

24972 Circuit Breaker

MINIATURE CIRCUIT BREAKER , 440VAC, 6A, CIRCUIT BREAKER TYPE: STANDARD

Image not available

- [Product Information](#)

Features and Specifications

Approvals: IEC 60947-2 Rated

Circuit Breaker Type: Standard

Catalog Reference Number: 0860CT0201

Enclosure Rating: IP40

For Use With: OEM Panels and Equipment

General Application: Short circuit and overload protection

Marketing Trade Name: Multi 9

Ampere Rating: 6A

Voltage Rating: 440VAC

Mounting Type: DIN Rail (35mm)

Weight: 4.23 Ounces

Number of Poles: 1-Pole

Short Circuit Current Rating: 30kA@130VAC - 15kA@240VAC - 4kA@415VAC

Type: C60H

Trip Curve: C Curve - Magnetic operates between 5 to 10 times

Wire Size: #18 to #4 AWG

Height: 3.19 Inches (18mm)

Width: 0.71 Inches (18mm)

Depth: 3.00 Inches (76mm)

Ordering and Shipping Information

- **Category** 01078 - Miscellaneous Items, Discount DE2, Circuit Breakers
- **Discount Schedule** DE2
- **Article Number** 785901150077
- **Package Qty** 1
- **Weight (lbs.)** 0.25
- **Availability Code** F
- **Returnability** N

Section 1—Introduction

Multi 9™ Products for Equipment Applications

The Multi 9 modular system of miniature circuit breakers and supplementary protectors, accessories, and peripherals provides complete protection of equipment or especially sensitive circuits within the equipment. Installation labor and space are both minimized by the modular architecture of the Multi 9 system, whether a single protective device or multiple devices with their accessories are being used.

Schneider Electric offers an extensive line of UL 489 Circuit Breakers and UL 1077 Supplementary Protectors. In addition, a variety of IEC certified Circuit Breakers and Accessories are available for OEM's whose products are destined for export beyond North America. To an OEM, this means that one family of electrical protection products can be used regardless of equipment destination.

The Standards include:

- UL 489 Standard for Circuit Breakers
- UL 489A Standard for DC Communication Applications
- UL 1077 Standard for Supplementary Protectors
- UL 1053 Ground Fault Sensing and Relaying Equipment
- IEC 60947-2 Low-voltage switchgear and controlgear - Part 2: Circuit-breakers
- CSA C22.2 No. 5 Standard for Circuit Breakers
- CSA C22.2 No. 235 Supplementary Protectors
- CCC Pending 4Q2007
- C60 Miniature Circuit Breakers are RoHS Compliant

Potential applications include semi-conductor machines, communication equipment, process control panels, computers, medical equipment, electronic controls, transformers, power supplies, and other electrical equipment.

System Flexibility

The Multi 9 System includes an extensive line of field-installable accessories. Plug-on electrical auxiliaries include shunt trip, undervoltage release, auxiliary switch, and alarm switch. Other protection devices include residual current devices, dc circuit breakers, and switches. Control and display devices include signal lamps, push buttons, and motor operators. There are also mechanical accessories for locking, operating, shielding, mounting, etc. The following diagram shows many of the Multi 9 system accessories.

Figure 1: Functional Diagram of Multi 9 System



Multi 9™ System Catalog

Section 1—Introduction

Advantages

Multi 9 C60 circuit breakers and supplementary protectors provide several features which are important to OEMs. These include:

- Small, compact size
- Easy installation on DIN rails
- Limits let-thru current
- Resetability, more convenient than fuses
- Electrical auxiliaries for control and status information
- Extensive variety of accessories

Figure 2: UL 489 Listed Multi 9 C60 Circuit Breakers



Better Protection—Multi 9 supplementary protectors and miniature circuit breakers limit let-through current, providing faster separation of the component from the fault, thereby reducing system damage.

More Selection—More ratings compatible with low-power electronic circuits are available in the range from 0.5 to 10 A. Others are provided in convenient steps, up to 63 A for the C60 products.

Reduction of Nuisance Tripping—Available with different trip characteristics to meet system needs: B, C and D curves, depending on the model.

Panel Space Savings—Multi 9 products are compact. Width per pole is only 0.71 in. (18 mm) for the C60 circuit breaker. All of the products are built in a consistent format with incremental widths of 0.35 in. (9 mm) (therefore the name Multi 9).

Easy Installation—The Multi 9 products mount easily onto a 35 mm DIN mounting rail. Large box lug terminals (pressure plate type) are suitable for use with copper wiring up to 2 AWG for C60 circuit breakers and supplemental protectors.

Reverse Feeding—Reverse feeding of line power is permitted.

Reliability—Each C60 miniature circuit breaker has an endurance of 10,000 operation cycles and voltage withstand of 6000 V impulse rating.

World-Wide Availability—The Multi 9 products are available and supported throughout the world by Schneider Electric.

From the Power Distribution Specialists—Schneider Electric can be your single source of protection equipment, with a comprehensive line of products for OEM products or the factory. In addition to the Multi 9 circuit breakers and supplementary protectors, these products include the following:

- QO® and QOU Miniature Circuit Breakers 10–125 A
- Compact® Molded Case Circuit Breakers 15–3200 A
- Powerpact® Electronic Trip Circuit Breakers 250–2500 A
- Masterpact® Universal Power Circuit Breakers 250–6300 A

Multi 9™ System Catalog
Section 3—IEC 60947-2 Rated Protection Devices

Section 3—IEC 60947-2 Rated Protection Devices

The Multi 9 system includes several families of miniature circuit protection devices that have the IEC ratings that are applicable in many countries other than the United States. These products are summarized below and discussed in more detail in the following pages. UL Listed and UL Recognized protection devices are described in Section 2, while accessories for both UL Listed and IEC Certified products are described in Section 5.

Table 15: Specifications for IEC Rated Miniature Circuit Breakers

Ratings per IEC 60947-2	DPN-N	C60N		C60H		C60L			C120H, NC125H			
		1	2, 3, 4	1	2, 3, 4	1	2, 3, 4		1	2, 3, 4		
Number of Poles	1 (Ø + N)	1	2, 3, 4	1	2, 3, 4	1	2, 3, 4		1	2, 3, 4		
Rated Current 25°C (77°F) I_n	1–40 A	0.5–63 A	0.5–63 A	0.5–63 A	0.5–63 A	0.5–63 A	0.5–25 A	32–40 A	50–63 A	—	—	
Rated Current (A) 40°C (104°F) I_n	—	—	—	—	—	—	—	—	—	10–125	10–125	
Rated Voltage U_e	230 V	440 V	440 V	440 V	440 V	440 V	440 V	440 V	440 V	440 V	440 V	
Ultimate Breaking Capacity (I_{cu}) as per IEC 60947-2 Standard	130 Vac	—	—	—	30 kA	—	—	—	—	30 kA	—	
	230–240 Vac	7.5 kA	10 kA	20 kA	15 kA	30 kA	25 kA	50 kA	40 kA	30 kA	15 kA	30 kA
	400–415 Vac	2 ¹ kA	3 ¹ kA	10 kA	4 ¹ kA	15 kA	6 ¹ kA	25 kA	20 kA	15 kA	4 ¹ kA	15 kA
	440 Vac	—	—	6 kA	—	10 kA	—	20 kA	15 kA	10 kA	—	10 kA
	1P 60 Vdc	—	15 kA	—	20 kA	—	25 kA	—		—	—	
	2P 125 Vdc	—	—	2P 20 kA	—	2P 25 kA	—	2P 30 kA		—	—	
Service Breaking Capacity	I_{cs} (% I_{cu})	50%	75%	75%	50%	50%	50%	—	—	75%	75%	
		B Curve	3–5	3–5	3–5	3–5	3–5	3.2–4.8		3.2–4.8	3.2–4.8	
		C Curve	7–10	7–10	7–10	7–10	7–10	7–10		7–10	7–10	
Magnetic Trip Curves	D Curve	—	10–14	10–14	10–14	10–14	10–14		10–14	10–14		
	K Curve	—	—	—	—	—	10–14		—	—		
	MA Curve	—	—	—	—	—	12		—	—		
	Z Curve	—	—	—	—	—	2.4–3.6		—	—		

¹ Single pole breaking capacity for IT type European grounding system (insulated neutral-double fault).

Table 16: Dimensions and Weights

Device	Size	Height		Width		Depth		Weight	
		in.	mm	in.	mm	in.	mm	oz.	g
DPN-N	1P	3.19	81	0.71	18	3.00	76	4.23	120
C60N	1P	3.19	81	0.71	18	3.00	76	3.88	110
	2P	3.19	81	1.42	36	3.00	76	7.75	220
	3P	3.19	81	2.13	54	3.00	76	11.64	330
	4P	3.19	81	2.48	72	3.00	76	15.52	440
C60H	1P	3.19	81	0.71	18	3.00	76	4.23	120
	2P	3.19	81	1.42	36	3.00	76	8.47	240
	3P	3.19	81	2.13	54	3.00	76	12.70	360
	4P	3.19	81	2.48	72	3.00	76	16.93	480
C60L	1P	3.19	81	0.71	18	3.00	76	4.23	120
	2P	3.19	81	1.42	36	3.00	76	8.47	240
	3P	3.19	81	2.13	54	3.00	76	12.70	360
	4P	3.19	81	2.48	72	3.00	76	16.93	480
C120H/NC125H	1P	3.19	81	0.71	27	3.00	76	6.35	180
	2P	3.19	81	2.13	54	3.00	76	12.70	360
	3P	3.19	81	3.19	81	3.00	76	19.05	540
	4P	3.19	81	4.25	108	3.00	76	25.40	720

IEC Rated C60 Miniature Circuit Breakers

The C60 family of Multi 9 circuit breakers meeting IEC 60947-2 is available primarily for equipment for export from the United States to countries requiring IEC Certification rather than UL Listing.

Three types of IEC Rated C60 devices are available: C60N, C60H, and C60L circuit breakers. These model numbers refer to the maximum current interrupting (Ultimate Breaking Capacity) ratings, see Table 15 on page 24.

Each of these devices is available with several characteristic trip curve ratings, as listed in the tables with catalog numbers. They include devices ranging from 0.5 to 63 A. (For higher current ratings, select devices from the higher current C120 series.)

Table 19: Specifications for IEC Rated C60 Miniature Circuit Breakers

High Voltage Withstand	6 kV	
Connections (Box Lug) for C60N/H/L Except C60L-MA ¹	0.5–25 A, 18–4 AWG (1–25 mm ²) Cu Only Cables	Torque to 22 lb-in (2.5 N•m)
	30–63 A, 18–2 AWG (1–35 mm ²) Cu Only Cables	Torque to 31 lb-in (3.5 N•m)
Connections for C60L-MA:	1.5–10 A Stranded 6 AWG (16 mm ²)	Torque to 35 lb-in (4 N•m)
	1.5–10 A Solid 4 AWG (25 mm ²)	Torque to 18 lb-in (2 N•m)
	12.5–40 A Stranded 4 AWG (25 mm ²)	Torque to 35 lb-in (4 N•m)
	12.5–40 A Solid 2 AWG (35 mm ²)	Torque to 31 lb-in (3.5 N•m)
Mounting	35 mm DIN rail	
Time-Current Curves	B, C, D, K, and MA	
Degree of Protection	Case	IP40 as per IEC 529
	Terminals	IP20
Temperature:	Calibration temperature: 30°C (86°F)	C60L calibrated at 40°C (104°F)
	Storage temperature	-40 to 80°C (-40 to 176°F)
	Operating temperature	-30 to 70°C (-22 to 158°F)
Tropicalization	Treatment 2	Relative Humidity: 95% at 131°F (55°C) per IEC 68-2-30
Number of Operating Cycles	Mechanical (O-C)	20,000
	Electrical (O-C)	10,000

See selection table for dimensions, weights and interrupting ratings

¹ Ring tongue terminal is optional

Standard Features

- Fast closing: Allows increased withstand to the high inrush currents of some loads
- Trip-free mechanism: Contacts cannot be held in the I-ON position when the C60 device is tripped automatically.
- Positive indication of contact disconnect. Green mechanical indication on front face of device shows that all poles are open.
- Suitable for reverse feeding.
- B curve: Overcurrent protection for sensitive equipment (computers, electronic devices, etc.):
 - C60N/H: The magnetic release operates between 3 and 5 times ampere rating.
- C curve: Overcurrent protection for all application types:
 - C60N/H: The magnetic release operates between 5 and 10 times ampere rating.
 - C60L: The magnetic release operates between 7 and 10 times ampere rating.
- D and K curves: Overcurrent protection for loads with high inrush currents (motors, transformers):
 - C60N/H/L: The magnetic release operates between 10 and 14 times ampere rating.
- MA curve: C60L-MA circuit breakers are designed for motor circuit protection against short circuits. These circuit breakers are equipped with magnetic-only trip units at 12 times ampere rating. Therefore they must be combined with a suitable thermal protection device.

Standards

- IEC 60947-2
- VDE 0660
- CE Marked

Catalog Numbers

Table 20: Catalog Numbers for IEC 60947-2 Rated C60N Miniature Circuit Breakers

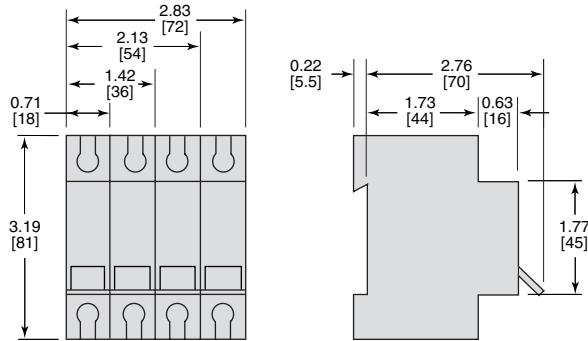
Rating	B Curve				C Curve				D Curve			
	1P	2P	3P	4P	1P	2P	3P	4P	1P	2P	3P	4P
0.5 A	—	—	—	—	24067	24068	24069	24070	—	—	—	—
1 A	24045	24071	24084	24097	24395	24331	24344	24357	24625	24653	24667	24681
2 A	24046	24072	24085	24098	24396	24332	24345	24358	24626	24654	24668	24682
3 A	24047	24073	24086	24099	24397	24333	24346	24359	24627	24655	24669	24683
4 A	24048	24074	24087	24100	24398	24334	24347	24360	24628	24656	24670	24684
6 A	24049	24075	24088	24101	24399	24335	24348	24361	24629	24657	24671	24685
10 A	24050	24076	24089	24102	24401	24336	24349	24362	24630	24658	24672	24686
16 A	24051	24077	24090	24103	24403	24337	24350	24363	24632	24660	24674	24688
20 A	24052	24078	24091	24104	24404	24338	24351	24364	24633	24661	24675	24689
25 A	24053	24079	24092	24105	24405	24339	24352	24365	24634	24662	24676	24690
32 A	24054	24080	24093	24106	24406	24340	24353	24366	24635	24663	24677	24691
40 A	24055	24081	24094	24107	24407	24341	24354	24367	24636	24664	24678	24692
50 A	24056	24082	24095	24108	24408	24342	24355	24368	24637	24665	24679	24693
63 A	24057	24083	24096	24109	24409	24343	24356	24369	24638	24666	24680	24694

Table 21: Catalog Numbers for IEC 60947-2 Rated C60H Miniature Circuit Breakers

Rating	B Curve				C Curve				D Curve			
	1P	2P	3P	4P	1P	2P	3P	4P	1P	2P	3P	4P
0.5 A	—	—	—	—	24900	24902	24906	24908	25171	25172	25173	25174
0.75 A	—	—	—	—	24901	24903	24907	24909	—	—	—	—
1 A	—	—	—	—	24968	24981	24994	25007	25152	25183	25196	25211
2 A	—	—	—	—	24969	24982	24995	25008	25155	25184	25197	25212
3 A	—	—	—	—	24970	24983	24996	25009	25157	25185	25198	25213
4 A	—	—	—	—	24971	24984	24997	25010	25158	25186	25199	25214
6 A	24643	24725	24738	24751	24972	24985	24998	25011	25159	25187	25200	25215
10 A	24644	24726	24739	24752	24973	24986	24999	25012	25160	25188	25201	25216
13 A	24645	—	—	—	—	—	—	—	—	—	—	—
16 A	24646	24727	24740	24753	24974	24987	25000	25013	25161	25189	25202	25217
20 A	24647	24728	24741	24754	24975	24988	25001	25014	25164	25190	25203	25218
25 A	24648	24729	24742	24755	24976	24989	25002	25015	25165	25191	25205	25219
32 A	24649	24730	24743	24756	24977	24990	25003	25016	25166	25192	25207	25220
40 A	24650	24731	24744	24757	24978	24991	25004	25017	25167	25193	25208	25221
50 A	24651	24732	24745	24758	24979	24992	25005	25018	25168	25194	25209	25222
63 A	24652	24733	24746	24759	24980	24993	25006	25019	25169	25195	25210	25223

UL 1077 Supplementary Protectors

Figure 29: C60 UL 1077 Supplementary Protectors



IEC Rated Circuit Breakers

Figure 30: IEC DPN-N Circuit Breaker

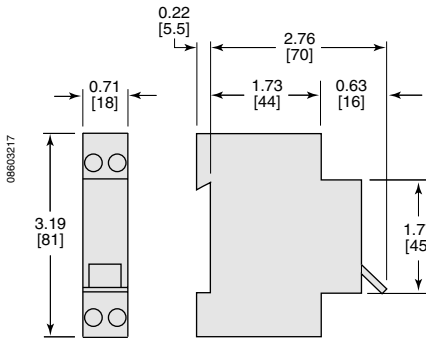
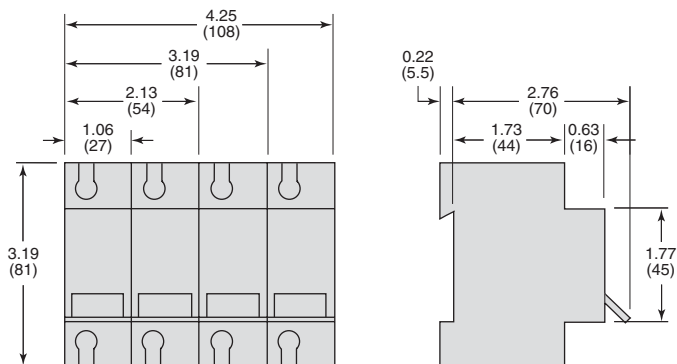


Figure 31: C60 IEC Circuit Breakers



Figure 32: C120 IEC Circuit Breaker



Dimensions: in.
(mm)