

SECTION 11036 - DC-SCR DRIVES

City of San Diego, CWP Guidelines

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

- A. The WORK of this Section includes providing all variable speed DC-SCR drive equipment, complete with drive motor, speed control unit, accessories, connections, supports, drive housing, and appurtenances as indicated herein to provide a complete and workable installation.

1.2 RELATED SECTIONS

- A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.
 - 1. Section 11030 Variable Speed Drives, General
 - 2. Section 16050 Basic Electrical Materials and Methods

1.3 CODES

- A. The WORK of this Section shall comply with the current editions of the following codes as adopted by the City of San Diego Municipal Code:
 - 1. National Electrical Code (NEC) NFPA 70

1.4 SPECIFICATIONS AND STANDARDS

- A. Commercial Standards:
 - 1. UL Underwriters Laboratories, Inc.

1.5 SHOP DRAWINGS AND SAMPLES

- A. The following shall be submitted in compliance with Section 01300:
 - 1. Shop drawings shall show physical appearance and dimensions, pertinent data such as horsepower, voltage, signal interfacing devices, and wire numbers.

1.6 SPECIAL WARRANTY

- A. The DC-SCR drive shall be warranted against defects for a period of two years starting upon final acceptance.
- B. During the warranty period, the CONTRACTOR shall respond to telephone notification of defective operation from the OWNER by dispatching a competent repair person to the project site within 24 hours. The repair person shall have access to all necessary parts within 24 hours. Repairs involving parts shall start within 48 hours of the notification above.
- C. The two-year warranty shall include all costs for repair at no additional cost to the OWNER.

PART 2 -- PRODUCTS

2.1 EQUIPMENT COMPATIBILITY

- A. Each DC-SCR drive shall be compatible with the equipment it serves.

2.2 DESIGN AND CONSTRUCTION

- A. **Drives:** DC-SCR drives shall utilize silicon controlled rectifiers for AC to DC power conversion. Controlled DC power shall be supplied to a DC drive motor which shall provide a 20 to 1 regulated speed range. The drive speed shall be adjusted over the speed range by control of armature voltage and motor field current. Armature voltage shall be controlled from zero to maximum providing smooth starting from zero speed. The drive unit shall be designed for continuous, full-torque operation at slow speed. The unit shall receive a remote speed control signal (4-20 ma) for speed control and shall have 4-20 ma speed signal output for remote indication.

The drives shall consist of the power unit, housing, the conversion unit and necessary control, and the DC motor.

- B. DC-SCR drive equipment shall be UL listed.
- C. The control system shall be arranged and wired in accordance with the diagrams indicated. Equipment components in the control units shall be as follows:
 - 1. Drive control panel complete with speed-adjusting potentiometer, speed indicator, on-off switch.
 - 2. Manual selector switch, two-position rated 120-volt and suitable for switching control for the variable speed drive panel from local to remote location.
 - 3. Indicating lights, oil tight, heavy duty type.
 - 4. Circuit breakers, molded case type [single pole, 120-volt] [2-pole, 240 volts] and [three pole rated 600-volt] as required.
 - 5. Timers for controlling utility water shall be pneumatic type, off-delay, with time adjusting dial and time range as indicated.
 - 6. Relays, rated 300-volt, 10-amperes, with field convertible contacts.
 - 7. Dry type transformer shall be 480-volt/120-volt sized for the equipment and provided with grounded secondary.

8. All necessary dry contacts for remote status and alarm indications. All necessary interphase points for external connections as indicated.
9. All components for each unit shall be mounted in NEMA 4X enclosures:
 - a. Remote operator adapter kit for buffering and filtering of external signals.
 - b. Tachometer feedback kit for accuracy of speed regulation to 0.5 percent with 95 percent load change.
 - c. Instrument interface/preset speed kit. Instrument signal interface shall be provided for isolation of powered or unpowered 4-20 mA signal.
 - d. Auxiliary contact kit for interconnection with external signalling devices.
 - e. Torque taper kit for changing speed-torque relationship to allow motor speed decrease as the load increases.
 - f. Separate NEMA 4/12 operator control stations for remote operation of the drive.
- D. **Motor:** Electric motors for equipment shall be as indicated and shall meet the performance criteria indicated in equipment specifications. Direct current motors shall comply with the requirements of NEMA standard MG1-12 and shall be rated for ambient temperature of 40 degrees C and minimum service factor of 1.0. Direct current motors shall be provided with Class F insulation, bearings rated for minimum AFBMA L-10 life of 20,000 hours, TEFC enclosures, and gasketed conduit boxes.

2.3 MANUFACTURERS

- A. Products of the type indicated shall be manufactured by one of the following (or equal):
 1. Control panel and accessories:

Reliance Electric Co. [DC1-V-S Drive] [Minpak Plus]
General Electric, Statotrol II
 2. Timers

Agastat Series 7000
 3. Relays

Allen Bradley, Type N
Square D, Type M

PART 3 -- EXECUTION

3.1 INSTALLATION

- A. DC-SCR drives shall be installed in strict accordance with the manufacturer's printed instructions.

3.2 FIELD TESTING

- A. Operation of the DC-SCR system shall be demonstrated to the CONSTRUCTION MANAGER to prove that under normal conditions the drive will perform flawlessly throughout the speed range indicated.

**** END OF SECTION ****