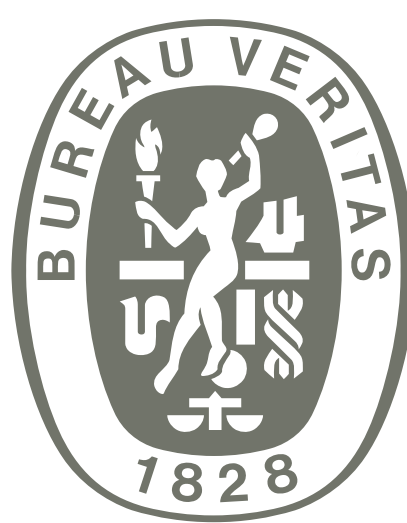




FOR EUROPE



LCIE



FOR INTERNATIONAL

# SIMULTANEOUS APPROVALS

Providing access to ATEX and IECEx global markets

Single set of tests and assessment  
Electrical and mechanical standards are technically identical  
Requirements for manufacturers' quality assurance are identical

## PROTECTION CONCEPTS

GAS ATMOSPHERES							
Installation	ATEX category	IEC Protection Level	Mode of Protection	IEC / EN Standards	EN Standards	ISO / IEC Standards	Protection concept
ZONE 2 ZONE 1 ZONE 0	II 10	EPL Ga	db	60079-10			Zones classification
			ds	60079-10			General requirements
			ia	60079-11			Flameproof enclosure
			ma	60079-18			Intrinsic safety
				60079-25			Encapsulation
				60079-26			Intrinsically safe system
				60079-27			Equipment protection level EPL Ga
				60079-27			FISCO and FNICO
				60079-28			Optical radiation
				60079-34			Quality system for elec. and non elec. equipment
ZONE 2 ZONE 1	II 20	EPL Gb	px	60079-2			General requirements
			py	60079-2			Flameproof enclosure
			qx	60079-2			Pressurised enclosure
			qy	60079-2			Pressurised enclosure
			a	60079-4			Powder filled
			eb	60079-7			Oil immersion
			ib	60079-11			Increased safety
			mb	60079-18			Intrinsic safety
				60079-25			Encapsulation
				60079-26			Intrinsically safe system
ZONE 2	II 30	EPL Gc	op is / op sh / op pr	60079-27			FISCO and FNICO
				60079-28			Optical radiation
				60079-34			Quality system for elec. and non elec. equipment
				60079-34			Non electrical equipment. General requirements
				60079-37			Non electrical equipment. Constructional safety
				60079-37			Non electrical equipment. Control of ignition
				60079-37			Non electrical equipment. Liquid immersion
				60079-37			Non electrical equipment. Liquid immersion
				60079-37			Non electrical equipment. Liquid immersion
				60079-37			Non electrical equipment. Liquid immersion
ZONE 2 ZONE 1 ZONE 0	II 10, II 20, II 30	EPL Ga, Gb, Gc	dc	60079-0			General requirements
			pz	60079-1			Flameproof enclosure
			ec	60079-2			Pressurisation
			ic	60079-7			Increased safety
			na	60079-11			Intrinsic safety
			nc	60079-15			Non sparking
			nL	60079-15			Energy limited
			nR	60079-15			Restricted breathing
			mc	60079-18			Encapsulation
				60079-25			Intrinsically safe system

DUST ATMOSPHERES							
Installation	ATEX category	IEC Protection Level	Mode of Protection	IEC / EN Standards	EN Standards	ISO / IEC Standards	Protection concept
ZONE 22 ZONE 21 ZONE 20	II 10	EPL Da	id	61241-0			Zones classification
			iaD	61241-1			General requirements
			id	61241-1			Intrinsic safety
			iaD	61241-1			Encapsulation
			pD	61241-4			Intrinsically safe system
				61241-0			Protection by enclosure
				61241-1			Pressurised enclosure
				61241-1			Quality system for elec. and non elec. equipment
				61241-1			Non electrical equipment. General requirements
				61241-4			Non electrical equipment. Constructional safety
ZONE 22 ZONE 21 ZONE 20	II 20	EPL Db	ib	60079-0			General requirements
			ib	60079-11			Intrinsic safety
			mb	60079-18			Encapsulation
			ib	60079-25			Intrinsically safe system
			ib	60079-26			Protection by enclosure
			id	61241-0			General requirements
			iaD	61241-1			Protection by enclosure
			pD	61241-4			Pressurised enclosure
				60079-34			Quality system for elec. and non elec. equipment
				60079-36			Non electrical equipment. General requirements
ZONE 22 ZONE 21 ZONE 20	II 30	EPL Dc	ic	60079-0			General requirements
			ic	60079-11			Intrinsic safety
			ic	60079-25			Intrinsically safe system
			ic	60079-31			Protection by enclosure
			id	61241-0			General requirements
			iaD	61241-1			Protection by enclosure
			icD	61241-1			Intrinsic safety
			mc	60079-18			Encapsulation
				60079-34			Quality system for elec. and non elec. equipment
				60079-36			Non electrical equipment. General requirements

## EXPLOSIVE ATMOSPHERES

### GAS GROUPS

- I : Methane\*
  - IIA : Propane\*
  - IIIB : Ethylene\*
  - IIIC : Hydrogen\*
- [\* Representative gas]

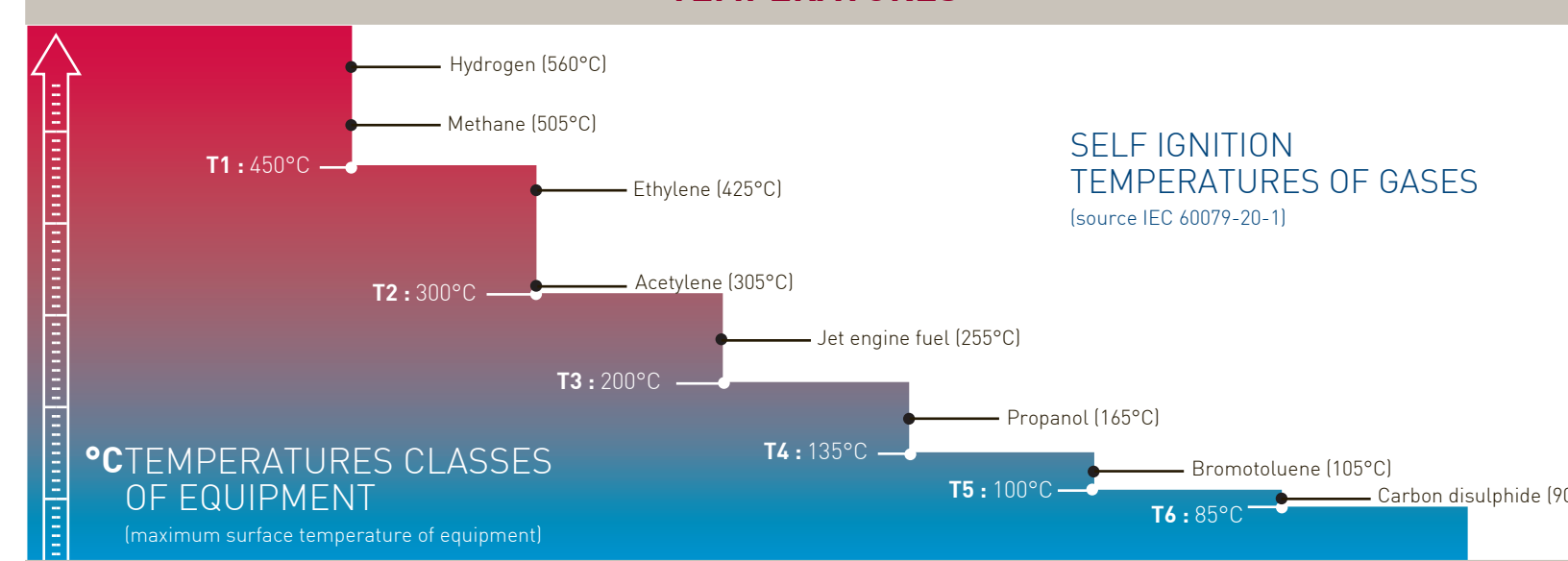
### DUST GROUPS

- IIA : Combustible flyings
- IIIB : Non conductive dust
- IIIC : Conductive dust

### EQUIPMENT

ATEX CATEGORY	IEC PROTECTION LEVEL (EPL)	ZONE OF INSTALLATION	ATMOSPHERE
1G	Ga	0	GAS
2G	Gb	1	
3G	Gc	2	
1D	Da	20	DUST
2D	Db	21	
3D	Dc	22	
M1	Ma	MINING	COAL DUST METHANE
M2	Mb		

### TEMPERATURES



## INGRESS PROTECTION OF ENCLOSURES ACCORDING TO EN/IEC 60529

### PROTECTION AGAINST SOLID BODIES

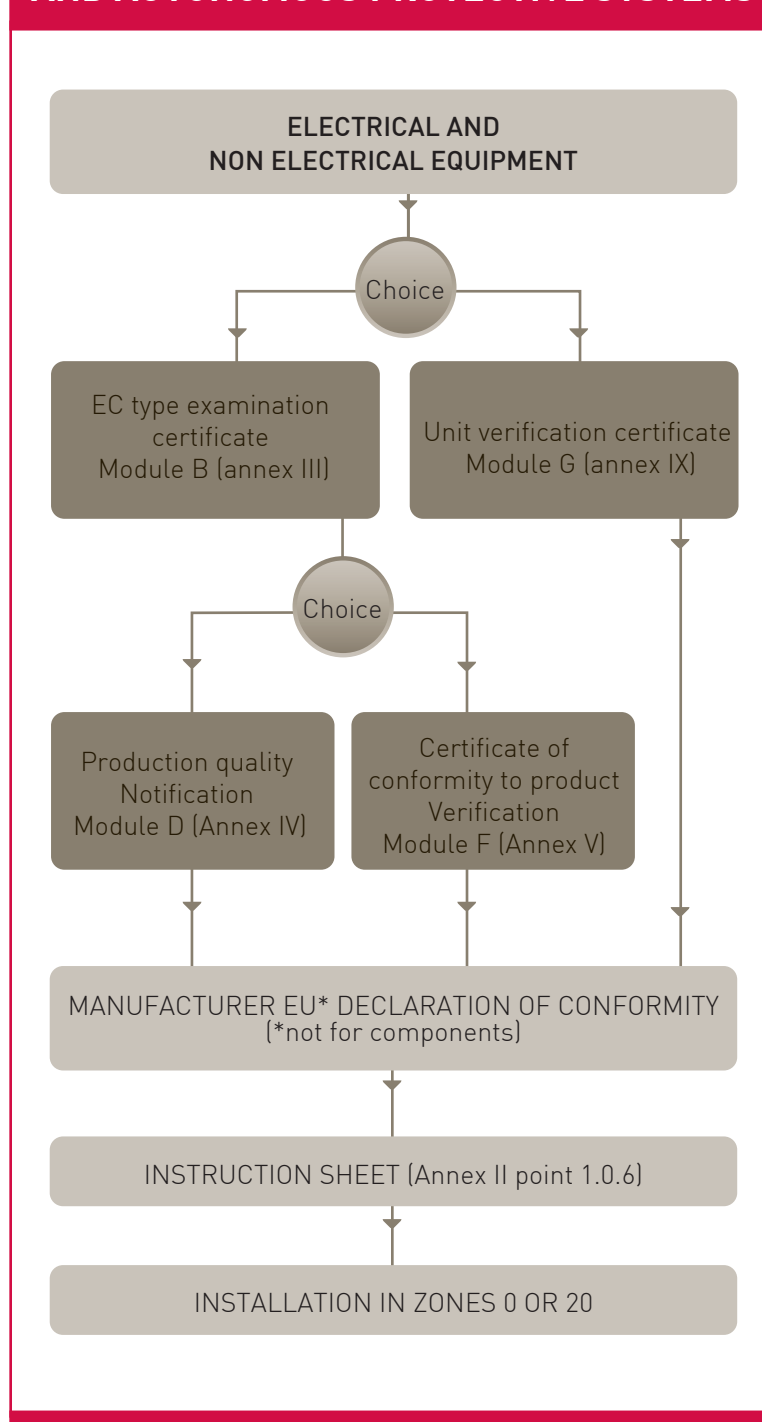
IP	TESTS
0	No protection
1	Protected against solid bodies larger than 50mm (e.g. accidental contact with hand)
2	Protected against solid bodies larger than 12,5mm (e.g. finger of the hand)
3	Protected against solid bodies larger than 2,5mm (tools, wires)
4	Protected against solid bodies larger than 1mm (fine tools, small wires)
5	Protected against dust (no harmful deposit)
6	Completely protected against dust

### PROTECTION AGAINST LIQUIDS

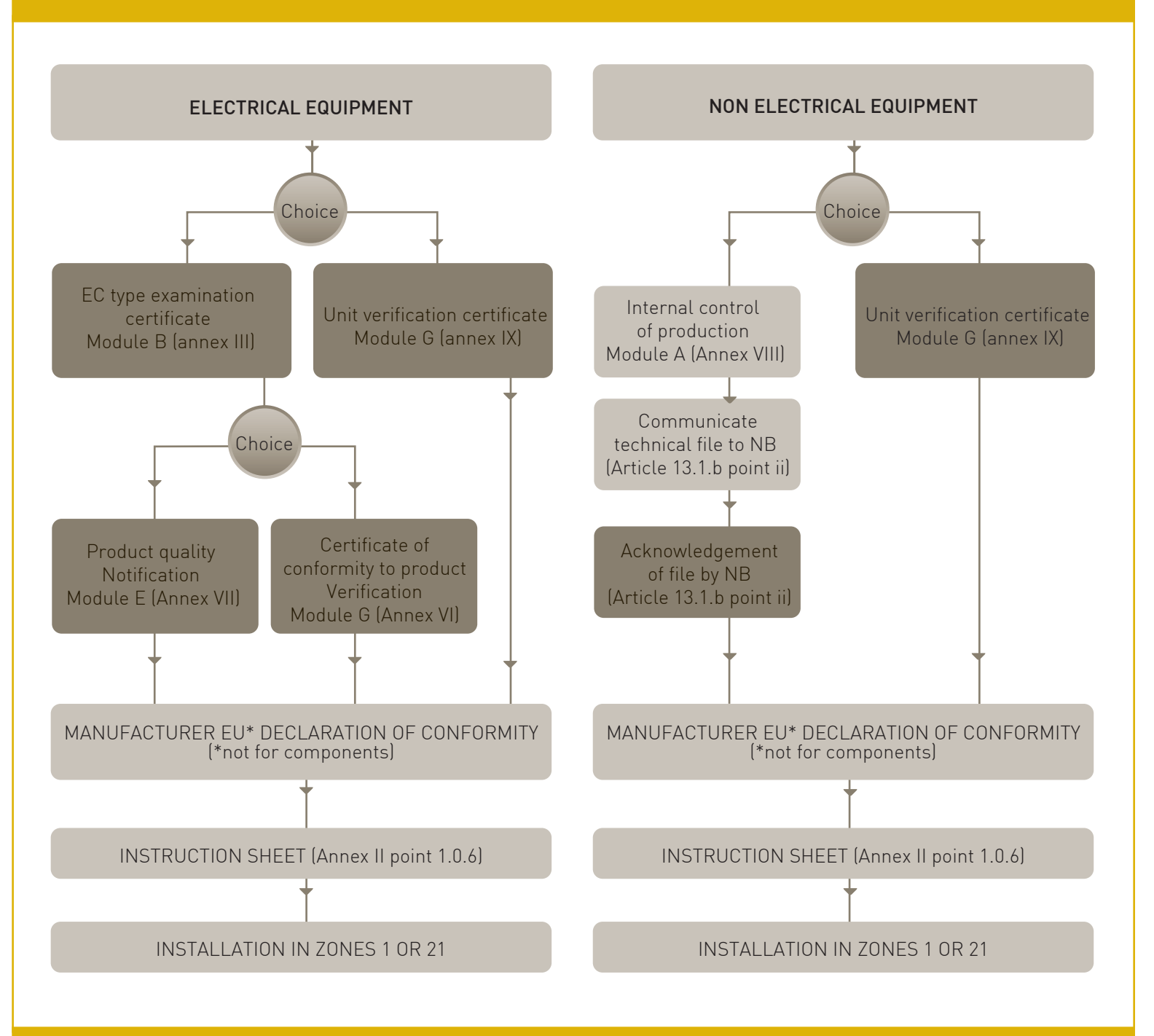
IP	TESTS
0	No protection
1	Protected against vertically falling drops of water (condensation)
2	Protected against drops of water falling at up to 15° from the vertical
3	Protected against drops of water falling at up to 60° from the vertical
4	Protected against projections of water from all directions
5	Protected against jets of water from all directions
6	Completely protected against jets of water of similar force to heavy sea
7	Protected against the effects of immersion
8	Protected against the effects of prolonged immersion under specified conditions

## ATEX CERTIFICATION PROCEDURES 2014/34/EU

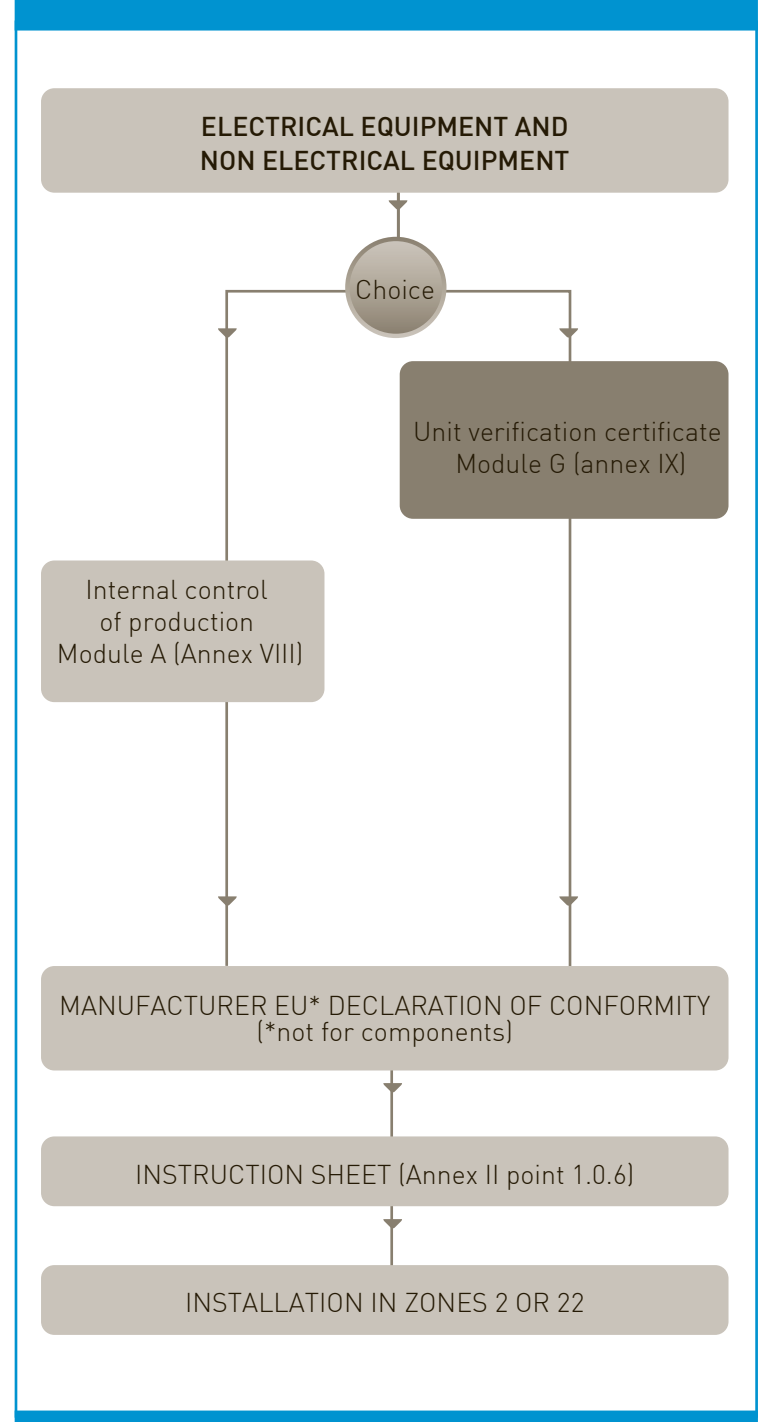
### EQUIPMENT GROUP I CATEGORY M1 EQUIPMENT GROUP II CATEGORY 1 AND AUTONOMOUS PROTECTIVE SYSTEMS



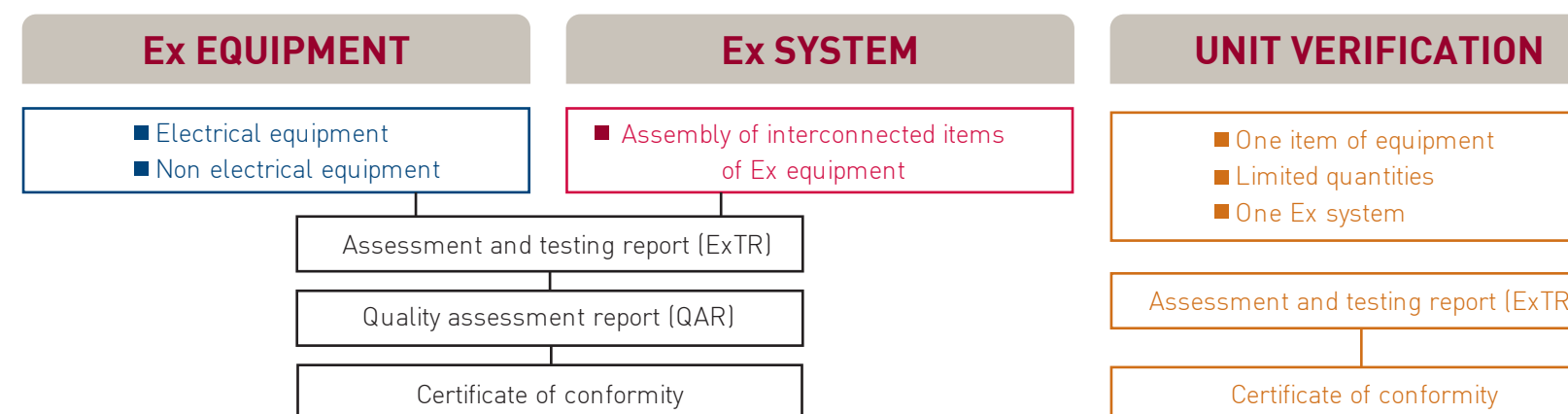
### EQUIPMENT GROUP I CATEGORY M2 EQUIPMENT GROUP II CATEGORY 2



### EQUIPMENT GROUP II CATEGORY 3



## IECEx CERTIFICATION SYSTEM



## GENERAL INFORMATION

ZONES / DIVISIONS CLASSIFICATION					
Country	Explosive atmosphere	Reference	Continuously present	Often present	Accidentally present
USA	GAS/DUST	NEC 500		Division 1	Division 2
	GAS	NEC 505	Class I - Zone 0	Class I - Zone 1	Class I - Zone 2
	DUST	NEC 506	Zone 20	Zone 21	Zone 22
Europe / International	GAS	EN/IEC 60079-10	Zone 0	Zone 1	Zone 2
	DUST	EN/IEC 60079-10	Zone 20	Zone 21	Zone 22

COMPARISON IEC / CENELEC AND NEC					
Class	Division	Group	REPRESENTATIVE SUBSTANCES		IEC / EUROPE
			Zone	Group	
GAS	I	A	Acetylene		0-1-2
		B	Hydrogen		
		C	Cyclopropane, Ethyl ether, Ethylene		
		D	Acetone, Benzene, Butane, Propane, Hexane, Paint solvent, Natural gas		
		E	Magnesium, Aluminium, Conductive dust with R < 10^9 Ohms/cm		
DUST	II	F	Coal		20-21-22
		G	Flour, Conductive dust with R > 10^9 Ohms/cm		
FIBER FLYINGS*	III	1-2	Cotton, Linen, Wood, Hemp		20-21-22

\* div. 1 - when handled, manufactured or used  
div. 2 - when stored, handled but not in manufacturing process

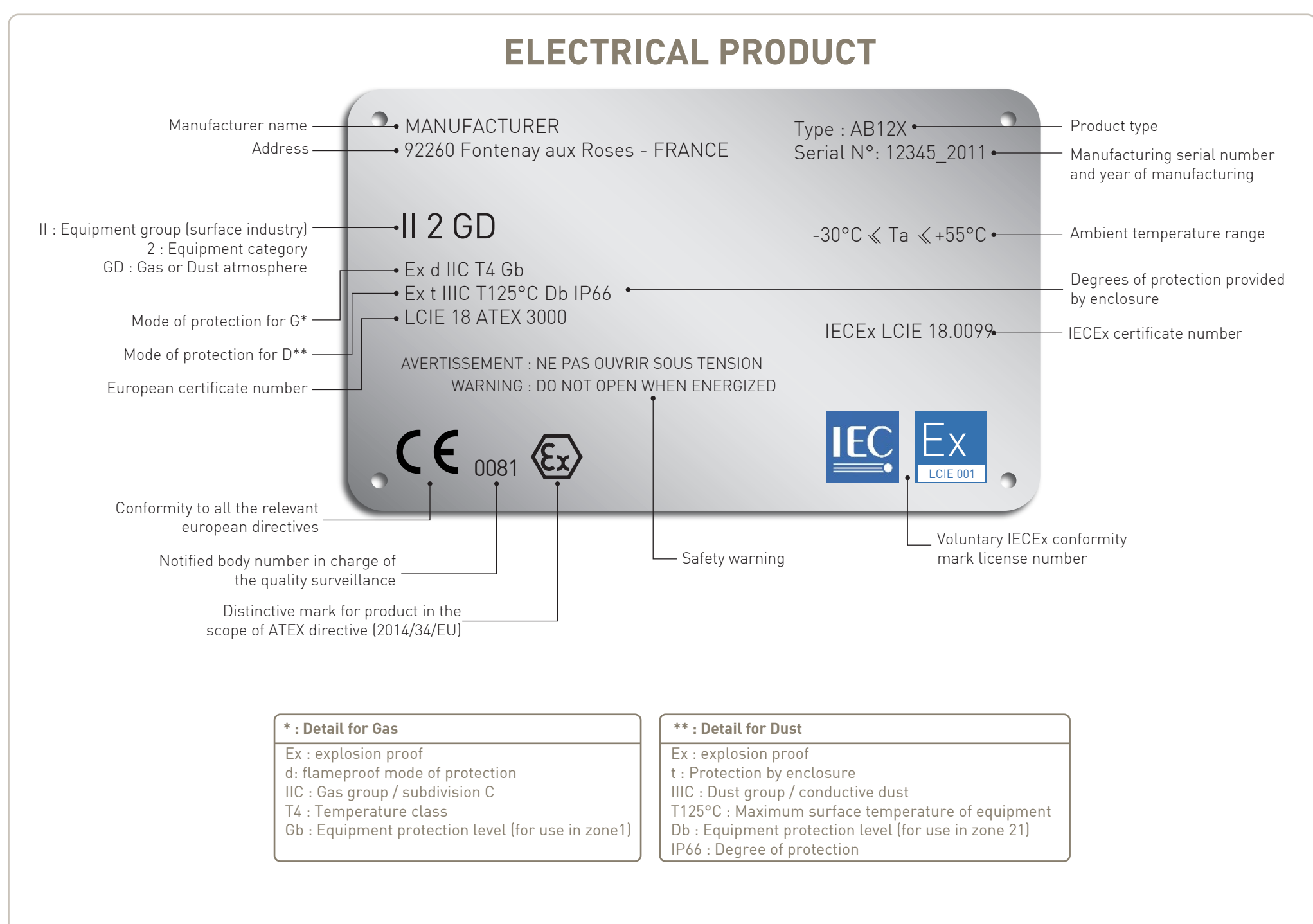
### ATEX SAFETY DEVICES

Zone of use of the EUC	Safety device ensuring the safety alone. Safety is ensured even if one fault occurs on the EUC.	Additional Safety device. Safety is ensured even if two faults occur on the EUC.
Zone 0	HFT = 1 and SIL 2	HFT = 0 and SIL 1
Zone 1	HFT = 0 and SIL 1	No requirement
Zone 2	No requirement	No requirement

## LCIE BUREAU VERITAS SERVICES

CERTIFICATION SERVICES			ACCESS TO LOCAL NATIONAL CERTIFICATION		
Product certification	Audits	Testing	Country	Documentation	Local LCIE partner
Technical consultancy	Storage of technical documentation	SIL (Safety Integrity Level)	China	Chinese explosion proof certificate	NEPSI / SIPAI / CCTEG
			Korea	Korean national certificate	KGS / KTL
			Brazil	INMETRO certificate	BV Brazil / NCC
			Russia	TRCU certificate (EAC)	NANO CCVE
TRAINING	INSPECTION OF INSTALLATIONS	QUALIFICATION OF REPAIR SHOPS	QUALIFICATION OF PERSONNEL		
Standard and customized training :	Gap analysis program :	Scheme for motors :	4 levels program :		
FORMATEX	ECARATEX	REPARATEX	QUALIFATEX		

## PRODUCT MARKING



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