

Circuit breakers

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Thermal-magnetic circuit breakers type GB2 for the protection of industrial equipment control circuits

Presentation, selection

Presentation

GB2 thermal-magnetic circuit breakers protect and isolate the control circuits of industrial equipment with contactor coils, transformers....

They protect and isolate single-phase auxiliary circuits such as solenoid valves, electro-brakes, battery chargers, supplied from the control circuit voltage.

GB2-CB, GB2-CD, GB2-DB

12 ratings are available, from 0.5 to 20 A, in single-pole (GB2-CB), single-pole + neutral (GB2-CD) and 2-pole (GB2-DB) versions.

They have a magnetic tripping threshold set at between 12 and 16 In to withstand the current peaks generated by many industrial components.

GB2-CS

2 ratings are available, 0.5 and 1 A, in single-pole version.
The magnetic tripping threshold is set between 5 and 7 In.

Functions, installation

Clip-on fixing onto all types of 35 mm \square rails, on \square rails and on Telequick mounting plates.

Upstream and downstream marking by means of AB1 clip-in markers.

Clear indication of "I" and "O" positions on the operator.

Tamper-proof device which requires no special maintenance (fixed magnetic and thermal tripping thresholds).

Selection for the protection of circuits supplied by transformers

Single-phase transformers.

Magnetising peak: 20 In.

Operating of magnetic trips: 13 In.

Power VA	Primary (1)		Secondary			
	220/240 V	380/415 V	24 V	48 V	110 V	220 V
40	GB2-DB05	GB2-DB05	GB2-CD07	GB2-CD06	GB2-CD05	GB2-CD05
63	GB2-DB05	GB2-DB05	GB2-CD08	GB2-CD07	GB2-CD06	GB2-CD05
100	GB2-DB06	GB2-DB05	GB2-CD10	GB2-CD07	GB2-CD06	GB2-CD05
160	GB2-DB07	GB2-DB06	GB2-CD14	GB2-CD09	GB2-CD07	GB2-CD06
250	GB2-DB07	GB2-DB06	GB2-CD16	GB2-CD12	GB2-CD08	GB2-CD07
400	GB2-DB08	GB2-DB07	GB2-CD22	GB2-CD14	GB2-CD09	GB2-CD07
630	GB2-DB10	GB2-DB08	–	GB2-CD21	GB2-CD12	GB2-CD08
1000	GB2-DB14	GB2-DB09	–	–	GB2-CD16	GB2-CD10
1600	GB2-DB20	GB2-DB14	–	–	–	GB2-CD14
2000	GB2-DB21	GB2-DB14	–	–	GB2-CD22	GB2-CD16
2500	GB2-DB22	GB2-DB20	–	–	–	GB2-CD20
3000	GB2-DB22	GB2-DB20	–	–	–	GB2-CD21
4000	–	GB2-DB21	–	–	–	GB2-CD22
5000	–	GB2-DB22	–	–	–	–

(1) If the breaking capacity of the GB2 is insufficient, use a GV2-RT with 2 poles connected in series, see page 3/45.

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Characteristics

Type			GB2-CB	GB2-CD	GB2-DB	GB2-CS
Environment						
Conforming to standards			IEC/EN 60947-1, 60947-2			
Product certifications			ASE, CSA, NEMKO, OVE, UL	ASE, NEMKO	–	–
Protective treatment			"TC"			
Degree of protection	Conforming to IEC/EN 60529		IP 20			
Shock resistance	Conforming to IEC/EN 60068-2-27		22 g _n for 20 ms			
Vibration resistance	Conforming to IEC/EN 60068-2-6		5 g _n (5...110 Hz)			
Ambient air temperature around the device	Storage	°C	- 40...+ 80			
	Operation	°C	- 20...+ 60			
Flame resistance	Conforming to IEC/EN 60695-2-1	°C	960			
Maximum operating altitude		m	3000			
Operating position	In relation to normal vertical mounting position					
Cabling	Solid cable	mm ²	Minimum c.s.a. 1 x 0.75		Maximum c.s.a. 1 x 6 or 2 x 4	
	Flexible cable with cable end	mm ²	1 x 0.75		1 x 4 or 2 x 2.5	
Tightening torque		Nm	1.2			

Technical characteristics

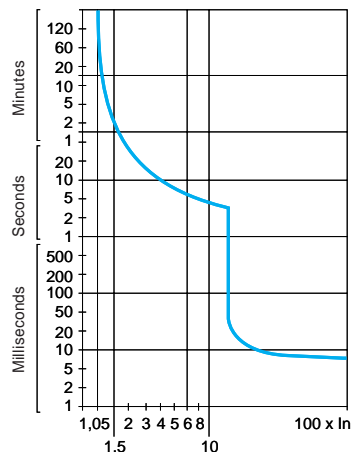
Utilisation category	Conforming to IEC/EN 60947-2		A	A	A	A					
Rated operational voltage (U_e)	Conforming to IEC/EN 60947-2	V	415 (1)	250	415	415 (1)					
	To CSA C22-2 Nr 14 and UL 1077	V	277	–	277	–					
Rated operational frequency	Conforming to IEC/EN 60947-2	Hz	50/60	50/60	50/60	50/60					
Rated impulse withstand voltage (U_{imp})	Conforming to IEC/EN 60947-2	kV	4	4	4	4					
Total power dissipated per pole		W	2	2	2	1.9					
Mechanical and electrical durability	C.O. : Close - Open	C.O.	8000	8000	8000	8000					
Operational current correction coefficient (∩ or ∩∩)	According to the ambient temperature	°C	- 20	- 10	0	+ 10	+ 20	+ 30	+ 40	+ 50	+ 60
	Correction coefficient		1.2	1.15	1.1	1.05	1	0.95	0.90	0.85	0.80
Tripping threshold	Of the magnetic trips		12...16 I _n	12...16 I _n	12...16 I _n	5...7 I _n					

(1) One GB2 on each live conductor.

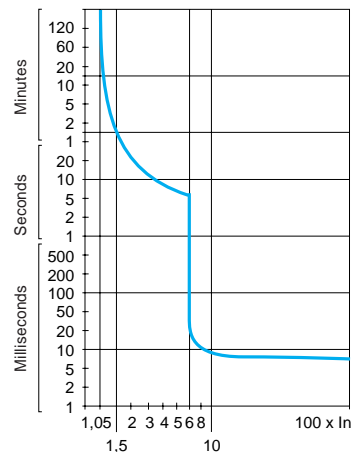
Tripping curves

Average operating time at 20 °C without prior current flow (cold state)

GB2-CB, GB2-CD, GB2-DB



GB2-CS



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Characteristics (continued)

Type	GB2-		CB05	CB06	CB07	CB08	CB09	CB10	CB12	CB14	CB16	CB20	CB21	CB22	
Rating		A	0.5	1	2	3	4	5	6	8	10	12	16	20	
Breaking capacity conforming to IEC/EN 60947-2 ~ 50/60 Hz	110 V	Icu	kA	50	50	15	10	6	3	3	3	2	2	2	
		Ics % (1)		100	50	50	50	50	75	75	75	75	75	75	75
	230/240 V	Icu	kA	50	50	15	3	3	2	1.5	1.5	1.5	1.5	1.5	1.5
		Ics % (1)		25	25	25	50	50	75	75	75	75	75	75	75
400/415 V	Icu	kA	50	50	15	3	3	2	1.5	1.5	1.5	1.5	1.5	1.5	
	Ics % (1)		25	25	25	50	50	75	75	75	75	75	75	75	
Associated fuses, if required if Isc > breaking capacity Icu conforming to IEC/EN 60947-2	110 V	aM	A	★	★	20	25	25	40	40	50	50	63	63	63
		gG	A	★	★	25	32	32	50	50	63	63	80	80	80
	230/240 V	aM	A	★	★	16	20	20	32	32	40	40	50	50	50
		gG	A	★	★	25	32	32	40	40	50	50	63	63	63
	400/415 V	aM	A	★	★	16	20	20	32	32	40	40	50	50	50
		gG	A	★	★	25	32	32	40	40	50	50	63	63	63
Type	GB2-		CD05	CD06	CD07	CD08	CD09	CD10	CD12	CD14	CD16	CD20	CD21	CD22	
Rating		A	0.5	1	2	3	4	5	6	8	10	12	16	20	
Breaking capacity conforming to IEC/EN 60947-2 ~ 50/60 Hz	110 V	Icu	kA	50	50	15	10	6	3	3	3	2	2	2	
		Ics % (1)		100	50	50	50	50	75	75	75	75	75	75	75
	230/240 V	Icu	kA	50	50	15	3	3	2	1.5	1.5	1.5	1.5	1.5	1.5
		Ics % (1)		25	25	25	50	50	75	75	75	75	75	75	75
Associated fuses, if required if Isc > breaking capacity Icu conforming to IEC/EN 60947-2	110 V	aM	A	★	★	20	25	25	40	40	50	50	63	63	63
		gG	A	★	★	25	32	32	50	50	63	63	80	80	80
	230/240 V	aM	A	★	★	16	20	20	32	32	40	40	50	50	50
		gG	A	★	★	25	32	32	40	40	50	50	63	63	63
	400/415 V	aM	A	★	★	16	20	20	32	32	40	40	50	50	50
		gG	A	★	★	25	32	32	40	40	50	50	63	63	63
Type	GB2-		DB05	DB06	DB07	DB08	DB09	DB10	DB12	DB14	DB16	DB20	DB21	DB22	
Rating		A	0.5	1	2	3	4	5	6	8	10	12	16	20	
Breaking capacity conforming to IEC/EN 60947-2 ~ 50/60 Hz	110 V	Icu	kA	50	50	15	10	6	3	3	3	2	2	2	
		Ics % (1)		100	50	50	50	50	75	75	75	75	75	75	75
	230/240 V	Icu	kA	50	50	15	3	3	2	1.5	1.5	1.5	1.5	1.5	1.5
		Ics % (1)		25	25	25	50	50	75	75	75	75	75	75	75
400/415 V	Icu	kA	50	50	15	3	3	2	1.5	1.5	1.5	1.5	1.5	75	
	Ics % (1)		25	25	25	50	50	75	75	75	75	75	1.5	75	
Associated fuses, if required if Isc > breaking capacity Icu conforming to IEC/EN 60947-2	110 V	aM	A	★	★	20	25	25	40	40	50	50	63	63	63
		gG	A	★	★	25	32	32	50	50	63	63	80	80	80
	230/240 V	aM	A	★	★	16	20	20	32	32	40	40	50	50	50
		gG	A	★	★	25	32	32	40	40	50	50	63	63	63
	400/415 V	aM	A	★	★	16	20	20	32	32	40	40	50	50	50
		gG	A	★	★	25	32	32	40	40	50	50	63	63	63

(1) As % of Icu.

★ Fuse not required. Breaking capacity Icu > Isc.

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Type	GB2-		●●05	●●06	●●07	●●08	●●09	●●10	●●12	●●14	●●16	●●20	●●21	●●22			
Breaking capacity (I_{cu}) conforming to IEC/EN 60947-2 ---	24 V	kA	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5			
	48 V	kA	1	1	1	1	1	1	1	1	–	–	–	–			
Operational current conforming to IEC/EN 60947-5-1 ---	DC-12	24 V	A	0.5	1	2	3	4	5	6	8	10	12	16	20		
		48 V	A	0.5	1	2	3	4	5	6	8	10	12	16	20		
	DC-13	24 V	A	0.5	1	2	3	4	5	6	8	10	12	16	20		
		48 V	A	0.5	1	2	3	4	5	6	8	–	–	–	–		
Type									GB2-CS05			GB2-CS06					
Rating									A			0.5			1		
Breaking capacity conforming to IEC/EN 60947-2 ~ 50/60 Hz	110 V		I _{cu}		kA		50			50							
	230/240 V		I _{cs} % (1)		kA		100			100							
	400/415 V (2)		I _{cu}		kA		50			50							
			I _{cs} % (1)		kA		25			25							
Breaking capacity (I_{cu}) conforming to IEC/EN 60947-2, ---	24 V		kA		1.5			1.5			1.5						
	48 V		kA		1			1			1						
Operational current conforming to IEC/EN 60947-5-1, ---	DC-12	24 V	A	0.5			1			1							
		48 V	A	0.5			0.5			1			1				
	DC-13	24 V	A	0.5			1			1							
		48 V	A	0.5			1			1							
Maximum permissible line length for star-delta starting (length of cable containing 2 or more conductors)	With contactors LC●-D09 to D18	Operational voltage		V	48	110	230	48	110	230	48	110	230				
		C.s.a.	0.60 mm ²	m	(3)	31	365	6	85	230							
			0.75 mm ²	m	(3)	39	460	8	110	290							
			1 mm ²	m	(3)	52	610	10	145	380							
			1.5 mm ²	m	(3)	78	910	15	220	570							
			2.5 mm ²	m	(3)	130	1520	26	360	950							
			4 mm ²	m	(3)	200	2400	41	580	1500							
		With contactors LC●-D25 to D32	Operational voltage		V	48	110	230	48	110	230						
			C.s.a.	0.60 mm ²	m	(3)	(3)	230	(3)	56	230						
				0.75 mm ²	m	(3)	(3)	290	(3)	70	290						
				1 mm ²	m	(3)	(3)	390	(3)	95	380						
				1.5 mm ²	m	(3)	(3)	580	(3)	140	570						
	2.5 mm ²			m	(3)	(3)	970	(3)	230	950							
	4 mm ²	m		(3)	(3)	1500	(3)	375	1500								
	With contactors LC●-D40 to D80	Operational voltage		V	48	110	230	48	110	230							
		C.s.a.	0.60 mm ²	m	(3)	(3)	46	(3)	13	100							
			0.75 mm ²	m	(3)	(3)	60	(3)	17	130							
			1 mm ²	m	(3)	(3)	80	(3)	22	170							
			1.5 mm ²	m	(3)	(3)	120	(3)	34	250							
			2.5 mm ²	m	(3)	(3)	190	(3)	56	420							
			4 mm ²	m	(3)	(3)	310	(3)	90	680							

(1) As % of I_{cu}.
(2) With one GB2-CS on each live conductor.
(3) Use relays.

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References

Circuit breakers with magnetic tripping threshold: 12 to 16 In



GB2-CB●●



GB2-CD●●



GB2-DB●●

Single-pole

Conventional rated thermal current Ith (1)	Magnetic tripping current Id ± 20 %	Sold in lots of	Unit ordering reference	Weight
A	A			kg
0.5	6.6	6	GB2-CB05	0.060
1	14	6	GB2-CB06	0.060
2	26	6	GB2-CB07	0.060
3	40	6	GB2-CB08	0.060
4	52	6	GB2-CB09	0.060
5	66	6	GB2-CB10	0.060
6	83	6	GB2-CB12	0.060
8	108	6	GB2-CB14	0.060
10	138	6	GB2-CB16	0.060
12	165	6	GB2-CB20	0.060
16	220	6	GB2-CB21	0.060
20	270	6	GB2-CB22	0.060

Single-pole + neutral

Conventional rated thermal current Ith (1)	Magnetic tripping current Id ± 20 %	Sold in lots of	Unit ordering reference	Weight
A	A			kg
0.5	6.6	6	GB2-CD05	0.070
1	14	6	GB2-CD06	0.070
2	26	6	GB2-CD07	0.070
3	40	6	GB2-CD08	0.070
4	52	6	GB2-CD09	0.070
5	66	6	GB2-CD10	0.070
6	83	6	GB2-CD12	0.070
8	108	6	GB2-CD14	0.070
10	138	6	GB2-CD16	0.070
12	165	6	GB2-CD20	0.070
16	220	6	GB2-CD21	0.070
20	270	6	GB2-CD22	0.070

2-pole

Conventional rated thermal current Ith (1)	Magnetic tripping current Id ± 20 %	Sold in lots of	Unit ordering reference	Weight
A	A			kg
0.5	6.6	3	GB2-DB05	0.115
1	14	3	GB2-DB06	0.115
2	26	3	GB2-DB07	0.115
3	40	3	GB2-DB08	0.115
4	50	3	GB2-DB09	0.115
5	66	3	GB2-DB10	0.115
6	83	3	GB2-DB12	0.115
8	108	3	GB2-DB14	0.115
10	138	3	GB2-DB16	0.115
12	165	3	GB2-DB20	0.115
16	220	3	GB2-DB21	0.115
20	270	3	GB2-DB22	0.115

(1) Conforming to IEC 947-1.

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Circuit breakers with magnetic tripping threshold: 5 to 7 In



GB2-CS●●

Single-pole

Conventional rated thermal current I _{th} (1)	Magnetic tripping current I _d ± 20 %	Sold in lots of	Unit ordering reference	Weight
A	A			kg
0.5	3.3	6	GB2-CS05	0.055
1	6	6	GB2-CS06	0.055

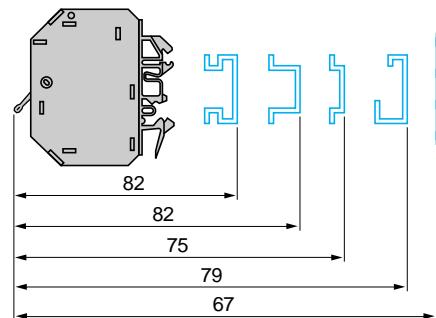
(1) Conforming to IEC 947-1.

Accessories for circuit breakers GB2-CB, DB and CS

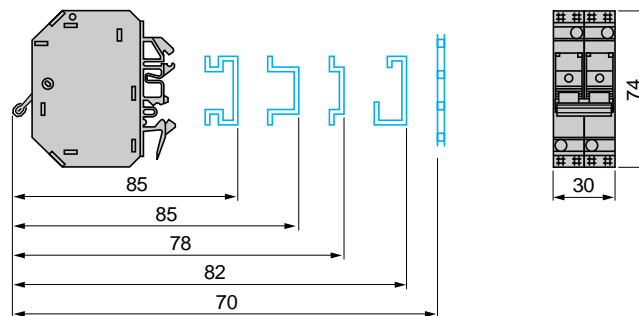
Description	Sold in lots of	Unit ordering reference	Weight
			kg
Busbar set for supply to 10 GB2-DB or 20 GB2-CB or GB2-CS with 2 connectors	1	GB2-G210	0.100
Supply connector	10	GB2-G01	0.013
Protective end covers	10	GB2-G02	0.001

Dimensions

GB2-CB●●, GB2-CD●●, GB2-CS●●



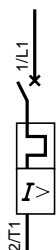
GB2-DB●●



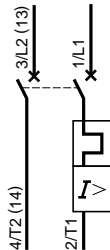
Marking: up to twelve AB1-R clip-in markers.

Schemes

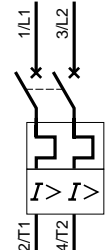
GB2-CB●●



GB2-CD●●



GB2-DB●●



GB2-CS●●

