



MIRETTI



Explosion Proof Protection Systems for Mobile Vehicles



Ex Systems enable trucks to be operated
in paints / coatings, pharma, foods & flavours,
inks, bottled gases, aerosols, army, oil & gas industries



High technical know-how in the Atex Explosion Protection of Mobile Vehicles.

For over 50 years Miretti Explosion Proof Protect + **1,500** units globally per annum
(Diesel, Diesel Stage V, Battery Electric, LPG, Hybrid, Lithium Battery Technology).

Our Group is an Approved Supplier to all of the leading Material Handling OEM's.

*Global Footprint Global Support
«by the customer's side, globally»*



Miretti Ex Solutions are available for OEM's including Still, Toyota, BYD, Hyster and Yale, Jungheinrich, Linde, MCFE, Doosan, Alkè, Haulotte, Manitou, Dieci, Hitachi, Caterpillar, New Holland, Volvo, Merlo, JLG, Terex, Mitsubishi, Clark, Crown, BT, Carer, Unicarriers, Nissan, Cesab, Heli, TCM.

Zone 2 – Cat. 3G equipment

Conversions for Zone 2

Miretti Atex Zone 2 Conversions provide a safe solution for both electric and diesel machines for use in Zone 2 areas when gas detection system is not required or can not be suitable on the machine.

Miretti Group have developed and certified a passive explosion protection system which can guarantee high levels of safety for the operators and environment with the minimum (smallest) impact on forklift truck.

Any potential source of ignition (eg. electrical, electrostatic, mechanical, and other) is removed by the explosion protection procedures in order to get a full ATEX industrial vehicle.

Miretti ensures that all converted equipment is compliant to ATEX Directive 2014/34/EU and EN 1755:2015 and to relevant local regulations with the Manufacturers approval.

Conversions for Zone 2 with DetEx, Gas Detector

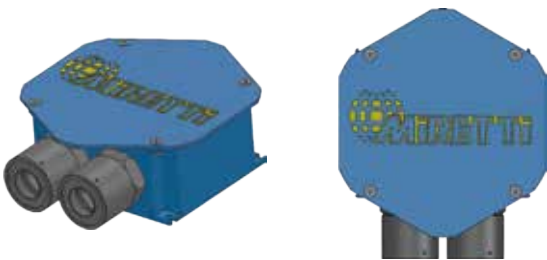
DetEx is an 'active' protection system that keeps the operator constantly informed advising if the operating area is safe or if it's hazardous. The most popular 'Zone 2' conversion features DetEx protection compliant with the ATEX directives. DetEx is suitable for every type of electric and diesel trucks/material handling vehicles.

The conversion includes the following: gas detection (infrared or pellistor heads), interface with operator, suitable enclosures for arcing and sparking components, surface temperature control, shutdown system with audible and visible alarms, stainless steel sheathed forks.



Focus on... DetEx, Gas Detection System

Active Conversion with Gas Detector Technology in areas where it is considered strictly necessary or is preferred by the end user.



- flexible configuration, new and compact design with touchscreen display
- suitable to any types of trucks respecting the ergonomics and spaces (often limited); also suitable to large earthmoving machines
- for both Diesel and Electric Battery Trucks
- cost effective Zone 2 ATEX compliant systems designed for almost all 3G applications
- truck operator receives Gas/Vapour audible and visual warnings at 10% LEL Propane in Air
- truck automatically shuts down to safety prevent an explosion at 25% LEL
- simple to operate and cost effective to maintain
- choice of infrared or pellistor gas sensors to suit virtually any end user application

Electric / Diesel

Miretti Ex Truck Systems provide a safe solution for both electric and diesel machines for use in Zone 2 areas (gas groups IIA and IIB; temperature class up to T3 or T4). The technology applies to both AC and DC motors.

Applied to a wide range of vehicles that can include forklift trucks, sweepers, mobile cranes, tow tractors and other industrial machines.

Miretti explosion proof conversions are designed not to have an impact on the functionality and compliance standards of the original equipment.

All explosion proof conversions are developed to maintain the original safety levels and ergonomics in conformity with local standards. The conversions have been designed and implemented with the most advanced technologies and with the help of solutions to simplify equipment maintenance, thus reducing intervention.

Our conversions do not alter the operation of the OEM unit nor do we compromise the footprint of the unit.

Zone 1 – Cat. 2G equipment

Miretti can convert almost all brands of forklift trucks and vehicles for a safe operation in Zone 1 areas; in fact many with standardized designs. All sources of ignition (eg. electrical, static, mechanical, heat sources and other) are protected so that the equipment can operate safely within potentially flammable atmospheres.

Conversions may include explosion proof Ex d enclosures for arcing and sparking components, surface temperature control and limitation, Ex e components, Ex i intrinsically safe circuits, Ex m encapsulation, Ex e battery, stainless steel sheathed forks etc.

Miretti ensures that all converted equipment is compliant to ATEX Directive 2014/34/EU and EN 1755:2015 and to relevant local regulations with the Manufacturers approval.



Electric / Diesel

Miretti Zone 1 explosion proof protections provide a safe solution for both electric and diesel vehicles for use in Zone 1 areas (gas groups IIA and IIB; temperature class up to T3 or T4). The technology applies for both AC and DC motors. Applied to a wide range of vehicles that can include forklift trucks, sweepers, mobile cranes, tow tractors and other industrial machines.

Miretti explosion proof diesel conversions are designed not to have an impact on the functionality and compliance standards of the original diesel equipment (eg. Tier 4 engines).

All explosion proof conversions are developed to maintain the original safety levels and ergonomics in conformity with local standards. The conversions have been designed and implemented with the most advanced technologies and with the help of solutions to simplify equipment maintenance, thus reducing intervention. Our conversions do not alter the operation of the OEM unit nor do we compromise the footprint of the unit.



Zone 21/22

Miretti can convert almost all brands of forklift trucks and vehicles for a safe operation in Zone 21 or 22 areas with many standardized designs. Combinations of conversions effective against both explosive gas and dust are available according to the Customer's requirements.

Conversions include explosion proof Ex d enclosures for triggering and sparking components, surface temperature control and limitation, Ex e components, Ex i intrinsically safe circuits, Ex m encapsulation, Ex e battery, IP enclosures, stainless steel sheathed forks etc.

Miretti ensures that converted equipment is fully compliant to ATEX Directive 2014/34/EU and to relevant local regulations with the Manufacturers approval.

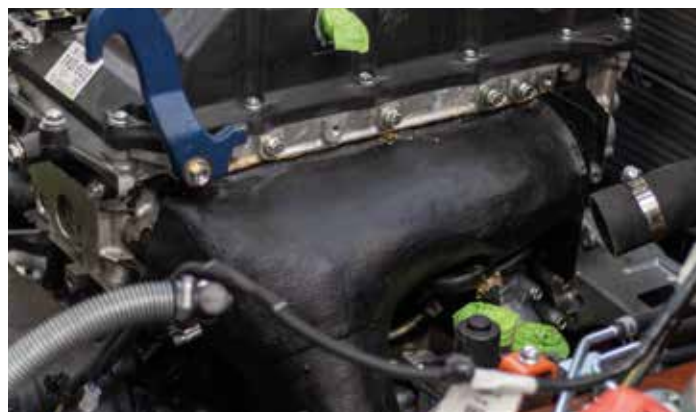
Focus on...

CoatEx

CoatEx provides a thermal barrier between hot engine surfaces (e.g. turbochargers and exhaust manifolds) and the external atmosphere.

CoatEx enables the OEM "dry" turbocharger and manifold to be retained reducing Zone 1 and 2 conversion costs and minimising risk of failure by fitting non OEM turbo and water cooled manifold.

It plays a crucial role in controlling heat release and limiting surface temperatures.



Gas Checker

Additional Safety for non classified areas.



Monitoring Gas System for locations where the hazardous atmosphere may occur but not in such quantities that are required solutions totally in compliant with Atex Directive or in workplaces close by areas which are formally classified as Atex Zones.

The System is a quick and cost-effective solution for an additional Safety.

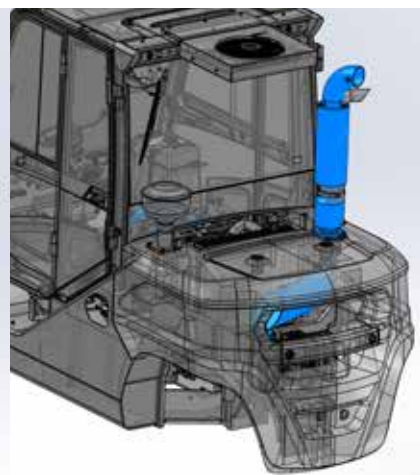
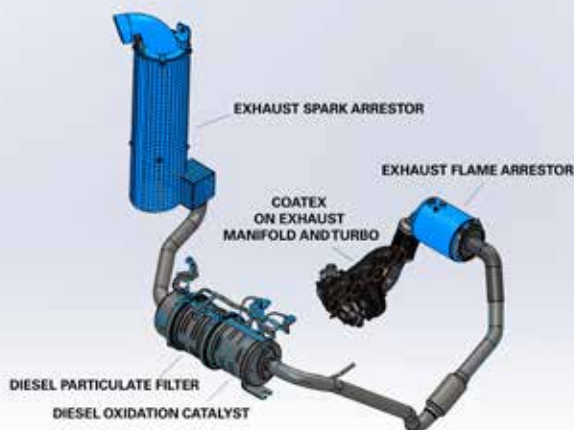
Gas Detection | Control Solution | Automatic Truck Shutdown. It is a kit of parts that can be installed locally to provide gas detection, visual/audible alarms and automatic equipment shutdown.

It's a flexible and reliable system that can be easily fitted on all types of trucks.

After Treatment System

DOC+DPF (for light power engines) or DOC+DPF+SCR (for heavy power engines)

Miretti can Explosion Proof Protect different typologies of DPF Systems by CoatEx insulation.



Our Special Projects

Wheel loaders, tow tractors, mobile cranes, scrubbers, access platforms, dump trucks, cranes, tankers, tower light etc...
Miretti also provide Explosion Protections for the Oil & Gas, Coal Mining & Tunnelling industries.



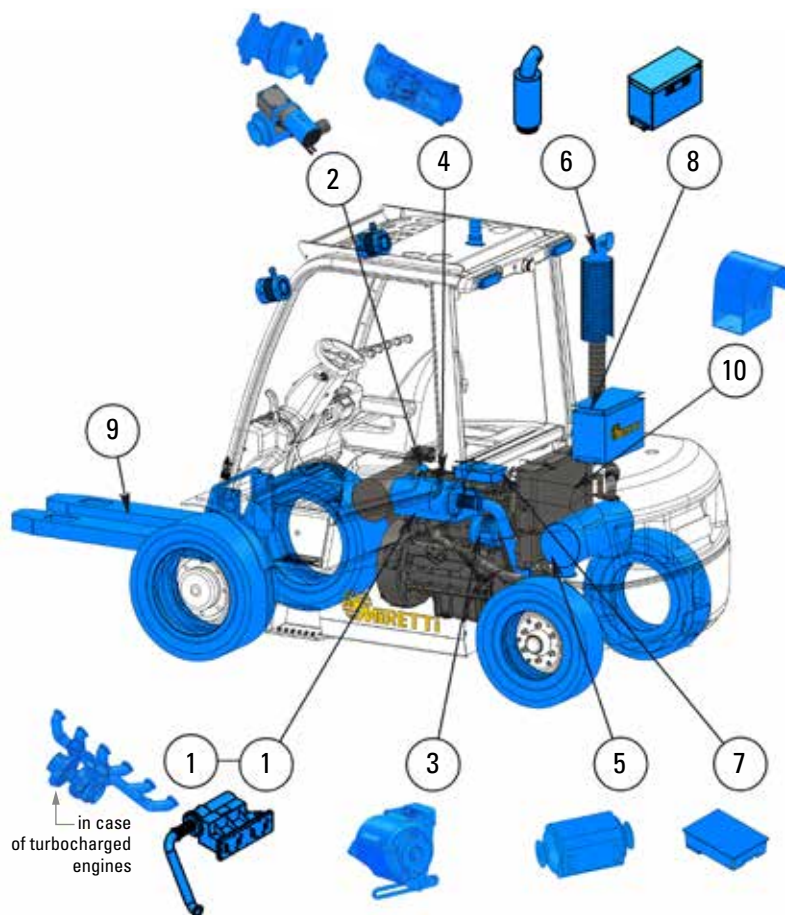
Zone 2/22 Cat. 3G/3D equipment

Diesel

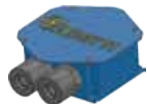
- 1 Exhaust manifold
in case of turbocharged engines:
exhaust insulated turbo and manifold with Coatex
- 2 Flame arrestor and shut down valve
- 3 Ex nC Generator - Ex t (dust)
- 4 Ex nC Starter motor - Ex t (dust)
- 5 Truck Filterex Cooler
- 6 Spark arrestor
- 7 Ex nA Electronic ECU - Ex t (dust)
- 8 Ex nA Battery box - Ex t (dust)
- 9 Fork Sheathing
- 10 Battery switch cut off

Other parts: Antistatic fan,
Ex Instrumentation and controls, Horn.

Options: Static Conductive Tires, lights,
heating kit, flashing beacon and reverse
gear horn, wipers.



Active Conversion with Gas Detector is available



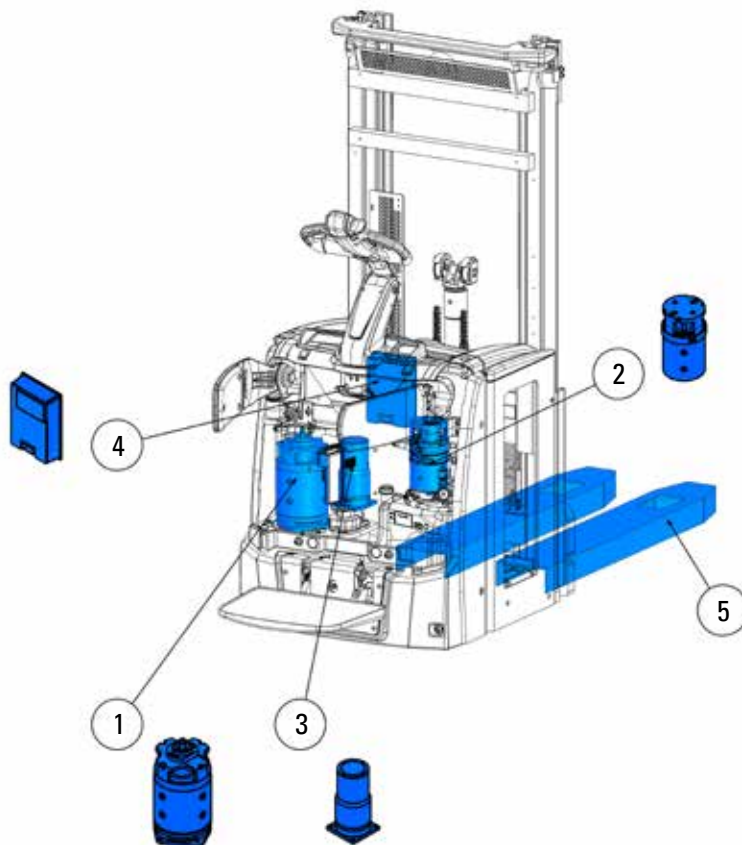
Miretti has developed for both diesel and electric trucks an Active Conversion with DetEx, Gas Detector Technology, in areas where it is considered strictly necessary or is preferred by the end user.

Electric

- 1 Ex nA Traction motor - Ex t (dust)
- 2 Ex d Pump motor - Ex t (dust)
- 3 Ex nA Steering motor - Ex t (dust)
- 4 Ex nA Inverter - Ex t (dust)
- 5 Fork Sheathing

Other parts: Ex instrumentation
and controls, horn.

Options: Static Conductive Tires, lights,
flashing beacon and reverse gear horn.



Miretti can convert all types and all brands of mobile vehicles (battery electric, diesel, diesel stage V,

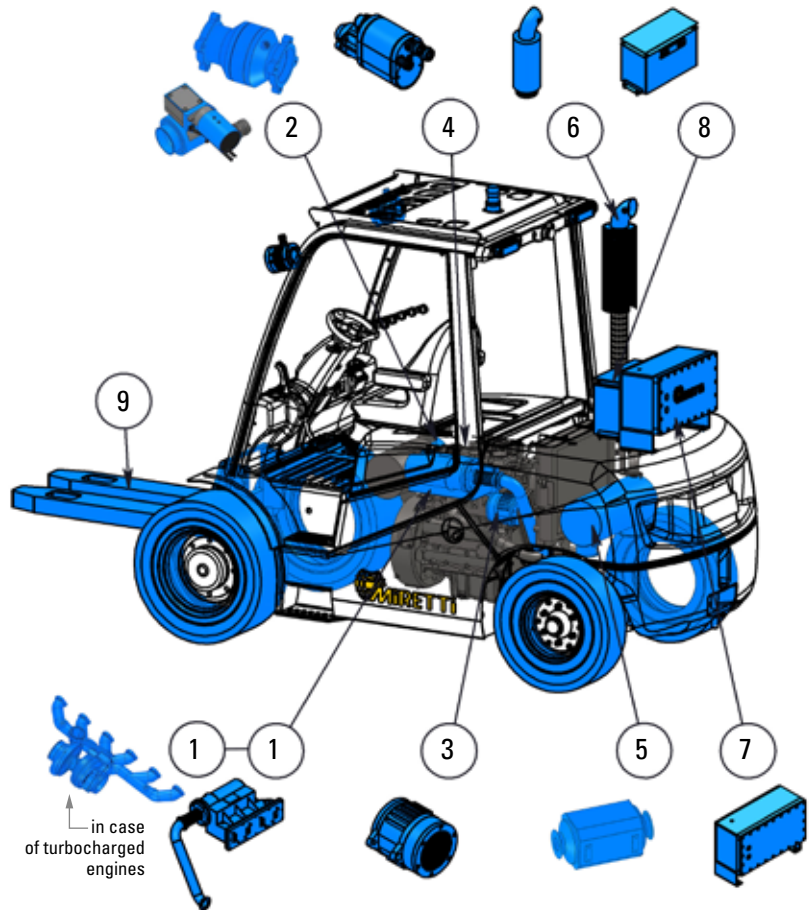
Zone 1/21 Cat. 2G/2D equipment

Diesel

- 1 Exhaust manifold
in case of turbocharged engines:
exhaust insulated turbo and manifold with Coatex
- 2 Flame arrestor and shut down valve
- 3 Ex d Generator - Ex t (dust)
- 4 Ex d Starter - Ex t (dust)
- 5 Truck Filterex Cooler
- 6 Spark arrestor
- 7 Ex d / Ex q / Ex m Electronic ECU - Ex t (dust)
- 8 Ex e Battery box
- 9 Fork Sheathing

Other parts: Antistatic fan,
Ex Instrumentation and controls, Horn.

Options: Static Conductive Tires, lights,
heating kit, flashing beacon and reverse
gear horn, wipers.

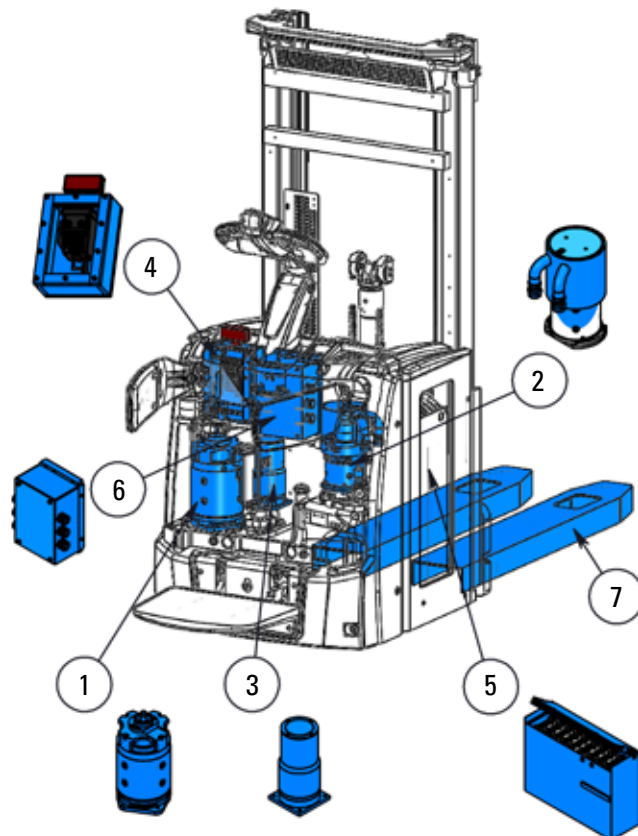


Electric

- 1 Ex e Traction motor - Ex t (dust)
- 2 Ex d Pump motor - Ex t (dust)
- 3 Ex e Steering motor - Ex t (dust)
- 4 Ex d Battery cutoff enclosure - Ex t (dust)
- 5 Ex e Battery box - Ex t (dust)
- 6 Ex e / Ex q / Ex m Inverter
- 7 Fork sheathing

Other parts: Ex instrumentation
and controls, horn.

Options: Static Conductive Tires, lights,
flashing beacon and reverse gear horn.



The images are indicative of a standard conversion.
Options are available. Please contact us for more information!

New Technologies & Innovative Solutions

Our Certifications, your Safety

Our products are certified according to ATEX, IECEx, NEC and other national standards.

In line with ISO 3691.1. requirements. We work in close collaboration with Truck Manufacturers and with their written approval of our systems the explosion proof modifications are compliant with applicable regulations.

All industrial trucks made Explosion Proof by Miretti satisfy the requirements of ATEX Directive 2014/34/EU with reference to the new European standard EN 1755:2015.

Truck Rental

Miretti provides explosion proof forklifts category 2 GD T4 for short term rental.



After Sales Service and Training

The Miretti after-sales service, present in most countries, ensures fast response times, dedicated assistance, telephone and on-site support and the availability of specific spare parts for more than ten years to help maintain constant productivity for customers.

Conversions are studied and implemented using solutions that simplify and speed up machinery maintenance. Maintenance interventions are carried out by skilled personnel, authorised and trained for the purpose in our head offices.

The Miretti After-Sales Service and the availability of local technical support through training courses for service engineers (carried out at the Milan HQ or locally when available) will support the client step by step in ensuring continuous uptime and protection of their environment.

Annual and/or three yearly Safety Audits for the Ex protection system are available on request.



Why choose Miretti?

Miretti has been leader since 1973 in the **Explosion Proof Protection** of mobile vehicles and industrial equipment and boasts impressive experience in the field. The company operates all over the world with branches in Italy (head office), USA, Singapore, China, Germany, UK, France, Spain, Hungary, Benelux, Middle East, Algeria, Israel, Australia. Miretti is ISO 9001, ISO 14001 and ISO 45001 certified and is an approved supplier for the most important world producers. Constant research focuses on new technologies and innovative solutions. All explosion proof conversions are developed and implemented in agreement with OEM Original Equipment Manufacturers to maintain original safety levels and ergonomics in conformity with local standards and regulations. Miretti ensures a reliable after-sales service, qualified technicians, quality and fast maintenance. Miretti Group has also been on the market since 1973 as a supplier of SCR DeNOx Systems and Catalysts thanks to many years of experience also in the field of Exhaust Cleaning Solutions reducing exhaust pollution. *"Explosion Protection Safety and Green Environment".*

Expertise of over 50 years
Quality & Innovation
Competitive Pricing
Certifications & Testing
After Sales Service
Training & Product Education
Research & Development
Reliable Customized Solutions
Global Footprint





we operate all over the world



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