

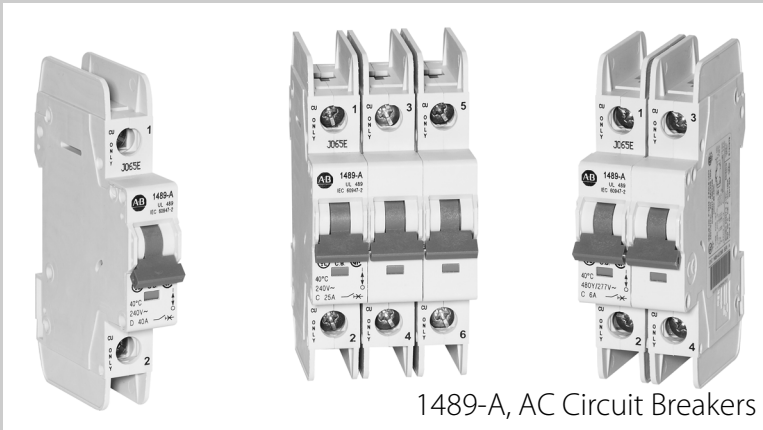
Bulletin 1489

UL489 Circuit Breakers

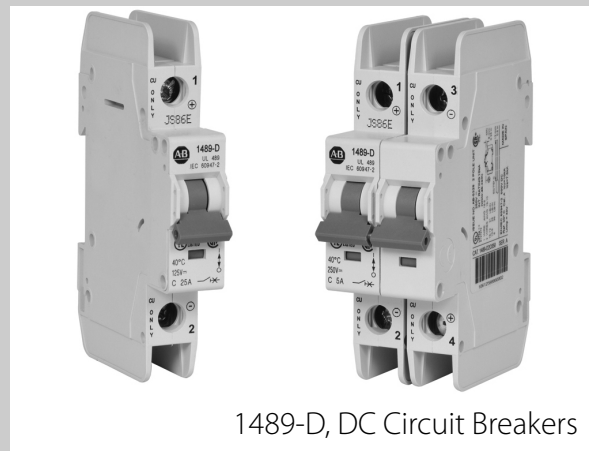
Tech Data

1489-A Standard AC Circuit Breaker

1489-D DC Circuit Breaker



1489-A, AC Circuit Breakers



1489-D, DC Circuit Breakers

LISTEN.
THINK.
SOLVE.®

**Bulletin 1489-A
Industrial Circuit
Breaker for AC
Applications**

Specifications

Bulletin 1489-A			
Number of Poles	1, 2, and 3		
Standards	UL 489 CSA C22.2 No. 5 EN/IEC 60947-2		
Certifications	UL Listed Circuit Breaker (File Number E197878) CSA Certified, VDE Certified, CE Marked		
HACR Rating (USA/Canada)	Yes		
SWD Rating (USA/Canada)	Yes (0.5...20 A)		
Calibration Temperature	UL/CSA: 40 °C EN/IEC: 30 °C		
Rated Interrupting Capacity	EN/IEC - Icu: 15 000 A		
	UL/CSA (See Below)		
	Trip Curve	Rated Current (In)	Interrupt Rating (UL/CSA)
	C Curve	0.5...13 A	10,000 A
		15...25 A	14,000 A
		30...40 A	10,000 A
D Curve	0.5...10 A	10,000 A	
	13...20 A	14,000 A	
	25...40 A	10,000 A	
Rated Tripping Current	UL/CSA: 0.5...32 A, 480Y/277V AC 0.5...40 A, 240V AC 0.5...40 A 48V DC 1-pole 0.5...40 A 96V DC 2-pole EN/IEC: 0.5...40 A, 415V AC 48V DC		
Degree of Protection	Finger-safe from front: -IP20 per IEC 529 from front -IP00 at wire terminals		
Dielectric Strength	1960V AC		
Shock	25 G Half sine wave for 11 ms (3 axes)		
Vibration	Frequency range: 10...200 Hz Max. Amplitude (p-p) = 0.030 in. Max. Acceleration = 5 G 2 hours each of 3 axes		
Normal Operating Environment	-25...+55 °C (-13...+131 °F) (non-condensing)		
Trip Curves	C curve (Inductive) 5...10 I _N D curve (Highly Inductive) 10...20 I _N		
Shipment and Short-Term Storage Limits	-40...+85 °C (-40...+185 °F)		
Wire Size	1 wire: #18...6 AWG 2 wires: #18...10 AWG		
Terminal Torque	#18...12 AWG: 21 lb•in. #10...8 AWG: 25 lb•in. #6 AWG: 36 lb•in. #2 Pozidriv		
Recommended Wire Strip Length	0.5 in. (12 mm)		

Bulletin 1489 UL 489 Circuit Breaker Specifications

Figure 1: Bulletin 1489-A Time Current Characteristic, UL

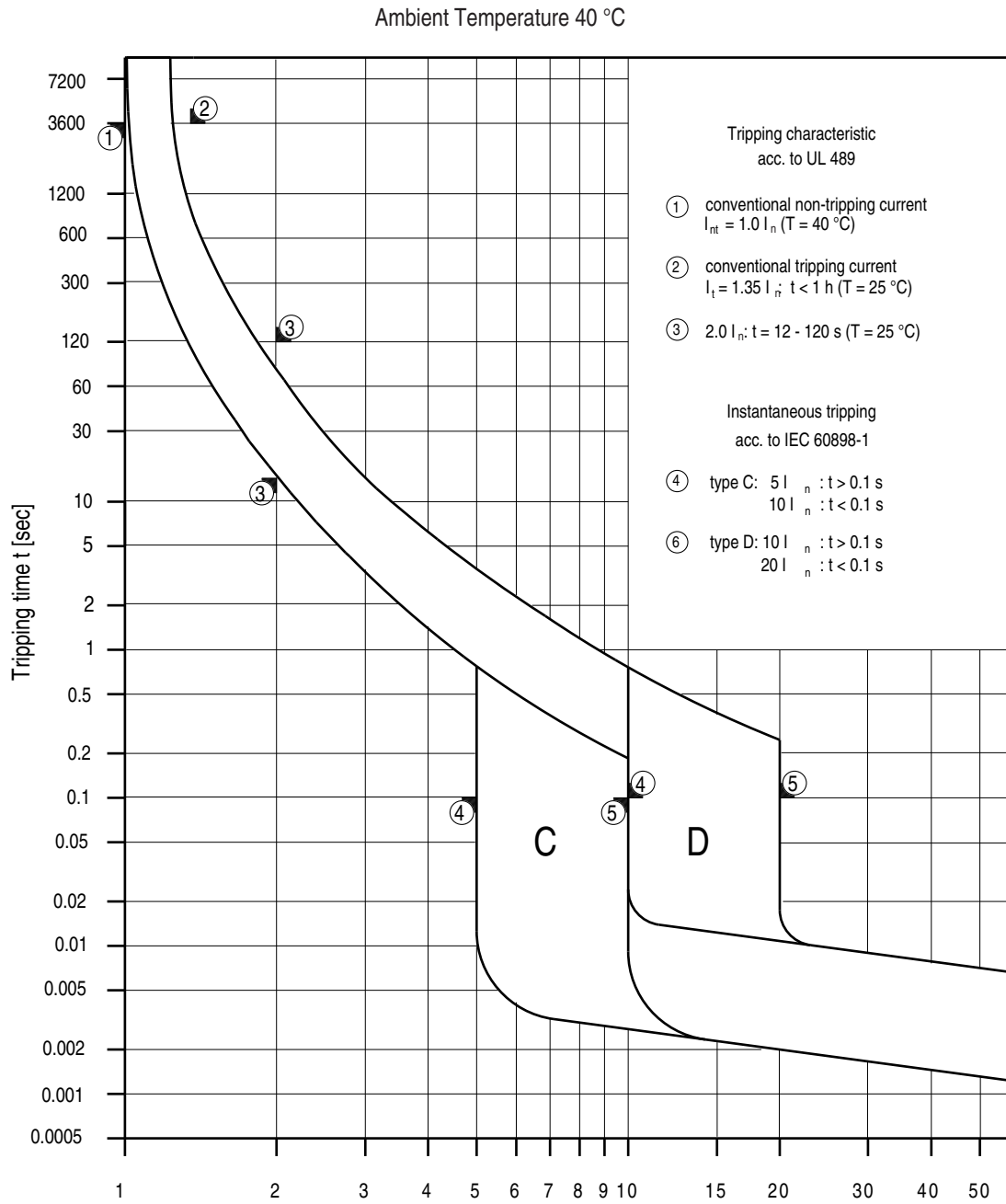


Figure 2: Bulletin 1489-A Power Loss at I_n

C Characteristic				D Characteristic			
I _n /A	1p	2p	3p	I _n /A	1p	2p	3p
	P* [W]	P* [W]	P* [W]		P* [W]	P* [W]	P* [W]
0.5	1.6	3.2	4.7	0.5	1.6	3.2	4.8
1	1.1	2.2	3.4	1	0.8	1.5	2.3
1.5	1.3	2.6	3.9	1.5	1.0	2.1	3.1
2	1.4	2.8	4.3	2	1.0	2.1	3.1
3	1.2	2.4	3.6	3	1.2	2.4	3.6
4	1.4	2.9	4.3	4	1.4	2.9	4.3
5	1.9	3.7	5.6	5	1.5	2.9	4.4
6	1.2	2.3	3.5	6	1.2	2.3	3.5
7	1.4	2.8	4.3	7	1.4	2.8	4.3
8	1.4	2.8	4.2	8	1.2	2.4	3.7
10	1.8	#3.6	5.3	10	1.5	3.0	4.5
13	2.4	4.7	7.1	13	2.0	4.1	6.1
15	1.9	3.8	5.6	15	1.5	3.1	4.6
16	2.1	4.3	6.4	16	1.7	3.5	5.2
20	2.9	5.8	8.7	20	1.8	3.7	5.5
25	3.1	6.2	9.3	25	2.6	5.1	7.7
30	3.0	6.0	9.0	30	2.7	5.4	8.1
32	3.4	6.8	10.2	32	3.1	6.2	9.3
35	3.7	7.4	11.0	35	3.8	7.6	11.3
40	4.0	8.1	12.1	40	3.9	7.8	11.6

*50Hz

Figure 3: Bulletin 1489-A Internal Resistance (Room Temperature)

C Characteristic			D Characteristic		
I _n /A	Z [mΩ]*	R [mΩ]*	I _n /A	Z [mΩ]*	R [mΩ]*
0.5	6400	6300	0.5	6400	6300
1	1100	1080	1	770	755
1.5	560	550	1.5	460	450
2	340	330	2	250	245
3	132	130	3	132	130
4	86	85	4	86	85
5	70	69	5	57	56
6	31	30	6	31	30
7	28	27	7	28	27
8	20	19.6	8	18	17.6
10	15.8	15.5	10	13.5	13.2
13	12.3	12.1	13	10.5	10.3
15	7.1	7.0	15	5.9	5.8
16	7.1	7.0	16	5.9	5.8
20	6.0	5.9	20	4.0	3.9
25	4.1	4.0	25	3.4	3.3
30	2.8	2.7	30	2.5	2.5
32	2.8	2.7	32	2.5	2.5
35	2.5	2.5	35	2.5	2.5
40	2.1	2.1	40	2.0	2.0

*50Hz

Figure 4: Bulletin 1489-A Influence of Ambient Temperature (T) on Load-Carrying Capacity

Bulletin 1489 Ambient Temperature Derating
 Calibration Temperature 40° C (UL)
 Application below 0° C is for non-condensing atmosphere*

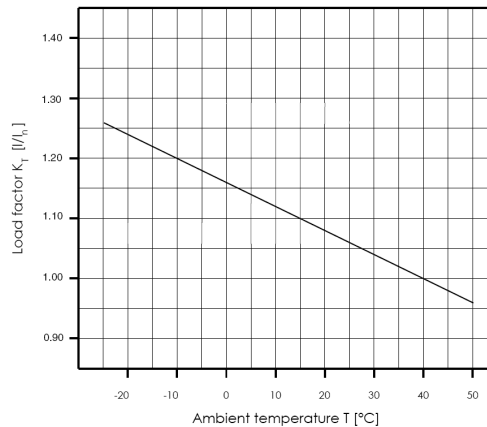
Device Marked Current Rating [A] @ 40 °C	Ambient Temperature (°C)											
	-25	-20	-10	0	10	20	30	35	40	45	50	55
0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.50	0.5	0.5	0.5
1.0	1.3	1.2	1.2	1.2	1.1	1.1	1.0	1.0	1.0	1.0	1.0	0.9
1.5	1.9	1.9	1.8	1.7	1.7	1.6	1.6	1.5	1.5	1.5	1.4	1.4
2.0	2.5	2.5	2.4	2.3	2.2	2.2	2.1	2.0	2.0	2.0	1.9	1.9
3.0	3.8	3.7	3.6	3.5	3.4	3.2	3.1	3.1	3.0	2.9	2.9	2.8
4.0	5.0	5.0	4.8	4.6	4.5	4.3	4.2	4.1	4.0	3.9	3.8	3.8
5.0	6.3	6.2	6.0	5.8	5.6	5.4	5.2	5.1	5.0	4.9	4.8	4.7
6.0	7.5	7.4	7.2	7.0	6.7	6.5	6.2	6.1	6.0	5.9	5.8	5.6
7.0	8.8	8.7	8.4	8.1	7.8	7.6	7.3	7.1	7.0	6.9	6.7	6.6
8.0	10.0	9.9	9.6	9.3	9.0	8.6	8.3	8.2	8.0	7.8	7.7	7.5
10.0	12.6	12.4	12.0	11.6	11.2	10.8	10.4	10.2	10	9.8	9.6	9.4
13.0	16.3	16.1	15.6	15.1	14.6	14.0	13.5	13.3	13	12.7	12.5	12.2
15.0	18.8	18.6	18.0	17.4	16.8	16.2	15.6	15.3	15	14.7	14.4	14.1
16.0	20.1	19.8	19.2	18.6	17.9	17.3	16.6	16.3	16	15.7	15.4	15.0
20.0	25.1	24.8	24.0	23.2	22.4	21.6	20.8	20.4	20	19.6	19.2	18.8
25.0	31.4	31.0	30.0	29.0	28.0	27.0	26.0	25.5	25	24.5	24.0	23.5
30.0	37.7	37.2	36.0	34.8	33.6	32.4	31.2	30.6	30	29.4	28.8	28.2
32.0	40.2	39.7	38.4	37.1	35.8	34.6	33.3	32.6	32	31.4	30.7	30.1
40.0	43.9	43.4	42.0	40.6	39.2	37.8	36.4	35.7	35	34.3	33.6	32.9

* Care should be taken for application below 0 °C. These devices are not certified to operate correctly in the presence of ice.

All other specifications for standard Bulletin 1489-A products remain unchanged.

The ambient temperature derating applies to applications of the device as an IEC Miniature Circuit Breaker (MCB), following 60 947-2 and as Circuit Breaker to UL489/CSA 22.2 No 5..

Ambient temperature refers to the free air temperature in contact with the 1489 device



Maximum load I_T at ambient temperature T:
 $I_T(T) = I_n \cdot K_T(T)$

Figure 5: Bulletin 1489-A Maximum Let Through Energy

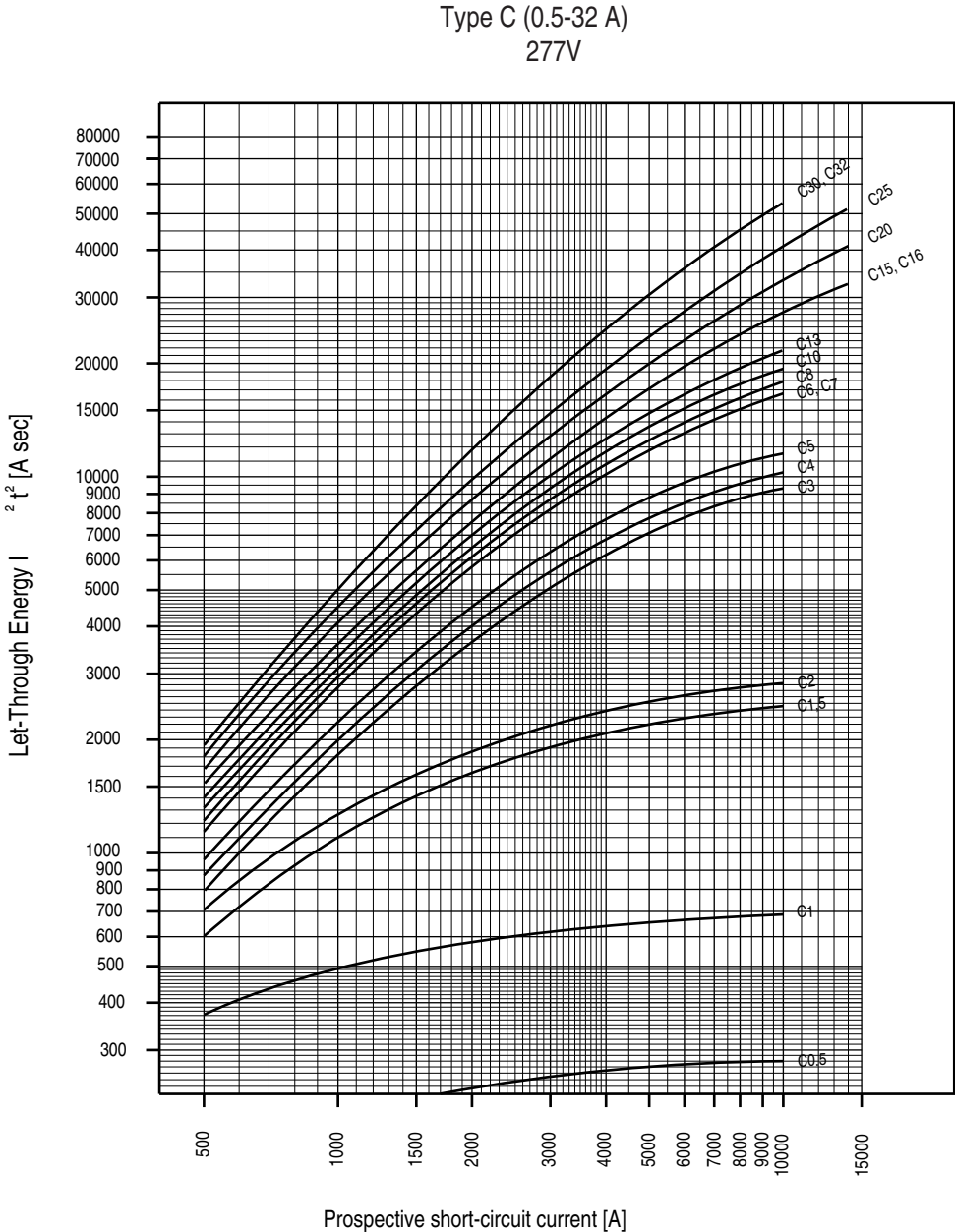


Figure 6: Bulletin 1489-A Maximum Let Through Energy

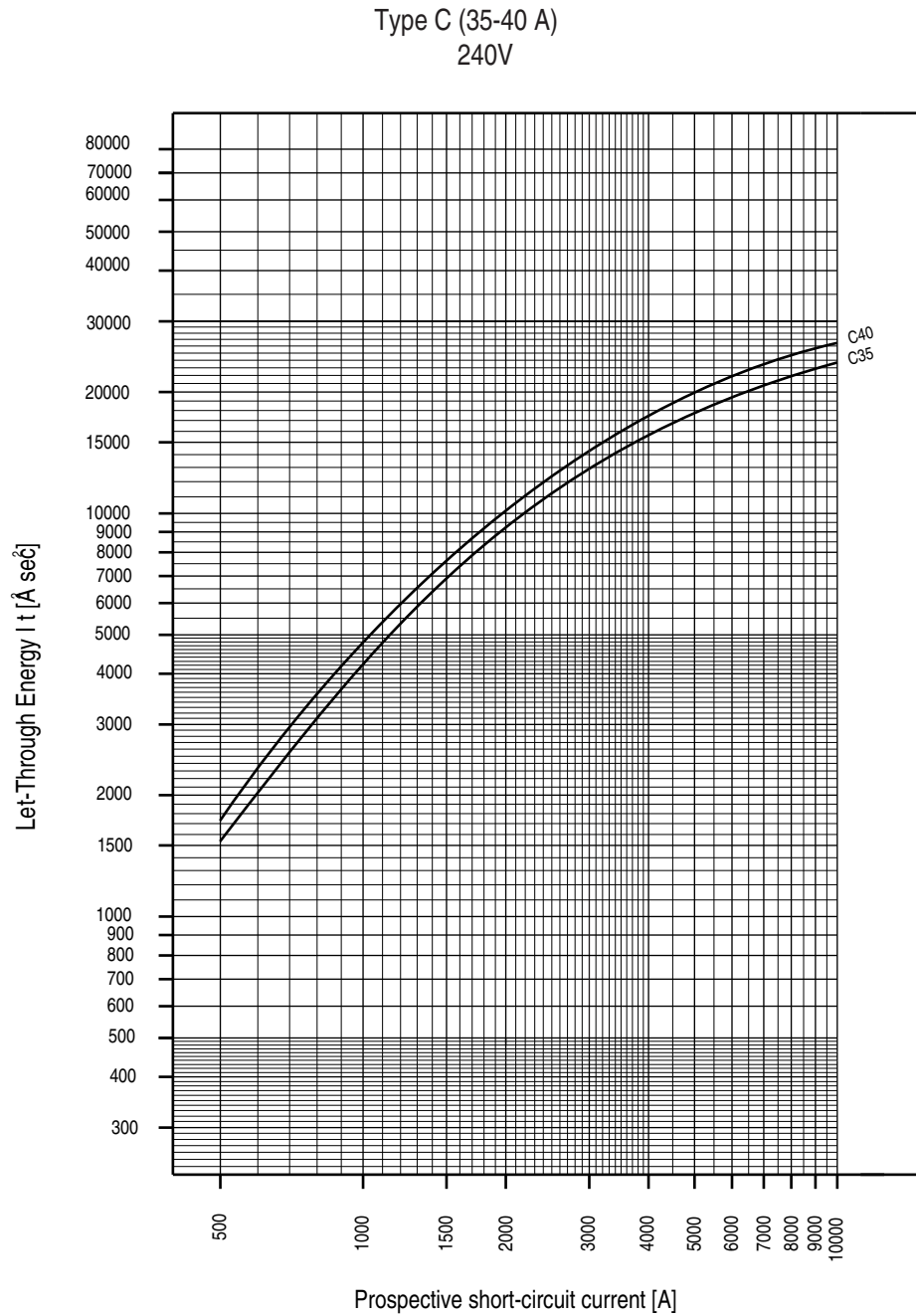


Figure 7: Bulletin 1489-A Maximum Let Through Energy

Type D (0.5-32 A)
277V

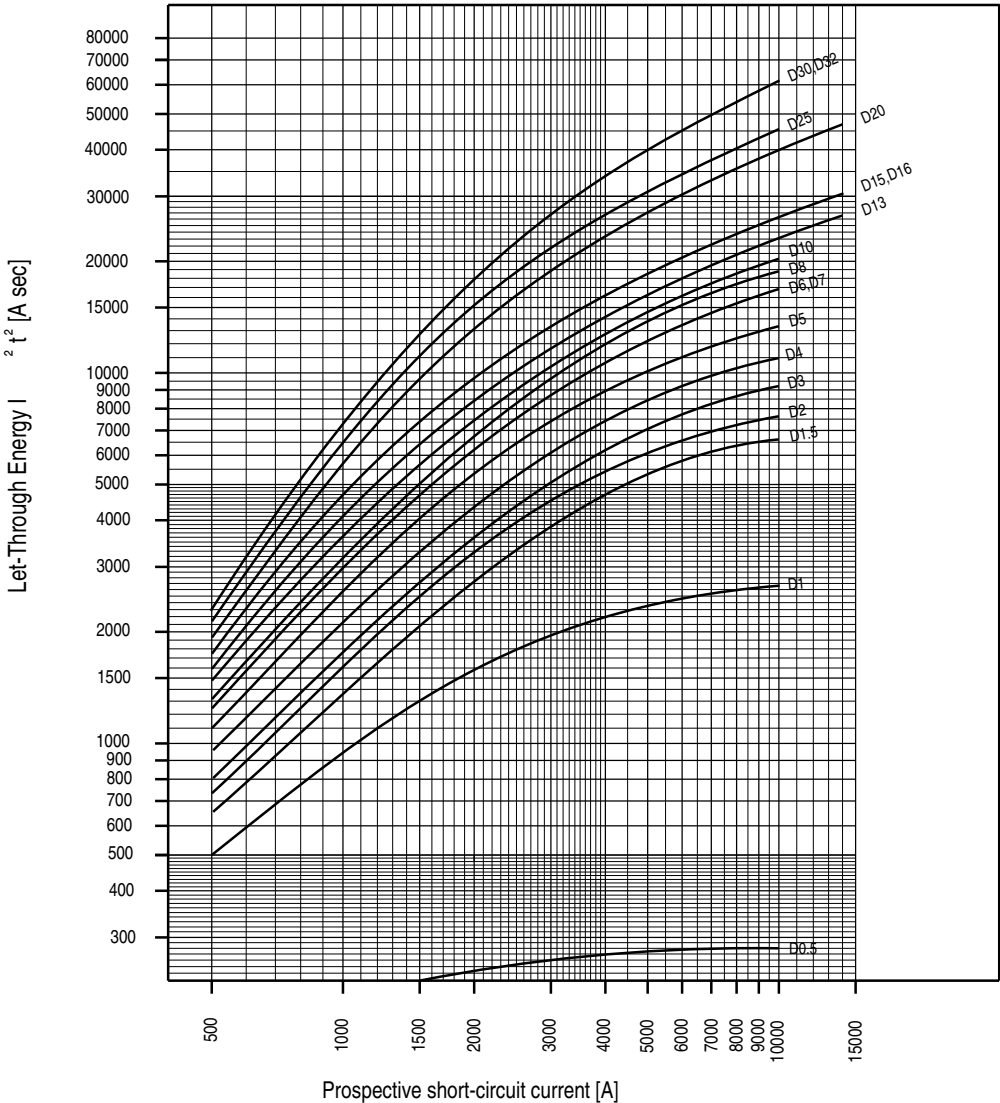


Figure 8: Bulletin 1489-A Maximum Let Through Energy

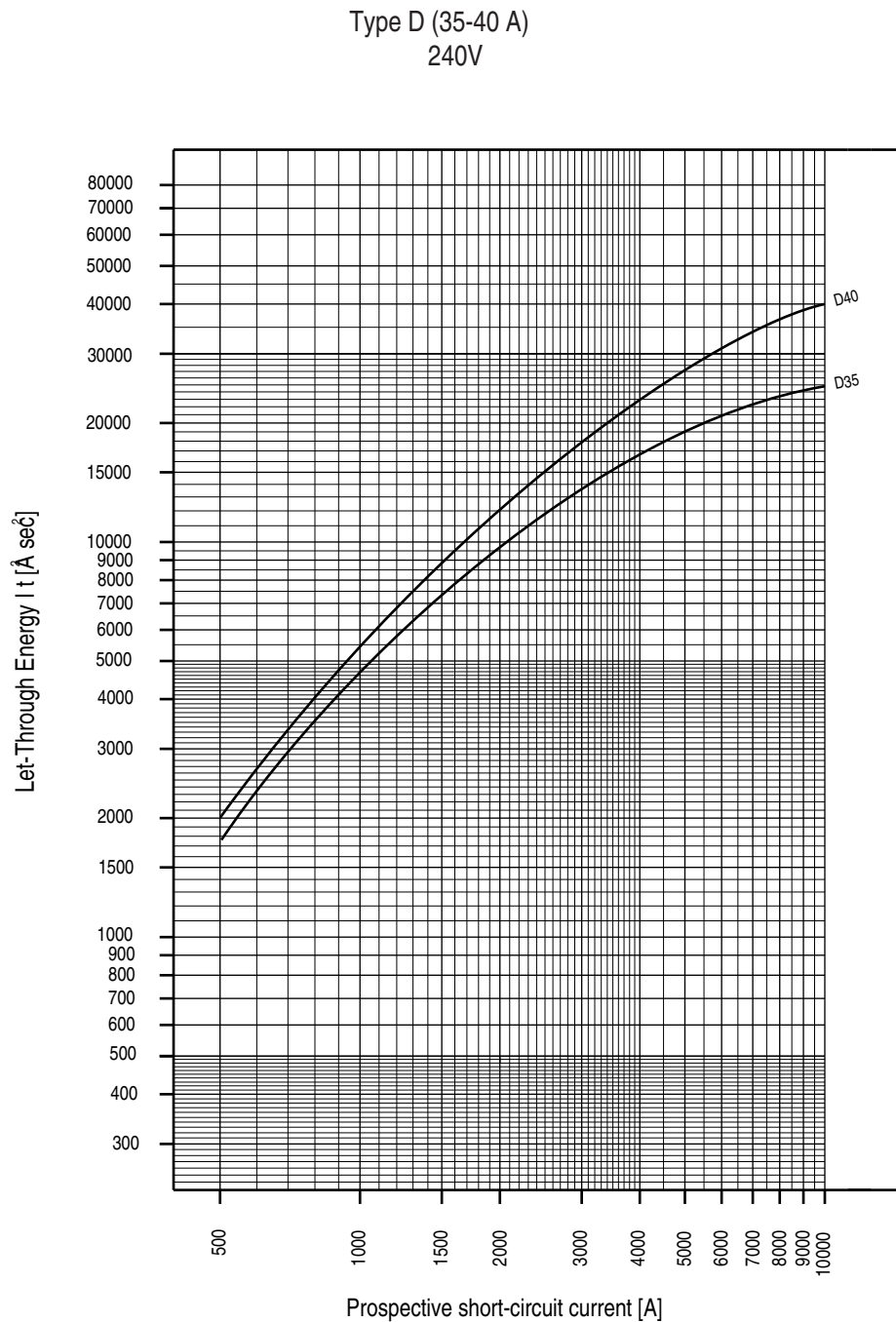
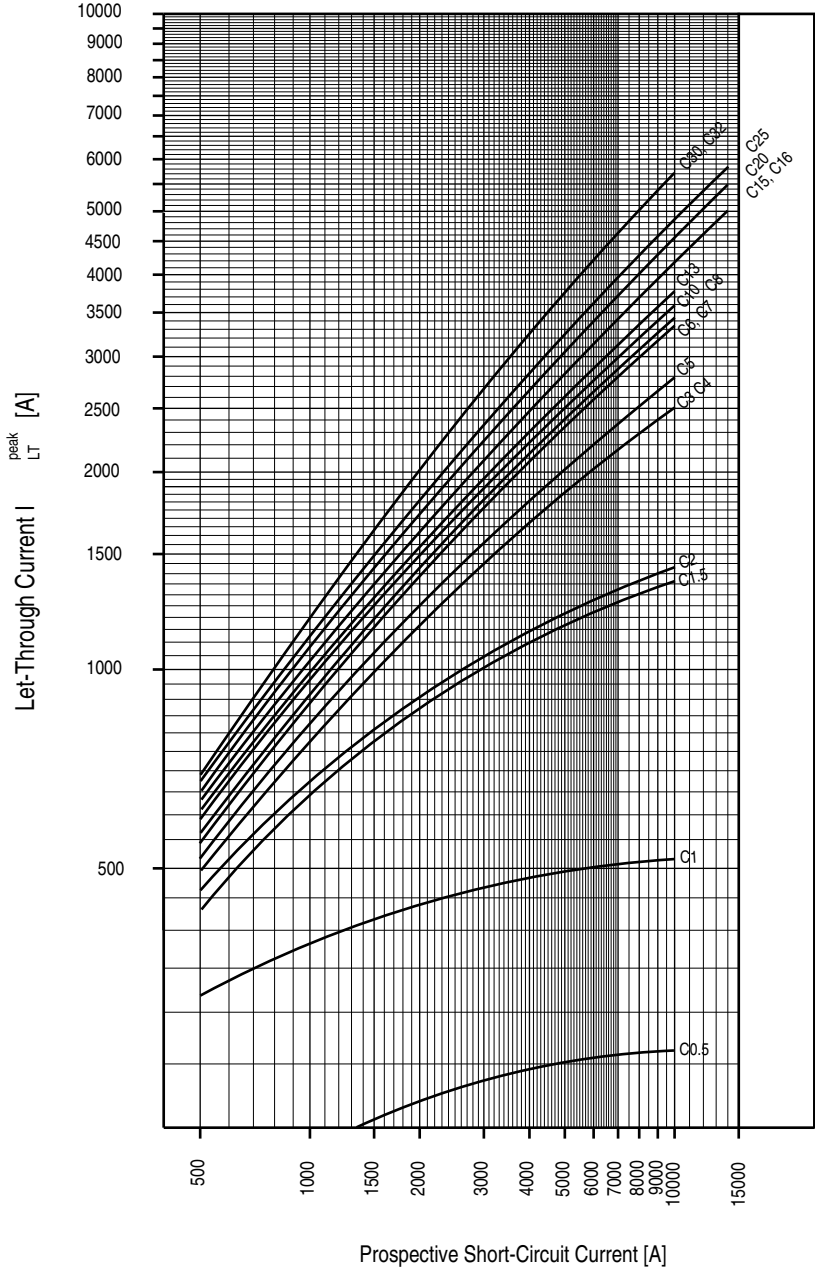


Figure 9: Bulletin 1489-A Maximum Let Through Current

Type C (0.5-32 A)
277V



Bulletin 1489 UL 489 Circuit Breaker Specifications

Figure 10: Bulletin 1489-A Maximum Let Through Current

Type C (35-40 A)
240V

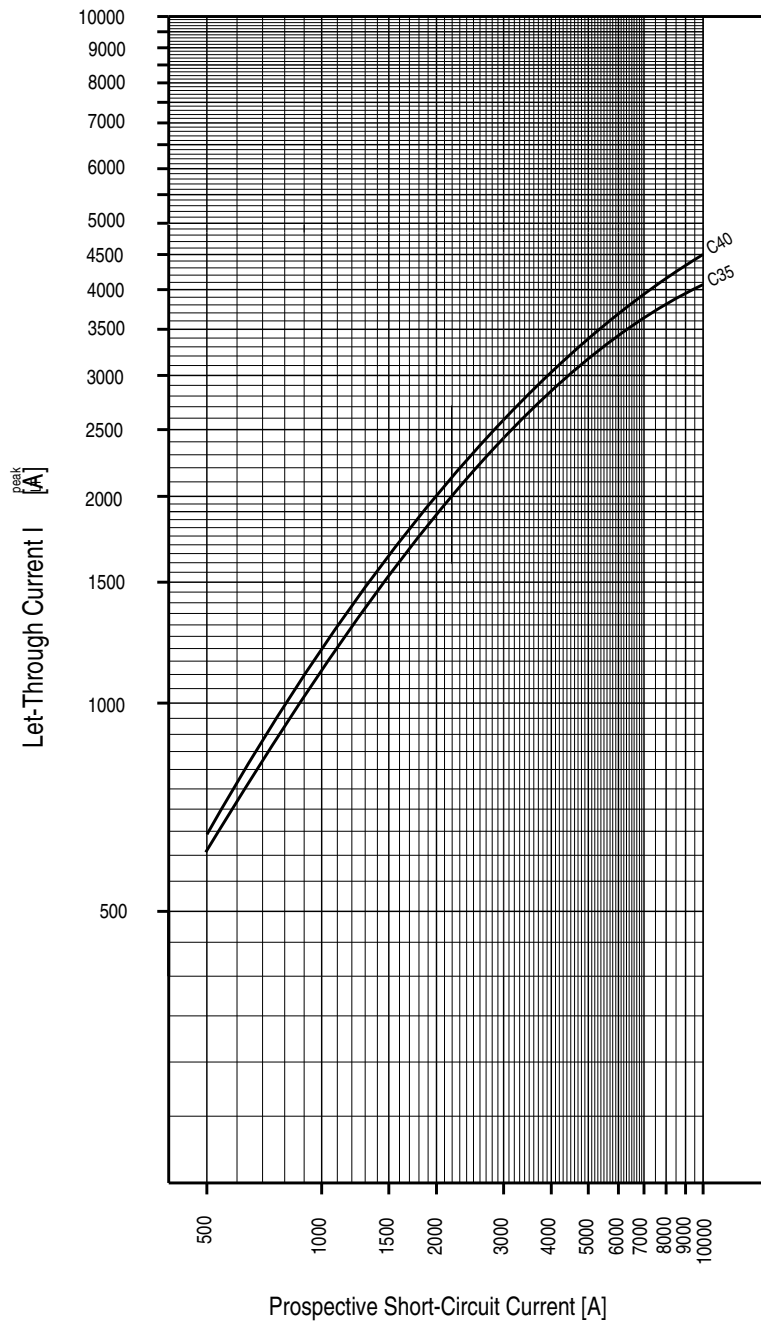


Figure 11: Bulletin 1489-A Maximum Let Through Current

Type D (0.5-32 A)
277V

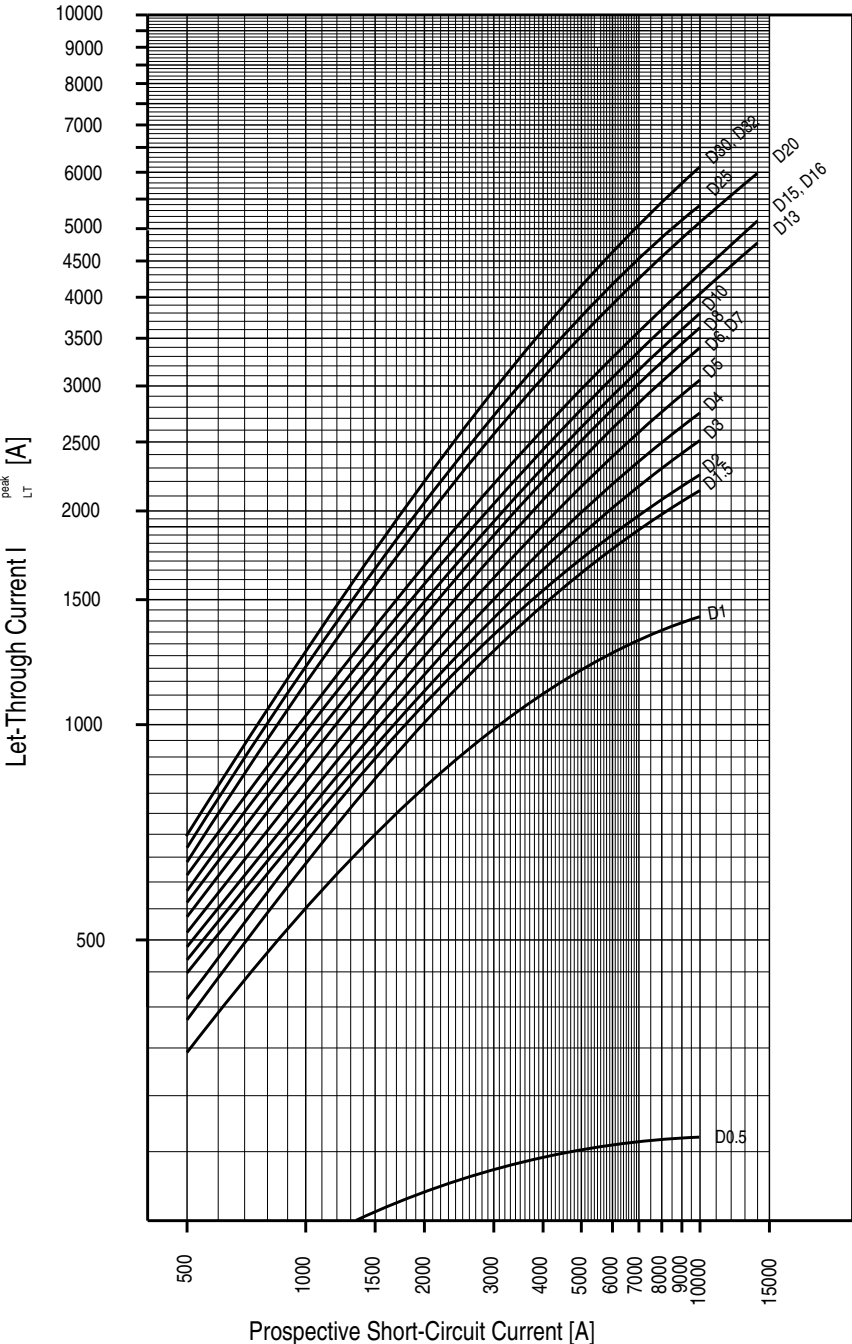
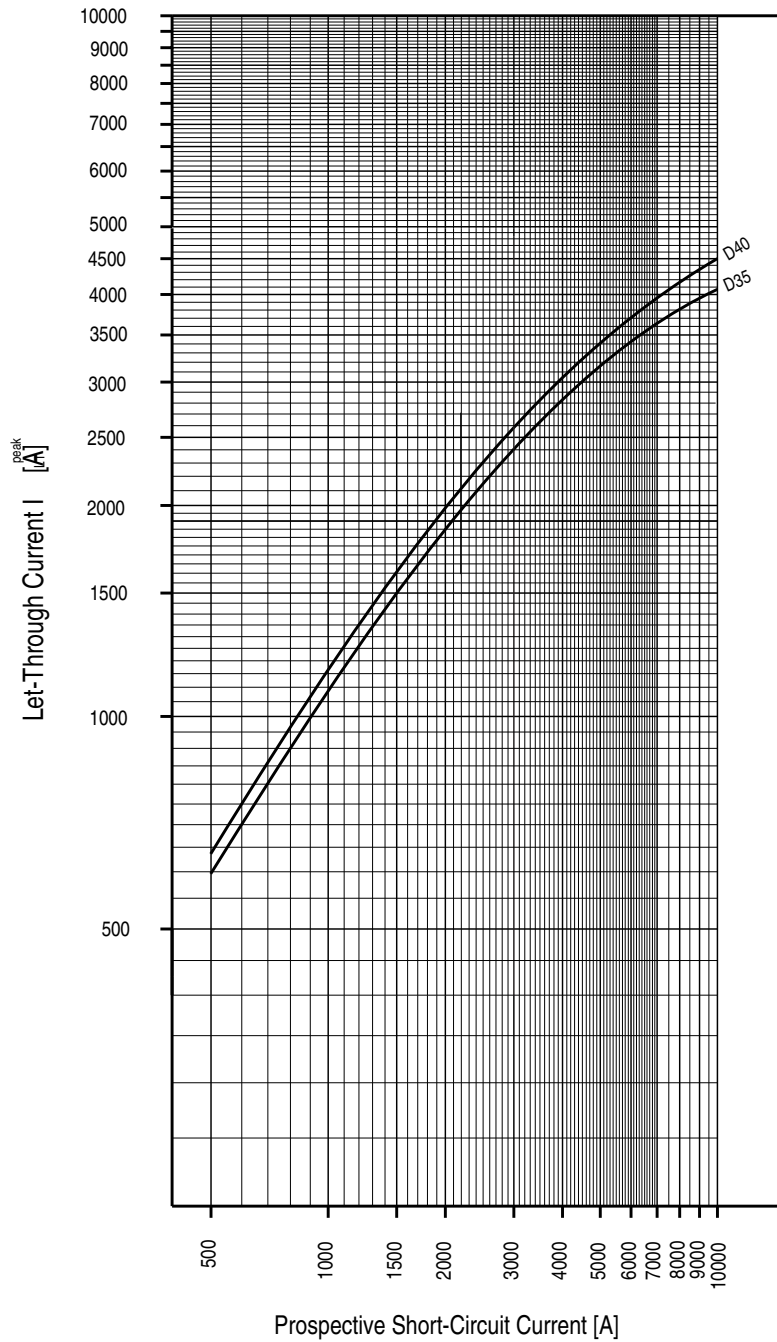


Figure 12: Bulletin 1489-A Maximum Let Through Current

Type D (35-40 A)
240V



**Bulletin 1489-D
Industrial Circuit
Breaker for DC
Applications**

Specifications

Bulletin 1489-D			
Number of Poles	1, 2, and 3		
Standards	UL 489 CSA C22.2 No. 5 EN/IEC 60947-2		
Certifications	UL Listed Circuit Breaker (File Number E197878) CSA Certified, CE Marked		
HACR Rating (USA/Canada)	N/A		
SWD Rating (USA/Canada)	N/A		
Calibration Temperature	UL/CSA: 40 °C EN/IEC: 30 °C		
Rated Interrupting Capacity	EN/IEC - Icu: 10 000 A		
	UL/CSA (See Below)		
	Trip Curve	Rated Current (In)	Interrupt Rating (UL/CSA)
	C Curve	2...40 A	10,000 A
Rated Tripping Current	UL/CSA: 2...40 A, -125V DC 1-pole -250V DC 2-pole EN/IEC: 2...40 A, -250V DC 1-pole -500V DC 2-pole		
Degree of Protection	Finger-safe from front: -IP20 per IEC 529 from front -IP00 at wire terminals		
Dielectric Strength	1960V AC		
Shock	25 G Half sine wave for 11 ms (3 axes)		
Vibration	Frequency range: 10...200 Hz Max. Amplitude (p-p) = 0.030 in. Max. Acceleration = 5 G 2 hours each of 3 axes		
Normal Operating Environment	-25...+55 °C (-13...+131 °F) (non-condensing)		
Trip Curve	C curve (Inductive) 7...15 I _N		
Shipment and Short-Term Storage Limits	-40...+85 °C (-40...+185 °F)		
Wire Size	1 wire: #18...6 AWG 2 wires: #18...10 AWG		
Terminal Torque	#18...12 AWG: 21 lb•in. #10...8 AWG: 25 lb•in. #6 AWG: 36 lb•in. #2 PoziDriv		
Recommended Wire Strip Length	0.5 in.		

Bulletin 1489 UL 489 Circuit Breaker Specifications

Figure 13: Bulletin 1489-D Circuit Diagram

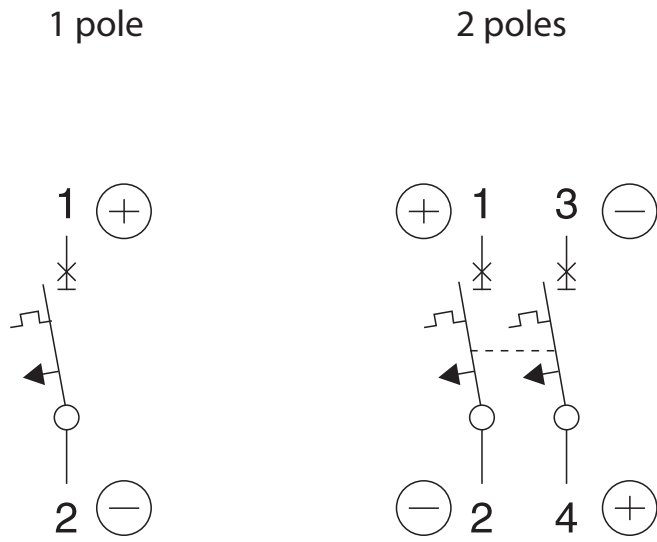
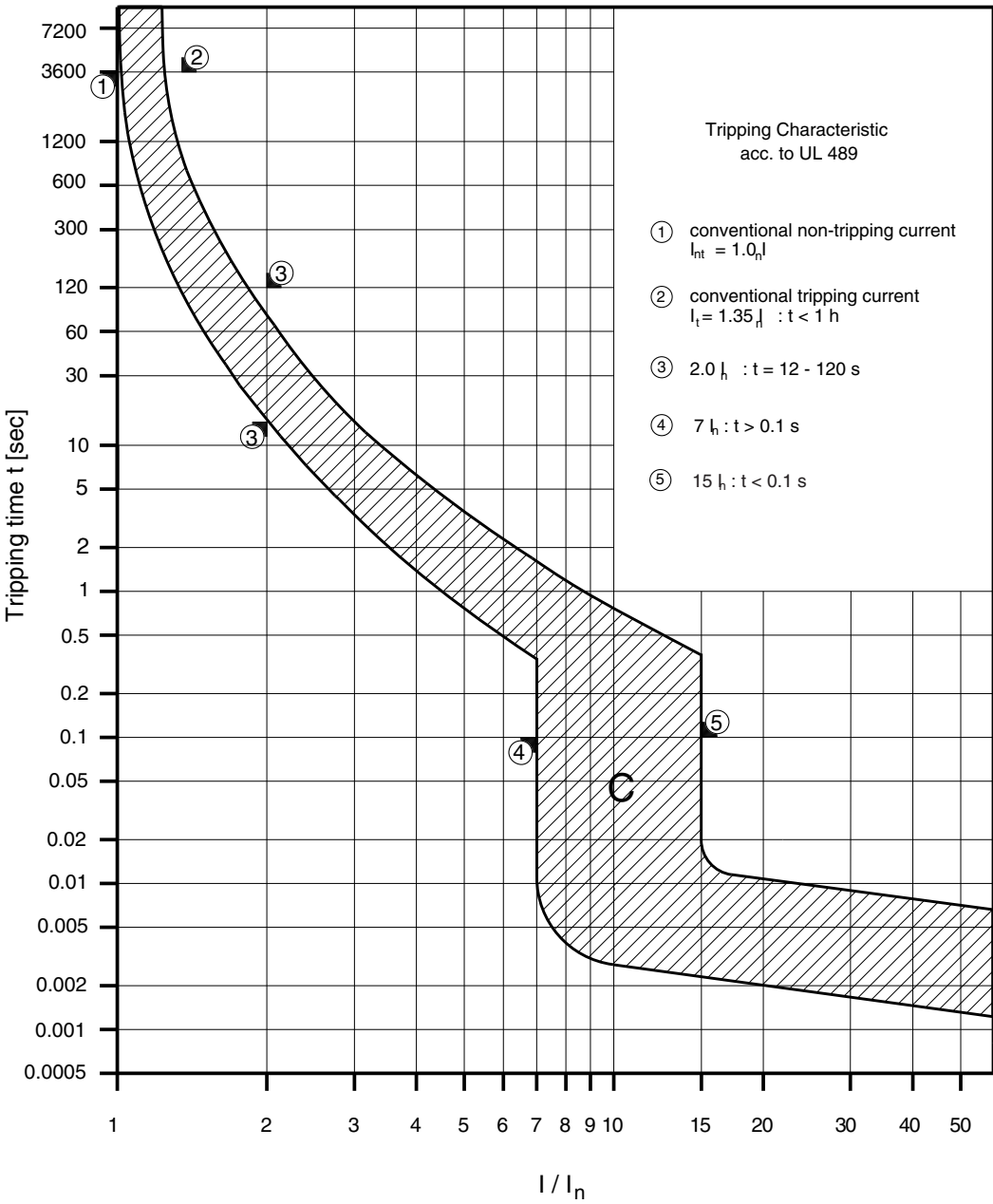


Figure 14: Bulletin 1489-D Time Current Charateristic, UL



Bulletin 1489-D Time Current Characteristic, IEC/EN

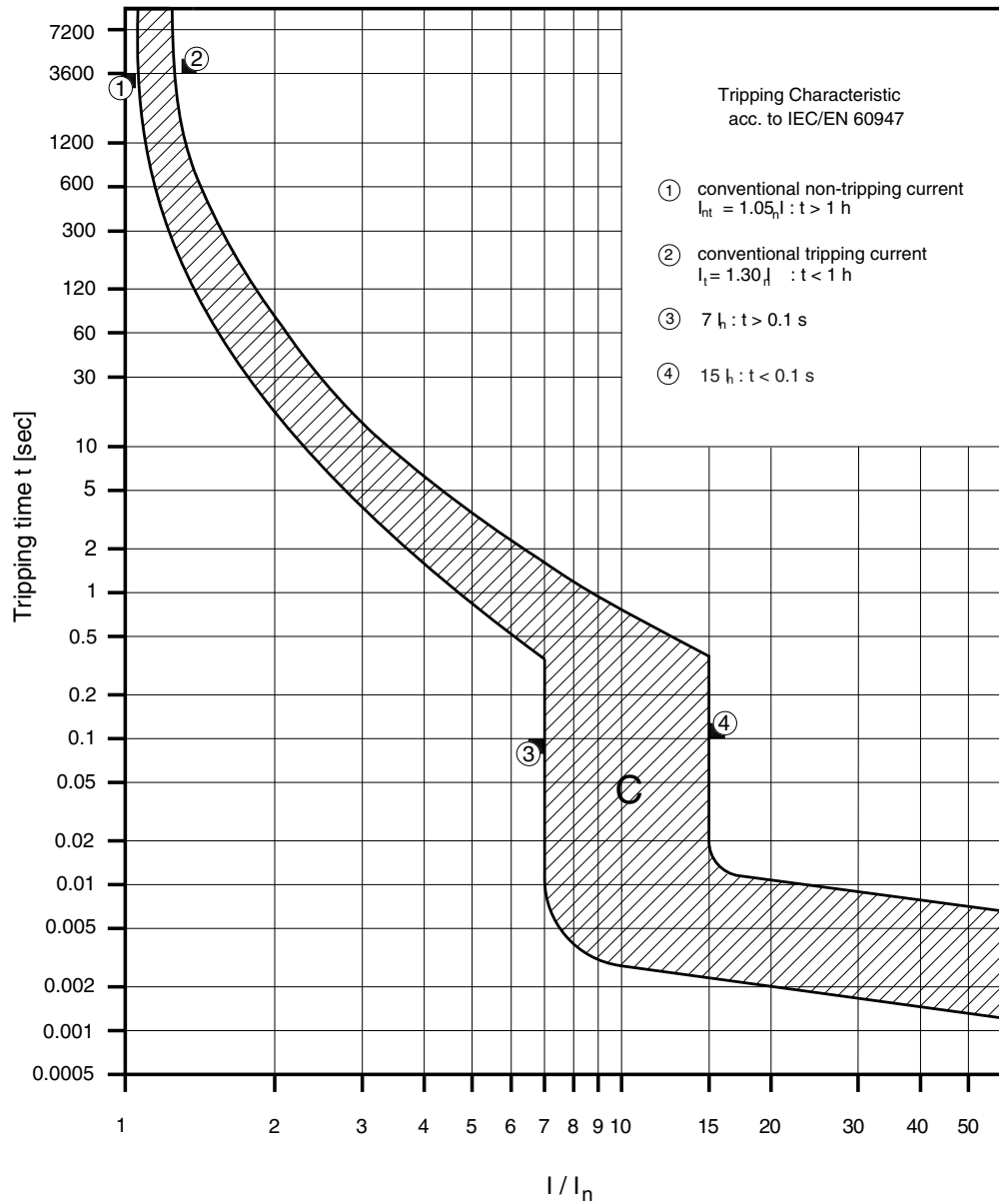


Figure 15: Bulletin 1489-D Power Loss at In

C Characteristic

I_n [A]	1p	2p
	P [W]	P [W]
2	1.4	2.8
3	1.2	2.4
4	1.4	2.8
5	1.4	2.8
6	1.2	2.4
7	1.7	3.4
8	1.4	2.8
10	1.8	3.6
13	2.3	4.6
15	1.9	3.8
16	2.1	4.3
20	2.9	5.8
25	3.0	6.0
30	3.0	6.0
32	3.4	6.8
35	3.7	7.4
40	4.0	8.1

Figure 16: Bulletin 1489-D Internal Resistance (Room Temperature)

C Characteristic

I_n /A	R [m]
2	341
3	128
4	84
5	56
6	31
7	28
8	21
10	16
13	12
15	7.0
16	7.0
20	5.9
25	4.2
30	2.7
32	2.7
35	2.5
40	2.1

Figure 17: Bulletin 1489-D Influence of Ambient Temperature (T) on Load-Carrying Capacity

Bulletin 1489 Ambient Temperature Derating
 Calibration Temperature 40° C (UL)
 Application below 0° C is for non-condensing
 atmosphere*

Device Marked Current Rating [A] @ 40 °C	Ambient Temperature (°C)											
	-25	-20	-10	0	10	20	30	35	40	45	50	55
0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.50	0.5	0.5	0.5
1.0	1.3	1.2	1.2	1.2	1.1	1.1	1.0	1.0	1.0	1.0	1.0	0.9
1.5	1.9	1.9	1.8	1.7	1.7	1.6	1.6	1.5	1.5	1.5	1.4	1.4
2.0	2.5	2.5	2.4	2.3	2.2	2.2	2.1	2.0	2.0	2.0	1.9	1.9
3.0	3.8	3.7	3.6	3.5	3.4	3.2	3.1	3.1	3.0	2.9	2.9	2.8
4.0	5.0	5.0	4.8	4.6	4.5	4.3	4.2	4.1	4.0	3.9	3.8	3.8
5.0	6.3	6.2	6.0	5.8	5.6	5.4	5.2	5.1	5.0	4.9	4.8	4.7
6.0	7.5	7.4	7.2	7.0	6.7	6.5	6.2	6.1	6.0	5.9	5.8	5.6
7.0	8.8	8.7	8.4	8.1	7.8	7.6	7.3	7.1	7.0	6.9	6.7	6.6
8.0	10.0	9.9	9.6	9.3	9.0	8.6	8.3	8.2	8.0	7.8	7.7	7.5
10.0	12.6	12.4	12.0	11.6	11.2	10.8	10.4	10.2	10	9.8	9.6	9.4
13.0	16.3	16.1	15.6	15.1	14.6	14.0	13.5	13.3	13	12.7	12.5	12.2
15.0	18.8	18.6	18.0	17.4	16.8	16.2	15.6	15.3	15	14.7	14.4	14.1
16.0	20.1	19.8	19.2	18.6	17.9	17.3	16.6	16.3	16	15.7	15.4	15.0
20.0	25.1	24.8	24.0	23.2	22.4	21.6	20.8	20.4	20	19.6	19.2	18.8
25.0	31.4	31.0	30.0	29.0	28.0	27.0	26.0	25.5	25	24.5	24.0	23.5
30.0	37.7	37.2	36.0	34.8	33.6	32.4	31.2	30.6	30	29.4	28.8	28.2
32.0	40.2	39.7	38.4	37.1	35.8	34.6	33.3	32.6	32	31.4	30.7	30.1
40.0	43.9	43.4	42.0	40.6	39.2	37.8	36.4	35.7	35	34.3	33.6	32.9

* Care should be taken for application below 0 °C. These devices are not certified to operate correctly in the presence of ice.

All other specifications for standard Bulletin 1489-A products remain unchanged.

The ambient temperature derating applies to applications of the device as an IEC Miniature Circuit Breaker (MCB), following 60 947-2 and as Circuit Breaker to UL489/CSA 22.2 No 5..

Ambient temperature refers to the free air temperature in contact with the 1489 device

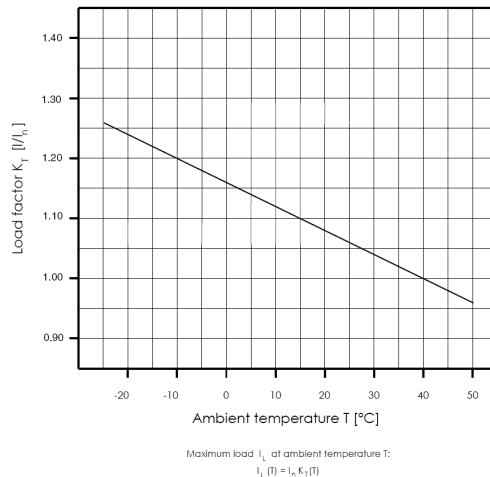


Figure 18: Bulletin 1489-D Maximum Let Through Energy

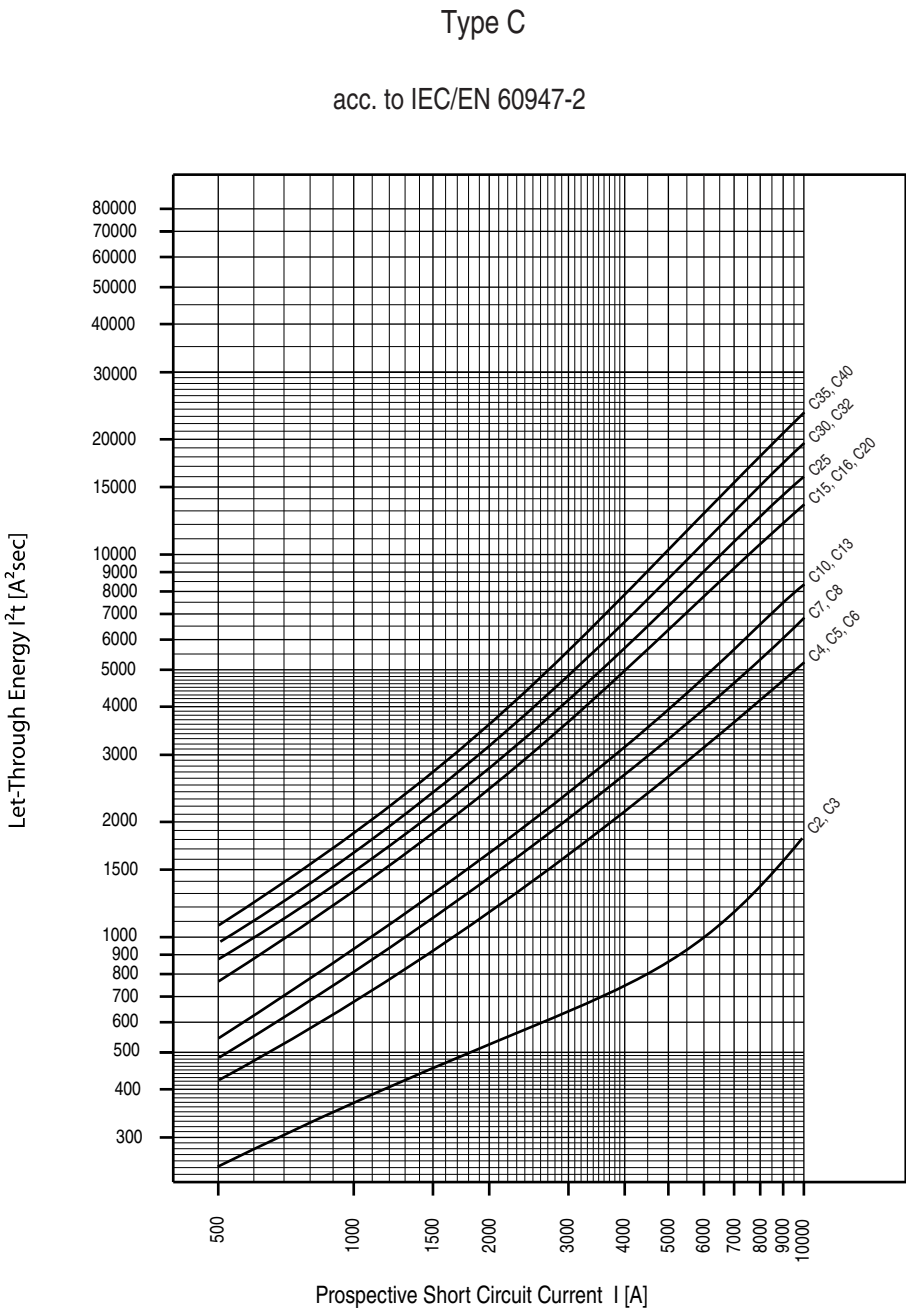
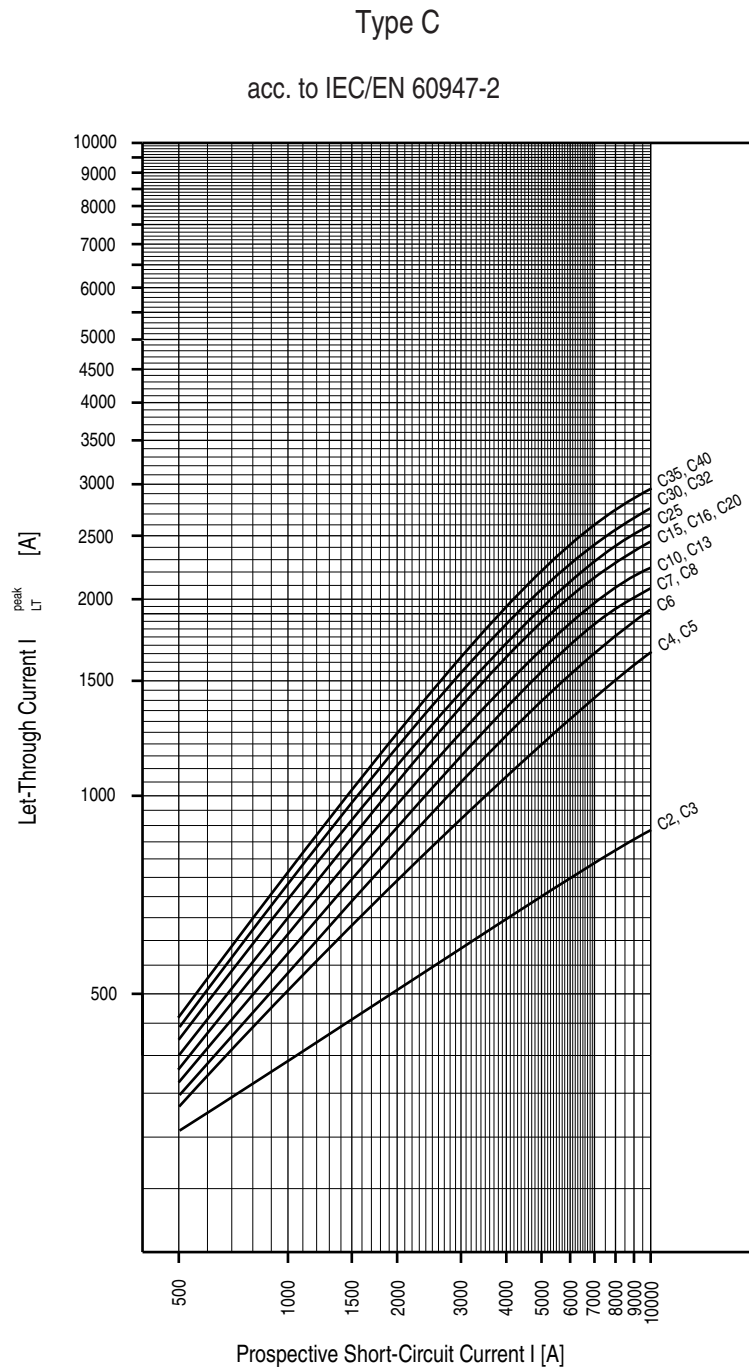


Figure 19: Bulletin 1489-D Maximum Let Through Current



Rockwell Automation and Allen-Bradley are trademarks of Rockwell Automation, Inc.

www.rockwellautomation.com

Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444

Europe/Middle East/Africa: Rockwell Automation, Vorstlaan/Boulevard du Souverain 36, 1170 Brussels, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640

Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846