

**MB and FD Series**  
**Unitized Distribution Substation**  
**Installation/Operation Guide**

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**To insure proper installation, this manual must be read prior to starting the installation process.**

## 1. Introduction

This manual covers installation instructions for the MB Series and FD Series of Unitized Distribution substations (UDS).

The MB Series UDSs are implemented with a circuit breaker on the secondary of the transformer and an optional circuit breaker on the primary of the transformer.

The FD Series UDSs are implemented with a fused disconnect switch on the secondary of the transformer and an optional fused disconnect switch on the primary of the transformer.

### *1.1 Reference Drawings (either standard drawings listed below or custom drawings for specific projects are included with each MB Series/FD Series UDS)*

Refer to the MAIN ASSEMBLY AND WIRING DIAGRAM which have been specifically prepared for your order. These drawings provide the overall cabinet dimensions, mounting information, component location, wiring, branch circuit breaker type and rating, plus a bill of material listing manufacturer and rating of all major components.

## 2. INITIAL CONSIDERATIONS

Move the UDS Cabinet to the desired location and remove the shipping crate from the cabinet.

Remove the field wiring entry plate on top of the cabinet to obtain access to wireways.

Turn the secondary disconnect switch (breaker) to the “OFF” position.

Loosen the fasteners which secure the door to the 42 circuit breakers and open the door. Place all the circuit breakers in the “OFF” position. Remove the five screws holding down the trim panel covering the 42 circuit breakers. Remove the trim panel to obtain access to the circuit breaker terminal blocks.

Remove the transformer cover plate.

If the optional primary disconnect switch (breaker) is installed, turn it to the “OFF” position, loosen the fasteners which secure the primary disconnect door and open the door.

### 3. CABINET WIRING

#### 3.1 *Load WIRING*

Ensure that each load wire pair from the field is electrically disconnected from all power sources prior to handling. Pull the wire pair from each load to the UDS cabinet and route through the field wiring entry in the top of the cabinet to the circuit breaker compartment. Cut and strip the wire pair for termination on the appropriate circuit breaker and the neutral bus located at the bottom of the circuit breaker compartment.

Prior to connecting the wire pair to the circuit breaker, verify the integrity of the wire insulation by Hy-potting each conductor to ground with voltage set for (2 x rated voltage + 1000V). If successful, connect each wire pair to the circuit breaker and/or neutral bus.

After all wire pairs have been connected, replace the trim panel that covered the circuit breakers, close the circuit breaker door and tighten the fasteners which secure the door.

#### 3.2 *FEEDER WIRING*

#### **WARNING:**

**MAKE SURE THAT THE THREE PHASE 400/415 & 480/600 VOLT, 50/60 HZ, CIRCUIT BREAKER OR DISCONNECT SWITCH WHICH WILL FEED POWER TO THE CABINET IS DE-ENERGIZED AND LOCKED OUT BEFORE ATTEMPTING TO PULL THE FEEDER CABLE TO THE UDS CABINET!**

Based on the transformer rating of the UDS cabinet, pull appropriately sized four conductor cable from the main disconnect switch or circuit breaker through the input power conduit at the top of the cabinet.

The **minimum** size wire is listed in the table below:

Cable Size	
400/415V transformer rating	Minimum wire size AWG
30 KVA	8 AWG
45 KVA	6 AWG
75 KVA	2 AWG
480v transformer rating	Minimum wire size AWG
30 KVA	8 AWG
45 KVA	6 AWG
75 KVA	2 AWG

Verify the feeder insulation by Hy-potting each feeder between phase and ground with voltage set to  $(2 \times \text{rated voltage} + 1000\text{V})$ , e.g., 2000 VAC for 400/415 & 480V rating, and 2500 VAC for 600V rating. If the Hy-pot test is successful, proceed to connect the ground wire in the feeder cable to the ground lug at the feeder supply point. Now proceed to connect each of the three phase conductors in the feeder cable circuit breaker or disconnect switch in the feeder supply point.

Close the transformer compartment door. Also close the optional primary disconnect switch door if applicable.

Ensure that the primary and secondary disconnect switches and the 42 circuit breakers on the UDS cabinet are all in the “OFF” position.

This completes the installation of the Unitized Distribution Substation.

#### **4. Operation**

Provide power to the UDS by closing the disconnect switch on the circuit breaker feeding the UDS.

If supplied as an option, place the primary disconnect switch or the primary circuit breaker to the “ON” position.

Place the secondary disconnect switch or breaker to the “ON” position.

Place the individual circuit breaker to the “ON” position, as desired.

Verify that the total load connected to the UDS does not exceed the rating of the transformer supplied, i.e., 30 KVA, 45 KVA or 75 KVA.

Cable Size	
600V transformer rating	Minimum wire size AWG
30 KVA	10 AWG
45 KVA	6 AWG
75 KVA	2 AWG

If the optional primary disconnect switch is installed, terminate the feeder wiring at the primary disconnect switch. Connect the three phase conductors in the cable (black, red and blue) to the disconnect terminals identified as “L1”, “L2”, and “L3”, respectively. Connect the ground conductor (green) to the ground lug provided in the primary disconnect compartment of the cabinet. Make sure that these terminations are secure.

If the optional primary disconnect switch is not installed, terminate the feeder wiring at the transformer located in the compartment at the bottom of the UDS cabinet. Connect the three phase conductors in the cable (brown, orange and yellow) to the transformer primary terminals identified as “H1”, “H2”, and “H3”, respectively. Connect the ground conductor (green) to the ground lug provided in the transformer compartment of the cabinet. Make sure that these terminations are secure.

Measure the phase to phase voltage of the power source that will feed the UDS cabinet. Referring to the tap chart on the transformer, connect the numbered taps on each coil which correspond most closely with the measured source voltage as shown in the table below.

400/415 volt transformer tap chart	
Line voltage	Tap number
435	1
425	2
415	3
404	4
394	5

480 volt transformer tap chart	
Line voltage	Tap number
504	1
492	2
480	3
468	4
456	5
444	6
432	7

600 volt transformer tap chart	
Line voltage	Tap number
600	1
585	2
570	3
555	4
540	5