

Section 16463

MINI-POWER CENTERS

PART 1 GENERAL

1.01 SUMMARY

This Section includes the furnishing and installing of single-phase and three-phase general purpose individually mounted mini-power centers of the two-winding type, self-cooled, as specified herein and as shown on the Plans.

1.02 MEASUREMENT AND PAYMENT

No separate measurement or payment for work performed under this Section. Include cost of same in Contract price bid for work of which this a component part.

1.03 REFERENCES

This specification references the following publications in their current editions. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

- A. IEEE C57.96: Guide for Loading Dry-Type Distribution and Power Transformers
- B. NSF/ANSI 61: Drinking Water System Components - Health Effects
- C. The mini-power center and all components shall be designed, manufactured and tested in accordance with the latest applicable standards of UL, ANSI and NEMA.

1.04 SUBMITTALS

- A. Submit the following under the provisions of Section 01330 – “Submittal Procedures:”
 - 1. The following information shall be submitted:
 - a. Dimension drawing weights
 - b. Transformer ratings including:
 - 1) kVA
 - 2) Primary and secondary voltage
 - 3) Taps
 - 4) Primary and secondary continuous current

- 5) Insulation class and temperature rise
 - 6) Sound level
 - c. Component ratings including:
 - 1) Voltage
 - 2) Continuous current
 - 3) Interrupting ratings
 - d. Cable terminal sizes
 - e. Product data sheets.
 - B. Operation and Maintenance Manuals
 - 1. Equipment operation and maintenance manuals shall be provided with each assembly shipped, and shall include instruction leaflets and instruction bulletins for the complete assembly and each major component.
 - C. For construction
 - 1. The following information shall be submitted for record purposes:
 - a. Final (as-built) drawings and information for items listed in Paragraph 1.04, and shall incorporate all changes made during the manufacturing process
 - b. Connection diagrams
 - c. Installation information
- 1.05 RELATED REQUIREMENTS
- A. Section 01330 – “Submittal Procedures:”
 - B. Regulatory Requirements:
 - 1. The assembly and all components shall be U.L. listed.
- 1.06 QUALITY ASSURANCE
- A. Qualifications
 - 1. The manufacturer of the assembly shall be the manufacturer of the secondary distribution equipment.

2. For the equipment specified herein, the manufacturer shall be ISO 9001 or 9002 certified.
3. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of five (5) years.

1.07 SYSTEM DESCRIPTION (NOT USED)

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Equipment shall be handled and stored in accordance with manufacturer's instructions. One (1) copy of these instructions shall be included with the equipment at time of shipment.

1.09-1.1 (NOT USED)

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Eaton
- B. Or Approved Equal

2.02 MATERIALS AND/OR EQUIPMENT

- A. See "ATTACHMENT" for specific details, drawings, and details related to the min-power center.
- B. Ratings
 1. kVA and voltage ratings can be found in the "ATTACHMENT" and/or shown on the Drawings.
 2. Units shall be designed for continuous operation at rated kVA, for 24 hours a day, 365 days a year operation, with normal life expectancy as defined in IEEE C57.96.
 3. Transformer sound levels shall not exceed the following ANSI and NEMA levels for self-cooled ratings:

Up to 9 kVA 40 db
10 to 30 kVA 45 db
- C. Construction

1. Each mini-power center shall include a primary main breaker, an encapsulated dry-type transformer and a Panelboard with secondary main breaker.
2. Mini-Power Center shall be rated for outdoor use with a NEMA 3R enclosure.
3. Mini-Power Center shall be provided with a Ground Bar for grounding of individual secondary circuits. The Neutral bar is grounded to the enclosure. A grounding terminal shall be provided on the enclosure.
4. Primary main, secondary main and feeder breakers shall be enclosed with a padlockable hinged door.
5. Mini-power centers shall be suitable for service entrance application and labeled as such.
6. Insulation Systems
 - a. Transformers shall be insulated with a 180 degrees C insulation system and rated at 115 degrees C temperature rise.
 - b. Required performance shall be obtained without exceeding the above-indicated temperature rise in a 40 degrees C maximum ambient, with a 30 degrees C average over 24 hours
 - c. All insulation materials shall be flame-retardant and shall not support combustion as defined in ASTM Standard Test Method D635
7. Core and Coil Assemblies
 - a. Transformer core shall be constructed with high-grade, non-aging, silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point. The transformer core volume shall allow efficient transformer operation at 10% above the nominal tap voltage. The core laminations shall be tightly clamped and compressed. Coils shall be wound of electrical grade copper with continuous wound construction.
 - b. The core and coil assembly shall be completely encapsulated in a proportioned mixture of resin and aggregate to provide a moisture proof, shock-resistant seal. The core and coil encapsulation system shall minimize the sound level.
 - c. The core of the transformer shall be grounded to the enclosure
 - d. Provide two (2) 5% FCBN taps

D. Bus

Secondary bus shall be copper

E. Main Devices

Each mini-power center shall include a primary main breaker with an interrupting rating of 65kA at 277/480 volts; and a secondary main breaker with an interrupting rating of 10kA at 120/240 volts, and a panelboard

F. Wiring/Terminations

1. All interconnecting wiring between the primary breaker and transformer, secondary main breaker and transformer and distribution section shall be factory installed.
2. All transformers shall be equipped with a wiring compartment suitable for conduit entry and large enough to allow convenient wiring.

G. Feeder Devices

The secondary distribution section shall accommodate twenty-four (24) one-inch plug-in breakers with 10 kA interrupting capacity.

H. Enclosure

1. The enclosure shall be made of heavy-gauge steel and the maximum temperature of the enclosure shall not exceed 90 degrees C.
2. The enclosure shall be totally enclosed, nonventilated, NEMA 3R, with lifting provisions.
3. Standard NEMA 3R indoor/outdoor heavy-gauge steel enclosure with a rugged baked-polymer polyester powder coat.
4. Covered with an NSF/ANSI 61 approved gray color.

2.03-2.04 (NOT USED)

PART 3 EXECUTION

3.01-3.02 (NOT USED)

3.03 ERECTION, INSTALLATION AND CONSTRUCTION

- A. The Contractor shall install all equipment per the manufacturer's recommendations and the Plans. See "ATTACHMENT" for reference drawing and detail numbers.

3.04-3.05 (NOT USED)

3.06 FIELD ADJUSTMENTS

Adjust taps to deliver appropriate secondary voltage.

3.07 CLEANING (NOT USED)

3.08 DEMONSTRATION/TESTING AND INSPECITON

A. Factory Testing

1. The following standard factory tests shall be performed on the equipment provided under this section. All tests shall be in accordance with the latest version of ANSI and NEMA.

- a. Ratio tests at the rated voltage connection and at all tap connections
- b. Polarity and phase-relation tests on the rated voltage connection
- c. Applied potential tests
- d. Induced potential test
- e. No-load and excitation current at rated voltage on the rated voltage connection

B. Field Testing

Measure primary and secondary voltages for proper tap settings

3.09-3.10 (NOT USED)

ATTACHMENT

[Design Engineer is to complete blanks per site requirements]

- A. Manufacturer: Eaton
- B. Model: P48G11S05P (5 kVA) or P48G11S07P (7.5 kVA)
- C. kVA Rating; 5kVA or 7.5 kVA
- D. Voltage Rating: 480V to 120/240V
- E. Feeder Breakers Single Pole: 12
Sizes: _____
- F. Feeder Breakers Two Pole: 6
G. Sizes: _____
- H. Maximum Amperage: 20 Amps @ 5 kVA or 30 Amps @ 7.5 kVA
- I. Mini-Power Center Drawings/Details
1. Drawing(s): _____
 2. Detail Number(s): _____
 3. Electrical Wiring Drawing(s): _____
 4. Electrical Wiring Detail(s): _____

END OF SECTION