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Table 18
Equipment suitable for explosive atmospheres
(See Rules 18-090, 18-100, 18-150, 18-190, 18-200, 18-250, J18-100, J18-150, J18-200, J18-250, J18-300, and J18-350.)

Area classification	Type (Level) of protection	
Zone 0	Intrinsic safety (Group II)	ia
	Encapsulation (Group II)	ma
	Flameproof (Group II)	da*
	Inherently safe optical radiation	op is, *with EPL Ga***
	Optical system with interlock	op sh, *with EPL Ga***
	Intrinsically safe	Intrinsically safe, IS, I.S., Exi, Exia, *for Class I*
	EPL††	Ga
Zone 1	Equipment suitable for use in Zone 0	
	Equipment suitable for use in Class I, Division 1	
	Flameproof (Group II)	d, db
	Intrinsic safety (Group II)	ib
	Increased safety (Group II)	e, eb
	Pressurized enclosure (Group II)	p, px, pxb, py, pyb
	Encapsulation (Group II)	m, mb
	Powder filling (Group II)	q, qb
	Liquid immersion (Group II)	o, ob
	Electrical resistance trace heating	60079-30-1, *with EPL Gb***
	Skin effect trace heating	CSA C22.2 No. 293.1, *with EPL Gb***
	Inherently safe optical radiation	op is, *with EPL Gb***
	Optical system with interlock	op sh, *with EPL Gb***
	Protected optical radiation	op pr, *with EPL Gb***
	EPL††	Gb
Zone 2	Equipment suitable for use in Zone 0	
	Equipment suitable for use in Zone 1	
	Equipment suitable for use in Class I, Division 1	
	Equipment suitable for use in Class I, Division 2	
	Type of Protection “n” (Group II)	nA, nC, nL, nR
	Pressurized enclosure (Group II)	pz, pzc
	Intrinsic safety (Group II)	ic
	Flameproof (Group II)	dc
	Increased safety (Group II)	ec
	Liquid immersion (Group II)	oc
	Encapsulation (Group II)	mc
	Electrical resistance trace heating	60079-30-1, *with EPL Gc***
	Skin effect trace heating	CSA C22.2 No. 293.1, *with EPL Gc***
	Impedance heating	CSA C22.2 No. 293.3, *with EPL Gc***
	Inherently safe optical radiation	op is, *with EPL Gc***
	Optical system with interlock	op sh, *with EPL Gc***
	Protected optical radiation	op pr, *with EPL Gc***
	EPL††	Gc
	Other electrical apparatus‡	
Zone 20	Equipment suitable for use in Class II, Division 1	
	Intrinsic safety (Group III)	ia
	Intrinsically safe	Intrinsically safe, IS, I.S., Exi, Exia, *for Class II*
	Protection by enclosure (Group III)	ta
	Encapsulation (Group III)	ma
	Inherently safe optical radiation	op is, *with EPL Da***
	Optical system with interlock	op sh, *with EPL Da***
	EPL††	Da
Group IIIA only	Equipment suitable for use in Class III, Division 1	

(Continued)

Table 18 (Continued)

Area classification	Type (Level) of protection	
Zone 21	Equipment suitable for use in Zone 20 Equipment suitable for use in Class II, Division 1	
	Intrinsic safety (Group III)	ib
	Protection by enclosure (Group III)	tb
	Pressurized enclosure (Group III)	p, px, pxb, py, pyb
	Encapsulation (Group III)	mb
	Electrical resistance trace heating	60079-30-1, *with EPL Db***
	Skin effect trace heating	CSA C22.2 No. 293.1, *with EPL Db***
	Inherently safe optical radiation	op is, *with EPL Db***
	Optical system with interlock	op sh, *with EPL Db***
	Protected optical radiation	op pr, *with EPL Db***
	EPL††	Db
Group IIIA only	Equipment suitable for use in Class III, Division 1	
Zone 22	Equipment suitable for use in Zone 20 Equipment suitable for use in Zone 21 Equipment suitable for use in Class II, Division 1 Equipment suitable for use in Class II, Division 2	
	Intrinsic safety (Group III)	ic
	Protection by enclosure (Group III)	tc
	Pressurized enclosure (Group III)	pz, pzc
	Encapsulation (Group III)	mc
	Electrical resistance trace heating	60079-30-1, *with EPL Dc***
	Skin effect trace heating	CSA C22.2 No. 293.1, *with EPL Dc***
	Impedance heating	CSA C22.2 No. 293.3, *with EPL Dc***
	Inherently safe optical radiation	op is, *with EPL Dc***
	Optical system with interlock	op sh, *with EPL Dc***
	Protected optical radiation	op pr, *with EPL Dc***
	EPL††	Dc
	Other electrical apparatus‡	
Group IIIA only	Equipment suitable for use in Class III, Division 2	
Class I, Division 1	Equipment marked for use in Class I, Division 1†	
	Intrinsically safe	Intrinsically safe, IS, I.S., Exi, Exia, *for Class I*
	Purged equipment to NFPA 496	Type X, *for Class I*
	Purged equipment to NFPA 496	Type Y, *for Class I*
	Equipment suitable for use in Zone 0	
	Intrinsic safety (Group II)	ia
	Encapsulation (Group II)	ma
	Flameproof (Group II)	da*
	Inherently safe optical radiation	op is, *with EPL Ga***
	Optical system with interlock	op sh, *with EPL Ga***
Class I, Division 2	Equipment suitable for use in Class I, Division 1	
	Equipment marked for use in Class I, Division 2†	
	Purged equipment to NFPA 496	Type Z, *for Class I*
	Equipment suitable for use in Zone 0, Zone 1, or Zone 2	
	Type of Protection “n” (Group II)	nA, nC, nL, nR
	Pressurized enclosure (Group II)	px, pxb, py, pyb, pz, pzc
	Intrinsic safety (Group II)	ia, ib, ic
	Flameproof (Group II)	da, db, dc
	Increased safety (Group II)	eb, ec
	Liquid immersion (Group II)	ob, oc
	Encapsulation (Group II)	ma, mb, mc
	Electrical resistance trace heating	60079-30-1, *with EPL Gb or Gc***
	Skin effect trace heating	CSA C22.2 No. 293.1, *with EPL Gb or Gc***
	Impedance heating	CSA C22.2 No. 293.3, *with EPL Gb or Gc***
	Inherently safe optical radiation	op is, *with EPL Ga, Gb, or Gc***
	Optical system with interlock	op sh, *with EPL Ga, Gb, or Gc***
	Protected optical radiation	op pr, *with EPL Gb or Gc***
	Other electrical apparatus‡	

(Continued)

Table 18 (Continued)

Area classification	Type (Level) of protection	
Class II, Division 1	Equipment marked for use in Class II, Division 1†	
	Intrinsically safe	Intrinsically safe, IS, I.S., Exi, Exia, *for Class II*
	Purged equipment to NFPA 496	Type X, *for Class II*
	Purged equipment to NFPA 496	Type Y, *for Class II*
	Equipment suitable for use in Zone 20§	
	Intrinsic safety (Group III)	ia
	Protection by enclosure (Group III)	ta
	Encapsulation (Group III)	ma
	Inherently safe optical radiation	op is, *with EPL Da***
	Optical system with interlock	op sh, *with EPL Da***
Class II, Division 2	Equipment suitable for use in Class II, Division 1	
	Equipment marked for use in Class II, Division 2†	
	Purged equipment to NFPA 496	Type Z, *for Class II*
	Equipment suitable for use in Zone 20, Zone 21, or Zone 22§	
	Intrinsic safety (Group III)	ia, ib, ic
	Protection by enclosure (Group III)	ta, tb, tc
	Pressurized enclosure (Group III)	px, pxb, py, pyb, pz, pzc
	Encapsulation (Group III)	ma, mb, mc
	Electrical resistance trace heating	60079-30-1, *with EPL Db or Dc***
	Skin effect trace heating	CSA C22.2 No. 293.1, *with EPL Db or Dc***
	Impedance heating	CSA C22.2 No. 293.3, *with EPL Db or Dc***
	Inherently safe optical radiation	op is, *with EPL Da, Db, or Dc***
	Optical system with interlock	op sh, *with EPL Da, Db, or Dc***
	Protected optical radiation	op pr, *with EPL Db or Dc***
	Other electrical apparatus‡	
Class III, Division 1	Equipment suitable for use in Class II, Division 1	
	Equipment marked for use in Class III, Division 1†	
	Intrinsically safe	Intrinsically safe, IS, I.S., Exi, Exia, *for Class II or Class III*
	Enclosure	Type 5‡‡
	Equipment suitable for use in Zone 20 or Zone 21§	
	Intrinsic safety (Group III)	ia, ib
	Protection by enclosure (Group III)	ta, tb
	Encapsulation (Group III)	ma, mb
	Inherently safe optical radiation	op is, *with EPL Da or Db***
	Optical system with interlock	op sh, *with EPL Da or Db***
Class III, Division 2	Equipment suitable for use in Class II, Division 1	
	Equipment suitable for use in Class II, Division 2	
	Equipment suitable for use in Class III, Division 1	
	Equipment marked for use in Class III, Division 2†	
	Equipment suitable for use in Zone 20, Zone 21, or Zone 22§	
	Intrinsic safety (Group III)	ia, ib, ic
	Protection by enclosure (Group III)	ta, tb, tc
	Pressurized enclosure (Group III)	px, pxb, py, pyb, pz, pzc
	Encapsulation (Group III)	ma, mb, mc
	Electrical resistance trace heating	60079-30-1, *with EPL Db or Dc***
	Skin effect trace heating	CSA C22.2 No. 293.1, *with EPL Db or Dc***
	Impedance heating	CSA C22.2 No. 293.3, *with EPL Db or Dc***
	Inherently safe optical radiation	op is, *with EPL Da, Db, or Dc***
	Optical system with interlock	op sh, *with EPL Da, Db, or Dc***
	Protected optical radiation	op pr, *with EPL Db or Dc***
	Other electrical apparatus‡	

* *"da" is limited to sensors of portable combustible gas detectors.*

† *With the exception of intrinsically safe equipment, equipment for use in a Class XX, Division XX location is not required to be marked with a type of protection — only the location where that equipment is permitted to be installed.*

‡ *"Other electrical apparatus" means electrical apparatus complying with the requirements of a recognized Standard for industrial electrical apparatus that does not in normal service*

a) have ignition-capable hot surfaces; or

b) produce incendive arcs or sparks.

See Rules 18-150 2), 18-250 2), J18-150 2) and 3), J18-252, J18-254, and J18-262. "Other electrical apparatus" also makes reference to equipment or systems currently acceptable as alternative means of protection (see Rules 18-066, 18-070, J18-066, and J18-068).

(Continued)

Table 18 (Concluded)

§ *For use in Class II and Class III, such (Zone acceptable) equipment is subject to the limitation of*
a) Rules J18-054 2) and J18-054 3) for Class II; and
b) Rule J18-054 4) for Class III.
Group IIIA equipment is not suitable for use in Class II locations.
** *Equipment marked with these types of protection is available in multiple levels of protection that are not specifically identified within the Ex marking.*
†† *The EPL takes precedence over the type of protection; for example, "Ex ia Gb" is suitable for Zone 1 (not Zone 0), "Ex op is Db" is suitable for Zone 21 (not Zone 20), and "Ex 60079-30-1 Gc is suitable for Zone 2 (not Zone 1). Selection according to the marked EPL is critical to the safe application of this equipment.*
‡‡ *In Class III, Division 1, switches, controllers, circuit breakers, fuses, control transformers, resistors, utilization equipment (fixed and portable), electric cranes, hoists, and similar equipment may be housed in Enclosure Type 5.*

Note: *This Table is structured to show the area classification on the left side and the permitted equipment on the right side. Zone equipment is suitable for use in some Class/Division locations and vice versa. This is indicated by the phrase "Equipment suitable for use in...". For example, in Class I, Division 1 locations, "Equipment suitable for use in Zone 0" means all equipment listed under Zone 0 can be used.*

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Table 18A
Equivalent Zone and Division Group classifications
[See Rules 18-050 7) and J18-050 5).]

	Group (for Zones)	Group (for Divisions)
Gases	IIC	A, B, C, D
	(IIB + H2)*	B, C, D
	IIB	C, D
	IIA	D
Dusts	IIIC	Class II, Group E
	IIIB	Class II, Group F, G
	IIIA	Class III

* *Equipment marked "IIB + H2" is suitable for atmospheres containing any Group IIA gas, Group IIB gas, or hydrogen. It is not completely equivalent to Group B, C, D.*

Notes:

1) *Equipment marked "IIC" may also be used in Group IIB and IIA classified locations. Equipment marked "IIB" may also be used in Group IIA classified locations.*

2) *Equipment marked "IIIC" may also be used in Group IIIB and IIIA classified locations. Equipment marked "IIIB" may also be used in Group IIIA classified locations.*