

SECTION 16485
MOTOR STARTERS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section describes general requirements, products, and methods of execution relating to manual and magnetic motor starters provided for use at ANC.

1.2 QUALITY ASSURANCE

- A. Equipment shall be of the latest approved design as manufactured by Square D Company to match equipment provided in C Concourse Phase 2 Building Completion Package. Equipment shall be in conformity with the governing standards.

PART 2 - PRODUCTS

2.1 AC FRACTIONAL MANUAL STARTERS

- A. The manual starter shall consist of a manually operated toggle switch equipped with red pilot light and melting alloy type thermal overload relay.
- B. Thermal unit shall be one-piece construction and interchangeable. Starter shall be inoperative if thermal unit is removed.

2.2 AC MANUAL STARTERS--LINE VOLTAGE TYPE

- A. Manual starters shall be constructed and tested in accordance with the latest published NEMA standards.
- B. The manual starters shall consist of a manually operated switch equipped with red pilot light and melting alloy type thermal overload relays in every phase conductor. Thermal units shall be one-piece construction and the starter shall be inoperative if any thermal unit is removed.
- C. Starters shall be furnished in a NEMA 1 general purpose enclosure unless otherwise indicated on the plans or required by the conditions of the area in which they are installed.

2.3 AC MAGNETIC STARTERS--LINE VOLTAGE TYPE

- A. Motor starters shall be across-the-line magnetic type rated in accordance with NEMA standards, sizes and horsepower ratings.
- B. Starters shall be mounted in NEMA 1 general purpose enclosures unless otherwise indicated on plans or required by the conditions of the area in which they are installed. NEMA 12 enclosures shall be provided for starters located in Level 4 Fan Rooms or other rooms used to transport environmental air.
- C. Starters shall be furnished with overload relays in every phase conductor and starters shall be inoperative if any overload unit is removed.
 - 1. Overload relays shall be the solid state type. Trip current rating shall be established by selection of overload relay and shall be adjustable (3 to 1 current range). The overload shall be self-powered, provide phase loss and phase unbalance protection, have a permanent tamper guard, and be ambient insensitive. Overload shall standard trip (Class 20) and shall have a mechanical test function.

- D. Starters through NEMA size five (5) shall be equipped with double break silver alloy contacts. All contacts shall be replaceable without removing power wiring or removing starter from panel.
- E. Coils shall be of molded construction and shall be 120 VAC. Starters shall have a fused 120V control power transformer in enclosure, or alternatively on 120/208 volt systems, the power system neutral conductor may be utilized. In all cases, control power shall be disconnected by the starter disconnecting means, unless otherwise specifically approved.
- F. Starters shall be suitable for field-addition of at least four (4) auxiliary electrical interlocks of any arrangement, normally-open or normally-closed.
- G. All starters shall have enclosure-mounted red running pilot light and Hand-Off-Auto switch.

2.4 AC COMBINATION STARTERS WITH FUSIBLE DISCONNECT SWITCH OR CIRCUIT BREAKER

- A. Combination starters shall be manufactured in accordance with the latest published NEMA standards, sizes and horsepower ratings.
- B. Disconnect switch combination starters shall consist of a visible blade disconnect switch and a motor starter.
- C. Combination starters shall be mounted in NEMA 1 general purpose enclosures unless otherwise indicated on the plans or required by the conditions of the area in which they are installed. NEMA 12 enclosures shall be provided for combination starters located in Level 4 Fan Rooms or other rooms used to transport environmental air.
- D. The disconnect handle used on combination starters shall always be in control of the disconnect device with the door opened or closed. The disconnect handle shall be clearly marked as to whether the disconnect device is "on" or "off".
- E. Magnetic starters provided under all Divisions shall be in accordance with this Section.

PART 3 - EXECUTION

3.1 COORDINATION

- A. Coordinate all details pertaining to the motor control equipment with the Division where the equipment is specified.

3.2 CONTROL WIRING

- A. Control wiring and control devices shall be provided under the Division in which the controlled equipment is specified. Coordinate all related work.

3.3 CONNECTIONS

- A. Provide liquid-tight flexible conduit connections to motors and other equipment subject to vibration. Minimum length 12".

3.4 NAMEPLATES

- A. Provide engraved nameplates for all starters. Coordinate names with mechanical equipment lists.

3.5 REDUCED VOLTAGE STARTERS

A. Reduced voltage starters shall be provided for all motors larger than:

208 volts 25 horsepower

460 volts 50 horsepower

1. This requirement shall apply to starters furnished in this Division and other Divisions.
2. Motors controlled by Variable Frequency Drives (VFDs) are not subject to this requirement.

3.6 TWO SPEED STARTERS

A. Provide two speed starters for all two speed motors. Starters shall comply with the requirements of the equipment and motor manufacturers.

B. This requirement shall apply to starters furnished in this Division and other Divisions.

END OF SECTION