



italkrane

THE HIGHEST LEVEL OF EXPLOSION PROTECTION

SOLUTIONS FOR LNG APPLICATION



italkrane s.r.l.

Italkrane was founded in Milan in 1962 by Enzo Banfi and Giovanni Penati who were until 2015 respectively the Managing Director and the Chairman of the Company. The object of the company is the design, construction and commercialisation of lifting and transport equipment. The founding members of the company already had a vast technical and commercial experience acquired during many years at responsible levels in a company at the time market leader in the sector. The founding members wanted to establish a factory which would be able to revolutionise the then currently out-dated techniques of production of bridge cranes and electric hoists and to make innovative, scrupulously designed machinery and equipment using new and advanced technologies. At the beginning, priority was given to the construction of electromechanical parts only with consulting services enabling the client himself to build the supporting metal structures in such a way that modern and efficient plant could be made. After five years, the company transferred its offices to a site outside Milan, where facilities were available for metal carpentry work and complete equipment could be supplied. The site in Bussero (15 Km east of Milan) comprises a modern factory and separate office-building studied to-give the greatest pleasure from an ecological point of view and to be perfectly in harmony with the surrounding habitat. Since 1962, Italkrane supports customers in every phase of the development and construction of machines through a team of experienced technicians and engineers able to solve any problem. Our experience, gained in over half a century of activity, is a guarantee of reliability and competence. Italkrane also supplies all the components necessary to produce the crane with the exception of the relative structures (available, on request, the technical drawings for the construction of the structures).

Italkrane elaborates and realizes customized projects to satisfy every customer need with efficient solutions.





Liquefied Natural Gas or LNG (Liquefied Natural Gas) is a gas mainly composed of methane, the simplest and most abundant hydrocarbon in nature, consisting of one carbon atom and four hydrogen atoms. After extraction and removal of impurities, it is cooled to -164°C . At this temperature it turns into a liquid, reducing its volume by 600 times. In its liquid state it can be easily stored in tanks, fed into LNG carriers, and transported over long distances to end consumer markets, where it is re-gasified and distributed.

The world is increasingly looking for fuels with a reduced environmental impact, and natural gas has long been recognized as the cleanest of fossil fuels. It is the fastest growing source of energy and global demand for LNG is expected to reach approximately 500 million tons per year by 2030, an increase of 200% since 2005. LNG currently accounts for about 25% of the international gas market. In this state it is odorless, colorless, only slightly toxic, and non-corrosive. This makes it a highly competitive and practical alternative to natural gas transported in pipelines.

It is estimated that world reserves will not be depleted for about 60 years. Gas-rich countries, particularly in the Arab and Asian regions, have for some years now been planning huge investments in the construction and/or expansion of liquefaction plants and related port terminals.

The largest LNG exporters are currently Qatar, Indonesia, Malaysia, Nigeria, and Algeria. Recently, Russia, Iran, Norway, Angola, and the Ivory Coast have also emerged as suppliers. The importing countries are Japan, India, South Korea, Pakistan, Chile and Brazil. Germany, Croatia, Italy, and Poland also plan to significantly increase LNG imports in the near future.

Natural gas is extremely dangerous and easily flammable. Therefore, every safety measure in the production chain, in large industrial liquefaction plants and in the natural gas regasification process must be scrupulously observed and taken.





Italkrane is internationally recognized as one of the most experienced and competent companies working in the field of explosion protection and is an important international player in this field. As a manufacturer of numerous components in this field, we have transferred our knowledge to the production of lifting equipment designed and built according to the specific needs of our customers.

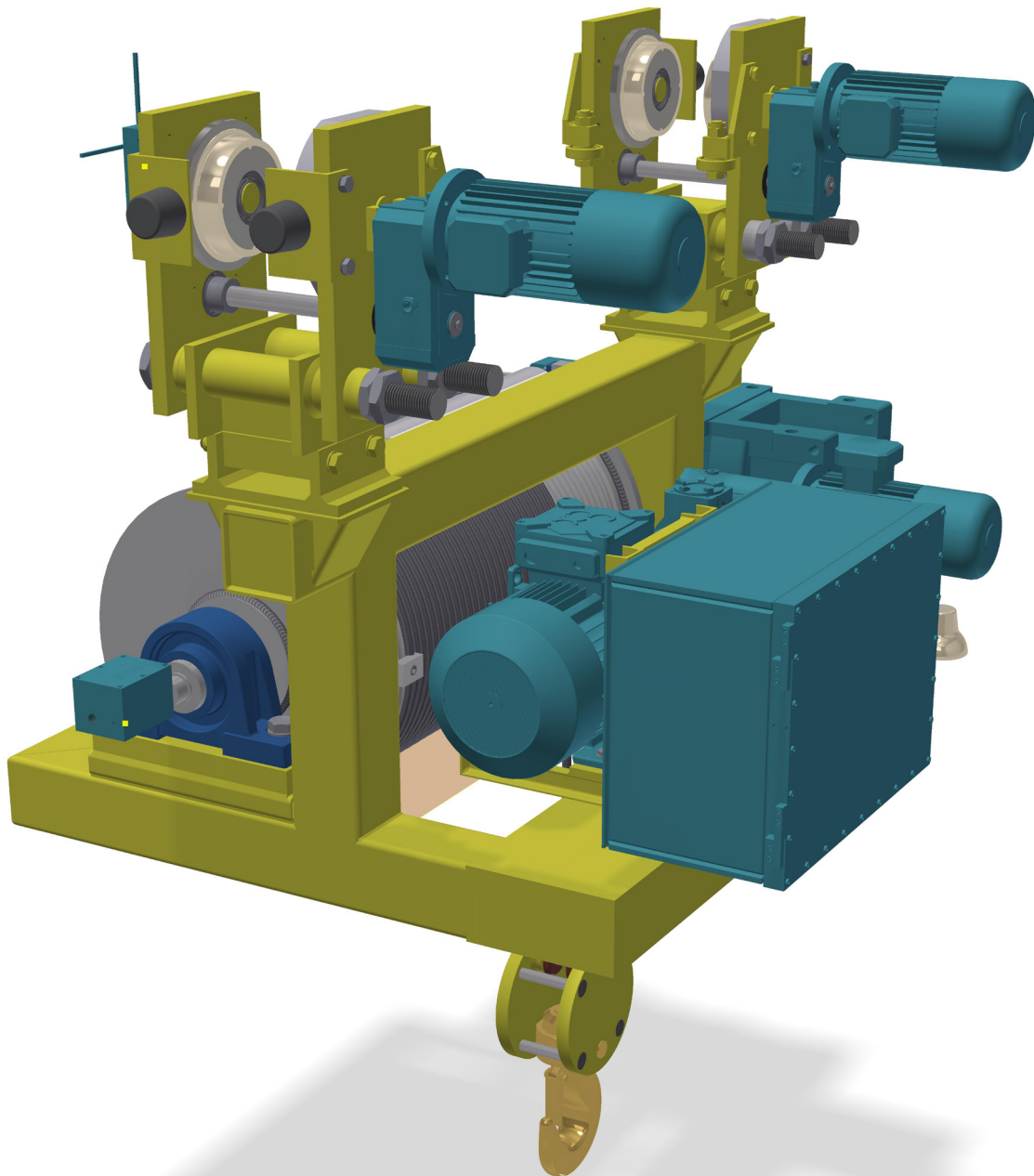
The experience and knowledge gained over more than sixty years, our continuous development of tailor-made solutions, and the approvals and certifications issued by INERIS and other control authorities in many countries around the world are a guarantee of our special expertise and justify the presence of our products in all major international projects.

All components used in our Ex lifting equipment are protected against explosions and our engineering solutions are based on our standard components. All parts, from the motor to the brake to the control device and control cabinet, are assembled and manufactured in-house according to integrated processes in a certified quality assurance system. This guarantees comprehensive, high-quality explosion protection that hoisting equipment manufacturers, end users and EPC contractors around the world have been relying on with ever-increasing confidence for decades.

All our products comply with the strict ATEX directives and the international IECEx regulations on mechanical and electrical explosion protection.

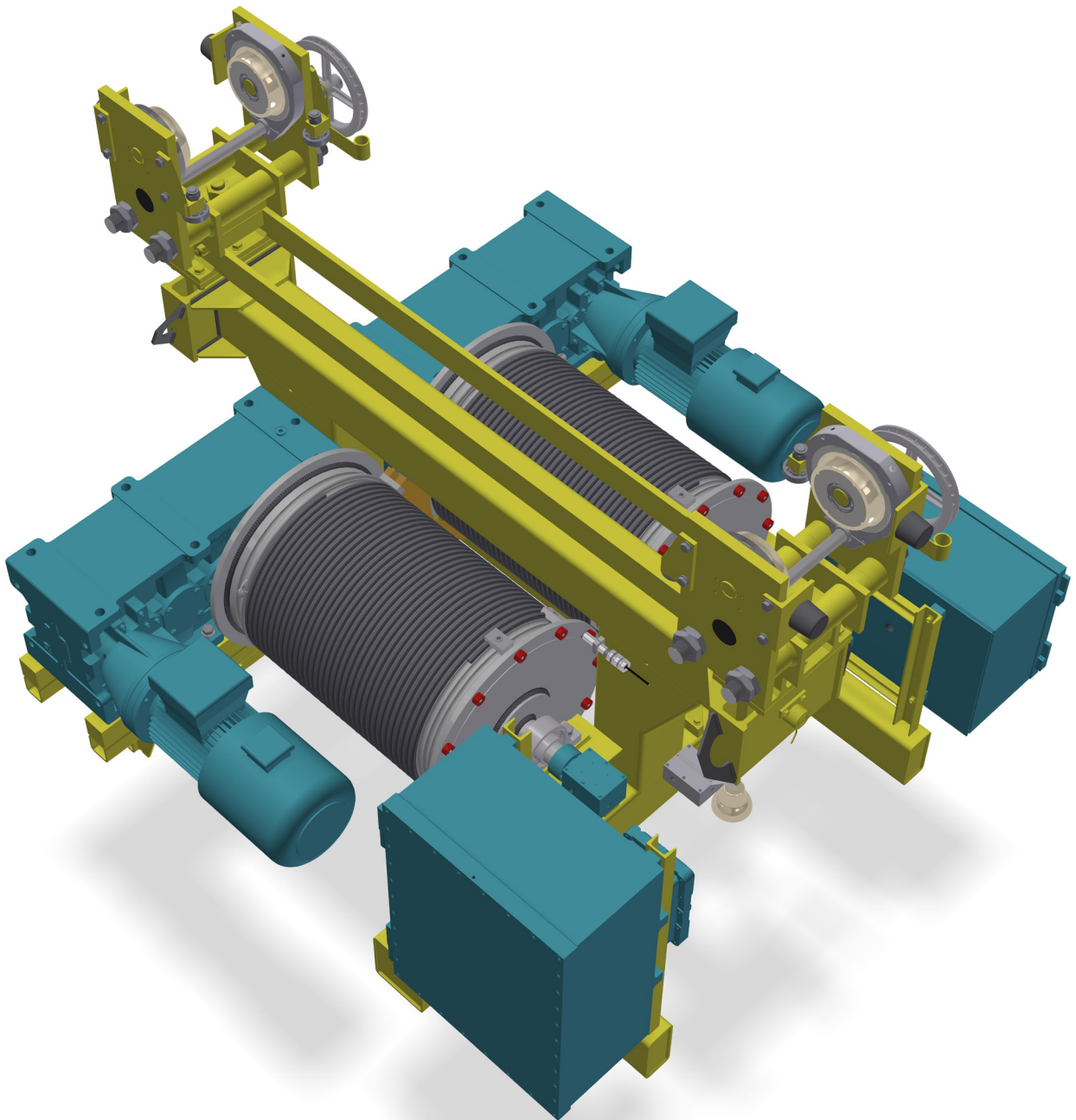
Safety level A

As a basic principle, LNG hoists are custom-built to individual specifications and requirements provided by system builders and EPC contractors. Safety Level A, the lowest level, uses explosion-proof winches from the Italkrane GOUP rope hoist program, specifically designed for routine maintenance work on LNG trains. The modular principle allows different customer requirements to be met.



Safety level B

The LNG winch in safety level B is equipped with two separately driven gear motors running parallel, two rope drums and two brakes. The brakes are designed so that each one individually can brake or hold the load in an emergency. The brakes are synchronously controlled and act as service and holding brakes. The non-standard wire ropes, permanently connected to the pump, are secured to the LNG hoist drum by an optional quick-action block. Generally, the hoisting is performed by one carrying rope, the second rope runs parallel as a dead rope without load. In the unlikely event that one of the ropes breaks, the second hoist can take over the load and continue lifting.





Italkrane LNG hoists are designed specifically for maintenance work on LNG tanks and are now successfully used in many plants and terminals around the world. Thanks to their high-quality components, robust construction, paint cycles that guarantee the highest corrosion resistance and extensive additional equipment, they are ideal for use in coastal areas with extreme weather conditions. The pumps in the tanks, which pump liquefied natural gas through a pipeline system at temperatures between -164 and -161°C , must be taken out of tanks up to 70 m high and transported outside up to five times a year for maintenance work.

The extreme conditions in the tank require non-standard ropes that are permanently connected to the liquefied natural gas pump and remain permanently in the tank. These ropes are attached to the hoist drum for maintenance work. The experts in our Technical Department develop these winches individually for each system manufacturer and EPC contractor, to meet their individual requirements, specifications, quality standards and national regulations.

Production in our factory with standardized components, rigorous testing procedures and certified quality control guarantee optimal explosion protection. Thanks to our experience, use of high quality and reliable products, dedicated engineering solutions, international certification and documentation tailored to customer requirements, we can finalize all projects economically, efficiently and with high overall quality.

Our strengths:

- State-of-the-art engineering capable of meeting the most diverse design requirements.
- Reliable technical solutions realized using field-proven components.
- Reference specialist for explosion-proof lifting equipment.
- In-house production with certified quality assurance.
- All customized solutions certified according to ATEX or IECEx directives.
- Comprehensive documentation tailored to a wide range of project requirements.

For all other applications required in LNG trains, Italkrane can offer every solution for all types of explosion-proof cranes and chain hoists, from individual customized solutions to complex engineering solutions. As a manufacturer with experience and expertise in all climatic zones of the world, we also provide safe hoisting technology and cranes suitable for operating in extreme climatic conditions such as saline environments, offshore and onshore installations, extreme heat or cold.

Even if your lifting equipment is down for maintenance for long periods, you can rely on Italkrane technology to be fully operational and work reliably and safely. Our Spare Parts Service can guarantee the supply of original spare parts quickly and cost-effectively, even for machines that have been in operation for several decades.





The explosion-proof GOUP rope hoists with modular design are available for working loads from 1,000 kg to 30,000 kg. They are built for use in Zone 1 or Zone 21 but are also available for use in Zone 2 or Zone 22. Explosion-proof ARG hoists are available for the lifting range up to 150,000 kg. The YOYO ex chain hoist is designed for a safe working load range from 500 kg to 6,300 kg. It is specifically designed for use in Zone 1 or Zone 21, however, it is also available for use in Zone 22.

- International specialist for explosion-proof technology and cranes.
- In-house production with certified quality assurance.
- GOUP ex rope hoists for use in Zone 1, Zone 21, Zone 2 and Zone 22.
- ARG ex hoists for use in Zone 1, Zone 21, Zone 2 and Zone 22.
- YOYO ex chain hoists for use in Zone 1, Zone 21 and Zone 22.
- All designs certified according to ATEX directives or IECEx standards.

REFERENCE LIST ARGANI E PARANCHI LNG

Client	Plant	Country	Final Client
EAV - TRACTBEL - STATOIL	LNG PLANT	NORWAY	 Statoil
ARABIAN GULF MATERIAL QATAR GAS	LNG PLANT	QATAR	 قطر غاز QATARGAS
ARABIAN GULF MATERIAL QATAR GAS	LNG PLANT	QATAR	
QATAR GAS	LNG PLANT	QATAR	
CB&I - GASCO	GASCO/RUWAIS	ABU DHABI	
ARABIAN GULF MATERIAL GASCO	LNG PLANT	ABU DHABI	
CB&I - GASCO	GASCO/RUWAIS	ABU DHABI	

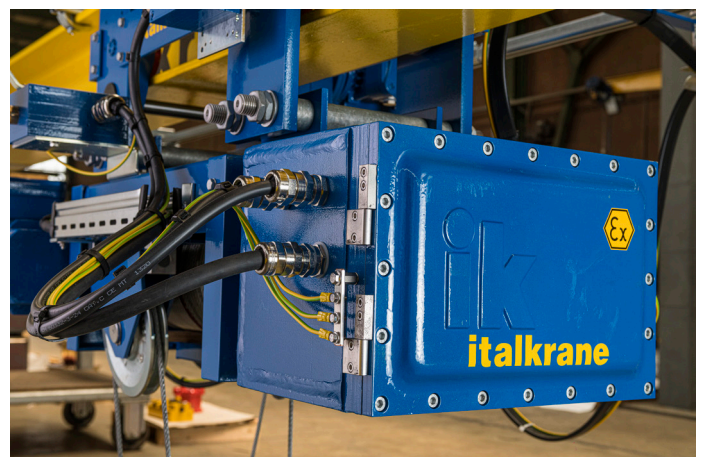
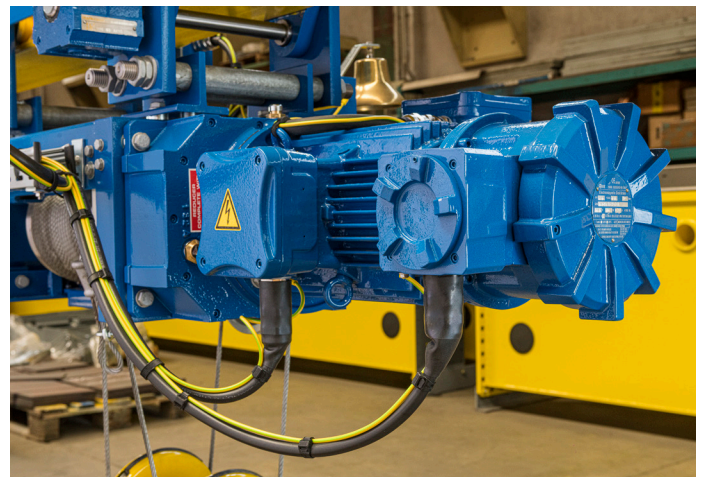


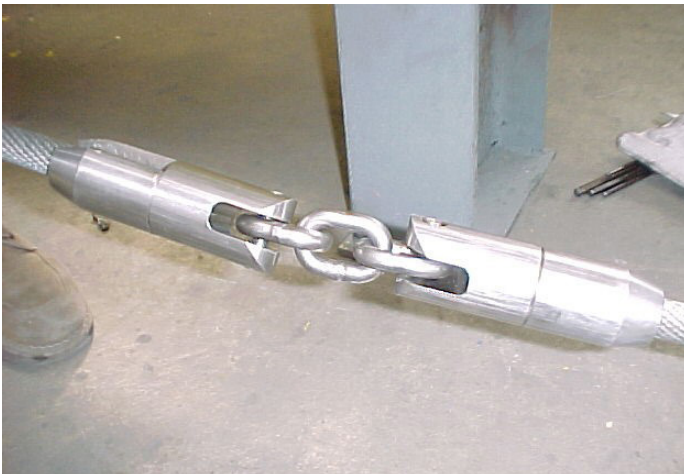
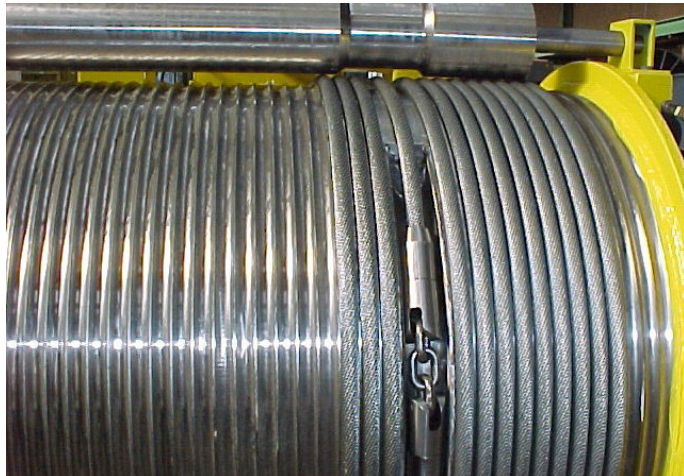
The field of natural gas liquefaction plants represents a demanding design challenge and requires high levels of expertise and experience to overcome. Working with flammable gas is extremely dangerous. In lifting equipment operating in a potentially explosive atmosphere, all electrical and non-electrical drive and control components or elements can trigger an explosion.

With its internationally recognized excellence in the field of explosion protection, Italkrane supplies winch equipment suitable for all fields of LNG technology. The range extends from the explosion-proof rope hoist to the chain hoist for routine maintenance work to the double safety LNG rope hoists, which guarantee the highest level of safety.

Some special features:

- Three-phase AC induction type squirrel-cage electric motors with cylindrical rotor, designed for heavy duty with reliable starting even under voltage. The motor windings comply with Insulation Class F with temperature rise limited to Class B. The motors are designed for heavy duty with S4 intermittent duty 40% 240 starts/hour. Compliant with International Efficiency Rating IE1, as defined by IEC 60034-30-1. In the case of 2-speed hoists, both motors are suitable for S4 intermittent duty 40% 240 starts/hour. Thermal protection by relay.
- The brakes are of the negative (fail-safe) electromagnetic disc type, specifically developed and produced in-house for hoisting service, with twice the torque of the motor and suitable for heavy-duty use. The hoist brake is equipped with multiple discs (2 to 4 depending on the selected size) ensuring greater safety and longer service life, even in heavy duty, in either Safe Area or ATEX -IEC Ex versions. In emergency situations, it is always possible to manually release the brake and safely lower the load.
- The motors for Zone 1 and Zone 21 and Zone 2 and 22 are made of grey cast iron, Ex d protection mode.
- All trolley wheels used in Ex machines made of AISI 304 as a minimum.
- Hinges of Ex enclosures made of AISI 304 .





- All round cable glands used in Ex machines are of the double seal type made of chrome-plated brass and additionally protected by PVC sheaths (shroud). Specific Ex cable glands are provided for flat cables.
- The type of protection of the enclosures for Zone 1, Zone 2 and Zone 21 on cranes and hoists are of type EX d.
- Overload protection for size 1/1 depends on the type of hoist and is provided by evaluation devices with field-tested analogue or digital load measurement.
- Non-standard rope drum for housing a work rope, to accommodate the optionally available quick-connect splice block. The customer's non-standard ropes for pump maintenance are connected by rope blocks. With the aid of the quick-connect splice block, the hoist can easily be fitted with a lower hook block to suit its application.
- FLY Ex control panels are specifically designed for the control of winches and cranes in hazardous areas. Equipped with a double trigger control, they have a mechanical protection rating of IP 66.
- Visual and acoustic signaling devices such as horns and flashing lights comply with ATEX directives and IECEx regulations. They can be used in Zone 1, Zone 2, Zone 21 and Zone 22. These warning devices can be activated by a button in the control panel.
- The type of protection of all castors is constructive safety. Wheels in Ex/spark-proof design, made of a thick-walled, wear-resistant bronze/aluminum alloy rolling band.





ITALKRANE lifting equipment

Bridge cranes

Electric wire rope hoists

Winches

Special cranes

Chain hoists

Crane kit

Components

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