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**MISCELLANEOUS PANEL DEVICES**

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**1. GENERAL**

**1.1 References - General**

- .1 Equipment, products, and execution must meet all requirements detailed in Section 17010 – Instrumentation and Control General Requirements.

**2. PRODUCTS**

**2.1 Miscellaneous Panel Devices**

.1 Pilot Lights

- .1 Supply and install LED or transformer type pilot lights for extended lamp life, oil tight, push to test, complete with appropriate colour lenses. Normal colours used are run = red, stop = green. Refer to Division 16 for additional information.

.2 Terminals

- .1 Supply and install strap screw type terminal blocks rated for 600 V.
- .2 Identify each terminal block within an enclosure with a unique machine printed terminal block number. Cabinet chassis grounding terminal blocks are to be identified by the electrical ground symbol.
- .3 Connections to screw terminals to be locking fork tongue insulated crimp type wire connectors.
- .4 Terminals to be Weidmuller or approved equal.
- .5 Supply and install a group of terminals for each of 120 VAC non-UPS hot and neutral, 120 VAC UPS hot and neutral and 24 VDC positive and negative power. Distribution wiring to have a thermal magnetic circuit breaker upstream of all major blocks of loads, adequately sized to protect the connected load while not causing nuisance tripping.
- .6 Supply and install Weidmuller disconnect type terminal blocks for each load or loop powered from the marshalling panels.

.3 Nameplates

- .1 Refer to Section 17010 – Instrumentation and Control General Requirements for nameplate Specification.

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**2.2 Signal Current Isolator**

- .1 Isolators shall be installed to provide galvanic isolation of milli-ampere transmission signals from transmitters with inadequately isolated output circuits.
- .2 Isolator shall be housed in a NEMA 250, Type 4/7 conduit body and derive its operating power from the signal input circuit.
- .3 Input and output signals shall be 4 to 20 mA, with an error not exceeding 0.1% of span. Input resistance will not exceed 550 ohms with an output load of 250 ohms.
- .4 Approved manufacturers are Moore Industries, Weidmuller or Phoenix.

**2.3 Intrinsic Safety Barriers and Relays**

- .1 Provide intrinsic safety barriers where required for two-wire transmitters of the active, isolating, loop powered type; MTL Type MT3042, Stahl 9005/01-252/100/00, Pepperl & Fuchs ZG series, or approved equal.
- .2 Provide dual type intrinsic safety barriers for process switches; MTL 787, Panalarm 201-BR2.
- .3 Intrinsic safety relays to be Gems or Warrick.

**2.4 Industrial Ethernet Switches**

- .1 Install rack mounted Ethernet Switches in separate network cabling termination cabinet mounted next to all control panels housing PLCs that interface to the WTP control and operator interface network as shown on the drawings. Connect to the PLCs, local HMIs, VFDs, power meters and motor protection relays as shown on the drawings using cable rated for 100 Base-TX, 10 BaseFL, or 100 BaseFX communication, as required by the device.
- .2 Switches shall comply with IEEE 802.3, 802.3u, 802.3x, 802.1D, IEC 61950-3.
- .3 Switched shall be connected in a ring topology utilizing a 1000SX Multimode backbone.
- .4 Provide switches as required to connect to the equipment indicated in the Drawings and the following minimum spare ports:
  - .1 4 - 10/100 Base T(x) RJ45 ports
  - .2 2 - 10 BaseFL multimode ports
  - .3 2 - 100 BaseFX multimode ports
- .5 Provide as a minimum two (2) switches in each cabinet for the PLC and HMI fibre networks.
- .6 Switches shall include one (1) relay output alarm contact rated for 1A@24 VDC.

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- .7 Input power shall be 120 VAC.
- .8 Switches shall be fast spanning for a sub-second recovery in a ring configuration.
- .9 Switches shall be Ruggedcom RSG2100 or approved equal.

### 2.5 Fibre Termination Panel

- .1 Fibre termination panel suitable for the termination of two (2) 24-strand multimode fibre optic cables.. Multiple 2-strand multimode fibre cables for connection to power meters and protection relays shall be terminated to same panel.
- .2 Termination panel shall be rack mounted, hinged front and rear doors, complete with grounding kit and cable strain relief.
- .3 Install in network cabling termination cabinet
- .4 Leviton DP-525 or approved equal.

### 2.6 Cat 5E Termination Panel

- .1 Rack mounted termination panel suitable for the termination of 24 Cat 5E cables.
- .2 Install in network cabling termination cabinet.

## 3. EXECUTION

### 3.1 References - General

- .1 Refer To Section 17010 – Instrumentation and Control General Requirements, Part 3.

**END OF SECTION**