

## SECTION 16485 - LOCAL CONTROL PANELS

### City of San Diego, CWP Guidelines

#### PART 1 - GENERAL

##### 1.1 WORK OF THIS SECTION

- A. The WORK of this Section includes providing local control panels including enclosures, wiring and control devices.

##### 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 13300 Instrumentation and Control
  - 2. Section 16050 Basic Electrical Materials and Methods
  - 3. Section 16170 Grounding System
  - 4. Section 16400 Electrical Service and Distribution

##### 1.3 CODES

- A. The WORK of this Section shall comply with the current editions, with revisions, of the following codes and City of San Diego Supplements:
  - 1. National Electrical Code

##### 1.4 SPECIFICATIONS AND STANDARDS

- A. Except as otherwise indicated, the current editions of the following apply to the WORK of this Section:
  - 1. JIC EGP-1 Electrical Standards for General Purpose Machine Tools
  - 2. NEMA 250 Enclosures for Electrical Equipment (1000 Volts Maximum)
  - 3. UL Underwriters' Laboratories

##### 1.5 SHOP DRAWINGS AND SAMPLES

- A. The following shall be submitted in compliance with Section 01300:
  - 1. Manufacturer's product data including catalogue cut sheets showing classifications.
  - 2. Arrangement drawings of the local control panel enclosure indicating the front door and rear panel equipment arrangement and dimensions.
  - 3. List of materials and components.

4. Connection diagrams.
5. Shop drawings indicating mounting of devices, discrete inputs and outputs, and termination points.

#### 1.6 OWNER'S MANUAL

- A. The following shall be included in the OWNER'S MANUAL in compliance with Section 01300:
  1. Manufacturer's installation instructions.
  2. Manufacturer's maintenance procedures.
  3. Manufacturer's certification that products comply with the indicated requirements.

#### 1.7 FACTORY TESTING

- A. **Product Testing:** Panels shall be tested at the factory for sequence of operation.
- B. **Witnesses:** The OWNER and the CONSTRUCTION MANAGER (at the option of either) reserves the right to witness factory tests.

#### 1.8 FIELD TESTING

- A. **Testing:** Panels shall be field-tested for functional operation after connection of external conductors and prior to equipment startup.

### PART 2 - PRODUCTS

#### 2.1 LABELING

- A. Products shall bear the UL label.

#### 2.2 CLASSIFICATION

- A. Unless otherwise indicated, enclosures installed indoors shall be NEMA 12 with gasketed doors. Enclosures installed outdoors or in corrosive areas shall be NEMA [4] [4X, nonmetallic]. Enclosures installed in the indicated hazardous areas shall comply with the NEC requirements for that area.

#### 2.3 SIZE

- A. Unless otherwise indicated, the minimum enclosure area, height by width, shall be twice the sum of the areas of the individual components mounted on the back panel. The enclosure depth shall not be less than 6 inches.

#### 2.4 LOCAL CONTROL PANELS (LCP)

- A. The LCP shall be designed to provide the indicated sequence of operations. The LCP controls shall be 120 VAC. Where the electrical power supply to the LCP is 240 VAC single phase or 480 VAC 3-phase, as indicated on the electrical drawings or elsewhere, the LCP shall be provided with a control power transformer. Control conductors shall comply with the requirements of Section 16050.

- B. Each LCP shall include terminal strips identified for the connection of external conductors. The LCP shall include sufficient terminal blocks to connect 25 percent additional conductors for future use. Termination points shall be identified in accordance with shop drawings. The LCP shall be the source of power for 120 VAC solenoid valves interconnected with the LCP. Equipment associated with the LCP shall be ready for service after connection of conductors to equipment, controls, and LCP.
- C. Internal wiring shall be factory-installed and shall be enclosed in plastic raceways with removable covers. Wiring to door-mounted devices shall be extra flexible and shall be anchored to doors using wire anchors cemented in place. Exposed terminals of door-mounted devices shall be guarded to prevent contact.
- D. Enclosures shall be either freestanding, or designed to be mounted on pedestals or equipment skids or as indicated. Internal control components shall be mounted on a removable mounting pan. Interior of enclosure and mounting pan shall be finished white. Enclosure shall include 100-watt incandescent light (min.) designed to be controlled by a hand-operated switch and a circuit breaker and 15-amp duplex receptacle.
- E. The main feeder disconnect shall be [flange-mounted] unless otherwise indicated.
- F. Each source of voltage and motor control shall include a means for disconnecting by disconnecting or pull-apart terminal blocks or a disconnect operable from the panel front.
- G. Motor starters, where indicated, shall comply with Section 16400. Each motor starter shall include contact closures for motor overload local indication and remote alarm.
- H. Discrete outputs from the LCP shall be provided by electrically isolated dry contacts rated for 5 amps at 120 VAC. Analog inputs and outputs shall be isolated 4-20 mA two-wire signal with power supply complying with Section 13300.
- I. Identification of panel-mounted devices, conductors, and electrical components shall comply with Section 16050.
- J. LCPs shall include programmable logic controllers (PCLs) in accordance with Section 13300].
- K. Indicating lights shall be "Push-to-Test" type.

## 2.5 COLOR CODING

- A. Wiring shall be color coded complying with Section 16050.

## 2.6 LABELING AND NAMEPLATES

- A. **Labeling:** Local control panel components shall be labeled to match the description on the elementary diagram. Internal components of the local control panel on the back side of the door shall be labeled with the same description as provided on the front side. Labeling shall be permanently marked on or near each component. Plastic embossed labels such as "Dymo" tape will not be accepted.
- B. **Nameplates:** External door-mounted components and the local control panel description shall be identified with plastic nameplates.

## 2.7 GROUNDING

- A. Neutrals of locally derived control circuits shall be grounded to the mounting plate using a copper bus or grounding lug. A grounding lug for a size No. 2 AWG bare copper conductor shall be included to ground the panel to the plant's grounding system.

## 2.8 MANUFACTURERS

- A. Products of the type or model (if any) indicated shall be manufactured by one of the following (or equal):

Hoffmann Engineering Co., Bulletin A  
E.M. Wiegman and Co., Inc.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Products, equipment, conduit, conductors and terminations shall be installed in accordance with the manufacturer's written installation instructions and Section 16050.
- B. LCP interior and exteriors shall be cleaned and coatings shall be touched up to match [original] [white] finish upon completion of the WORK.
- C. Alternating current control circuits shall be grounded. One terminal of each load device shall be connected to the grounded conductor. Control contracts shall be installed in the ungrounded side of the circuit.
- D. Signal and control wiring shall be separated and installed in separate wireways.
- E. The panel shall be grounded to the plant grounding system as indicated.
- F. Local control panel centers shall be mounted at [ ] [36] [48] inches [minimum] above the finished floor.
- G. A copy of the wiring diagrams shall be placed on the inner panel door. Drawings shall be enclosed in a transparent, protective jacket. A metal pocket measuring not less than 10 inches wide by 8 inches high by 3/4-inch deep shall be provided on the inside of the door for the drawings.

\*\* END OF SECTION \*\*