



DIRECTIVE 94/9/CE (ATEX= ATMOSPHERE EXPLOSIVE) OF THE EUROPEAN PARLIAMENT AND COUNCIL (MARCH 23, 1994): IMPACT ON LIGHTING FIXTURES

APPLICATIONS

Polycarbonate and steel waterproof fixtures can be installed outdoors or indoors, in industrial areas, cantilever roofs, environments at risk of fire, and in any other premise compatibly with the fumes and atmospheric or chemical agents which affect the use of plastic materials: check compatibility with corrosive agents.

APPLICATION OF RELEVANT REGULATION:

- Directive 94/9/CE (ATEX) was enforced and made compulsory on 30 June 2003. Back in January 1998 the CEI 64-2 regulation was replaced for the classification of hazardous areas and for the construction of electrical equipment suitable for potentially explosive atmospheres containing GAS (C1 and C3 environments).

- The directive applies to electrical and non-electrical products used in explosive atmospheres. The following are excluded from this directive:
 - medical equipment used in medical environments;
 - protection equipment and systems, when the risk of explosion is exclusively due to the presence of explosive substances;
 - equipment suitable for domestic use, not suitable for commercial areas where the atmosphere is rarely explosive and can only become so in case of a gas leak;
 - individual safety devices, as per directive 89/689/CEE;
 - sea-going ships and mobile offshore units;
 - means of transport (vehicles and related trailers); however, vehicles used in potentially explosive areas are not excluded;
 - weapons, ammunition and war material.

- Equipment suitable for AD/FT systems became obsolete in July 2003. Therefore, this identification will be deleted from new classification and construction regulations for explosion-prone environments.

- The new classification of explosion-prone areas identifies hazardous environments where the atmosphere contains gas substances (vapours or mists) with ZONE 0, ZONE 1, ZONE 2. Hazardous environments containing explosive substances and combustible powders are referred to as ZONE 20, ZONE 21, ZONE 22.

ZONE 0 = an area where the atmosphere is constantly filled with explosive gas over long periods of time.

ZONE 1 = an area where lighting fixtures can operate in an explosive gas-filled atmosphere.

ZONE 2 = an area where an explosive gas-filled atmosphere is not allowed when a lighting fixture is operating normally. An explosion-prone atmosphere is a rare occurrence and only lasts for a very short period of time.

ZONE 20 = an area where the atmosphere is filled with combustible powders either permanently or over long periods of time, or frequently.

ZONE 21 = an area where the atmosphere occasionally contains combustible powders when the lighting fixture is operating normally.

ZONE 22 = an area where the atmosphere is unlikely to be filled with combustible powders when the lighting fixture is operating normally. An explosion-prone atmosphere is a rare occurrence and only lasts for a very short period of time.

- a notified Organization should be in charge of prototype certification and product control, which are compulsory requirements for ZONE 0, 1, 20 and 21 as regards electrical equipment. In-house manufacturing checks and the creation of a technical file confirming product compliance (attachment II of 94/9/Ce) are required for ZONE 2 and 22, and should be guaranteed for the entire production line (attachment VIII of 94/9/Ce).

- zone 2 and 22 represent the largest areas as regards hazardous environments.

- "Former AD/FT" products can be installed in hazardous areas 2 and 22, provided basic safety requirements are complied with. Electrical systems used in zone 2 should be designed using the "n" protection system, according to regulation CEI EN 60079-15 (CEI 31-64), while the electrical systems developed for zone 22 should be designed according to regulations CEI EN 61241-0 (CEI 31-73) and CEI EN 61241-1 (CEI 31-69).



CATEGORIES OF ELECTRICAL FIXTURES:

- Category 1: certification by notified body
- Category 2: certification by notified body.
- Category 3: certification by manufacturer.

Currently Disano Illuminazione manufactures **category 3** lighting fixtures suitable for **zones 2 and 22**.

ZONE	Overall duration of ATEX in one year (CEI 31-35)
Zone 0 =	Over 1000h
Zone 1 =	Over 10h until 1000h
Zone 2 =	Over 0.1h until 10h

- Examples of DISANO products

Article	Electric gear	Zone 2	Zone 22
921 Hydro	CEL-F	X	
992EL Eterna	CEL-F	X	X
994EL Forma	CEL	X	X

- Hazardous places according to Legislative Decree 233/03

Business	Places
chemical and petrochemical industry	gas-fuelled heating plants with P>35Kw
pharmaceutics industry	garages, repair shops body shops
metal processing	fuel distribution
food industry (storage and processing of cereals, flour and sugar)	bread baking ovens
processing of wood	places where painting processes occur
fabric and spinning industry	distilleries, production of alcoholic beverages

- Place: Paint factory

Flammable substances	T start	[°C]
Decane		201
Hydrogen		500
Methyl Chloride	•	625
Cyclohexanol	•	300
Amyl acetate		360
Benzole		498
Formaldehyde		424
Propane		470
Kerosene		210
Butyl cellosolve	•	239
Ethyl acetate	•	426
Acetone	•	465

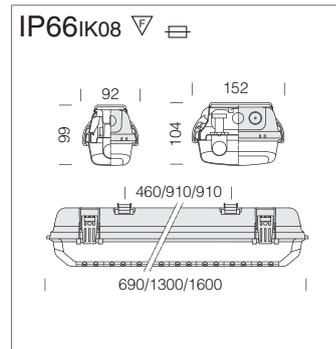
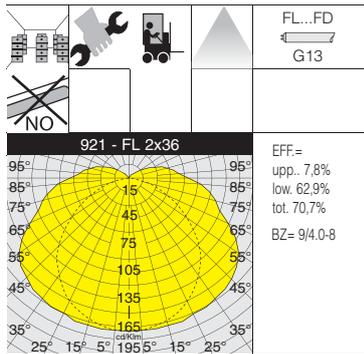
ELECTRICAL SYSTEMS FOR AREAS CONTAINING EXPLOSIVE GAS:	
Ex nA II 3G T6 Ta -20°C ÷ +40°C	
Ex =	ELECTRICAL SYSTEM BUILT AND TESTED FOR UTILIZATION IN AN ATMOSPHERE FILLED WITH EXPLOSIVE GASSES.
nA =	THE ELECTRICAL SYSTEM DOES NOT PRODUCE SPARKS WHEN OPERATING NORMALLY.
II =	ELECTRICAL SYSTEM SUITABLE FOR AREAS WITH A POTENTIALLY EXPLOSIVE ATMOSPHERE, DIFFERENT FROM MINES, WITH FIREDAMP.
3 =	CATEGORY 3 APPLIANCE.
G =	PROTECTION AGAINST GAS CATCHING FIRE.
T6 =	MAXIMUM INTERNAL OR EXTERNAL SURFACE TEMPERATURE; CLASSIFICATION ACCORDING TO REGULATION CEI EN 60079-0 TABLE 2
Ta =	AMBIENT TEMPERATURE FOR USE IN COMPLIANCE WITH THE ELECTRICAL SYSTEM.

ELECTRICAL SYSTEMS FOR AREAS CONTAINING EXPLOSIVE POWDERS:	
Ex II 3D tD A 22 IP6X T 100°C	
Ex =	ELECTRICAL SYSTEM BUILT AND TESTED FOR UTILIZATION IN AN ATMOSPHERE CONTAINING COMBUSTIBLE POWDERS.
II =	ELECTRICAL SYSTEM FOR AREAS WITH A POTENTIALLY EXPLOSIVE ATMOSPHERE, DIFFERENT FROM MINES, WITH FIREDAMP.
3D =	CATEGORY 3 APPLIANCE.
tD =	DUST-PROOF BOX. PROTECTS AGAINST ALL VISIBLE DUST PARTICLES.
A =	METHOD A: PROTECTS AGAINST EXPLOSION.
22 =	PERMITTED HAZARDOUS AREA.
IP6X =	BOX ENTIRELY PROTECTED AGAINST DUST
T 100°C =	MAXIMUM TEMPERATURE IN A DUST-FREE ENVIRONMENT

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SELECTION OF ELECTRICAL SYSTEMS IN RELATION TO HAZARDOUS AREAS		
HAZARDOUS AREA	CLASSIFICATION	PROTECTIONS PERMITTED
	0	“ia” INTRINSIC SAFETY ACCORDING TO REGULATION CEI EN 50020
ATMOSPHERE CONTAINING GAS Explosion-prone electrical systems CEI EN 60079-14	1	“D” explosion-proof protection boxes according to regulation ceI en 60079-1 “P” internal overpressure systems according to regulation ceI en 60079-2 “Q” can be filled with sand according to regulation ceI en 50017 “O” oil immersion according to regulation ceI en 50015 “E” higher safety levels according to regulation ceI en 60079-7 “I” intrinsic safety according to regulation ceI en 5002 “M” encapsulation according to regulation ceI en 50028
	2	“D” explosion-proof protection boxes according to regulation ceI en 60079-1 “P” internal overpressure systems according to regulation ceI en 60079-2 “Q” can be filled with sand according to regulation ceI en 50017 “O” oil immersion according to regulation ceI en 50015 “E” higher safety levels according to regulation ceI en 60079-7 “I” intrinsic safety according to regulation ceI en 50020 “M” encapsulation according to regulation ceI en 50028 “N” standard protection system according to regulation ceI en 60079-15
ATMOSPHERE CONTAINING powders electrical systems protected by protection boxes	20	GROUP II CATEGORY 1 EQUIPMENT
	21	GROUP II CATEGORY 1,2 EQUIPMENT
	22	GROUP II CATEGORY 1,2,3 EQUIPMENT

RELEVANT REGULATIONS	
Directive 94/9/CE entrusts conformed European regulations with the task of setting out basic technical requirements to guarantee safety in explosion-prone areas, replacing contrasting national and European regulations belonging to the same sector.	
CEI EN 60079-0	Electrical systems for potentially explosive atmospheres GENERAL REGULATIONS
CEI EN 60079-15	Electrical systems for potentially explosive atmospheres. PROTECTION METHOD “n”
CEI EN 60079-10	Electrical systems for potentially explosive atmospheres containing gasses CLASSIFICATION OF HAZARDOUS AREAS
CEI EN 60079-14	Electrical systems for potentially explosive atmospheres containing gasses ELECTRICAL SYSTEMS FITTED IN EXPLOSION-PRONE AREAS
CEI EN 61241-14	Electrical systems used in areas containing combustible powders. Part 14: selection and installation
CEI EN 61241-17	Electrical systems used in areas containing combustible powders. Part 17: check and maintenance
CEI EN 61241-0	Electrical systems used in areas containing combustible powders. Part 0: general rules
CEI EN 61241-1:	Electrical systems used in areas containing combustible powders. Part 1: protection using “tD” protection boxes



Housing: injection moulded in grey polycarbonate, RAL 7035, vandal resistant and self-extinguishing, UV stabilized, high mechanical resistance, supplied with stainless steel latches.

Diffuser: injection moulded, in clear polycarbonate, prismatic on the inside, self-extinguishing and UV stabilized.

Reflector: in pre-enamelled galvanized steel, white, anti-yellowing treatment.

Gaskets: all the gaskets are integrated and made of anti-ageing material.

Cable gland: resistant to impact, suitable for application in explosion-prone areas.

Electronic ballast: cathode pre-heating, thermal protection and energy efficiency class A2.

Internal electric gear: single-pole PVC cable with 0.5 sq mm cross section, heat resistant at 90°C.

921 Hydro ATEX ATEX certification by a third party IMQ 09 ATEX 030 X CEL-F			
wattage	weight	code	classification ATEX
FL 1x18	1.40	164520-00	Ex nAII3GT4
FL 1x36	2.10	164521-00	Ex nAII3GT4
FL 1x58	2.80	164522-00	Ex nAII3GT4
FL 2x18	1.80	164523-00	Ex nAII3GT4
FL 2x36	2.80	164524-00	Ex nAII3GT4
FL 2x58	3.60	164525-00	Ex nAII3GT4

Not to be installed on surfaces subject to strong vibrations, outdoor or on hanging ropes, walls, under metal grids, rods, or in any event, exposed to direct sunlight.

CATEGORY 3D

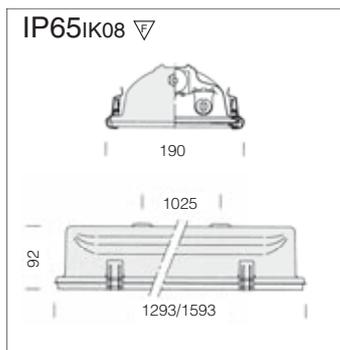
These lighting fixtures can be used solely in class 22 areas, in a combustible powder-free atmosphere when operating normally. However, should this happen, it would only last for a very short period of time. The lighting fixture guarantees the protection level required when operating normally.

921 EL Hydro - 994 EL FORMA ATEX CEL-F	
Protection against explosions	Ex nA II 3G
Hazardous area permitted	Zone 2
Ambient temperature permitted	ranging from +10°C and +30°C; 2X58W from +10°C and +30°C
Protection level	IP66
Mechanical resistance of the casing	IK08 (5J)
Relevant regulations	CEI EN 60598-1 CEI 60598-2-1 CEI EN 60529 CEI EN 50102 CEI EN 60079-0 CEI EN 60079-15

"n" PROTECTION

It is a protection system applied to the electric gear so as to prevent an explosion-prone atmosphere from igniting when operating normally, and in some atypical conditions. These lighting fixtures can be used solely in class 2 areas, namely, in those areas where the atmosphere is unlikely to contain gas and to become explosive when operating normally. If that occurs, the presence of an explosion-prone atmosphere is rare and only lasts for a very short period of time. This protection system applies solely to lighting fixtures and group II electrical components, category 3G.

992 EL ETERNA - 994 EL FORMA ATEX CEL-F	
Protection against explosions	Ex II 3D tD A 22; EX nA II 3G
Hazardous area permitted	Zone 22; Zone 2
Ambient temperature permitted	ranging from -20°C and +40°C 3x58W from -20°C and + 30°C
Protection level	IP65
Mechanical resistance of the casing	IK10 (20J)
Relevant regulations	CEI EN 60598-1 CEI EN 60598-2-1 CEI EN 60529 CEI EN 50102 CEI EN 61241-0 CEI EN 61241-1 CEI EN 60079-0 CEI EN 60079-15



Housing/Frame: in steel drawn in a single piece with high mechanical resistance.

Reflector: in white aluminium.

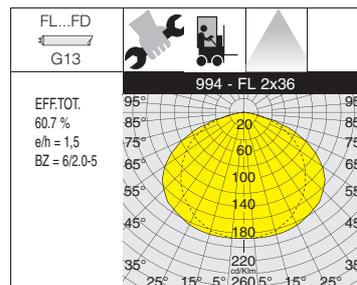
Diffuser: tempered glass, 5 mm thick, resistant to thermal shock and impact.

Gaskets: integrated gaskets made of silicone rubber, resistant to low and high temperatures.

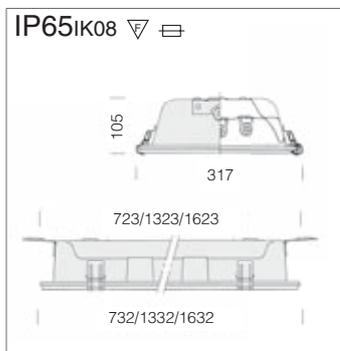
Cable gland: in shock resistant metal, suitable for application in explosion-prone areas, working temperature: -30°C to +90°C.

Internal electric gear: single-pole PVC cable with 0.5 sq mm cross section, insulated, heat resistant at 90°C.

Power supply terminal: two poles + earth with maximum allowed lead cross section 2.5 sq mm.



994 Forma - ATEX certification by a third party IMQ 09 ATEX 034						
		CEL				
wattage	colour	weight	code	classification ATEX		
FL 1x36	s. silver	11.80	162475-00	Ex nAII 3 GT4		Ex tD A 22 T60°C
FL 1x58	s. silver	15.90	162476-00	Ex nAII 3 GT4		Ex tD A 22 T65°C
FL 2x36	s. silver	12.90	162477-00	Ex nAII 3 GT4		Ex tD A 22 T75°C
FL 2x58	s. silver	17.20	162478-00	Ex nAII 3 GT4		Ex tD A 22 T75°C



Housing/Frame: in AISI 304 18/8 stainless steel.

Reflector: in 99.85 high gloss aluminium, its large size guarantees high efficiency.

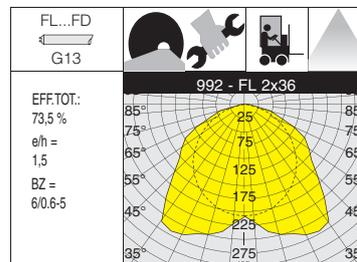
Diffuser: tempered glass, 5 mm thick, resistant to thermal shock and impact.

Gaskets: integrated gaskets made of silicone rubber, resistant to low and high temperatures.

Cable gland: in shock resistant metal, suitable for application in explosion-prone areas, working temperature: -30°C to +90°C.

Internal electric gear: single-pole PVC cable with 0.5 sq mm cross section, insulated, heat resistant at 90°C.

Power supply terminal: two poles + earth with maximum allowed lead cross section 2.5 sq mm.



992 Eterna - ATEX certification by a third party IMQ 09 ATEX 031						
		CEL-F				
wattage	colour	weight	code	classification ATEX		
FL 2x18	inox	6.90	162373-00	Ex nAII 3 G T4		Ex tD A 22 T70°C
FL 2x36	inox	11.80	162374-00	Ex nAII 3 G T4		Ex tD A 22 T60°C
FL 2x58	inox	15.90	162375-00	Ex nAII 3 G T4		Ex tD A 22 T70°C
FL 3x36	inox	12.90	162377-00	Ex nAII 3 G T4		Ex tD A 22 T70°C
FL 3x58	inox	17.20	162378-00	Ex nAII 3 G T4		Ex tD A 22 T75°C



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