



HAZARDOUS DUTY

A major safety concern in industrial plants is the occurrence of fires and explosions. No other aspect of industrial safety receives more attention in the form of codes, standards, technical papers, and engineering design. Hazardous locations can be described as those locations where electrical equipment might be installed, which by their nature, might present a condition which could become explosive if the elements for ignition are present. The most certain method of preventing an explosion is to locate electrical equipment outside of hazardous areas whenever possible. Unfortunately, flammable substances are not always avoidable. There are a great variety of applications, especially in the chemical and petrochemical industries, that require explosion protected equipment.

When selecting an explosion proof motor, an understanding of the Class/Division system is very important. Area classification methods provide a description of the hazardous material that may be present, and the probability that it is present, so that the appropriate equipment may be selected and safe installation practices may be followed.

Actually determining the classification of a specific location requires a thorough understanding of the particular site. An exhaustive study of the site must be undertaken before a decision can be made as to what Class, Division, and Group is to be assigned. It is beyond the scope of Electric Motor Wholesale to engage in a discussion of how a location should be classified. Furthermore, Electric Motor Wholesale cannot and will not provide instruction as to the specific equipment required for a location. Please reference your local authorities for assistance in classifying your area and selecting appropriate equipment.

North American installations

North American standards for electric motors generally fall into one of two divisions. Division 1 Explosion Proof motors are UL Listed in accordance with NFPA Class I (Flammable Gases) or Class II (Combustible Dusts) and Groups (gases or dusts), depending upon the atmosphere. Division 2 motors are CSA Certified and are marked similarly to Division 1 equipment. Inverter Duty motors through 449T frames are CSA Certified for use in Division 2 locations.

European installations

Motors for hazardous locations in Europe must meet a different set of standards and require different markings than those of North America. CENELEC sets the standards for equipment in hazardous locations for Europe. Motors for use in explosive atmospheres in Europe are often referred to as flameproof (Zone 1) or non-sparking (Zone 2) motors. These motors must comply with the ATEX Directive. The ATEX Directive covers all electrical equipment used in explosive atmospheres. To ensure compliance with the Directive, equipment must meet the essential ATEX requirements and carry the CE mark on the nameplate. Other information required on the nameplate includes the Ex symbol, group & category, Ex protection method, gas group, and temperature code, example (II 3 G Ex nA IIC T3).

The tables following describe LEESON Electric and Lincoln Motors capabilities by Area Classification and by Temperature Code.

LEESON® Electric and Lincoln Motors Hazardous Duty Motor Area Classification Chart

Class I Area Classification (Flammable Gases, Vapors or Mists)				Class II Area Classification (Combustible Dusts)			
North America		Europe - ATEX Ⓞ (Category G - Gases)		North America		Europe - ATEX Ⓞ (Category D - Dusts)	
Division 1 Explosion Proof	Division 2 TEFC & TENV	Zone1 Flameproof	Zone 2 Non-Sparking	Division 1 Explosion Proof	Division2	Zone 21 Flameproof	Zone 22 Non-Sparking
① Group A	Group A	N/A	N/A	-	-	-	-
② Group B	Group B	N/A	N/A	-	-	-	-
Group C	Group C	N/A	N/A	-	-	-	-
Group D	Group D	N/A	N/A	-	-	-	-
-	-	N/A	-	Group EⓄ	-	N/A	N/A
-	-	N/A	-	Group F	Group FⓄ	N/A	N/A
-	-	N/A	-	Group G	Group GⓄ	N/A	N/A

- Group is not applicable to that Division or Zone, or is not defined.
- ① Group is not available from LEESON Electric and Lincoln Motors.
- ② Contact factory representative for availability.
- ③ Please contact your local LEESON sales office for ATEX certification

LEESON Electric and Lincoln Motors Hazardous Duty Motor Temperature Code Chart

TEMPERATURE CODES			Division 1 Explosion Proof / Flameproof		Division 2 / Non-Sparking
			Class I Area Classification (Flammable Gases, Vapors or Mists)	Class II Area Classification* (Combustible Dusts)	Class I Area Classification (Flammable Gases, Vapors or Mists)
Temp.	UL/CSA	ATEX	Division 1/Zone 1	Division 1/Zone 21	Division 2/Zone 2
280°C	T2A	T2(280)	Explosion Proof - Class I, Group D (Group C as noted)		
260°C	T2B	T2(260)			Severe Duty & IEEE-841 @ 1.15 S.F., Class I, Groups A,B,C,D (Sine wave power)
215°C	T2D	T2(215)			
200°C	T3	T3			
165°C	T3B	T3(165)	Explosion Proof - Class I, Group D (Group C as noted), Sine wave or PWM power	Explosion Proof - Class II, Groups F & G, Sine wave or PWM power	
160°C	T3C	T3(160)			
135°C	T4	T4			

* Class II, Division 2 motors are not available from LEESON Electric and Lincoln Motors.

Division I & II ambient range is -25°C to +40°C