



Molded Case Circuit Breakers

Table 38.1
AC Interrupting Ratings — UL Listed Except as Noted

Circuit Breaker Type	Max. Ampere Rating	Max. ac Voltage	Voltage									
			120/240		240		277		480		600	
			Multi-Pole (2P)	1 Pole	Multi-Pole (3P)	1 Pole	277/480 Multi-Pole	1 Pole	Multi-Pole	1 Pole	Multi-Pole	1 Pole
THQB, C, L	100 ^⑦ , 70 ^⑤	120/240	10000	5000	10000	8660						
THHQB, C, L	100, 70 ^⑤	120/240	22000	5000	22000	8660						
TXQB, C, L	30		65000	5000	65000	8600						
TQD	225		10000	5000	10000	8660						
TQDL	200		10000	5000								
THQD	225		22000	5000	22000	8660						
THQDL	200	120/240	22000	5000								
TEB	100	120		10000								
TEB	100	240			10000	8660						
TEY	100	277/480	65000	65000	65000	8660 ^②	14000	14000				
TED	100	480								10000		
TED	100	277						14000				
TED	100	480			18000	8660			18000	8660		
TB-1	100	600			200000	8660			200000	8660	200000	8660
TEC	150	600			10000	8660			10000	8660	10000	8660
TEC and TECL	150	600			100000	8660			100000	8660	100000	8660
TED	150	600			18000	8660			18000	8660	14000	8660
THED	30	277						65000				
THED	150	600			42000	8660			25000	8660	18000	8660
TEL	150	600			100000	8660			65000	8660	25000	8660
TEML	150	600			100000	8660			65000	8660	25000	8660
THLC-1 ^⑥	150	480			200000	8660			150000	8660	50000	8660
TFJ, TFK ^④ , TFC	225	600			25000	8660			22000	8660	18000	8660
THFK ^④	225	600			65000	8660			25000	8660	18000	8660
TFL	225				100000	8660			65000	8660	25000	8660
TLB-2	225	480			85000	8660			50000	8660		
THLC-2 ^⑥	225	480			200000	8660			150000	8660	50000	8660
TJD	400	240	22000	10000	22000	8660						
TJ ^{①④}	600	600			42000	8660			30000	8660	22000	8660
THJ ^{①④}	600	600			65000	8660			35000	8660	25000	8660
TLB-4	400	480			85000	8660			50000	8660		
TJH	600	600			65000	8660			35000	8660	25000	8660
TJL	600	600			100000	8660			65000	8660	30000	8660
THLC-4 ^⑥	400	480			200000	8660			150000	8660	50000	8660
TB-4	400	600			200000	8660			200000	8660	200000	8660
TB-6	600	600			200000	8660			200000	8660	200000	8660
TK ^④	1200	600			42000	12120			30000	12120	22000	12120
THKMA ^④	1200	600			65000	12120			35000	12120	25000	12120
TKH	1200	600			65000	12120			50000	12120	25000	12120
TKL ^③	1200	600			100000	12120			65000	12120	42000	12120
TB-8	800	600			200000	8660			200000	8660	200000	8660

① Includes J, K, C, and 4V suffixes.

② Includes C, MA and 4V suffixes.

③ Includes 4V suffixes.

④ Interchangeable thermal-magnetic trip circuit breakers are not UL listed for reverse feed.

⑤ Single pole limit.

⑥ If model is rated for 600 volts.

⑦ 110A for THQC.

Note: The single pole interrupting ratings shown are the UL listed values for three pole devices and are not necessarily the maximum capability of the device.

Single pole interrupting capability must be considered when molded case circuit breakers are used on ungrounded or resistance grounded distribution systems.

Note: For series-connected ratings with main circuit breakers or fuses, refer to publication DET-008.



Molded Case Circuit Breakers

Table 39.1
DC Interrupting Ratings — UL Listed Except as Noted by (*)

Circuit Breaker Type	125 Volts	250 Volts		300 Volts		400 Volts		500 Volts			600 Volts	
	1 Pole	1 Pole	2 Pole	1 Pole	2 Pole	1 Pole	2 Pole	1 Pole	2 Pole	3 Pole ^①	1 Pole	2 Pole
TEB	5000	—	5000									
TED4, TEC, TED6	10000	—	14000*							10000		
THED	20000*	—	20000*		20000*		20000*					
TFJ, TFK, TFC	10000	—	10000							10000		
THFK	20000*	—	20000*		20000*		20000*					
TJJ, TJK4, TJC, TJD	10000	10000	10000		20000*					20000		
THJK4, THJK6	20000*	10000	40000		20000*		20000*		20000*			
TKMA8, TKC800	10000	10000	10000	10000*						22000		
TKC361200L	22000*	22000*	23000*	10000*	23000*	10000*	23000*		23000*			23000*
THKMA8	20000*	20000*	20000*	10000*	20000*	10000*	20000*	10000*	20000*			

* Not UL listed.

① UL listed for 500 volts 3 poles in series ungrounded battery applications.

Notes:

- Direct current interrupting ratings are based on a system fault time constant of 8 ms (milliseconds) or less.
- Multi-pole ratings (2 or 3) are based on midpoint grounded systems with one pole in positive leg and one pole in negative leg, or end grounded systems with two or three poles wired in series in the ungrounded leg.
- Single-pole ratings are for application in ungrounded systems.

Table 39.2
Interrupting Rating Multiplying Factors for Power Factors Lower Than (or X/R Ratios Higher Than) Test Values

Power Factor (Percent)	X/R Ratio	Rated Maximum Interrupting Rating		
		1 to 10 kA ^① Multiplier	11 to 20 kA Multiplier	21 kA and Higher Multiplier
4	24.980	.61	.72	.81
5	19.974	.62	.74	.82
6	16.637	.63	.75	.83
7	14.251	.64	.76	.84
8	12.460	.65	.77	.85
9	11.066	.66	.78	.87
10	9.950	.67	.79	.88
11	9.036	.68	.80	.89
12	8.273	.69	.81	.90
13	7.627	.69	.82	.91
14	7.072	.70	.83	.93
15	6.591	.71	.84	.94
16	6.169	.72	.85	.95
17	5.797	.73	.86	.96
18	5.465	.74	.87	.97
19	5.167	.75	.88	.98
20	4.899	.76	.89	1.000
21	4.656	.77	.90	1.000
22	4.434	.77	.91	1.000
23	4.231	.78	.92	1.000
24	4.045	.79	.94	1.000
25	3.873	.80	.95	1.000
26	3.714	.81	.96	1.000
27	3.566	.82	.97	1.000

Power Factor (Percent)	X/R Ratio	Rated Maximum Interrupting Rating		
		1 to 10 kA ^① Multiplier	11 to 20 kA Multiplier	21 kA and Higher Multiplier
28	3.429	.83	.98	1.000
29	3.300	.83	.99	1.000
30	3.180	.84	1.000	1.000
31	3.067	.85	1.000	1.000
32	2.961	.86	1.000	1.000
33	2.861	.87	1.000	1.000
34	2.766	.88	1.000	1.000
35	2.676	.88	1.000	1.000
36	2.592	.89	1.000	1.000
37	2.511	.90	1.000	1.000
38	2.434	.91	1.000	1.000
39	2.361	.91	1.000	1.000
40	2.291	.92	1.000	1.000
41	2.225	.93	1.000	1.000
42	2.161	.94	1.000	1.000
43	2.100	.95	1.000	1.000
44	2.041	.95	1.000	1.000
45	1.984	.96	1.000	1.000
46	1.930	.97	1.000	1.000
47	1.878	.97	1.000	1.000
48	1.828	0.98	1.000	1.000
49	1.779	0.99	1.000	1.000
50	1.732	1.000	1.000	1.000

① kA = Kiloamps (1 kA is 1,000 amps) rms, symmetrical.



Table 40.1
Estimated 400-415 Hz Interrupting Ratings in Amperes — Not UL Listed

Circuit Breaker Type	Volts			
	120	120/208 and 120/240	277/480	346/600
THQL, B, C		1000		
THHQL, B, C		2200		
TXQL, B, C		6500		
TQD, TQDL		1000		
THQD, THQDL		2200		
TEY	6500	6500	1400	
TEB	1000	1000	—	—
TED 4	1800	1800	1400	—
TED 6	1800	1800	1400	1400
THED	6500	6500	2500	1800
TFL, TEL	10000	10000	6500	2500
TFJ, TFK	2500	2500	2200	2200
THFK	6500	6500	2500	2200
THLC-1	20000	20000	15000	5000
TJD		2200	2200	
TJJ, TJK	4200	4200	3000	2200
TJ ^①	4200	4200	3000	2200
THJ ^①	6500	6500	3500	2500
TJH	6500	6500	3500	2500
TJL	10000	10000	6500	3000
TK ^①	4200	4200	3000	2200
THK ^①	6500	6500	5000	2500
TKH	6500	6500	5000	2500
TKL	10000	10000	6500	4200

① Includes solid state trips.

Note: 400-Hertz interrupting ratings are based on engineering judgement, taking into consideration the operating characteristics of molded case circuit breakers and the worldwide lack of test facilities to verify performance.

Table 40.2
Q-Line and TEB Molded Case Switch Short Circuit Withstand Rating^①

Molded Case Switch Catalog Number	Maximum Rating Protective Device ^②		Short Circuit Withstand Rating
	Voltage	Amps	Amps rms Sym
TQL, TQB, TQC21Y690	120/240	60	10,000
TQL, TQB, TQC21Y100	120/240	100	10,000
TQL, TQB, TQC22Y60	240	60	10,000
TQL, TQB, TQC22Y100	240	100	10,000
TQL, TQB, TQC32Y60	240	60	10,000
TQL, TQB, TQC32Y100	240	100	10,000
TEB111Y100	240	100	10,000
TEB122Y100	240	100	10,000
TEB132Y100	240	100	10,000

① Q-Line and TEB molded case switches have a 10,000 amp symmetrical short circuit withstand rating when protected by a fuse or circuit breaker rated 10,000 amps IC or greater and whose ampere rating does not exceed the ampere rating of the switch.

② Protective device must be on line side of molded case switch.

Note: Circuit breakers, Mag-Break[®] instantaneous only breakers and molded case switches are inherently horsepower rated by the testing performance requirements in UL489. They are therefore not marked with horsepower ratings. See NEC Article 430-109.



Table 41.1
Molded Case Switch Short Circuit Withstand Rating

Molded Case Switch		Protective Device ^①		Short Circuit Withstand Ratings	
Ampere Rating	Catalog Number	Type	Max. Amp Rating	Amps rms Sym.	Max. Voltage
100	TED113Y100	Any fuse or circuit breaker rated 10,000A 240V	100	10,000	240
100	TED134Y100	TED134100	100	14,000	480
150	TED136Y150	TED126150	150	14,000	600
		TED134150	150	14,000	480
225	TFJ236Y225	TED, THED	150	14,000	600
		TFJ, TFK, THFK	225	14,000	600
		Class J Fuse	400	14,000	600
		TQD32Y225	TQD	225	14,000
400	TJD432Y400	TJD	400	22,000	240
		Class T Fuse	400	50,000	240
400	TJJ436Y400	TFJ, TFK, THFK	225	18,000	600
				22,000	480
		TJJ, THJK, TJ4V, THJ4V, TJJL4S, TJJL4SS, TJH4S, TJH4SS	400	30,000	480
600	TJK636Y600	Class J Fuse	400	50,000	600
		TJJ, THJK,	400	22,000	600
		TJ4V, THJ4V,		30,000	480
		TJJL4S, TJJL4SS, TJH4S, TJH4SS	600	50,000	600
		Class J Fuse		22,000	600
		TJK, THJK,		30,000	480
		800	TKMA836Y800	TJ4V, THJ4V,	600
TJJL6S, TJJL6SS, TJH6S, TJH6SS	22,000			600	
TJK, THJK,	30,000			480	
TJ4V, THJ4V,	800			22,000	600
TJJL6S, TJJL6SS, TJH6S, TJH6SS				30,000	480
TKM, THKM,	800			50,000	600
TK4V, THK4V,				22,000	600
TKL8S, TKL8SS, TKH8S, TKH8SS		30,000	480		
1200	TKMA3Y1200	Class L Fuse	800	50,000	600
		TJK, THJK,	600	22,000	600
		TJ4V, THJ4V,		30,000	480
		TJJL6S, TJJL6SS, TJH6S, TJH6SS	1200	22,000	600
		TKM, THKM,		30,000	480
		TK4V, THK4V		50,000	600
		TKL12S, TKL12SS, TKH12S, TKH12SS	1200	50,000	600

① Three-pole, 600 volt switches cover 2-pole, 600 volt and 2- and 3-pole, 480 volt switches.

Table 41.2
Electrical Formula — For Obtaining kW, kVA, Horsepower and Amperes

Wanted	Single-phase	Alternating Current Two-phase, Four-wire	Three-phase	Direct Current
Kilowatts	$\frac{I \times E \times PF}{1000}$	$\frac{I \times E \times 2 \times PF}{1000}$	$\frac{I \times E \times 1.73 \times PF}{1000}$	$\frac{I \times E}{1000}$
kVA	$\frac{I \times E}{1000}$	$\frac{I \times E \times 2}{1000}$	$\frac{I \times E \times 1.73}{1000}$	$\frac{I \times E}{1000}$
Horsepower	$\frac{I \times E \times \% \text{ Eff.} \times PF}{746}$	$\frac{I \times E \times 2 \times \% \text{ Eff.} \times PF}{746}$	$\frac{I \times E \times 1.73 \times \% \text{ Eff.} \times PF}{746}$	$\frac{I \times E \times \% \text{ Eff.}}{746}$
Amperes from kVA	$\frac{kVA \times 1000}{E}$	$\frac{kVA \times 1000}{2 \times E}$	$\frac{kVA \times 1000}{1.73 \times E}$	$\frac{kVA \times 1000}{E}$
Amperes from kW	$\frac{kW \times 1000}{E \times PF}$	$\frac{kW \times 1000}{2 \times E \times PF}$	$\frac{kW \times 1000}{1.73 \times E \times PF}$	$\frac{kW \times 1000}{E}$
Amperes from Hp	$\frac{Hp \times 746}{E \times \% \text{ Eff.} \times PF}$	$\frac{Hp \times 746}{2 \times E \times \% \text{ Eff.} \times PF}$	$\frac{Hp \times 746}{1.73 \times E \times \% \text{ Eff.} \times PF}$	$\frac{Hp \times 746}{E \times \% \text{ Eff.}}$

E = Volts
I = Amperes
% Eff. = Percent Efficiency
PF = Power Factor

A.C. Short Circuit Determination —

For methods of calculating short-circuit currents for industrial and commercial power systems, request a copy of GET-3550.