



OFF-SHORE HOISTS AND CRANES

PRODUCTS

COMPANY

CONTACTS



The installation of handling equipment in off-shore platforms requires special features in order to match with:

- High temperatures up to +55 °C
- Low temperatures down to -30 °C
- High lifting speeds when unloading from sea level
- Aggressive atmosphere
- Oscillation of the platform structure

In the years ELBE have achieved a deep experience in off-shore handling systems, applying special materials and finish to their products:

- Spark-proof manual chain hoists SLAS/SHAS
- Spark-proof manual Overhead Cranes
- Explosion-proof electric Overhead Cranes
- Spark-proof manual Jib Cranes BJ
- Explosion-proof electric Jib Cranes
- Explosion-proof electric chain hoists BCX/SHCX
- Explosion-proof electric wire rope hoists BWX/BWSX/BWWX
- Explosion-proof electric winches BAX

Note: see the site of any single product in order to get all the information



OFF-SHORE HOISTS AND CRANES



15T capacity Jib crane placed on platform



Electric equipment and test operation





OFF-SHORE HOISTS AND CRANES



10 T capacity

11 m arm

20 m height of hook





OFF-SHORE HOISTS AND CRANES



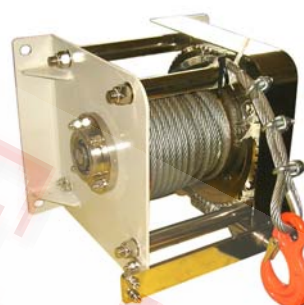
SLAS manual chain hoist



SLAS with travel braice



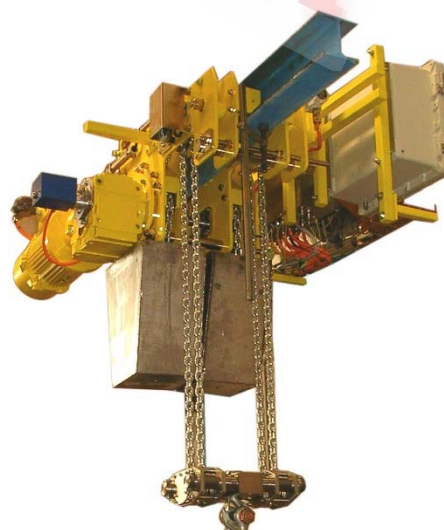
AMS spur gear manual winch



Worm gear manual winch



BCX electric chain hoist



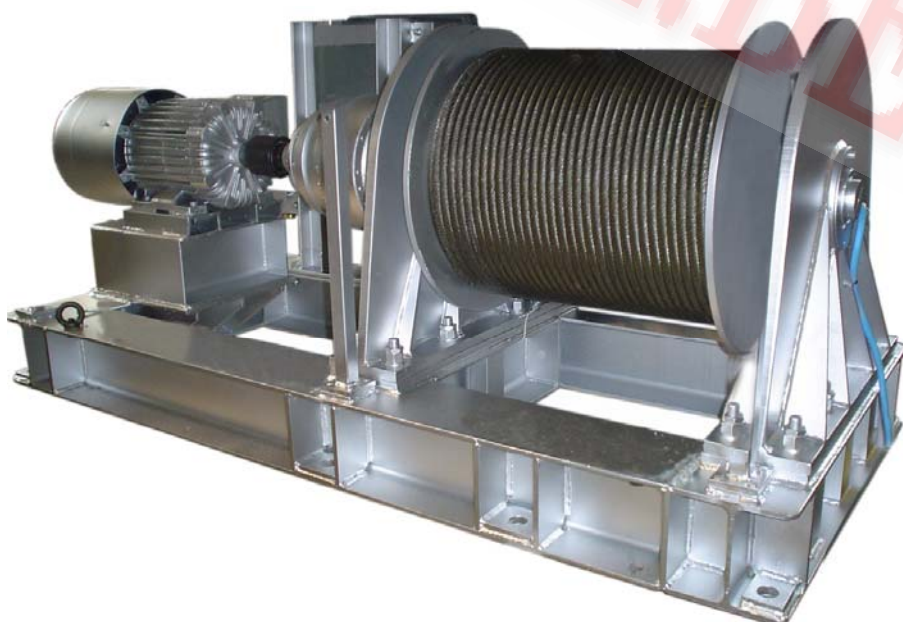
Low headroom



OFF-SHORE HOISTS AND CRANES



Explosion-proof underslung
crane EUMX



BAX explosion-proof electric wire
rope hoist



OFF-SHORE HOISTS AND CRANES



Lifting motor ELBE, self-braking type with A/C brake



Electric operated cable reel for hoist feeding



Control panel made of stainless steel AISI 316



Trolley detail



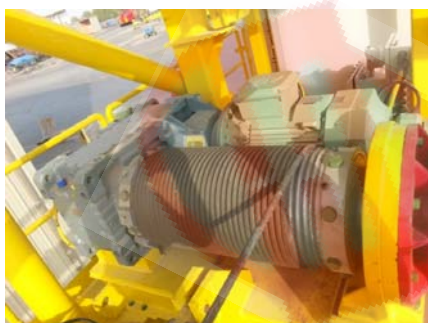
OFF-SHORE HOISTS AND CRANES



Hoist and travel winches



Rope clamps



Drum and rope



Lifting disc brake



Emergency brake

Stainless steel rope attack with load cell

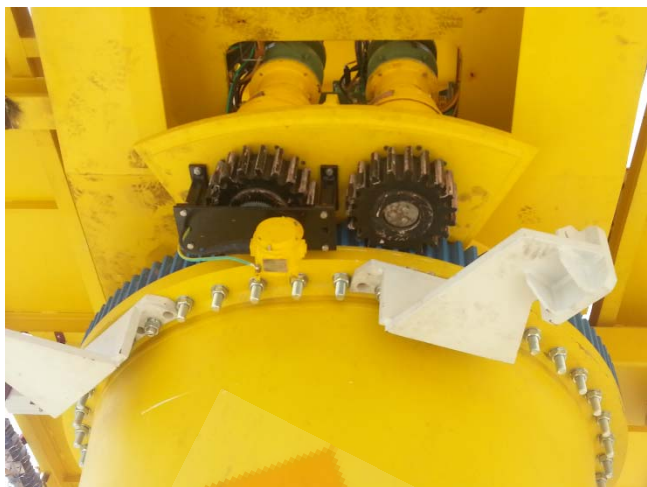


Rotatory up / down limit switch





OFF-SHORE HOISTS AND CRANES



Gears and sleeving ring



Two rotation motors



Two rotation gears



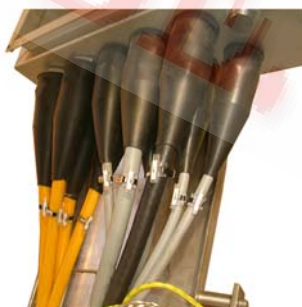
Rotation motors with block



Rotation gear with limit switch

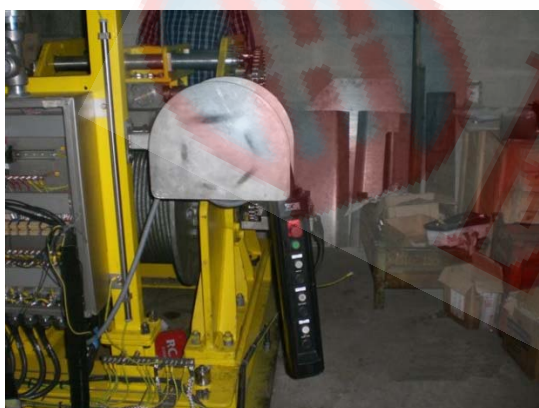
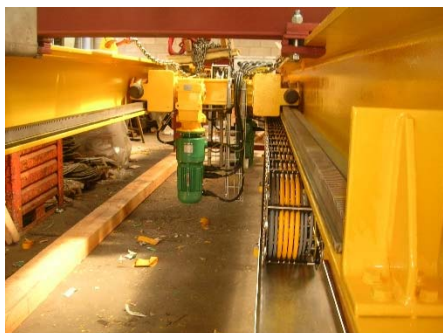


OFF-SHORE HOISTS AND CRANES





OFF-SHORE HOISTS AND CRANES





OFF-SHORE HOISTS AND CRANES



Push button station with gothic feeding line



High quality cables





OFF-SHORE HOISTS AND CRANES



Explosion-proof main and auxiliary switches



OFF-SHORE HOISTS AND CRANES





OFF-SHORE HOISTS AND CRANES



ExplosionProtection

An International Comparison Guide for the Oil & Gas Industry



Explosion Protection Essential Requirements	USA & CANADA NEC / CEC (National Electrical Code / Canadian Electrical Code)	EUROPE ATEX (Atmosphere Explosive)	AUSTRALIA AS/NZS	WORLDWIDE IECEx (International Electrotechnical Commission)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
1.0 Hazardous-Area Classification Hazardous locations are defined as areas where flammable gases or vapours, liquids or dusts, may be present in quantities sufficient to create an explosive atmosphere. • Worldwide, differing Ex standards use hazardous area classifications to classify environments dependent on the frequency and persistence of a potentially explosive atmosphere occurring. • Hazardous area classification should be carried out as an integral part of the risk assessment to identify areas where control over ignition sources is needed. For more information, visit www.pyrosys.com	1.1 North American Classification • North American Ex standards in both the US and Canada follow two different approaches: the traditional 'Class, Division' method under NEC 500 (US) / CEC Annex J (Canada) and the new 'International Zoning System' under NEC 500 (US) / CEC Section 18 (Canada). <table><tr><th>NEC / US</th><th>CEC / Canada</th><th>Zone 0</th><th>Zone 1</th><th>Zone 2</th></tr><tr><td>Class I, Div 1</td><td>Class I, Div 1</td><td>Zone 0</td><td>Zone 1</td><td>Zone 2</td></tr><tr><td>Class I, Div 2</td><td>Class I, Div 2</td><td>Zone 0</td><td>Zone 1</td><td>Zone 2</td></tr></table> * The Division classifications stated above are in accordance to Class I areas. For more information, visit www.pyrosys.com	NEC / US	CEC / Canada	Zone 0	Zone 1	Zone 2	Class I, Div 1	Class I, Div 1	Zone 0	Zone 1	Zone 2	Class I, Div 2	Class I, Div 2	Zone 0	Zone 1	Zone 2	1.2 European Classification (CENELEC) • Within Europe, the ATEX directives are imposed as a minimum requirement for Ex application. • ATEX 1999/91/EC introduces hazardous area classification of work places into zones, depending on the frequency and time that an explosive atmosphere is present. <table><tr><th>ATEX 1999/91/EC</th><th>Zone 0</th><th>Zone 1</th><th>Zone 2</th></tr><tr><td>ATEX 1999/91/EC</td><td>Zone 0<td>Zone 1</td><td>Zone 2</td></td></tr></table> • Special precautions need to be taken in hazardous areas to prevent equipment becoming a source of ignition. • For more information, visit www.pyrosys.com/information-enquiry	ATEX 1999/91/EC	Zone 0	Zone 1	Zone 2	ATEX 1999/91/EC	Zone 0 <td>Zone 1</td> <td>Zone 2</td>	Zone 1	Zone 2	1.3 Australian Classification (IEC) • Australia has also implemented the IEC's International Zoning System. • For further information on the Australian IEC hazardous classification system, see AS/NZS3000:2018. • This standard has replaced the former AS/NZS 3000:2010. <table><tr><th>Australia</th><th>Zone 0</th><th>Zone 1</th><th>Zone 2</th></tr><tr><td>Australia</td><td>Zone 0</td><td>Zone 1</td><td>Zone 2</td></tr></table> • For more information, visit www.pyrosys.com/australia	Australia	Zone 0	Zone 1	Zone 2	Australia	Zone 0	Zone 1	Zone 2	1.4 IEC Classification (IEC 60079, IEC Section 18) • The IEC's International Zoning System has become increasingly accepted worldwide. • Although the IEC's system aims to provide a standardised approach to location, protection, safety and measurements, it is aware that many nations such as the US have implemented a number of country specific deviations in order to comply to current safety standards under the NEC. <table><tr><th>IEC</th><th>Zone 0</th><th>Zone 1</th><th>Zone 2</th></tr><tr><td>IEC</td><td>Zone 0<td>Zone 1</td><td>Zone 2</td></td></tr></table> • For further information on IEC hazardous classifications, see: • IEC 60079-10: Electrical Apparatus for Explosive Atmospheres, Classification of Hazardous Areas. • IEC 60079-11: Electrical Apparatus for Explosive Atmospheres, Protection by Enclosure.	IEC	Zone 0	Zone 1	Zone 2	IEC	Zone 0 <td>Zone 1</td> <td>Zone 2</td>	Zone 1	Zone 2																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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2.0 Explosion Groups Explosion groups are designated to classified hazardous areas to identify the ignition related properties of an explosive atmosphere. • Worldwide, there are a number of different systems in place. The traditional North American Class, Division system uses a different system to that used under ATEX in Europe and by the IEC, altering the way in which equipment manufacturers build and mark certified Ex equipment. For more information, visit www.pyrosys.com	2.1 North American Explosion Groups (NEC 500 / CEC Annex J) • The NEC & CEC Division systems use Classes and Groups to identify a hazard. The systems refer to Class I environments, where gases & vapours represent an explosive atmosphere, most commonly present in the oil and gas industry. • Groups further define the type of hazard in a Class I location. <table><tr><th>Group</th><th>Atmosphere containing...</th></tr><tr><td>Group I</td><td>Acetylene & similar gases</td></tr><tr><td>Group II</td><td>Hydrogen & similar gases</td></tr><tr><td>Group III</td><td>Ethylene & similar gases</td></tr><tr><td>Group IV</td><td>Propane & similar gases</td></tr></table> For more information, visit www.pyrosys.com	Group	Atmosphere containing...	Group I	Acetylene & similar gases	Group II	Hydrogen & similar gases	Group III	Ethylene & similar gases	Group IV	Propane & similar gases	2.2 European Explosion Groups (CENELEC) • In comparison to the traditional North American standards, ATEX classifies atmospheres containing flammable gases / vapours as Group I hazardous areas. These groups are defined under EN60959. <table><tr><th>Group</th><th>Atmosphere containing...</th></tr><tr><td>Group I</td><td>Acetylene, Methane & similar gases</td></tr><tr><td>Group II</td><td>Hydrogen, Ethylene & similar gases</td></tr><tr><td>Group III</td><td>Propane, Hydrogen & similar gases</td></tr></table> For more information, visit www.pyrosys.com/information-enquiry	Group	Atmosphere containing...	Group I	Acetylene, Methane & similar gases	Group II	Hydrogen, Ethylene & similar gases	Group III	Propane, Hydrogen & similar gases	2.3 Australian Explosion Groups • Australia has adapted the IEC methods of classifying explosion groups. • Hazardous areas with gas or vapours present are designated Group I locations and the gases which make up the atmosphere are sub-categorised under the IEC's three groups, A, B and C. <table><tr><th>Group</th><th>Atmosphere containing...</th></tr><tr><td>Group A</td><td>Acetylene, Methane & similar gases</td></tr><tr><td>Group B</td><td>Hydrogen, Ethylene & similar gases</td></tr><tr><td>Group C</td><td>Propane, Hydrogen & similar gases</td></tr></table> • For more information on the Australian IEC gas grouping system, see AS/NZS3000:2018.	Group	Atmosphere containing...	Group A	Acetylene, Methane & similar gases	Group B	Hydrogen, Ethylene & similar gases	Group C	Propane, Hydrogen & similar gases	2.4 IEC Explosion Groups (IEC 60079, IEC Sec. 18) • The IEC's apparatus grouping system has been adopted by the ATEX directives in Europe and throughout the world, including the US (NEC 500, CEC Annex J) and Australia. • The groups below, assigned to gases and vapours are categorised as Group I locations, as used in Europe. <table><tr><th>Group</th><th>Atmosphere containing...</th></tr><tr><td>Group I</td><td>Acetylene, Methane & similar gases</td></tr><tr><td>Group II</td><td>Hydrogen, Ethylene & similar gases</td></tr><tr><td>Group III</td><td>Propane, Hydrogen & similar gases</td></tr></table> • For more information on IEC hazardous classifications, see: • IEC 60079-10: Electrical Apparatus for Explosive Atmospheres, Classification of Hazardous Areas. • IEC 60079-11: Electrical Apparatus for Explosive Atmospheres, Protection by Enclosure.	Group	Atmosphere containing...	Group I	Acetylene, Methane & similar gases	Group II	Hydrogen, Ethylene & similar gases	Group III	Propane, Hydrogen & similar gases																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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3.0 Temperature Classifications Temperature classes are assigned to indicate the safe working limit of the gases and vapours that could be present in a hazardous area. • Equipment and apparatus working in a hazardous area must be designed / modified to the assigned T-Class to ensure surface temperatures do not exceed the ignition temperature of hazardous gases and vapours. • Different country-specific Ex standards have appointed different temperature classification systems so it is important to ensure your Ex equipment is modified to the correct level of protection. For more information, visit www.pyrosys.com	3.1 North American Temperature Classification (NEC 500 / CEC Annex J) • The traditional North American Class, Division system uses a unique temperature classification system to that adopted under the IEC. <table><tr><th>Maximum Surface Temp</th><th>T-Class</th><th>Maximum Surface Temp</th><th>T-Class</th></tr><tr><td>400 °C (752 °F)</td><td>T1</td><td>150 °C (302 °F)</td><td>T3</td></tr><tr><td>380 °C (716 °F)</td><td>T2</td><td>140 °C (284 °F)</td><td>T4</td></tr><tr><td>350 °C (662 °F)</td><td>T3</td><td>130 °C (266 °F)</td><td>T5</td></tr><tr><td>320 °C (608 °F)</td><td>T4</td><td>120 °C (248 °F)</td><td>T6</td></tr><tr><td>300 °C (572 °F)</td><td>T5</td><td>110 °C (230 °F)</td><td>T7</td></tr><tr><td>275 °C (525 °F)</td><td>T6</td><td>100 °C (212 °F)</td><td>T8</td></tr></table> For more information, visit www.pyrosys.com	Maximum Surface Temp	T-Class	Maximum Surface Temp	T-Class	400 °C (752 °F)	T1	150 °C (302 °F)	T3	380 °C (716 °F)	T2	140 °C (284 °F)	T4	350 °C (662 °F)	T3	130 °C (266 °F)	T5	320 °C (608 °F)	T4	120 °C (248 °F)	T6	300 °C (572 °F)	T5	110 °C (230 °F)	T7	275 °C (525 °F)	T6	100 °C (212 °F)	T8	3.2 European Temperature Classification (CENELEC) • ATEX has adopted the IEC's methods of temperature classification, appointing a more generalised classification to a range of temperatures rather than the North American approach, using a number of T-Class. <table><tr><th>Maximum Surface Temp</th><th>T-Class</th></tr><tr><td>450 °C</td><td>T1</td></tr><tr><td>380 °C</td><td>T2</td></tr><tr><td>350 °C</td><td>T3</td></tr><tr><td>300 °C</td><td>T4</td></tr><tr><td>275 °C</td><td>T5</td></tr><tr><td>250 °C</td><td>T6</td></tr><tr><td>225 °C</td><td>T7</td></tr><tr><td>200 °C</td><td>T8</td></tr></table> For more information, visit www.pyrosys.com	Maximum Surface Temp	T-Class	450 °C	T1	380 °C	T2	350 °C	T3	300 °C	T4	275 °C	T5	250 °C	T6	225 °C	T7	200 °C	T8	3.3 Australian Temperature Classifications • Australia has also adopted the IEC methods of temperature classification. <table><tr><th>Maximum Surface Temp</th><th>T-Class</th></tr><tr><td>450 °C</td><td>T1</td></tr><tr><td>380 °C</td><td>T2</td></tr><tr><td>350 °C</td><td>T3</td></tr><tr><td>300 °C</td><td>T4</td></tr><tr><td>275 °C</td><td>T5</td></tr><tr><td>250 °C</td><td>T6</td></tr><tr><td>225 °C</td><td>T7</td></tr><tr><td>200 °C</td><td>T8</td></tr></table> For more information, visit www.pyrosys.com	Maximum Surface Temp	T-Class	450 °C	T1	380 °C	T2	350 °C	T3	300 °C	T4	275 °C	T5	250 °C	T6	225 °C	T7	200 °C	T8	3.4 IEC Temperature Classification • The IEC's international apparatus grouping system has been adopted by many nations and Ex standards. • For more information on IEC temperature classification, see IEC 60079-10. <table><tr><th>Maximum Surface Temp</th><th>T-Class</th></tr><tr><td>450 °C</td><td>T1</td></tr><tr><td>380 °C</td><td>T2</td></tr><tr><td>350 °C</td><td>T3</td></tr><tr><td>300 °C</td><td>T4</td></tr><tr><td>275 °C</td><td>T5</td></tr><tr><td>250 °C</td><td>T6</td></tr><tr><td>225 °C</td><td>T7</td></tr><tr><td>200 °C</td><td>T8</td></tr></table> For more information, visit www.pyrosys.com	Maximum Surface Temp	T-Class	450 °C	T1	380 °C	T2	350 °C	T3	300 °C	T4	275 °C	T5	250 °C	T6	225 °C	T7	200 °C	T8																																																																																																																																																																																																																																																																																																																																																																																																													
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4.0 Equipment Marking / Certification Explosion Proof equipment should be supplied with certified documentation and be clearly marked, displaying the measures the equipment has undergone to operate in classified hazardous areas. • Throughout the world, differing country specific standards impose different equipment marking methods, so it is important to understand how they compare. For more information, visit www.pyrosys.com	4.1 North American Equipment Marking (NEC 500 / CEC Annex J) • NEC 500 / CEC Annex J Equipment Marking. <table><tr><th>Ex Standard</th><th>Typical Example of Equipment Marking</th></tr><tr><td>NEC 500 / CEC Annex J</td><td>CLASS I, DIVISION 1, GROUPS A, B, C, D, T3</td></tr></table> NEC 500 / CEC Annex J Class I = Hazardous Area, Division 1 = Area Classification, Groups A, B, C, D = Flammable Gas Groups, T3 = Equipment Temperature Class	Ex Standard	Typical Example of Equipment Marking	NEC 500 / CEC Annex J	CLASS I, DIVISION 1, GROUPS A, B, C, D, T3	4.2 European Equipment Marking (CENELEC) • ATEX Equipment Marking. <table><tr><th>Ex Standard</th><th>Typical Example of Equipment Marking</th></tr><tr><td>ATEX 1999/91/EC</td><td>Ex d, IIC, T3, Ex d, IIC, T3</td></tr></table> ATEX 1999/91/EC Ex = Exempt from marking, IIC = IIC Equipment Category, T3 = Type of Ex Atmosphere, d = Flame Protection Method, IIC = Equipment Group, T3 = Temperature Class	Ex Standard	Typical Example of Equipment Marking	ATEX 1999/91/EC	Ex d, IIC, T3, Ex d, IIC, T3	4.3 Australian Equipment Marking • Electrical equipment used in a hazardous area must be certified to the IEC or Australian standards via an acceptable certification scheme. Acceptable schemes include IECEx, ATEX and AS/NZS. • Other equipment (e.g. ATEX, FM, UL) can usually be used if the legal owner justifies and accepts their use and an assessment is made as to the equivalence of safety of the equipment compared to IECEx / ATEX or AS/NZS equipment. <table><tr><th>Ex Standard</th><th>Typical Example of Equipment Marking</th></tr><tr><td>AS/NZS3000:2018</td><td>Ex d, IIC, T3</td></tr></table> AS/NZS3000:2018 Ex = Exempt from marking, IIC = IIC Equipment Category, T3 = Type of Ex Atmosphere, d = Flame Protection Method, IIC = Equipment Group, T3 = Temperature Class	Ex Standard	Typical Example of Equipment Marking	AS/NZS3000:2018	Ex d, IIC, T3	4.4 IEC Equipment Marking (IEC 60079, IEC Sec. 18) • IEC Equipment Marking. <table><tr><th>Ex Standard</th><th>Typical Example of Equipment Marking</th></tr><tr><td>IEC 60079-10</td><td>Ex d, IIC, T3</td></tr></table> IEC 60079-10 Ex = Exempt from marking, IIC = IIC Equipment Category, T3 = Type of Ex Atmosphere, d = Flame Protection Method, IIC = Equipment Group, T3 = Temperature Class	Ex Standard	Typical Example of Equipment Marking	IEC 60079-10	Ex d, IIC, T3																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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Immersion	Ex o	Ex o	Ex o	Ex o	Ex o	Ex o	Ex o	Ex o	Protection by immersion	Division 1 or 2	Zone 1 or 2	Encapsulation	Ex m	Ex m	Ex m	Ex m	Ex m	Ex m	Ex m	Ex m	Encapsulated apparatus	Division 1 or 2	Zone 1 or 2	Type 'n' Protection	Ex n	Ex n	Ex n	Ex n	Ex n	Ex n	Ex n	Ex n	Non-sparking apparatus	Division 2	Zone 2	Ventilation	Ex s	Ex s	Ex s	Ex s	Ex s	Ex s	Ex s	Ex s	Protection by ventilation	Division 2	Zone 2	<table><tr><th>Protection Method</th><th>IEC</th><th>CENELEC</th><th>CSA (IEC)</th><th>CSA (Annex J)</th><th>NEC 500</th><th>NEC 500</th><th>AS/NZS</th><th>Type of Protection</th><th>Mode of Protection</th><th>NEC 500 / CEC Annex J Permitted Division</th><th>NEC 500 / CEC Annex J Permitted Zone</th></tr><tr><td>Flameproof</td><td>Ex d</td><td>Ex d</td><td>Ex d</td><td>Ex d</td><td>Ex d</td><td>Ex d</td><td>Ex d</td><td>Ex d</td><td>Enclosure contains internal explosion</td><td>Division 1 or 2</td><td>Zone 1 or 2</td></tr><tr><td>Intrinsic Safety</td><td>Ex i</td><td>Ex i</td><td>Ex 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2</td><td>Zone 2</td></tr></table>	Protection Method	IEC	CENELEC	CSA (IEC)	CSA (Annex J)	NEC 500	NEC 500	AS/NZS	Type of Protection	Mode of Protection	NEC 500 / CEC Annex J Permitted Division	NEC 500 / CEC Annex J Permitted Zone	Flameproof	Ex d	Ex d	Ex d	Ex d	Ex d	Ex d	Ex d	Ex d	Enclosure contains internal explosion	Division 1 or 2	Zone 1 or 2	Intrinsic Safety	Ex i	Ex i	Ex i	Ex i	Ex i	Ex i	Ex i	Ex i	Ex i	Division 1 or 2	Zone 1 or 2	Intrinsic Safety	Ex i	Ex i	Ex i	Ex i	Ex i	Ex i	Ex i	Ex i	Ex i	Division 1 or 2	Zone 1 or 2	Pressurisation	Ex p	Ex p	Ex p	Ex p	Ex p	Ex p	Ex p	Ex p	Protection by over pressure enclosure	Division 1 or 2	Zone 1 or 2	Increased Safety	Ex e	Ex e	Ex e	Ex e	Ex e	Ex e	Ex e	Ex e	Electric sparks & high temp. possibilities eliminated	Division 1 or 2	Zone 1 or 2	Oil Immersion	Ex o	Ex o	Ex o	Ex o	Ex o	Ex o	Ex o	Ex o	Protection by immersion	Division 1 or 2	Zone 1 or 2	Encapsulation	Ex m	Ex m	Ex m	Ex m	Ex m	Ex m	Ex m	Ex m	Encapsulated apparatus	Division 1 or 2	Zone 1 or 2	Type 'n' Protection	Ex n	Ex n	Ex n	Ex n	Ex n	Ex n	Ex n	Ex n	Non-sparking apparatus	Division 2	Zone 2	Ventilation	Ex s	Ex s	Ex s	Ex s	Ex s	Ex s	Ex s	Ex s	Protection by ventilation	Division 2	Zone 2	<table><tr><th>Protection Method</th><th>IEC</th><th>CENELEC</th><th>CSA (IEC)</th><th>CSA (Annex J)</th><th>NEC 500</th><th>NEC 500</th><th>AS/NZS</th><th>Type of Protection</th><th>Mode of Protection</th><th>NEC 500 / CEC Annex J Permitted Division</th><th>NEC 500 / CEC Annex J Permitted Zone</th></tr><tr><td>Flameproof</td><td>Ex d</td><td>Ex d</td><td>Ex d</td><td>Ex d</td><td>Ex d</td><td>Ex d</td><td>Ex d</td><td>Ex d</td><td>Enclosure contains internal explosion</td><td>Division 1 or 2</td><td>Zone 1 or 2</td></tr><tr><td>Intrinsic Safety</td><td>Ex i</td><td>Ex i</td><td>Ex i</td><td>Ex i</td><td>Ex i</td><td>Ex i</td><td>Ex i</td><td>Ex i</td><td>Ex i</td><td>Division 1 or 2</td><td>Zone 1 or 2</td></tr><tr><td>Intrinsic Safety</td><td>Ex i</td><td>Ex i</td><td>Ex i</td><td>Ex 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2</td></tr><tr><td>Type 'n' Protection</td><td>Ex n</td><td>Ex n</td><td>Ex n</td><td>Ex n</td><td>Ex n</td><td>Ex n</td><td>Ex n</td><td>Ex n</td><td>Non-sparking apparatus</td><td>Division 2</td><td>Zone 2</td></tr><tr><td>Ventilation</td><td>Ex s</td><td>Ex s</td><td>Ex s</td><td>Ex s</td><td>Ex s</td><td>Ex s</td><td>Ex s</td><td>Ex s</td><td>Protection by ventilation</td><td>Division 2</td><td>Zone 2</td></tr></table>	Protection Method	IEC	CENELEC	CSA (IEC)	CSA (Annex J)	NEC 500	NEC 500	AS/NZS	Type of Protection	Mode of Protection	NEC 500 / CEC Annex J Permitted Division	NEC 500 / CEC Annex J Permitted Zone	Flameproof	Ex d	Ex d	Ex d	Ex d	Ex d	Ex d	Ex d	Ex d	Enclosure contains internal explosion	Division 1 or 2	Zone 1 or 2	Intrinsic Safety	Ex i	Ex i	Ex i	Ex i	Ex i	Ex i	Ex i	Ex i	Ex i	Division 1 or 2	Zone 1 or 2	Intrinsic Safety	Ex i	Ex i	Ex i	Ex i	Ex i	Ex i	Ex i	Ex i	Ex i	Division 1 or 2	Zone 1 or 2	Pressurisation	Ex p	Ex p	Ex p	Ex p	Ex p	Ex p	Ex p	Ex p	Protection by over pressure enclosure	Division 1 or 2	Zone 1 or 2	Increased Safety	Ex e	Ex e	Ex e	Ex e	Ex e	Ex e	Ex e	Ex e	Electric sparks & high temp. possibilities eliminated	Division 1 or 2	Zone 1 or 2	Oil Immersion	Ex o	Ex o	Ex o	Ex o	Ex o	Ex o	Ex o	Ex o	Protection by immersion	Division 1 or 2	Zone 1 or 2	Encapsulation	Ex m	Ex m	Ex m	Ex m	Ex m	Ex m	Ex m	Ex m	Encapsulated apparatus	Division 1 or 2	Zone 1 or 2	Type 'n' Protection	Ex n	Ex n	Ex n	Ex n	Ex n	Ex n	Ex n	Ex n	Non-sparking apparatus	Division 2	Zone 2	Ventilation	Ex s	Ex s	Ex s	Ex s	Ex s	Ex s	Ex s	Ex s	Protection by ventilation	Division 2	Zone 2
Protection Method	IEC	CENELEC	CSA (IEC)	CSA (Annex J)	NEC 500	NEC 500	AS/NZS	Type of Protection	Mode of Protection	NEC 500 / CEC Annex J Permitted Division	NEC 500 / CEC Annex J Permitted Zone																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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