Time current curves Power Defense MCCB
Frame 6 PXR electronic trip units
Standards: UL, CSA, IEC, CCC

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### Table 1. Revision notes

**Note:** Unless noted below, all curves remain unchanged from their prior revision.

<table>
<thead>
<tr>
<th>Revision</th>
<th>Curve number</th>
<th>Page</th>
<th>Date</th>
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<tr>
<td>1</td>
<td>Power Defense frame 6 initial release</td>
<td></td>
<td>12/14/2018</td>
</tr>
<tr>
<td>2</td>
<td>Edits to curve notes</td>
<td></td>
<td>2/6/2019</td>
</tr>
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</table>
Table 2. Breaker catalog number convention

Note: 1 See catalog for ## (protection type and available configured options).

Table 3. Electronic trip unit catalog number convention

Note: IEC standard breakers include the CE mark; GB standard breakers include the CCC mark.
This information is provided only as an aid to understand the catalog numbers.
It is not to be used to build catalog numbers for circuit breakers or trip units as all combinations may not be available.
### Table 4. Symmetrical RMS interruption ratings $I_{cu}$ (kA) for each breaker frame

<table>
<thead>
<tr>
<th>Voltage</th>
<th>UL / CSA</th>
<th>IEC / CCC</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>240V</td>
<td>480V</td>
</tr>
<tr>
<td>GLOBALLY RATED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PDG6xM</td>
<td>125</td>
<td>65</td>
</tr>
<tr>
<td>PDG6xN</td>
<td>150</td>
<td>85</td>
</tr>
<tr>
<td>PDG6xP</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

**GLOBALLY RATED (UL 100%)**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>UL / CSA</th>
<th>IEC / CCC</th>
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<tbody>
<tr>
<td></td>
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<td>85</td>
</tr>
<tr>
<td>PDF6xP**</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

**1600A and 2000A frames only.**

### Table 5. Curve notes

1. These curves apply for 50Hz and 60Hz applications.
2. The maximum voltage rating for the frame style is stated in Table 4.
3. These curves are comprehensive for Power Defense style circuit breakers including frame sizes, ratings and constructions stated.
4. The total clearing times shown include the response time for the trip unit, the breaker opening and the interruption of the current. The bottom of the time band is the minimum commit to trip time.
5. The end of the curve is determined by the application or the interrupting rating of the circuit breaker.
6. All electronic trip units have an over temperature protection feature that will trip the breaker when the internal temperature of the ETU is over 105°C.

### Labels

- **Figure 1. Power Defense frame 6 trip unit front labels.**
  - **Note:** Trip unit drawings in Figure 1 are representative of the face plates provided. Values on the trip unit dials will change based upon the specific breaker and trip unit. Refer to the time current curve of the breaker or the PXR User Guide for the specific settings.
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Curves

Figure 2. 1600A/2000A frame PXR 20D / PXR 25 - I^t long delay and flat short delay.
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Figure 3. 2500A frame PXR 20D / PXR 25 - I²t Long Delay and Flat Short Delay Curves
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Frame 6 PXR electronic trip units

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---

**Figure 4. 1600A/2000A frame PXR 20 - I²t Long Delay and Flat Short Delay Curves**

**PD6 1600A/2000A**

**PXR 20 - I²t Long Delay and Flat Short Delay Curves**

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**Notes:**

1. Long Delay pickup is 110% of the Ir setting with ±5% tolerance.
2. Long Delay Time Settings as shown have ±0%/-30% tolerance.
3. If Thermal Memory is enabled, trip times may be shorter than indicated in this curve.
4. Short Delay pickup settings as shown have ±5% tolerance.
5. Short Time delay slopes are shown with tolerance.
6. If the Long Delay time is projected to be faster than the Short Delay time, the Long Delay trip time will go no faster than the Short Delay time value.
7. With ZSI enabled and no auxiliary power, tripping times for 3-phase faults will be a maximum of 60ms for 60Hz and 63ms for 50Hz.
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**Technical Data**

**TD012068EN**

**Effective February 2019**

**Time current curves Power Defense MCCB**

**PD6 2500A**

**PXR 20 - I 2t Long Delay and Flat Short Delay Curves**

<table>
<thead>
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<th>Ir setting</th>
<th>PDG 2500A</th>
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<td>1700A</td>
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<td>1800A</td>
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<td>2000A</td>
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<td>2100A</td>
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<td>2200A</td>
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<td>9</td>
<td>2400A</td>
</tr>
<tr>
<td>10</td>
<td>2500A</td>
</tr>
</tbody>
</table>

**Notes:**

1. Long Delay pickup is 110% of the Ir setting with ±5% tolerance.
2. Long Delay Time Settings as shown have +0% / -30% tolerance.
3. If Thermal Memory is enabled, trip times may be shorter than indicated in this curve.
4. Short Delay pickup settings as shown have ±5% tolerance.
5. Short Time delay slopes are shown with tolerance.
6. If the Long Delay time is projected to be faster than the Short Delay time, the Long Delay trip time will go no faster than the Short Delay time value.
7. With ZSI enabled and no auxiliary power, tripping times for 3-phase faults will be a maximum of 60ms for 60Hz and 63ms for 50Hz.

**Figure 5. 2500A frame PXR 20 - I 2t long delay and flat short delay.**

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Figure 6. 1600A/2000A frame PXR 20D / PXR 25 - I²t Long Delay and I²t Short Delay Curves

Notes:
1. Long Delay pickup is 110% of the Ir setting with ±5% tolerance. It is set from Min to Max at steps of 10A.
2. Long Delay Time Settings adjustable from 0.5s - 24s at steps of 0.1s with +0%/-30% tolerance.
3. If Thermal Memory is enabled, trip times may be shorter than indicated in this curve.
4. Short Delay pickup settings adjustable from 1.5x to 9x at steps of 0.1x with ±5% tolerance.
5. Short delay time settings adjustable from 0.067s - 0.300s at steps of 0.010s with tolerances as follows:
   - I²t time delay slope settings from 0.3 to 0.100s have a tolerance of ±30%
   - Slope settings below 0.100s to 0.067s have a +0/-40% tolerance after 8x time delay.
   - Time delay settings greater than 0.200s have tolerances of +0/-30%, time delay settings between 0.200s and 0.100s have tolerances of +0/-40%, and time delay settings below 0.100s to 0.067s have tolerances of +0/-50%.
6. If the Long Delay time is projected to be faster than the Short Delay time, the Long Delay trip time will go no faster than the Short Delay time value.
7. With ZSI enabled and no auxiliary power, tripping times for 3-phase faults will be a maximum of 60ms for 60Hz and 63ms for 50Hz.
Figure 7. 2500A frame PXR 20D / PXR 25 - $I_t$ long delay and $I_t$ short delay.
Figure 8. 1600A/2000A frame PXR 20 I²t long delay and I²t short delay.

PD6 1600A/2000A PXR 20 - I²t Long Delay and I²t Short Delay Curves

Notes:
1. Long Delay pickup is 110% of the Ir setting with ±5% tolerance.
2. Long Delay Time Settings as shown have ±0% / ±30% tolerance.
3. If Thermal Memory is enabled, trip times may be shorter than indicated in this curve.
4. Short Delay pickup settings as shown have ±5% tolerance.
5. Short Time delay I²t slopes and flat times are shown with tolerances.
6. If the Long Delay time is projected to be faster than the Short Delay time, the Long Delay trip time will go no faster than the Short Delay time value.
7. With ZSI enabled and no auxiliary power, tripping times for 3-phase faults will be a maximum of 60ms for 60Hz and 63ms for 50Hz.
Figure 9. 2500A frame PXR 20 I²t long delay and I²t short delay.
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Figure 10. 1600A/2000A frame PXR 20D / PXR 25 - I^4t Long Delay and Flat Short Delay Curves

Notes:
1. Long Delay pickup is 110% of the Ir setting with ±5% tolerance. Ir is set from Min to Max at steps of 10A
2. Long Delay Time Settings adjustable from 0.5s - 7s at steps of 0.1s with ±0% - 30% tolerance.
3. If Thermal Memory is enabled, trip times may be shorter than indicated in this curve.
4. Short Delay pickup settings adjustable from 1.5x - 9x at steps of 0.1x with ±5% tolerance.
5. Short delay time settings adjustable from 0.50s - 0.500s at steps of 0.01s with tolerances as follows: time delay settings greater than 0.20s have tolerances of ±0/30%, time delay settings between 0.200s and 0.100s have tolerances of ±0/40%, and time delay settings below 0.100s to 0.050s have tolerances of ±0/50%.
6. If the Long Delay time is projected to be faster than the Short Delay time, the Long Delay trip time will go no faster than the Short Delay time value.
7. With ZSI enabled and no auxiliary power, tripping times for 3-phase faults will be a maximum of 60ms for 60Hz and 63ms for 50Hz.

Current in Multiples of Long Delay Pickup (I_r)

Time in Seconds

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Style: Frame 6
Configuration: 3 and 4 Poles
Trip Unit Type: Power Xpert Release - PXR20D / PXR25
Curve: Long I4t Delay and Short Flat Delay

Ir setting
Min. 1600A
Max. 2500A

Notes:
1. Long Delay pickup is 110% of the Ir setting with ±5% tolerance. Ir is set from Min to Max at steps of 10A at steps of 0.1s with +0/-30% tolerance.
2. If Thermal Memory is enabled, trip times may be shorter than indicated in this curve.
3. Short Delay pickup settings adjustable from 1.5x - 6x at steps of 0.1x with ±5% tolerance.
4. Short delay time settings adjustable from 0.050s – 0.500s at steps of 0.010s with tolerances as follows: time delay settings greater than 0.200s have tolerances of +0/-30%, time delay settings between 0.200s and 0.100s have tolerances of +0/-40%, and time delay settings below 0.100s to 0.050s have tolerances of +0/-50%.
5. If the Long Delay time is projected to be faster than the Short Delay time, the Long Delay trip time will go no faster than the Short Delay time value.
6. With ZSI enabled and no auxiliary power, tripping times for 3-phase faults will be a maximum of 60ms for 60Hz and 63ms for 50Hz.
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Figure 12. PXR 20D / PXR 25 ground (earth) flat delay.
Figure 13. PXR 20D / PXR 25 - ground (earth) I^2T delay.

**Notes:**
1. Ground Pickup settings adjustable from 0.2x - 1.0x at steps of 0.01x are for Residual sensing with a tolerance of ±10%.
2. Ground I^2T delay time settings adjustable from 0.067s – 0.300s at steps of 0.010s with tolerances as follows: I^2T slope tolerances are +0/-30%, flat time delay settings after 1.0x Ie for settings of 0.300s to 0.200s have tolerances of +0/-30%, time delay settings between 0.200s to 0.100s have tolerances of +0/-40% and time delay settings below 0.100s to 0.067s have tolerances of +0/-50%.
3. If Thermal Memory is enabled, trip times may be shorter than indicated in this curve.
4. With ZSI enabled and no auxiliary power, tripping times for 3-phase faults will be a maximum of 60ms for 60Hz and 63ms for 50Hz.
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Figure 14. PXR 20 - ground (Earth) flat delay.

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Notes:
1. Ground pickup settings as shown are for residual sensing with a tolerance of ± 10%.
2. Ground slope flat time setting are shown with tolerances.
3. If Thermal Memory is enabled, trip times may be shorter than indicated in this curve.
4. With ZSI enabled and no auxiliary power, tripping times for 3-phase faults will be a maximum of 60ms for 60Hz and 63ms for 50Hz.
Figure 15. PXR 20 - ground (earth) I^2t delay.
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Figure 16. 1600A frame PXR 20D / PXR 25 - instantaneous and override.
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Figure 17. 2000A frame PXR 20D / PXR 25 - instantaneous and override.

Notes:
1. The instantaneous pickup settings adjustable from 2x – 8.8x (Max) at steps of 0.10x with a ±10% tolerance.
2. For high fault current levels a fixed instantaneous override is provided at 17500A and has a ±15% tolerance.

Figure 17. 2000A frame PXR 20D / PXR 25 - instantaneous and override.

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Figure 18. 2500A frame PXR 20D / PXR 25 - instantaneous and override. November 2018
Figure 19. 1600A frame PXR 20 - instantaneous and override.
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PXR 20 2000A Frame Instantaneous Curves

Notes:
1. The Instantaneous pickup settings as shown with ±10% tolerance.
2. For high fault current levels a fixed instantaneous override is provided at 17500A and has ±15% tolerance.

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Figure 20. 2000A frame PXR 20 - instantaneous and override.

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PXR 20 2500A Frame Instantaneous Curves

Notes:
1. The Instantaneous pickup settings as shown with a ±10% tolerance.
2. For high fault current levels a fixed instantaneous override is provided at 17500A and has a ±15% tolerance.

Figure 21. 2500A frame PXR 20 - instantaneous and override.

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### PXR 20 / PXR 20D / PXR 25 - Maintenance Mode Curves

- **Time Current Curves**
- **Power Defense Circuit Breakers**
- **Style:** Frame 6
- **Configuration:** 3 and 4 Poles
- **Trip Unit Type:** Power Xpert Release - PXR20 / PXR20D / PXR25
- **Curve:** Maintenance Mode Protection

**Notes:**
1. Reduction Pickup settings have a ±20% tolerance.

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**Figure 22. PXR 20 / PXR 20D / PXR 25 - maintenance mode.**

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