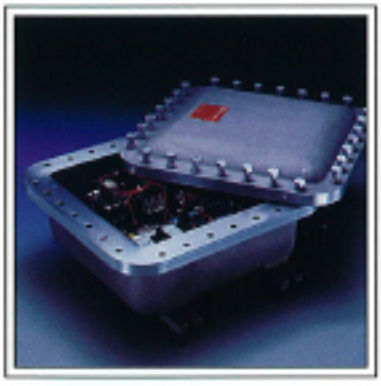
Explosion Proof Electrical Components



Nema 7/9 Control Enclosures

Nema control enclosures are designed to reduce or eliminate the risk of explosion in hazardous environments. Nema 7 enclosures prevent ignition of gas external to the enclosure by containing the explosion within the panel. Nema 9 enclosures are sealed to prevent an explosion by excluding the entry of explosive amounts of hazardous dust.

Explosion or Dust Ignition Proof Motors

Explosion proof motors and brakes perform in the same way as Nema 7 control enclosures, preventing the ignition of external gas by containing the explosion within the motor and brake. Dust-ignition proof motors prevent ignition of the dust in the atmosphere, or which has built-up on the motor and brake, by operating at temperatures below the ignition point of the hazardous materials. Illustrated is an explosion proof motor and brake for use in a Class 2, Group F, Division 1 atmosphere.

Explosion Proof Limit Switch Enclosures

Unprotected limit switches can also pose an explosion risk in hazardous environments. Explosion proof and dust ignition proof geared or block type limit switches are provided for Nema 7 and 9 equipment. Illustrated is a Nema 7 geared limit switch enclosure.

Intrinsically Safe Controls & Pendants

Intrinsically safe systems engage a motion's contactors with electrical components operating at voltages too low to cause ignition of gases or dust. While the motion's controls must be housed in a Nema 7 or 9 enclosure, the pendant station can use a smaller, lighter, standard enclosure (as shown) reducing operator fatigue and permitting easier operation of the equipment.

Spark Resistant Mechanical Components

Stainless Steel Wire Rope

For hazardous applications that require spark resistant features, the hoists are reeved with stainless wire rope instead of the standard plow steel. Stainless steel rope reduces the possibility of sparking when making contact with the rope drum, sheaves, or external objects with which it may come in contact with.

Bronze Hooks & Lower Blocks

Solid, cast bronze hooks reduce the possibility of sparking in the event the hook strikes steel or other ferrous metal objects. Hooks are provided with stainless steel, spring-loaded safety latches as a standard feature. The entire lower block body is fabricated from solid bronze plate. Solid bronze is used instead of coated steel because coating can chip or wear off – solid bronze does not.

Bronze Trolley Wheels

Trolley wheels manufactured from Manganese bronze reduce the possibility of sparking when in contact with steel rails, bridge or runway beams, or drive pinions, thereby also reducing the possibility of igniting the hazardous atmosphere. Illustrated are wheels for under-running monorail hoists.

Bronze Bridge Wheels

Top or under-running bridge crane wheels are manufactured from manganese bronze for spark-resistant requirements. Bronze wheels contacting a steel rail, runway beam or drive pinion reduces the possibility of hazardous sparks. Illustrated are wheels and pinions for under-running bridge cranes.

Yale® HOISTS

Yale®

POLIPASTOS

PARA OPERACIONES EN ATMOSFERAS EXPLOSIVAS

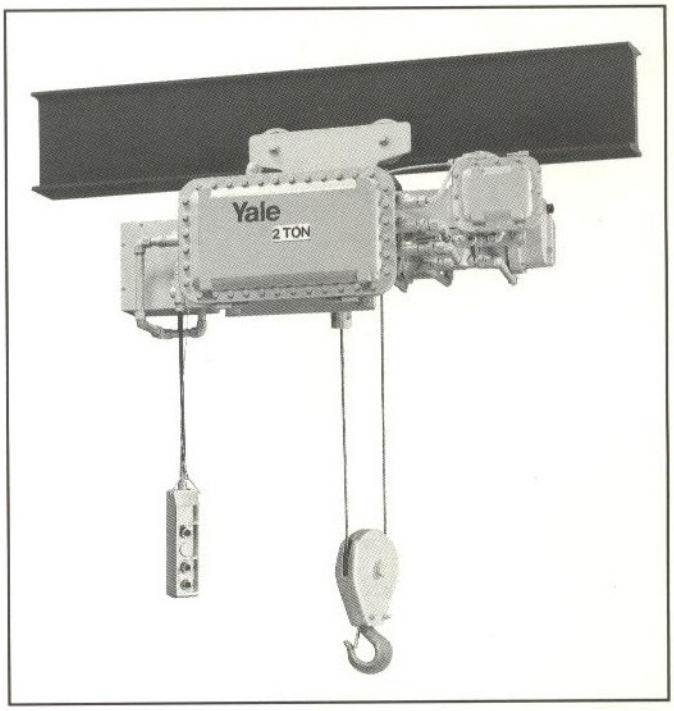
- **Cargas nominales desde 1/2 ton. hasta 35 ton.**
- Ideal para aplicaciones en refinerías, plantas de productos químicos y plásticos, así como en plataformas marinas.
- Algunos componentes, tales como la caja de control, el mando, los limitadores de recorrido, el motor y el embrague, vienen con una cubierta protectora especial que permite contener las explosiones dentro del espacio en que puedan ocurrir.
- Conducto de metal rígido para evitar daño en los cables electricos.
- Ganchos y ruedas del trole hechos en bronce, para los modelos indicados.
- También pueden obtenerse cables y ruedas del trole hechos en acero inoxidable.

Los polipastos de cable eléctrico Yale EW pueden ser modificados para que operen en locales donde se encuentran, o puedan encontrarse, gases inflamables, residuos o fibras. Estos polipastos han sido diseñados para evitar la combustión de materiales peligrosos que puedan hallarse en el ambiente, ya que cualquier explosión será contenida dentro del polipasto.

Las cajas especiales (aprobadas por el Underwriters Laboratory) permiten contener una explosión dentro de las mismas, de tal modo que no pueda afectar las demás cajas o los materiales volátiles que puedan hallarse en el entorno. Estos componentes han sido diseñados para tolerar la presión causada por una explosión interna. Algunos de los componentes especialmente protegidos son el panel de control, el mando, los limitadores de recorrido, el motor y los frenos.

Dado que el calor es un factor de gran incidencia en muchas instalaciones donde existen condiciones peligrosas, el diseño de los componentes que generan calor permite disipar el calor antes de que la temperatura ascienda a un grado que resulte peligroso. Se pueden utilizar termostatos para evitar que el equipo continúe funcionando bajo condiciones de sobrecalentamiento.

Con la excepción de los cables de suministro eléctrico, los cables colgantes del mando y los conductores conectados a un trole articulado, el cableado está cubierto por un conducto de metal rígido que protege el aislamiento del conductor. El tubo aislante (sometido a prueba) incorpora un accesorio hermético para evitar que la explosión se propague al exterior o a un receptáculo adyacente. Las conexiones especiales (sometidas a prueba) se utilizan en los empalmes del cableado. Para más información, solicite el catálogo 3440B.



Nota: La instalación correcta de estos polipastos especiales es tan importante para la seguridad de su funcionamiento como los componentes especiales que han sido incorporados al diseño del aparato. En caso de duda, consulte con la autoridad local en materia de electricidad.

En términos generales, la siguiente tabla indica los tipos de componentes utilizados para cumplir con los requisitos de las distintas Clases, Grupos y Divisiones. No pueden obtenerse cubiertas protectoras especiales para la Clase I ni para los Grupos A y B.

Clase	Grupo	División	Construcción a prueba de explosión (1)							
			Caja del motor	Caja del freno	Caja de control	Caja del limit. recorrido (4)	Caja del mando.	Método de cableado	Método de cableado flexible	Cajas de empalme
I	A	1	No disponible							
		2	No disponible							
	B	1	No disponible							
		2	TENV (2)	TENV	NEMA 7B	NEMA 7B	Sealed Contacts	Conducto rígido	Sealtite o SO	General Purpose
	C	1	I-C (3)	I-C	NEMA 7C	NEMA 7C	NEMA 7C	Conducto rígido	Flexible Fittings	NEMA 7C
		2	TENV (2)	TENV	NEMA 7C	NEMA 7C	NEMA 7D o hermético	Conducto rígido	Sealtite o SO	General Purpose
	D	1	I-D	I-D	NEMA 7D	NEMA 7D	NEMA 7D	Conducto rígido	Flexible Fittings	NEMA 7D
		2	TENV (2)	TENV	NEMA 7D	NEMA 7D	NEMA 7D o hermético	Conducto rígido	Sealtite o SO	General Purpose
II	E	1	II-E	II-E	NEMA 9E	NEMA 9E	NEMA 9E	Conducto rígido	Sealtite o SO	NEMA 9E
	F	1	II-F	II-F	NEMA 9F	NEMA 9F	NEMA 9F	Conducto rígido	Sealtite o SO	NEMA 9F
		2	TENV (2)	TENV	Sellado contra residuos	Sellado contra residuos	Sellado contra residuos	Conducto rígido (5)	Sealtite o SO	Sellado contra residuos
	G	1	II-G	II-G	NEMA 9G	NEMA 9G	NEMA 9G	Conducto rígido	Sealtite o SO	NEMA 9G
		2	TENV (2)	TENV	Sellado contra residuos	Sellado contra residuos	Sellado contra residuos	Conducto rígido (5)	Sealtite o SO	Sellado contra residuos
III		1	TENV (2)	TENV	Sellado contra residuos	Sellado contra residuos	Sellado contra residuos	Conducto rígido (5)	Sealtite o SO	Sellado contra residuos
		2	TENV (2)	TENV	Sellado contra residuos	Sellado contra residuos	Sellado contra residuos	Conducto rígido (5)	Sealtite o SO	Sellado contra residuos

(1) Uso interior UNICAMENTE. Consulte con un ingeniero para efectuar la instalación exterior.
(2) Siempre deberán usarse los termostatos de los motores. Requiere un interruptor técnico en la caja de controles.
(3) No disponible en armazón 56 (RT, TT, etc.)
(4) El limitador de carga requiere un adaptador Intrinsecamente seguro.
(5) Pueden usarse tramos cortos de conducto protector o cable SO en aplicaciones que no corren riesgo de daño físico.

REFERENCIA PARA NEMA - NEC

NEMA 7 = Clase I
NEMA 9 = Clase II
Los grupos de letras son iguales en ambos sistemas.

HAZARDOUS ENVIRONMENTS

EXPLOSION-PROOF WIRE ROPE HOISTS WITH SPARK-RESISTANT FEATURES

Yale Global King explosion-proof wire rope hoists are engineered and built for use in Division 2, Class I, Groups B, C & D hazardous environments. These units feature special enclosures, metal clad electrical cables and fittings, and intrinsically safe limit switches and control stations.

Our explosion-proof units are well suited for offshore rigging platforms and downstream processing facilities in the Oil and Gas Industry where flammable gases and liquids are present. Spark-resistant options are available on Global King with underhung and top-running trolleys, as well as deck-mounted configurations.

Tagged Division 2 Hazardous Location motors, which surpass OSHA requirements, as well as optional corrosion-resistant features are also available upon request.

STANDARD FEATURES

WIRE ROPE DRUM
Machined from quality steel, deep-grooved with a rope guide to help ensure the rope stays in the grooves. Wire rope is secured to the drum with three heavy ductile iron clamps and designed to have three extra wraps of wire rope on the drum with the rope at full extension (low hook).

HEAVY-DUTY DISC BRAKES
Rated at 200% torque, provide quick, positive stops and load holding.

GEARING
Triple reduction hoist gearing is oil bath lubricated, operating in an oil-tight, cast aluminum gear case.

FRAME
Heavy steel frame provides a solid foundation and positive alignment of key components.

TRUNNION-STYLE BLOCK & HOOK
Bearing-mounted trunnion hook rotates 360° and swings back and forth 180° for easier load adjustment.

LOW HEADROOM
Reeved to a low-headroom design lower block for minimum headroom and maximum lift.

TROLLEY
Available as monorail or top-running units. (See trolley details on pages 5 and 7)

ELECTRONIC HOIST MONITORING CARD
Hoist comes standard with Pulse™ Monitor Card that records key information that can simplify troubleshooting and help reduce maintenance costs. Requires Pulse Monitor computer interface kit (sold separately) to read the data.

DEFINITION OF DIVISION, CLASS & GROUP

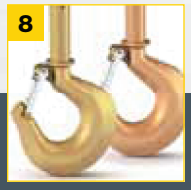
DIVISION 2
Locations in which hazardous concentrations are handled, processed or used but are normally within closed containers or closed systems from which they can escape only in the case of accidental rupture or breakdown.

CLASS 1
Locations in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

GROUP B
Atmospheres containing hydrogen, or gases and vapors of equivalent hazard, such as manufactured gas.

GROUP C
Atmospheres containing ethyl-ether vapors, ethylene or cyclo propane.

GROUP D
Atmospheres containing gasoline, hexane, naptha, benzine, butane, alcohol, acetone, benzol, lacquer solvent vapors or natural gas.



EXPLOSION-PROOF FEATURES:

1 NEMA 4/7/9 RATED CONTROL ENCLOSURE
Hoist and trolley controls are housed in a NEMA 4/7/9 rated enclosure with hoist motion monitor, thermal overloads, over-capacity limit switch and more. Two-speed control for smooth acceleration and precise load positioning.

2 MC (METAL CLAD) ELECTRICAL CABLE & FITTINGS
Where required.

3 STANDARD MOTOR
Standard motor (not shown) is two-speed with a 4:1 ratio from high to low speed. Low speed allows for precise load handling and high speed is ideal for fast throughput. Optional Division 2 Hazardous Location motor is shown in photo.

4 INTRINSICALLY SAFE LIMIT SWITCHES
Standard upper/lower geared hoist motion limit switch prevents overloading. Optional block-operated upper control circuit limit switch is available.

5 INTRINSICALLY SAFE CONTROL STATION
Available when required.

SPARK-RESISTANT OPTIONS:

6 BRONZE SHEAVES
Allow for safe and smooth operation, while preventing sparking as a result of friction between the wire rope and lower sheaves located within the hook block.

7 BRONZE TROLLEY WHEELS
Reduce possibility of sparking when in contact with steel rails, bridge, runway beams or drive pinions, thereby also reducing the possibility of igniting hazardous atmospheres.

8 BRONZE OR COPPER-PLATED LOAD HOOK
Solid bronze or copper-plated load hooks with our standard nylon sheave covers reduce the possibility of sparking in the event the hook block strikes steel or other ferrous metal objects. Load hooks include stainless steel spring-loaded safety latches.

9 DROP STOPS WITH RUBBER BUMPERS
Prevents sparking in the event of accidental collision with other equipment on beam.

CORROSION-RESISTANT OPTIONS:

Available for the Global King and World Series hoists. Contact a CMCO customer service representative if required for your application.