



# EXPLOSION PROTECTION

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COMPREHENSIVE COMPETENCE AND EXPERIENCE

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# COMPETENT PARTNER IN EXPLOSION PROTECTION

Whether in a chemical plant, in wood processing or in a steel mill – **flammable atmospheres** can occur in many industries. These kinds of hazardous areas pose particular challenges for operations. Not only do they expose materials and technology to serious threats, but more importantly, employees as well. It is not merely the **safety of the people and equipment** in these harsh and hazardous environments that is being ensured. In many companies, operations stand and fall by it as well. Specially designed products are required to safely perform work in these conditions and comply with relevant laws, regulations and standards for hazardous areas.

Columbus McKinnon offers **comprehensive engineering solutions for explosion-hazard areas** that easily meet these unique demands. Our experts are well versed in the specific requirements of hazardous and harsh environments and have a sound understanding of ATEX regulations and IECEx standards, as well as other international explosion protection regulations.

Our **seamless portfolio of explosion-proof products** guarantees the safety of people and facilities, and provides outstanding performance even in tough conditions. From **electric lifting and crane technology** to **manual and pneumatic lifting technology** as well as **drive and lifting technology**, we deliver reliable and safe devices for every field of application. With our **three strong brands of STAHL CraneSystems, Yale and Pfaff-silberblau**, we are your competent contact for all aspects of explosion protection.

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In the GATE terminal in the port of Rotterdam, special redundantly-designed LNG lifting devices by STAHL CraneSystems are used to service the liquid gas pumps. The explosion-proof lifting equipment is used on swing cranes and has a load-carrying capacity of 2 x 2,400 kg.

# 3 STRONG BRANDS – FROM A SINGLE SOURCE



## **STAHL CraneSystems** **Electric lifting and crane technology**

The technology behind the lifting and crane technology by STAHL CraneSystems is part of a worldwide premium class. With 145 years of experience, the STAHL CraneSystems brand stands for reliable and safe lifting equipment and crane components as well as methodical engineering solutions. The seamless product portfolio ranges from chain and cable hoists to crane head carriers, travel drives and wheel blocks to crane electrics, from easy-to-use control units to complex control systems. As one of the first and for many years only manufacturers, STAHL CraneSystems has significantly influenced and driven the development of explosion-proof lifting technology since the late 1920s. Customers benefit from our know-how as the world's leading manufacturer of explosion-proof components and systems: our entire product range is available in an explosion-proof version pursuant to ATEX or IECEx.



## **Yale** **Manual and pneumatic lifting technology**

Yale (Columbus McKinnon Industrial Products) is the leading brand in manual standard lifting equipment in Europe. Back in 1877, Yale produced the first hand chain hoist with load pressure brake – a design principle that continues to be used today. The application-oriented line and all of the innovative new and ongoing enhancements to existing Yale products continue to set the bar higher and higher with regard to quality, reliability and safety. Our wide range of products includes lifting equipment, rope hoists and cranes, load suspension equipment and weighing technology, hydraulic tools, heavy duty undercarriages, industrial trucks, textile lifting equipment and load securing equipment, with some products also available in an explosion-proof ATEX version.



## **Pfaff-silberblau** **Drive and lifting technology**

Pfaff-silberblau (Columbus McKinnon Engineered Products) has been a technology leader in components and system solutions for mechanical drive and lifting technology for 150 years. Our extensive portfolio ranges from high-quality spindle lifting elements, innovative linear actuators, lifting columns, bevel gearboxes and rotary feedthroughs to high-performance lifting tables and cable winches including accessories. Using these components as a basis, customer-specific solutions are possible for a wide variety of applications, with the option of a version built to APEX standards as well.



# THE GROUP



## About Columbus McKinnon

For almost 150 years Columbus McKinnon has been one of the world's leading companies for lifting technology and intelligent motion control in material handling. Our high-quality brands such as STAHL CraneSystems, Magnetek, Pfaff-silberblau, Duff-Norton, Yale, Dorner, CM and montratec design and manufacture a comprehensive portfolio of durable and reliable products for a variety of industries which can move, lift, position and secure loads ergonomically and safely.

Columbus McKinnon combines experience, know-how and innovation with a broad understanding of user requirements; this allows us to perfectly address the requirements and wishes of our customers. We offer complete systems for lifting, pulling and securing materials that have been specially developed for industry-specific requirements.

Columbus McKinnon is headquartered in Charlotte, North Carolina. Our global presence includes offices and manufacturing facilities in North America, Latin America, Europe, Africa and Asia.

## THE INDUSTRIES

- Automotive industry
- Bus and rail industry
- Chemical and pharmaceutical industry
- Power supply
- Entertainment
- Aerospace
- Marine and port industry
- Metal industry
- Offshore



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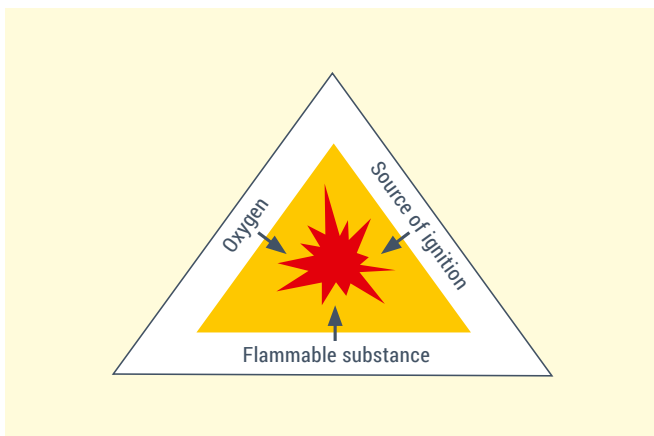
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# EXPLOSION PROTECTION WORLDWIDE

Explosion protection has evolved into a high level of security worldwide: Most countries have corresponding protective regulations, laws, ordinances and standards in place. Since the laws governing the occurrence of explosions are the same everywhere, the measures for their prevention follow similar principles. The goal is to harmonize approval conditions and conformity provisions internationally.



## Overview of the most important international standards and guidelines

In technical systems, explosion hazards can arise if three factors come together: a combustible substance (in the corresponding distribution and concentration), oxygen (in the air) and an ignition source. Flammable substances can consist of gases, mist, vapors or dusts. During a firedamp explosion in mining, an explosive atmosphere of methane gas, oxygen, and fine carbon dust is ignited by, for example, an electric spark. In mills, fine dust particles pose a risk of flour dust explosion. However, explosive atmospheres can also arise in other industries, e.g. in the chemical or petrochemical industry. The goal of explosion protection is to avoid ignition or to minimize the effect of an explosion to a non-hazardous level in order to avoid serious personal injury, property damage and environmental damage. To that end, various regulations are in place worldwide.

## ATEX

The ATEX ("Explosive Atmospheres") guidelines form the basis for uniform European explosion protection. The ATEX Product Directive 2014/34/EU (ATEX 95) and ATEX Operator Directive 1999/92/EC (ATEX 137) are mandatory for all EU Member States. The ATEX safety concept applies to the manufacture of both electrical and non-electrical operating devices as well as the operation of these devices in the applicable industrial facilities. The ATEX guidelines also define the obligations of the operators and employers to protect employees in explosion-hazard areas.

## Regulations in Germany

In addition to the ATEX guidelines, a number of other rules and regulations also apply in Germany, such as the ExVO explosion protection regulation (implementation of ATEX Directive 2014/34/EU), the BSV industrial safety regulation (implementation of ATEX Directive 1999/92/EC), the TRBS technical rules for operational safety, the TRGS technical rules for hazardous substances (TRGS 727), the DGVU German statutory accident insurance rules (e.g. DGVU rule 113-001 and DGVU rule 109-001), the BGI professional association information (e.g. DGVU information 209-046 [BGI 740]) as well as the rules of the VDI (e.g. 2263 and 3673).

## IECEX

IECEX is an international explosion protection system under the auspices of the IEC (International Electrotechnical Commission). The IECEX system is used for conformity assessment and certification of equipment, systems and services for use in explosion-hazard areas. Worldwide, the IECEX

system supports the standardization of standards and the creation of country-independent and region-independent conformity certificates (CoC) in order to simplify the free global movement of goods. Extensive class and requirement conformance already exists between the European ATEX directives and the IECEx regulations. IECEx is of great importance outside Europe. A total of 36 countries have joined IECEx. There are 60 recognized IECEx certification bodies (ExCB) and many recognized test laboratories (ExTLs) worldwide. In countries that recognize IECEx, certified equipment can be put into commission without additional testing.

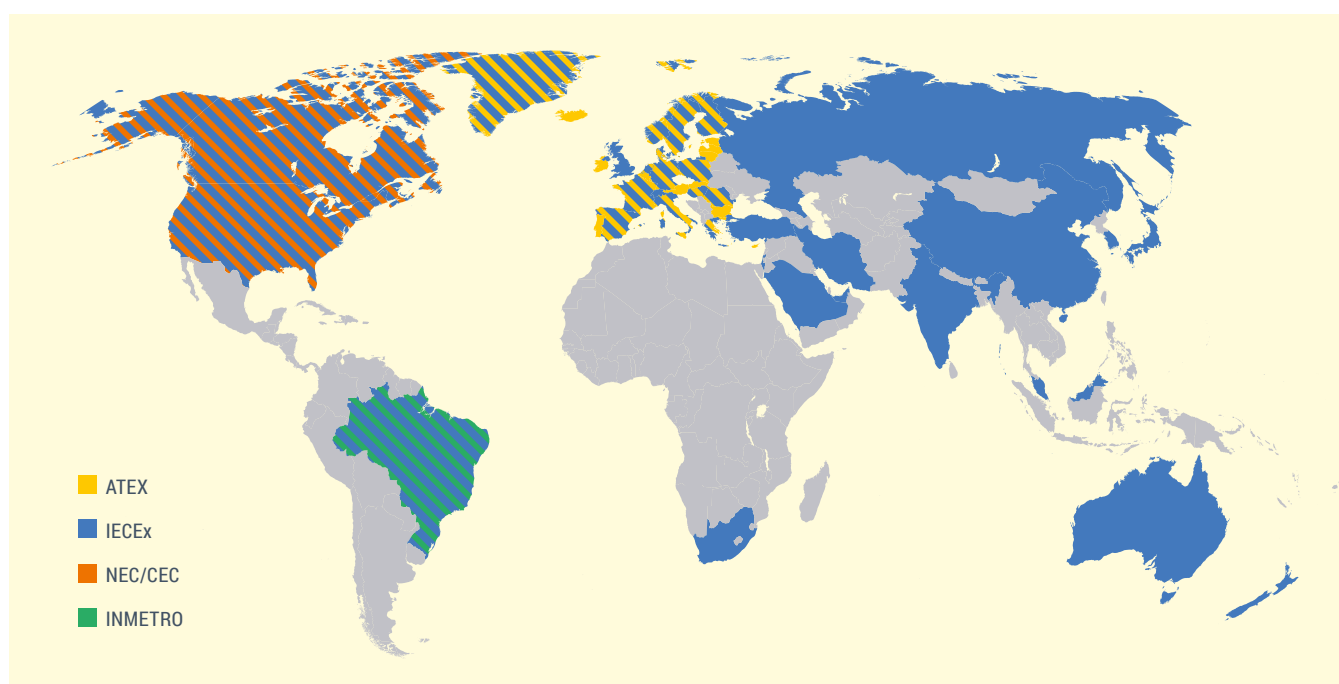
### INMETRO

INMETRO – the national Institute for Measurement Technology, Quality and Technology – evaluates products exported to Brazil for compliance with the national requirements. The statutory provisions for products in explosion-hazard areas are regulated by regulation Portaria INMETRO/MDIC No. 115 of 2022. The requirements are closely aligned with the IECEx system, but contain some specific requirements, such as testing.

Test reports prepared outside Brazil must, for example, come from a test facility recognized by ILAC (International Laboratory Accreditation Cooperation).

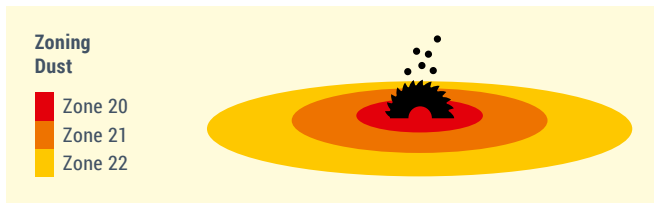
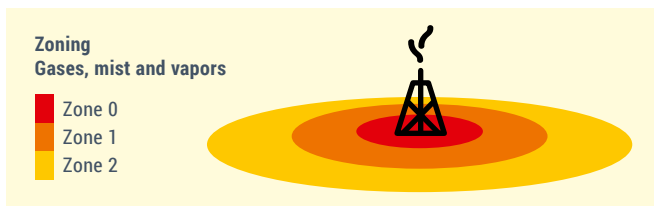
### NEC/CEC

With the National Electrical Code (NEC) in the USA and the Canadian Electrical Code (CEC) in Canada, two systems are used in North America, although the division system differs from the zone systems valid in Europe (ATEX) and internationally (IECEx) in, for example, its classification of explosion-hazard areas, temperature classes, explosion groups and explosion protection types. In the division system, explosion-hazard areas are classified according to “Class” (general type of hazardous substance, e.g. gas = Class I), “Division” (frequency of hazardous substance) and “Group” (specific type of hazardous substance, e.g. hydrogen = B). The IECEx zone concept was introduced in the USA as another accepted classification concept in 1996 with Article 505 of the NEC, and in Canada with CEC issue 1998.



# THE ATEX PRINCIPLES IN EUROPE

In Europe, the ATEX guidelines define the legal and technical principles for the protection of employees and the use and operation of equipment in explosion-hazard areas. These largely correspond to the international IECEx regulations. This brochure can only provide limited insight into the European explosion protection guidelines; it does not replace the intensive discussion of the country-specific regulations.



## Overview of the most important legal and technical principles

Operating equipment that is used in explosive atmospheres must be designed in such a way that they do not become sources of ignition. This means that they must be designed, manufactured and, of course, labeled according to the applicable regulations (ATEX Product Directive 2014/34/EU, IECEx regulations, etc.).

## Legal principles

For operators and employers, ATEX Directive 1999/92/EC specifies the legal obligations for the protection of employees when working in explosion-hazard areas. The operator's obligations include defining technical and organizational measures that prevent the occurrence of explosions. To that end, they must, for example, assess the hazard potential and the explosion risk, ensure a safely designed work area and classify the explosion-hazard areas into zones in accordance with the guidelines in order to safely use the equipment classified in categories (see table). In addition, there are also specifications for documentation and labeling as well as maintenance and monitoring of the industrial systems.

## Technical principles

ATEX Product Directive 2014/34/EU classifies devices for use in explosion-hazard areas into different groups, categories, classes and ignition protection types. The classification is based on the area of application or the safety measure of the protective measures and the type and frequency of the occurrence of an explosive atmosphere. The manufacturer must test the corresponding equipment under the most unfavorable conditions in order to exclude potential sources of ignition and to guarantee the safety of the equipment.



## Explosion group

The type of explosive atmosphere at the site of use determines the explosion group. Classification is into three groups: Group I includes pit construction at risk of firedamp, Group II includes areas at risk of gas explosions (with subclasses IIA, IIB, IIC with increasing hazardous nature of the gases), Group III includes areas at risk of dust explosion (with subclasses IIIA, IIIB, IIIC according to the type and conductivity of the dust).

## Device category and device protection level

The device category determines for which zone and type of explosive atmosphere a device is suitable. This basically involves a classification into one of two groups: Group I with equipment categories M1 and M2 covers use in mining in pit construction with a risk of firedamp. The devices for use in the other areas at risk of gas or dust explosion (1G, 2G, 3G or 1D, 2D, 3D) are summarized under Group II. In the DIN EN IEC 60079-0 standard for electrical components and devices, Equipment Protection Levels (EPLs) are defined according to the categories.

## Temperature class

The ignition temperature represents the lowest temperature value at which a hot surface can ignite the corresponding explosive atmosphere. Therefore, the maximum surface temperature for equipment must always be less than the ignition temperature of the gas/air or steam/air mixture. The temperature classes are divided into 6 levels, whereby class T1 applies to a maximum surface temperature of < 450°C and class T6 to a maximum temperature of < 85°C.

## Ignition protection types

Various technical measures can be employed to design equipment that is explosion-proof. For example, the enclosure can be protected against the intrusion of dust (ignition protection type *protection through enclosure Ex t* IEC 60079-31/EN 60079-31) or electrical equipment parts where ignition can be assumed are immersed in a protective liquid (ignition protection type *oil encapsulation Ex o* IEC 60079-6/EN 60079-6). The type of protection selected depends on the type and function of the device.

DEVICE CATEGORY AND DEVICE PROTECTION LEVEL	EU Directive 2014/34/EU (ATEX)		IEC	Protection level
	Device group	Device category	EPL	Zone
Construction of pits at risk of firedamp	I	M1	Ma	–
	I	M2	Mb	–
Areas at risk of gas explosion	II	1G	Ga	Zone 0
	II	2G	Gb	Zone 1
	II	3G	Gc	Zone 2
Areas at risk of dust explosion	II	1D	Da	Zone 20
	II	2D	Db	Zone 21
	II	3D	Dc	Zone 22

SYSTEM	ATEX: Legally required in the EU	IECEx: On a voluntary basis in the EU
Testing & conformity of non-electrical devices	DEVICE CATEGORY 2 AND 3 Internal production control, EU declaration of conformity and CE marking (documentation filed)	DEVICE PROTECTION LEVEL (EPL A, B, C) Not yet clarified, most likely similar to the electrical devices (ISO 80079-36 and -37)
Certificates	Certificate with filing number	IECEx online database
Repair shops	Regulated nationally (no EU-certified workshops)	Certified service facilities
Service personnel	Regulated nationally (no EU-certified personnel)	Certified competent employees

# STAHL CRANESYSTEMS

## ELECTRIC LIFTING AND CRANE TECHNOLOGY

As a global market leader in explosion protection, we offer a seamless portfolio of electrical lifting and crane technology for zone 1, zone 2, zone 21 and zone 22 as well as engineering solutions. Experience and know-how from decades of in-house basic research and development guarantee safety and quality down to the last detail.

All explosion-protected products are based on tried-and-tested standard components from our own production and comply with the latest ATEX and IECEx regulations.



### CHAIN HOISTS ST EX

The ST Ex chain hoists are specifically built for use in zone 1 or zone 21, but can also be designed for use in zone 22. The mechanical design is type-tested. The ST Ex series is available in 13 load capacity ranges, from 125 kg to 6,300 kg. The ST Ex chain hoist is stationary and used with suspension hooks or eyelets, rigid mounting and with roller or electric undercarriage and is particularly suitable for heavy industrial use. Short height options are available for each type of chain hoist and optimize the usable hook height. In addition to the standard designs, additional special designs and custom solutions are also available.



### CABLE HOISTS SH EX, AS 7 EX, AS 7 SW EX AND WINCHES SHW EX

The SH Ex and AS 7 Ex cable hoists as well as the SHW Ex winch are designed for use in zone 1 or zone 21, but can also be designed for use in zone 2 or zone 22. They have a modular design. For a load capacity range of 500 kg to 32,000 kg, the SH Ex series is available in five sizes with 26 load capacity variants. The higher load capacity range of up to 125,000 kg is covered by the established types AS 7 Ex and AS 7 Ex ZW. The SHW Ex winch series is available by request for heavy duty applications up to 250,000 kg.

The cable hoists have a compact and robust design that is largely low-maintenance. They are extremely reliable, extremely powerful and exceptionally durable. LNG lifting equipment has been specially designed for maintenance work on LNG tanks and their modular design principle allows them to be adapted to different customer requirements. The explosion-proof cable hoists meet all requirements for the storage and transport of liquid hydrogen. The version designed for gas group IIC satisfies all prescribed guidelines.

## CRANE COMPONENTS AND ELECTRICS

The function and power of a crane system depends on the quality of all of its components. The entire product portfolio is available in explosion-proof versions. Explosion-proof crane, driving and control technology, housing and electrical systems complement each other and offer both safety and economic efficiency.

## EX ENGINEERING SOLUTIONS

For each customer, experts from our engineering department develop solutions according to individual instructions, specifications, quality standards and country-specific regulations. With extensive know-how, international certifications and customer-specific documentation, we are able to carry out methodical engineering solutions economically, effectively and with consistently high quality.

## EXPLOSION PROTECTION PORTFOLIO

- ATEX or IECEx based design with certified quality
- Country-specific certifications available
- Comprehensive product portfolio for zone 1, zone 2, zone 21 and zone 22
- Chain hoist series ST Ex for load capacities up to 6,300 kg
- Cable hoist series SH Ex and AS 7 Ex for load capacities up to 125,000 kg
- Heavy duty application range up to 250,000 kg available with SHW Ex winch upon request
- All lifting and crane technology as well as standard program equipment available in an explosion-proof version

**For further information or inquiries, please contact us at:**

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Type	Ex label according to ATEX/IECEx				NEC/CEC
	Areas at risk of gas explosion		Areas at risk of dust explosion		-
	Zone 1	Zone 2	Zone 21	Zone 22	Class I, Div 2
<b>ST Ex</b> 125 – 6,300 kg	II 2 G Ex db eb IIB T4 Gb II 2 G Ex db eb IIC T4 Gb  II 2 G Ex h IIB T4 Gb II 2 G Ex h IIC T4 Gb	-	II 2 D Ex tb IIIC T120°C Db  II 2 D Ex h IIIC T120°C Db	II 3 D Ex tc IIIC T120°C Dc  II 3 D Ex h IIIC T120°C Dc	Class I, Zone 1, AEx db eb IIC T4 Gb Class I, Division 2, Groups A, B, C, D, T4
<b>SH Ex</b> 500 – 32,000 kg	II 2 G Ex db eb IIB T4 Gb II 2 G Ex db eb IIC T4 Gb  II 2 G Ex h IIB T4 Gb II 2 G Ex h IIC T4 Gb	II 3 G Ex db eb ec IIB T3 (T4) Gc II 3 G Ex db eb ec IIC T3 (T4) Gc  Ex h IIB T4 Gb Ex h IIC T4 Gb II 3 G Ex h IIB T3 (T4) Gc II 3 G Ex h IIC T3 (T4) Gc	II 2 D Ex tb IIIC T120°C Db  II 2 D Ex h IIIC T120°C Db	II 3 D Ex tc IIIC T120°C Dc  Ex h IIIC T120°C Db II 3 D Ex h IIIC T120°C Dc	Class I, Zone 1, AEx db eb IIC T4 Gb Class I, Division 2, Groups A, B, C, D, T4
<b>AS 7 Ex</b> 32,000 – 125,000 kg	II 2 G Ex db eb IIB T4 Gb II 2 G Ex db eb IIC T4 Gb  II 2 G Ex h IIB T4 Gb II 2 G Ex h IIC T4 Gb	II 3 G Ex db eb ec IIB T3 (T4) Gc II 3 G Ex db eb ec IIC T3 (T4) Gc  Ex h IIB T4 Gb Ex h IIC T4 Gb II 3 G Ex h IIB T3 (T4) Gc II 3 G Ex h IIC T3 (T4) Gc	II 2 D Ex tb IIIC T120°C Db  II 2 D Ex h IIIC T120°C Db	II 3 D Ex tc IIIC T120°C Dc  Ex h IIIC T120°C Db II 3 D Ex h IIIC T120°C Dc	Class I, Zone 1, AEx db eb IIC T4 Gb Class I, Division 2, Groups A, B, C, D, T4
<b>SHW Ex</b> 32,000 – 250,000 kg	II 2 G Ex db eb IIB T4 Gb II 2 G Ex db eb IIC T4 Gb  II 2 G Ex h IIB T4 Gb II 2 G Ex h IIC T4 Gb	Ex db eb ec IIB T3 (T4) Gc Ex db eb ec IIC T3 (T4) Gc  II 3 G Ex h IIB T3 (T4) Gc II 3 G Ex h IIC T3 (T4) Gc	II 2 D Ex tb IIIC T120°C Db  II 2 D Ex h IIIC T120°C Db	II 3 D Ex tc IIIC T120°C Dc  II 3 D Ex h IIIC T120°C Dc	-

# YALE – MANUAL AND PNEUMATIC LIFTING TECHNOLOGY

The Yale brand offers non-electrical equipment that is specifically designed for use in areas at risk of gas and dust explosions. Yale's explosion-protected manual lifting equipment, components and accessories are approved for Zone 1, Zone 2, Zone 21 and Zone 22 according to the ignition hazard assessment with some also approved for category I/M2 (mining). The corresponding documents are filed with TÜV Rheinland. A corresponding certificate can be enclosed with the delivery at the customer's request.



## CPA ATEX COMPRESSED AIR CHAIN HOISTS

The CPA ATEX compressed air chain hoists are characterized by their high load capacity for a variety of industrial applications. Their low weight makes these robust devices easy to transport. Equipped with suspension hooks and designed for load capacities of 125 to 980 kg. The CPA ATEX 20-8 to 100-3 series with suspension hooks or integrated undercarriage has a load capacity of 2,000 to 10,000 kg. With 100% duty cycle and unlimited switching frequency, they are suitable for heavy duty applications. The clear division of the components means maintenance is easy and cost-effective.



## YALELIFT 360 ATEX HAND CHAIN HOISTS

Based on ATEX Directive 2014/34/EU, the Yalelift 360 model line has been further developed for use in explosion-hazard areas. The line's 360° hand chain guide allows the pulley to be used in any situation and from any position, even in tight spaces. Even from the side, the Yalelift 360 can be operated from any position, making it suitable for horizontal pulling and clamping work. The operator is no longer forced to work in the hazardous load area. The Yalelift 360 ATEX manual chain hoist is designed for a load capacity of 500 to 20,000 kg. The Yalelift IT ATEX model ensures greater flexibility of use with the same load capacity and a very low-build, integrated manual undercarriage. For tight spaces, the Yalelift LH with its short construction height and a load capacity of 500 to 10,000 kg is the perfect solution.

## C/D 85 AND UNOPLUS-A ATEX MANUAL LEVER HOISTS

The C/D 85 and UNOplus-A ATEX manual lever hoists are ideal for moving and positioning heavy machinery and lashing heavy loads. The C 85 ATEX manual lever hoist with roller chain has a load capacity of 750 to 3,000 kg, the D 85 ATEX version with round steel chain has a load capacity of 750 to 10,000 kg. The UNOplus-A ATEX lever hoist with compact height, robust steel plate construction and smooth chain release are easy to use even in the smallest of spaces. It has a load capacity of 750 to 6,000 kg.

## HTP ATEX AND HTG ATEX MANUAL UNDERCARRIAGES

Undercarriages are used for precise positioning and easy movement of larger loads in connection with a manual or compressed air hoist. Undercarriages are available in an explosion-proof version with a load capacity of 500 to 20,000 kg.

## ZWW-L ATEX WALL-MOUNTED RACK AND PINION JACK

The explosion-proof wall-mounted rack and pinion jack is suitable for lifting, lowering, pulling and pushing, horizontally moving, supporting, adjusting or fixing heavy components or entire devices. Available with load capacity of 600 kg and 1,000 kg.

## EXPLOSION PROTECTION PORTFOLIO

- ATEX Design
- CPA ATEX compressed air chain hoists with load capacities of 125 – 10,000 kg
- Hand chain hoists Yalelift 360 ATEX, Yalelift 360 IT ATEX and Yalelift 360 LH ATEX with 360° hand chain guide, optional short construction heights and load capacities of 500 – 20,000 kg or 500 – 10,000 kg
- C/D 85 and UNOplus-A ATEX manual lever hoists with load capacities of 750 – 10,000 kg or 750 – 6,000 kg
- HTP ATEX and HTG ATEX manual undercarriages for all manual lifting equipment
- ZWW-L ATEX wall-mounted rack and pinion jack with load capacity of 600 and 1,000 kg

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Type	Ex label according to ATEX				
	Areas at risk of gas explosion		Areas at risk of dust explosion		Mining
	Zone 1	Zone 2	Zone 21	Zone 22	M2
<b>Compressed air chain hoists</b> CPA ATEX   125 – 980 kg	–	II 3 G Ex h IIA T4 Gc	–	II 3 D Ex h IIIA T135°C Dc	–
<b>Compressed air chain hoists</b> CPA ATEX   2,000 – 10,000 kg	II 2 G Ex h IIB T4 Gb II 2 G Ex h IIC T4 Gb*	II 3 G Ex h IIA T4 Gc	II 2 D Ex h IIIB T135°C Db, II 2 D Ex h IIIC T135°C Db*	II 3 D Ex h IIIA T135°C Dc	I M2 Ex h Mb
<b>Spur gear hoists</b> Yalelift   500 – 20,000 kg	II 2 G Ex h IIB T4 Gb II 2 G Ex h IIC T4 Gb	II 3 G Ex h IIA T4 Gc	II 2 D Ex h IIIB T135°C Db II 2 D Ex h IIIC T135°C Db	II 3 D Ex h IIIA T135°C Dc	–
<b>Manual lever hoists</b> C/D 85   50 – 10,000 kg	–	–	–	–	I M2 Ex h Mb
<b>Manual lever hoists</b> UNOplus-A ATEX   750 – 6,000 kg	–	II 3 G Ex h IIA T4 Gc	–	II 3 D Ex h IIIA T135°C Dc	I M2 Ex h Mb
<b>Manual undercarriages</b> HTP/HTG ATEX   500 – 20,000 kg	II 2 G Ex h IIC T4 Gb	II 3 G Ex h IIA T4 Gc	II 2 D Ex h IIIC T135°C Db	II 3 D Ex h IIIA T135°C Dc	–
<b>Wall-mounted rack &amp; pinion jack</b> ZWW-L ATEX 600/800   600 kg	–	II 3G Ex h IIB T4 Gc	–	II 3D Ex h IIIB T135°C Dc	–
<b>Wall-mounted rack &amp; pinion jack</b> ZWW-L ATEX 1000/600   1,000 kg	–	II 3G Ex h IIB T3 Gc	–	II 3D Ex h IIIB T200°C Dc	–

# PFAFF-SILBERBLAU

## DRIVE AND LIFTING TECHNOLOGY

The Pfaff-silberblau brand has a long tradition of mechanical drive and lifting technology for the safe movement of goods and structures. The comprehensive product portfolio of sophisticated electromechanical components, linear drive technology, spindle lifting elements and lifting columns allow components and solutions to be combined as needed. In addition to standard solutions, Pfaff-silberblau also supplies custom solutions for explosion protection that meet customers' specific needs.



### BETA EX ELECTRIC WINCH

The BETA EX electric winch models are designed for special applications in explosive environments and are designed in accordance with EU Directives 2014/34/EU and MRL 2006/42/EC. The load capacity of the BETA EX electric winches is between 320 and 7,500 kg. Since electric winches tend to be used in highly unique settings, the electric winches have a flexible modular system that allows them to be assembled for a specific use.

### OMEGA ATEX CONSOLE CABLE WINCH WITH LOAD PRESSURE BRAKE

The OMEGA-EX console cable winch was specifically developed for the high safety requirements of explosion-hazard areas.

From an energy perspective, each individual part of the OMEGA-EX is designed to effectively prevent surfaces from improper heating. Their load capacity is 1,000 kg.

### BEVEL GEARBOXES

The K...13 series bevel gearboxes are an important contribution to multi-worm gear screw jack systems in connection with hoist drives, connecting shafts, motor, etc. The K...13 bevel gearboxes are also available in explosion-proof versions in four different sizes.



### LINEAR DRIVES

The electromechanical linear drives are high-quality, universally usable and require little effort to maintain. As indispensable links in production, they ensure the flow of goods and transport in a wide range of industries. The following models are available in ATEX-based explosion-proof versions: The ELA electromechanical linear drive with a load capacity of 550 to 1,300 kg is designed for compression and tensile loads, and is just as versatile as the HLA high-performance linear drive, with a load capacity of 1,000 to 10,000 kg. The ALS thrust bearing system with a load capacity of 1,250 to 10,000 kg is used in mechanical engineering.

### WORM GEAR SCREW JACKS

The worm gear screw jacks of the Merkur, SHE/SHE-S, SSP, HSE series are possible in versions for use according to ATEX Directive 2014/34/EU.

#### Standard MERKUR worm gear screw jacks

The MERKUR series offers high flexibility with a load range of 250–50,000 kg. Its cubic housing design allows for all-round processing and thus easy alignment of the lifting elements during installation. The MERKUR series is optimal for uses where high loads must be positioned with moderate duty cycles and low dynamics.

#### Standard SHE/SHE-S worm gear screw jacks

The SHE series worm gear screw jacks cover a load range of 500 to 200,000 kg and impress structurally with a classic ductile iron housing design. The SHE series is optimal for uses where high loads must be precisely positioned and lifted at medium duty cycles and moderate lifting speeds. Stainless SHE-S screw jacks were developed for use in corrosive environments.

#### High-performance HSE worm gear screw jacks

The resilient HSE series is used where large loads must be moved with increased duty cycles as well as medium and high hoisting speeds. The housing is made of ductile iron and has cast-on cooling fins that allow high heat dissipation to the environment. The high-performance HSE worm gear screw jacks cover a load range of 500 to 100,000 kg.

#### Worm gear screw jacks with stainless SSP swivel tabs

The SSP series of stainless SSP worm gear screw jacks was developed to meet the requirements of modern paper machines, and is based on a standardized kit that can be combined individually. The high-grade stainless steel series can be used in a wide variety of mechanical lifting solutions, and is intended for use in a range of 5,000 to 25,000 kg.

#### EXPLOSION PROTECTION PORTFOLIO

- Optional ATEX-based version
- BETA EX electric winch for load capacities of 320-7,500 kg, OMEGA-EX console cable winch for load capacities of up to 1,000 kg
- Standard MERKUR worm gear screw jacks for load capacities of 250–50,000 kg, standard SHE and SHE-S worm gear screw jacks (stainless) for load capacities of 500–200,000 kg, high-performance HSE worm gear screw jacks for load capacities of 500–100,000 kg, worm gear screw jacks with SSP swivel tabs for load capacities of 5,000–25,000 kg
- ELA electromechanical linear drives for load capacities of 550–1,300 kg, HLA high-performance linear drives with a load capacity of 1,000–10,000 kg, ALS thrust bearing system with a load capacity of 1,250–10,000 kg
- K...13 bevel gearboxes in four sizes

**For further information or inquiries, please contact us at:**

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Type	Ex label according to ATEX			
	Areas at risk of gas explosion		Areas at risk of dust explosion	
	Zone 1	Zone 2	Zone 21	Zone 22
<b>BETA EX electric winch</b> 320 – 7,500 kg	II 2 G Ex h IIB T4 Gb	II 3 G Ex h IIB T4 Gb	II 2 D Ex h IIIB T125°C Db	II 3 D Ex h IIIB T135°C Db
<b>OMEGA ATEX console cable winch</b> 1,000 kg	II 2 G Ex h IIB T6 Gb	–	II 2 D Ex h IIIB T85°C Db	–
<b>K...13 bevel gearbox</b> Up to 700 Nm	II 2 G Ex h IIB T4 Gb	II 3 G Ex h IIB T4 Gb	II 2 D Ex h IIIB T125°C Db	II 3 D Ex h IIIB T125°C Db
<b>Electromech. linear drive ELA</b> 550 – 1,300 kg	II 2 G Ex h IIB T4 Gb	II 3 G Ex h IIB T4 Gb	II 2 D Ex h IIIB T125°C Db	II 3 D Ex h IIIB T125°C Db
<b>HLA high-performance linear drive</b> 1,000 – 10,000 kg	II 2 G Ex h IIB T4 Gb	II 3 G Ex h IIB T4 Gb	II 2 D Ex h IIIB T125°C Db	II 3 D Ex h IIIB T125°C Db
<b>ALS thrust bearing system</b> 1,250 – 10,000 kg	II 2 G Ex h IIB T4 Gb	II 3 G Ex h IIB T4 Gb	II 2 D Ex h IIIB T125°C Db	II 3 D Ex h IIIB T125°C Db
<b>MERKUR worm gear screw jacks</b> 250 – 50,000 kg	–	II 3 G Ex h IIB T4 Gb	–	II 3 D Ex h IIIB T125°C Db
<b>SHE/SHE-S worm gear screw jacks</b> 500 – 200,000 kg	II 2 G Ex h IIB T4 Gb	II 3 G Ex h IIB T4 Gb	II 2 D Ex h IIIB T125°C Db	II 3 D Ex h IIIB T125°C Db
<b>HSE worm gear screw jacks</b> 500 – 100,000 kg	II 2 G Ex h IIB T4 Gb	II 3 G Ex h IIB T4 Gb	II 2 D Ex h IIIB T125°C Db	II 3 D Ex h IIIB T125°C Db
<b>SSP worm gear screw jacks</b> 5,000 – 25,000	II 2 G Ex h IIB T4 Gb	II 3 G Ex h IIB T4 Gb	II 2 D Ex h IIIB T125°C Db	II 3 D Ex h IIIB T125°C Db

## COLUMBUS MCKINNON

Columbus McKinnon has a history of over 150 years and is a world leader in lifting and intelligent motion control technology. The innovative portfolio of high-quality brands, including STAHL CraneSystems, Magnetek, Pfaff-silberblau, Duff-Norton, Yale, Dorner, CM and montratec addresses the needs of our customers by enhancing safety and promoting growth and efficiency. Experience, expertise and innovation

combined with a deep understanding of user needs are the formula for success that has long underpinned our portfolio of hoists, material handling equipment and lifting accessories. Columbus McKinnon is a global organization headquartered in Charlotte, USA (North Carolina). Its global presence includes offices and manufacturing facilities in North America, Latin America, Europe, Africa and Asia.



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