

**Part 1            General**

**1.1                RELATED WORK**

- .1        Section 16050 – Basic Materials & Methods
- .2        Section 16151 – Mechanical Equipment Wiring

**1.2                SUBMITTALS**

- .1        Submit shop drawings and product data in accordance with Section 16050.
- .2        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.

**1.3                OPERATION AND MAINTENANCE DATA**

- .1        Provide data for incorporation into Maintenance Manual specified in Section 16050.
- .2        Include operation and maintenance data for each type and style of starter.

**1.4                MAINTENANCE MATERIALS**

- .1        Provide maintenance materials in accordance with Section 16050.
  - .1        4 contacts, stationary.
  - .2        4 contacts, movable.
  - .3        2 contacts, auxiliary.
  - .4        2 control transformers.
  - .5        2 operating coils.
  - .6        2 fuses.
  - .7        10 indicating lamps.
  - .8        OA kit.

**Part 2            Products**

**2.1                MATERIALS**

- .1        Starters: to CSA C22.2 No. 14, EEMAC E14-1.
  - .1        Starters smaller than EEMAC “1” are not acceptable.
  - .2        EEMAC/NEMA rated type only – IEC type not allowed.

**2.2                MANUAL MOTOR STARTERS**

- .1        Single-phase and three-phase manual motor starters of size, type, rating, and EEMAC “1” enclosure with components as follows:
  - .1        Switching mechanism, quick make and break.
  - .2        Overload heaters, manual reset, trip indicating handle.
- .2        Accessories:
  - .1        Toggle switch.

- .2 Indicating light.
- .3 Locking tab to permit padlocking in "ON" or OFF" position.
- .4 Flush-mounted type for public areas or as indicated.

**2.3 FULL VOLTAGE MAGNETIC STARTERS**

- .1 Magnetic of size, type, rating and EEMAC "1" enclosure 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 Power and control terminals.
  - .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 transformer.
- .2 Accessories:
  - .1 Pushbuttons and selector switches labelled as indicated.
  - .2 Two indicating lights:
    - .3 RED – "OFF" and GREEN – "ON"
  - .4 Two N/O and two N/C spare auxiliary contacts, unless otherwise indicated.
  - .5 HOA selector switch.

**2.4 CONTROL TRANSFORMER**

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

**2.5 FINISHES**

- .1 Apply finishes to enclosure in accordance with Section 16050.

**2.6 EQUIPMENT IDENTIFICATION**

- .1 Provide equipment identification in accordance with Section 16050.
- .2 Identify manual starters with Size 2 nameplates, indicating motor number, description and horsepower.
- .3 Identify magnetic starters with Size 4 nameplates, indicating motor number, description, horsepower and voltage.

**2.7 MANUFACTURERS**

- .1 Acceptable manufacturers are: Westinghouse Canada Inc., Square D Company Limited, Allen Bradley Canada Company, Siemens Canada Ltd., and Cutler Hammer Canada Limited.

**Part 3 Execution**

**3.1 INSTALLATION**

- .1 Install starters, connect power and control as indicated.
- .2 Install correct fuses and overload devices.

**3.2 TESTS**

- .1 Perform tests in accordance with Section 16050 and manufacturer's instructions.
- .2 Operate switches and contactors to verify correct functioning.
- .3 Perform starting and stopping sequences of motors and controls.
- .4 Check that sequence controls, interlocking with other separate related starters, equipment, control devices, operate as indicated.
- .5 Ensure that motor rotation corresponds with the direction required by the driven equipment.

**END OF SECTION**