

## **PART 1 - GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 26 05 00 - Common Work Results - Electrical.

### **1.2 REFERENCES**

- .1 Canadian Standards Association (CSA International).
  - .1 CSA C22.2 No. 60947-4-1.

### **1.3 SHOP DRAWINGS AND TECHNICAL DATA**

- .1 Provide required shop drawings.
- .2 Provide shop drawings for each type of starter to indicate:
  - .1 Mounting method and dimensions.
  - .2 Starter size and type.
  - .3 Layout and components.
  - .4 Enclosure types.
  - .5 Wiring diagram.
  - .6 Interconnection diagrams.

### **1.4 CLOSEOUT SUBMITTALS**

- .1 Submit operation and maintenance data for each type and style of motor starter for incorporation into operation and maintenance manual.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Starters conform to CSA C22.2 No. 60947-4-1.
  - .2 Starters' brand must be Cutler-Hammer or Square D.
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## **2.2 MANUAL STARTERS**

- .1 Single phase manual starters, size, type and rating, and enclosure type as indicated in the drawing, provided the following:
  - .1 A snap mechanism and fast closing.
  - .2 An element of protection against thermal overloads, manual reset, with remote indicator trigger.
- .2 Accessories:
  - .1 Rocker spotted robust as indicated on drawings.
  - .2 Robust lamp, LED type and color as indicated on drawings.
  - .3 Device lockout position "ON" or "OFF".

## **2.3 FULL VOLTAGE MAGNETIC STARTERS**

- .1 Magnetic starters and combined, size, type and rating as indicated under CSA box Type 1 unless otherwise indicated, provided the following:
    - .1 Contactor solenoid operated, rapid action type. Minimum size: 0.
    - .2 Motor overload protective device in each phase, manually reset from outside enclosure.
    - .3 Terminals for supply and control cables.
    - .4 Wiring and schematic diagram inside starter enclosure in visible location.
    - .5 Identify each wire and terminal for external connections, within starter, with permanent number marking identical to diagram.
    - .6 Control voltage: 24 VAC.
  - .2 Combination type starters to include fused disconnect switch with operating lever on outside of enclosure to control disconnect, and provision for:
    - .1 Locking in "OFF" position with up to three padlocks.
    - .2 Locking in "Auto" position.
    - .3 Independent locking of enclosure door.
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- .4 Provision for preventing switching to "ON" position while enclosure door open.
- .5 Install three lock "OFF".
- .3 Accessories:
  - .1 Selector switches: 3-position "ON-OFF-AUTO" heavy duty labelled as indicated.
  - .2 Two (2) indicating lights: heavy duty LED, oil tight type, color: red: ready/green: ON.
  - .3 Two spare auxiliary contacts NO and NC unless otherwise indicated.
  - .4 Phase failure detector and the phase inversion for any motors of 10 HP and above.
  - .5 Each starter supply an engine of 25 HP or over must be fitted with a trigger unit for thermistors and a white lamp on the front of the starter with the annotation "Overheating".

## **2.4 CONTROL TRANSFORMERS**

- .1 Control transformers, dry type, single, with primary voltage as indicated and the secondary voltage of 24 V, equipped with two (2) primary fuses and one (1) secondary fuse connected in circuit with the starters as indicated.
- .2 Rated control transformers determined by the load control circuit with safety margin of 20%.

## **2.5 FINISHES**

- .1 Apply finishes to enclosure in accordance with Section 26 05 00 - Common Work Results - Electrical.

## **2.6 EQUIPMENT IDENTIFICATION**

- .1 Provide equipment identification in accordance with Section 26 05 00 - Common Work Results - Electrical.
- .2 Magnetic starter designation label, white plate, black letters, Size 1 engraved as indicated.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- .1 Install starters and control devices in accordance with manufacturer's instructions.
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- .2 Fuses and overload protection are properly sized.
- .3 If the motor is not visible from the starter or the disconnect switch, the contractor must supply a disconnect switch at less than 1,500 mm from the motor.
- .4 Install overload protection elements according to the load and adjust according to the nominal current on the motor nameplate. The adjustment range of the thermal protection elements must be selected so that the desired setpoint is the center of the range.

### **3.2 FIELD QUALITY CONTROL**

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results - Electrical, and manufacturer's instructions. Coordinate tests with the Contractor of the associated equipment of the starters. This Contractor must be present; otherwise, the Electrical Contractor will be liable for damages.
- .2 Operate switches and contactors to verify correct functioning.
- .3 Perform starting and stopping sequences of contactors and relays.
- .4 Check that sequence controls, interlocking with other separate related starters, equipment, and control devices, operate as indicated.

**END OF SECTION**

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