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**Part 1 General****1.1 RELATED SECTIONS**

- .1 Section 01 00 10 – General Instructions.

**1.2 REFERENCES**

- .1 International Electrotechnical Commission (IEC)
  - .1 IEC 60947-4-1 Ed. 3.0 b:2009, Low-voltage switchgear and control gear - Part 4-1: Contactors and motor-starters - Electromechanical contactors and motor-starters.
- .2 Canadian Standards Association (CSA International).
  - .1 CSA C22.2 No.14-05, Industrial Control Equipment, (Includes Update No. 3 (2008)).

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 00 10 – General Instructions.
- .2 Product Data:
  - .1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Provide shop drawings: in accordance with Section 01 00 10 – General Instructions.
    - .1 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 Provide maintenance materials in accordance with Section 01 00 10 – General Instructions.
- .2 Submit operation and maintenance data for each type and style of motor starter for incorporation into maintenance manual.

**1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle in accordance with Section 01 00 10 – General Instructions.

- .2 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.
- .3 Packaging Waste Management: remove for reuse packaging materials in accordance with Section 01 00 10 – General Instructions.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Starters: to IEC 60947-4 with AC4 utilization category.
- .2 Provide Motor Circuit Protectors (MCP) in all starters. Refer to Section 26 28 16.02- Moulded Case Circuit Breakers.

### **2.2 MANUAL MOTOR STARTERS**

- .1 Single phase manual motor starters of size, type, rating, and enclosure type as indicated, with components as follows:
  - .1 Switching mechanism, quick make and break.
  - .2 One overload heater, manual reset, trip indicating handle.
- .2 Accessories:
  - .1 Toggle switch, pushbutton: heavy duty labelled as indicated.
  - .2 Indicating light: heavy duty LED type and red colour.
  - .3 Locking tab to permit padlocking in "ON" or "OFF" position.

### **2.3 FULL VOLTAGE MAGNETIC STARTERS**

- .1 Combination magnetic starters of size, type, rating and enclosure type as indicated with components as follows:
  - .1 Contactor solenoid operated rapid action type.
  - .2 Motor overload protective device in each phase, manually reset from outside enclosure.
  - .3 Wiring and schematic diagram inside starter enclosure in visible location.
  - .4 Identify each wire and terminal for external connections, within starter, with permanent number marking identical to diagram.
- .2 Combination type starters to include motor circuit interrupter with operating lever on outside of enclosure to control disconnect motor circuit interrupter and provision for:
  - .1 Locking in "OFF" position with up to 3 padlocks.
  - .2 Independent locking of enclosure door.
  - .3 Provision for preventing switching to "ON" position while enclosure door open.
- .3 Accessories:
  - .1 HAND OFF AUTOMATIC (HOA): Selector switches: heavy duty labelled as indicated.

- .2 Indicating lights: heavy duty LED type, red to indicate motor running.
- .3 1-N/O and 1-N/C spare auxiliary contacts unless otherwise indicated.

#### **2.4 CONTROL TRANSFORMER**

- .1 Single phase, dry type, control transformer with primary voltage as indicated and 120 V secondary, complete with secondary fuse, installed in with starter as indicated.
- .2 Size control transformer for control circuit load plus 20% spare capacity.

#### **2.5 ACCESSORIES**

- .1 Pushbutton: heavy duty, oil tight as required.
- .2 Selector switches: heavy duty, oil tight as required.
- .3 Indicating lights: heavy duty, oil tight, type and colour as indicated.

#### **2.6 FINISHES**

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

#### **2.7 EQUIPMENT IDENTIFICATION**

- .1 Provide equipment identification in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Manual starter designation label, white plate, black letters, size 1, engraved as indicated.
- .3 Magnetic starter designation label, white plate, black letters, size 4 engraved as indicated.

### **Part 3 Execution**

#### **3.1 INSTALLATION**

- .1 Install starters and control devices in accordance with manufacturer's instructions.
- .2 Install and wire starters and controls as indicated.
- .3 Confirm motor nameplate and adjust overload device to suit.

#### **3.2 FIELD QUALITY CONTROL**

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical and manufacturer's instructions.
- .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, control devices, operate as indicated.

**END OF SECTION**