Part 1 GENERAL

1.1 REFERENCES

.1 International Electrotechnical Commission (IEC)

.1 IEC 947-4-1-2002, Part 4: Electromechanical contactors and motor-starters.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.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 33 00 - Submittal Procedures.

.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.

1.3 CLOSEOUT SUBMITTALS

.1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Submit operation and maintenance data for each type and style of motorstarter for incorporation into maintenance manual.

.3 Extra Materials:

.1 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[s].

.5 1 operating coil.

.6 2 fuses.

.7 10% indicating lamp bulbs used.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

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.

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 circuit breaker, 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 oil tight labelled as indicated.

.2 Indicating lights: heavy duty, oil tight type and color as indicated.

.3 1-N/O and 1-N/C spare auxiliary contacts unless otherwise indicated.

2.4 FULL VOLTAGE REVERSING MAGNETIC STARTERS

.1 Full voltage reversing magnetic starters of size, type, rating and enclosure type as indicated with components as follows:

.1 Two - 3 pole magnetic contactors mounted on common base.

.2 Mechanical and electrical interlocks to prevent both contactors from operating at same time.

.3 Three overload relays with heater elements, manual reset.

.2 Accessories:

.1 Pushbuttons and Selector switches: heavy duty oil tight labelled as indicated.

.2 Indicating lights: heavy duty, oil tight type and color as indicated.

.3 Auxiliary control devices as indicated.

2.5 MULTI-SPEED STARTERS

.1 2 speed starters of size, type, rating and enclosure type as indicated. Starter suitable for constant torque type motor and with components as follows:

.1 One-3 pole contactor for each winding for separate winding motors.

.2 One-3 pole and one-5 pole contactor for each reconnectable winding for consequent pole type motors.

.3 Three overload relays with 3 heater elements and manual reset for each speed.

.2 Accessories:

.1 Pushbuttons and Selector switches: heavy duty, oil tight labelled as indicated.

.2 Indicating lights: heavy duty, oil tight], type and color as indicated.

.3 Auxiliary control devices as indicated.

2.6 MAGNETIC STARTER, REDUCED VOLTAGE, AUTO-TRANSFORMER

.1 Auto-transformer starter closed circuit transition type, of size, type, rating and enclosure type as indicated and with following components:

.1 Three-3 pole contactors.

.2 Auto-transformer with 50%, 65% and 80% taps.

.3 One adjustable pneumatic timing relay.

.4 One-3 pole manual reset overload device.

.5 Thermal overload protection of auto-transformers.

.2 Accessories:

.1 Pushbuttons and Selector switches: heavy duty, oil tight labelled as indicated.

.2 Indicating lights: heavy duty, oil tight type and color as indicated.

.3 Auxiliary control devices as indicated.

2.7 MAGNETIC STARTER REDUCED VOLTAGE STAR-DELTA

.1 Reduced voltage star-delta open transition starter, of size, type, rating and enclosure type as indicated, with components as follows:

.1 Two-3 pole delta contactors with auxiliary relays and interlocks.

.2 One-3 pole star contactor with auxiliary relays and interlocks.

.3 Mechanical interlock to interlock one delta contactor and the star contactor.

.4 One timing relay.

.5 Three pole manual reset overload relays.

.2 Reduced voltage star-delta closed transition starter, of size, type, rating and enclosure type as indicated, with components as follows:

.1 Two-3 pole delta contactors with auxiliary relays and interlocks.

.2 One-3 pole star contactor with auxiliary relay and interlocks.

.3 One-3 pole transition contactor.

.4 One set of transition resistors.

.5 Mechanical interlock, to interlock one delta contactor and the star contactor.

.6 One timing relay.

.7 Three pole manual reset overload relays.

.3 Accessories:

.1 Pushbuttons and Selector switches: heavy duty, oil tight labelled as indicated.

.2 Indicating lights: [standard] [heavy duty] [oil tight], type and color as indicated.

.3 Auxiliary control devices as indicated.

2.8 MAGNETIC STARTER REDUCED VOLTAGE PART WINDING

.1 Two-step reduced voltage, part winding starter of size, type, rating and enclosure type as indicated, with components as follows:

.1 Two-3 pole contactors.

.2 Adjustable pneumatic timer.

.3 Six manual reset overload relays.

.2 Three step reduced voltage part winding starter of size, type, rating and enclosure type as indicated, with components as follows:

.1 Three-3 pole contactors.

.2 One set starting resistors.

.3 Six manual reset overload relays.

.3 Accessories:

.1 Pushbuttons and Selector switches: heavy duty, oil tight labelled as indicated.

.2 Indicating lights: heavy duty, oil tight type and color as indicated.

.3 Auxiliary control devices as indicated.

2.9 THREE PHASE MANUAL REVERSING STARTER

.1 Three phase manual reversing starter of size, type, rating and enclosure type as indicated, with components as follows:

.1 Two-3 pole manual motor starters, quick make and break.

.2 Six overload relays and manual reset.

.3 Mechanical interlock to prevent both switches from closing at same time.

.2 Accessories:

.1 Pushbuttons and Selector switches: heavy duty, oil tight labelled as indicated.

.2 Indicating lights: heavy duty, oil tight type and colour as indicated.

2.10 THREE PHASE MANUAL TWO SPEED SEPARATE WINDING STARTERS

.1 Three phase manual two speed separate winding starters of size, type, rating and enclosure type as indicated with components as follows:

.1 Two-3 pole manual motor starters, quick make and break.

.2 Six overload relays and manual reset.

.3 Mechanical interlock to prevent both switches from closing at same time.

.2 Accessories:

.1 Pushbuttons and Selector switches: heavy duty, oil tight labelled as indicated.

.2 Indicating lights: heavy duty, oil tight type and colour as indicated.

2.11 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.

2.12 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.

2.13 FINISHES

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

2.14 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 2 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 Ensure correct fuses installed.

.4 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.

3.3 CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION