



Safety is for life.™



# REMBE® EXPLOSION SAFETY



■ Made  
■ in  
■ Germany

Consulting. Engineering. Products. Service.



Dear Customer and Partner,

Over the last five years, REMBE® has built a team of experts in the field of explosion safety that is unmatched among other manufacturers. We are no longer just a manufacturer of products and components but a consultancy, engineering house and a full service provider.

We deliver turn-key explosion safety concepts all over the world, for all delicate or complex applications, and in a variety of industries including aerospace, cosmetics, chemicals, foodstuffs, pharmaceuticals, biotech, energy, timber, infrastructure, transport and more.

To guarantee REMBE® quality in both special applications and large scale projects we have put together a team of specialists that is unique in the world of explosion safety.

Furthermore, we are again setting the trend by bringing solutions to market that protect your life and budgets while still preserving nature. Solutions like the Q-Rohr® DFE (REMBE® invented flameless venting with the Q-Rohr® 25 years ago) or the TARGO-VENT provide maximum safety, full business continuity and absolute peace of mind.

Let's not forget the people involved. Here are some selected members of my global team of safety professionals, which is led by Dr. Lottermann. If there is anything I can do for you please let me know. You can reach me at [stefan.penno@rembe.de](mailto:stefan.penno@rembe.de).

Have a safe and successful day.

A handwritten signature in blue ink, appearing to read 'Stefan Penno'.

Stefan Penno



**Dr. Johannes Lottermann** studied safety engineering at the University of Wuppertal before he worked for the renowned German mining safety consulting company DMT GmbH & Co. KG. At DMT Johannes led the Department of Technical Fire and Explosion Safety. In 2010 he joined REMBE® to work in industrial explosion safety. With his consulting background and a PhD in Integral Fire and Explosion Safety Concepts he is now REMBE®'s Director Explosion Safety, delivering the complete package of consulting, engineering, products and service. Johannes is also a proactive member in numerous committees and international associations such as the VDI, VDSI, VGB and NFPA, and he chairs the Scientific Technical Committee of the Intercontinental Association for Explosion Protection IND EX e.V. Johannes is consistently able to understand our customers' needs and fulfil their technical and commercial requirements.



**Francesca Vincenzi** is an engineering specialist in explosion safety who has no issues getting her hands dirty when inspecting an industrial site. She has more than 10 years experience as a consultant in the Italian food, pharmaceuticals and timber industries. Since joining REMBE® in 2012, Francesca has expanded her scope to include Europe and North America, and since 2014 she has been a Senior Consultant in Explosion Safety. This position covers full-spectrum safety scans for medium- and large-scale factories. Her customers respect her comprehensive and competent safety concepts, her broad expertise, and her likeable personality.



**Andrea Vincenzi** worked at several globally active engineering companies in the explosion safety sector before joining REMBE® as a Senior Consultant. Like Johannes and Francesca, he travels worldwide to run safety scans and develop protection concepts in all kinds of production plants, especially in coating, timber handling and food manufacturing facilities. With more than eight years of experience in ATEX consulting he has become a reliable associate in every way. He is known for his rational decision-making while his relaxed and friendly character allows him to remain calm regardless of the challenges he faces. Many of his worldwide clients insist on being consulted by him and no other - they deeply trust his honesty and professionalism.



**Roland Bunse** studied at the University of Paderborn and has a degree in mechanical engineering, but it is not his theoretical background that separates him from other sales engineers. It is his wide range of practical experience that makes his senior status self-evident. Roland has carried out thousands of dust and gas explosions, knows the physics behind the scenes and understands how to convert this knowledge into cost-effective and safe solutions for our customers. He came on board in 1994 and constantly supported our research and development of explosion safety devices including the unique Q-Rohr®, the EXKOP® Isolation System and TARGO-VENT. Roland also holds several patents and contributes to national and international standardization groups like CEN or VDI. So when you need a hands-on technical genius, Roland is the first choice. He is straightforward, solutions-oriented and gets things done properly in compliance with worldwide standards.



## REMBE® Safety Days

Every year we organise a two-day networking event which focuses a special topic.

In 2017 the event was centered on "Explosion Safety for spray dryers" and 2018 on "Explosion Safety in the woodworking industry".

At these gatherings, we discuss concrete application cases, the latest research results and much more with industry experts and users. We also provide ample time for the mutual exchange of ideas.

In 2019, the Safety Days will be devoted to fire and explosion safety in food and beverage industries.

If you are interested, please send an email to [safetydays@rembe.de](mailto:safetydays@rembe.de) or visit our website [www.rembe.de](http://www.rembe.de).

# THE PRINCIPLES OF EXPLOSION SAFETY

## Why do explosions occur?

When a combustible material, an ignition source and atmospheric oxygen collide in a confined space, the result is an explosion. Preventative explosion safety measures aim to stop this potentially lethal mixture from occurring. However, in practice, the vast number of potential ignition sources alone almost always makes this impossible. Consequently, the most important steps towards explosion safety for industrial companies are protection measures that minimise the damage caused by an explosion. Industrial plants must always be protected against the consequences of explosions to ensure that employees are safe and production can be resumed quickly. After all, every hour of lost production costs money. In most cases, explosion safety can be provided cost-effectively through explosion venting and explosion suppression.

We would be happy to show you solutions tailored to your processes that will reduce the damage caused by an explosion to a negligible level – enabling you to resume production quickly after an explosion.

The five requirements for a dust explosion.



## The 3 key features of a modern safety concept

1. **Reliability and productivity:** Protective systems must be permanently available and operational. The possibility of false triggers must be excluded as this reduces the productivity of the plant.
2. **Compliance:** Modern protective systems must satisfy all legal requirements and thus guarantee legal compliance for plant operators.
3. **Cost-effectiveness:** Protective systems must be as simple as possible to install and require minimum investment of time and financial resources. The total costs of ownership of the systems must also be kept as low as possible.

All safety concepts from REMBE® meet these requirements. That's a promise!

## Why is explosion safety so crucial?

Higher – faster – further: not just the objective in sport but also in the development of industrial plant technology. 21<sup>st</sup> century machinery has long been optimised and is running at high speeds. However, as plants approach their maximum capacity, the risk of an explosion also increases. Rising levels of fine particles produced by fast-running machines are one of the main reasons that the probability of explosions increases. These explosions almost always cost human lives, but even if nobody is harmed, an explosion in an inadequately protected industrial plant can still cause immense structural and financial damage. History shows that explosions in unprotected plants have driven companies to bankruptcy time and time again. After all, every day of lost production puts **the company's existence at risk**. Explosion safety concepts usually enable businesses to **eliminate production downtime entirely or at the very least reduce it dramatically – and with REMBE® products it is always more affordable than you think.**

Assessment, prevention and protection – REMBE® is your expert partner.

## 3 steps to make your processes safer

### 1. Risk assessment

A risk assessment determines the probability that an explosive mixture of dust and air (divided into zones) will come into contact with an effective ignition source. If there is a danger of an explosion occurring, you must take steps to prevent, or at least reduce, the probability of this happening (see step 2).

Alternatively, you must implement protective systems that reduce to an acceptable level the damage an explosion would cause (see step 3).

### 2. Prevention and organisational measures

- **Technical measures:** Effective dust extraction systems reduce the build-up of explosive atmospheres. Inert gas blanketing is also recommended to reduce oxygen levels.
- **Eliminate effective ignition sources:** Only ever use the appropriate equipment (e.g. category 1D) and prevent foreign bodies from entering the product stream. Check that equipment is correctly grounded to avoid electrostatic discharges.
- **Organisational measures:** Employees should always receive comprehensive training. Documented cleaning procedures and permit-to-work systems for hot-work create an additional level of safety.

### 3. Protective measures

- **Explosion pressure resistant or explosion-proof vessels:** These terms are used to describe vessels that are strong enough to withstand the maximum explosion pressure.
- **Conventional explosion venting:** Explosion venting is a technique for protecting enclosed vessels that prevents the pressure within the vessel from rising above a permitted level. Breaking points, such as explosion vents, in the walls of the plant, rupture when the pressure reaches a predefined level and thus reduce the pressure in the vessel below its strength.
- **Flameless explosion venting:** This essentially uses the same principle as conventional explosion venting. However, it offers the advantage that the explosion can be vented indoors because the flame and pressure wave of the explosion are contained. This eliminates the risk of injury even when working in close proximity to the equipment.
- **Explosion suppression:** Pressure and/or infrared sensors detect the explosion at a very early stage. Within a few milliseconds, a control system smothers the germ of the explosion using an extinguishing powder that is released into the plant.

Protective measures against explosions also include isolation systems in order to prevent the devastating effects of explosion propagation or secondary explosions in the connected vessels.

# SAFETY IS FOR

Our mission: your safety.

Operational safety is an important responsibility. In fact, it's a mission to which we have dedicated ourselves wholeheartedly for over 45 years now. Throughout the world our experts have a single aim – to provide the best possible protection for your systems and processes.

**You'll benefit from our decades of experience** which ensures that you always receive an honest analysis and products of the highest quality. Working diligently and responsibly, our attention is fully focused on the customised optimisation of your routines, manufacturing processes and products.

## Consulting

**We don't just work at our desks.  
We also work on your premises.**

Each production facility is different and has different requirements. This is why our experts have a close look at your entire plant with you to determine what's genuinely reasonable and what will be the best solution for you. It's your perfect investment in safety.

**Solutions off the peg? Not from REMBE®.**

Once we have looked at all the relevant documents, we will identify all the existing space for improvement and create a profitable safety policy for you that is perfectly geared to suit your company.

## Engineering

**We don't just make recommendations.  
We give you the best solution.**

From the paper to production: you will have a safety system that is perfectly tailored to suit your processes and operational requirements.

**Whether it's explosion safety or process safety,** our engineering ensures that you get the best solution at all times – **Made in Germany.**

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## Quality – the key to your safety

Our products are manufactured according to the latest up-to-date international standards for management systems, pressure equipment and explosion safety devices. As well as prioritising quality and reliability, we attach major importance to eco-friendly technologies, manufacturing processes and compliance with standards. High-quality materials from controlled sources ensure that our products have exceptionally long lifetimes.



# LIFE.

## **A decision for REMBE® means opting for perfect safety.**

As an independent, medium-sized, German company we supply products **Made in Germany** – a further bonus for your safety. Moreover, you will always have the support of our experts in matters of explosion safety and pressure relief – 24/7, all the year round. It is our promise!

## Products

**Our products are not just excellent. They are approved and certified.**

Good is never good enough for us. So we keep putting ourselves on the test bench. The result is safety products licensed under globally recognised and industry-specific standards and regulations.

Moreover, we are the first company worldwide to offer SIL-equivalent parameters for mechanical (flameless) explosion venting products and the relevant signalling units.

**This high quality standard makes perfect economic sense for you.** Our extensive product range ensures that you always receive the most cost-effective and reliable solution for your needs.

**We take responsibility for the big picture.** With us you get everything from a single source, thus ensuring good profitability and legal security.



## Service

**Downtime costs money. Our service never stands still – throughout the world.**

From start-up to regular maintenance – we ensure that your production runs smoothly and without disruptions. All the products we produce can be identified by their batch and serial numbers for many decades, allowing exact reproduction.

**If you're ever in a dreadful hurry,** why not use our Rush Order Service? We can guarantee that you are given the highest priority and that your product is made straight away. Depending on the destination, we'll deliver within less than 24 hours. This also applies to spares and custom designs.

### **"REMBE® speaks your language"**

Our global network of offices and our many international experts can guarantee that we always understand you and your needs. Just give us a ring.

## Certification

### **Management systems**

EN ISO 9001:2015, ISO/TS 29001:2010, KTA 1401

### **Products**

ATEX Directive 2014/34/EU, TR CU 012 / 2011, TR CU 010 / 2011, TR CU 032 / 2013, FM Global, GL, EHEDG, PED 2014/68/EU, ASME Sec. VIII, Div. 1, China Manufacture License, KOSHA (South Korea)

### **Testing standards**

AD 2000-Merkblatt A1, EN ISO 4126-2, EN 1127-1 /-13463/ -14373/-14491/-14797/-14994/-15233/-16009/ -16447, VDI 3673, NFPA 68, NFPA 69, IEC 61508

### **Approval of German Aviation Authorities**

Known Consignor (KC/00912/01)

### **Approval of German Customs Authorities**

AEOF - Customs Simplifications/Security and Safety (DE AEOF 126130)

Selection guide

# WHICH IS THE BEST REMBE® PRODUCT FOR YOUR REQUIREMENTS?

REMBE® is a specialist in protecting every area of your production plant. The best strategy for protecting your plant against explosions depends on the locations of the various plant components. Start in the middle and select the right protection system for your needs.

**TARGO-VENT + Explosion vent**

Add-on module for explosion vents to reduce the size of hazardous areas (p. 22)



Close to traffic routes and walkways

Located outdoors

Passenger traffic nearby

No passenger traffic nearby (safety distance of min. 20 m)

Explosion isolation

**EXKOP® System**

Isolation with controller and quench valves (p. 32)



**Q-Flap RX™**

Non-return explosion valve (p. 34)



**VENTEX®**

Explosion safety valve (p. 35)



**Q-Bic™**

Isolation using a chemical barrier

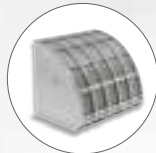


\*This diagram is simplified and does not claim to be complete.





**Q-Rohr®**  
Flameless venting  
of dust and  
gas explosions (p. 26)



**Q-Box**  
Cost-effective indoor  
explosion venting of  
dust explosions (p. 28)



**Q-Bic™**  
Explosion suppression,  
also for toxic and  
pharmaceutical substances

**Flameless explosion venting/explosion suppression**

Well away from an external wall

Passenger traffic nearby

**Located indoors**

Close to an external wall  
(1–6 m)

No passenger traffic nearby  
(safety distance of min. 20 m)

**Conventional explosion venting with explosion vents**

**Explosion vent**

REMBE® offers you the optimum  
explosion vent for every application and  
all operating conditions (from p. 12)



**Explosion vent + vent duct**

The explosion vent is connected to a  
duct, which transmits the explosion to  
a vent duct cover (from p. 12)



**START**

Find the optimum  
explosion protective  
system for your entire  
plant and vessels such  
as silos, filters, cyclones,  
separators, mixers,  
dryers, etc.

**Explosion**

### Typical Applications for our Products

REMBE® explosion safety products are installed in a number of different industries and various plant locations. You can find a small selection of typical applications on this double page.

Please note that industrial explosion safety does not follow a standard recipe, but requires a thorough analysis of the installation. We will gladly support you in that respect.

Give us a call on: T +49 2961 7405-0 or contact us via email: [info@rembe.de](mailto:info@rembe.de)

#### Filter

Dust collectors are used to capture dust, which is intentionally or unintentionally generated during the process. Therefore, an increased risk of explosion will be present within the dust collectors especially during the pulse-cleaning of the filter elements. Dust collectors are therefore generally protected with vent panels. The Q-Box or the Q-Rohr® are commonly used in indoor areas. The original flameless venting devices which were developed by REMBE® in the 1980s, provide a relief of the explosion from the vessel, and protect the environment at the same time. Detailed information on how this technology works, can be read as of p. 26.

If transport or traffic routes are located in the vicinity of the explosion venting, a vent panel in combination with the TARGO-VENT (p. 22) add-on module should be used, in order to deflect the flame and shock wave of the explosion to safe areas.

Protective systems are used for the isolation in order to prevent an explosion propagation into interconnected areas. In this example, this is a Q-Flap RX™ non-return valve (p. 34) and a VENTEX® decoupling valve (p. 35).



#### Silo

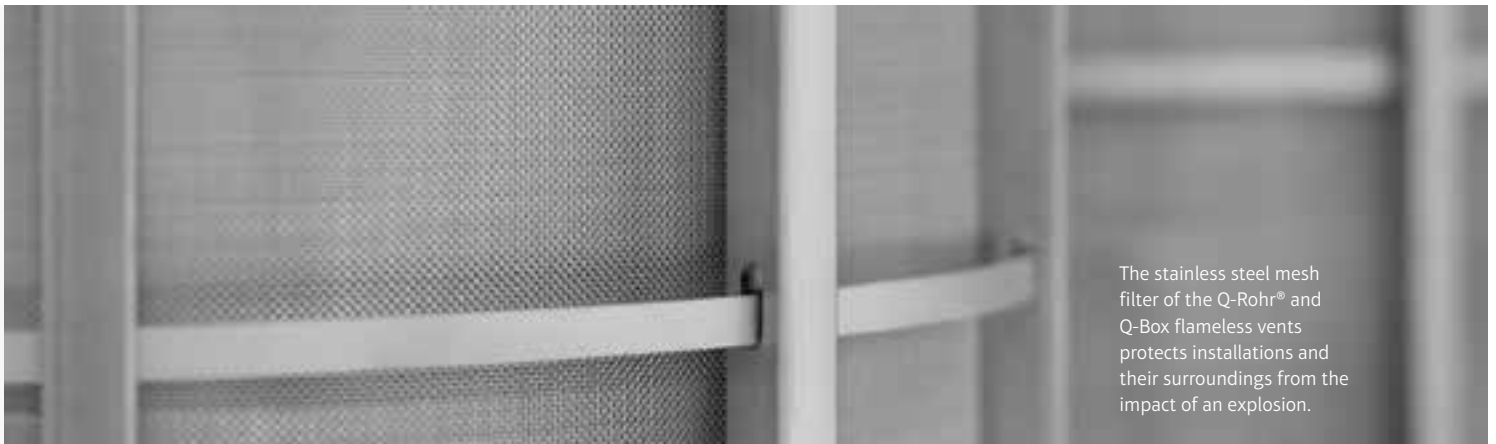
There is a particularly high risk during the filling of a silo through an explosive dust- air mixture. This is precisely the time frame with the highest likelihood of an explosion.

In outdoor areas, silos are usually relieved with vent panels (as of p. 12) – different types can be used depending on the filling process (see table on p. 13). There are a number of different panels that might be used (see table on p. 13). Q-Box (p. 28) or Q-Rohr® (p. 26) are installed for safe indoor venting.

Explosion isolation is usually achieved through quench valves (p. 32). These completely seal the pipes within a few milliseconds, thus inhibiting the explosion from propagating further.

The stainless steel mesh filter of the flameless venting devices Q-Rohr® and Q-Box protect the system and the vicinity from the effects of an explosion.





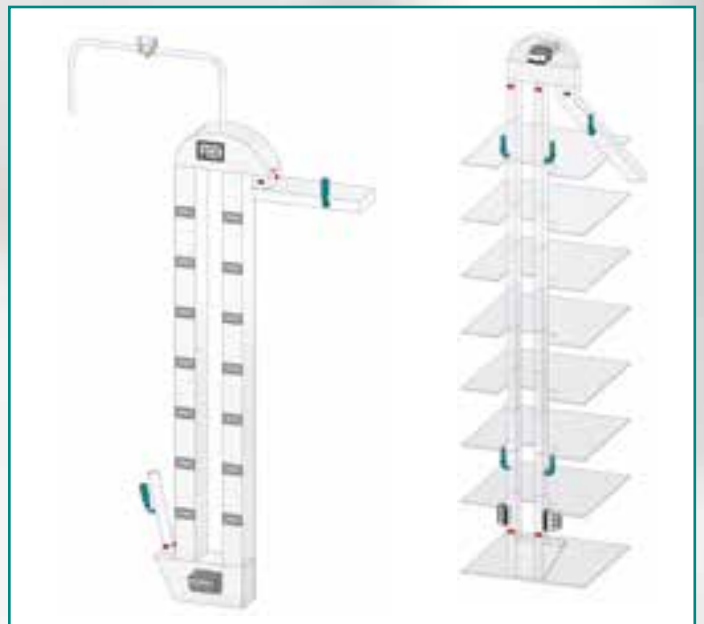
The stainless steel mesh filter of the Q-Rohr® and Q-Box flameless vents protects installations and their surroundings from the impact of an explosion.

## Elevators

Elevators convey large amounts of (combustible) bulk materials, and thus pose a high risk for an explosion. The size and strength of the bucket elevator determine the number and mounting distance for the required protective systems, depending on the bulk material involved.

Outdoor elevator shafts are commonly protected with vent panels (as of p. 12), whereas Q-Box are applied indoors (p. 28). A combination of conventional and flameless venting is also feasible, depending on the conditions of the installation. The isolation of the up/down stream conveyors is usually performed with rotary valves or Q-Bic™ chemical barrier (p. 36). Additionally, it is possible to use quench valves to prevent the explosion propagation through connected aspiration lines.

For very high elevators, REMBE® has developed the ElevatorEX: The first type- examined overall protective system at its time. It combines the advantages of conventional explosion venting with flameless venting device technologies, and explosion suppression.



## Spray dryer

Usually, spray dryers are protected with a combination of explosion isolation systems and vent panels. If a free and safe relief is not possible, the vent panels are replaced by a flameless venting device. To prevent explosion propagation, the connecting pipes are usually isolated with Q-Bic™ chemical barrier (p. 36).

For hygienically demanding processes, the special vent panels EGV HYP (p. 18) and ERO (p. 19) are used. Through this, bacteria formation, deposits and cross-contamination does not stand a chance. In addition to the protection against the influence of weather, to improve the hygienic termination, but also to reduce noise emissions, KAD covers (p. 23) are installed on the blow-off channels.

The combination of ERO (p. 19) and Q-Rohr® (p. 26) also enables the flameless venting for these hygienic applications.





# CONVENTIONAL EXPLOSION VENTING WITH EXPLOSION VENTS

## Explosion vents

In the case of an explosion, an explosion vent will rupture and thus protect the vessel by reducing the overpressure within it and releasing the explosion into the surrounding environment in a controlled manner. Industrial processes vary widely depending on the sector and the product.

No two processes are identical. For this reason, REMBE® supplies explosion vents in a variety of different shapes, materials, temperature and pressure resistances and many other specifications.

## Uses of explosion vents

In outdoor plant components, explosion vents are used for explosion safety. They **safeguard outdoor equipment** such as silos, filters, elevators, bunkers, cyclones and other dust-handling facilities.



## Advantages of using high-quality explosion vents

- Easy to install
- No maintenance required
- Long service life
- Quick to replace after an explosion event especially with the REMBE® Rush Order Service (p. 7).

REMBE® explosion vents – the reliable and cost-effective solution for explosion safety.

Explosion vents from REMBE®:

## Highest quality guaranteed – from standard versions to individual customised solutions

REMBE® offers you the optimum explosion vent for all applications and operating conditions.

Whether your application is in a sanitary apparatus or under extreme conditions, e.g. rapidly fluctuating, pressure cycling, low vacuum and overpressure or high operating temperatures, **we can supply you the optimum explosion vent for your requirements.**

You will receive a complete protection concept that is perfectly adapted to your process.

All REMBE® explosion vents are **Made in Germany** and certified in accordance with ATEX RL 2014/34/EU and EN 14797.



## Product selection guide for explosion venting with REMBE® explosion vents

Application	Operating conditions	Product
Silo/Vessel	Mechanical filling	<b>EGV</b> (p. 14)
	Pneumatic filling	<b>EDP</b> (p. 15)
Filter/Cyclone	Overpressure or low vacuum	<b>EGV</b> (p. 14)
	Low to medium vacuum or pressure cycling	<b>EDP</b> (p. 15)
	High vacuum or pressure cycling	<b>ODV</b> (p. 17)
	Hygienic requirements and high vacuum	<b>ERO</b> (p. 19)
	Large vent areas with low burst pressure and medium or high vacuum	<b>MDX</b> (p. 16)
Elevator/Chain conveyor	All	<b>EGV</b> (p. 14)
Spray dryer	Hygienic requirements to avoid cross contamination	<b>EGV HYP</b> (p. 18)
	No hygienic requirements	<b>EGV</b> (p. 14)
Screen/Sieve	Slight vibration	<b>EGV</b> (p. 14)
	Strong vibration	<b>EDP</b> (p. 15)
Gas motors	All	<b>EDP*</b> (p. 15)

\*Type selection based on process temperature.



Optimum protection for cyclone, silos and elevators: the REMBE® explosion vent EGV.

## EGV

For zero to low pressure or vacuum

### Applications

From spray dryers, elevators and chain conveyors to screens with light vibration, silos with mechanical filling and cyclones – the REMBE® explosion vent EGV is suitable for use in a wide range of applications in all sectors for both non-pressurised processes and processes with low vacuum or overpressure (up to 50% of static burst pressure). The standard burst pressure is 0.1 bar at 22 °C (71.6 °F).

### Mechanism

When pressure rises, the EGV explosion vent opens at the defined breaking point and releases pressure out of the vessel into the surrounding area.

### Certification



ATEX  
EC type examination  
certificate no.  
FSA 04 ATEX 1538 X

SIL equivalent SIL 4

### Your advantages

- **High venting capacity and full bore opening** due to low surface weight.
- **High stability and opening speed** through integrated bionic structure.
- Direct installation of the explosion vent even on round vessels **prevents bacteria formation**. No complicated flange constructions required.
- **Adapts perfectly to your process** due to the wide range of EGV geometries available.
- **Quick and easy installation** while torque is independent. No additional counter frame required.
- **Significant space savings** due to the integrated gasket and frame in the explosion vent.
- **Guaranteed leaktight integrity**. Independently verified.



All versions of the EGV are available with insulation to prevent the build-up of deposits as a result of the temperature falling below the dew point.



Angular, round, semicircular or trapezoidal, the EGV is available in a range of different geometries and can be adapted to round vessels, if necessary.

**Made in Germany**

You can find an overview of the standard sizes for the EGV on page 20, associated accessories are from page 23. You can find detailed information and contact details for enquiries at [www.rembe.de](http://www.rembe.de). Give us a call on: T +49 2961 7405-0 or contact us via email: [info@rembe.de](mailto:info@rembe.de)



Cost-effective protection:  
Storage silos with EDP explosion vents.



## EDP

For low to medium vacuum and pressure cycling

### Applications

The domed, single-layer REMBE® explosion vent EDP is suitable for use in processes with medium vacuum or overpressure (**up to 70% of min. response pressure (pstat)**) and slight pressure cycling. It is particularly suitable for vessels with pneumatic filling equipment, filters, cyclones and sieves with strong vibration. The standard explosion pressure is 0.1 bar at 22 °C (71.6 °F).

### Mechanism

When pressure rises, the EDP explosion vent opens and releases pressure out of the vessel into the surrounding area.

### Your advantages

- The domed construction provides **high stability and pressure cycling resistance**.
- **Quick and easy installation** while torque is independent. No additional counter frame required.
- **Significant space savings** due to the integrated gasket and tensioning frame in the explosion vent.



EDP with signalling:  
quick and easy to install.

**Made  
in  
Germany**

### Certification



ATEX  
EC type examination  
certificate no.  
FSA 04 ATEX 1538 X

**SIL equivalent** SIL 4



You can find an overview of the standard sizes for the EDP on page 20, associated accessories are from page 23. You can find detailed information and contact details for enquiries at [www.rembe.de](http://www.rembe.de). Give us a call on: T +49 2961 7405-0 or contact us via email: [info@rembe.de](mailto:info@rembe.de)



## MDX

for low burst pressure  
with high vacuum

### Applications

Filters with **high vacuum requirements and large vent areas** are protected with the MDX vent panel. With a standard burst pressure of 0.05 bar at 22°C, the MDX can also be used in other system components with a medium to high pressure, as well as for vacuum and alternating pressures.

**Its unique one-piece design provides a combination of precise opening behaviour with a high vacuum resistance and the lowest possible weight per surface area unit.**

### Mechanism

In case of a sudden pressure increase, the MDX vent panel will open and release the pressure from the vessel .

### Your advantages

- **Reduction of deposits:** the design guarantees high pressure resistance without the need for an extra vacuum support
- **Weight savings** through three-dimensional reinforcement corrugations
- **Low initial purchase costs:** single-layer vent panel



The design of the MDX makes it the ideal vent panel, even under high vacuum, lowest burst pressure and alternating pressures.

**Made  
in  
Germany**

You can find detailed information and contact details for enquiries relating to MDX explosion vents at [www.rembe.de](http://www.rembe.de). Give us a call on: T +49 2961 7405-0 or contact us via email: [info@rembe.de](mailto:info@rembe.de)  
You can find appropriate signalling devices and other accessories from page 23.





ODV: Protection of a wood chips bunker.



## ODV

For high to full vacuum and pressure cycling

### Applications

REMBE® explosion vent ODV is used under demanding vacuum to overpressure cyclic operating conditions. Designed for working pressures of up to **80% of static burst pressure**.

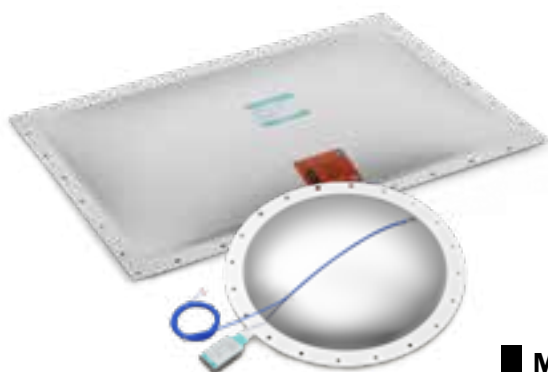
The ODV is ideal for use in applications such as dust collector with frequent jet-pulse cleaning, high vacuum or suction conveyors. It is **vacuum resistant** and the standard explosion pressure is 0.1 bar at 22 °C (71.6 °F).

### Mechanism

When pressure rises, the ODV explosion vent opens and releases pressure out of the vessel into the surrounding area.

### Your advantages

- **Low response pressure with full vacuum resistance is possible.**
- High working pressure resistance of the explosion vent offers **maximum productivity for your processes.**
- Triple-section domed construction ensures **high-pressure cycling resistance and exceptional service life.**
- **Round versions and special customised solutions** possible.



ODV with signalling:  
quick and easy to install.

■ Made  
■ in  
■ Germany

### Certification



ATEX  
EC type examination  
certificate no.  
FSA 04 ATEX 1538 X

SIL equivalent SIL 4

### ODU

For fluctuating overpressure

The REMBE® explosion vent ODU is ideal for applications that involve pressure cycling but no vacuum. In this version, the vacuum support used on the ODV is replaced by a supporting lower section.

You can find an overview of the standard sizes for the ODV on page 20, associated accessories are from page 23. You can find detailed information and contact details for enquiries at [www.rembe.de](http://www.rembe.de). Give us a call on: T +49 2961 7405-0 or contact us via email: [info@rembe.de](mailto:info@rembe.de)



## Vent panels for hygienically demanding processes

With the vent panels EGV HYP and ERO which were designed for production facilities with highly elevated hygienic requirements, REMBE® is able to provide safety and cleanliness Made in Germany.

## EGV HYP

for zero to low negative pressure applications

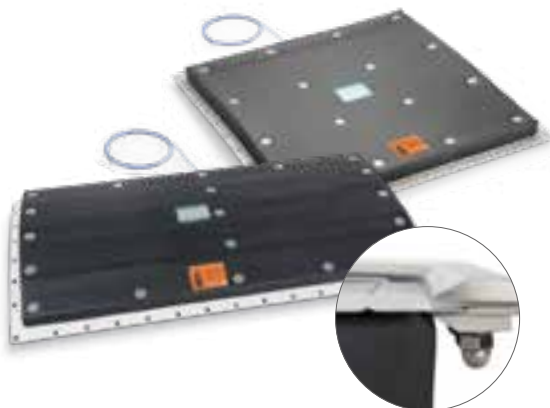
Certified in accordance with **EHEDG** (European Hygienic Engineering & Design Group)

### Applications

The EGV HYP was specially designed for hygienically demanding systems in the food and pharmaceutical industry, and is often used in critical systems such as spray and fluidbed dryers.

**The special feature:** The patented, full-flat, chamfered gasket system has a flush internal sealing area with the vent panel, and facilitates the avoidance of cross-contamination.

A direct mounting of the vent panel to round vessel forms is also possible due to pre-bending.



**Made in Germany**

The innovative sealing concept of the EGV HYP is able to convince. Deposits and bacterial growth are permanently prevented.



### Mechanism

In case of a sudden pressure increase, the EGV HYP vent panel will open and release the pressure from the vessel

### Your advantages

- Hygienic design will continuously assure a **high product quality**.
- **Protects against cross-contamination** when changing products.
- Enables **CIP cleaning**.
- **Increased service life** of the vent panel under alternating temperature and pressure stresses through the integrated bionic structure.
- **Reduces sound emissions** (e.g. from hammers) at the venting channels.

### Certification



ATEX  
EC type examination  
certificate no.  
FSA 04 ATEX 1538 X

**SIL equivalent SIL 4**

You can find detailed information and contact details for enquiries relating to EGV HYP explosion vents at [www.rembe.de](http://www.rembe.de). Give us a call on: T +49 2961 7405-0 or contact us via email: [info@rembe.de](mailto:info@rembe.de)  
You can find appropriate signalling devices and other accessories from page 23.





# ERO

for low to medium pressure and alternating pressure

The only vent panel with USDA approval

## Applications

The ERO sanitary vent panel is used in the pharmaceutical, chemical and food industry in a broad range of system areas. The smooth and closed stainless steel membrane which faces the process, optimally seals the vessel and enables **sterilization of the vent panel while still installed**. The hygienic and robust design enables a reliable response, even at the lowest burst pressures.

The working pressure is at 75% of the minimum burst pressure.

## Mechanism

In case of a sudden pressure increase, the ERO vent panel will open and release the pressure from the vessel.

## Your advantages

- The only vent panel with **USDA approval**.
- **Easy and safe to maintain sterile** through the special design of the ERO.
- **Easy installation** and low maintenance effort.



In conjunction with the Q-Rohr®, the ERO vent panel even enables flameless venting for hygienically demanding applications.

Made in Germany

## Certification



ATEX  
EC type examination  
certificate no.  
FSA 04 ATEX 1538 X

SIL equivalent SIL 4

You can find an overview of the standard sizes for the ERO on page 20, associated accessories are from page 23. You can find detailed information and contact details for enquiries at [www.rembe.de](http://www.rembe.de). Give us a call on: T +49 2961 7405-0 or contact us via email: [info@rembe.de](mailto:info@rembe.de)



## All standard sizes and vent areas at a glance.

Rectangular vent panels					
Max. size of wall opening – nominal vent dimensions [mm]	Effective venting area [cm <sup>2</sup> ]				
	EGV (p. 14) For zero to low pressure or vacuum	EDP (p. 15) For low to medium vacuum and pressure cycling	ODV (p. 17) For high to full vacuum and pressure cycling	KAD (p. 23) weather cover for vent pipes/ducts	TARGO-VENT (p. 22) Opening angle limiter
130×500	650	650	500	650	–
229×305	700	700	540	700	–
150×600	900	900	750	900	–
180×420	750	750	640	750	–
270×465	1250	1250	1.000	1250	–
200×460	920	920	790	920	–
247×465	1100	1100	970	1100	–
205×610	1250	1250	1000	1250	–
340×385	1300	1300	1100	1300	–
314×424	1330	1330	1150	1330	–
305×457	1350	1350	1200	1350	–
315×467	1470	–	–	–	–
247×610	1500	1500	1300	1500	–
340×440	1490	1490	1300	1490	–
400×400	1600	1600	1400	1600	–
410×410	1680	1680	1450	1680	–
404×420	–	–	1500	–	–
305×610	1860	1860	1600	1860	<b>X</b>
354×580	2050	2050	1800	2050	–
375×655	2450	2450	2200	2450	–
440×605	2660	2660	2400	2660	–
470×610	2850	2850	2600	2850	–
490×590	2890	2890	2600	2890	–
500×620	–	–	2800	–	–
300×1000	3000	3000	2750	3000	–
386×920	–	–	3200	–	–
454×760	3400	–	–	–	–
570×620	–	–	3200	–	–
450×800	3600	3600	3300	3600	–
600×600	3600	3600	3300	3600	–
590×620	–	–	3350	–	–
605×605	–	–	3350	–	–
575×645	3700	3700	3400	3700	–
610×610	3720	3720	3400	3720	–
457×890	4100	4100	3750	4100	–
650×650	4220	–	–	–	–
520×820	4260	4260	4000	4260	–
370×1220	4500	–	–	–	–
653×653	4260	4260	3900	4260	–
600×800	4800	4800	4400	4800	–
710×710	5000	5000	4700	5000	–
620×820	5100	5100	4750	5100	<b>X</b>
586×920	5400	5400	5000	5400	<b>X</b>
500×1100	5500	5500	5100	5500	–
750×840	6300	6300	5900	6300	–
620×1020	6320	6320	6000	6320	–
800×800	6400	6400	6000	6400	–
457×1500	6850	6850	6350	6850	–
610×1118	6810	6810	6400	6810	<b>X</b>
645×1130	–	–	6800	–	–

## Rectangular vent panels

Max. size of wall opening – nominal vent dimensions [mm]	Effective venting area [cm <sup>2</sup> ]				
	EGV (p. 14) For zero to low pressure or vacuum	EDP (p. 15) For low to medium vacuum and pressure cycling	ODV (p. 17) For high to full vacuum and pressure cycling	KAD (p. 23) weather cover for vent pipes/ducts	TARGO-VENT (p. 22) Opening angle limiter
720 × 1020	7340	7340	6950	7340	–
760 × 1114	8450	–	–	–	–
840 × 920	7700	7700	7300	7700	–
920 × 920	8500	8500	8000	8500	<b>X</b>
457 × 2000	9140	9140	8500	9140	–
920 × 1020	9350	9350	8800	9350	–
586 × 1630	–	–	8900	–	–
1000 × 1000	10000	10000	9500	10000	–
915 × 1118	10200	10200	9700	10200	<b>X</b>
770 × 1340	10300	10300	9800	10300	–
1020 × 1020	10400	10400	9900	10400	–
790 × 1340	10500	–	–	–	–
586 × 1893	–	–	10400	–	–
920 × 1254	11500	11500	11000	11500	–
740 × 1630	–	–	11450	–	–
750 × 1900	–	–	13500	–	–
1130 × 1130	12750	12750	12200	12750	–
860 × 1520	13000	–	–	–	–
940 × 1440	13500	13500	13000	13500	–
940 × 1600	15000	–	–	–	–
1110 × 1460	16000	16000	15600	16000	–
920 × 1920	17500	17500	17000	17500	–
1000 × 2000	20000	–	–	–	–

## Round vent panels

DN [mm]	Effective venting area [cm <sup>2</sup> ]					
	ODV (p. 17) For high to full vacuum and pressure cycling	ERO (p. 19) For low to medium pressure, and alternating pressures		EDP (p. 15) For low to medium vacuum and pressure cycling	EGV (p. 14) For zero to low pressure or vacuum	KAD (p. 23) weather cover for vent pipes/ducts
		< 1.000 mmWS	> 1.000 mmWS			
200	245	340	245	340	340	–
300	600	750	600	750	750	–
400	1000	1200	1000	1200	1200	1200
500	1660	1900	1660	1900	1900	1900
600	2500	2700	2500	2700	2700	2700
700	3500	3800	3500	3800	3800	3800
800	4600	5000	4600	5000	5000	5000
		< 500 mmWS				
900	5900	6300	6300	6300	6300	6300
1000	7400	7800	7800	7800	7800	7800
1100	8950	9500	9500	9500	9500	9500
1200	10000	11300	11300	11300	11300	11300
		< 200 mmWS				
1300	12500	13200	13200	13200	13200	13200
1400	15000	15400	15400	15400	15400	15400

REMBE® vent panels can be supplied in any desired dimension and with a customized bolt pattern.

The special **EGV HYP**, **ERO** and **MDX** vent panels are fundamentally available in any size. Especially the standard sizes 586 × 920, 920 × 920, 1000 × 1000, 610 × 1118 and 915 × 1118 do provide economic benefits.

Other dimensions available on request.

Without TARGO-VENT the flame creates a dangerous situation in operating areas.



With TARGO-VENT the flame is deflected into safe areas.



## TARGO-VENT

Add-on module for explosion vents to reduce the size of dangerous areas

In the case of an explosion outside a building, explosion vents open and release the explosion flame and pressure wave into the environment. Adequate safety areas are crucial. They must be kept free of buildings and be out of bounds to both vehicles and pedestrians. These empty areas cannot be used commercially but still incur operating costs. TARGO-VENT limits the opening angle of an explosion vent in order to protect people, vehicles or subsequently erected buildings. By decreasing the size of dangerous areas, TARGO-VENT helps you to **reduce your safety areas** to a minimum and increase usable operating space while providing optimum protection against explosions.

### Applications

Ideal for rectangular explosion vents

- venting into areas used by vehicles or pedestrians
- used in outdoor applications
- that vent into previously clear areas which have subsequently been built upon

### Mechanism

TARGO-VENT limits the opening angle of the explosion vent and guides the explosion pressure wave, flames and heat into defined areas. This minimises the size of the safety areas required.

### Your advantages

- Smaller safety areas required in front of vent openings – **more productive use of valuable operating areas.**
- **Smaller area required** for explosion venting than with alternative deflectors.
- **Low cost protection** of infrastructure.
- **Safe traffic routes for people and vehicles** while simultaneously reducing the safety area required.
- Retrofitting with TARGO-VENT provides **greater safety for existing installations.**
- **Maintenance-free and long service life** through the use of stainless steel.



■ Made  
■ in  
■ Germany

### Certification



ATEX  
EC type examination  
certificate no.  
FSA 13 ATEX 1637

You can find an overview of the standard sizes for the TARGO-VENT on page 20. You can find detailed information and contact details for enquiries at [www.rembe.de](http://www.rembe.de). Give us a call on: T +49 2961 7405-0 or contact us via email: [info@rembe.de](mailto:info@rembe.de)



# ACCESSORIES

for optimum adaptation of explosion vents to meet your requirements

## Signalling units from REMBE®

Signalling units enable you to shut down a plant quickly in the event of an explosion and also trigger isolation systems which protect adjacent parts of the plant. Automated processes also use intelligent signalling systems to monitor the status of the entire plant and any disruptions that occur. This is not just essential in venting ducts, it can also play an important role in free venting.

**Signalling units can be retrofitted to either round or rectangular vents that have already been installed.**

For evaluation of the signals, we offer isolation amplifiers with relay outputs which guarantee an intrinsically safe closed-circuit current. The potential-free relay contact ensures that the plant is deactivated safely and the alarm functions correctly.

## SK signalling unit

This signalling unit uses the **closed-circuit current principle**. A signalling cable is integrated onto the explosion vent during the manufacturing process to create a highly reliable unit. When the explosion vent opens, the signalling cable circuit gets interrupted.

## RSK signalling unit

The **RSK signalling unit can be retrofitted** to either round or rectangular explosion vents. The signalling cable is fixed in position over the breaking point of the explosion vent. When the explosion vent opens, the RSK signalling cable circuit gets interrupted.



## BIRD signalling unit

The BIRD signalling unit contains a **ceramic bar with integrated electrical conductors**. When the explosion vent opens, the circuit breaks. The standard version of the BIRD unit can withstand temperatures of up to 150 °C (302 °F). A high temperature version, resistant up to 400 °C (752 °F), is also available. The device is mounted using a stainless steel angle and mounting frame.



## Further accessories for explosion venting with explosion vents

**Mounting frame and flange**  
Galvanised or stainless steel.

**Weather resistant insulation**  
Prevent condensation, improve thermal insulation and **up to 50 % noise emissions**. **Thermal insulation products** reduce expensive energy and temperature losses from the protected vessels and prevent condensation related product build-up.

**A range of gaskets for all process conditions**  
For example, for high temperature or sterile requirements.

**KAD: weather cover for vent pipes/ducts**  
Reliable protection against penetration by snow, rain and dust with a low response pressure. Also reduces noise during normal operation. Their inflammability provides advantages over plastic or polystyrene coverings with regard to the risks of explosion-induced subsequent fires.



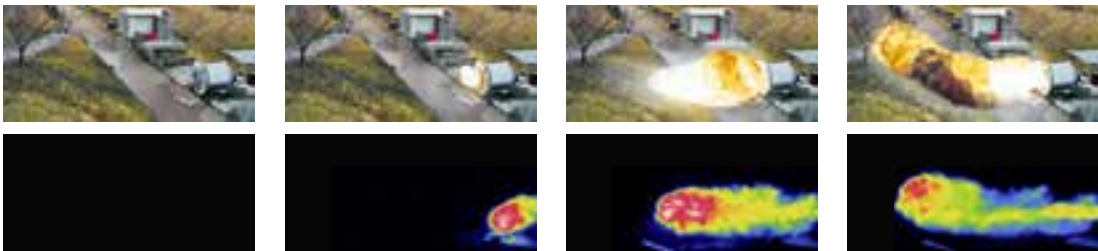
You can find an overview of the standard sizes for the KAD on page 20. You can find detailed information and contact details for enquiries at [www.rembe.de](http://www.rembe.de). Give us a call on: T +49 2961 7405-0 or contact us via email: [info@rembe.de](mailto:info@rembe.de)



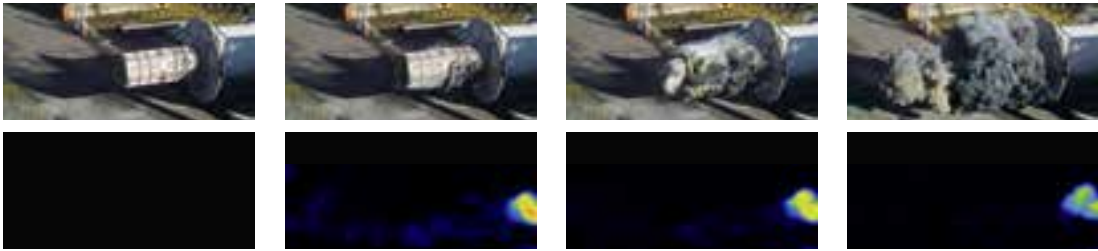
Flameless explosion venting



**FLAMELESS  
EXPLOSION  
VENTING**



Thermographic investigation of a dust explosion: conventional explosion venting with an explosion vent.



Identical explosion with the Q-Rohr®: no heat generated outside the vessel with only a slight pressure rise and minimal noise volume.



## Explosion safety with vent ducts: expensive and unproductive

**The situation:** Indoor plant components cannot be protected by explosion vents alone. The dust and flames exiting the vessel pose an enormous threat to both the safety of employees and the plant itself. Secondary explosions resulting from the dust thrown up by the initial explosion are just one example. Vent ducts are often used to channel the pressure wave and flames from an explosion to an outdoor area.

**The problem:** This solution prevents process-optimised plant design. The longer the venting duct, the stronger the duct and the plant itself must be and the higher the associated costs. The reason: the greater the distance of the explosion from its source, the greater the pressure that the duct and the plant must withstand.

REMBE® offers an inexpensive and much more effective solution!



## The cost-effective solution: flameless explosion venting

During flameless explosion venting, the flames are cooled rapidly and efficiently in the mesh filter of the flame absorber and extinguished immediately. No flames and no pressure wave exit the vessel. The production plant can now be designed to create the optimum process conditions. Likewise, the typical pressure wave and noise in the production hall are reduced to a barely perceptible minimum. The filter design guarantees that no burned or combustible materials are ejected. This not only reduces the consequences of the explosion, but also provides the highest level of protection for employees.

## The advantages of flameless explosion venting

Flameless indoor explosion venting consigns expensive protection systems with complicated vent ducts to the history books. Companies are once again free to focus on optimising the design of their processes and plants for maximum efficiency.

This form of flame- and dust-free explosion venting is **the safest and most cost-effective solution for indoor use.**



0 ms

5 ms

15 ms



20 ms

25 ms

40 ms

55 ms



75 ms

90 ms

125 ms

150 ms



175 ms

200 ms

275 ms

350 ms



425 ms

500 ms

The explosion flame is cooled completely in just 500 milliseconds (ms).

The Q-Rohr® stainless steel mesh filter eliminates explosions in just a few milliseconds.

# Flameless explosion venting



## Q-ROHR®

Flameless explosion venting for dust and gas explosions



**Safety and operating efficiency go hand in hand.** The Q-Rohr® enables you to implement flame arresting and particulate retention explosion venting in closed rooms. No complicated ducts for outdoor venting or associated restructuring of production equipment are required. **With the Q-Rohr® there is now nothing to prevent you from using the optimum layout for your production plant while guaranteeing the best possible explosion safety.** In addition, Q-Rohr® is unrivalled in terms of running costs. Eliminating vent ducts saves you money not only on installation but also on servicing and maintenance.

### Applications

The Q-Rohr® is ideal for indoor plants that are at risk of dust and gas explosions. Many new plants are equipped directly with the Q-Rohr® as it offers a wide range of flexible installation options. Retrofitting is also simplicity itself. **The Q-Rohr® can be used to protect filters, dryers, cyclones and it can be used with gases, hybrid mixtures, metal dusts, melting dusts or fibres.**

Optional sanitary cover prevents accumulation/contamination of the Q-Rohr® flame trap mesh in dusty areas.



### Mechanism

The special stainless steel mesh filter inlet developed by REMBE® cools the hot flame gases extremely efficiently (up to 1.500 °C (2.732 °F) or even 3.000 °C (5.432 °F) for metal dusts). This reduces the volume of gas ejected and extinguishes the explosion.

### Please note!

The combination of the Q-Rohr® and isolation systems prevents pressure waves and flames propagating to other parts of the plant.

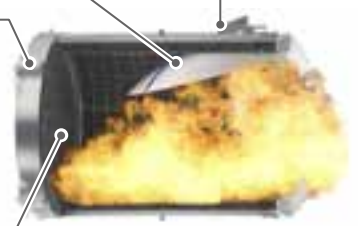


Integrated REMBE® explosion vent incl. signalling unit and pre-installed gasket

Explosion-proof housing structure with riveted retention rails, which remains stable even during extremely dynamic explosions

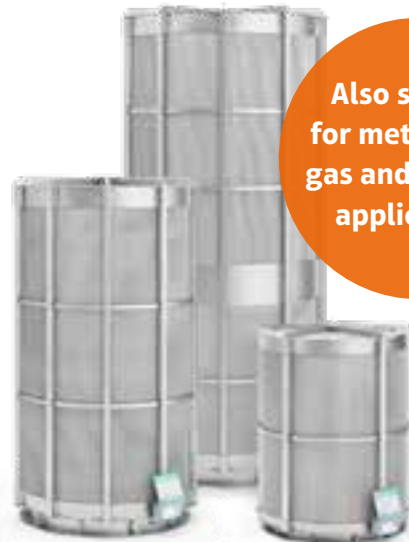
Reusable stainless steel dust filter with integrated pressure wave absorber

Pre-wired junction box with transformer isolated barrier (intrinsically safe)



Q-Rohr® components.

Also suitable for metal dusts, gas and hygienic applications



Q-Rohr® is available in the sizes DN 200 to DN 800. Customised versions up to DN 1400 are also possible.

Made in Germany



The perfect solution for indoor explosion safety: Q-Rohr®.

Product separator for a day silo in a Nestlé muesli production facility.

## Your advantages

- **Perfect protection of the surrounding area.** Guaranteed flame arresting and particulate retention – no hazardous pressure wave effects.
- **REMBE® is the first manufacturer in the world to be certified for metal dusts.**
- **The complete production process remains in the building.**
- **No running costs** for vent ducts or external maintenance, a visual inspection is sufficient.
- The Q-Rohr® is a **flexible solution** – it can even be used in the middle of your production halls. Proximity to an external wall is not required.

- **Integrated signalling unit** for reliable monitoring.
- **Noise level and rise of pressure typically associated with explosions are greatly reduced** to an acceptable harmless level.
- **Immediately reusable** and operational after cleaning of the flame filter and replacement of the explosion vent.

## Your competitive advantages

- **Process-optimised plant layout**
- **No external maintenance costs**

## Certification

### Patents:

DE 38 22 012;  
US 7,905,244



Meets the requirements of NFPA 68



Germanischer Lloyd  
Q-Rohr® 19496-11 HH



ATEX  
EC type examination  
certificate no.  
IBExU 11 ATEX 2152 X



ATEX  
EC type examination  
certificate no.  
IBExU 13 ATEX 2085 X



ATEX  
EC type examination  
certificate no.  
IBExU 13 ATEX 2086 X



ATEX  
EC type examination  
certificate no.  
IBExU 14 ATEX 2027 X

**SIL equivalent** SIL 2

You can find detailed information and contact details for enquiries relating to Q-Rohr® at [www.rembe.de](http://www.rembe.de).  
Give us a call on: T +49 2961 7405-0 or contact us via email: [info@rembe.de](mailto:info@rembe.de)



Protection of a crushing plant in the recycling industry.



## Q-BOX

Cost-effective indoor explosion venting for dust explosions



### Applications

The Q-Box is designed for plants that are at risk of dust explosions, such as filters, elevators or silos with  $K_{st}$ -Values  $< 200 \text{ bar} \times \text{m/s}$  with low rigidity and large explosion venting areas. The rectangular connection complements the dimensions of standard explosion vents, thus allowing it to be **retrofitted to existing indoor and outdoor equipment**.

The sanitary cover protects the Q-Box against dust from outside sources.



### Mechanism

The Q-Box guarantees safe explosion venting in working areas. Like the Q-Rohr®, the flame gases are instantly extinguished inside the Q-Box by efficient cooling.

Also suitable for outdoor applications!



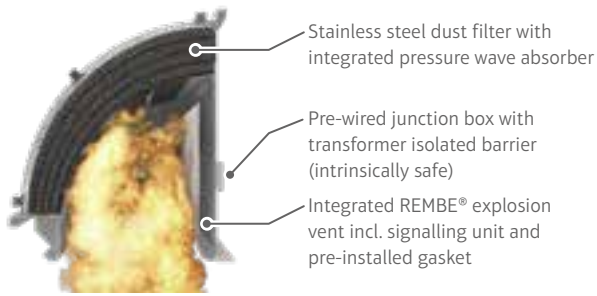
### Please note!

The combination of the Q-Box and isolation systems prevents pressure waves and flames propagating to other parts of the plant.



Easy retrofitting:  
The dimensions of the Q-Box perfectly match the dimensions of REMBE® standard explosion vents.

**Made in Germany**



Q-Box components.



"EGGER operates a fully integrated wood factory that manufactures and finishes particle and MDF board, laminate flooring and sawn timber. We have used venting equipment from REMBE® to protect our employees and equipment for many years. We are impressed by the expert advice provided by their consultants and the safety concept, which has been tailored to our specific requirements."

Ferdinand Martini, safety specialist at Egger

## Your advantages

- Flexible use of the Q-Box permits **process-efficient plant design**.
- **Reduces noise levels.**
- **Perfect protection of the surrounding area.** Neither heat, dusts nor a dangerous pressure wave emerge from the vessel – everything stays in the Q-Box.
- **Cost-effective alternative to venting ducts.** No running costs for venting ducts and external maintenance, a visual inspection is sufficient.
- **Integrated signalling unit** for reliable monitoring.
- **Reduced downtime:** Access to the protected system doesn't require a safety-related locking mechanism (LOTO)
- **Flexible solution for indoor and outdoor use.**
- **Simple retrofitting to existing explosion vent installations.**

## Your competitive advantages

- Process-optimised plant layout.
- No external maintenance costs.

## Certification



ATEX  
EC type examination  
certificate no.  
BVS 16 ATEX H 021 X



Meets the  
requirements  
of NFPA 68

SIL equivalent SIL 2

## Q-BALL®

Maximum venting effectiveness –  
at a minimum weight



The future of  
flameless venting:  
with its unrivalled light  
weight, Q-Ball® is the  
perfect solution for  
a broad range of  
applications.

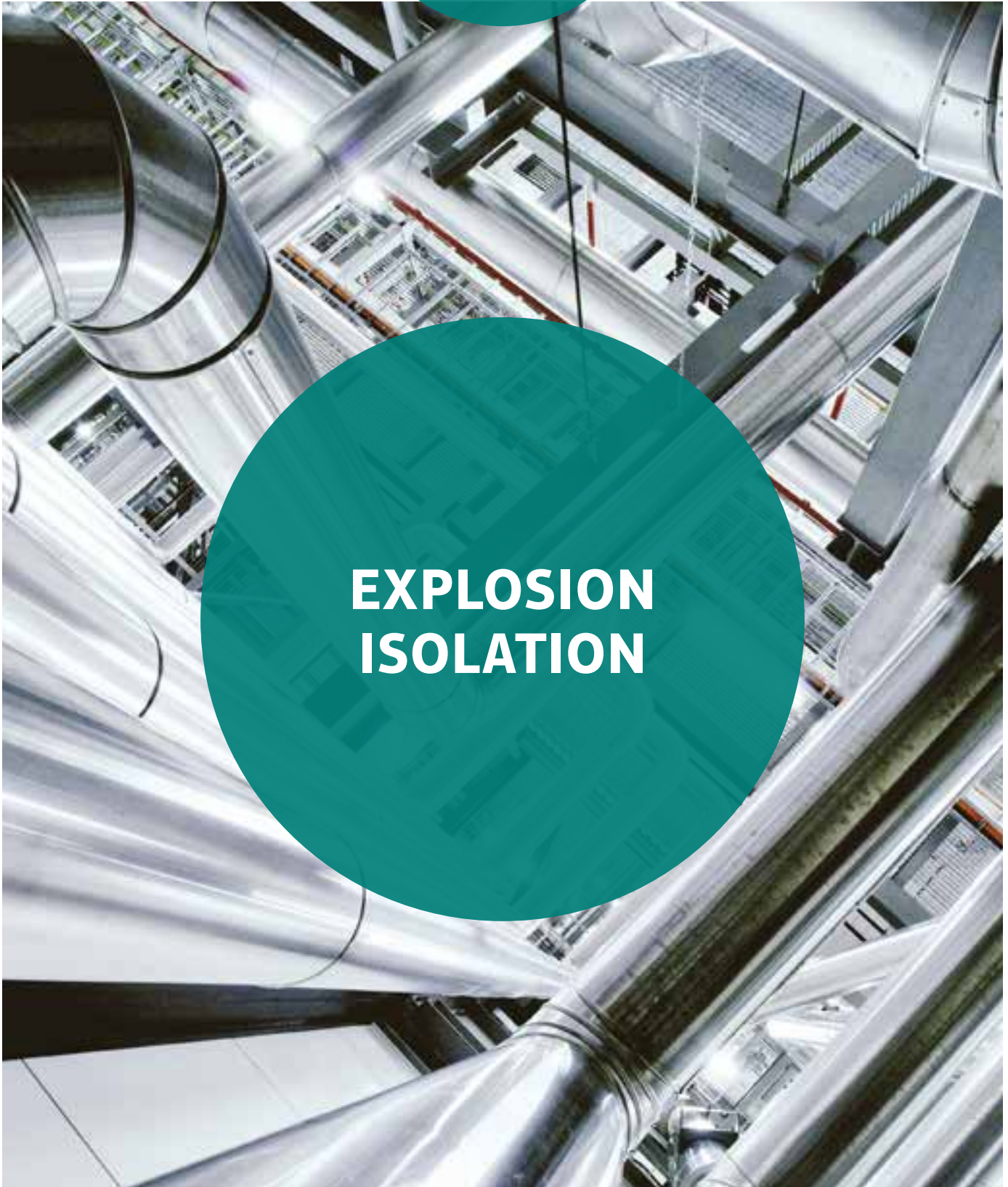
As the inventor of this technology, REMBE® will usher in a new era of flameless venting devices with the Q-Ball®. Let us surprise you!

## Your advantages

- Simple installation.
- Low weight.
- Available in different sizes.

You can find detailed information and contact details for enquiries relating to Q-Box and Q-Ball® at [www.rembe.de](http://www.rembe.de). Give us a call on: T +49 2961 7405-0 or contact us via email: [info@rembe.de](mailto:info@rembe.de)





# EXPLOSION ISOLATION

## What is explosion isolation?

The objective of explosion isolation or decoupling is to **protect adjacent parts of the plant and prevent the explosion from propagating.**

Explosion isolation is mandatory – secondary explosions in interconnected vessels would cause a high risk.

## Why is isolation so important?

In practice, many vessels, silos and devices are connected by pipes, pneumatic conveyors and dust extraction or aspiration lines. If a dust explosion occurs, the flames and pressure waves can spread through these conduits to other parts of the plant. Pre-compression and flame jet ignition exacerbate the explosion in connected vessels. The result is a series of secondary explosions that cause even more catastrophic damage.

**An isolation system prevents explosions from propagating and thus minimises the consequences of an explosion. It ensures optimum protection for adjacent parts of the plant.**


detectors or sensors which register the pressure rise or flames and trigger countermeasures, e.g. closing a valve.

## Different types of isolation

Explosion isolation systems use components such as quench valves and non-return flaps or valves. Chemical extinguishing barriers are also commonly used to smother the explosion flames. Valves and extinguishing barriers are capable of isolating components in both directions simultaneously.

## Active and passive isolation systems

Isolation systems can be either active or passive. **Passive isolation systems** react simply due to the effect of the explosion. Their structural design prevents flames and pressure waves from spreading. **Active systems** have



Explosion safety from REMBE® is more than an individual product – it is always a complete solution. There is no other way that we can guarantee the safety of your employees and provide full protection for your plant. This is why venting and isolation must always work hand-in-hand for effective explosion safety – no ifs, ands or buts.

### Product selection guide for isolation systems

Applications	EXKOP® QV II/QV III (p. 32)	Q-Flap RX™ (p. 34)	VENTEX® (p. 35)	Q-Bic™ (p. 36)
Vertical pipes	✓		✓	✓
Horizontal pipes	✓	✓	✓	✓
Pneumatic conveyor lines	✓			✓
Aspiration lines	✓	✓	(✓)	✓
Chutes and rectangular ducts				✓
Air intake openings	✓	(✓)	✓	
Mechanical conveyors				✓
Multi-inlet pipes	(✓)			✓

(✓) = May only be used in special cases.

Isolation of a pipe  
with EXKOP® QV II.

## EXKOP® SYSTEM

Space-saving, bidirectional isolation

This system isolates plant components in both directions and comprises a self-monitoring EXKOP® controller with data storage and one or several quench valves.

### Applications

EXKOP® systems are suitable for **filling lines, aspiration lines and pipes, pneumatic conveyor lines and air intake openings.** As well as operating as a decoupling system for dust-bearing plants, the EXKOP® system can also be used as a spark arrester or overpressure limiter.

### Mechanism

In the event of an explosion, the EXKOP® controller receives a trigger signal (e.g. from the signalling unit of the Q-Rohr® or an explosion vent, from a pressure switch or spark detector) and activates the connected EXKOP® quench valves. These close within a few milliseconds and thus protect adjacent plant components. After being triggered, the quench valves can be put back in operation once again at the touch of a button.

The EXKOP® system is ideal in combination with explosion vents or flameless explosion venting solutions.



The EXKOP® system comprises a controller and one or several quench valves.

■ Made  
■ in  
■ Germany





## Create your perfect isolation solution

### EXKOP® controller

Product	Up to 2 quench valves	Up to 3 quench valves	More than 3 quench valves	Configurable in- and outputs
EXKOP® mini	✓			✓
EXKOP® TriCon	✓	✓		✓
EXKOP® II	✓	✓	✓	✓



### EXKOP® quench valve

Product	Pipe diameter up to 250 mm	Pipe diameter greater than 300 mm	Installation in hygienic areas
EXKOP® QV II	✓		✓
EXKOP® QV III		✓	✓

## Certification



ATEX  
EC type examination  
certificate no.  
FSA 04 ATEX 1537 X  
FSA 15 ATEX 1660 X

## Your advantages

- **Effective protection through high-speed detection** of explosion events.
- **Returns to operation again immediately** after triggering.
- **Self-monitoring safety electronics with operating data storage.**
- Modem-compatible system analysis allows for **remote maintenance.**
- **System status or error messages reported immediately** via the operating and display panel.

- Processes wide range of trigger signals for **easy retrofitting to existing plants.**
- **Fail Safe mechanism** automatically closes the valve if the power/compressed air fails or the valve is manipulated.

## Your competitive advantages

- **Reliable, process-optimised protection** against explosions in adjacent plant components.
- **Avoid downtime** after the mechanism is triggered.

You can find detailed information and contact details for enquiries relating to the EXKOP® system at [www.rembe.de](http://www.rembe.de). Give us a call on: T +49 2961 7405-0 or contact us via email: [info@rembe.de](mailto:info@rembe.de)



# Q-FLAP RX™

Economic isolation of raw gas lines  
to filters and dust collectors

## Applications

In the event of an explosion, the Q-Flap RX™ non-return valve effectively isolates plant components in almost all industrial sectors. The Q-Flap RX™ is also perfectly suited for the aspiration lines of dust collectors and for the suction intake lines of mills.

The nominal pipe sizes up to DN 400 are primarily used for decentralised extraction systems in the pharmaceutical and chemical industries, whereas nominal pipe sizes between DN 450 and DN 710 are mainly used for centralized dust extractors in the grain and food industry. Nominal pipe sizes from DN 800 to DN 1250 are common in the wood and heavy industry.

In order to meet the highly diverse requirements for these individual industries, the Q-Flap RX™ product range offers three different design versions. The nominal pipe sizes up to DN 710 feature an inspection flap, the larger nominal pipe sizes have a modular design. This ensures that a maintenance and servicing of any pipe size can be carried out easily.

## Your advantages

- **Quick maintenance without the need for a complete dismantling of the device**, simply by completely opening the inspection flap on pipe sizes up to DN 710.
- **Optionally: longer maintenance intervals** by integrating a supervision function.
- **Flexible use:** The Q-Flap RX™ is available for all common nominal pipe sizes up to DN 1250.

## Certification



Meets the requirements of NFPA 69 (Option)

## Mechanism (DN 140 to DN 710)

### Basic position

During standstill, the valve blade closes due to its inherent weight and moves into the basic position.

### In operation

During an operation of the system, the non-return valve installed on the suction side is kept open by the air flow.

### In case of an explosion

In the event of an explosion, the valve blade is closed by the pressure wave that propagates within the pipeline. This effectively inhibits the explosion from spreading any further. Personnel working at potentially affected points or suction-side plant components are thus protected against the effects of an explosion.



Made  
in  
Germany



The Q-Flap RX™ ensures reliable explosion isolation to protect your plant and minimize the effects of an explosion.

You can find detailed information and contact details for enquiries relating to the Q-Flap RX™ isolation system at [www.rembe.de](http://www.rembe.de). Give us a call on: T +49 2961 7405-0 or contact us via email: [info@rembe.de](mailto:info@rembe.de)



# VENTEX®

## Isolation with explosion safety valves

VENTEX® valves are often used when explosion-proof decoupling of pressurized containers is required or air supply openings have to be secured effectively against flame and pressure discharge. The decades-old proven design offers you an effective, passive explosion safety solution.

These valves can be controlled with or without external energy and offer simple and reliable explosion safety due to their extremely low response pressure and ease of maintenance.

## Applications

VENTEX® can be used in plants that process combustible dusts (incl. metal dusts), gases or hybrid mixtures.

Common application areas include the pharmaceutical industry, chemical/petrochemical companies and research laboratories.



VENTEX® – the ideal explosion safety valve for combustible dusts.

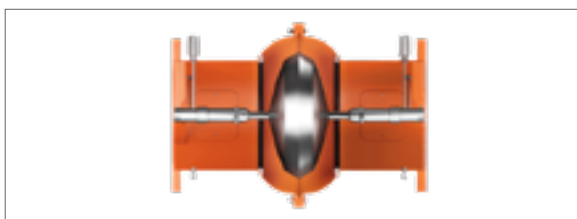
## Certification



ATEX  
EC type examination  
certificate no.  
FSA 12 ATEX 1623 X

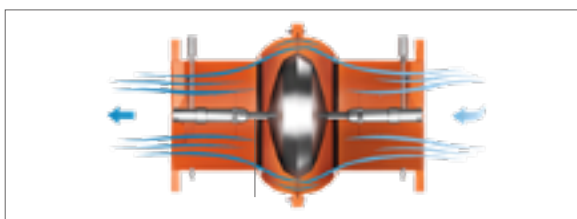
## Mechanism

Example using the VENTEX® ESI-E/D: explosion safety with one-way or two-way acting system without external energy.



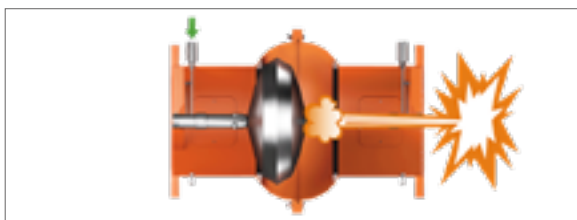
### Idle state

When there is no flow of air, the closing device is in the open position.



### Normal operation

Air flows around the open closing device.



### Explosion event

The pressure wave pushes the closing device against a seal, locking the valve and effectively preventing the spread of flames and pressure.

## Your advantages

- Low response pressure
- Short mounting distance

You can find detailed information and contact details for enquiries relating to the VENTEX® explosion safety valve at [www.rembe.de](http://www.rembe.de). Give us a call on: T +49 2961 7405-0 or contact us via email: [info@rembe.de](mailto:info@rembe.de)


Coming  
soon

## EXPLOSION SUPPRESSION 4.0

The new REMBE® Q-Bic™

The REMBE® engineering team, under the leadership of Dr.-Ing. Johannes Lottermann and Roland Bunse, is currently developing a new explosion isolation and suppression solution for your applications.

Thereby, we are placing the same high demands on this product in terms of quality and reliability, that you are accustomed to with all other REMBE® systems. You'll be absolutely amazed.



## GROUNDING SYSTEM

## FARADO® I

for use with mobile tanks and trucks

The self-monitoring grounding system FARADO® I has been developed for the grounding during the filling and emptying of mobile tanks and trucks. The grounding clamp SRC-2 is connected to the object to be grounded. The FARADO® I checks the contact of the grounding clamp through a capacitance measurement.

If the FARADO® I detects the grounded truck, the pumps, valves or mechanical conveyors connected to the ground relay are activated for the filling process. The connection between the clamp and the object is permanently monitored.

If the clamp fails or falls off, the grounding relay will output a corresponding signal and the filling process will be interrupted. Under special weather conditions, such as wet conditions, it is possible that the preset capacity will not be reached. Connected pumps and valves will then no longer be enabled.

Here, FARADO® I offers the possibility to switch from the capacitive to the resistive mode. The resistive mode will then check whether a grounding connection has been established.

## FARADO® I for Big Bags, type C

The self-monitoring grounding system FARADO® I FIBC has been specially developed for the grounding during the filling and emptying of flexible bulk material containers named Big Bags, type C.

For an effective grounding, two FIBC grounding clamps are attached diagonally to the grounding straps of the Big Bag.

The FARADO® I FIBC detects whether the Big Bag is grounded through to the resistance. When properly grounded, the potential-free contact is used to enable the filling. If there is no proper grounding, this release will not occur. The FARADO® I FIBC also has a manipulation monitoring system that reliably detects a shortcircuiting of the two clamps.

## Your advantages

- **Modern design – space-saving housing.**
- **Tamper-proof** thanks to electronic control key.
- **Clear LED status message.**
- **Explosion-proof grounding clamps** made of non-sparking die-cast aluminium.
- **Smooth running and robust cable reel** for easy handling.
- **Intuitive operability** even by authorised third-party personnel.



## Grounding clamps

Approved and reliable grounding clamps are characterised by their high clamping forces, and ability to penetrate through existing insulating layers such as dirt, grease, paint and rust. This establishes an effective metal-to-metal connection and guarantees a secure grounding.



Grounding clamps

## Grounding cables and grounding reels

The clamps can be individually or optionally supplied in combination with the matching grounding cables. This enables a location-appropriate selection. The single-core, spiral grounding cables are available in different lengths. When grounding an object more than 5 m away from the grounding point, we recommend the use of grounding reels. Through their locking mechanism, the discharge rollers have no resetting force, which means that even smaller, lighter objects can be safely grounded. In addition, the cable is rolled back into the steel housing after the utilization in order to avoid tripping hazards.



Grounding cable



Grounding reels

You can find detailed information and contact details for enquiries relating to our grounding system at [www.rembe.de](http://www.rembe.de). Give us a call on: T +49 2961 7405-0 or contact us via email: [info@rembe.de](mailto:info@rembe.de)



# WHAT CUSTOMERS, EXPERTS AND EMPLOYEES ARE SAYING ABOUT REMBE®



## **REMBE®: Constant Research and Development**

*Prof. Dr. Siegfried Radandt  
(Managing Director of the Research Establishment for Applied System Safety and Health (FSA), Mannheim)*

*"Explosion safety products from REMBE® meet the highest safety and quality standards because the company consistently focuses on customers' needs, product inventions and their consulting approach. It participates in research and development projects run by the FSA and thus contributes to improving the state of the technology. REMBE® invests heavily in testing its systems and therefore has an excellent understanding of its possibilities and limitations. The workers in its production department receive special training so that they know exactly what the products they manufacture will be used for later. They are fully aware that explosion safety has to be taken very seriously."*



## **REMBE® products: durable, effective and affordable**

*Klaus Rabenstein  
(Explosion Safety Specialist at Herding)*

*"We often use REMBE® explosion vents for explosion safety in our outdoor filter plants. The explosion vents are durable and easy to install, which makes them an optimum solution for our needs. The purchased products we use in our filters must also comply with high quality standards. REMBE® fully satisfies all our requirements. Increasingly, we are fitting our indoor filter plants with Q-Rohr® protection systems. Simple, effective, affordable and space-saving, they allow our customers to integrate the filter into the production process with maximum efficiency. Both the filter and the surrounding area are optimally protected."*

## **Perfect service around the clock**

*Gerhard Deitert  
(SARVAL Fischermanns GmbH)*

*"You can rely on your products and your service around the clock. They have helped twice, both times, quickly and without any complications, thank you very much for going beyond what is a "normal" service!"*



## **Tailor-made solutions from REMBE®**

*Lars Dammann  
(Head of Occupational Health and Safety/Environment at DMK Deutsches Milchkontor)*

*"The key advantage of working with REMBE® is not just the extremely safe design of their explosion safety solutions but also the way they take into account your individual operating requirements. For example, when protecting our production plants REMBE® engineers also consider our high standards in the area of hygiene and offer an appropriate version of the product. As a dairy company, this is absolutely mandatory for us and our customers."*



## Trust the professionals – trust REMBE®

Richard Siwek  
(Owner of the FireEx Group)

*"Explosion safety is an issue in every industry, from wood and chemicals to food and pharmaceuticals – it is often possible to minimise the risk of explosion. However, it is almost impossible to completely eliminate the hazard entirely. This is why it is important to take action before disaster strikes and trust the professionals in this vital area. Unfortunately, too many companies still fail to focus on providing the correct protection and every year people die as a consequence. In addition, the commercial damage suffered by plant operators is often devastating. The specialists from REMBE® are an excellent choice if you are interested in reliable and cost-effective explosion safety."*



## Always a step ahead

Gerhard Nied  
(former Director of Technology at AZO)

*"REMBE® explosion safety solutions are characterised by a high level of innovation. Only recently, our companies worked together as partners to launch an innovative solution for protecting pneumatically filled silos. This solution saves our customers an enormous amount of money and maximises protection against explosions."*



## A passion for our products

Dr.-Ing. Johannes Lottermann  
(Director Explosion Safety)

*"Admittedly: Our team is comprised of a younger generation. But the exact motivation that drives my employees is what sets them apart from Generation Y - they don't seek money, power or status, but rather the attainment of actual goals by performing meaningful tasks. In short: The passion, to avoid explosions from creating any suffering!"*



## New possibilities to promote your safety

Andrea Vincenzi  
(Senior Consultant)

*"Together, we are breaking new ground to ensure the best possible safety for everyone. This is our task, in cooperation with our customers."*



## Our conviction is what drives us

Till Westerbarkey  
(Managing Director,  
REMBE® América Latina Ltda.)

*"If a team is as motivated as this one, nothing is impossible. For our team, safety isn't just a word – it's a way of life. That's why I couldn't think of a better place to do what I love: Help save lives, and make the world a safer place for everyone."*

# GLOBALLY LOCAL

## REMBE® locations

We have founded a number of companies around the world to provide you with local service. REMBE® is represented in more than 80 countries globally by well-known and long-standing partners.

**Find the representative responsible for your country at: T + 49 2961 7405-0, [info@rembe.de](mailto:info@rembe.de) or [www.rembe.de](http://www.rembe.de)**

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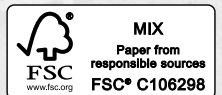
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