

## **SECTION 17150 ELECTRONIC RELAY SYSTEM**

### **PART 1 - GENERAL**

#### **1.01 SUMMARY.**

- A. Provide Electronic Relay System as specified herein. Installing contractor shall receive, place, connect, and mount all equipment specified in this Section per the manufacturer's instructions. Installing contractor shall furnish all hardware, wire, connectors, and other necessary items as required for a complete and functional control system.
- B. Related Sections:
  - 1. Section 17000 Security Electronics, General
  - 2. Section 17120 Touch Screen System
  - 3. Section 17140 Programmable Logic Controller
  - 4. Section 17200 Intercommunications System

#### **1.02 REFERENCES.**

- A. Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title, or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- B. Underwriter's Laboratories (UL)
  - 1. UL 508 Industrial Control Equipment
  - 2. NEC National Electrical Code (latest edition)

#### **1.03 WORK INCLUDED**

- A. Provide relays, terminals, power supplies, cabinetry and other equipment as required to install an Electronic Relay System to facilitate a completely function system as shown on the drawings or as specified herein.
- B. Major Sub-systems include:
  - 1. Programmable Logic Controllers (PLC's).
  - 2. Electronic relay system.

#### **1.04 COORDINATION WITH OTHER TRADES**

- A. Coordinate the work of this Section with that of other sections as required to ensure that the entire work of this Project will be carried out in an orderly, complete and coordinated fashion.

#### **1.05 APPROVALS**

- A. General
  - 1. Submittals shall be made in accordance with the General Provisions (Section 17000) of these specifications.
- B. Specific Requirements:
  - 1. Submit catalog cuts for all equipment and devices being furnished under this Section.

#### **1.06 DESCRIPTION**

- A. The relays shall provide the actual switching of power to all electric locking hardware, lights etc.
- B. All relays shall be mounted in NEMA-1 type cabinets with removable steel mounting plate. The cabinet shall be sized according to the number of relays required by the job and constructed of code grade steel. The cabinets shall be mounted where shown on the drawings.
- C. All relays shall be of the electro-mechanical type. The use of solid state type relays is strictly prohibited.
- D. All relays, terminals and other equipment shall be standard off the shelf, commercially available components.
- E. **Relays and terminals for each device, i.e. doors, shall be grouped together and each terminal labeled with the device designation, wire color, power supply nomenclature and PLC I/O.**
- F. **Each door shall have a device for overcurrent protection. Overcurrent protection devices shall be circuit breakers, fuses shall not be acceptable. The overcurrent device shall provide protection for both constant lock power (if applicable) and unlock/lock signal voltage.**
- G. All control wiring in the relay cabinet shall be grouped and laced with nylon tie straps with a maximum spacing of one inch. Straps will be placed within 1/2" on each side of all bundle breakouts. Wiring will be supported at intervals not exceeding four inches and labeled at both ends.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Relays
  - 1. Nominal input voltage 24 VDC.
  - 2. Nominal input current 9 mA.
  - 3. Typical response time 5 ms.
  - 4. Typical release time 8 ms.
  - 5. Continuous current rating 10 A.
  - 6. Relays shall be Din rail mounted with a base structure and field replaceable relay module. Relay boards containing multiple relays shall not be acceptable.
  - 7. Shall have LED indication for relay status.
  - 8. Acceptable Manufacturers
    - a. Phoenix
    - b. Omron
    - c. Idec
- B. Power Supplies
  - 1. Nominal input voltage 115 VAC.
  - 2. Nominal output voltage 24 VDC.
  - 3. Output current 10 A.
  - 4. MTBF > 500,000 hrs
  - 5. Ambient temperature operating range -25 C to 70 C.
  - 6. Din rail mounted
  - 7. Acceptable Manufacturers
    - a. Phoenix
    - b. Power One
- C. Circuit Breakers
  - 1. Shall be thermal miniature circuit breaker, pluggable in a screw type terminal block.

2. Sized for the device being protected.
3. Rated surge 3 kV.
4. Nominal voltage 65 VDC, 250 VAC.
5. Ambient operating temperature -20 C to 60 C.
6. Acceptable Manufacturers
  - a. Phoenix

### **PART 3 - EXECUTION**

#### **3.01 MANUFACTURER'S INSTRUCTIONS**

- A. Compliance: Comply with manufacturer's product data; including product technical bulletins, product catalog, installation instructions, submittal sketches or drawings, and product carton instructions for installation.

#### **3.02 EXAMINATION**

- A. Site Verification of Conditions: Verify that related conditions, including equipment that has been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.
- B. All devices connected to equipment specified in this section shall bear the UL, cUL, or CSA label and comply with all applicable National Electrical Code (NEC) standards.

#### **3.03 PREPARATION**

- A. All equipment related to the system shall be factory tested before shipment.

#### **3.04 INSTALLATION**

- A. Contractor shall furnish all equipment, labor, system setup, and other services necessary for the proper installation of the products/system as indicated on the drawings and specified herein.
- B. All control wiring systems shall use solid or stranded copper conductors. Stranded conductors shall be acceptable only where all terminations can be made to lugs. Where stranded conductors are used, all terminations shall be made with crimp type lugs, correctly sized for termination, and applied to conductor with crimping tool intended for use with the lug used.
- C. All wiring systems shall be labeled and color coded with labeling and coding shown on shop drawings. White conductors shall be used only for neutral conductors and green only for grounding conductors. All conductors within junction boxes, pull boxes and equipment enclosures shall be grouped and laced with nylon tie straps with identification tabs (equivalent to Ideal Industries #41-693 write-on I.D. marker plates) in individual sets, serving individual locks or groups. Conductor group shall be identified on the tab with respect to room or area served. Control system conductors shall not be spliced; control conductors shall be continuous between the control panel and the relay cabinet.
- D. Install in accordance with all local and pertaining codes and regulations.
- E. All equipment and systems shall be installed by the ESC. Subcontracting of equipment installation shall not be permitted.
- F. Equipment shall be ready to use condition at end of installation.
- G. Energize equipment in accordance with manufacturer's instructions.
- H. All panels must be certified and listed by UL and must be labeled accordingly.

#### **3.05 PROTECTION AND CLEANING**

- A. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
- B. Touch up, repair, or replace damaged components before Substantial Completion.

- C. Remove temporary tags, coverings, and construction debris from interior and exterior surfaces of equipment. Remove construction debris from equipment area and dispose of debris.
- D. Clean integral air filters, heatsinks, grills, and fans before Substantial Completion and Commissioning Services.

3.06 WARRANTY

- A. The ESC shall provide a single source warranty for all supplied equipment specified in this section to be free of defects in material and workmanship for a period of one (1) year from the date of substantial completion.

**END OF SECTION 17150**