

Explosion proof conversions for industrial vehicles

ATEX protection
(Zones 1, 2, 21 or 22)

Gali

GALI, with more than 30 years of experience in the field, is specialist in the conversion of forklift trucks and other industrial vehicles enabling them to operate in potential explosive atmospheres (ATEX). There are a big number of industrial places processes that involve the possibility to generate gases and dust that, when mixed with air would create an explosive atmosphere.

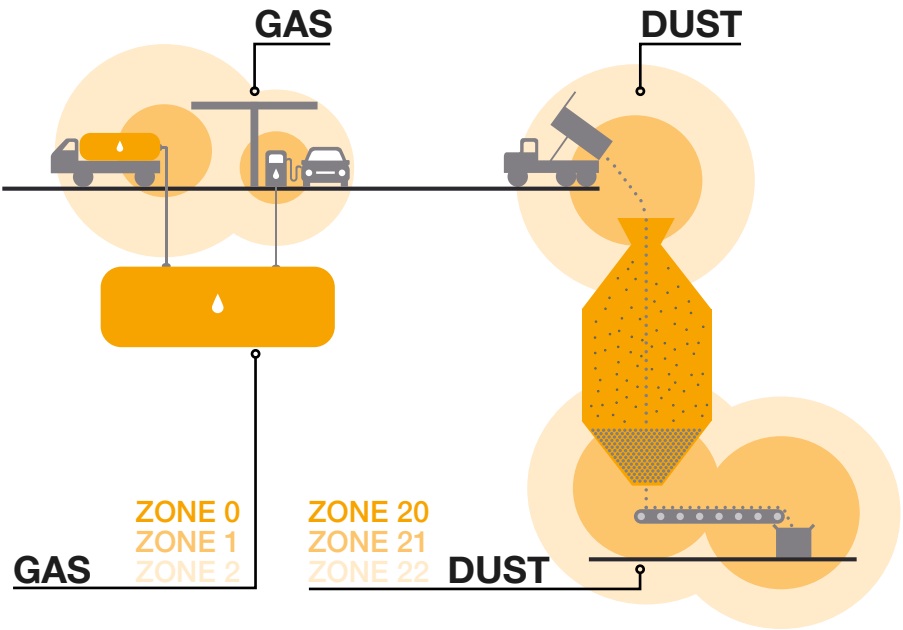
In this situation, any ignition source, such as an electrical arc, mechanical sparks, hot exhaust gases, static electricity, high surface temperatures, etc., will ignite an explosion.

Since 1994, the European Directive ATEX 94/92/CE obliges companies to define these Zones and to protect all apparatus, installations and mobile equipment that work within them, under the liability of owners, executives and heads of health and safety. The Directive ATEX 2014/34/EU, known as ATEX, specifies the requirements for all equipment used in Zones defined as potentially explosive atmospheres.

As a specialist in the protection of industrial vehicles, GALI has developed its range of explosion proof conversions with full guarantee of its transformations compliance under the ATEX 2014/34/EU, providing all necessary legal documentation with the vehicle.

“more than 30 year of experience and thousand of successful industrial vehicles protected.”

GALI conversion	ATEX zone	ATEX category	gas classification	temperature class	definitions
GALITEX	ZONE 1	2G	IIA, IIB, IIB + H2, Gases, Vapours & Mists	T1 (450°C) T2 (300°C) T3 (200°C) T4 (135°C) T5 (100°C) T6 (85°C)	A place in which an explosive atmosphere is likely to occur in normal operation.
GALITEX or GALIGAS	ZONE 2	3G			A place in which an explosive atmosphere is not likely to occur in normal operation, but may occur for short periods.
GALIDUX	ZONE 21	2D	IIIA, IIIB, IIIC Combustible Dust	T 200°C T 135°C	A place in which an explosive atmosphere is likely to occur in normal operation.
GALIDUX	ZONE 22	3D			A place in which an explosive atmosphere is not likely to occur in normal operation, but may occur for short periods.



“Gali Ex protections enable industrial vehicles to be safe operated in potentially hazardous areas.”



GALI provides a safe solution for electric or diesel vehicles operating in Zone 1/21 & Zone 2/22 areas (gas or dust) in compliance to ATEX Directive 2014/34/EU.

The vehicles can be forklifts trucks, lifting platforms, cranes, floor washers, tractors, side loaders etc. and will be protected with the minimum impact for the operability of the vehicle ensuring that the original minimum specifications are maintained.

To provide the appropriate explosion protection, we have a questionnaire to clearly state the corresponding classified hazardous areas where the industrial vehicle will operate.



ATEX DATA SHEET

Questionnaire for the forklift protection (or similar mobile lifting elements) according to 2014/34/EU ATEX with activity in potentially explosive zones.

1. Client
Telephone: _____ Fax: _____ E-mail: _____
Person in charge: _____

2. Forklift truck type and capacity
☐ Pallet ☐ Stacker ☐ Electric ☐ Diesel ☐ Retractable ☐ Trilateral ☐ Orders
☐ Counterbalanced ☐ Counterbalanced ☐ Propeller

Models: _____

3. Classification of the hazardous area please indicate the most predominant

A. GAS/VAPOUR/FLAMMABLE SUBSTANCES
Zone 1 Possible explosive atmosphere ☐ Active Protection ☐
Zone 2 Sporadic explosive atmosphere ☐ Passive Protection ☐

Gas Group and temperature class of substances (see Annex A Norme EN 50521):

Gas	IA	IB	IC	Temperature	T1 (450°C)	T2 (300°C)	T3 (200°C)	T4 (135°C)	T5 (100°C)	T6 (85°C)
	IA	IB	IC	Acetylene (C2H2) + H2						
				IC Hydrogen						

* For active protection specify the exact type of gases

B. FLAMMABLE DUST
Zone 21 Possible explosive atmosphere ☐ Dust ☐ Electroconductor ☐
Zone 22 Sporadic explosive atmosphere ☐ NO Electroconductor ☐

List of dusts: _____

ATEX DATA SHEET GALI

Electrical GALITEX CAT 2G or 3G for Zone 1 or 2 Gas

GALI protects Electrical industrial vehicles for safe operation in ATEX Zone 1 or Zone 2. Areas where the presence of gas and vapors may create an ignition hazard.

All possible ignition sources are protected to assure that the vehicle is safe to operate in a potential explosive atmosphere.

Typical conversion done in the vehicle may include: flameproof Ex d / Ex e enclosures, surface temperature control, Ex d / Ex e motors (DC and AC), Ex e traction batteries, Ex i intrinsically safe electrical circuits, stainless steel forks, etc.



“the conversion guarantees an electrical and mechanical protection to avoid any explosion risk.”





***101**
New electric wiring according to EN60079-14



***102**
Motors DC: Ex d / AC: Ex e



***103**
ATEX battery Ex e



***104**
Ex d battery connectors



***105**
Antistatic strips



***110**
Antistatic wheels < 10⁹ Ω



***106**
Ex m valves, coils and sensors



***107**
GALI control system to prevent overheating and insulation fault



***108**
Ex d enclosures with sparking components (relays, contactors, fuses, Electronic ECUs, etc)



***109**
Ex d display



***111**
Stainless-steel clad forks

CAT 2G

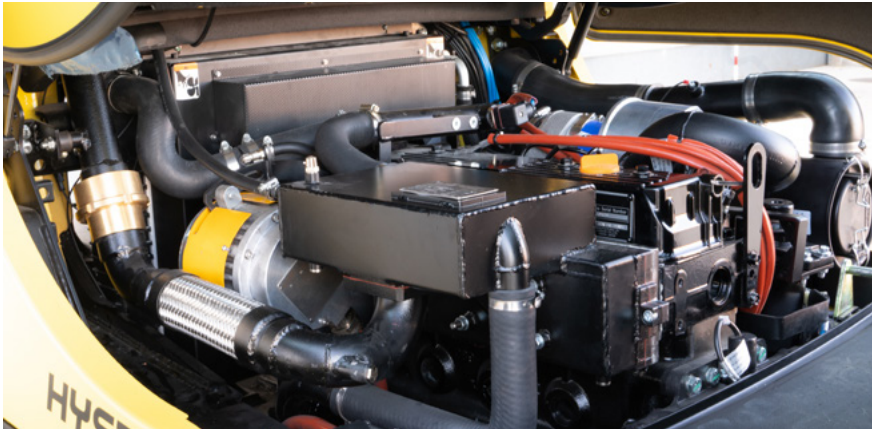
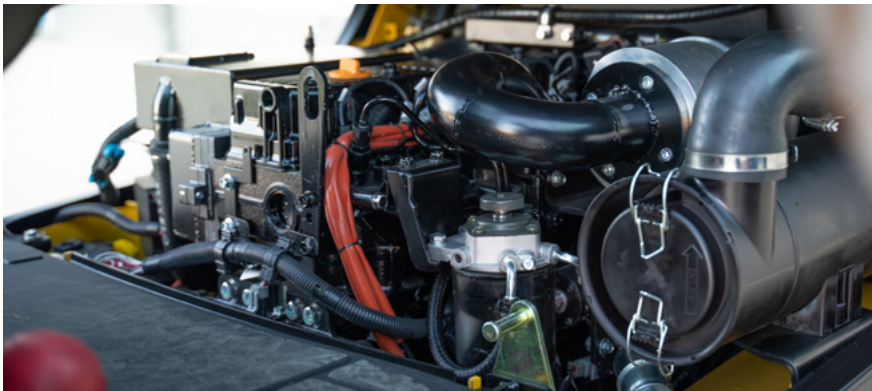
* Scheme for commercial reference only, the final product may change.

Diesel GALITEX CAT 2G or 3G for Zone 1 or 2 Gas

GALI protects Diesel industrial vehicles for safe operation in ATEX Zone 1 or Zone 2. Areas where the presence of gas and vapors may create an ignition hazard.

All possible ignition sources are protected to assure that the vehicle is safe to operate in a potential explosive atmosphere.

Typical conversion done in the vehicle may include: flameproof Ex d / Ex e enclosures, surface, gases and coolant temperature control, Ex d / Ex nR starter motors, Ex e mb batteries, Ex d alternator, inlet shutdown valve, inlet and exhaust flame arrestor, spark arrestor, exhaust gases heat exchanger, Ex i intrinsically safe electrical circuits, stainless steel forks, etc.



“installation and conversion of the engine components to assure a safe operation for the diesel vehicles.”



***201**
New electric wiring according to EN60079-14

***202**
Ex d electric starter

***203**
Starting battery Ex e

***204**
Explosion proof diesel engine with inlet and exhaust flame arrestor, Ex m shut off valve, manifold and exhaust gases heat exchanger + spark arrestor.

***210**
Antistatic strips

***205**
Ex m valves, coils and sensors

***206**
GALI control system to prevent and control overspeed, overheating, insulate fault, coolant & exhaust gasses temperature control, oil pressure, etc.

***207**
Ex d enclosures with sparking components (relays, contactors, fuses, Electronic ECUs, etc)

***208**
Ex d display

***209**
Ex d charging alternator

***211**
Antistatic wheels < 10⁹ Ω

***212**
Stainless-steel clad forks

CAT 2G

* Scheme for commercial reference only, the final product may change.

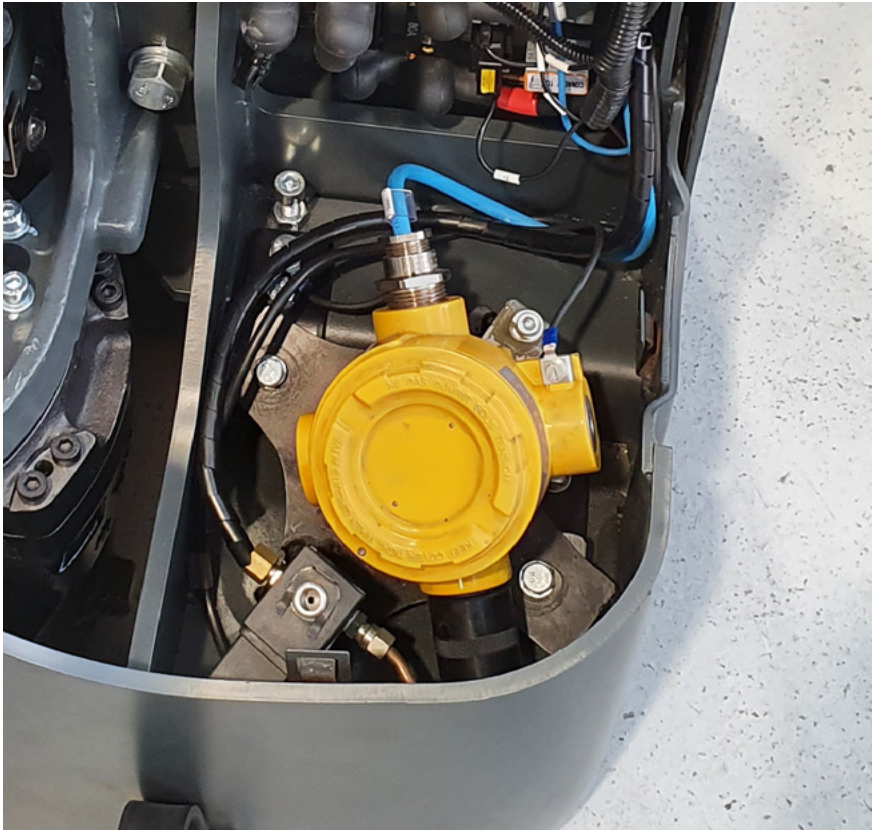
Electrical GALIGAS CAT 3G for Zone 2 Gas

GALI protects Electrical industrial vehicles for safe operation in ATEX Zone 2. Areas where the presence of gas and vapors may create an ignition hazard.

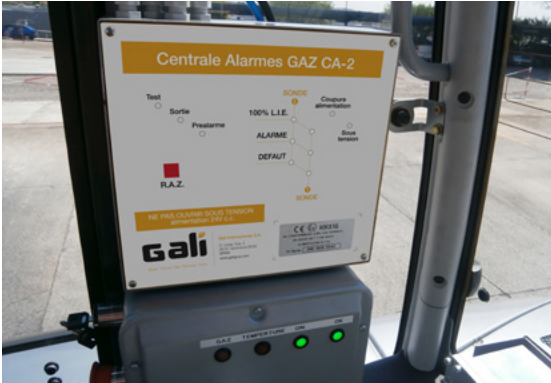
Our GALIGAS system is an active protection allowing the operator to be informed if the area is safe for operation. The conversion includes gas detectors which will provide a visual/audible warning for the operator to drive out of hazard area if the gas/vapor is detected at 10% LEL.

If gas/vapor reaches the 25% LEL the vehicle will automatically come to a controlled stop.

Our GALIGAS system incorporates an automatic start up self-test.



“liftruck will automatically shut down at 25% LEL. Easy to operate and to maintain.”



*301

All arcing, sparking and hot components are fitted with restricted breathing enclosures.



*302
Motor DC:
Ex nR



*303
Original battery conversion:
Ex e



*304
Battery connectors:
Ex e IP23



*305
Antistatic strips



*310
Stainless-steel clad
forks



*306
Control module



*307
Gas bottle



*308
Gas detector



*309
Contactors/relays/fuses:
Ex nR (IP65)



CAT 3G

* Scheme for commercial reference only, the final product may change.

Electrical GALIDUX CAT 2D or 3D for Zone 21 or 22 Dust

GALI protects Electrical industrial vehicles for safe operation in ATEX Zone 21 or Zone 22. Areas where the presence of dust and powder may create an ignition hazard.

All possible ignition sources are protected to assure that the vehicle is safe to operate in a potential explosive atmosphere.

Typical conversion done in the vehicle may include: flameproof Ex t IP65 enclosures, surface temperature control, Ex t IP65 motors (DC and AC), Ex t traction batteries with IP65 plugs, Ex i intrinsically safe electrical circuits, stainless-steel clad forks, etc.



“the protection ensures the safe operation of the vehicles in zones where dust and power ignition risk may exist.”



***401**
Motors:
Ex t (IP65)



***402**
ATEX battery
Ex t (IP65)



***403**
Ex d t (IP65)
battery
connectors



***404**
Antistatic strips



***409**
Stainless-steel
clad forks



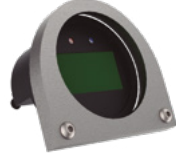
***405**
Ex t (IP65)
valves, coils,
sensors



***406**
GALI control
system to prevent
overheating and
insulation fault



***407**
Protection
displays:
Ex t (IP65)



***408**
Ex t (IP65)
enclosures for
relays, fuses,
contactors, etc



CAT 2D

* Scheme for commercial reference only, the final product may change.

Diesel GALIDUX CAT 2D or 3D for Zone 21 or 22 Dust

GALI protects Diesel industrial vehicles for safe operation in ATEX Zone 21 or Zone 22. Areas where the presence of dust and powder may create an ignition hazard.

All possible ignition sources are protected to assure that the vehicle is safe to operate in a potential explosive atmosphere.

Typical conversion done in the vehicle may include: flameproof Ex t IP65 enclosures, surface, gases and coolant temperature control, Ex t IP65 starter motors, Ex e mb batteries, Ex d/Ex t alternator, spark arrestor, exhaust gases heat exchanger, Ex i intrinsically safe electrical circuits, stainless steel forks, etc.



“engine components are protected to ensure the vehicle to safely operate where explosive air mixture with dust or power might be present.”



CAT 2D

* Scheme for commercial reference only, the final product may change.

What optional elements of an industrial vehicle can we offer?

GALI Ex protection allows all kind of industrial vehicles and machinery to safe operate in chemical, paints, coatings, defense, food, cosmetics, pharmaceutical, mining, petrochemical and other industries.

We provide also the conversion for many additional elements incorporated in the vehicles.

- * Cabin heating & air conditioning.
- * Working lights: front/rear, blue-light, cabin light, accessories lights,...
- * Flashing beacon.
- * Front and rear Ex d wiper.
- * Fleet manager or other managing controls.
- * Turbo coating protection for diesel vehicles in accordance to STAGE V standards.
- * DPF coating protection for diesel vehicles in accordance to STAGE V standards.
- * Atex batteries.

“Gali provides full service for the entire working life of the vehicle.”





lights



lights



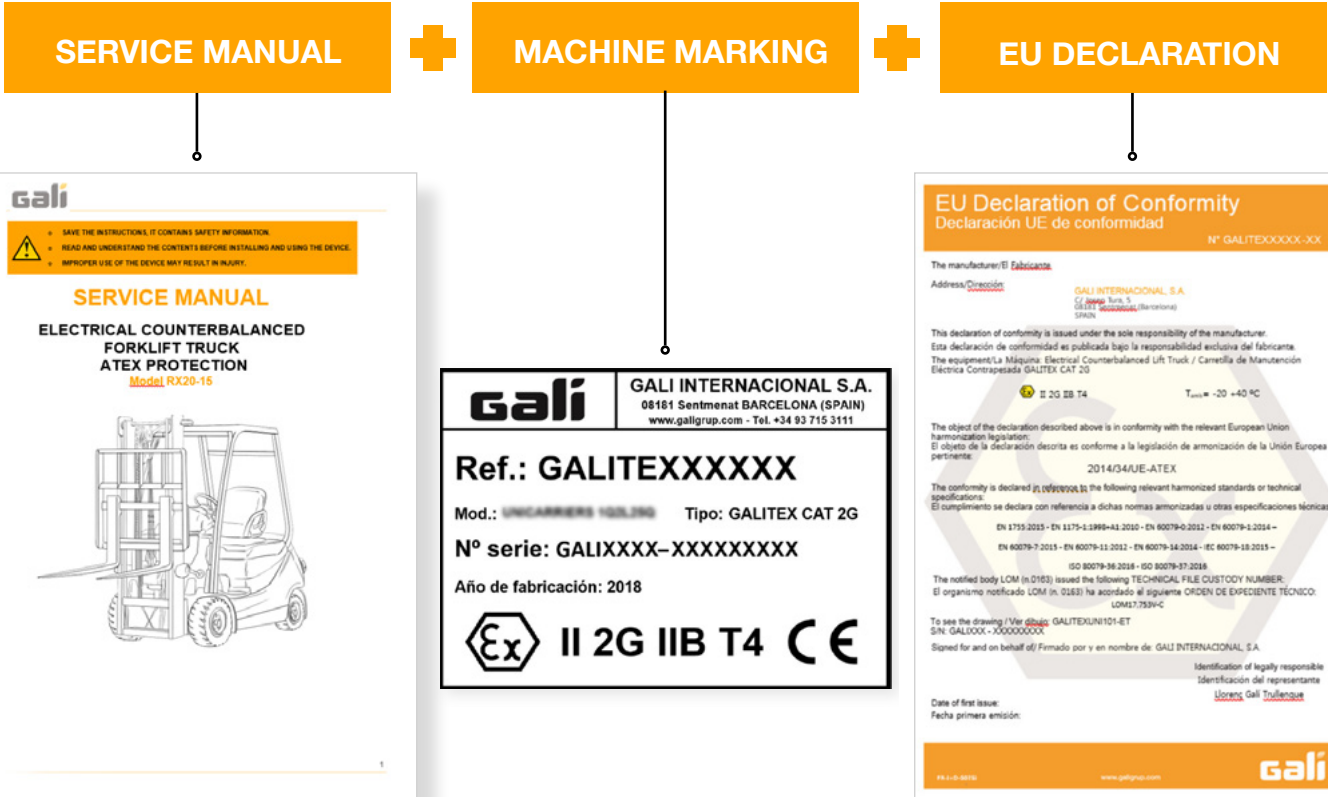
wiper



battery connectors

Certification, testing & technical documentation

All Gali protections are according to ATEX 2014/34/EU based on the European EN 1755:2015 standards. We have our in-house testing facilities to ensure the best quality during all the process of the Ex-conversion.



Maintenance & after sales service

GALI offers a repair and maintenance service for its conversions, available either at our own installations or at customer's locations, providing a fast response and availability of the needed spare parts.



“explosion proof protection for all type of mobile industrial vehicles.”



“availability of spare parts and on-time after sales service on site.”



“all potential sources of ignition are protected assuring a safe ATEX vehicle.”

SegurATEX

The ATEX 94/92/CE Users' Directive obliges to maintain the safety level of the industrial vehicle during its life time.

The obliged maintenance includes the regular inspection of key safe points of the vehicle.

Gali offers its SegurATEX detailed inspection for its Ex conversions to ensure that the client's Ex vehicles maintain its original level of protection.

Following the EN 60079-17:2014, the Detailed inspection shall be done every three years.

Ism-ATEX courses

All preventive, maintenance and repair service have to be performed by an ATEX trained personnel in accordance with the manufacturer instruction manual.

GALI offers Ism-ATEX courses, leading to a personal INERIS certificate, providing the after sales teams and engineers with the necessary knowledge to manage the risk involved in potentially explosive atmospheres.

Courses for commercials teams and end users.



ELECTRIC						
GAS			DUST		GAS + DUST	
ZONE 1	ZONE 2	ZONE 2	ZONE 21	ZONE 22	ZONE 1 & 21	ZONE 2 & 22
CAT 2G GALITEX	CAT 3G GALITEX	CAT 3G GALIGAS (ACTIVE protection)	CAT 2D GALIDUX	CAT 3D GALIDUX	CAT 2GD GALITEX-DUX	CAT 3GD GALITEX-DUX

DIESEL						
GAS			DUST		GAS + DUST	
ZONE 1	ZONE 2	ZONE 21	ZONE 22	ZONE 1 & 21	ZONE 2 & 22	
CAT 2G GALITEX	CAT 3G GALITEX	CAT 2D GALIDUX	CAT 3D GALIDUX	CAT 2GD GALITEX-DUX	CAT 3GD GALITEX-DUX	



“Gali participates in the international ATEX committees as Spanish technical expert.”

Ism-ATEX Nivel 1EM
Curso de capacitación para técnicos de mantenimiento de instalaciones en ATEX Instalaciones para/en ATEX Zona 1/21 - Zona 2/22. Las carretillas de manutención son instalaciones móviles.
Obtención de Carnet de capacitación Ism-ATEX (evaluación a superar) Certificado expedido por el Organismo Notificado Francés INERIS*
* El Certificado Ineris es de validez TRES años, con puesta al día. Quien realice la puesta al día debe informar del nº de Certificado/carnet que renueva.
Duración 3 días
Horario 8.30h -13.30h y 14.30h - 17.30h
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