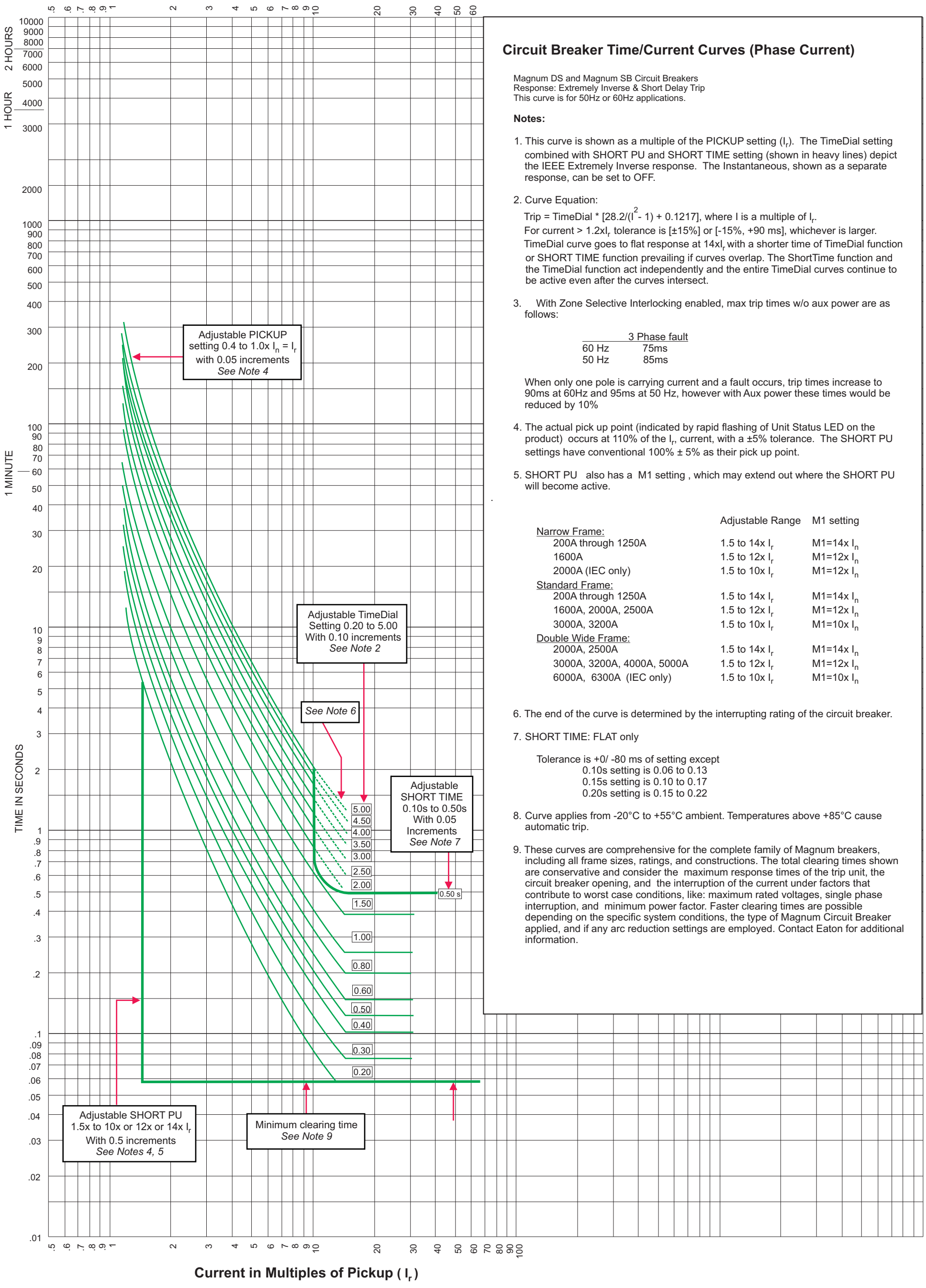
Digitrip 1150 - IEEE Curves
Extremely Inverse



Circuit Breaker Time/Current Curves (Phase Current)

Magnum DS and Magnum SB Circuit Breakers
Response: Extremely Inverse & Short Delay Trip
This curve is for 50Hz or 60Hz applications.

Notes:

1. This curve is shown as a multiple of the PICKUP setting (I_r). The TimeDial setting combined with SHORT PU and SHORT TIME setting (shown in heavy lines) depict the IEEE Extremely Inverse response. The Instantaneous, shown as a separate response, can be set to OFF.

2. Curve Equation:
   Trip = TimeDial * $[28.2/(I^2 - 1) + 0.1217]$, where I is a multiple of I_r.
   For current > 1.2xI_r tolerance is [±15%] or [-15%, +90 ms], whichever is larger.
   TimeDial curve goes to flat response at 14xI_r with a shorter time of TimeDial function or SHORT TIME function prevailing if curves overlap. The ShortTime function and the TimeDial function act independently and the entire TimeDial curves continue to be active even after the curves intersect.

3. With Zone Selective Interlocking enabled, max trip times w/o aux power are as follows:

	3 Phase fault
60 Hz	75ms
50 Hz	85ms

   When only one pole is carrying current and a fault occurs, trip times increase to 90ms at 60Hz and 95ms at 50 Hz, however with Aux power these times would be reduced by 10%

4. The actual pick up point (indicated by rapid flashing of Unit Status LED on the product) occurs at 110% of the I_r, current, with a ±5% tolerance. The SHORT PU settings have conventional 100% ± 5% as their pick up point.

5. SHORT PU also has a M1 setting , which may extend out where the SHORT PU will become active.

	Adjustable Range	M1 setting
Narrow Frame:		
200A through 1250A	1.5 to 14x I_r	M1=14x I_n
1600A	1.5 to 12x I_r	M1=12x I_n
2000A (IEC only)	1.5 to 10x I_r	M1=12x I_n
Standard Frame:		
200A through 1250A	1.5 to 14x I_r	M1=14x I_n
1600A, 2000A, 2500A	1.5 to 12x I_r	M1=12x I_n
3000A, 3200A	1.5 to 10x I_r	M1=10x I_n
Double Wide Frame:		
2000A, 2500A	1.5 to 14x I_r	M1=14x I_n
3000A, 3200A, 4000A, 5000A	1.5 to 12x I_r	M1=12x I_n
6000A, 6300A (IEC only)	1.5 to 10x I_r	M1=10x I_n

6. The end of the curve is determined by the interrupting rating of the circuit breaker.

7. SHORT TIME: FLAT only

   Tolerance is +0/ -80 ms of setting except
   0.10s setting is 0.06 to 0.13
   0.15s setting is 0.10 to 0.17
   0.20s setting is 0.15 to 0.22

8. Curve applies from -20°C to +55°C ambient. Temperatures above +85°C cause automatic trip.

9. These curves are comprehensive for the complete family of Magnum 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 under factors that contribute to worst case conditions, like: maximum rated voltages, single phase interruption, and minimum power factor. Faster clearing times are possible depending on the specific system conditions, the type of Magnum Circuit Breaker applied, and if any arc reduction settings are employed. Contact Eaton for additional information.