

261300S02 Medium Voltage Circuit Breaker – CONTROL PANEL Specifications

Note: The UK purchase order number is to be referenced to on each shipment.

8.0 BREAKER CONTROL PANEL

This panel shall be constructed to mount on hinges in the control panel space of the Myers Controlled Power Medium – Voltage Substation Breaker type FVR and rotate outward for installation and maintenance. Supply the hinge mechanism and retainers for mounting the control panel in the breaker.

8.1 Control Panel Equipment

The control panel shall be supplied with the following items:

1. Breaker Control Switch: This type switch is primarily intended for the control of electrically operated circuit breakers. It shall be of pistol-grip fixed-handle design multi-pole rotary control switch with cam operated momentary contacts (Model SB or Type W). The multi-stage design shall have a six-contact frame with targets and a pull to lock in the trip position. It shall be equipped with red and green LED indicator lights which are powered by the trip circuit. Red indicates the breaker is closed and the trip circuit is complete and energized. Green indicates the breaker is open and the trip circuit is energized.
2. Three (3) indicating ammeters, 0 - 5 amp range, analog.
3. One (1) thermal ammeter with maximum indicator for measuring neutral current, 0-5 amp range.
4. Three (3) phase over-current extremely-inverse relays (ABB CO-Hi – Lo Style number 265CO47A07 or equivalent) with time taps 1-12, including instantaneous attachment having a range of 6 to 144.

One (1) residual ground over-current relay (ABB CO-11 Style number 265CO47A07 or equivalent) with time taps 1-12, including instantaneous attachment having a range of 6 to 144.

5 One (1) Square D Power Logic METSEPM8244 series meter, 0.2% accuracy, full instrumentation 3-phase, 4-wire Wye power and energy meter. Unit input voltage shall be (57VLN/100VLL to 400VLN/690VLL), 0.1% reading. Power supply shall be 125/300V DC or 90 – 415V AC control voltage. Meter shall feature dual port Ethernet and RS485 communication, three on-board digital status / counter inputs, one KY (form A) energy pulse output, PQ compliance reporting and basic analysis, date / time for event logging, 12-cycle waveform and capture in onboard non-volatile memory..

Meter reference number METSEPM8244 DIN rail mounted meter w / remote display. Modular I / O accessories shall be two METSEPM89M2600 Square D

261300S02 Medium Voltage Circuit Breaker – CONTROL PANEL Specifications

Dated: 01/2018

Applies to: All Projects

University of Kentucky

Page 1

261300S02 Medium Voltage Circuit Breaker – CONTROL PANEL Specifications

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I / O modules: 6 digital inputs and 2 relay outputs (total 12 digital inputs and 4 relay outputs). See section 9.1 for control function connections.

6. Meter potential will be derived from Substation Bus Potentials mounted in the station steel. Potential secondary, out of the station Potential Junction Box to the breaker cabinet, will be supplied by others via a 4 conductor cable. Breaker manufacturer will supply a 4 post terminal block on which to terminate the potential cable in the breaker mechanism cabinet (#12 wire). Wiring from the 4- post terminal block is to be terminated on the three post potential fuse block by breaker manufacturer (4th position to be grounded). The breaker is to have one (1) three post fuse block on which to terminate the potential wires from the control panel.

7. Additional Signals for control:

One (1) ABB type FT test switch for Square D Power Logic Circuit Monitor current circuits, ABB style number 129A518G001

One (1) ABB type FT test switch for Square D Power Logic Circuit Monitor potential and contact inputs, ABB style number 129A501G001

One (1) 4 position terminal block to assist in delivering bus metering potential to the control panel (discussed in 6 above).

One (1) 4 position short circuiting terminal block to assist in delivering relay and metering current on to the control panel.

8.3 RS485 Signal Cable Surge Suppression will be supplied on the breaker control panel along with miscellaneous wire and mounting hardware.

9.1 SCADA EQUIPMENT

9.1.1 1200-Amp and-2000 Amp Breakers

SCADA equipment is specified for all medium voltage breakers. This is through the Square D CM8244 Circuit Monitor I/O accessory module METSEPM89M2600. The Square D I/O module has 6 digital inputs and 2 relay outputs. This CM8244 Circuit Monitor will require two modules for a total of 12 digital inputs and 4 relay outputs.

9.1.2 The CM8244 I/O module METSEPM89M2600 has two output relays that operate on 24-volt DC only. For this reason, a 130-volt DC to 24-volt DC regulated source will be required. The 130-volt DC power for this circuit should come from the same fuse from which the CM8244 is sourced. The power required to operate this device is small since it is only needed to operate three Potter & Brumfield 24 volt DC type KRP relays.

261300S02 Medium Voltage Circuit Breaker – CONTROL PANEL Specifications

Dated: 01/2018

Applies to: All Projects

University of Kentucky

Page 2

261300S02 Medium Voltage Circuit Breaker – CONTROL PANEL Specifications

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These relays will be de-energized except when it is necessary to operate the breaker remotely. The KRPs should be equipped with indicator lights in the relays to help determine when the relay coil is energized.

9.1.3 One of the KRP relays in the remote control circuit should be labeled RC for “Remote Close”. It should operate to close the breaker when the CM8244, I/O module #1 contacts labeled [1] and [2] close. The normal closed state for the CM8244, I/O module #1 is labeled [1] and [3]. A contact from the KRP should be in the breaker close circuit and will cause the breaker to close when the CM8244, I/O module #1 relay contacts labeled [1] and [2] close.

9.1.4 One of the KRP relays in the remote control circuit should be labeled RT for “Remote Trip”. It should operate to trip the breaker when the CM8244, I/O module #1 contacts labeled [4] and [5] close. The normal closed state for this contact on the CM8244 I/O module #1 is labeled [4] and [6]. A contact from the KRP should be in the breaker trip circuit and will cause the breaker to trip when the CM8244, I/O module #1 relay contacts labeled [4] and [5] close.

9.1.5 The third KRP relay in the remote control circuit should be labeled RTC for “Remote Trip/Close”. It should operate to supply 24 volt DC power to the RT and RC relays when the CM8244, I/O module #2 contacts labeled [1] and [2] close. The normal closed state for this contact on the CM8244, I/O module #2 is labeled [1] and [3]. This relay is energized first to start the remote trip and close operation of the breaker. The CM8244, I/O module #2 relay will hold itself in for 30 seconds or until the breaker operates. After 30 seconds, the remote control circuit will return to a de-energized state.

9.1.6 There should be a 3PDT-type toggle switch as an IEEE 43 mounted on the control panel, in line with the control switch. One third of this switch should be in the RT relay’s breaker trip circuit. Another third should be in the RC relay’s breakers close circuit. The last third should connect to the CM8244 digital input. This will show the dispatcher the breaker remote control is ON and ready to be operated. It shall be labeled Remote Control ON and Remote Control OFF.

10.0 Electrical Testing of the Breaker Control Panel.

10.1 A control panel is typically made up of:

1. Trip Circuit
2. Close Circuit
3. Metering Potential Circuit
4. Metering Control Circuit 130 volt DC and 24 volt DC

261300S02 Medium Voltage Circuit Breaker – CONTROL PANEL Specifications

Dated: 01/2018

Applies to: All Projects

University of Kentucky

Page 3

261300S02 Medium Voltage Circuit Breaker – CONTROL PANEL Specifications

Note: The UK purchase order number is to be referenced to on each shipment.

5. Communication Circuit

Using a 600 volt Megger, attach one side to the panel ground. Attach the test lead to the circuit being tested. The circuit should withstand 300 volts for one minute. The 24 volt portion and the 125 volt DC to 24 volt DC power supply and the CM8244 should not be exposed to test voltage on either side of the CM8244 or the 125 volt DC to 24 volt DC power supply.

The Communication Circuit should only be tested to 50 volts. Disconnect the cat6 wiring from the CM8244 before testing the communication circuit. The cat 6 surge arrestors should not be exposed to the 50 volt test voltage either.

Apply an AC current of 5 amps to the current circuit one phase at a time. Test for presence of Current in phase A, B, and C and neutral relays and visually verify current in the ammeters.

Looking at the rear of the Breaker Control Panel, the panel hinges should be on the left hand side of the panel. Wiring from the control panel shall terminate on post terminal blocks located on the back left side of the panel. The terminal blocks shall be placed between the hinges of the panel and the equipment on the panel. UK electrical personnel shall complete connection between the panel terminal blocks and the breaker terminal blocks in the field. The control panel must have clearance to swing out on the hinges for maintenance.

11.1 MISCELLANEOUS

The vendor shall provide four (4) complete sets of prints for each breaker ordered. The prints shall include the following: nameplate, outline, control, elementary and connection diagrams, instruction books and complete renewal parts lists.

The order shall be considered incomplete and payment may be withheld until all prints are received. Prints should be sent to:

University of Kentucky
Peterson Service Building, Room 211R
Lexington, KY 40506-0005
Attn: Facilities Management Department

Shipping instructions for the breakers will be on the individual purchase orders.

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261300S02 Medium Voltage Circuit Breaker – CONTROL PANEL Specifications

Dated: 01/2018

Applies to: All Projects

University of Kentucky

Page 4