

# Data Bulletin

## Wiring Conductor Ampacity to Temperature Rating

### INTRODUCTION

Square D molded-case circuit breakers are marked with both the size and insulation temperature rating (e.g., #2 Cu, 60/75°C) of the conductors approved for use with the circuit breaker. Properly sized conductors allow the circuit breaker thermal-sensing elements to match the conductor thermal-protection requirements.

Underwriter Laboratories Inc. (UL) standards require that molded-case circuit breakers rated at 125 amperes or less be marked with the conductor insulation-temperature rating. Table 1 contains a listing of wire temperature ratings for Square D circuit breakers. The wire temperature rating is determined by testing the circuit breaker under full-load current with conductors sized for the appropriate temperature rating—60°C or 75°C. The temperature rise at the circuit breaker terminals must not exceed 50°C above ambient per UL Standard 489.

Conductors with 90°C rated insulation can be used on circuit breakers rated for 60°C or 75°C wiring only if their size is based on the ampacity of the lower temperature-rated wire (reference Table 2). If the 90°C wire size were to be selected based on the ampacity allowed in the 90°C column of Table 2, the smaller resulting wire size would generate additional heat at the circuit breaker terminals and possibly cause nuisance tripping.

**Table 1: Circuit Breaker Wiring Temperature Ratings**

Circuit Breaker	Amperes	Temperature Rating (°C)
QO(B), QOT, QOU, GFI, QH, QOH	10–30	60/75
QOU	10–70	60/75
QO-GFI	40–60	75
QO-H, QO-VH	40–125	75
QO(B)	35–100	75
Q2, Q2L	100–125	75
QOM1	70–125	75
QOM2	100–125	75
EH(B)	15–20	60/75
EH(B)	25–100	75
EDB, EGB, EJB	15–125	75
FD, FG, FJ	15–100	75
FA, FH, FC, FY	15–30	60/75
FA, FH, FC, FI	35–100	75
FI	20–30	60/75
GJL	15–100	75
KI, KC	110–125	75
KA, KH	70–125	75
KD, KG, KJ	100–125	75
LE, LX, LXI	100	75
LA, LH, Q4, LC, LI, LE, LX, LXI	125	75
ME, MX	125	75
PG, PJ, PL	125	75



Table 2: Wiring Conductor Ampacity-to-Temperature Ratings—NEC\*

Size	Maximum Operating Temperature (ref. NEC table 310-16)					
	Insulation Types 60°C (140°F)	Insulation Types 75°C (167°F)	Insulation Types 90°C (194°F)	Insulation Types 60°C (140°F)	Insulation Types 75°C (167°F)	Insulation Types 90°C (194°F)
AWG or kcmil	TW, UF	FEPW, RH, RHW, THHW, THW, THWN, XHHW, USE, ZW	TBS, SA, SIS, FEP, FEPB, MI, RHH, RHW-2, THHN, THHW, THW-2, THWN-2, USE-2, XHH, XHHW, XHHW-2, ZW-2	TW, UF	RH, RHW, THHW, THW, THWN, XHHW, USE	TBS, SA, SIS, THHN, THHW, THW-2, THWN-2, RHH, RHW-2, USE-2, XHH, XHHW, XHHW-2, ZW-2
	Ampacity (Copper)			Ampacity (Aluminum/Copper-clad Aluminum)		
18	—	—	14	—	—	—
16	—	—	18	—	—	—
14	20†	20†	25†	—	—	—
12	25†	25†	30†	20†	20†	25†
10	30†	35†	40†	25†	30†	35†
8	40	50	55	30	40	45
6	55	65	75	40	50	60
4	70	85	95	55	65	75
3	85	100	110	65	75	85
2	95	115	130	75	90	100
1	110	130	150	85	100	115
1/0	125	150	170	100	120	135
2/0	145	175	195	115	135	150
3/0	165	200	225	130	155	175
4/0	195	230	260	150	180	205
250	215	255	290	170	205	230
300	240	285	320	190	230	255
350	260	310	350	210	250	280
400	280	335	380	225	270	305
500	320	380	430	260	310	350
600	355	420	475	285	340	385
700	385	460	520	310	375	420
750	400	475	535	320	385	435
800	410	490	555	330	395	450
900	435	520	585	355	425	480
1000	455	545	615	375	445	500
1250	495	590	665	405	485	545
1500	520	625	705	435	520	585
1750	545	650	735	455	545	615
2000	560	665	750	470	560	630

\* When using table, refer to application notes and correction factors in current edition of NEC.

† The load current rating and the overcurrent protection for conductor types marked with an obelisk (†) shall not exceed 15 amperes for 14 AWG, 20 amperes for 12 AWG, and 30 amperes for 10 AWG copper; or 15 amperes for 12 AWG and 25 amperes for 10 AWG aluminum and copper-clad aluminum after any correction factors for ambient temperature and number at conductors have been applied (ref. NEC 240-3d).

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