2


3

without borders

for every application

R. STAHL is at home the world over and we are always somewhere near you. With great commitment, competent teams tackle our customers' wishes and ensure they comply with national conditions and the conditions in the specific environment. Irrespective of whether hot or cold, whether caustic or subject to abrasion, the system solutions from R. STAHL are always safe and explosion protected. Worldwide these solutions are used in the pharmaceutical industry, in harsh offshore operations, at extreme depths or extremely high temperatures. All standard components comply with ingress protection IP66, suitable for all typical applications. For products that are used offshore, for instance, enclosures are available in high quality aluminium with a copper content of less than 0.5%, high quality stainless steel or salt-water resistant plastic. The formation of condensed water inside the enclosure can be effectively prevented by heating elements or fans. Our concepts have already been successfully tested and used in projects around the world.

International certification
> IECEx, CENELEC and NEC

Ambient temperature range
> – 20°C … + 40°C
> – 50°C … + 55°C
> Others on request

Sea water resistant
> Stainless steel, AISI 316 L
> GRP
> Copper-free aluminium

Safe and reliable technology
> Quality assurance is implemented in all manufacturing steps and is one of our major management principles

Proven and robust products
> 80 years of experience in development and manufacturing

Installation techniques
> Direct entry with cable glands
> Direct entry with conduits
> Indirect cable entry with connection chamber

Type of protection (IP-rating)
> IP65 and IP66

Worldwide organisation
> Over 70 subsidiaries for your support with explosion protection

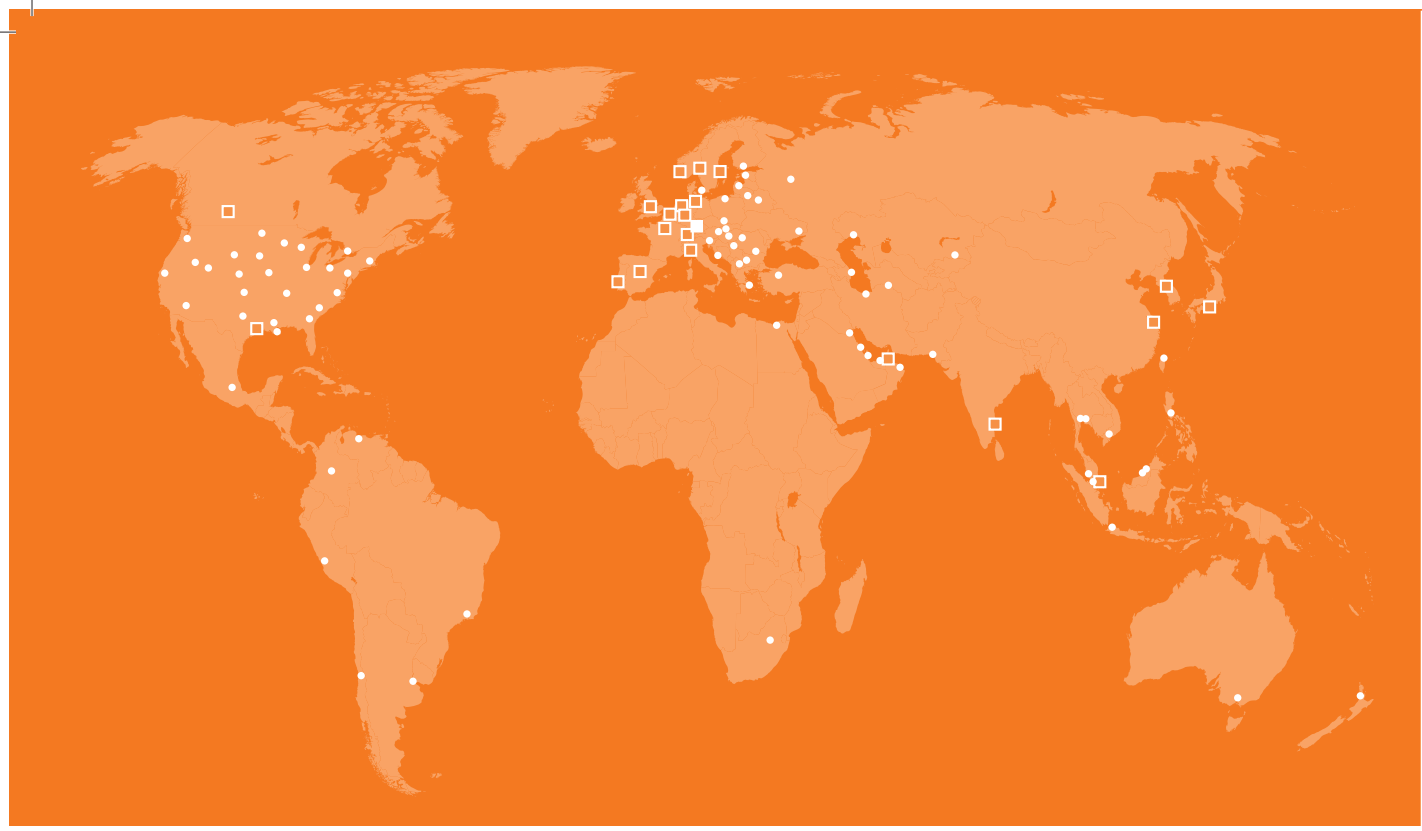










visuell.de

R. STAHL
Am Bahnhof 30, 74638 Waldenburg
Germany
Telephone +49 7942 943-0
Fax +49 7942 943-4333

www.stahl.de

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