

## CIRCUIT BREAKERS

### DESIGN GUIDELINES

1. Summary:
  - a. This section provides guidelines and standards for Circuit Breakers (600V and below).
2. Design
  - a. Branch circuit breakers shall be bolt-on-type, replaceable without disturbing adjacent breakers.
  - b. Circuit breakers shall be furnished with lug kits to accept cabling as shown on plans and one-lines.
  - c. Series-connected rated circuit breakers are not allowed. Circuit breakers shall be fully rated to intercept the symmetrical short-circuit current available at the terminals as determined by a short-circuit study.
3. Construction/Trip Unit Type
  - a. Less than 200A Frame: Molded Case Circuit Breakers (MCCB) with Thermal-Magnetic fixed trip units. (Where required to meet specific protective schemes or selective coordination determined by the designer, solid state, adjustable trip breakers may be used on 200A or less frame breakers as defined below.)
  - b. 200A and larger: MCCB with solid state, adjustable trip type. Trip units shall have field adjustable tripping characteristics as follows:
    - Long and short-time pickup.
    - Long and short-time delay.
    - Instantaneous
    - Ground Fault pickup and delay (where required by code)
    - True RMS sensing
    - Field Interchangeable rating plugs.
    - Thermal and magnetic back-up protection.
  - c. Main-Tie-Main circuit breakers on Service Switchboards in substations shall be draw-out type and utilize Insulated Case Circuit Breakers (ICCB) or Low-Voltage Power Circuit Breakers (LVPCB) selected based on project specific requirements determined by the designer. Refer to Service and Distribution Design Standard.
4. Related Sections
  - a. Service and Distribution
  - b. Panelboards
  - c. Switchboards
  - d. Enclosed Switches and Enclosed Circuit Breakers

EQUIPMENT and PRODUCT REQUIREMENTS

1. Circuit Breakers
  - a. Approved Manufacturers:
    - Square D
    - Eaton Cutler-Hammer
2. Solid-State Digital Trip Units
  - a. Approved Manufacturers:
    - Square D Micrologic 3.0, 5.0 or 6.0 Series based on project and coordination requirements.
    - Approved Equal by Eaton Cutler-Hammer

END OF SECTION