Effective December 2019
Supersedes February 2019

Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

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Figure 49. 45A fixed thermal fixed magnetic.

Figure 50. 50A fixed thermal fixed magnetic.

Figure 51. 60A fixed thermal fixed magnetic.

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Figure 53. 80A fixed thermal fixed magnetic.

Figure 54. 90A fixed thermal fixed magnetic.

Figure 55. 100A fixed thermal fixed magnetic.

Figure 56. 110A fixed thermal fixed magnetic.

Figure 57. 125A fixed thermal fixed magnetic.

Figure 58. 150A fixed thermal fixed magnetic.

Figure 59. 15A fixed thermal fixed magnetic.

Figure 60. 20A fixed thermal fixed magnetic.

Figure 61. 25A fixed thermal fixed magnetic.

Figure 62. 30A fixed thermal fixed magnetic.

Figure 63. 35A fixed thermal fixed magnetic.

Figure 64. 40A fixed thermal fixed magnetic.

Figure 65. 45A fixed thermal fixed magnetic.

Figure 66. 50A fixed thermal fixed magnetic.

Figure 67. 60A fixed thermal fixed magnetic.

Figure 68. 70A fixed thermal fixed magnetic.

Figure 69. 80A fixed thermal fixed magnetic.

Figure 70. 90A fixed thermal fixed magnetic.

Figure 71. 100A fixed thermal fixed magnetic.

Figure 72. 110A fixed thermal fixed magnetic.

Figure 73. 125A fixed thermal fixed magnetic.

Figure 74. 150A fixed thermal fixed magnetic.

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## Technical Data

**TD012064EN**

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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>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td>02/15/2019</td>
</tr>
<tr>
<td>Power Defense frame 2 initial release</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>12/2019</td>
</tr>
<tr>
<td>Short delay time tolerance changes on PXR curves. Updated let through curves.</td>
<td></td>
<td></td>
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</table>
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
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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 2. Circuit breaker catalog number convention

<table>
<thead>
<tr>
<th>Breaker family</th>
<th>PDG2 3 M 0225 P 2 M J</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDG2 = Frame 2 Global UL / CSA / IEC / GB</td>
<td>Interrupting rating designator</td>
</tr>
<tr>
<td>PDF2 = Frame 2 Global-100% UL / CSA / IEC / GB (uses PDG trip units)</td>
<td>Continuous current rating</td>
</tr>
<tr>
<td>PDD2 = Frame 2 IEC / GB</td>
<td>F = 25</td>
</tr>
<tr>
<td>PDC2 = Frame 2 IEC / GB</td>
<td>G = 35</td>
</tr>
<tr>
<td>PDC9 = Frame 9 IEC / GB</td>
<td>K = 50</td>
</tr>
<tr>
<td>Interrupting rating</td>
<td>L = 65</td>
</tr>
<tr>
<td>Continuous current</td>
<td>N = 85</td>
</tr>
<tr>
<td>designator</td>
<td>P = 100</td>
</tr>
<tr>
<td>IA at 415 V (IEC)</td>
<td></td>
</tr>
<tr>
<td>kA at 480 V (UL)</td>
<td></td>
</tr>
<tr>
<td>F = 25</td>
<td></td>
</tr>
<tr>
<td>G = 35</td>
<td></td>
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<td>K = 50</td>
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<td>M = 65</td>
<td></td>
</tr>
<tr>
<td>N = 85</td>
<td></td>
</tr>
<tr>
<td>P = 100</td>
<td></td>
</tr>
<tr>
<td>IA at 415 V (IEC)</td>
<td></td>
</tr>
<tr>
<td>F = 25</td>
<td></td>
</tr>
<tr>
<td>G = 35</td>
<td></td>
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<tr>
<td>K = 50</td>
<td></td>
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<td>L = 65</td>
<td></td>
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<tr>
<td>N = 85</td>
<td></td>
</tr>
<tr>
<td>P = 100</td>
<td></td>
</tr>
<tr>
<td>Features</td>
<td>N = None</td>
</tr>
<tr>
<td>ETU protection style</td>
<td>R = Relays</td>
</tr>
<tr>
<td>ETU trip unit style</td>
<td>Z = ZSI</td>
</tr>
<tr>
<td>Magnetic Protection</td>
<td>M = Modbus</td>
</tr>
<tr>
<td>Thermal magnetic</td>
<td>C = CAM interface</td>
</tr>
<tr>
<td>Thermal</td>
<td>D = Modbus &amp; CAM interface</td>
</tr>
<tr>
<td>Magnetic</td>
<td>W = ZSI &amp; Modbus</td>
</tr>
<tr>
<td>Thermal</td>
<td>X = ZSI &amp; CAM interface</td>
</tr>
<tr>
<td>Magnetic</td>
<td>Y = ZSI, Modbus, &amp; CAM interface</td>
</tr>
<tr>
<td>Magnetic</td>
<td>A = Adjustable magnetic</td>
</tr>
<tr>
<td>Magnetic</td>
<td>F = Fixed magnetic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poles</th>
<th>Terminals included</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = 1 pole</td>
<td>N = No terminals</td>
</tr>
<tr>
<td>2 = 2 pole</td>
<td>J = Line and load terminals</td>
</tr>
<tr>
<td>3 = 3 pole</td>
<td>K = Line only terminals</td>
</tr>
<tr>
<td>4 = 4 pole with 100% neutral protection</td>
<td>L = Load only terminals</td>
</tr>
<tr>
<td>6 = 4 pole with 60% neutral protection</td>
<td></td>
</tr>
<tr>
<td>0 = 4 pole with 0% neutral protection</td>
<td></td>
</tr>
</tbody>
</table>

Note: IEC standard breakers include the CE mark; GB standard breakers include the CCC mark.

ETU trip unit style
B = PXR 10
E = PXR 20
D = PXR 200
P = PXR 25

Thermal magnetic style
T = Thermal
V = Thermal 50° C calibrated

ETU protection style
1 = LI
2 = LSI
3 = LSIG
4 = LSI ARMS
5 = LSIG ARMS
Table 3. Electronic trip unit catalog number convention

<table>
<thead>
<tr>
<th>Style family</th>
<th>PDG2 = Frame 2 Global UL / CE / CSA / CCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trip unit</td>
<td>PXR = Electronic</td>
</tr>
<tr>
<td>Poles</td>
<td>3 = Electronic</td>
</tr>
<tr>
<td></td>
<td>4 = Electronic</td>
</tr>
<tr>
<td>Ampere frame rating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0060 = 60 A frame</td>
</tr>
<tr>
<td></td>
<td>0063 = 63 A frame IEC only</td>
</tr>
<tr>
<td></td>
<td>0100 = 100 A frame</td>
</tr>
<tr>
<td></td>
<td>0150 = 150 A frame</td>
</tr>
<tr>
<td></td>
<td>0160 = 160 A frame IEC only</td>
</tr>
<tr>
<td></td>
<td>0200 = 200 A frame</td>
</tr>
<tr>
<td></td>
<td>0225 = 225 A frame</td>
</tr>
<tr>
<td></td>
<td>0250 = 250 A frame IEC only</td>
</tr>
<tr>
<td>Features</td>
<td></td>
</tr>
<tr>
<td>N = None</td>
<td></td>
</tr>
<tr>
<td>R = Relays</td>
<td></td>
</tr>
<tr>
<td>Z = ZSI</td>
<td></td>
</tr>
<tr>
<td>M = Modbus</td>
<td></td>
</tr>
<tr>
<td>C = CAM interface</td>
<td></td>
</tr>
<tr>
<td>D = Modbus &amp; CAM interface</td>
<td></td>
</tr>
<tr>
<td>W = ZSI &amp; Modbus</td>
<td></td>
</tr>
<tr>
<td>X = ZSI &amp; CAM interface</td>
<td></td>
</tr>
<tr>
<td>Y = ZSI, Modbus, &amp; CAM interface</td>
<td></td>
</tr>
<tr>
<td>ETU trip unit style</td>
<td></td>
</tr>
<tr>
<td>B = PXR 10</td>
<td></td>
</tr>
<tr>
<td>E = PXR 20</td>
<td></td>
</tr>
<tr>
<td>D = PXR 200</td>
<td></td>
</tr>
<tr>
<td>P = PXR 25</td>
<td></td>
</tr>
<tr>
<td>ETU protection style</td>
<td></td>
</tr>
<tr>
<td>1 = LI</td>
<td></td>
</tr>
<tr>
<td>2 = LSI</td>
<td></td>
</tr>
<tr>
<td>3 = LSIG</td>
<td></td>
</tr>
<tr>
<td>4 = LSI ARMS</td>
<td></td>
</tr>
<tr>
<td>5 = LSIG ARMS</td>
<td></td>
</tr>
</tbody>
</table>

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. Thermal magnetic trip unit catalog number convention

<table>
<thead>
<tr>
<th>Style family</th>
<th>PDG2 = Frame 2 Global UL / CE / CSA / CCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trip unit</td>
<td>TFA = Thermal fixed - adjustable magnetic</td>
</tr>
<tr>
<td></td>
<td>TAA = Thermal adjustable - adjustable magnetic</td>
</tr>
<tr>
<td></td>
<td>VFA = Thermal fixed 50% C calibrated- adjustable magnetic</td>
</tr>
<tr>
<td></td>
<td>VAA = Thermal adjustable 50% °C calibrated- adjustable magnetic</td>
</tr>
<tr>
<td>Poles</td>
<td>3 = 3 pole</td>
</tr>
<tr>
<td></td>
<td>4 = 4 pole with 100% neutral protection</td>
</tr>
<tr>
<td></td>
<td>6 = 4 pole with 60% neutral protection</td>
</tr>
<tr>
<td></td>
<td>9 = 4 pole with 0% neutral protection</td>
</tr>
<tr>
<td>Ampere frame rating</td>
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</tr>
<tr>
<td></td>
<td>0015 = 15 A frame</td>
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<tr>
<td></td>
<td>0020 = 20 A frame</td>
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<tr>
<td></td>
<td>0025 = 25 A frame</td>
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<td></td>
<td>0030 = 30 A frame</td>
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<td></td>
<td>0035 = 35 A frame</td>
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<td></td>
<td>0040 = 40 A frame</td>
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<tr>
<td></td>
<td>0045 = 45 A frame</td>
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<td>0050 = 50 A frame</td>
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<td>0060 = 60 A frame</td>
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<tr>
<td></td>
<td>0070 = 70 A frame</td>
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<td></td>
<td>0080 = 80 A frame</td>
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<td></td>
<td>0090 = 90 A frame</td>
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<tr>
<td></td>
<td>0100 = 100 A frame</td>
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<tr>
<td></td>
<td>0110 = 110 A frame</td>
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<tr>
<td></td>
<td>0125 = 125 A frame</td>
</tr>
<tr>
<td></td>
<td>0150 = 150 A frame</td>
</tr>
<tr>
<td></td>
<td>0175 = 175 A frame</td>
</tr>
<tr>
<td></td>
<td>0200 = 200 A frame</td>
</tr>
<tr>
<td></td>
<td>0225 = 225 A frame</td>
</tr>
</tbody>
</table>

Note: IEC standard breakers include the CE mark; GB standard breakers include the CCC mark.
## Table 5. Symmetrical RMS interruption ratings $I_{cu}$ (kA) for each breaker frame

<table>
<thead>
<tr>
<th>Frame</th>
<th>Voltage</th>
<th>UL / CSA</th>
<th>IEC / CCC</th>
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<th>250Vdc*</th>
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<tr>
<td></td>
<td>240V</td>
<td>480V</td>
<td>600V</td>
<td>240V</td>
<td>415V</td>
</tr>
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<td>PDG2xF</td>
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<td>PDG2xG</td>
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<td>85</td>
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<td>22</td>
<td>85</td>
<td>50</td>
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<td>PDG2xM</td>
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<td>25</td>
<td>100</td>
<td>70</td>
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<tr>
<td>PDG2xN</td>
<td>150</td>
<td>85</td>
<td>30/25</td>
<td>150</td>
<td>70</td>
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<tr>
<td>PDG2xP</td>
<td>200</td>
<td>100</td>
<td>35/25</td>
<td>200</td>
<td>100</td>
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<td>PDC2xF</td>
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<td>36</td>
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<tr>
<td>PDC2xK</td>
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<td>PDC2xP</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>200</td>
<td>-</td>
</tr>
</tbody>
</table>

### Table 6. Curve notes

1. These curves apply for 50Hz and 60Hz applications.
2. The maximum voltage rating for the frame style is stated in Table 5.
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. Thermal Magnetic trip unit calibration based on 40°C ambient, cold start. Tested with 4 feet of rated wire (75°C) per terminal. Tested in open air with current in all poles.
7. Thermal Magnetic trip unit instantaneous calibration based on single pole testing.
8. All time current data for PXR is based on 3 phase testing. For ground testing refer to Instruction Leaflet IL012125EN.
**Labels**

PXR 25 and PXR 20 – unit with LSIG protection pictured

PXR 20 – unit with LSIG protection pictured

PXR 10 – unit with LSI protection pictured

Adjustable thermal, adjustable magnetic unit pictured

---

**Figure 1. Power Defense frame 2 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.
Curves

Figure 2. PXR 20D / PXR 25 - I²t long delay and flat short delay curves (200A - 250A Frames).
Figure 3. PXR 20D / PXR 25 - \( t_l \) Long Delay and Flat Short Delay Curves (60A - 160A Frames).
Figure 4. PXR 20 - Pt long delay and flat short delay for 200A - 250A frames.
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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 delay time settings 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, tripping times for 3-phase faults, no auxiliary power will be a maximum of 68ms for 60Hz and 63ms for 50Hz.
Figure 5. PXR 20 - \(I_t\) long delay and flat short delay for 60A - 160A frames.
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Figure 6. PXR 20D / PXR 25 - I^2t Long and I^2t Short Delay Curves for all Frames

Notes:
1. Long delay pickup is 110% of the Ir setting at steps of 1A with ±5% tolerance.
2. Long delay time settings adjustable from 0.5s - 24s at steps of 0.1s with ±5% 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 - 8x at steps of 0.1x with ±5% tolerance.
5. Short delay I^2t slope time settings adjustable from 0.067s to 0.300s at steps of 0.010s with tolerances as follows: I^2t slope time delay settings 0.300s to 0.200s have tolerances of +0/-30%, time delay settings between 0.190s to 0.160s have tolerances of +0/-30%, time delay settings between 0.150s to 0.100s have tolerance of +0/-40%, and time delay settings between 0.090s 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, tripping times for 3-phase faults, no auxiliary power will be a maximum of 60ms for 60Hz and 63ms for 50Hz.
PXR20 - \( i^2 \)t Long Delay and \( i^2 \)t Short Delay Curves

**Notes:**
1. Long delay pickup is 110% of the \( i_r \) setting with ±5% tolerance.
2. Long delay time settings as shown have +0% to -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 delay time settings 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, tripping times for 3-phase faults, no auxiliary power will be a maximum of 60ms for 60Hz and 63ms for 50Hz.

---

Figure 7. PXR 20 \( i^2 \)t long delay and \( i^2 \)t short delay for all frames.
PXR20D / PXR25 - I\(t\) Long Delay and Flat Short Delay Curves

**Technical Data**

**TD012064EN**

Effective December 2019

**Time current curves**

Power Defense MCCB

Frame 2 thermal-magnetic and PXR electronic trip units

Standards: UL, CSA, IEC, CCC

---

**Figure 8. PXR 20D / PXR 25 - I\(t\) long delay and flat short delay for 200A - 250A frames.**

<table>
<thead>
<tr>
<th>Current in Multiples of Long Delay Pickup (I(t))</th>
<th>Time in Seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01</td>
<td>0.1</td>
</tr>
<tr>
<td>0.1</td>
<td>1.0</td>
</tr>
<tr>
<td>1.0</td>
<td>10.0</td>
</tr>
<tr>
<td>10.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Notes:**

1. Long delay pickup is 110% of the Ir setting at steps of 1A with ±5% tolerance.
2. Long delay time settings adjustable from 0.5s - 7s at steps of 0.1s with ±5% 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 - 12.0x at steps of 0.1x with ±5% tolerance.
5. Short delay time settings adjustable from 0.050s - 0.500s at steps of 0.010s with tolerances as follows: time delay settings between 0.050s to 0.200s have tolerances of ±0/-20%, time delay settings between 0.200s to 0.250s have tolerances of ±0/-30%, time delay settings between 0.150s to 0.100s have tolerances of ±0/-40% and time delay settings between 0.090s to 0.050s have tolerances of ±20/-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, tripping times for 3-phase faults, no auxiliary power will be a maximum of 60ms for 60Hz and 63ms for 50Hz.
Figure 9. PXR 25 - \(1^t\) long delay and flat short delay for 60A - 160A frames.

December 2019
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Notes:
1. Ground pickup settings adjustable from 0.2x - 1.0x at steps of 0.010x for residual sensing with a tolerance of ±10%.
2. Ground time delay settings adjustable from 0.100s - 1.00s at steps of 0.010s with tolerances as follows: time delay settings 0.100s to 0.200s have tolerances of ±0.020%, time delay settings between 0.190s to 0.160s have tolerances of ±0.030%, and time delay settings between 0.150s to 0.100s have tolerances of ±0.040%.
3. If thermal memory is enabled, trip times may be shorter than indicated in this curve.
4. With ZSI enabled, tripping times for 3-phase faults, no aux. power will be a maximum of 60ms for 60Hz and 63ms for 50Hz.

Figure 10. PXR 20D / PXR 25 ground (earth) flat delay.
**Time current curves Power Defense MCCB**

Frame 2 thermal-magnetic and PXR electronic trip units

Standards: UL, CSA, IEC, CCC

---

**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 I²t slope time settings are adjustable from 0.067s - 0.300s at steps of 0.010s with tolerances as follows: I²t slope time delay settings 0.300s to 0.200s have tolerances of +0/-30%, time delay settings between 0.190s to 0.160s have tolerances of +0/-40%, and time delay settings between 0.150s to 0.100s have tolerances of +0/-40% and time delay settings between 0.090s to 0.067s have tolerances of +20%/-50%. After approximately 1x the I²t slope will go flat and those times have tolerances as follows: time delay settings 0.300s to 0.200s have tolerances of +0/-20%, time delay settings between 0.190s to 0.160s have tolerances of +0/-30%, and time delay settings between 0.150s to 0.100s have tolerances of +0/-40% and time delay settings between 0.090s to 0.050s have tolerances of +20%/-50%.

3. If thermal memory is enabled, trip times may be shorter than indicated in this curve.

4. With ZSI enabled, tripping times for 3-phase faults, no aux. power will be a maximum of 60ms for 60Hz and 63ms for 50Hz.

---

**Figure 11. PXR 20D / PXR 25 - ground (earth) I²t delay.**

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Figure 12. PXR 20 - ground (earth) flat delay.
Figure 13. PXR 20 - ground (earth) $I^2T$ delay.
- Time current curves Power Defense MCCB
- Frame 2 thermal-magnetic and PXR electronic trip units
- Standards: UL, CSA, IEC, CCC

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Figure 14. PXR 20D / PXR 25 - instantaneous and override for 60A frame.

**Technical Data TD012064EN**

**Effective December 2019**
Time current curves Power Defense circuit breakers

- Style: Frame 2
- Configuration: 3 and 4-poles
- Trip unit type: Power Xpert Release-PXR
- Frame: PDG2

Notes:
1. The instantaneous pickup settings adjustable from 2x – 11x (max) at steps of 0.10x with a ±10% tolerance.
2. For high fault current levels, a fixed instantaneous override is provided at 1100A and has a ±15% tolerance.

Figure 15. PXR 20D / PXR 25 - instantaneous and override for 100A frame.
Figure 16. PXR 20D / PXR 25 - instantaneous and override for 150A frame.

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 2100A and has a ±15% tolerance.
PXR 20D / PXR 25 - 225A Frame Instantaneous Curves

- **Time current curves**
- **Power Defense circuit breakers**
- **Style**: Frame 2
- **Configuration**: 3 and 4-poles
- **Trip unit type**: Power Xpert Release
- **Frame**: PDG2

**Notes:**
1. The instantaneous pickup settings adjustable from 2x – 9.3x(Max) at steps of 0.10x with a ±10% tolerance.
2. For high fault current levels a fixed instantaneous override is provided at 2100A and has a ±15% tolerance.

---

Figure 17. PXR 20D / PXR 25 - instantaneous and override for 225A frame.

---
Figure 18. PXR 20D / PXR 25 - Instantaneous and override for 63A frame.
**Figure 19. PXR 20D / PXR 25 - instantaneous and override for 100A frame.**

**F.A.T-N**

- **Time current curves**
- **Power Defense circuit breakers**
- **Style:** Frame 2
- **Configuration:** 3 and 4-poles
- **Trip unit type:** Power Xpert Release
- **Frame:** PDC2

**Notes:**
1. The instantaneous pickup settings adjustable from 2x – 11×(Max) at steps of 0.10x with a ±10% tolerance.
2. For high fault current levels, a fixed instantaneous override is provided at 1100A and has a ±15% tolerance.
Figure 20. PXR 20D / PXR 25 - instantaneous and override for 160A frame.
Figure 21. PXR 20D / PXR 25 - instantaneous and override for 200A frame.

Notes:
1. The instantaneous pickup settings adjustable from 2x – 10.5x(Max) at steps of 0.10x with a ±10% tolerance.
2. For high fault current levels a fixed instantaneous override is provided at 2100A and has a ±15% tolerance.
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Figure 22. PXR 20D / PXR 25 - instantaneous and override for 250A frame.

Notes:
1. The instantaneous pickup settings adjustable from 2x – 8.4x(Max) at steps of 0.10x with ±10% tolerance.
2. For high fault current levels a fixed instantaneous override is provided at 2100A and has ±15% tolerance.
Time current curves Power Defense circuit breakers

Style: Frame 2
Configuration: 3 and 4-poles
Trip unit type: Power Xpert Release-PXR 20 / PXR 10
Frame: PDG2

Notes:
1. The instantaneous pickup settings shown have a ±10% tolerance.
2. For high fault current levels a fixed instantaneous override is provided at 1100A and has a ±15% tolerance.

Figure 23. PXR 20 / PXR 10 - instantaneous and override for 60A frame.
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Figure 24. PXR 20 / PXR 10 - instantaneous and override for 100A frame.
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Figure 25. PXR 20 / PXR 10 - instantaneous and override for 150A frame.

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 2100A and has a ±15% tolerance.
Figure 26. PXR 20 / PXR 10 - instantaneous and override for 225A frame.
Figure 27. PXR 20 / PXR 10 - instantaneous and override for 63A frame.
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Effective December 2019

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Figure 28. PXR 20 / PXR 10 - instantaneous and override for 100A frame.

Notes:
1. The instantaneous pickup settings shown have a ±10% tolerance.
2. For high fault current levels a fixed instantaneous override is provided at 1100A and has a ±15% tolerance.
Technical Data TD012064EN
Effective December 2019

Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Figure 29. PXR 20 / PXR 10 - instantaneous and override for 160A frame.
December 2019
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Figure 30. PXR 20 / PXR 10 - instantaneous and override for 200A frame.

Notes:
1. The instantaneous pickup settings shown have a ±10% tolerance.
2. For high fault current levels a fixed instantaneous override is provided at 2100A and has a ±15% tolerance.
Figure 31. PXR 20 / PXR 10 - instantaneous and override for 250A frame.

Notes:
1. The instantaneous pickup settings shown have a ±10% tolerance.
2. For high fault current levels, a fixed instantaneous override is provided at 2100A and has a ±15% tolerance.
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

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Technical Data TD012064EN

Figure 32. PXR 10 LSI profile for short flat curves.

### Time current curves
Power Defense circuit breakers

**Style:** Frame 2  
**Configuration:** 3 and 4-poles  
**Trip unit type:** Power Xpert Release-PXR 10

**Notes:**
1. Long delay pickup is 110% of the Ir setting with ±5% tolerance.
2. Long delay time setting has ±0%/±30% tolerance. It is fixed at a 10s time band.
3. Instantaneous pickup settings have ±10% tolerance.
4. Short delay pickup settings as shown have ±5% tolerance.
5. If thermal memory is enabled, trip times may be shorter than indicated in this curve.
6. Setting J in the table is the default value but can be programmed from a minimum of 2x to a maximum of 10x in steps of 0.5x and a time delay of 50ms to 300ms in steps of 50ms using the Power Xpert Protection Manager software (PXPM).
7. When Profile K is selected, PXR 10 LSI style curve should be used.

<table>
<thead>
<tr>
<th>Profile</th>
<th>Isd (n x Ir)</th>
<th>tsd (s)</th>
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<tbody>
<tr>
<td>A</td>
<td>2</td>
<td>0.150</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>0.300</td>
</tr>
<tr>
<td>C</td>
<td>2</td>
<td>0.300</td>
</tr>
<tr>
<td>D</td>
<td>4</td>
<td>0.150</td>
</tr>
<tr>
<td>E</td>
<td>4</td>
<td>0.150</td>
</tr>
<tr>
<td>F</td>
<td>6</td>
<td>0.150</td>
</tr>
<tr>
<td>G</td>
<td>6</td>
<td>0.300</td>
</tr>
<tr>
<td>H</td>
<td>10</td>
<td>0.150</td>
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<tr>
<td>J</td>
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<th>PDG 100A</th>
<th>PDG 150A</th>
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<td>50A</td>
<td>80A</td>
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<tr>
<td>4</td>
<td>25A</td>
<td>50A</td>
<td>70A</td>
<td>110A</td>
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<td>5</td>
<td>30A</td>
<td>60A</td>
<td>80A</td>
<td>125A</td>
</tr>
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<td>6</td>
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<td>60A</td>
<td>100A</td>
<td>150A</td>
<td>225A</td>
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</table>

<table>
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<th>PDG 63A</th>
<th>PDG 100A</th>
<th>PDG 165A</th>
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<td>25A</td>
<td>50A</td>
</tr>
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<td>2</td>
<td>18A</td>
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<td>40A</td>
<td>63A</td>
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<td>90A</td>
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<td>100A</td>
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<tr>
<td>10</td>
<td>63A</td>
<td>100A</td>
<td>160A</td>
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</table>

<table>
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<th>PDG 200A</th>
<th>PDG 250A</th>
</tr>
</thead>
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<td>1</td>
<td>40A</td>
<td>50A</td>
<td>63A</td>
</tr>
<tr>
<td>2</td>
<td>50A</td>
<td>60A</td>
<td>80A</td>
</tr>
<tr>
<td>3</td>
<td>63A</td>
<td>80A</td>
<td>100A</td>
</tr>
<tr>
<td>4</td>
<td>70A</td>
<td>90A</td>
<td>125A</td>
</tr>
<tr>
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<td>80A</td>
<td>100A</td>
<td>150A</td>
</tr>
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<td>150A</td>
<td>175A</td>
<td>225A</td>
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<tr>
<td>10</td>
<td>160A</td>
<td>200A</td>
<td>250A</td>
</tr>
</tbody>
</table>
Figure 33. PXR 10 LSI profile for $I^2t$ short curves.
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Effective December 2019

Figure 34. PXR 10 LI style 60A frame.
Technical Data TD012064EN
Effective December 2019

Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Figure 35. PXR 10 Li style 100A frame.

Notes:
1. Long delay pickup is 110% of the Ir setting with ±5% tolerance.
2. Long delay time setting has +0%/-30% tolerance.
3. Instantaneous pickup settings have ±10% tolerance.
4. For high fault current levels a fixed instantaneous override is provided at 1100A and has ±15% tolerance.
5. If thermal memory is enabled, trip times may be shorter than indicated in this curve.
Technical Data

Effective December 2019

Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Figure 36. PXR 10 LI style 150A frame.

Notes:
1. Long delay pickup is 110% of the Ir setting with ±5% tolerance.
2. Long delay time setting has ±0%/-30% tolerance.
3. Instantaneous pickup settings have ±10% tolerance.
4. For high fault current levels a fixed instantaneous override is provided at 2100A and has a ±15% tolerance.
5. If thermal memory is enabled, trip times may be shorter than indicated in this curve.
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Figure 37. PXR 10 LI style 225A frame.

Notes:
1. Long delay pickup is 110% of the Ir setting with ±5% tolerance.
2. Long delay time setting has +0%/-30% tolerance.
3. Instantaneous pickup settings have ±10% tolerance.
4. For high fault current levels a fixed instantaneous override is provided at 2100A and has a ±15% tolerance.
5. If thermal memory is enabled, trip times may be shorter than indicated in this curve.
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Technical Data
Effective December 2019

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Figure 38. PXR 10 Li style 63A frame.
Figure 39. PXR 10 LI style 100A frame.
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

technical data
TD012064EN
Effective December 2019

Figure 40. PXR 10 LI style 160A frame. December 2019
Figure 41. PXR 10 LI style 200A frame.
Figure 42. PXR 10 Li style 250A frame.
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

15A Fixed Thermal Fixed Magnetic

- **Eaton Corporation**: January 2012
- **Eaton Corporation**: December 2019

**Figure 43. 15A fixed thermal fixed magnetic.**
Figure 44. 20A fixed thermal fixed magnetic.
Figure 45. 25A fixed thermal fixed magnetic.
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Figure 46. 30A fixed thermal fixed magnetic.

**Figure 46. 30A fixed thermal fixed magnetic.**

**E.T.N**

**Time current curves**

**Power Defense circuit breakers**

- **Style**: Frame 2
- **Configuration**: 1 pole
- **Trip unit type**: Thermal magnetic
- **Trip unit style**: Fixed thermal - fixed magnetic
- **Breaker frame**: PDG or PDC style

**Notes:**

1. Single pole test data at 25°C based on NEMA procedures (AB 4) for verifying performance of molded case circuit breakers.
2. DC instantaneous trip values are approximately 40% higher.

Current in Amperes

- **Maximum Single Pole Trip**

Time in Seconds

- **Minimum Tolerance**
- **Maximum Tolerance**
**Time current curves Power Defense MCCB**

Frame 2 thermal-magnetic and PXR electronic trip units

Standards: UL, CSA, IEC, CCC

---

**35A Fixed Thermal Fixed Magnetic**

- **Time current curves**
- **Power Defense circuit breakers**
  - Style: Frame 2
  - Configuration: 1 pole
  - Trip unit type: Thermal magnetic
  - Trip unit style: Fixed thermal - fixed magnetic
  - Breaker frame: PDG or PDC style

**Notes:**
1. Single pole test data at 25°C based on NEMA procedures (AB 4) for verifying performance of molded case circuit breakers.
2. DC instantaneous trip values are approximately 40% higher.

---

**Figure 47. 35A fixed thermal fixed magnetic.**

- **Current in Amperes**
  - 0.01
  - 0.10
  - 1.00
  - 10.00
  - 100.00
  - 1000.00
  - 10000.00

- **Time in Seconds**
  - 0.01
  - 0.10
  - 1.00
  - 10.00
  - 100.00
  - 1000.00

---

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Figure 48. 40A fixed thermal fixed magnetic.
Figure 49. 45A fixed thermal fixed magnetic.
Figure 50. 50A fixed thermal fixed magnetic.

Notes:
1. Single pole test data at 25°C based on NEMA procedures (AB 4) for verifying performance of molded case circuit breakers.
2. DC instantaneous trip values are approximately 40% higher.
Figure 51. 60A fixed thermal fixed magnetic.
Figure 52. 70A fixed thermal fixed magnetic.
Figure 53. 80A fixed thermal fixed magnetic.
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Effective December 2019

Figure 54. 90A fixed thermal fixed magnetic.

Notes:
1. Single pole test data at 25°C based on NEMA procedures (AB 4) for verifying performance of molded case circuit breakers.
2. DC instantaneous trip values are approximately 40% higher.
Eaton Corporation

100A Fixed Thermal Fixed Magnetic

**Notes:**
1. Single pole test data at 25°C based on NEMA procedures (AB 4) for verifying performance of molded case circuit breakers.
2. DC instantaneous trip values are approximately 40% higher.

---

**Figure 55.** 100A fixed thermal fixed magnetic.
Figure 56. 110A fixed thermal fixed magnetic.
Technical Data TD012064EN
Effective December 2019

Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

125A Fixed Thermal Fixed Magnetic

- Maximum Single Pole Trip

Notes:
1. Single pole test data at 25°C based on NEMA procedures (AB 4) for verifying performance of molded case circuit breakers.
2. DC instantaneous trip values are approximately 40% higher.

Figure 57. 125A fixed thermal fixed magnetic.
Figure 58. 150A fixed thermal fixed magnetic.

Notes:
1. Single pole test data at 25°C based on NEMA procedures (AB 4) for verifying performance of molded case circuit breakers.
2. DC instantaneous trip values are approximately 40% higher.
Technical Data TD012064EN
Effective December 2019

Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Figure 59. 15A fixed thermal fixed magnetic.

Eaton Corporation
January 2012

Notes:
1. Single pole test data at 25°C based on NEMA procedures (AS 4) for verifying performance of molded case circuit breakers.
2. DC instantaneous trip values are approximately 40% higher.

Maximum Single Pole Trip Times at 25°C

interuption rating and application determines end of curve

415V-480V
240V
600V

Maximum
Tolerance

Minimum
Tolerance

Current in Amperes

Time in Seconds

Figure 59. 15A fixed thermal fixed magnetic.
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Effective December 2019

Technical Data TD012064EN

20A Fixed Thermal Fixed Magnetic

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Time current curves
Power Defense circuit breakers
Style: Frame 2
Configuration: 1, 3, 4 pole
Trip unit type: Thermal magnetic
Trip unit style: Fixed thermal - fixed magnetic
Breaker frame: PDG or PDC style

Notes:
1. Single pole test data at 25°C based on NEMA procedures (AB 4) for verifying performance of molded case circuit breakers.
2. DC instantaneous trip values are approximately 40% higher.

Figure 60. 20A fixed thermal fixed magnetic.
**25A Fixed Thermal Fixed Magnetic**

Time current curves
Power Defense circuit breakers
Style: Frame 2
Configuration: 1, 3, 4 pole
Trip unit type: Thermal magnetic
Trip unit style: Fixed thermal - fixed magnetic
Breaker frame: PDG or PDC style

**Notes:**
1. Single pole test data at 25°C based on NEMA procedures (AB 4) for verifying performance of molded case circuit breakers.
2. DC instantaneous trip values are approximately 40% higher.

**Figure 61. 25A fixed thermal fixed magnetic.**
Figure 62. 30A fixed thermal fixed magnetic.
35A Fixed Thermal Fixed Magnetic

Time current curves
Power Defense circuit breakers
Style: Frame 2
Configuration: 2, 3, 4 pole
Trip unit type: Thermal magnetic
Trip unit style: Fixed thermal - fixed magnetic
Breaker frame: PDG or PDC style

Notes:
1. Single pole test data at 25°C based on NEMA procedures (AB 4) for verifying performance of molded case circuit breakers.
2. DC instantaneous trip values are approximately 40% higher.

Figure 63. 35A fixed thermal fixed magnetic.
**40A Fixed Thermal Fixed Magnetic**

*EATON*

**Time current curves**

Power Defense circuit breakers

- **Style:** Frame 2
- **Configuration:** 2, 3, 4 pole
- **Trip unit type:** Thermal magnetic
- **Trip unit style:** Fixed thermal - fixed magnetic
- **Breaker frame:** PDG or PDC style

**Notes:**

1. Single pole test data at 25°C based on NEMA procedures (AB 4) for verifying performance of molded case circuit breakers.
2. DC instantaneous trip values are approximately 40% higher.

---

**Figure 64. 40A fixed thermal fixed magnetic.**

- Maximum Single Pole Trip Times at 25°C
- Maximum Tolerance
- Minimum Tolerance
- Interruption rating and application determines end of curve

**Voltage Levels:**
- 240V
- 480V
- 600V

---

**Current in Amperes**

**Time in Seconds**

- 0.01
- 0.10
- 1.00
- 10.00
- 100.00
- 1000.00
- 10000.00
- 100000.00
- 1000000.00

---

**Notes:**

- Single pole test data at 25°C based on NEMA procedures (AB 4) for verifying performance of molded case circuit breakers.
- DC instantaneous trip values are approximately 40% higher.
Figure 65. 45A fixed thermal fixed magnetic.
50A Fixed Thermal Fixed Magnetic

EATON

Time current curves
Power Defense circuit breakers
Style: Frame 2
Configuration: 2, 3, 4 pole
Trip unit type: Thermal magnetic
Trip unit style: Fixed thermal - fixed magnetic
Breaker frame: PDG or PDC style

Notes:
1. Single pole test data at 25°C based on NEMA procedures (AB 4) for verifying performance of molded case circuit breakers.
2. DC instantaneous trip values are approximately 40% higher.

Figure 66. 50A fixed thermal fixed magnetic.
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Technical Data TD012064EN
Effective December 2019

60A Fixed Thermal Fixed Magnetic

Figure 67. 60A fixed thermal fixed magnetic.
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Technical Data TD012064EN
Effective December 2019

70A Fixed Thermal Fixed Magnetic

Time current curves
Power Defense circuit breakers
Style: Frame 2
Configuration: 2, 3, 4 pole
Trip unit type: Thermal magnetic
Trip unit style: Fixed thermal - fixed magnetic
Breaker frame: PDG or PDC style

Notes:
1. Single pole test data at 25°C based on NEMA procedures (AB 4) for verifying performance of molded case circuit breakers.
2. DC instantaneous trip values are approximately 40% higher.

Figure 68. 70A fixed thermal fixed magnetic.
Figure 69. 80A fixed thermal fixed magnetic.
Figure 70. 90A fixed thermal fixed magnetic.
100A Fixed Thermal Fixed Magnetic

**E.T.O.N**
Time current curves
Power Defense circuit breakers
Style: Frame 2
Configuration: 2, 3, 4 pole
Trip unit type: Thermal magnetic
Trip unit style: Fixed thermal - fixed magnetic
Breaker frame: PDG or PDC style

Notes:
1. Single pole test data at 25°C based on NEMA procedures (AB 4) for verifying performance of molded case circuit breakers.
2. DC instantaneous trip values are approximately 40% higher.

### Figure 71. 100A fixed thermal fixed magnetic.
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Effective December 2019

Figure 72. 110A fixed thermal fixed magnetic.
**125A Fixed Thermal Fixed Magnetic**

**Notes:**
1. Single pole test data at 25°C based on NEMA procedures (AB 4) for verifying performance of molded case circuit breakers.
2. DC instantaneous trip values are approximately 40% higher.

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Maximum Single Pole Trip Times at 25°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>600V</td>
<td></td>
</tr>
<tr>
<td>415/480V</td>
<td></td>
</tr>
<tr>
<td>240V</td>
<td></td>
</tr>
</tbody>
</table>

**Time current curves**
- Power Defense circuit breakers
- Style: Frame 2
- Configuration: 2, 3, 4 pole
- Trip unit type: Thermal magnetic
- Trip unit style: Fixed thermal - fixed magnetic
- Breaker frame: PDG or PDC style

**Figure 73. 125A fixed thermal fixed magnetic.**

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**Technical Data TD012064EN**
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**Time current curves Power Defense MCCB**
**Frame 2 thermal-magnetic and PXR electronic trip units**
**Standards: UL, CSA, IEC, CCC**
150A Fixed Thermal Fixed Magnetic

Figure 74. 150A fixed thermal fixed magnetic.
Figure 75. 175A fixed thermal fixed magnetic.
Figure 76. 200A fixed thermal fixed magnetic.
225A Fixed Thermal Fixed Magnetic

Time current curves
Power Defense circuit breakers
Style: Frame 2
Configuration: 2, 3, 4 pole
Trip unit type: Thermal magnetic
Trip unit style: Fixed thermal - fixed magnetic
Breaker frame: PDG or PDC style

Notes:
1. Single pole test data at 25°C based on NEMA procedures (AB 4) for verifying performance of molded case circuit breakers.
2. DC instantaneous trip values are approximately 40% higher.

Figure 77. 225A fixed thermal fixed magnetic.
Figure 78. 160A/200A/250A adjustable thermal and adjustable magnetic.
Figure 79. 240V let-through current 150A.

PD2 150A 240V
Peak Let Through Current

Peak Let-Through Current, kA

Available Short Circuit Current, kA\text{rms}

240V
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Effective December 2019

Figure 80. 240V let-through energy 150A.

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Figure 81. 240V let-through current 225A.
Figure 82. 240V let-through energy 225A.
Effective December 2019

PD2 225A 415V-480V
Peak Let Through Current

Available Short Circuit Current, kA

Peak Let-Through Current, kA

Figure 83. 415V-480V let-through current 225A.
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Figure 84. 600V let-through current 150A.
Figure 85. 600V let-through energy 150A.
Figure 86. 600V let-through current 225A.
Figure 87. 600V let-through energy 225A.
Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC

Notes
Technical Data
Effective December 2019

Time current curves Power Defense MCCB
Frame 2 thermal-magnetic and PXR electronic trip units
Standards: UL, CSA, IEC, CCC