
PART 1 - GENERAL

1.1 WORK OF THIS SECTION

- A. This section of the Specifications details the components to be provided by the BMCS subcontractor relating to the following:
1. Control Relays - Latching
 2. Control Relays - Momentary.
 3. Time Delay Relays
 4. Current Sensing Relays.
 5. Ambient Light Level Sensors.
 6. Emergency Fan Operation Break Glass.
 7. Emergency Plant Shutdown Break Glass.
 8. Motion Sensors.
 9. Lighting zone override switch.
 10. Momentary Pushbuttons.
 11. Critical Alarm Annunciator.

PART 2 - PRODUCTS

2.1 CONTROL RELAYS - LATCHING

- A. Provide latching control relays as required to meet the failure positions identified in the sequences of operation. Relays shall meet, at minimum, the following requirements:
1. Pickup rating, time and hold rating as required for individual applications.
 2. Rated for a minimum of ten (10) million mechanical operations and a minimum of 500,000 electrical operations.
 3. Provide complete isolation between the control circuit and the digital output.
 4. Located in the DCP, UC or other local enclosures.
 5. Malfunction of a BMCS component shall cause the controlled output to fail to the positions identified in the failure procedure within the operating sequences.
 6. 10 amp contact rating.
 7. Pin type terminals with appropriate socket to allow for relay replacement without disconnecting control cabling.
- B. If it meets the above requirements, provide IDEC RR2KP Series or approved equal.

2.2 CONTROL RELAYS - MOMENTARY

- A. Provide momentary control relays as required to meet the failure positions identified in the sequences of operation. Relays shall meet, at minimum, the following requirements:
1. Coil ratings of 120 VAC, 50 mA or 10-30 VAC/VDC, 40 mA as suitable for the application.
 2. Provide complete isolation between the control circuit and the digital output.
 3. Pickup rating, time and hold rating as required for individual applications.
 4. Rated for a minimum of ten (10) million mechanical operations and a minimum of 500,000 electrical operations.
 5. Provide complete isolation between the control circuit and the digital output.
 6. Located in the DCP, UC or other local enclosures.
 7. Pin type terminals with appropriate socket to allow for relay replacement without disconnecting control cabling.
 8. Internal status LED.
- B. If it meets the above requirements, provide IDEC RR Series or approved equal.

2.3 TIME DELAY RELAYS

- A. Provide time delay relays as indicated within the Field Termination Schedules and sequences of operation. Time delay relays shall meet, at minimum, the following requirements:
1. Coil ratings of 24 or 120 VAC/VDC as suitable for the application.

2. Provide complete isolation between the control circuit and the digital output.
3. External control switch for freezestat interface.
4. Adjustable 0-10 minute ON delay.
5. Rated for a minimum of ten (10) million mechanical operations and a minimum of 100,000 electrical operations.
6. One SPST Normally Open contact for alarm monitoring and One SPST Normally Closed contact for fan interlock, rated for 16 amps each at 120 Vac. Use of SPDT contacts shall not be permitted.
7. Provide complete isolation between the control circuit and the digital output.
8. Located in the DCP, UC or other local enclosures.
9. Pin type terminals with appropriate socket to allow for relay replacement without disconnecting control cabling.
10. Internal status LED.

B. If it meets the above requirements, provide Kele TDRSOXP or approved equal.

2.4 CURRENT SENSING RELAY

- A. Provide current sensing relays as indicated in the Field Termination Schedules. Current metering transformers and relays shall meet, at minimum, the following specifications:
1. Rated for the applicable load.
 2. The output relay shall have an accessible trip adjustment over its complete operating range. Provide LED indication of relay status.
 3. Long term drift shall not exceed 5% of full range per 6 months.
 4. Current transformer and relay shall have over current and over voltage protection.
 5. Split core or solid core shall be sized for the application.
 6. Relay shall be in a dustproof housing.
 7. Accuracy- 2% of reading from 10% to 100% of full scale range, 2% full scale from 0 to 10% of full scale range.
 8. Temperature range of -15 Deg. C. to 60 Deg. C. (5 Deg. F. to 140 Deg. F.).
- B. If it meets the above requirements, provide Kele and Associates model (S)CS1150A or approved equal.

2.5 AMBIENT LIGHT LEVEL SENSOR

- A. Provide ambient light level sensors as indicated within the Field Termination Schedules. Light level sensor shall meet, at minimum, the following requirements:
1. Non-corroding and weatherproof housing with sensor shield suitable for exterior installations.
 2. 4-20 mA or 0-10 VDC output proportional to the ambient light level.
 3. Accuracy at room temperature: 1%, 38 Deg. C. (100 Deg. F.) temperature: 2.5%
 4. Solid-state photo diode circuitry and transducer as required.
 5. Mounted on the exterior of a North wall on the roof.
 6. Sensor reading from 0 to 750 foot candles.
 7. Temperature and humidity independent.
 8. Temperature range of -12 Deg. C. to 49 Deg. C. (10 Deg. F to 120 Deg. F.).
- B. If it meets the above requirements, provide Multi-Point Celestial Model MK7-B or approved equal.

2.6 EMERGENCY FAN OPERATION BREAK GLASS

- A. Provide emergency fan operation break glass to activation the central plant ventilation system as indicated within the Field Termination Schedules. Fan operation break glass shall meet, at minimum, the following requirements:
1. Grey cover plate.
 2. Break glass type with hammer.
 3. Labeled "EMERGENCY VENTILATION".
 4. Five glass discs per unit.
 5. Two NO contacts and two NC contacts.
- B. If it meets the above requirements, provide Intec Controls I-EBG1-2, or approved equal.

2.7 EMERGENCY PLANT SHUTDOWN BREAK GLASS

- A. Provide emergency plant shut down break glass to shut down all electrical operating equipment in the central plant as indicated within the Field Termination Schedules. Plant shut down break glass shall meet, at minimum, the following requirements:
1. Grey cover plate.
 2. Break glass type with hammer.
 3. Labeled "EMERGENCY PLANT SHUTDOWN".
 4. Five glass discs per unit.
 5. Two NO contacts and two NC contacts.
- B. If it meets the above requirements, provide Intec Controls I-EBG1-2, or approved equal.

2.8 MOTION SENSOR

- A. Provide motion sensors at locations indicated within the Field Termination Schedules. Motion sensors shall meet, at minimum, the following requirements:
1. Dual technology, passive infrared and ultrasonic type.
 2. Ceiling mounted.
 3. 360 degree coverage of 30 feet radius at 9 feet above finished floor.
 4. Operating power of 24 VDC/VAC 43mA maximum.
- B. If it meets the above requirements, provide Kele & Associates DT-300 series or approved equal.

2.9 LIGHTING ZONE OVERRIDE SWITCH

- A. Provide lighting zone override switches as indicated in the Field Termination Schedules to provide user override control of the time scheduled lighting zone control. Lighting switches shall meet, at minimum, the following requirements:
1. Wall mounted.
 2. Low voltage momentary switch compatible with the BMCS input.
 3. White cover and switch plate.
 4. Push button type switch.
 5. Submit sample for Architect approval.
- B. If it meets the above requirements, provide Kele & Associates Model KSW-P2 series or approved equal.

2.10 MOMENTARY PUSHBUTTON

- A. Provide momentary pushbutton as indicated in the Field Termination Schedules. Momentary pushbuttons shall meet, at minimum, the following requirements:
1. Screw terminal mount.
 2. Momentary switch.
 3. Internal LED indicating status.
 4. Rated for a minimum of one million mechanical operations.
 5. SPDT contacts rated for the application.
 6. Located in the DCP, UC or other local enclosures.
- B. If it meets the above requirements, provide IDEC Model LW series or approved equal.

2.11 CRITICAL ALARM ANNUNCIATOR

- A. Provide critical alarm annunciators as indicated in the Field Termination Schedules. Critical alarm annunciators shall meet, at minimum, the following requirements:
1. Audible alarm with continuous or pulsed tone with adjustable repeat time.
 2. Silence switch with adjustable time delay.
 3. Internal LED indicating status.
 4. Mounts to single gang electrical backbox.
- B. If it meets the above requirements, provide Kele RAD-1 or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install sensors in accordance with the manufacturer's recommendations to sense the variables specified.
- B. Mount sensors securely. Mountings shall be suitable for the environment within which the sensor operates.
- C. Install sensors as required to properly sense the controlled medium. Sensor locations shall be such that access to the instruments can be obtained for service and removal. If the installation location is found to be unacceptable by the Consultant, then the sensors shall be relocated as directed at no additional cost to the Owner.
- D. Sensors mounted on water lines shall have isolation valves that shall enable the sensor to be easily removed without the need to drain any lines or portions of lines.

END OF SECTION