



Hazardous Duty Motors



A Regal Brand

REGAL

LEESON has the motor you need for the toughest applications.

Hazardous Duty motors up to 500 HP.

LEESON Electric has been an innovator of the design and production of explosion proof motors for many years. Our AC line of products runs from 1/3 thru 2 HP, 1 phase and 1/3 thru 500 HP, 3 phase. Many of our 3 phase products already comply to the EISA requirements for Premium Efficiency and are Inverter Rated. We also carry a line of DC explosion proof motors 1/3 thru 3/4 HP, in voltages ranging from 12 to 180 Volts.

Each LEESON Electric motor is a combination of features and materials carefully engineered to provide a reliable, efficient and long lasting motor.

Hazardous Duty

Hazardous Duty motors are totally enclosed (fan cooled or non-ventilated) motors designed for applications in hazardous atmospheres containing explosive gases and/or combustible dusts.

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).

LEESON is certified for ATEX Zone 2 and 22 and has UL certification for Explosion Proof Motors

For Division I, Division II, Class I, Groups C & D – Class II, Groups F & G Capabilities by Area Classification and by Temperature Code

Hazardous Duty Specifications



Specification	Explosion Proof	ATEX Zone 2 and 22	IEEE841	Mill & Chem Duty
AC (Alternating Current)	■	■	■	■
DC (Direct Current)	■			
1 Phase	■			
3 Phase	■	■	■	■
TEFC	■	■	■	■
TENV	■	■		
56 - 140T Frame Rolled Steel	■		②	
180T thru 449 Frame Cast Iron	■	■	■	■
Premium Efficient	■	■	■	■
Inverter Rated	■ ①		■	■
N/C T-Stats	■ ①	■		■
Epoxy Painted		■	■	■
Shaft Seals Both Ends		■	■	■
Internal Corrosion Protection		■	■	■
IP 55 Enclosure				■
IP 56 Enclosure		■	■	
T2A-Temperature Code			■	
T2B-Temperature Code		■		■
T3B-Temperature Code	■	■		
Re-greaseable Bearings			■	■
Cast Iron Conduit Box	■	■	■	■
Drains		■		■
Stainless Steel Nameplate		■	■	■
Class F Insulation with Class H Components	■	■	■	
3-year Warranty	■	■		■
5-year Warranty			■	
UL and CSA	■	■	■	■
DIV 2 CSA Certified	■ ①		■	■

① 3 phase only as noted ② 143/5T frame only & are cast iron frame



Explosion Proof Motor Features





The explosion proof line of motors proves to have many more capabilities than we currently carry in our product catalog.

- 56 thru 449T frame
- 350 HP maximum
- 3600 & 1800 RPM, 1200 RPM available through 250 HP
- 1 PH Voltage 115/208-230
- 3 PH Voltage 208-230/460 except 449T frame
- 56 thru 140T frame rolled steel construction
- 180T thru 449T frame cast iron construction
- Automatic overload and thermostat protection
- Explosion proof conduit box
- Double shielded ball bearings
- 1.0 and 1.15 service factor
- Enclosures: TEFC-XP = EPFC, TENV-XP = EPNV
- UL Listed and CSA Certified
- Temperature code T3B
- C-face, rigid mount, D-flange, P-Base mountings available
- INPRO seals available
- Brake motors available
- 50 HZ, 190/380 Volts available at next lower HP
- Inverter rated
- Division I and II, Class I, Group C & D, with Conduit Box
 - » Group C = Acetaldehyde, cyclopropane, diethyl ether, ethylene
 - » Group D = Acetone, acrylonitrile, ammonia, benzene, butane, ethanol, ethylene dichloride, gasoline, hexane, isoprene, methane(natural gas), methanol, naphtha, propane, propylene, styrene, toluene, vinyl acetate, vinyl chloride, xylene
- Division I and II, Class II, Group E, F & G, with conduit box
 - » Group E = Aluminum, magnesium and other metal dusts with similar characteristics
 - » Group F = Carbone black, coke or coal dust
 - » Group G = Flour, starch or grain dust
- Precision Balance
- F-2 Mounting
- Washguard with 303 or 304 stainless steel shaft
- Internal shaft grounding rings 180 through 449T frame

ATEX Motor Features



LEESON also has the capability to manufacture ATEX certified products in both the NEMA and IEC frame sizes.

Zone 2 (Atex Category 3G) and Zone 22 (Atex Category 3D)

- 143T thru 5811 NEMA Frame, 112 thru 315 IEC Frame
- Enclosures include:
 - » TEFC, totally enclosed fan cooled
 - » TEBC, totally enclosed blower cooled
 - » TENV, totally enclosed non-vent
- IP-56
- Cast iron construction
- Severe duty
- Non-sparking fan
- 600 Volts maximum
- 3 Phase only
- Class F or H inverter duty insulation, 10:1 constant torque
- Thermostats hermetically sealed
- Thermistors (Siemens)
- F-1 and F-2 mountst
- F-3 mount requires the conduit box be integrated into the cast frame
- Terminal block in explosion proof conduit box
- Space heaters
- 1.0 and 1.15 Service Factor
- 60 and 50 Hz
- 40° C ambient
- Temperature codes T2B or T3, see chart below
- External grounding device on base or frame
- EPACT or NEMA premium efficiency
- Vertical shaft up
- Vertical shaft down requires drip cover
- Breathers on each side for horizontal mounting
- Insulated ball bearings
- Inpro seals both ends
- Shaft grounding ring provisions
- CE required
- ATEX instruction manual shipped with all motors
- Nameplate must have specific markings:
 - »  Ex
 - »  CE
 - » Name and address of manufacturer
- The marking of the equipment or protective system must include the following:
 - »  II 3 GD c Ex tc IIIB T* Dc, Ex nA IIC T* Gc
 - »  I 3 GD c Ex tc IIIB T* Dc, Ex nA nC IIC T* Gc

ATEX Motor Features (cont'd)

Zone 22 Hazardous Areas

- 143T thru 5811 NEMA Frame, 112 thru 315 IEC Frame
- Enclosures include:
 - » TEFC, totally enclosed fan cooled
 - » TEBC, totally enclosed blower cooled
 - » TENV, totally enclosed non-vent
- IP-56
- Cast iron construction, round body only
- XRI-841, standard is up to 500 HP
- Premium efficiency
- Non-sparking fan
- 600 Volts maximum
- 3 Phase only
- Class F or H insulation, inverter duty, 10:1 constant torque
- Thermostats hermetically sealed
- Thermistors: Required in addition to thermostats, 3 per motor
- F-1 and F-2
- F-3 requires the conduit box be integrated into the cast frame
- Terminal block required for all mountings
- Terminal block in explosion proof conduit box, required
- 40° C ambient
- Space heaters: 5 HP and larger, 60 Hz 120v or 50 Hz
- Phase sequence/rotation on required
- 1.0 and 1.15 service factor
- 60 and 50 Hz
- 50 degree C ambient, arctic duty
- Hermetically sealed thermostats
- Thermistors required (Siemens 150C)
- Temperature code T3
- External grounding device on base or frame
- EPACT or NEMA premium efficiency
- Vertical shaft up
- Vertical shaft down requires drip cover
- Breathers on each side for horizontal mounting
- Insulated ball bearings
- Inpro seals both ends
- Grease fittings for inlet and outlets even if extension tube is used
- Shaft grounding ring provisions
- CE required
- ATEX instruction manual shipped with all motors
- Nameplate must have specific markings:
 - » 
 - » 
 - » Name and address of manufacturer

Explosion Proof and Hazardous Duty motors can be used in many different applications such as:

Spray painting and finishing areas

Utility gas plants

Petroleum dispensing locations

Dry cleaning facilities

Process facilities manufacturing or using explosive solvents

Fuel servicing areas such as gas stations

Flour and feed mills

Grain elevators

Plants that manufacture fireworks

Coal preparation and handling



1051 Cheyenne Ave.
Grafton, WI 53024
PH: 262-377-8810
FAX: 262-377-9025

www.leeson.com



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