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**PART 1        GENERAL**

**1.1            RELATED SECTIONS**

- .1        Section 01 33 00 – Submittal Procedures.
- .2        Section 26 05 00 – Common Work Results - Electrical.

**1.2            REFERENCES**

- .1        Codes and standards referenced in this section refer to the latest edition thereof.
- .2        International Electrotechnical Commission (IEC)
  - .1        IEC 947-4-1, Part 4: Contactors and motor-starters.

**1.3            SUBMITTALS**

- .1        Indicate:
  - .1        Mounting method and dimensions.
  - .2        Starter size and type.
  - .3        Layout of identified internal and front panel components.
  - .4        Enclosure types.
  - .5        Wiring diagram for each type of starter.
  - .6        Interconnection diagrams.

**1.4            CLOSEOUT SUBMITTALS**

- .1        Provide operation and maintenance data for motor starters for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
- .2        Include operation and maintenance data for each type and style of starter.

**1.5            EXTRA MATERIALS**

- .1        Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
- .2        Provide listed spare parts for each different size and type of starter:
  - .1        3 contacts, stationary.
  - .2        3 contacts, movable.
  - .3        1 contacts, auxiliary.
  - .4        1 control transformer.
  - .5        1 operating coil.
  - .6        2 fuses.

- .7 10% indicating lamp bulbs used.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Starters: to IEC 947-4 with AC4 utilization category.

### **2.2 MANUAL MOTOR STARTERS**

- .1 Single and Three 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 and Three overload heaters, manual reset, trip indicating handle.
- .2 Accessories:
  - .1 Toggle switch or pushbutton: heavy duty labelled as indicated.
  - .2 Indicating light: heavy duty type and colour as indicated.
  - .3 Locking tab to permit padlocking in "ON" or "OFF" position.
  - .4 Complete with two (2) N/O and two (2) N/C contact.

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

- .1 Magnetic and 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 fused disconnect switch with operating lever on outside of enclosure to control disconnect, 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 Pushbuttons and Selector switches: heavy duty labelled as indicated.
  - .2 Indicating lights: heavy duty type and color as indicated.
  - .3 3-N/O and 3-N/C spare auxiliary contacts unless otherwise indicated.
  - .4 N/C auxiliary contact suitable for fire alarm shutdown on main control circuit.

## **2.4 CONTROL TRANSFORMER**

- .1 Single phase, dry type, control transformer with primary voltage as indicated and 24 or 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 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 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, connect power and control as indicated.
- .2 Ensure correct fuses and overload devices elements installed.

## **3.2 FIELD QUALITY CONTROL**

- .1 Perform tests in accordance with Section 26 05 00 – Common Work Results - Electrical , manufacturer's instructions.
- .2 Operate switches, 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**