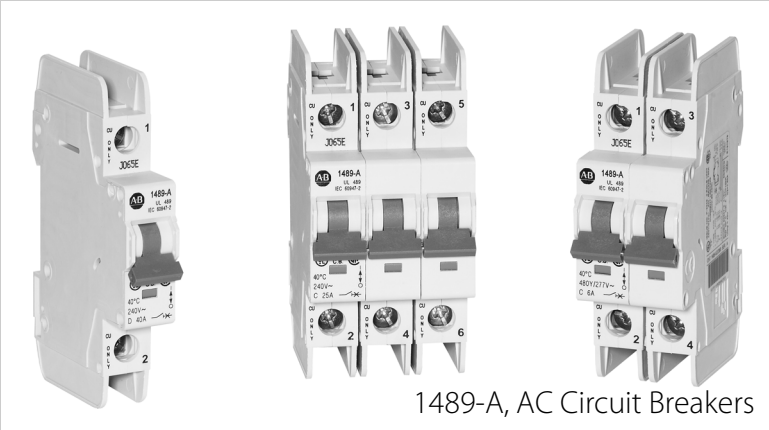
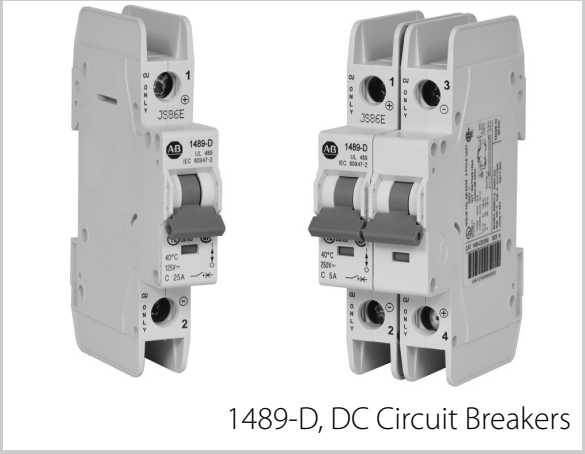
Bulletin 1489
UL489 Circuit Breakers

Tech Data

1489-A Standard AC Circuit Breaker
1489-D DC Circuit Breaker



1489-A, AC Circuit Breakers



1489-D, DC Circuit Breakers

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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 - *I*cu: 15 000 A		
	UL/CSA (See Below)		
	Trip Curve	Rated Current (In)	Interrupt Rating (UL/CSA)
	C Curve	0.5...15 A	10,000 A
		16...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.		

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

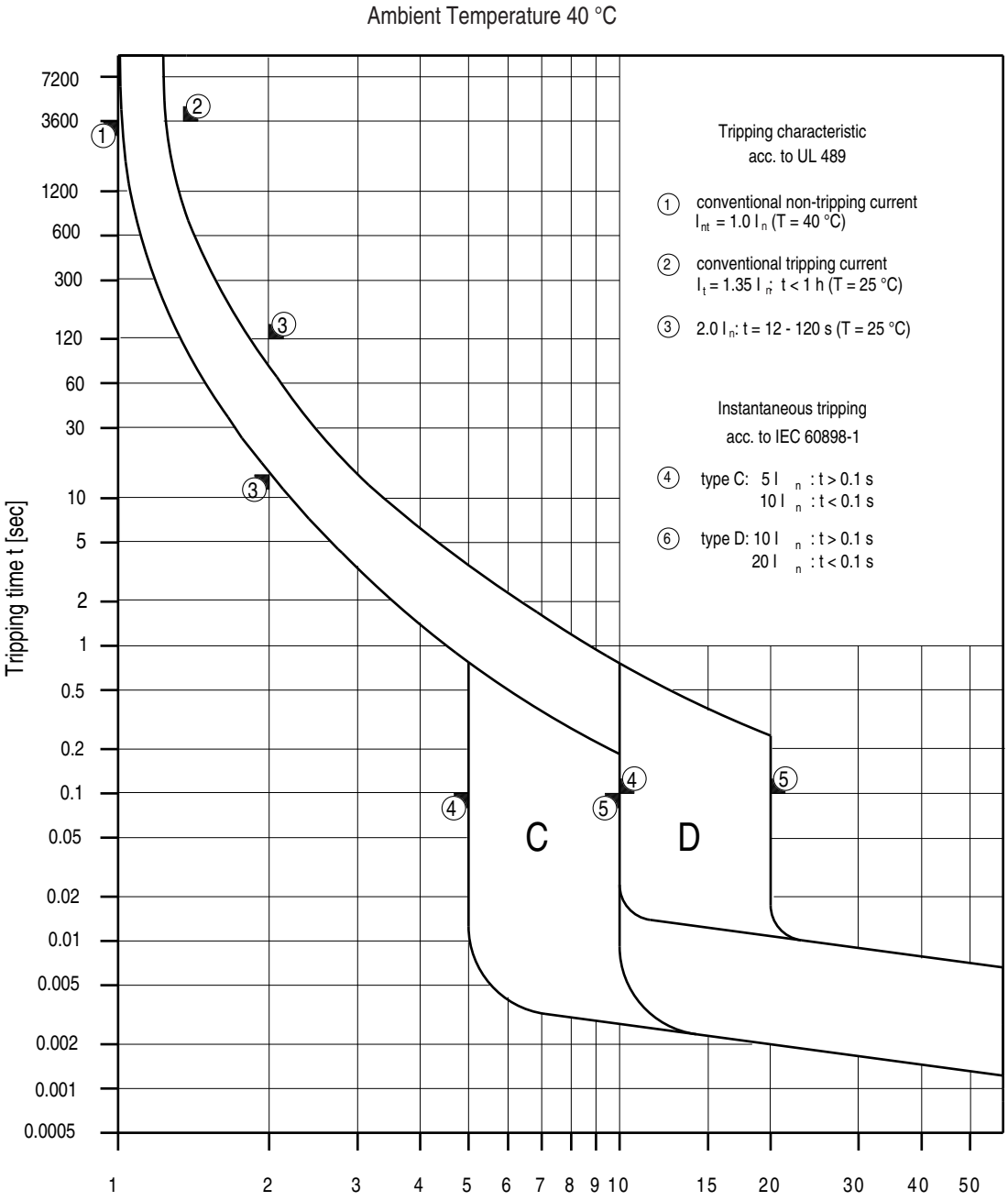


Figure 2: Bulletin 1489-A Power Loss at In

C Characteristic

	1p	2p	3p
I_n /A	P* [W]	P* [W]	P* [W]
0.5	1.6	3.2	4.7
1	1.1	2.2	3.4
1.5	1.3	2.6	3.9
2	1.4	2.8	4.3
3	1.2	2.4	3.6
4	1.4	2.9	4.3
5	1.9	3.7	5.6
6	1.2	2.3	3.5
7	1.4	2.8	4.3
8	1.4	2.8	4.2
10	1.8	#3.6	5.3
13	2.4	4.7	7.1
15	1.9	3.8	5.6
16	2.1	4.3	6.4
20	2.9	5.8	8.7
25	3.1	6.2	9.3
30	3.0	6.0	9.0
32	3.4	6.8	10.2
35	3.7	7.4	11.0
40	4.0	8.1	12.1

*50Hz

D Characteristic

	1p	2p	3p
I_n /A	P* [W]	P* [W]	P* [W]
0.5	1.6	3.2	4.8
1	0.8	1.5	2.3
1.5	1.0	2.1	3.1
2	1.0	2.1	3.1
3	1.2	2.4	3.6
4	1.4	2.9	4.3
5	1.5	2.9	4.4
6	1.2	2.3	3.5
7	1.4	2.8	4.3
8	1.2	2.4	3.7
10	1.5	3.0	4.5
13	2.0	4.1	6.1
15	1.5	3.1	4.6
16	1.7	3.5	5.2
20	1.8	3.7	5.5
25	2.6	5.1	7.7
30	2.7	5.4	8.1
32	3.1	6.2	9.3
35	3.8	7.6	11.3
40	3.9	7.8	11.6

*50Hz

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

C Characteristic

I_n /A	Z [mΩ]*	R [mΩ]*
0.5	6400	6300
1	1100	1080
1.5	560	550
2	340	330
3	132	130
4	86	85
5	70	69
6	31	30
7	28	27
8	20	19.6
10	15.8	15.5
13	12.3	12.1
15	7.1	7.0
16	7.1	7.0
20	6.0	5.9
25	4.1	4.0
30	2.8	2.7
32	2.8	2.7
35	2.5	2.5
40	2.1	2.1

*50Hz

D Characteristic

I_n /A	Z [mΩ]*	R [mΩ]*
0.5	6400	6300
1	770	755
1.5	460	450
2	250	245
3	132	130
4	86	85
5	57	56
6	31	30
7	28	27
8	18	17.6
10	13.5	13.2
13	10.5	10.3
15	5.9	5.8
16	5.9	5.8
20	4.0	3.9
25	3.4	3.3
30	2.5	2.5
32	2.5	2.5
35	2.5	2.5
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 40º C (UL)
Application below 0º 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 devcies 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

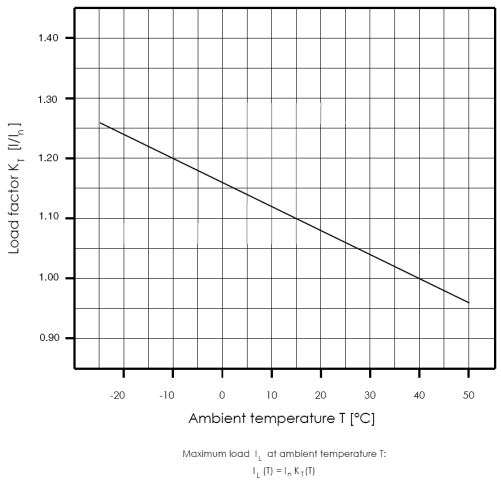


Figure 5: Bulletin 1489-A Maximum Let Through Energy

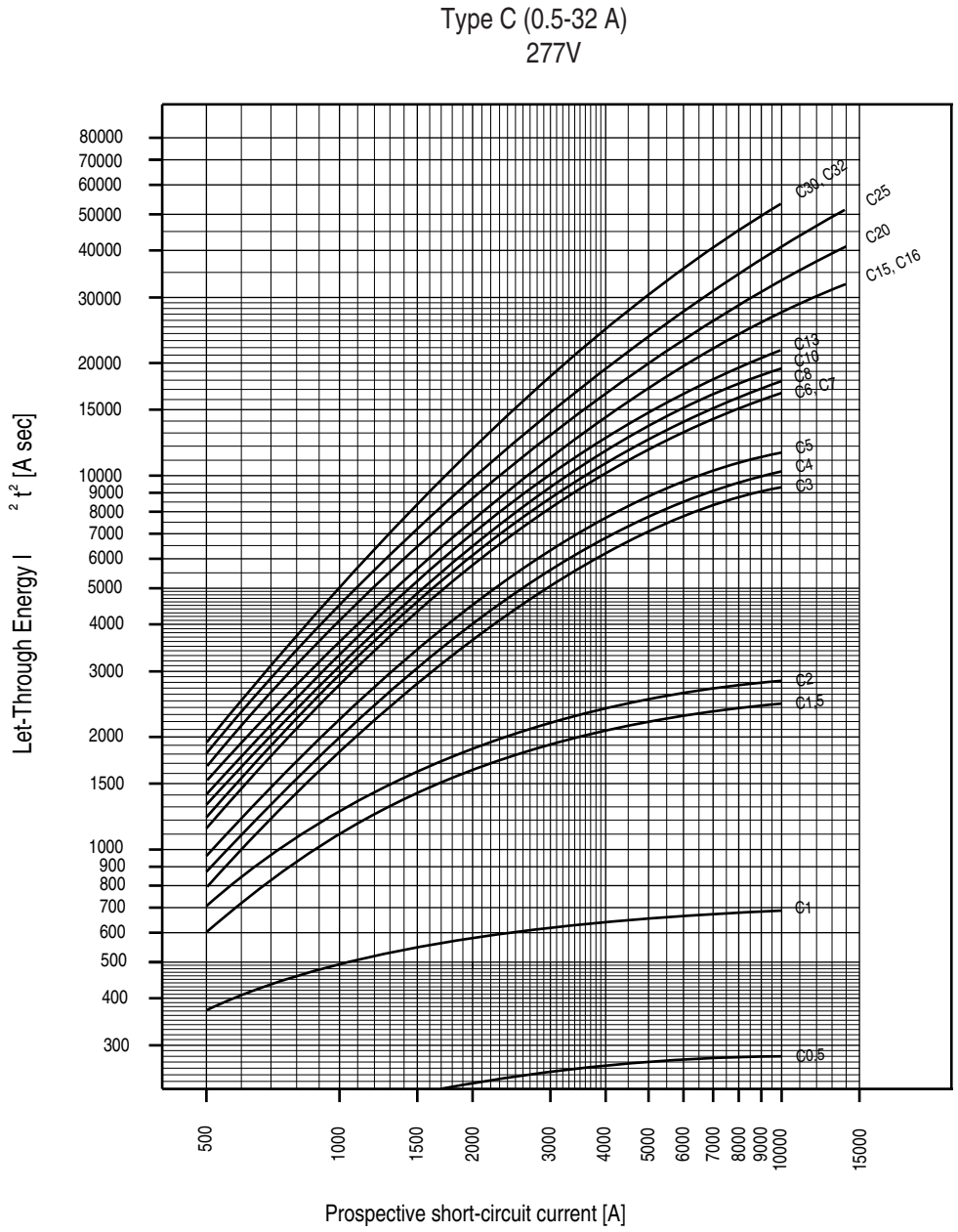


Figure 6: Bulletin 1489-A Maximum Let Through Energy

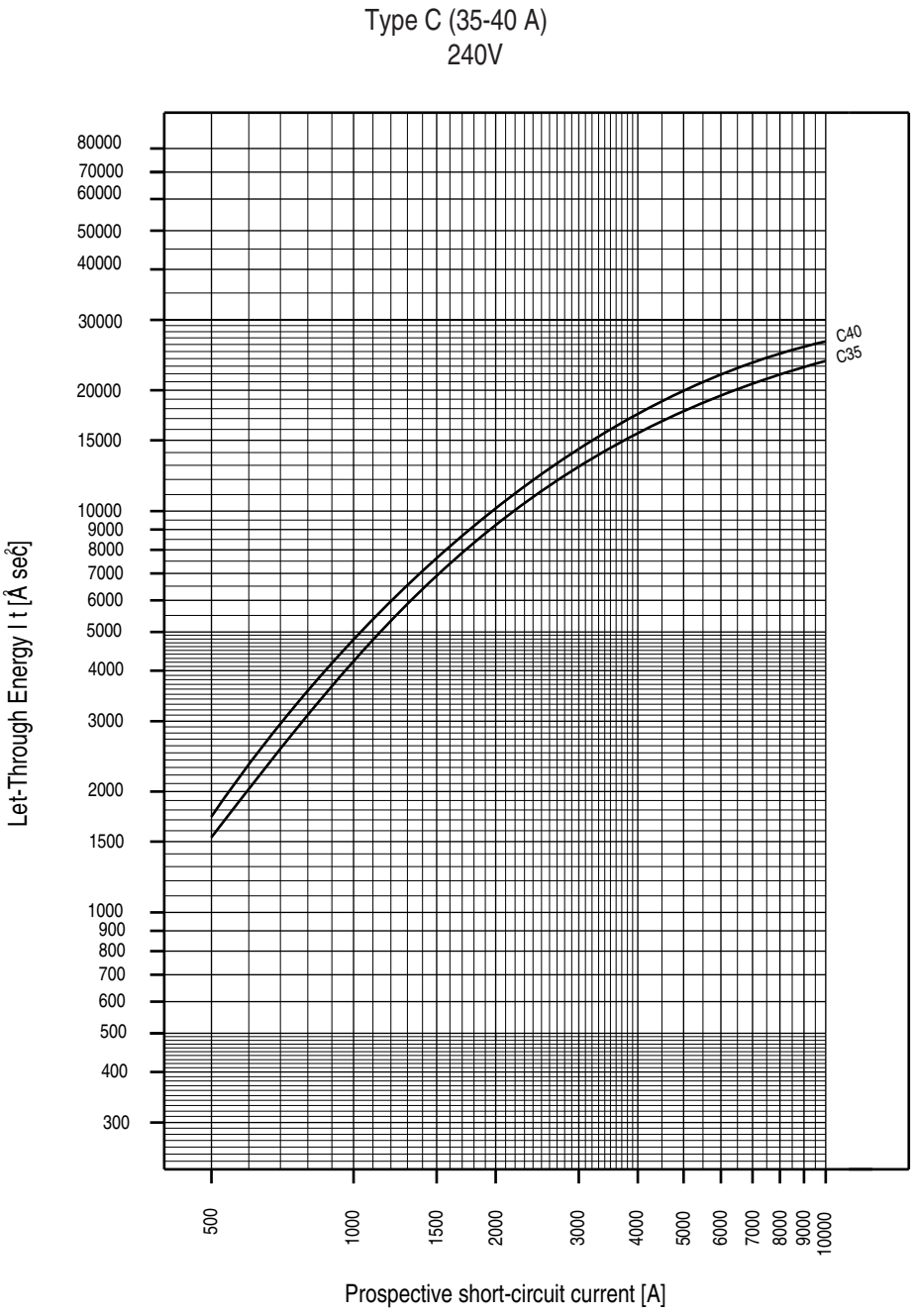


Figure 7: Bulletin 1489-A Maximum Let Through Energy

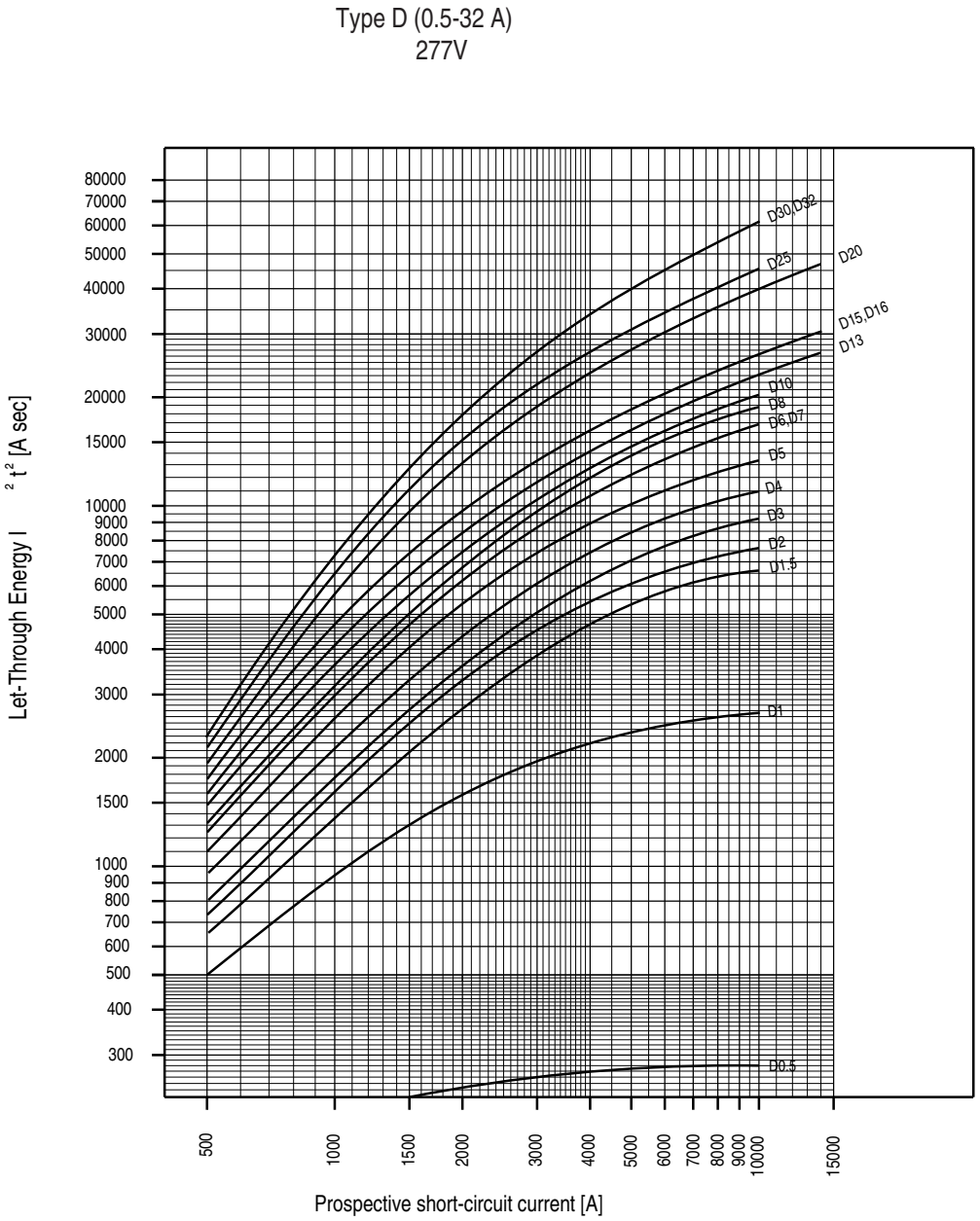


Figure 8: Bulletin 1489-A Maximum Let Through Energy

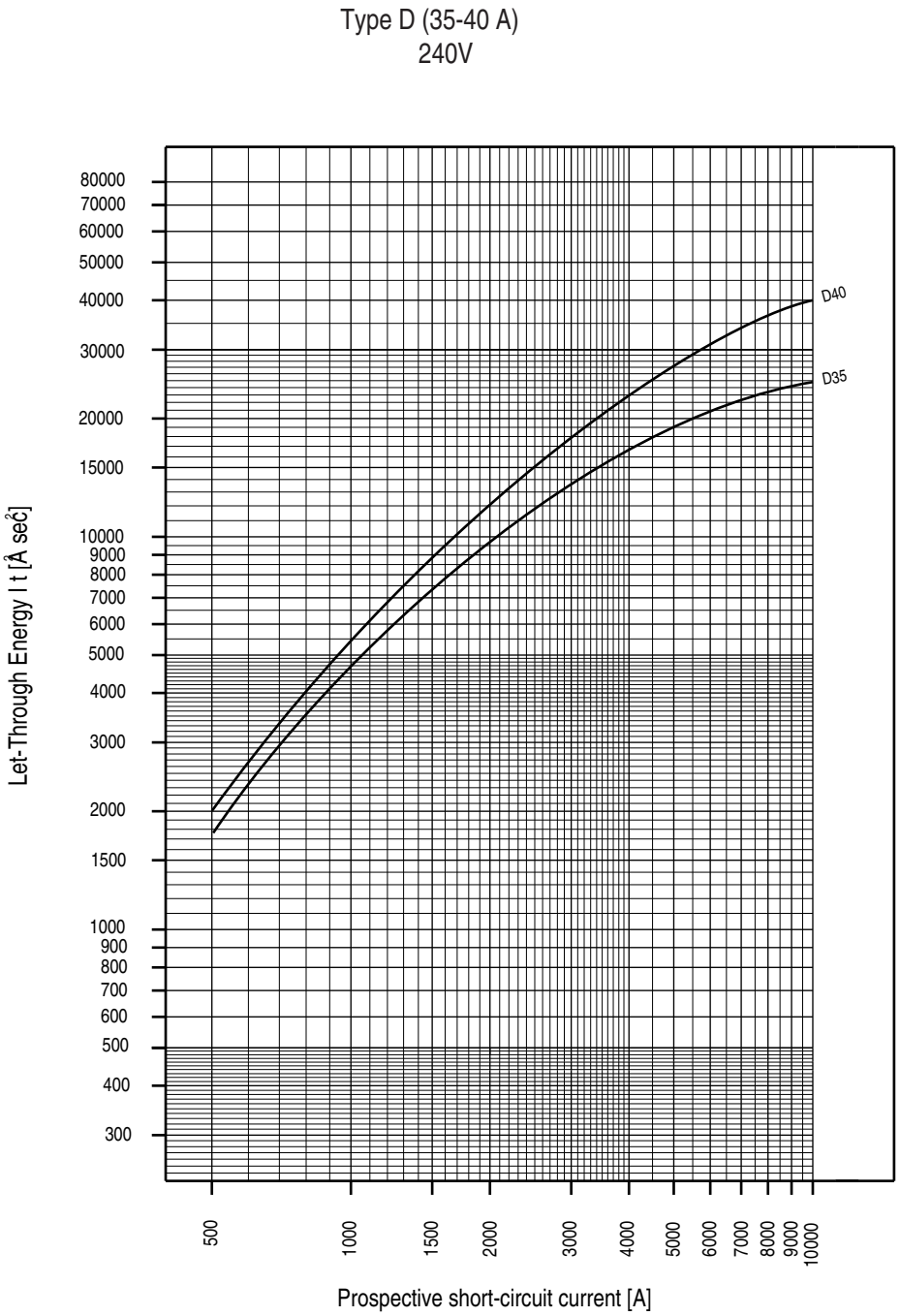


Figure 9: Bulletin 1489-A Maximum Let Through Current

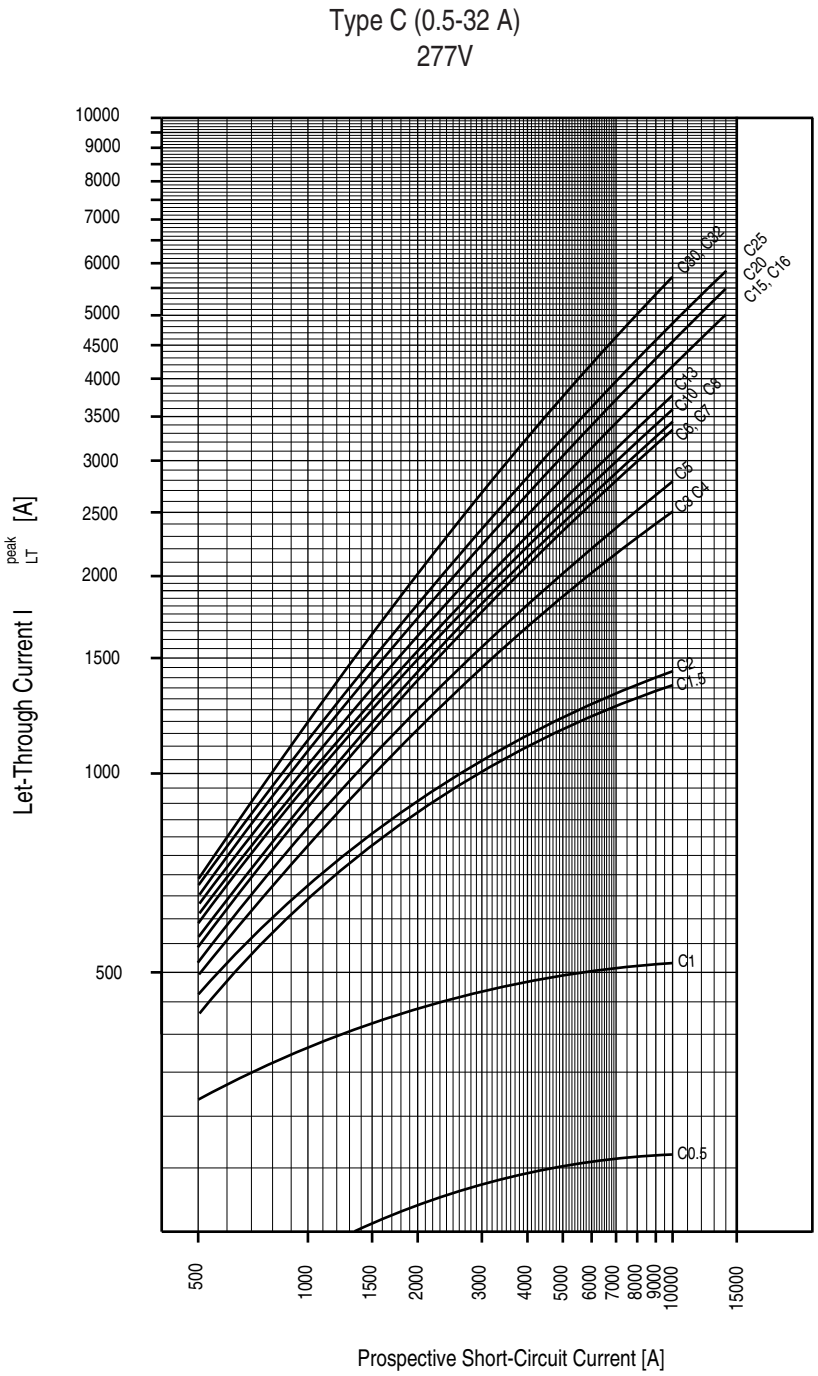


Figure 10: Bulletin 1489-A Maximum Let Through Current

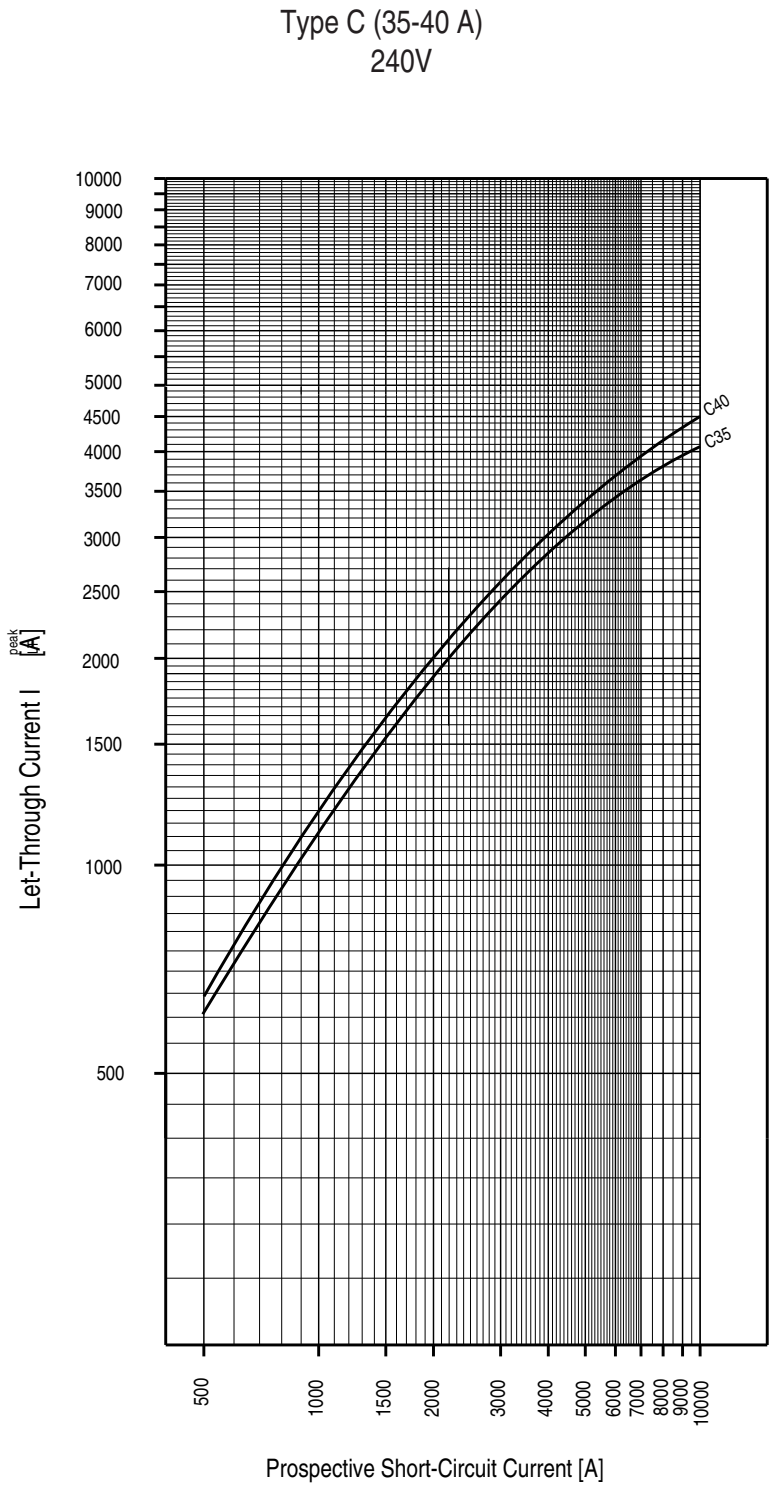


Figure 11: Bulletin 1489-A Maximum Let Through Current

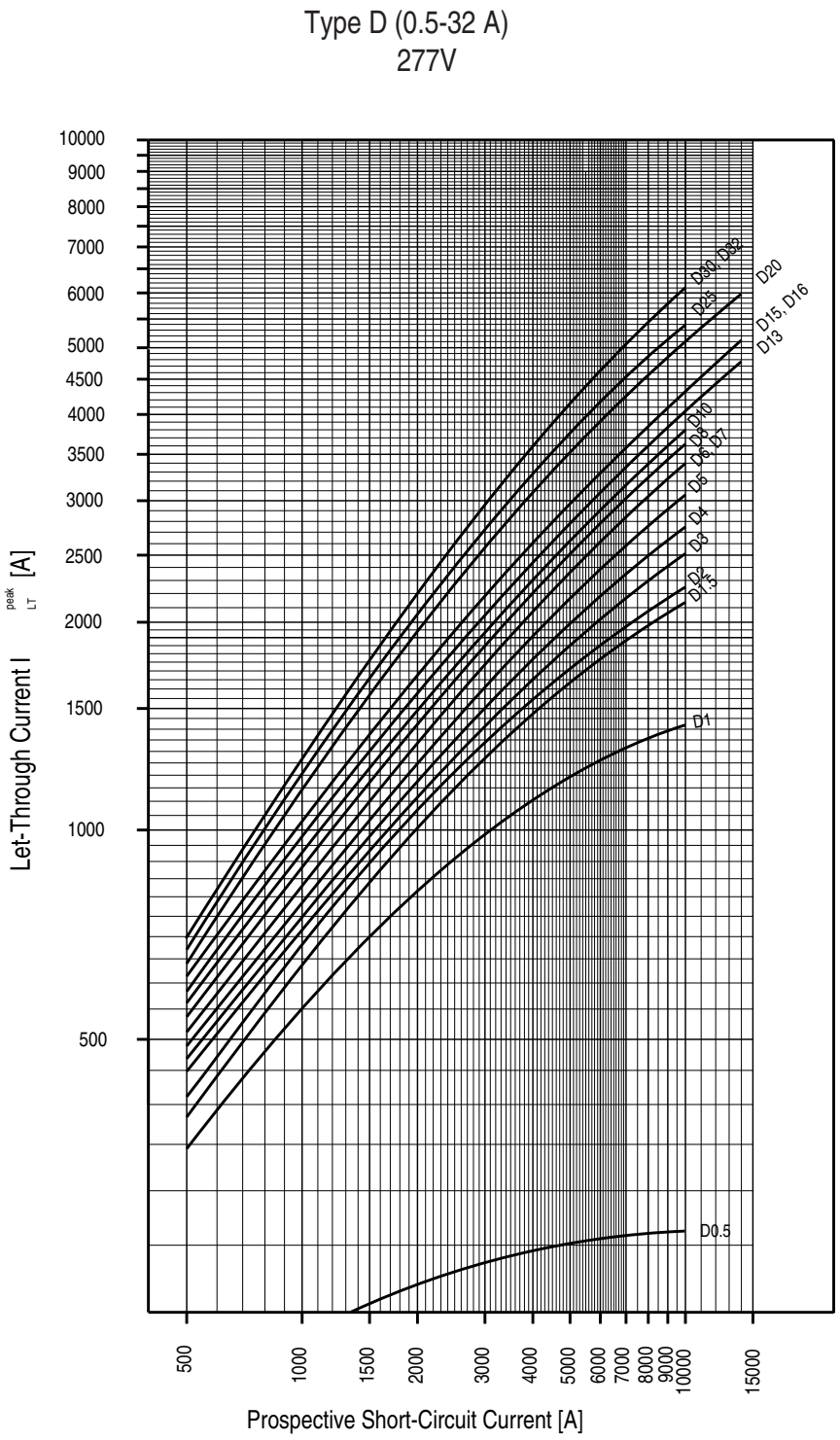
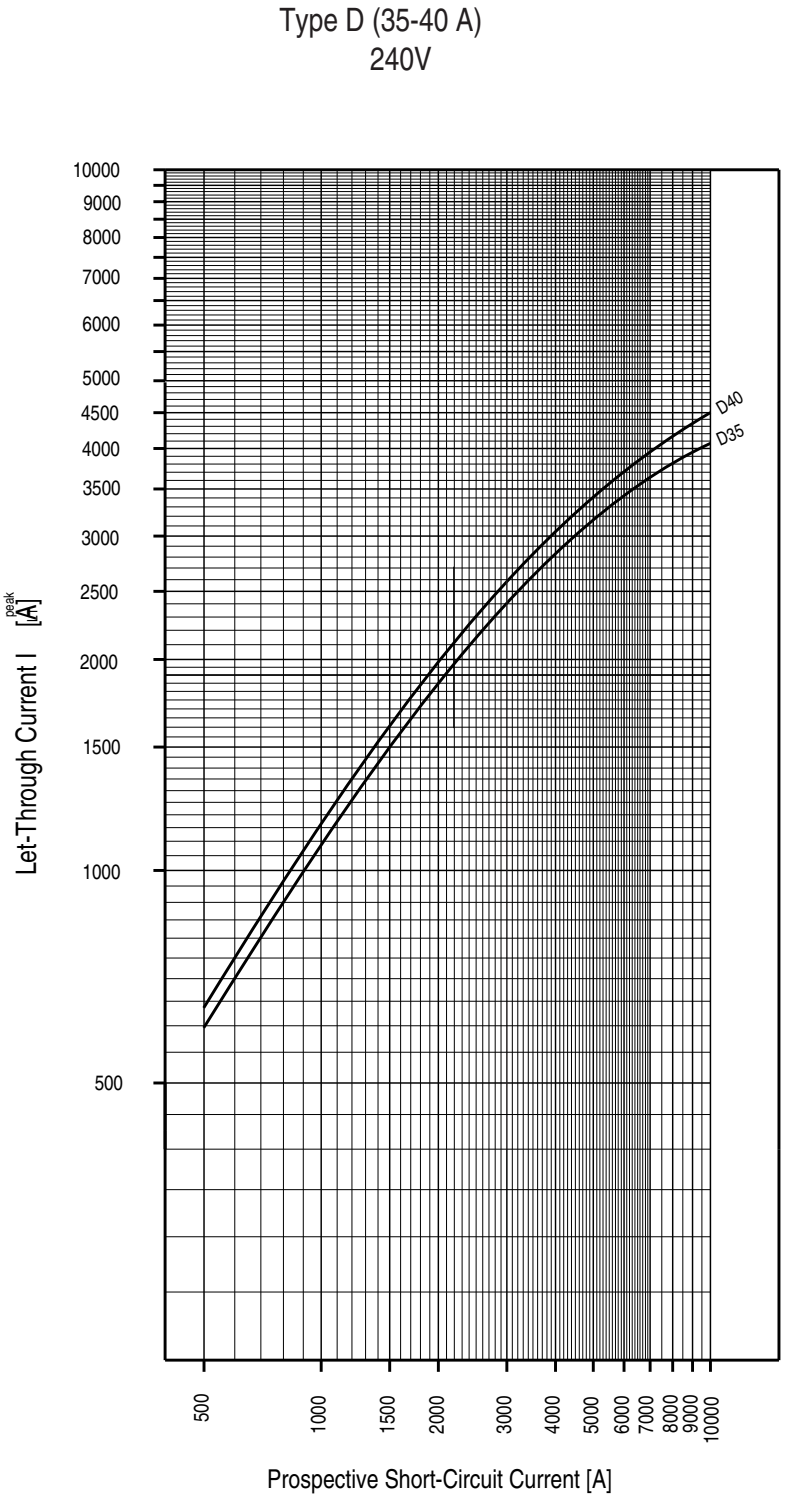


Figure 12: Bulletin 1489-A Maximum Let Through Current



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 - *I*cu: 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.		

Figure 13: Bulletin 1489-D Circuit Diagram

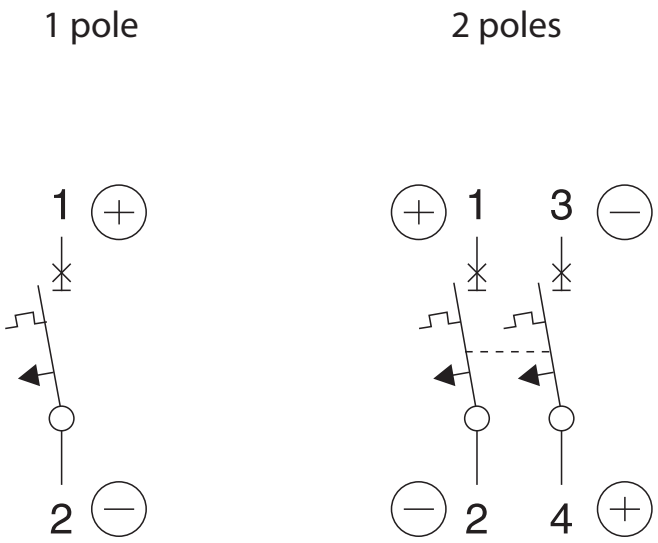
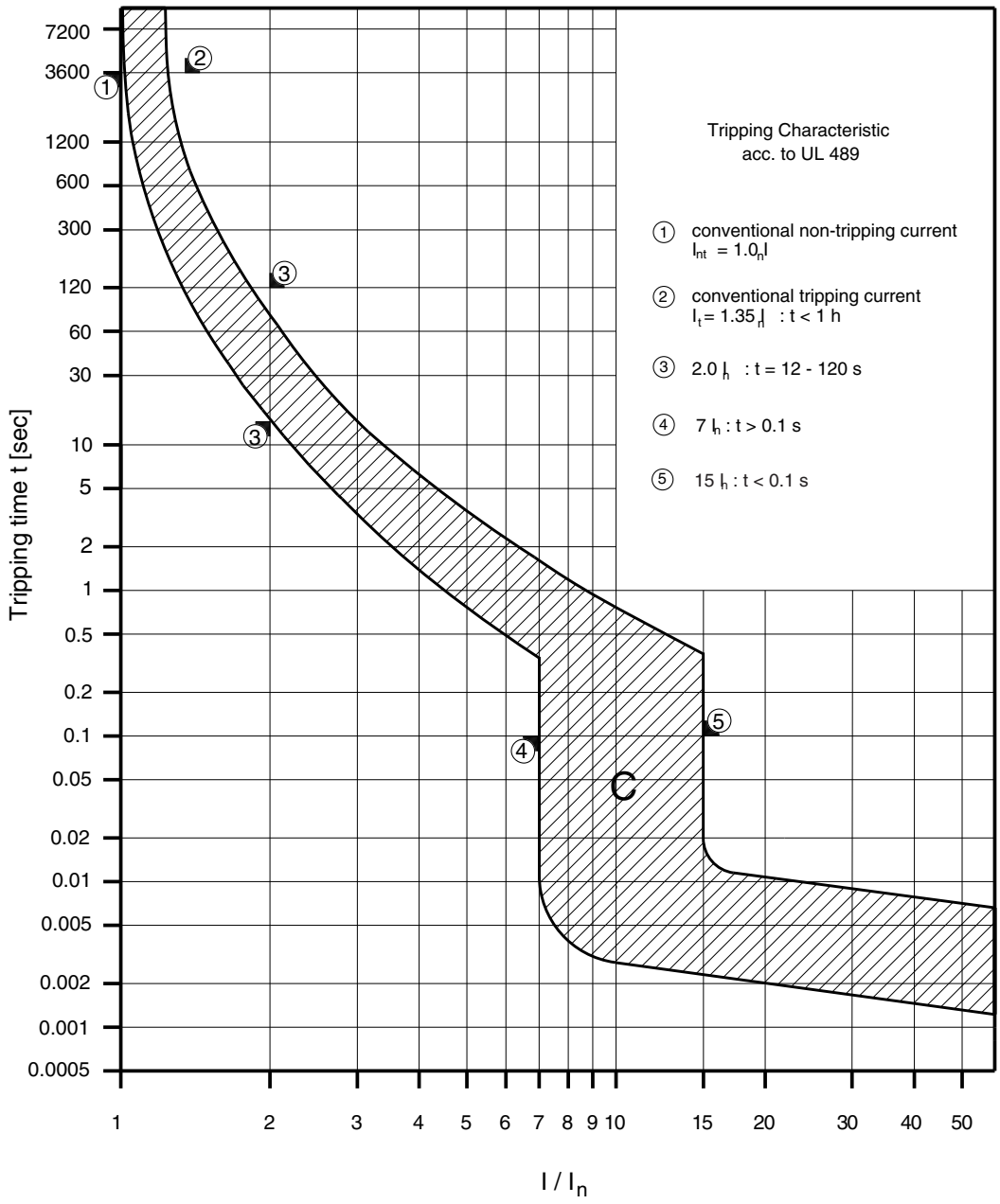


Figure 14: Bulletin 1489-D Time Current Charateristic, UL



Bulletin 1489-D Time Current Charateristic, IEC/EN

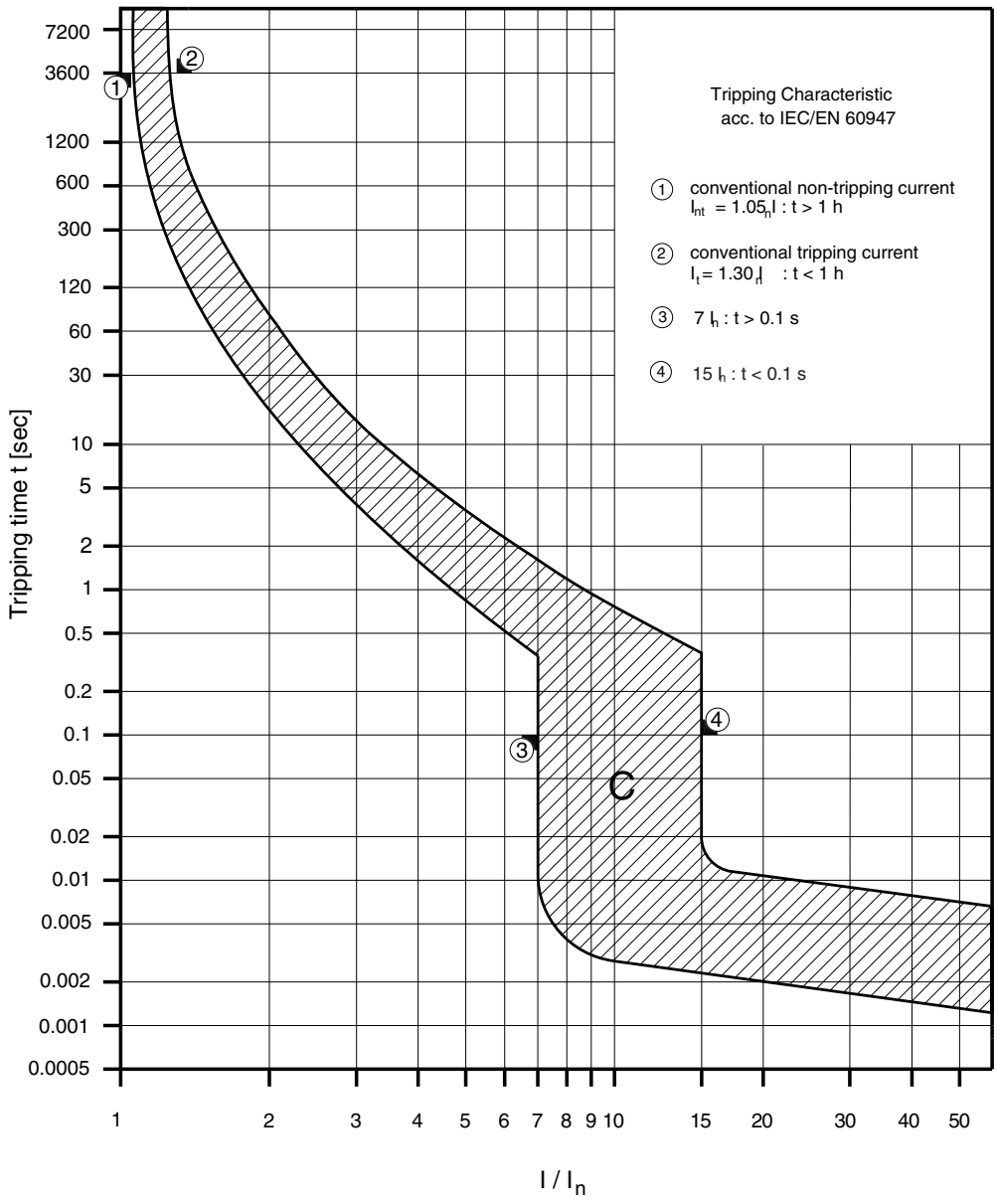


Figure 15: Bulletin 1489-D Power Loss at In

C Characteristic

	1p	2p
I_n [A]	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 devcies 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

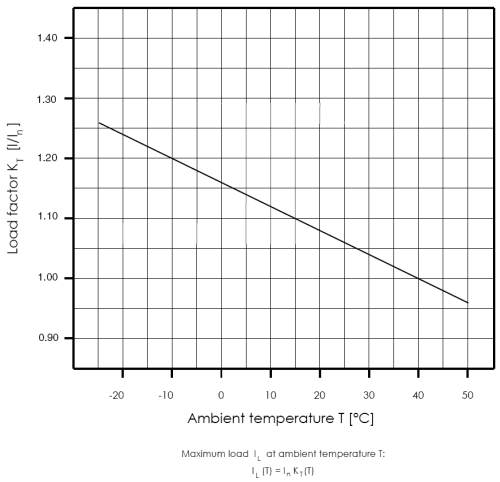


Figure 18: Bulletin 1489-D Maximum Let Through Energy

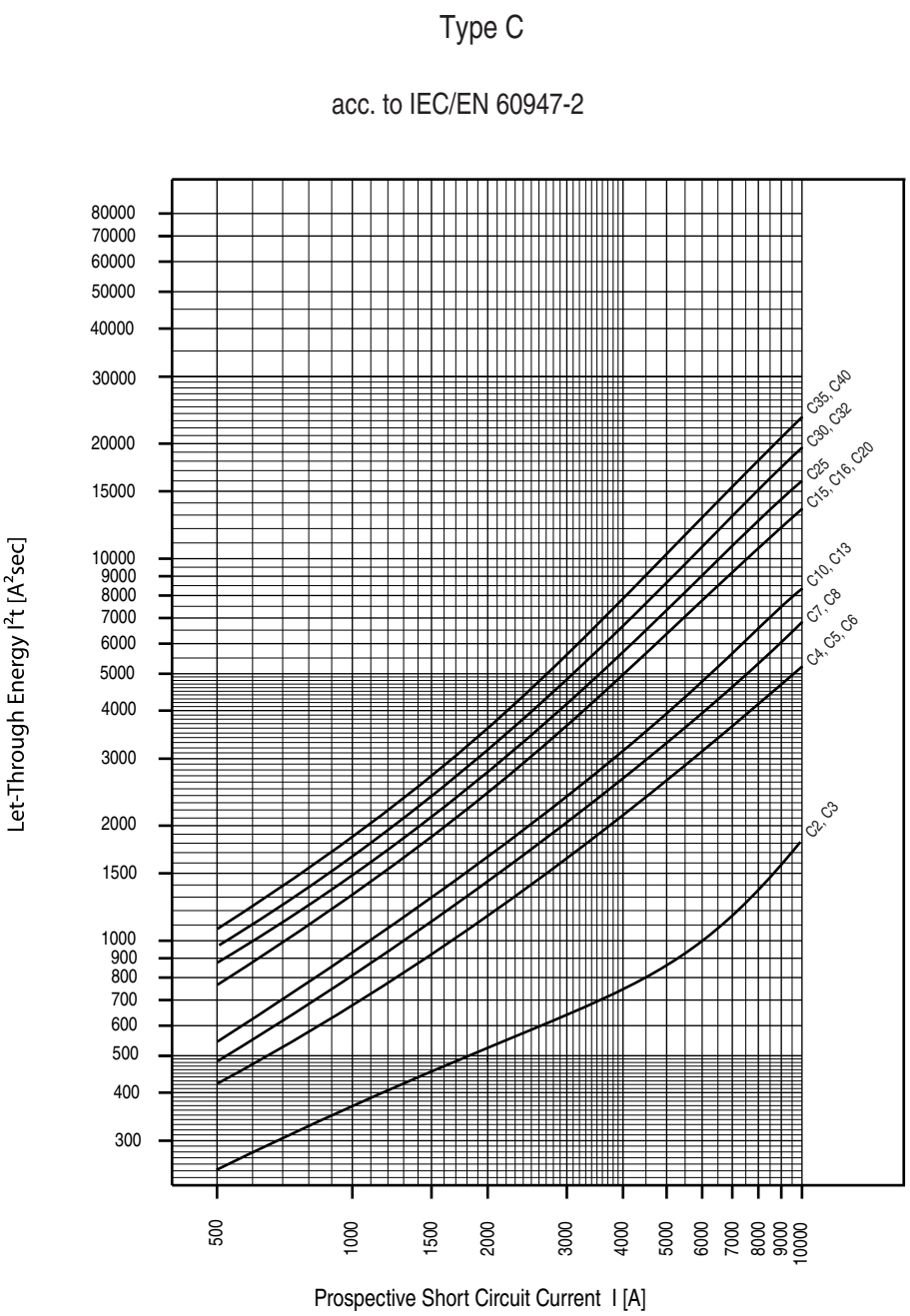
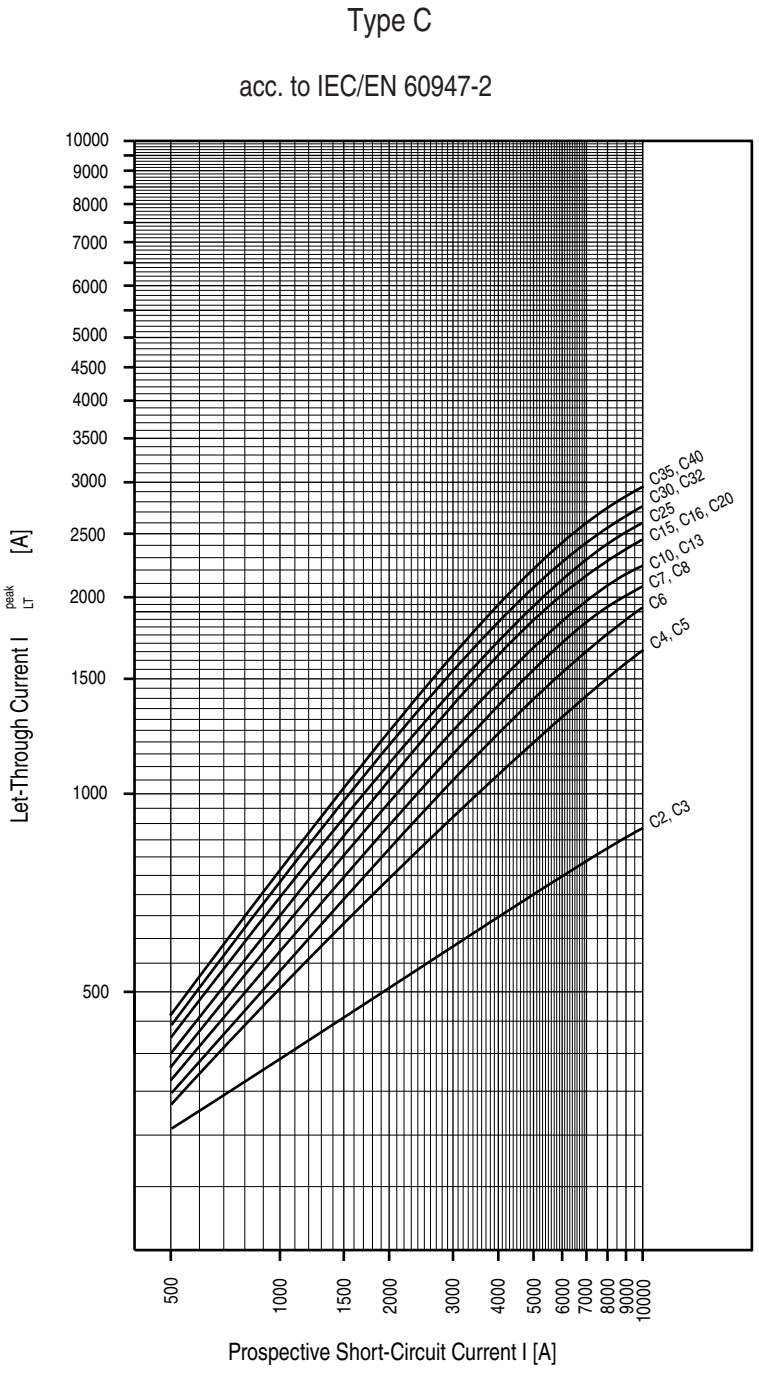


Figure 19: Bulletin 1489-D Maximum Let Through Current



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

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