

SECTION 26 29 00 LOW VOLTAGE CONTROLLERS, LIGHTING CONTACTORS

PART 1 - GENERAL

1.1 SCOPE

- A. Electrically held lighting contactors rated up to 400 Amps.
- B. Mechanically and magnetically held lighting contactors rated up to 400 Amps.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract apply to this section.

1.3 SUBMITTALS

- A. Submit shop drawings and product data for approval and final documentation in the quantities listed according to the Conditions of the Contract. All transmittals shall be identified by customer name, customer location and customer order number.

1.4 RELATED STANDARDS

- A. The lighting contactors shall be manufactured and tested according to the latest applicable standards of the following agencies:
 - 1. NFPA 70 – National Electrical Code.
 - 2. CSA C22.2 No. 14, Industrial Control Equipment.
 - 3. NEMA ICS 2 – Controllers, Contactors and Overload Relays.
 - 4. NEMA ICS 5 – Control Circuit and Pilot Devices.
 - 5. NEMA ICS 6 – Enclosures for Industrial Controls and Systems.
 - 6. UL 508, Industrial Control Equipment.
 - 7. Unit(s) must be certified by the following agencies
 - a. UL
 - b. CSA or cUL

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Engage a firm with at least 35 years experience in manufacturing lighting contactors.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in factory labeled packages.
- B. Store and handle in strict compliance with manufacturer's instructions and recommendations. Protect from potential damage from weather and construction operations. Store so condensation will not form on or in controller and if necessary, apply temporary heat where required to obtain suitable service conditions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The Contactors shall be manufactured by Siemens or pre-approved equal. Approved manufacturers are as follows:
 - 1. SIEMENS
 - 2. []

2.2 ELECTRICALLY HELD LIGHTING CONTACTORS (SIEMENS CLASS LE, LC OR EQUAL)

- A. OVERVIEW

1. Description: NEMA ICS 2 electrically held magnetic lighting contactor with continuously rated coils. Contactors shall be rated for all standard type ballast and tungsten lighting as well as general use and resistive heating loads.
2. Contactor Ampere Rating: *[20] [30] [60] [100] [200] [300] [400], [as scheduled] [as indicated]*.
3. Poles: *[_ normally open contacts], [_ normally closed contacts], [as scheduled] [as indicated]*.
4. Power Contacts: To be totally enclosed in contactor housing and have double break operation.
5. Coil operating voltage: *[120] [208] [277] [480] [_] volts, [60] [_] Hz.*
6. Wiring: Straight-through wiring (with all terminals clearly marked.)
7. Enclosure: NEMA ICS 6, Type *[open] [1] [3R] [4] [4X] [12] [_], [as indicated] [as required to meet conditions of installation]*.

B. ACCESSORIES

1. Pilot Devices: NEMA ICS 5, cover-mounted type or flange-mounted 30mm type based upon enclosure selection. Contacts shall be rated NEMA B600 for cover-mounted devices and NEMA A600 for flange-mounted 30mm devices.
 - a. *Pushbutton: [On – Off] [_]*
 - b. *Selector Switch: [Hand/Off/Auto] [Off/On] [_]*
 - c. *Indicating Light(s): [Red On] [Green Off] [_]*
2. Control Power Transformers: *[480] [277] [240] [_] volt primary, and [120] [_] volt secondary, [_ VA minimum] [as scheduled]*. Provide fused *[primary and]* secondary and connect non-fused leg of secondary to enclosure.

2.3 ELECTRICALLY HELD COMBINATION LIGHTING CONTACTORS (SIEMENS CLASS LE OR EQUAL)

A. OVERVIEW

1. Description: NEMA ICS 2, electrically held combination magnetic lighting contactor with continuously rated coils. Contactors shall be rated for all standard type ballast and tungsten lighting as well as general use and resistive heating loads. Unit shall contain a color coded externally operated handle. Handle shall give positive visual indication of ON/OFF status and be lockable in the ON or OFF positions with up to three padlocks.
2. Disconnect Type: **Select a, b or c below**
 - a. *Non-Fusible Switch Assembly: NEMA KS 1, enclosed knife switch with visible blades.*
 - b. *Fusible Switch Assembly: NEMA KS 1, enclosed knife switch with fuse block and fuse clips. Fuse clips will be designed to accommodate [UL 198E, Class {RK1} {RK5}] [UL 198C, Class J] fuse clips that accept [250] [600] volt, [dual element] current limiting, [time delay] [one-time] fuses. Short-circuit current rating: 100,000 RMS amperes up to 600 volts when protected with Class R fuses.*
 - c. *Circuit breaker employing adjustable magnetic trip settings with a short-circuit rating of 25,000 RMS amperes up to 480 volts.*
3. Contactor Ampere Rating: *[20] [30] [60] [100] [200] [300] [as scheduled] [as indicated]*.
4. Poles: *[3] [4] normally open contacts [as scheduled] [as indicated]*.
5. Power Contacts: To be totally enclosed in contactor housing and have double break operation.
6. Coil operating voltage: *[120] [208] [277] [480] [_] volts, [60] [_] Hz.*
7. Wiring: Straight-through wiring (with all terminals clearly marked.)
8. Enclosure: NEMA ICS 6, Type *[1] [3R] [4] [4X] [12] [_], [as indicated] [as required to meet conditions of installation]*.

B. ACCESSORIES

1. Pilot Devices: NEMA ICS 5, flange-mounted 30mm type. Contacts shall be rated NEMA A600.

- a. **Pushbutton: [On – Off] []**
 - b. **Selector Switch: [Hand/Off/Auto] [Off/On] []**
 - c. **Indicating Light(s): [Red On] [Green Off] []**
2. Control Power Transformers: **[480] [277] [240] []** volt primary, and **[120] []** volt secondary, **[_VA minimum] [as scheduled]**. Provide fused **[primary and]** secondary and connect non-fused leg of secondary to enclosure.

2.4 MECHANICALLY AND MAGNETICALLY HELD LIGHTING CONTACTORS (SIEMENS CLASS CLM, LC OR EQUAL)

A. OVERVIEW

1. Description: NEMA ICS 2 mechanically held lighting contactor which is electrically operated. Standard coil clearing contacts are to be provided so that the contactor coils shall be energized only during the instance of operation. Contactors shall be rated for all standard type ballast and tungsten lighting as well as general use and resistive heating loads.
2. Contactor Ampere Rating: **[20] [30] [60] [100] [200] [300] [400], [as scheduled] [as indicated]**.
3. Poles: **[_ normally open contacts], [_ normally closed contacts], [as scheduled] [as indicated]**.
4. Power Contacts: To be totally enclosed in contactor housing and have double break operation.
5. Coil operating voltage: **[120] [208] [277] [480] [] volts, [60] [] Hz.**
6. Enclosure: NEMA ICS 6, Type **[open] [1] [3R] [4] [4X] [12] [], [as indicated] [as required to meet conditions of installation]**.

B. ACCESSORIES

1. Pilot Devices: NEMA ICS 5, cover-mounted type or flange-mounted 30mm type based upon enclosure selection. Contacts shall be rated NEMA B600 for cover-mounted devices and NEMA A600 for flange-mounted 30mm devices.
 - a. **Pushbutton: [On – Off] []**
 - b. **Selector Switch: [Hand/Off/Auto] [Off/On] []**
 - c. **Indicating Light(s): [Red On] [Green Off] []**
2. Control Power Transformers: **[480] [277] [240] []** volt primary, and **[120] []** volt secondary, **[_VA minimum] [as scheduled]**. Provide fused **[primary and]** secondary and connect non-fused leg of secondary to enclosure.
3. Control Modules (Class CLM 20 Amp only) **[Select a, b or c]**
 - a. **Accessory 47 (2 Wire Control)**
 - b. **Accessory 48 (3 Wire Control)**
 - c. **Accessory 49 (On/Off Control)**
4. Control Modules (Converts Class LC 30 Amp electrically held to mechanically held) **[Select one from list below]**
 - a. **Accessory 49LCCM1A (2-wire, 24VAC)**
 - b. **Accessory 49LCCM2A (2-wire, 110-120VAC)**
 - c. **Accessory 49LCCM3A (2-wire, 200-277VAC)**
 - d. **Accessory 49LCCM4A (3-wire, 24VAC)**
 - e. **Accessory 49LCCM5A (3-wire, 110-120VAC)**
 - f. **Accessory 49LCCM6A (3-wire, 200-277VAC)**

2.5 MECHANICALLY AND MAGNETICALLY HELD COMBINATION LIGHTING CONTACTORS (SIEMENS CLASS CM OR EQUAL)

A. OVERVIEW

1. Description: NEMA ICS2, mechanically held lighting contactor which is electrically operated. Standard coil clearing contacts are to be provided so that the contactor coils shall be energized only during the instance of operation. Contactors shall be rated for all standard type ballast and tungsten lighting and resistive heating loads. Unit shall contain

- a color coded externally operated handle. Handle shall give positive visual indication of ON/OFF status and be lockable in the ON or OFF positions with up to three padlocks.
2. Disconnect Type: **[Select a, b or c below]**
 - a. **Non-Fusible Switch Assembly: NEMA KS 1, enclosed knife switch with visible blades.**
 - b. **Fusible Switch Assembly: NEMA KS 1, enclosed knife switch with fuse block and fuse clips. Fuse clips will be designed to accommodate [UL 198E, Class {RK1} {RK5}] [UL 198C, Class J] fuse clips that accept [250] [600] volt, [dual element] current limiting, [time delay] [one-time] fuses. Short-circuit current rating: 100,000 RMS amperes up to 600 volts when protected with Class R fuses.**
 - c. **Circuit breaker employing adjustable magnetic trip settings with a short-circuit rating of 25,000 RMS amperes up to 480 volts.**
 3. Contactor Ampere Rating: **[20] [30] [60] [100] [200] [300] [as scheduled] [as indicated].**
 4. Poles: **[2] [3] normally open contacts [as scheduled] [as indicated].**
 5. Power Contacts: Composed of silver-cadmium-oxide. To be totally enclosed in contactor housing and have double break operation.
 6. Coil operating voltage: **[120] [208] [277] [480] [] volts, [60] [] Hz.**
 7. Enclosure: NEMA ICS 6, Type **[1] [3R] [4] [4X] [12] [], [as indicated] [as required to meet conditions of installation].**
- B. ACCESSORIES
1. Pilot Devices: NEMA ICS 5, flange-mounted 30mm type. Contacts shall be rated NEMA A600.
 - a. **Pushbutton: [On – Off] []**
 - b. **Selector Switch: [Hand/Off/Auto] [Off/On] []**
 - c. **Indicating Light(s): [Red On] [Green Off] []**
 2. Control Power Transformers: **[480] [277] [240] []** volt primary, and **[120] []** volt secondary, **[_VA minimum] [as scheduled]**. Provide fused **[primary and]** secondary and connect non-fused leg of secondary to enclosure.
 3. Control Modules (20 Amp Only) **[Select a, b or c]**
 - a. **Accessory 47 (2 Wire Control)**
 - b. **Accessory 48 (3 Wire Control)**
 - c. **Accessory 49 (On/Off Control)**

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The Contractor shall install all equipment in accordance with the contract drawings and manufacturers recommendations and manuals.
- B. Install contactors where indicated, in accordance with manufacturer's instructions.
- C. Install fuses in fusible switches.
- D. Adjust all circuit breakers, switches, access doors and operating handles for free mechanical and electrical operation as described in manufacturer's instructions.
- E. Clean interiors of all enclosed electrical equipment to remove construction debris, dirt and shipping materials.
- F. Repaint scratched or marred exterior surfaces to match original finish.

3.2 ADJUSTMENTS AND CLEANING

- A. The Contractor shall perform necessary field adjustments of the circuit breakers to place the equipment in final operating condition. The settings shall be in accordance with the approved protective device coordination study or as directed by the Engineer.

3.3 TESTING

- A. Perform factory and installation tests in accordance with applicable NEC, NEMA and UL requirements.

3.4 WARRANTY

- A. Equipment manufacturer warrants that all goods supplied are free of non-conformities in workmanship and materials for one year from date of initial operation, but not more than eighteen months from date of shipment.

END OF SECTION