UBW Technical Manual
# UBW Technical Manual

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</table>
General Description

General Circuit Breaker Information

WEG’s molded-case circuit breakers are designed to provide circuit protection for low voltage distribution systems. They are described by NEMA as, “...a device for closing and interrupting a circuit between separable contacts under both normal and abnormal conditions,” and further-more as, “...a breaker assembled as an integral unit in a supporting and enclosing housing of insulating material.” The NEC® describes them as, “A device designed to open and close a circuit by non-automatic means, and to open the circuit automatically on a predetermined overload of current, without injury to itself when properly applied within its rating.”

So designed, WEG circuit breakers protect conductors against overloads and conductors and connected apparatus, such as motors and motor starters, against short circuits.

Circuit Breaker Components and Functions

Being essentially high interrupting capacity switches with repetitive elements, WEG’s circuit breakers are comprised of three main functional components. These are:

1. Trip elements (thermal-magnetic or electronic)
2. Operating mechanism
3. Arc extinguishers

1. Trip Elements

The function of the trip element is to trip the operating mechanism in the event of a prolonged overload or short-circuit current. To accomplish this, a thermal- magnetic trip action is provided.

Thermal-Magnetic Breakers

WEG thermal-magnetic breakers are general purpose devices suitable for the majority of breaker applications and are considered the industry standard. Available from 15–800 A, thermal-magnetic breakers provide accurate reliable overload and short-circuit protection for conductors and connected apparatus.

Thermal trip action is achieved through the use of a bimetal heated by the load current. On a sustained over-load, the bimetal will deflect, causing the operating mechanism to trip.

2. Operating Mechanism

The function of the operating mechanism is to provide a means of opening and closing the breaker contacts. All mechanisms are of the quick-make, quick-break type and are “trip free.” “Trip free” mechanisms are designed so that the contacts cannot be held closed against an abnormal circuit condition and are sometimes referred to as an “overcenter toggle mechanism.” In addition to indicating whether the breaker is “on” or “off,” the operating mechanism handle indicates when the breaker is “tripped” by moving to a position midway between the extremes. This distinct trip point is particularly advantageous where breakers are grouped, as in panelboard applications, because it clearly indicates the faulty circuit. The operating mechanism contains a positive on feature. In the normal switching operation, the handle of the circuit breaker will not be capable of being left readily at or near the off position when the main contacts are closed.

3. Arc Extinguishers

The function of the DE-ION® arc extinguisher is to confine, divide extinguish the arc drawn between opening breaker contacts. It consists of specially shaped steel grids isolated from each other and supported by an insulating housing.

When the contacts are opened, the arc drawn induces a magnetic field in the grids, which in turn draws the arc from the contacts and into the grids. The arc is thus split into a series of smaller arcs and the heat generated is quickly dissipated through the metal. These two actions result in a rapid removal of ions from the arc, which hastens dielectric build-up between the contacts and results in rapid extinction of the arc.

Electronic RMS Trip Breakers

WEG electronic trip breakers are generally applied for applications where high levels of system coordination are called for. Available from 500–2500 A, today’s electronic trip breakers can provide superior protection and coordination as well as additional protection features. Both the overload trip action and the short-circuit trip action of breakers with Digitrip electronic trip units are achieved by the use of current transformers and solid-state circuitry that monitors the current and initiates tripping through a flux shunt trip when an overload or a short circuit is present.

All multiple-pole circuit breakers have trip elements in each pole and a common trip bar. An abnormal circuit condition in any one pole will cause all poles to open simultaneously.

Electronic RMS trip breakers can include trip features such as:

- Adjustable long-time pickup
- Adjustable short-time pickup
- Adjustable long delay time
- Adjustable short delay time
- Adjustable instantaneous pickup

Trip unit adjustments are made by setting switches on the front of the trip unit or by programming the trip unit electronically.

All electronic RMS trip breakers are equipped with a manual push-to-trip mechanism.
**Molded-Case Circuit Breakers**

<table>
<thead>
<tr>
<th>Description</th>
<th>UBW Breakers Frames 225 to 2500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select trip</td>
<td>Selective trip over a smaller range of fault currents within the interrupting rating (low short-time ratings). Typically 10–13 times the frame size</td>
</tr>
<tr>
<td>Operator type</td>
<td>Types of operators: mechanically operated over-center toggle or motor operator</td>
</tr>
<tr>
<td>Closing speed</td>
<td>Greater than 5-cycle closing for electrically operated devices</td>
</tr>
<tr>
<td>Mounting</td>
<td>Typically fixed-mounted but large frame sizes may be available in drawout construction</td>
</tr>
<tr>
<td>Interrupting rating</td>
<td>Interrupting duty at 480 Vac: 22–100 kA</td>
</tr>
<tr>
<td>Current limiting</td>
<td>Current limiting available with and without fuses up to 200 kA</td>
</tr>
<tr>
<td>Relative cost</td>
<td>Low</td>
</tr>
<tr>
<td>Available frame sizes</td>
<td>Large number of frame sizes available. Typical 15–2500 A</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Very limited maintenance possible on larger frame sizes</td>
</tr>
<tr>
<td>Enclosure types</td>
<td>Used in enclosures, panelboards, switchboards, MCCs and control panels</td>
</tr>
<tr>
<td>Series ratings</td>
<td>Available in series ratings</td>
</tr>
<tr>
<td>Enclosed rating</td>
<td>80% continuous-current rated</td>
</tr>
<tr>
<td>Standards</td>
<td>NEMA AB1/AB3 UL 489</td>
</tr>
</tbody>
</table>

**UBW Part Number Sequence**

- **UBW**
  - WEG UBW Breaker Series
  - Frame Size:
    - 225
    - 250
    - 400
    - 600
    - 800
    - 1200
    - 2500
  - KAIC@480V:
    - N=35 KAIC
    - S=50 KAIC
    - H=65 KAIC
    - L=100 KAIC
  - **2 2 5**
  - N - F - T - U
  - FTU Thermal and Magnetic
    - or
    - ELS Electronic Trip
    - or
    - ELSI Electronic Trip with Maintenance Mode
  - 1 5
  - 3 A
  - Breaker Amps (Max)
    - 15, 20, 30, 40, 50, 60, 70, 80, 100, 125, 200, 225, 250, 400, 600, 800, 1200, 1600, 2000, 2500
  - 3 Pole/Amp

*If ordering with factory installed options replace 3A with alpha numeric option code sequence*

Data subject to change without notice.
### Molded-Case Circuit Breakers

#### Intermuting Capacity Ratings

<table>
<thead>
<tr>
<th>Frame</th>
<th>Type</th>
<th>Poles</th>
<th>240ac</th>
<th>480ac</th>
<th>600ac</th>
<th>250dc</th>
</tr>
</thead>
<tbody>
<tr>
<td>225 Frame</td>
<td>N</td>
<td>3</td>
<td>65K</td>
<td>35K</td>
<td>N/A</td>
<td>10K</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>3</td>
<td>100K</td>
<td>65K</td>
<td>N/A</td>
<td>22K</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>3</td>
<td>200K</td>
<td>100K</td>
<td>N/A</td>
<td>22K</td>
</tr>
<tr>
<td>250 Frame</td>
<td>N</td>
<td>3</td>
<td>65K</td>
<td>35K</td>
<td>18K</td>
<td>10K</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>3</td>
<td>100K</td>
<td>65K</td>
<td>25K</td>
<td>22K</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>3</td>
<td>200K</td>
<td>100K</td>
<td>N/A</td>
<td>22K</td>
</tr>
<tr>
<td>400 Frame</td>
<td>N</td>
<td>3</td>
<td>65K</td>
<td>35K</td>
<td>18K</td>
<td>10K</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>3</td>
<td>100K</td>
<td>65K</td>
<td>35K</td>
<td>22K</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>3</td>
<td>200K</td>
<td>100K</td>
<td>65K</td>
<td>22K</td>
</tr>
<tr>
<td>600 Frame</td>
<td>N</td>
<td>3</td>
<td>65K</td>
<td>35K</td>
<td>25K</td>
<td>22K</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>3</td>
<td>100K</td>
<td>65K</td>
<td>35K</td>
<td>25K</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>3</td>
<td>200K</td>
<td>100K</td>
<td>65K</td>
<td>22K</td>
</tr>
<tr>
<td>800 Frame</td>
<td>S</td>
<td>3</td>
<td>65K</td>
<td>50K</td>
<td>25K</td>
<td>22K</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>3</td>
<td>100K</td>
<td>65K</td>
<td>35K</td>
<td>25</td>
</tr>
<tr>
<td>1200 Frame</td>
<td>S</td>
<td>3</td>
<td>85K</td>
<td>50K</td>
<td>25K</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>3</td>
<td>100K</td>
<td>65K</td>
<td>35K</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>3</td>
<td>N/A</td>
<td>100K</td>
<td>65K</td>
<td>NO</td>
</tr>
<tr>
<td>2500 Frame</td>
<td>H</td>
<td>3</td>
<td>125K</td>
<td>65K</td>
<td>50K</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>3</td>
<td>200</td>
<td>100K</td>
<td>65K</td>
<td>NO</td>
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</table>

Data subject to change without notice.
### Molded-Case Circuit Breakers

#### Minimum Interrupting Time

<table>
<thead>
<tr>
<th>Minimum Interrupting Time</th>
<th>500</th>
<th>300</th>
<th>200</th>
<th>100</th>
<th>50</th>
<th>30</th>
<th>15</th>
<th>10</th>
<th>5</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (s)</td>
<td>1,000</td>
<td>500</td>
<td>300</td>
<td>200</td>
<td>100</td>
<td>50</td>
<td>30</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>3</td>
<td>2</td>
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</tbody>
</table>

#### Maximum Interrupting Time

<table>
<thead>
<tr>
<th>Maximum Interrupting Time</th>
<th>1,000</th>
<th>500</th>
<th>300</th>
<th>200</th>
<th>100</th>
<th>50</th>
<th>30</th>
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<tr>
<td>Time (s)</td>
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<td>500</td>
<td>300</td>
<td>200</td>
<td>100</td>
<td>50</td>
<td>30</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Circuit Breaker Time/Current Curves

**Series 225 Frame Circuit Breakers**

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (80°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

- **Maximum Vac**: 600 at 50/60 Hz
- **Maximum Vdc**: 250

#### Interrupting Rating (UL/CSA Listed)

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>@240Vac</th>
<th>@480Vac</th>
<th>@600Vac</th>
<th>@250Vac</th>
</tr>
</thead>
<tbody>
<tr>
<td>15A</td>
<td>85</td>
<td>75</td>
<td>65</td>
<td>10</td>
</tr>
<tr>
<td>18A</td>
<td>80</td>
<td>75</td>
<td>65</td>
<td>10</td>
</tr>
<tr>
<td>30A</td>
<td>100</td>
<td>90</td>
<td>75</td>
<td>25</td>
</tr>
<tr>
<td>40A</td>
<td>100</td>
<td>90</td>
<td>75</td>
<td>25</td>
</tr>
<tr>
<td>50A</td>
<td>100</td>
<td>90</td>
<td>75</td>
<td>25</td>
</tr>
</tbody>
</table>

#### Notes:


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**UBW Time Current Curves 225N/H**

- **Interrupting Rating (UL/CSA Listed)**
- **Continuous amperes**
- **Instantaneous trip, amperes**
- **Symmetrical RMS amperes (kA)**
- **Breaker Type**
- **Interruption Rating**
- **Maximum Vac**
- **Maximum Vdc**

---

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

- **Maximum Vac**: 600 at 50/60 Hz
- **Maximum Vdc**: 250

---

Data subject to change without notice.
Circuit breaker time/current curves
Series C F-frame circuit breakers

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Breaker rating
Continuous amperes Instantaneous trip amperes
15A See curve

Interrupting Rating (UL/CSA Listed)
Symmetrical RMS amperes (kA) Amps (KA)

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>240Vac</th>
<th>480Vac</th>
<th>600Vac</th>
<th>250Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>200</td>
<td>100</td>
<td>35</td>
<td>22</td>
</tr>
</tbody>
</table>

Notes:
1 Single-pole test data at 25°C based on NEMA procedures (AB 4-2003) for verifying performance of molded case circuit breakers.
Molded-Case Circuit Breakers

UBW Time Current Curves

225N/H

<table>
<thead>
<tr>
<th>CURRENT IN AMPERES</th>
</tr>
</thead>
<tbody>
<tr>
<td>6000</td>
</tr>
<tr>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TIME IN SECONDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10000</td>
</tr>
<tr>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CURRENT IN AMPERES</th>
</tr>
</thead>
<tbody>
<tr>
<td>6000</td>
</tr>
<tr>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TIME IN SECONDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10000</td>
</tr>
<tr>
<td>6</td>
</tr>
</tbody>
</table>

**Circuit Breaker Time/Current Curves**

**Series 225 Circuit Breakers**

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (80°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

- **Maximum Vac**: 600 at 50/60 Hz
- **Maximum Vdc**: 250

**Breaker rating**

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>Continuous Amps</th>
<th>Instantaneous Trip, Amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>20A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symmetrical RMS amperes (kA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>240Vac</td>
</tr>
<tr>
<td>6S</td>
</tr>
<tr>
<td>100</td>
</tr>
</tbody>
</table>

**Notes:**

Series C F-frame circuit breakers

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Breaker rating
Continuous amperes Instantaneous trip, amperes
20A See curve

Interrupting Rating (UL/CSA Listed)
Symmetrical RMS amperes (kA) Amps (kA)
Breaker Type @240Vac @480Vac @600Vac 250Vdc
20A 200 100 35 22

Notes:
1 Single-pole test data at 25°C based on NEMA procedures (AB 4-2003) for verifying performance of molded case circuit breakers.
Molded-Case Circuit Breakers

Time Current Curves
225 N., H.

Circuit breaker time/current curves
225 circuit breakers

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Breaker rating
Continuous amperes Instantaneous trip, amperes
30A See curve

Interrupting Rating (UL/CSA Listed)

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>Symmetrical RMS amperes (kA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>@240Vac</td>
</tr>
<tr>
<td>F</td>
<td>10</td>
</tr>
<tr>
<td>H</td>
<td>10</td>
</tr>
</tbody>
</table>

Notes:
1 Single-pole test data at 25°C based on NEMA procedures (AB 4-2003) for verifying performance of molded case circuit breakers.
Circuit breaker time/current curves

Series C F-frame circuit breakers

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Breaker rating

Continuous amperes Instantaneous trip amperes

30A See curve

Interrupting Rating (UL/CSA Listed)

Symmetrical RMS amperes (kA) Amps (KA)

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>@ 240Vac</th>
<th>@ 480Vac</th>
<th>@ 600Vac</th>
<th>250Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
<td>200</td>
<td>300</td>
<td>100</td>
</tr>
</tbody>
</table>

Notes:

1 Single-pole test data at 25°C based on NEMA procedures (AB 4-2003) for verifying performance of molded case circuit breakers.
Time Current Curves

225 N/H

Circuit breaker time/current curves

Series C F-frame circuit breakers

Catalog Types: ED, HED, FDB, FD and HFD circuit breakers, two-, three- and four-pole.

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

Maximum Vac: 600 at 50/60 Hz

Maximum Vdc: 250

Breaker rating

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>Continuous amperes</th>
<th>Instantaneous trip, amperes</th>
</tr>
</thead>
<tbody>
<tr>
<td>40A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Interrupting Rating (UL/CSA Listed)

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>600Vac</th>
<th>480Vac</th>
<th>250Vac</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>100</td>
<td>65</td>
<td>25</td>
</tr>
<tr>
<td>N</td>
<td>10</td>
<td>10</td>
<td>22</td>
</tr>
</tbody>
</table>

Notes:

UBW Time Current Curves
225 L

Circuit breaker time/current curves
225 circuit breaker

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Breaker rating
Continuous amperes Instantaneous trip, amperes
40A See curve

Interrupting Rating (UL/CSA Listed)
Symmetrical RMS amperes (kA) Amps (kA)
Breaker Type @240Vac @480Vac @600Vac 250Vdc
L 200 100 35 22

Notes:
1 Single-pole test data at 25°C based on NEMA procedures (AB 4-2003) for verifying performance of molded case circuit breakers.
Circuit breaker time/current curves

225 Circuit breaker

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Breaker rating

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>Continuous amperes</th>
<th>Instantaneous trip, amperes</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>See curve</td>
<td></td>
</tr>
</tbody>
</table>

Interrupting Rating (UL/CSA Listed)

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>240Vac</th>
<th>480Vac</th>
<th>600Vac</th>
<th>250Vac</th>
</tr>
</thead>
<tbody>
<tr>
<td>50A</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

Symmetrical RMS amperes (kA)

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>@240Vac</th>
<th>@480Vac</th>
<th>@600Vac</th>
<th>250Vac</th>
</tr>
</thead>
<tbody>
<tr>
<td>50A</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

Circuit breaker time/current curves
225 circuit breakers

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Torted in open air.

Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Breaker rating
Continuous amperes Instantaneous trip amperes
50A See curve

Interrupting Rating (UL/CSA Listed)

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>Symmetrical RMS amperes (kA) @240Vac</th>
<th>@480Vac</th>
<th>@600Vac</th>
<th>@250Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>100</td>
<td>35</td>
<td>22</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Breaker rating

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>Symmetrical RMS amperes (kA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>240Vac</td>
</tr>
<tr>
<td>60A</td>
<td>65</td>
</tr>
<tr>
<td>EHD</td>
<td>35</td>
</tr>
<tr>
<td>FDB</td>
<td>10</td>
</tr>
<tr>
<td>FD</td>
<td>14</td>
</tr>
<tr>
<td>HFD</td>
<td>—</td>
</tr>
</tbody>
</table>

Notes:

Molded-Case Circuit Breakers

UBW Time Current Curves

Circuit breaker time/current curves
UBW 225L circuit breakers

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Breaker rating

Continuous amperes Instantaneous trip amperes

60A See curve

Interrupting Rating (UL/CSA Listed)

Symmetrical RMS amperes (kA) Amps (KA)

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>@240Vac</th>
<th>@480Vac</th>
<th>@600Vac</th>
<th>@250Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>200</td>
<td>100</td>
<td>50</td>
<td>22</td>
</tr>
</tbody>
</table>

Notes:

Time Current Curves
225 N., H.

Circuit breaker time/current curves
225 circuit breakers
For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (90°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Breaker rating
Continuous amperes Instantaneous trip amperes
70A See curve

Interrupting Rating (UL/CSA Listed)
Symmetrical RMS amperes (kA)

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>@240Vac</th>
<th>@480Vac</th>
<th>@600Vac</th>
<th>250Vac</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>FDB</td>
<td>65</td>
<td>35</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>FD</td>
<td>—</td>
<td>14</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>EHD</td>
<td>14</td>
<td>14</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>FD</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>22</td>
</tr>
</tbody>
</table>

Notes:
1 Single-pole test data at 25°C based on NEMA procedures (AB 4-2003) for verifying performance of molded case circuit breakers.
Circuit breaker time/current curves

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Breaker rating
Continuous amperes Instantaneous trip, amperes
70A  See curve

Interrupting Rating (UL/CSA Listed)

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>@ 240Vac</th>
<th>@ 480Vac</th>
<th>@ 600Vac</th>
<th>250Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>200</td>
<td>100</td>
<td>35</td>
<td>22</td>
</tr>
</tbody>
</table>

Notes:
**Molded-Case Circuit Breakers**

**Data subject to change without notice.**

---

**Time Current Curves**

**225 N., H.**

---

**Circuit breaker time/current curves**

**C F-frame circuit breakers**

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

- **Maximum Vac:** 600 at 50/60 Hz
- **Maximum Vdc:** 250

**Breaker rating**

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>Continuous amperes</th>
<th>Instantaneous trip amperes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>@ 240Vac</td>
<td>@ 480Vac</td>
</tr>
<tr>
<td></td>
<td>65</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>65</td>
</tr>
</tbody>
</table>

**Interrupting Rating (UL/CSA Listed)**

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>Symmetrical RMS amperes (kA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>@ 250Vac</td>
</tr>
<tr>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>

**Notes:**

Molded-Case Circuit Breakers

Circuit breaker time/current curves
UBW 225L current curves

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Breaker rating
Continuous amperes Interrupting amperes
Instantaneous trip

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>Symmetrical RMS amperes (kA)</th>
<th>Amps (KA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>80A</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>50</td>
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<tr>
<td></td>
<td>0.001</td>
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</tbody>
</table>

Notes:
1 Single-pole test data at 25°C based on NEMA procedures (AB 4-2003) for verifying performance of molded case circuit breakers.

Maximum single-pole trip times at 25°C (1)
Circuit breaker time/current curves

225 circuit breakers

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Interrupting Rating (UL/CSA Listed)

<table>
<thead>
<tr>
<th>Symmetrical RMS amperes (kA)</th>
<th>Breaker Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>@240Vac</td>
<td>@480Vac</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N</th>
<th>90</th>
<th>35</th>
<th>18</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>100</td>
<td>65</td>
<td>25</td>
<td>22</td>
</tr>
</tbody>
</table>

Notes:


Maximum single-pole trip times at 25°C (s)
Circuit breaker time/current curves
225L Circuit Breakers

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Breaker rating
Continuous amperes  Instantaneous trip, amperes
90A  See curve

Interrupting Rating (UL/CSA Listed)

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>@240 Vac</th>
<th>@480 Vac</th>
<th>@600 Vac</th>
<th>250Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>90</td>
<td>70</td>
<td>50</td>
<td>22</td>
</tr>
</tbody>
</table>

Notes:
1 Single-pole test data at 25°C based on NEMA procedures (AB 4-2003) for verifying performance of molded case circuit breakers.
Series C® F-frame circuit breakers

Based on rated wire (60°C up to 125A, 75°C above 125A) per terminal.

Tested in open air with current in all poles.


Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Breaker rating

Continuous amperes    Instantaneous trip, amperes

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>240Vac</th>
<th>480Vac</th>
<th>600Vac</th>
<th>250Vac</th>
</tr>
</thead>
<tbody>
<tr>
<td>100A</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDB</td>
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<td>10</td>
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<tr>
<td>EDB</td>
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<td>35</td>
<td>18</td>
<td>10</td>
</tr>
<tr>
<td>EDB</td>
<td>200</td>
<td></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>EDB</td>
<td>100</td>
<td></td>
<td>10</td>
<td></td>
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<tr>
<td>EDB</td>
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<td></td>
</tr>
<tr>
<td>EDB</td>
<td>22</td>
<td></td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

Circuit breaker time/current curves

225 circuit breakers

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Interrupting Rating (UL/CSA Listed)

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>@240Vac</th>
<th>@480Vac</th>
<th>@600Vac</th>
<th>250Vac</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFD</td>
<td>65</td>
<td>35</td>
<td>18</td>
<td>10</td>
</tr>
<tr>
<td>FD</td>
<td>18</td>
<td>14</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>FDB</td>
<td>18</td>
<td>14</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>EHD</td>
<td>200</td>
<td></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>EDB</td>
<td>100</td>
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<td>10</td>
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<td>EHS</td>
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<td></td>
</tr>
<tr>
<td>EDC</td>
<td>22</td>
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<td>10</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

1 Single-pole test data at 25°C based on NEMA procedures (AB 4-2003) for verifying performance of molded case circuit breakers.
### Molded-Case Circuit Breakers

#### UBW Time Current Curves

**225L**

<table>
<thead>
<tr>
<th>Current IN AMPERES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
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<tr>
<td>0</td>
</tr>
</tbody>
</table>

**Circuit breaker time/current curves**

**225L Circuit Breakers**

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

- **Maximum Vac:** 600 at 50/60 Hz
- **Maximum Vdc:** 250

**Breaker rating**

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>240Vac</th>
<th>480Vac</th>
<th>600Vac</th>
<th>250Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>200</td>
<td>100</td>
<td>50</td>
<td>22</td>
</tr>
</tbody>
</table>

**Interrupting Rating (UL/CSA Listed)**

<table>
<thead>
<tr>
<th>Symmetrical RMS amperes (kA)</th>
<th>Amps (KA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>240Vac</td>
<td>200</td>
</tr>
<tr>
<td>480Vac</td>
<td>100</td>
</tr>
<tr>
<td>600Vac</td>
<td>50</td>
</tr>
<tr>
<td>250Vdc</td>
<td>22</td>
</tr>
</tbody>
</table>

**Notes:**

Circuit breaker time/current curves
225 circuit breakers

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Breaker rating
Continuous amperes Instantaneous trip, amperes
125A See curve

Interrupting Rating (UL/CSA Listed)

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>240Vac</th>
<th>480Vac</th>
<th>600Vac</th>
<th>250Vac</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>65</td>
<td>35</td>
<td>18</td>
<td>10</td>
</tr>
<tr>
<td>100</td>
<td>85</td>
<td>25</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
UBW Time Current Curves
225L

Circuit breaker time/current curves
UBW 225L Circuit Breakers

For application and coordination purposes only. Based on 40°C ambient, cold start.
Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Breaker rating
Continuous amperes Instantaneous trip, amperes
125A See curve

Interrupting Rating (UL/CSA Listed)

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>@240Vac</th>
<th>@480Vac</th>
<th>@600Vac</th>
<th>250Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>220</td>
<td>100</td>
<td>15</td>
<td>22</td>
</tr>
</tbody>
</table>

Notes:
1 Single-pole test data at 25°C based on NEMA procedures (AB 4-2003) for verifying performance of molded case circuit breakers.

Maximum single-pole trip times at 25°C

Minimum

Maximum

Maximum interrupting time
Circuit breaker time/current curves

225 circuit breakers

Catalog Types: ED, EDB, EDS, EDH, EDIC, EHD, FDB, FD and HFD circuit breakers, two-, three- and four-pole.

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Breaker rating
Continuous amperes Instantaneous trip, amperes

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>240 Vac</th>
<th>480 Vac</th>
<th>600 Vac</th>
<th>250 Vac</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>65</td>
<td>35</td>
<td>18</td>
<td>10</td>
</tr>
<tr>
<td>H</td>
<td>100</td>
<td>65</td>
<td>25</td>
<td>22</td>
</tr>
</tbody>
</table>

Notes:
UBW Time Current Curves
225L

Circuit breaker time/current curves
225L Circuit Breakers

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125A, 75°C above 125A) per terminal. Tested in open air.

Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Breaker rating
Continuous amperes Instantaneous trip amperes
150A See curve

Interrupting Rating (UL/CSA Listed)

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>@240Vac</th>
<th>@480Vac</th>
<th>@600Vac</th>
<th>@250Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>200</td>
<td>100</td>
<td>35</td>
<td>22</td>
</tr>
</tbody>
</table>

Notes:
Time Current Curves
225 N., H.

Circuit breaker time/current curves
225 circuit breakers

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (75°C) per terminal. Tested in open air.

Maximum Vac: 600 at 50/60 Hz
Maximum Vdc: 250

Breaker rating
In amperes Instantaneous pick-up, amperes Rms
175 2400
200 2400
225 2400

Interrupting Rating
Symmetrical RMS amperes (kA), I_{cu}

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>240Vac</th>
<th>480Vac</th>
<th>600Vac</th>
<th>250Vac</th>
</tr>
</thead>
<tbody>
<tr>
<td>I_{cu}</td>
<td>100</td>
<td>95</td>
<td>25</td>
<td>22</td>
</tr>
</tbody>
</table>

Notes:
1. Fixed inverse-time overcurrent release.
3. Total operation time.
4. In this interruption region:
   The curve is drawn for I_{n} = 200A. For I_{n} ≤ 200A, the end points in this region are displaced along the current-axis by a factor (200A/I_{n}).

---

Maximum single-pole trip times at 25°C (°C)

---

Maximum trip time

---

Minimum trip time

---

Current in multiples of I_{n}
For application and coordination purposes only. Based on cold start at rated ambient temperature. Connected with four (4) feet of rated wire (60/75°C) per terminal with all poles wired in series. Tested in open air. Instantaneous tripping is single pole.

Maximum Vac: 600V at 50/60Hz
Maximum Vdc: 250V

Breaker Rating
Continuous Amps | Instantaneous trip amperes
--- | ---
200A | See curve, may be 42% higher for dc voltages

Interruption Ratings (UL/CSA listed)

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>240 Vac</th>
<th>480 Vac</th>
<th>600 Vac</th>
<th>250 Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>200</td>
<td>100</td>
<td>35</td>
<td>22</td>
</tr>
</tbody>
</table>

Maximum Single Pole Trip Times at 25°C

Minimum Tolerance

Maximum Tolerance

240V 480V 600V

The interruption rating and application determine the end of curve.
For application and coordination purposes only.
Based on cold start at rated ambient temperature.
Connected with four (4) feet of rated wire (60/75°C) per terminal with all poles wired in series. Tested in open air.
Instantaneous tripping is single pole.

Maximum Vac: 600V at 50/60Hz
Maximum Vdc: 250V

<table>
<thead>
<tr>
<th>Breaker Rating</th>
<th>Continuous Amps</th>
<th>Instantaneous trip amperes</th>
</tr>
</thead>
<tbody>
<tr>
<td>225A</td>
<td>See curve</td>
<td>May be 42% higher for dc voltages</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>Symmetrical RMS amperes (kA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>240 Vac 480Vac 600 Vac 250 Vdc</td>
</tr>
<tr>
<td></td>
<td>200 100 35 22</td>
</tr>
</tbody>
</table>

interruption rating and application determines end of curve

Figure 46. Types ED, EDB, EDS, EDH, EDC, EHD, FDB, FD, HFD, FDC 225A 2, 3, & 4 pole—Curve Number TC012035EN
UBW Time Current Curves
250N, H

Molded-Case Circuit Breakers

Data subject to change without notice. UBW Technical Manual | 33

UBW Time Current Curves
250N, H

Circuit Breaker Time/Current Curves

For application and coordination purposes only. Thermal calibration based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (80°C up to 125 amps, 75°C above 125 amps) per terminal. Tested in open air with current in all poles. Instantaneous calibration based on single-pole tests.

Maximum Voltage
520 V, AC (50/60 Hz)
260 V, DC

Breaker Rating
Rated Amperes (I)
Instantaneous Trip Amperes
(see figure below).

250
65 to 100% of trip unit rating (DC values are approximately 40% higher)

Interrupting Rating
UL/CSA
RMS sym. 1A, 50/60 Hz
Ia, DC

N
240 V
65
65

N
200 V
100
200

Note: For additional information on the trip unit, see UL 2900.
(1) Single pole test data at 25°C based on NEMA procedures (A5-4-1991) for verifying performance of molded case circuit breakers.

Individual Pole Adjustments
Typical Trip Unit Nameplate

Amps (I) 40°C Cat. No.

adjustable magnetic trip

maximum single pole trip times at 25°C (note 1)

minimum

maximum

maximum interrupting time

interrupting rating determines end of curve

CURRENT IN PERCENT OF BREAKER TRIP UNIT RATING (I)

TIME IN SECONDS

1 hour

1000

500

100

50

10

1

0.1

0.05

0.01

0.005

0.001

10

50

100

500

1,000

5,000

10,000

50,000

100,000
For application and coordination purposes only. Thermal calibration based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (80°C up to 126 amps, 70°C above 126 amps) per terminal. Tested in open ar with current in all poles. Instantaneous calibration based on single-pole tests.

**Maximum Voltage**
- 600 V, AC (50/60 Hz)
- 550 V, DC

**Breaker Rating**
- Rated Amperes (L)
  - Instantaneous Trip Amperes (see figure below)
  - 250
  - 500 to 1000% of trip unit rating (DC values are approximately 40% higher)

**Interruption Rating**

<table>
<thead>
<tr>
<th>UL/CSA</th>
<th>RMS sym. kA, 50/60 Hz</th>
<th>kA, DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>240 V</td>
<td>460 V</td>
</tr>
<tr>
<td>J</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>IEC: 107-1 (P1)</td>
<td>RMS sym. kA, 50/60 Hz</td>
<td>kA, DC</td>
</tr>
<tr>
<td>J</td>
<td>240 V, (0 A)</td>
<td>380 V, (0 A)</td>
</tr>
<tr>
<td>J</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

**Notes:**
- For additional information on the trip unit, see IL 290G00.
- For PI, Ip and threshold values, see AD 25-166.
- Single pole test data at 25°C based on NEMA procedures (AB 4-1991) for verifying performance of molded case circuit breakers.

**Typical Trip Unit Nameplate**

- Individual Pole
- Adjustments
- Maximum Interrupting Time
- Adjustable Magnetic Trip
- Maximum Single Pole Trip Times at 25°C (note 1)

**Thermal Magnetic Trip Time**

- 600V AC
- 460V AC
- 240V AC

**Push to Trip**

- Data subject to change without notice.
UBW Time Current Curves
400N, H

Current in Percent of Breaker Trip Unit Rating (Iₚ)

Thermal-Magnetic Circuit Breaker Time/Current Curves
For application and coordination purposes only. Based on cold start at rated ambient temperature. Connected with four (4) feet of rated wire (60/75°C) per terminal with all poles wired in series. Tested in open air.

Breaker Rating
Rated Amperes (Iₚ)  Instantaneous Trip Amperes
10-400  Settings are 500 to 1000% of trip unit rating. For DC, instantaneous trip may be 42% higher.

UL/CSA rms Sym. kA, 50/60 Hz

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>240V</th>
<th>480V</th>
<th>600V</th>
<th>250Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>100</td>
<td>85</td>
<td>35</td>
<td>22</td>
</tr>
</tbody>
</table>

Typical Trip Unit Nameplate

- Adjustments
- Individual Pole
- Adjustable Magnetic Trip, 5x - 10x
Thermal-Magnetic Circuit Breaker Time/Current Curves

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 125 amps, 75°C above 125 amps) per terminal. Tested in open air with current in all poles. Instantaneous calibration based on single-pole tests.

**Maximum Voltage**: 600 Vac (60 Hz) – 250 Vdc

<table>
<thead>
<tr>
<th>Breaker Rating</th>
<th>Instantaneous Trip Amperes</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-400</td>
<td>500 to 1000% of trip unit rating (See Figure Below)</td>
</tr>
<tr>
<td></td>
<td>(DC values are approximately 40% higher)</td>
</tr>
</tbody>
</table>

**UL/CSA rms Sym. kA, 50/60 Hz**

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>240V</th>
<th>480V</th>
<th>600V</th>
<th>250Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Data</td>
<td>200</td>
<td>100</td>
<td>60</td>
<td>22</td>
</tr>
</tbody>
</table>

Single-pole test data at 25°C based on NEMA Procedures (AB 4) for verifying performance of molded-case circuit breakers.

**Note**: For additional information on the trip unit, see IL 29C603.
Molded-Case Circuit Breakers

Maximum Single Pole Trip Times at 25°C

Typical Trip Unit

Nameplate

Individual Pole Adjustments

Thermal Magnetic Trip Unit

Push to Trip

Magnetic

Multiples Of In

10

7.5

10

5

1

.5

.3

.2

.1

.05

.03

.02

.01

.005

.003

.002

.001

1 HOUR

1 MINUTE

1000

200

600

900

700

500

300

200

100

80

60

90

70

50

40

30

20

10

8

6

9

7

5

4

3

2

1

Interrupting Rating

Determines End of Curve

Current in Percent of Breaker Trip Unit Rating (In)

Interrupting Rating

UL/CSA rms Sym. kA, 50/60 Hz  kA, DC

Breaker Type 240V  480V  600V  250V

N  65  35  25  10

H  100  65  35  20

IEC 60947-2 rms Sym. kA, 50/60 Hz       kA, DC

Breaker Type 240V  (Ue)  415V  (Ue)  690V  (Ue)  250V  (Ue)

N  65  17  40  10  10  10  3

H  100  25  65  17  65  17  20  5

Notes:


Data subject to change without notice.
Molded-Case Circuit Breakers

UBW Time Current Curves

600L

Circuit Breaker Time/Current Curves

For application and coordination purposes only. Thermal calibration based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (75°C) per terminal. Tested in open air with current in all poles. Instantaneous calibration based on single-pole tests.

Maximum Voltage: 600V, AC (50/60 Hz) 250V, DC

Breaker Rating
Rated Instantaneous Trip Amperes
Amperes (Ib) (See Figure Below)

UL/CSA rms kA, 50/60 Hz kA, DC
Breaker Type 240V 480V 600V 250V

Utilization Category A
UIMP = 8 kV

Notes: For additional information on the trip unit, see IL 29C606.

1 Single pole data at 25°C based on NEMA Procedures (AB 4) for verifying performance of molded case circuit breakers.

Maximum Instantaneous Trip Time

Minimum Instantaneous Trip Time

Maximum Single Pole Trip Times at 25°C

Individual Pole Adjustments

Adjustable Magnetic Trip

Maximum Interrupting Time

Interrupting Rating

Determines End of Curve

Maximum Voltage:
600V , AC (50/60 Hz) 250V , DC
Maximum Interrupting Time

Interrupting Rating

Utilization Category A

U_{\text{LBP}} = 8 \text{ kV}

Notes:

For additional information on the trip unit, see IL 29C607.

Single pole data at 25°C based on NEMA Procedures (AB 4) for verifying performance of molded case circuit breakers.

Circuit Breaker Time/Current Curves

For application and coordination purposes only. Thermal calibration based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (75°C) per terminal. Tested in open air with current in all poles. Instantaneous calibration based on single-pole tests.

Maximum Voltage: 600V, AC (50/60 Hz) 250V, DC

Breaker Rating

Rated Instantaneous Trip Amperes

Amperes (I_i)

(See Figure Below)

400 to 800% of trip unit rating (DC values are approximately 40% higher)

Interrupting Rating

Breaker Type UL/CSA rms Sym. kA, 50/60 Hz kA, DC

240V 480V 600V 250V

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>I_{\text{cu}}</th>
<th>I_{\text{cs}}</th>
<th>I_{\text{cu}}</th>
<th>I_{\text{cs}}</th>
<th>I_{\text{cu}}</th>
<th>I_{\text{cs}}</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>100</td>
<td>65</td>
<td>35</td>
<td>25</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>I</td>
<td>150</td>
<td>100</td>
<td>70</td>
<td>50</td>
<td>20</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>200</td>
<td>150</td>
<td>100</td>
<td>50</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>250</td>
<td>200</td>
<td>150</td>
<td>70</td>
<td>30</td>
<td>20</td>
</tr>
</tbody>
</table>

Notes:

For additional information on the trip unit, see IL 29C607.

Single pole data at 25°C based on NEMA Procedures (AB 4) for verifying performance of molded case circuit breakers.

Adjustable Magnetic Trip

Individual Pole Adjustments

Maximum Intermittent Time

Interrupting Rating Determines End of Curve

Maximum Single Pole Trip Times at 25°C

100 - 800

400 to 800% of trip unit rating (DC values are approximately 40% higher)

Thermal Calibration

Based on 40°C ambient, cold start.

<table>
<thead>
<tr>
<th>Current in Percent of Breaker Trip Unit Rating (In)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
</tr>
<tr>
<td>80</td>
</tr>
<tr>
<td>50</td>
</tr>
<tr>
<td>30</td>
</tr>
<tr>
<td>20</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>0.5</td>
</tr>
<tr>
<td>0.3</td>
</tr>
<tr>
<td>0.2</td>
</tr>
<tr>
<td>0.1</td>
</tr>
<tr>
<td>0.05</td>
</tr>
<tr>
<td>0.03</td>
</tr>
<tr>
<td>0.02</td>
</tr>
<tr>
<td>0.01</td>
</tr>
<tr>
<td>0.005</td>
</tr>
<tr>
<td>0.003</td>
</tr>
<tr>
<td>0.002</td>
</tr>
<tr>
<td>0.001</td>
</tr>
<tr>
<td>0.0005</td>
</tr>
</tbody>
</table>

Maximum Voltage: 240V 380V 415V 250V

Breaker Type

Utilization Category A

U_{\text{LBP}} = 8 \text{ kV}

Notes:

For additional information on the trip unit, see IL 29C607.

Single pole data at 25°C based on NEMA Procedures (AB 4) for verifying performance of molded case circuit breakers.
**Molded-Case Circuit Breakers**

**Data subject to change without notice.**

---

**UBW Time Current Curves**

**1200S, H, L**

**Notes:**

1. Curve accuracy applies from –20°C to +55°C ambient. For possible continuous ampere derating for ambient above 40°C, refer to Eaton. Temperatures above +85°C cause an overtemperature protection trip.

2. Application frequency is 50/60 Hz.

3. There is a memory effect that can act to shorten the Long Delay. If the breaker trips on a Long Delay overload and is quickly reset, the memory capacitor will still have charge and a subsequent overload will cause the breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately five minutes is required between overloads to completely reset memory.

4. The right portion of the curve is determined by the interrupting rating of the circuit breaker.

5. The left portion of the curve is shown as a multiple of the Long Delay Setting (Long Delay Pickup = 115% of Ir). Range is 110–120%.

6. Total clearing times shown include the response times of the trip unit, the breaker opening, and the interruption of the current.

7. The Short Delay Pickup has nine settings/positions, 2–8; the last two switch positions are the same: 9X.

8. Short Delay I^2T band has a tolerance of +15%.

9. Breakpoint back to FLAT response occurs @ 8x Ir for upper line of the I^2T curve.

10. For high fault current levels, an additional fixed instantaneous hardware override is provided to trip the breaker at 14400A. Instantaneous tolerance is ±15%. For the 1600A frame only, if Ir is set to the maximum (position H) and SDPU is set to the maximum (position 9), then the SDPU setting and the Instantaneous Override are set to the same value. The Instantaneous Override has precedence over SDPU. Therefore, the breaker will trip on Instantaneous Override.

11. Maximum clearing time when using zone selective interlocking is 62ms.
Available Short Delay Pickup Settings
2–8; 9 x I \text{L} = 5% (See Note 7)

Available Short Delay
Pickup Settings
2–8; 9 x I \text{L} = 5% (See Note 7)

Notes:
1. Curve accuracy applies from -20°C to +65°C ambient. For possible continuous amperage derating for
ambient above 40°C refer to WEG. Temperatures above +85°C cause an overtemperature protection
trip.
2. Application frequency is 50/60 Hz.
3. There is a memory effect that can act to shorten the Long Delay. If the breaker trips on a Long Delay
overload and is quickly reset, the memory capacitor will still have charge and a subsequent overload
will cause the breaker to trip in a shorter time than normal. The amount of time delay reduction is
inverse to the amount of time that has elapsed since the previous overload. Approximately five
minutes is required between overloads to completely reset memory.
4. The right portion of the curve is determined by the interrupting rating of the circuit breaker.
5. The left portion of the curve is shown as a multiple of the Long Delay Setting.
(Long Delay Pickup = 115% of \(I \text{L}\). Range is 110–120%)
6. Total clearing times shown include the response times of the trip unit, the breaker opening,
and the interruption of the current.
7. The Short Delay Pickup has nine settings (positions 2–8); the last two switch positions are
the same: 9%
8. For high fault current levels, an additional fixed instantaneous hardware override is provided to trip
the breaker at 14400A. Instantaneous tolerance is \(+/- 20\%\). For the 1600A frame only, if \(I \text{L}\) is set to
the maximum (position H) and SDPU is set to the maximum (position 9), then the SDPU setting and
the Instantaneous Override are set to the same value. The Instantaneous Override has precedence
over SDPU. Therefore, the breaker will trip on Instantaneous Override.
9. Maximum clearing time when using zone selective interlocking is 62ms.
**UBW Time Current Curves**

**2500H/L**

**Maintenance Mode/Instantaneous Setting**

Triplet Type: 38 (ALSII), 39 (ALSIG)

**ALSII (With Maintenance Mode)**

**Notes:**

1. The maintenance mode feature must be ENABLED for these curves to apply. The LED indicator is blue when in maintenance mode.
2. The end of the curve is determined by the interrupting rating of the circuit breaker.
3. Total clearing times shown include the response times of the trip unit, the breaker opening, and the interruption of the current.
4. Available pickup settings (x IR) (tolerance is ±15%) 2.5, 4, 6, 7, 8, 10.
5. The Maintenance Mode consists of the two lowest settings of the INST switch: 2.5x and 4.0x.
6. The Remote Maintenance Mode is enabled by applying 24 VDC to the two wire cable that exists the left side of the breaker. The wires are color coded as follows: Yellow = +24 V and Black = common ground. A blue colored LED, on the left side of the breaker is the Maintenance Mode section of the trip unit, will light. The lighted blue LED indicates that the lowest setting of the Maintenance Mode is enabled. This setting corresponds to 2.5x of IR. Turning the contact switch on the trip unit has no affect on either the Maintenance Mode or the INST Mode settings while the blue LED is lit. In addition to the blue colored LED, a relay contact (C, NO) is available. The wires for this contact exit the left hand side of the breaker and are color coded as follows: Blue = C, and Red = NO.

**Relay Wiring**

**Left Side of Breaker**

- Yellow: 24 Vdc
- Black: common ground
- Blue: C
- Red: NO

**Application**

Determines End of Curve

**UBW Time Current Curves**

**2500H/L**

**Maintenance Mode Trip**

**Instantaneous Mode Trip**

**Current in Multiples of Ratings (IR)**

**Time in Seconds**

**Last Instantaneous Value**

- 800A: 16x
- 1200A/1250A: 12x
- 1600A: 9x

**Activities:**

- Push to Trip
- Remote MM

**Notes:**

- The maintenance mode feature must be ENABLED for these curves to apply. The LED indicator is blue when in maintenance mode.
- The end of the curve is determined by the interrupting rating of the circuit breaker.
- Total clearing times shown include the response times of the trip unit, the breaker opening, and the interruption of the current.
- Available pickup settings (x IR) (tolerance is ±15%) 2.5, 4, 6, 7, 8, 10.
- The Maintenance Mode consists of the two lowest settings of the INST switch: 2.5x and 4.0x.
- The Remote Maintenance Mode is enabled by applying 24 VDC to the two wire cable that exists the left side of the breaker. The wires are color coded as follows: Yellow = +24 V and Black = common ground. A blue colored LED, on the left side of the breaker is the Maintenance Mode section of the trip unit, will light. The lighted blue LED indicates that the lowest setting of the Maintenance Mode is enabled. This setting corresponds to 2.5x of IR. Turning the adjustable switch on the trip unit has no affect on either the Maintenance Mode or the INST Mode settings while the blue LED is lit. In addition to the blue colored LED, a relay contact (C, NO) is available. The wires for this contact exit the left hand side of the breaker and are color coded as follows: Blue = C, and Red = NO.
UBW Time Current Curves
2500H, L

Max. Total Clearing Time

Available Short Delay Pickup Settings
Iₒ / Iₒ x 1 x 5%
(See Note 7)

Available Long Delay Time
2, 4, 6, 10, 12, 15, 20, 24 sec
Shown @ 6 x Iₒ ± 0%/–30%

Max. Total Clearing Time

Available Sensors
Rated Amps
1600A 2000A 2500A
1 1600A 1000A 1600A
2 1600A 1200A 1700A
3 1800A 1400A 1800A
4 1900A 1600A 2000A
5 2000A 1700A 2100A
6 2000A 1800A 2200A
7 2000A 1900A 2300A
8 2000A 2000A 2400A
9 2000A 2100A 2500A

Notes:
1. Curve accuracy applies from –20°C to +55°C ambient. For possible continuous amperage derating for
ambient above 40°C, refer to WEG. Temperatures above +55°C cause an over-temperature protection trip.
2. Application frequency is 50/60 Hz.
3. There is a memory effect that can act to shorten the long delay. If the breaker trips on a long delay
overload and is quickly reset, the memory capacitor will still have charge, and a subsequent overload
will cause the breaker to trip in a shorter time than normal. The amount of time delay reduction is
inverse to the amount of time that has elapsed since the previous overload. Approximately five
minutes is required between overloads to completely reset memory.
4. The right portion of the curve is determined by the interrupting rating of the circuit breaker.
5. The left portion of the curve is shown as a multiple of the Long Delay Setting.
6. Total clearing times shown include the response times of the trip unit, the breaker opening, and the interruption of the current.
7. The short delay pickup has nine settings/positions; 1600A/2000A - 2, 3, 4, 5, 6, 7, 8, 9, 10
2500A - 2, 3, 4, 5, 6, 6
8. For high fault current levels, an additional fixed instantaneous hardware override is provided to trip the breaker at 17500A. Instantaneous tolerance is ±20%.
9. Maximum clearing time when using zone selective interlocking is 62ms.

Adjustable Flat Trip Style (LSI, LSIG, ALSI, ALSIG)
UBW Time Current Curves
2500H, L

Current in Multiples of (I) / TIME IN SECONDS
1 HOUR 2 HOURS 1 MINUTE

Available Long Delay Time
2, 4, 7, 10, 12, 15, 20, 24 sec
Shown at 6 x Ir, –10% / –20%

Maximum Total Clearing Time

Minimum Total Clearing Time

Current in Multiples of (Ir)

Available Short Delay Pickup Settings
2–8, 9 x Ir ± 5%
(See Notes 7 and 10)

ρT Short Delay
(See Note 9)

67 ms

ρT Trip Style (LS, LSG)

Notes:
1. Curve accuracy applies from –20°C to +55°C ambient. For possible continuous ampere derating for
ambient above 40°C, refer to WEG. Temperatures above +89°C cause an overtemperature protection
trip.
2. Application frequency is 50/60 Hz.
3. There is a memory effect that can act to shorten the long delay. If the breaker trips on a long delay
overload and is quickly reset, the memory capacitor will still have charge, and a subsequent overload
will cause the breaker to trip in a shorter time than normal. The amount of time delay reduction is
inverse to the amount of time that has elapsed since the previous overload. Approximately five
minutes is required between overloads to completely reset memory.
4. The right portion of the curve is determined by the interrupting rating of the circuit breaker.
5. The left portion of the curve is shown as a multiple of the Long Delay Setting.
6. Total clearing times shown include the response times of the trip unit, the breaker opening,
and the interruption of the current.
7. The short delay pickup has nine settings/positions; 1600A/2000A - 2, 3, 4, 5, 6, 7, 8, 8, 9
2500A - 2, 2, 2, 3, 4, 5, 6, 6
8. For high fault current levels, an additional fixed instantaneous hardware override is provided to trip the
breaker at 11500A, instantaneous tolerance is ±20%.
9. Short delay ρT band has a tolerance of ±15%.
10. Breakpoint back to FLAT response occurs at 8 x Ir for upper line of the ρT curve.
11. Maximum clearing time when using zone selective interlocking is 62ms.
Notes:
1. The Maintenance Mode feature must be ENABLED for these curves to apply. The LED indicator is blue when in Maintenance Mode.
2. The end of the curve is determined by the interrupting rating of the circuit breaker.
3. Total clearing times shown include the response times of the trip unit, the breaker opening, and the interruption of the current.
4. Available pickup settings (xIn) (tolerance is ±15%) 1600A Frame: 2.5, 4, 6, 7, 8, 9
   2000A Frame: 2.5, 4, 6, 7, 8, 9
5. These curves are comprehensive for the complete family of Series G R-Frame electronic breakers, including all frame sizes, ratings, and constructions. The total clearing times shown are conservative and consider the maximum response times of the trip unit, the circuit breaker opening, and the interruption of the current in worst case conditions such as: maximum rated voltages, single-phase interruption, and minimum power factor. Faster clearing times are possible depending on the specific system conditions.

Figure 5. Maintenance Mode/Instantaneous Setting 1600A/2000A (ALSI, ALSIG) - Curve Number TC01210024E, September 2015

Notes:
1. The Maintenance Mode feature must be ENABLED for these Series 2500 Frame Trip Unit Nameplates

ALSI (With Maintenance Mode)

<table>
<thead>
<tr>
<th>Status</th>
<th>Test / Alarm</th>
<th>Cause of Trip</th>
<th>Removal Time (ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engaged</td>
<td>Remove</td>
<td>Short</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Short</td>
<td>300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Short</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Short</td>
<td>2.5</td>
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<tr>
<td></td>
<td></td>
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<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Short</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Short</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Short</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Short</td>
<td>9</td>
</tr>
</tbody>
</table>

Remote MM

NP 6635C07 H24

*I600A/2000A Faceplates shown, 2500A Faceplates may differ
Time Current Curves
225, 250, 400, 600

Available Short Circuit Current, kA rms

Peak Let-Through I^2t, A^2 sec

Peak Let-Through I^2t Curve — 240 V

Peak Let-Through Current Curve — 240 V

Peak Let-Through Current, kA

Available Short Circuit Current, kA rms

Data subject to change without notice.
Available Short Circuit Current, kA rms

Peak Let-Through I^2t, A^2 sec

Peak Let-Through I^2t — 600 V

Peak Let-Through Current — 600 V

Data subject to change without notice.
Available Short Circuit Current, kA rms

Peak Let-Through I²t Curve — 480V

Peak Let-Through Current — 480 V
# UBW Dimensions

(Outside)

Frames 225, 250, 400, 600, 800, 1200, 2500

<table>
<thead>
<tr>
<th>Frame Size</th>
<th>Overall Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>Inches/mm</td>
</tr>
<tr>
<td>225</td>
<td>6/152</td>
</tr>
<tr>
<td>250</td>
<td>10/254</td>
</tr>
<tr>
<td>400</td>
<td>10.12/257</td>
</tr>
<tr>
<td>600</td>
<td>10.75/273.05</td>
</tr>
<tr>
<td>800</td>
<td>16/406.4</td>
</tr>
<tr>
<td>1200</td>
<td>16/406.4</td>
</tr>
<tr>
<td>2500</td>
<td>16/406.4</td>
</tr>
</tbody>
</table>
### Mounting Hardware and Mounting Holes Dimensions

<table>
<thead>
<tr>
<th>Frame</th>
<th>Qty</th>
<th>Std Bolt Size</th>
<th>Metric Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>225</td>
<td>4</td>
<td>5/32-32</td>
<td>M4x0.70</td>
</tr>
<tr>
<td>250</td>
<td>4</td>
<td>1/4-20</td>
<td>M6-1.0</td>
</tr>
<tr>
<td>400</td>
<td>4</td>
<td>1/4-20</td>
<td>M6-1.0</td>
</tr>
<tr>
<td>600</td>
<td>4</td>
<td>1/4-20</td>
<td>M6-1.0</td>
</tr>
<tr>
<td>800</td>
<td>4</td>
<td>1/4-20</td>
<td>M6-1.0</td>
</tr>
<tr>
<td>1200*</td>
<td>4</td>
<td>5/16-18</td>
<td>M8-1.25</td>
</tr>
<tr>
<td>2500^</td>
<td>4</td>
<td>3/8-16</td>
<td>M11-1.50</td>
</tr>
</tbody>
</table>

^ Supplied with Breaker

### Dimensions

<table>
<thead>
<tr>
<th>Frame</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>225</td>
<td>1.375(39.3)</td>
</tr>
<tr>
<td>250</td>
<td>1.375 (39.37)</td>
</tr>
<tr>
<td>400</td>
<td>1.71(43.66)</td>
</tr>
<tr>
<td>600</td>
<td>8.75(222.25)</td>
</tr>
<tr>
<td>800 (MDL)</td>
<td>2.75(69.85)</td>
</tr>
<tr>
<td>1200</td>
<td>2.75(69.85)</td>
</tr>
<tr>
<td>2500</td>
<td>14.50(368.30)</td>
</tr>
<tr>
<td>Rotary Handle Mechanism Kit</td>
<td>Mounting Hardware Provided</td>
</tr>
<tr>
<td>----------------------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>UBW 225</td>
<td>(2)8-32 x 1.5 screw, (2)8-32 x 3.5 screw, (4) .164 lock washer, (2) .164 flat washer</td>
</tr>
<tr>
<td>UBW 250</td>
<td>(2)1/4-20 x 2.75 screw, (2)1/4-20 x 4.5 screw, (2)10-32 x 3.375 screw, (4) .250 lock washer, (2) .250 flat washer, (2) 190 lock washer, (2) #10 flat washer</td>
</tr>
<tr>
<td>UBW 400</td>
<td>(2)1/4-20 x 1.5 screw, (2)1/4-20 x 4.5 screw, (2)10-32 x 3.375 screw, (4) .250 lock washer, (2) .250 flat washer, (2) 190 lock washer, (2) #10 flat washer</td>
</tr>
<tr>
<td>UBW 600/800</td>
<td>($) 8-32 x 2.125 screw, (4) 1/4-20 x 20 screw, (2)8-32 x 2.50 screw, (4) .250 lock washer, ($) .250 flat washer, (4) .164 lock washer</td>
</tr>
</tbody>
</table>