PowerMark Load Centers and Residential Circuit Breakers
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- ABB Load Center Features & Benefits
- ABB Circuit Breaker Offerings
- ABB Electronic Circuit Breaker Offerings
- ABB Value Propositions
- Available Tools & Resources
PowerMark Gold™ load centers

Highest quality construction

- **Solid copper bus standard** at no additional price.
- **Tin plated copper bus** assures reliable operation for a lifetime.
- **Tapered stabs** provide stronger breaker connection yet facilitate easier installation.
- 22kAIC main breaker standard on single phase and 3-phase.
- Galvanized, **commercial-quality** enclosure won’t corrode.
- **Ultra-rigid enclosure** construction assures long life.
PowerMark Gold™ load centers

Safety accessories – convenient and easy to install

- Main breaker configuration allows top or bottom feed without modification
- One-piece interior removes and reinstalls easily
- Full-length raised neutrals are easier to wire, reducing installation time and cost
- Minimum 100% neutral terminations
- Combination slotted/Robertson square-drive speeds screw wiring
- All holes rated for 14-4 wire
- 100% rated split neutral on each side
- Steel (not plastic) breaker mounting rail
- Tie bar may be removed to split neutral/ground
PowerMark Gold™ load centers

Quick & easy installation

- **Spring-loaded** front is self-leveling so it’s easier to install.
- Neutrals bondable on either side.
- Entire main lug line easily converts to main breaker.
- Combination surface/ flush front.
- Large, easy-to-read circuit directory.
- Many Models support THQP breakers!
# Main breaker kits

## Main circuit breaker kits

<table>
<thead>
<tr>
<th>Ampere rating</th>
<th>Product number</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>THQMV100D</td>
</tr>
<tr>
<td>125</td>
<td>THQMV125D</td>
</tr>
<tr>
<td>150</td>
<td>THQMV150D</td>
</tr>
<tr>
<td>175</td>
<td>THQMV175D</td>
</tr>
<tr>
<td>200</td>
<td>THQMV200D</td>
</tr>
<tr>
<td>225</td>
<td>THQMV225D</td>
</tr>
</tbody>
</table>

**PowerMark Gold™ main circuit breaker kit**

For use with 125A PowerMark Gold™ Load Centers; 22kAIC RMS symmetrical; For bottom feed, also purchase TRL22 door handle.

**Description**

Main circuit breaker kit – Order appropriate THQL 10kAIC or THHQL 22kAIC breakers separately

<table>
<thead>
<tr>
<th>Product number</th>
</tr>
</thead>
<tbody>
<tr>
<td>TQMH000</td>
</tr>
</tbody>
</table>
Focus on “Ease of Install”

- Removal of 3/8” knockouts.
- One anchor for ½” knockouts.
- Tangential knockouts.
- Centerline keyhole for hands free mounting.
- Slotted mounting holes on the side.
- ½” Breaker flexibility.
- Cover included with load center.
- Backed out neutral screws.
PowerMark Gold™ load centers

3/8” 1- Anchor Knockout

1/2 “ 1- Anchor Knockout

1/2 “ 2- Anchor Knockout
**PowerMark Gold™ load centers**

**Focus on “Ease of Install”**

- Removal of 3/8” knockouts.
- One anchor for ½” knockouts.
- **Tangential knockouts.**
- Centerline keyhole for hands free mounting.
- Slotted mounting holes on the side.
- ½” Breaker flexibility.
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PowerMark Gold™ load centers

Concentric Knockouts

Tangential Knockouts
Focus on “Ease of Install”

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PowerMark Gold™ load centers
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- Backed out neutral screws.
PowerMark Gold™ load centers

With neutral screws in the raised position

In addition to all the other features that lower your cost by making installation faster and easier, all PowerMark Gold™ load centers from ABB now come with neutral screws in the raised position – just insert the wire and tighten.

ABB gives you a headstart on installation
PowerMark Gold™ load center high-capacity load centers

- 80 & 64 circuit capacity.
- All positions support our exclusive 1/2” breakers.
- Maximum flexibility for breaker placement.
- Main lug/convertible version has dual ground bars and large ground lug included.

### Indoor NEMA type 1 enclosure combination flush/ Surface front

<table>
<thead>
<tr>
<th>Main Amp rating</th>
<th>1” THQL 1P 2P</th>
<th>1/2” THQP 1P 2P</th>
<th>Total 1-pole spaces</th>
<th>Catalog #</th>
<th>Equipment ground kit(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>40 20</td>
<td>80 38</td>
<td>80</td>
<td>TM4015C80</td>
<td>Order separately if required</td>
</tr>
<tr>
<td>200</td>
<td>32 16</td>
<td>64 30</td>
<td>64</td>
<td>TLM3220C64G2</td>
<td>(2) TGK24, (1) TLK250</td>
</tr>
<tr>
<td></td>
<td>32 16</td>
<td>64 30</td>
<td>64</td>
<td>TM3220C64</td>
<td>Order separately if required</td>
</tr>
<tr>
<td></td>
<td>40 20</td>
<td>80 38</td>
<td>80</td>
<td>TLM4020C80G2</td>
<td>(2) TGK32, (1) TLK250</td>
</tr>
<tr>
<td></td>
<td>40 20</td>
<td>80 38</td>
<td>80</td>
<td>TM4020C80</td>
<td>Order separately if required</td>
</tr>
</tbody>
</table>
## Nomenclature

**Product number guide for load centers – Product number for illustrative purposes only**

### GE identification

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Main breaker</td>
</tr>
<tr>
<td>L</td>
<td>Main lug</td>
</tr>
<tr>
<td>LM</td>
<td>Convertible</td>
</tr>
<tr>
<td>PL</td>
<td>Main lug (Thermoplastic)</td>
</tr>
</tbody>
</table>

### Maximum number 1” spaces

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2, 4, 6, 42</td>
<td></td>
</tr>
</tbody>
</table>

### Insert for 3-phase 4-wire

- **Load centers**
  - **Bus ampere rating**
    - 40 – 40 Amps
    - 70 – 70 Amps
    - 10 – 100 Amps
    - 12 – 125 Amps
    - 15 – 150 Amps
    - 20 – 200 Amps
    - 22 – 225 Amps
    - 30 – 300 Amps
    - 40 – 400 Amps
    - 60 – 600 Amps

### Insert for specials

<table>
<thead>
<tr>
<th>Insert for specials</th>
</tr>
</thead>
<tbody>
<tr>
<td>G or T = Factory installed ground bar</td>
</tr>
<tr>
<td>B = Bottom feed main breaker</td>
</tr>
<tr>
<td>FL = Factory installed feed-through lugs</td>
</tr>
<tr>
<td>D = Optional door for 6-8 circuit panel. (Doors standard on all units 12 circuits or greater)</td>
</tr>
</tbody>
</table>

### Insert for PowerMark Gold

- **CU = Copper Bus**
- **42 = Copper Bus full 42 circuit panel**

### Enclosure type

<table>
<thead>
<tr>
<th>Enclosure type</th>
</tr>
</thead>
<tbody>
<tr>
<td>C = Combination surface/ flush</td>
</tr>
<tr>
<td>F = Flush</td>
</tr>
<tr>
<td>S = Surface</td>
</tr>
<tr>
<td>R = Outdoor</td>
</tr>
</tbody>
</table>

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ABB residential THQL breakers

A tradition of performance

– Copper stabs for corrosion resistance.
– **Every breaker** is calibrated to assure optimum trip performance.
– Heat-resistant thermoset case.
– **Cemented** calibration screw prevents shifting. Others simply tape over their calibration screw.
– Lug screw is retained. It won’t fall out.
– Trip indication.
ABB residential THQP ½” breakers

Same performance, half the size!

– Similar internal design as ABB’s 1-inch breaker.
– You can buy 1 breaker at a time unlike competition’s Tandems and Quads which can be difficult to use.
– Tested to the same UL specifications as 1” breaker.
– Saves space and money by using a smaller, less expensive load center.
– Minimize load center upgrades by freeing up space when new circuits are required.
## Circuit Breaker Nomenclature

### Product number guide for Q-line plug-in circuit breakers – Product number for illustrative purposes only

<table>
<thead>
<tr>
<th>GE Identification</th>
<th>Interrupting rating</th>
<th>Type</th>
<th>Ampere rating</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H = 10kAIC</td>
<td>QL</td>
<td>Ground Fault/ Arc Fault Circuit Interrupter</td>
<td>1= 120/240V</td>
</tr>
<tr>
<td></td>
<td>HH = 22kAIC</td>
<td>QP</td>
<td></td>
<td>2= 240V</td>
</tr>
<tr>
<td></td>
<td>X = 65kAIC</td>
<td>QB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HQL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ground Fault/ Arc Fault Circuit Interrupter</th>
</tr>
</thead>
<tbody>
<tr>
<td>AF2 = 1- &amp; 2-pole combination Arc Fault Circuit Interrupter</td>
</tr>
<tr>
<td>GFEP = 1- &amp; 2-pole Ground Fault with Equipment Protection interrupter – 30mA</td>
</tr>
<tr>
<td>GFT = 1- &amp; 2-pole Ground Fault with Self-Test Feature Interrupter – 5 mA</td>
</tr>
<tr>
<td>DF = 1-pole Dual Function GFCI/ AFCI Ground Fault &amp; combination Arc Fault Circuit Interrupter</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poles (1,2,3)</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1= 120/240V</td>
</tr>
<tr>
<td>11</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
</tr>
<tr>
<td>GFT</td>
<td>2= 240V</td>
</tr>
</tbody>
</table>

1 Omit character for THQP breakers, which are all 120/240V
Household breakers per NEC 2020

- **AFCI**
  - Family room
  - Dining room
  - Living room
  - Bedroom
  - Sunroom
  - Library

- **DFCI**
  - Den
  - Office
  - Hallways
  - Closets
  - Rec room
  - Kitchen
  - Dishwasher
  - Clothes washer
  - Laundry room
  - Kitchen counter
  - Porch - Pool area
  - Dryer
  - Range
  - Outdoor

- **GFCI**
  - Bathroom
  - Garage
  - HVAC
  - Air handler
  - Water heater
  - Free
  - Unfinished basement
  - Finished basement
  - Garage
  - Family room
  - Dining room
  - Office
  - Laundry rooms
  - Closet
  - Hallways
  - Porch
  - Rec Room

1 DFCI required if within 6’ of sink

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What is an Arc Fault Circuit Interrupter?

**AFCI**

- AFCI technology provides increased protection over conventional circuit breakers by detecting potentially hazardous conditions known as “Arc Faults”.

- Once a dangerous arcing condition is recognized, the device de-energizes the entire circuit before it can become a fire hazard.

ABB Combination AFCI – Ends in Suffix “AF2”
What is an Arc Fault?

An arc fault is the flow of electricity over an unintended path. Two types of arc faults can occur:

1. **Parallel Arc Fault** – Unintentional flow of electricity between two separate wires (line-to-line, line-to-neutral, line-to-ground)

2. **Series Arc Fault** – Unintentional flow of electricity over a gap within a single wire

If left alone, arc faults can ignite combustible materials which can lead to an electrical fire.
Examples of Arc Faults

Cables that are improperly nailed or stapled too tightly
Extension or appliance cords that have worn/cracked insulation
Nails driven into walls can break wire insulation
Wires punctured by a screw or drill bit
Furniture pushed against electrical cords
5 kinds of protection

- Arc faults; Parallel, Ground, Series
- Overload & Short circuit

Integral dual function test switch to test the breaker’s Parallel and Series protection.
Locate tripped breakers fast with trip flag.

Suitable for use on shared neutral circuits.
- GE’s shared neutral capability can save significantly on installation costs!
- Instructions packaged with the product (DET-719) spell out how to take advantage!

ABB’s mixed neutral capability can save big headaches on retrofit.
- No need to locate neutrals that have been tied together within the home – A common ¶
- Save big in labor and be more certain of your Labor hours when you bid an AFCI retrofit
ABB IS AFCI competitive advantage
1. Retrofit solution – Wire it your way

Arc-fault circuit breaker connection diagram

Arc-fault circuit breaker

Load neutral wire (white)

Coiled white wire and load neutral wire connects to load center neutral

120 Vac Duplex Receptacle

Load power wire (Black)

Arc-fault circuit breaker

120 Vac Duplex Receptacle

Load neutral wire (white)

Coiled white wire connects to load center neutral

Load power wire (Black)
1. Retrofit solution typical pre-2000s mixed neutral wiring
2. New construction solution – The tie breaker

Wiring diagram

Note: For simplicity the ground wires are not shown

Panel

Tie handle bars together with THT104

Neutral lug of second AFCI can be left open

AFCI pigtails

Neutral bar

Branch circuit #1 (A-phase)

Black conductor

White conductor

Red conductor 12/14-3 NM-B

Junction box

12/14-2 NM-B

12/14-2 NH-B

Branch circuit #2 (B-phase)

12/14-3 NM-B

12/14-2 NH-B

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Dual Function Circuit Interrupter (DFCI)

**Features / benefit**

**DFCI & GFCI in same breaker**
- Save $$ over AFCI + GFCI receptacle

**Reduced call backs**
- All resets done at the load center
- Easy for homeowner to find

**Compact design**
- Doesn’t block load center wire way
- Speeds wiring

**Troubleshooting ease**
- LED indicates last known trip condition
- Troubleshooting card included with product

**Self-test failure indication**
- Blinking during test fail
- Lock-out after fail

**Meets NEC 2020**
- NEC 2020 requires AF+GFCI circuits
- DFCI easy to apply
- Avoids accessibility issues

DFCI = Code compliant + Easy to apply solution
The ABB IS DFCI Operation

DFCI

Push to test

ABB’s two position push to test allows verification of the AFCI and GFCI protection independently. It's also a good way to practice observing the LED indications covered below.

<table>
<thead>
<tr>
<th>LED Color Pattern</th>
<th>Last known trip condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orange</td>
<td>Overload</td>
</tr>
<tr>
<td>Orange – Yellow</td>
<td>Ground fault</td>
</tr>
<tr>
<td>Orange – Red</td>
<td>Arc fault</td>
</tr>
</tbody>
</table>
GFCI w/ Self-test

GFCI 5mA protection breakers to include self test functionality

Features/ Benefits
- Meet UL requirements
- UL943 Ed 5 (June 2015)
- GE GFCI performs self-test every 16 minutes
- 5mA protection
- “T” suffix indicates GFCI self-test catalog number
- Added safety
- Added trip flag
- LED Indicates self-test noncompliance
- Led in trip flag window
- Revised instruction - Trilingual
- Electronic breakers have family resemblance with the test buttons in same location as DF and AF

GFCI Self-Test = UL compliance & Safer product
The ABB THQLSURGE

**Benefits**
- AC power surge protective device for the entire home or office – computers, TV, appliances and all other sensitive electronic equipment
- Mitigates against surge damage caused by lightning and utility switching events
- Installs in your GE PowerMark™ load center (the best location for protecting all AC circuits in your home) directly onto the bus
- Up to 50,000 amps of surge protective strength
- Meets newest UL 1449 4th edition surge protection requirements
- 3-year, $15,000 connected equipment warranty (from date of purchase) when installed according to NEC® electrical and safety codes on cULus approved equipment
- Can be installed to meet NEC® 2020 Art. 230.67 SPD requirements for dwelling units at or adjacent to service entrances

**Product features**
- Single phase, three wire, 120/240 VAC, 50 kA rated
- UL 1449 4th edition listed (VZCA:E316636 and VZCA7:E316636) as a Type 1 SPD with a 100 kA SCCR rating
- Monolithic, high energy metal oxide varistors per mode with integral thermal and overcurrent protection
- Illuminated LED indicates proper function of protective elements
Meter socket load centers overview

Features

- Combination load center with meter for utility. Many utilities are available
- Ring & Ringless Designs.
- Circuits up to 42.
- Side by Side, Top/Bottom and Wide Body designs.
- Formula A2 breaker for 150A and above
Thanks for your business.
Find out more at electrification.us.abb.com