Time Current Curves
Series NRX NF and RF Circuit Breakers
PXR 20/25 Trip Units

Contents
Description                                      Page
Revision notes                                    2
PXR catalog number convention                   3
PXR 20 trip units                                4
PXR 25 trip units                                5
Curves
Long Delay I$^t$ and Short Delay Flat Response: TC013001E 6
Long Delay I$^t$ and Short Delay I$^t$ Response TC013002E 7
Long Delay I$^t$ and Short Delay Flat Response: TC013003E 8
Long Delay I$^t$ and Short Delay I$^t$ Response TC013004E 9
Long Delay I$^t$ and Short Delay Flat Response: TC013005E 10
Long Delay I$^t$ and Short Delay I$^t$ Response: TC013006E 11
Long Delay I$^t$ and Short Delay Flat Response: TC013007E 12
Long Delay I$^t$ and Short Delay I$^t$ Response: TC013008E 13
Ground (Earth) Flat Response:                   TC013009E 14
Ground (Earth) I$^t$ Response:                  TC013010E 15
Instantaneous Response:                         TC013011E 16
High Instantaneous Response:                    TC013012E 17
Maintenance Mode Protection Response:           TC013013E 18
Revised 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>
</table>
PXR catalog number convention

Table 1. Breakdown of the PXR Trip Unit Catalog Numbering Convention.

<table>
<thead>
<tr>
<th>Style Family</th>
<th>Protection</th>
<th>Arc Flash Reduction Maintenance System (ARMS) Protection</th>
<th>Communications</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Selective Protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Power and Selective Protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Harmonic and Advanced Protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frame Style</td>
<td>Ground Fault Protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>000</td>
<td>Standard Frame Style</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

General curve notes:

1. These curves apply to 50Hz and 60Hz applications.
2. These curves are comprehensive for Series NRX NF/RF (IZMX 16/40) style circuit breakers including all frame sizes, ratings and constructions. 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.
3. These curves apply to an ambient of -20°C to +50°C. Trip Unit temperature above 85°C will cause an over-temperature trip and light the Long cause of trip LED.
4. The end of the curve is determined by the application or the interrupting rating of the circuit breaker.
PXR 20 trip units

Figure 1. PXR 20 Trip Units.
PXR 25 trip units

Figure 2. PXR 25 Trip Units.
Curves

Figure 3. PXR 20/25 Long Delay I’t and Short Delay Flat Response

Curve Number: TC013001E August 2016
Notes:
1. Long Delay pickup is 110% of the I₀ setting (0.4, 0.5, 0.6, 0.7, 0.75, 0.8, 0.9, 0.95, 1.0) with ±5% tolerance.
2. Long Delay Time Settings 0.5s to 24s 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 have ±10% tolerance.
5. Short Time delay (0.5, 0.4, 0.3) I₂t slopes have a +0%/-30% tolerance, 0.1s slope has a +0%/-40% 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, tripping times for 3-phase faults, no aux. power will be a maximum of 75ms for 60Hz and 80ms for 50Hz.
Notes:
1. Long Delay pickup is 110% of the Ir setting (0.4, 0.5, 0.6, 0.7, 0.75, 0.8, 0.9, 0.95, 1.0) with ±5% tolerance.
2. Long Delay Time Settings 0.5, 1, 2, 4, 7, 10, 12, 15, 20, 24s (not all 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 of 1.5, 2, 2.5, 3, 4, 5, 6, 7, 8, 10 (not all shown) have ±10% tolerance.
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, tripping times for 3-phase faults, no aux. power will be a maximum of 75ms for 60Hz and 80ms for 50Hz.
Time Current Curves
Series NRX NF and RF Circuit Breakers
PXR 20/25 Trip Units

Notes:
1. Long Delay pickup is 110% of the Ir setting (0.4, 0.5, 0.6, 0.7, 0.75, 0.8, 0.9, 0.95, 1.0) with ±5% tolerance.
2. Long Delay Time Settings 0.5, 1, 2, 4, 7, 10, 12, 15, 20, 24s (not all 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 of 1.5, 2, 2.5, 3, 4, 5, 6, 7, 8, 10 (not all shown) have ±10% tolerance.
5. Short Time delay (0.5, 0.4, 0.3) I^2t slopes have a +0% to -30% tolerance, 0.1s slope has a +0% to -40% 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, tripping times for 3-phase faults, no aux. power will be a maximum of 75ms for 60Hz and 80ms for 50Hz.

Figure 6. PXR 20/25 Long Delay I^0.5t and Short Delay I^t Response
Curve Number: TC013004E  August 2016.
Notes:
1. Long Delay pickup is 110% of the Ir setting (0.4, 0.5, 0.6, 0.7, 0.75, 0.8, 0.9, 0.95, 1.0) with ±5% tolerance.
2. Long Delay Time Settings 0.5, 1, 2, 4, 7, 10, 12, 15, 20, 24s (not all 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 have of 1.5, 2, 2.5, 3, 4, 5, 6, 7, 8, 10 (not all shown) ±10% tolerance.
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, tripping times for 3-phase faults, no aux. power will be a maximum of 75ms for 60Hz and 80ms for 50Hz.
Notes:
1. Long Delay pickup is 110% of the Ir setting (0.4, 0.5, 0.6, 0.7, 0.75, 0.8, 0.9, 0.95, 1.0) with ±5% tolerance.
2. Long Delay Time Settings 0.5, 1, 2, 4, 7, 10, 12, 15, 20, 24s (not all 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 of 1.5, 2, 2.5, 3, 4, 5, 6, 7, 8, 10 (not all shown) have ±10% tolerance.
5. Short Time delay (0.5, 0.4, 0.3) I’s slopes have a ±0%/±30% tolerance, 0.1s slope has ±0%/±40% 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, tripping times for 3-phase faults, no aux. power will be a maximum of 75ms for 60Hz and 80ms for 50Hz.
Figure 9. PXR 20/25 Long Delay I^t and Short Delay Flat Response

Notes:
1. Long Delay pickup is 110% of the Ir setting (0.4, 0.5, 0.6, 0.7, 0.75, 0.8, 0.9, 0.95, 1.0) with ±5% tolerance.
2. Long Delay Time Settings 0.5s to 7s 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 of 1.5, 2.5, 3, 4, 5, 6, 7, 8, 10 (not all shown) have ±10% tolerance.
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, tripping times for 3-phase faults, no aux. power will be a maximum of 75ms for 60Hz and 80ms for 50Hz.
7. For the Long Time I^t slope only, all settings above 7 seconds will default to a maximum allowable 7 second time delay band.
Figure 10. PXR 20/25 Long Delay $I_t$ and Short Delay $I_t$ Response

Curve Number: TC013008E  August 2016.
Figure 11. PXR 20/25 Ground (Earth) Flat Response

Curve Number: TC013009E  August 2016.
Notes:
1. Ground Pickup settings shown are for Residual sensing with a tolerance of ±10%.
   Pick up settings for Source Ground/Zero Sequence sensing have a tolerance of ±15%.
2. If Thermal Memory is enabled, trip times may be shorter than indicated in this curve.
3. Break point is at 0.625 x In from I’t to flat.
4. Ground slope: I’t, tolerance is:
   0.1s, 0.2s: +0%/-40%
   0.3s, 0.4s, 0.5s: +0%/-30%
5. With ZSI enabled, tripping times for 3-phase faults, no aux. power will be a maximum of 75ms for 60Hz and 80ms for 50Hz.
Notes:
1. The Instantaneous pickup settings have a ±10% tolerance.
Figure 14. PXR 20/25 High Instantaneous Response

Notes:
1. The 90kA peak curve applies to IEC and UL 489 Selective NF (IZMX16) frame Series NRX breakers
2. The 167 kA peak curve applies to RF (IZM40) frame Series NRX breakers with an (Icu) interrupting rating of 100kA and above.
3. The 138 kA peak curve applies to UL 489 Selective Series NRX RF frame series with an (Icu) interrupting rating of 85kA and above.
4. The 18-6 7kA peak curves apply to UL 489 Switchboard Protective Series NRX breakers with the instantaneous asymmetrical peak value of 22.5 times the frame current rating.
5. The Instantaneous pickup settings have a ±10% tolerance.
6. This protection is functional even when the Instantaneous is set to the OFF position.
7. The PXR trip unit will light the Instantaneous LED for a High Instantaneous trip.
8. The total High Instantaneous 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 under factors that contribute to 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.
Notes:
1. Reduction Pickup settings have a ±20% tolerance.
2. The trip unit will light the Instantaneous LED for a Maintenance Mode protective trip.
Time Current Curves
Series NRX NF and RF Circuit Breakers
PXR 20/25 Trip Units

Notes:
At Eaton, we’re energized by the challenge of powering a world that demands more. With over 100 years’ experience in electrical power management, we have the expertise to see beyond today. From groundbreaking products to turnkey design and engineering services, critical industries around the globe count on Eaton.

We power businesses with reliable, efficient and safe electrical power management solutions. Combined with our personal service, support and bold thinking, we are answering tomorrow’s needs today. Follow the charge with Eaton. Visit eaton.com/electrical.