## 1.0 Scope

1.1 To define the requirements for 3-phase electric chain hoists.

## 2.0 Codes and Standards

2.1 ASME B30.16 "Overhead Hoists (Underhung)

2.2 ASME HST-1M "Performance Standard for Electric Chain Hoists"

2.3 FEM 9.682 "Rules for the Design of Serial Lifting Equipment – Selection of Lifting Motors"

2.4 ISO 4301-1 "Cranes and Lifting Appliance – Classification"

2.5 JIS B 8815 "Electric Chain Hoists"

2.6 IEC 34-5 "Rotating Electrical Machines – Classification of Degrees of Protection Provided by Enclosures of Rotating Electrical Machines (IP Code)"

2.7 IEC 529 "Degrees of Protection Provided by Enclosures (IP Code)

2.8 NFPA 70 "National Electric Code"

2.9 UL 1340 "Standard for Hoists"

2.10 RoHS (Restriction of Hazardous Substances) Compliance

## 3.0 Design

3.1 The electric chain hoists shall be model ER2 as supplied by Harrington Hoists, Inc. The hoists shall be rated 1/8 US Ton through 20 US Ton.

3.2 The electric chain hoists shall meet the specifications and dimensions of EDOC0405, "ER2 Electric Chain Hoist Model ER2A - Specifications and Dimensions" and EDOC408, "ER2, ER2M, ER2G & ER2P Electric Chain Hoist 8 to 20 Ton, Model ER2A – Specifications and Dimensions".

3.3 The electric chain hoists shall meet the design and construction criteria of paragraph 2.1 above.

3.4 The hoists' enclosure ratings shall provide protection against water jets from any direction in accordance with IP55 of paragraph 2.7 above.

3.5 The electric chain hoist shall be equipped with a two-button pendant control station with a rating of IP65 per item 2.7 above. The pendant shall connect to the hoist via a quick disconnect plug/socket assembly and it shall be equipped with integral strain relief.

3.6 The dual speed electric chain hoist shall be equipped with a two-button pendant control station with an emergency stop button.

3.7 The electric chain hoists shall be certified and listed to UL 1340 per item 2.9 above.

3.8 The electric chain hoist shall be built without the use of six environmentally harmful materials listed in the RoHS standard per item 2.10 above. In addition, nine other environmentally harmful materials are excluded.

3.9 The electric chain hoists shall be equipped with unique load sheave with 5 pockets as standard and 6 pockets for smaller body hoists. Increased number of pockets reduces chain vibration and increases chain life.

3.10 The electric chain hoist, up to 3 ton capacity, with the exception of 2 1/2 ton, shall be equipped with external pins for suspension, which allow for quick change from one suspension configuration to another.

3.11 The electric chain hoist with PT push trolley mount and MR motorized trolley mount are configured as perpendicular to the beam on single fall models. Parallel mount is available as option.

3.12 The electric chain hoists shall be equipped with an engineered fan blade and fan cover design, which provide high air flow for cooling the motor and brake.

3.13 The hoists' motor shall be of the totally enclosed fan-cooled squirrel cage induction type. It shall be compatible for 208-230/460 volt 3 phase power at 60 Hertz, and it shall be equipped with thermal overload protection. The motor's insulation shall meet Class B requirements. The hoists' motor shall be rated in accordance with paragraph 2.3 above and shall carry the following ratings:

**Single Speed Motor**

Short Time Rating: 60 minutes

Intermittent Rating: 60% ED, 360 starts/hr.

**Dual Speed Motor**

Short Time Rating: 40 minutes (30 min. high speed, 10 min. low speed)

Intermittent Rating: 60% ED (40% high speed, 20% low speed), 360 starts/hr (120 high speed, 240 low speed)

3.14 The electric chain hoist shall have a nominal operating voltage range of 208-230V or 415-460V. Minimum and maximum allowable operating voltage shall be defined as ±10% of the nominal operating voltage range in order to compensate for the variations in power supply.

3.15 The electric chain hoists shall be classified with a duty rating of H4 per item 2.2 above.

3.16 In addition to the duty rating requirement of item 3.15 above, the electric chain hoists shall carry rating classifications in accordance with items 2.3, 2.4, and 2.5 above, as per the following charts.

| Capacity (US Tons) | Product Code | Classification | |
|---|---|---|---|
| | | JIS/ISO | FEM |
| 1/8 | (N)ER2001H | M5 | 2m |
| 1/4 | (N)ER2003S | M5 | 2m |
| 1/4 | (N)ER2003H | M5 | 2m |
| 1/2 | (N)ER2005L | M5 | 2m |
| 1/2 | (N)ER2005S | M5 | 2m |
| 1 | (N)ER2010L | M5 | 2m |
| 1 | (N)ER2010S | M5 | 2m |
| 1-1/2 | (N)ER2015S | M5 | 2m |
| 2 | (N)ER2020C | M5 | 2m |
| 2 | (N)ER2020L | M4 | 1Am |

| Capacity (US Tons) | Product Code | Classification | |
|---|---|---|---|
| | | JIS/ISO | FEM |
| 2 | (N)ER2020S | M4 | 1Am |
| 2-1/2 | (N)ER2025S | M4 | 1Am |
| 3 | (N)ER2030C | M4 | 1Am |
| 5 | (N)ER2050L | M4 | 1Am |
| 8 | (N)ER2080S | M4 | 1Am |
| 10 | (N)ER2100L | M4 | 1Am |
| 10 | (N)ER2100S | M4 | 1Am |
| 15 | (N)ER2150S | M4 | 1Am |
| 20 | (N)ER2200S | M4 | 1Am |

3.17 The electric chain hoists shall be equipped with a DC current electromagnetic brake. The brake is equipped with electrical failsafe design. The electromagnetic brake is at least 150% braking capacity, and rated for at least 1,000,000 brake operations before adjustment. The hoist brake is under warranty for 10 years.

3.18 The electric chain hoists shall be equipped with a friction clutch in the transmission between the hoists' electric motor and the load sheave. The friction clutch shall prevent the motor from turning the load sheave when the load exceeds the friction clutch setting. This mechanism protects the hoist from overwinding. Carbon friction material provides consistent performance over a wide temperature range.

3.19 For ER2 models, secondary brake shall be installed in the transmission between the hoists' electric motor and the load sheave. This Weston style mechanical load brake provides an additional safety feature. (N)ER2 does not include this secondary brake.

3.20 The dual speed electric chain hoists shall be equipped with a variable frequency drive, located under the control cover. VFD provides the high/low speed ratio of 6:1 as standard, with adjustability up to 12:1. VFD also provides options such as 2 step and 3 step infinitely variable control.

3.21 The electric chain hoists shall be equipped with fixed, non-adjustable over-travel limit switches for the Up and Down directions of hoist operation. The limit switches, when activated, shall interrupt the control circuit to prevent additional lifting or lowering.

3.22 The electric chain hoists shall be equipped with case-hardened Grade 80 nickel plated load chain.

3.23 The load chain shall have a pitch to diameter ratio of 2.8:1.

3.24 The electric chain hoists shall be equipped with hooks that are drop forged from carbon steel, and are designed for ductile mode failure upon overload. The hooks shall be equipped with spring loaded latch type throat closures. The bottom hook shall be equipped with a thrust ball bearing for 360 degree swivel. The electric chain hoists up to 5 ton capacity shall be equipped with notched hook and latch system. This system provides positive closing and improves resistance against lateral forces.

3.25 The electric chain hoists shall be equipped with a microprocessor based meter with on-board readout for monitoring the number of starts/stops and total hoist run time.

3.26 The electric chain hoists shall employ a transmission comprised of spur and helical gearing operating in an oil bath. ER2 hoist (with mechanical brake) oil compartment shall be equipped with a pressure relief vent plug.

3.27 The electric chain hoists shall be equipped with a warning tag per item 2.1 above. The warning tag shall be attached to the pendant cord, it shall be made of durable plastic laminated construction, and it shall give comprehensive information for the safe operation of the hoist.

3.28 The electric chain hoists shall have a single fall of load chain for capacities 2.5 US Tons and below, with the exception of 020C (2 ton double fall hoist).

## 4.0 Documentation

4.1 Each electric chain hoist shall be supplied with an Owner's Manual that includes the following information.

- 4.1.1 Important Information and Warnings
- 4.1.2 Installation and Operation
- 4.1.3 Inspection
- 4.1.4 Lubrication, Maintenance and Handling, and Troubleshooting

4.2 Each electric chain hoist shall be supplied with a Parts List.

4.3 Each electric chain hoist shall be supplied with a test certificate attesting that the hoist successfully passed a factory load test to 125% of rated capacity in accordance with ASME B30.16 requirements.