

# Protection components

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

### 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  $\perp$  rails, on  $\perp$  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.

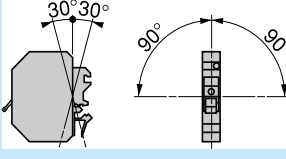
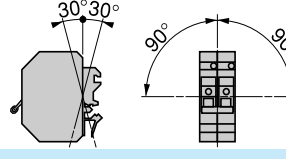
Operation of magnetic trips: 13 In.

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 24508/7.

# Protection components

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

Circuit-breaker type		GB2 CB	GB2 CD	GB2 DB	GB2 CS	
<b>Environment</b>						
Conforming to standards		IEC 60947-1, 947-2, EN 60947-1, 60947-2				
Product certifications		CSA, NEMKO, UL	NEMKO, UL	-	-	
Protective treatment		"TC"				
Degree of protection		Conforming to IEC 60529 IP 20				
Shock resistance		Conforming to IEC 60068-2-27 22 gn for 20 ms				
Vibration resistance		Conforming to IEC 60068-2-6 5 gn (5...110 Hz)				
Ambient air temperature around the device		Storage °C -40...+80				
		Operation °C -20...+60				
Flame resistance		Conforming to IEC 60695-2-1 °C 960				
Maximum operating altitude		m 3000				
Operating position		In relation to normal vertical mounting plane				
		 <p>GB2 CB, CD, CS</p>		 <p>GB2 DB</p>		
Cabling			Minimum c.s.a.		Maximum c.s.a.	
Solid cable		mm <sup>2</sup>	1 x 0.75		1 x 6 or 2 x 4	
Flexible cable with cable end		mm <sup>2</sup>	1 x 0.75		1 x 4 or 2 x 2.5	
Tightening torque		N.m	1.2			

<b>Technical characteristics</b>										
Utilisation category		Conforming to IEC 60947-2		A		A		A		A
Rated operational voltage (Ue)		Conforming to IEC 60947-2		V 415 (1)		250		415		415 (1)
		Conforming to CSA C22-2 Nr 14 and UL 1077		V 277		-		277		-
Rated operational frequency		Conforming to IEC 60947-2		Hz 50/60		50/60		50/60		50/60
Rated impulse withstand voltage (U imp)		Conforming to IEC 60947-2		kV 4		4		4		4
Total power dissipated per pole		W 2		2		2		2		1.9
Mechanical and electrical durability		C.O.: Closing - Opening		C.O. 8000		8000		8000		8000
Operational current correction coefficient (~ or ---)		According to the permissible 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 In		12...16 In		12...16 In		5...7 In

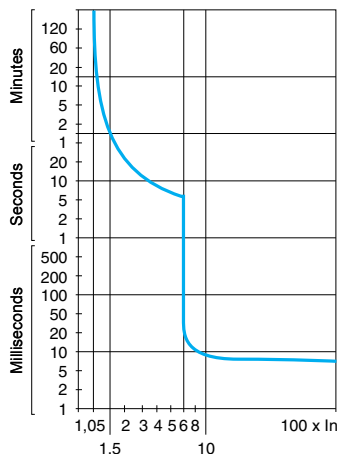
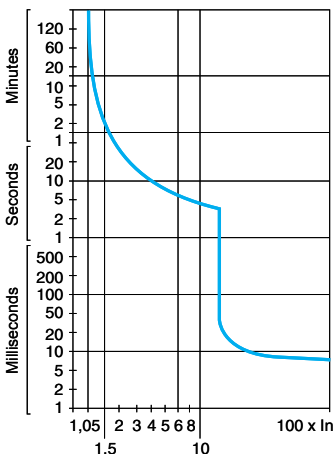
(1) One GB2 circuit-breaker on each live conductor.

## 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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Circuit-breaker type			GB2													
Rating			A	CB05	CB06	CB07	CB08	CB09	CB10	CB12	CB14	CB16	CB20	CB21	CB22	
<b>Breaking capacity</b> conforming to IEC 60947-2 ~ 50/60 Hz	110 V	l <sub>cu</sub>	kA	50	50	15	10	6	3	3	3	2	2	2	2	
		l <sub>cs</sub> % (1)		100	50	50	50	50	75	75	75	75	75	75	75	75
	230/240 V	l <sub>cu</sub>	kA	50	50	15	3	3	2	1.5	1.5	1.5	1.5	1.5	1.5	1.5
		l <sub>cs</sub> % (1)		25	25	25	50	50	75	75	75	75	75	75	75	75
	400/415 V	l <sub>cu</sub>	kA	50	50	15	3	3	2	1.5	1.5	1.5	1.5	1.5	1.5	1.5
		l <sub>cs</sub> % (1)		25	25	25	50	50	75	75	75	75	75	75	75	75
<b>Associated fuses, if required</b> if I <sub>sc</sub> > breaking capacity I <sub>cu</sub> conforming to IEC 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	

Circuit-breaker type			GB2													
Rating			A	CD05	CD06	CD07	CD08	CD09	CD10	CD12	CD14	CD16	CD20	CD21	CD22	
<b>Breaking capacity</b> conforming to IEC 60947-2 ~ 50/60 Hz	110 V	l <sub>cu</sub>	kA	50	50	15	10	6	3	3	3	2	2	2	2	
		l <sub>cs</sub> % (1)		100	50	50	50	50	75	75	75	75	75	75	75	75
	230/240 V	l <sub>cu</sub>	kA	50	50	15	3	3	2	1.5	1.5	1.5	1.5	1.5	1.5	1.5
		l <sub>cs</sub> % (1)		25	25	25	50	50	75	75	75	75	75	75	75	75
	400/415 V	l <sub>cu</sub>	kA	50	50	15	3	3	2	1.5	1.5	1.5	1.5	1.5	1.5	1.5
		l <sub>cs</sub> % (1)		25	25	25	50	50	75	75	75	75	75	75	75	75
<b>Associated fuses, if required</b> if I <sub>sc</sub> > breaking capacity I <sub>cu</sub> conforming to IEC 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	

Circuit-breaker type			GB2													
Rating			A	DB05	DB06	DB07	DB08	DB09	DB10	DB12	DB14	DB16	DB20	DB21	DB22	
<b>Breaking capacity</b> conforming to IEC 60947-2 ~ 50/60 Hz	110 V	l <sub>cu</sub>	kA	50	50	15	10	6	3	3	3	2	2	2	2	
		l <sub>cs</sub> % (1)		100	50	50	50	50	75	75	75	75	75	75	75	75
	230/240 V	l <sub>cu</sub>	kA	50	50	15	3	3	2	1.5	1.5	1.5	1.5	1.5	1.5	1.5
		l <sub>cs</sub> % (1)		25	25	25	50	50	75	75	75	75	75	75	75	75
	400/415 V	l <sub>cu</sub>	kA	50	50	15	3	3	2	1.5	1.5	1.5	1.5	1.5	1.5	1.5
		l <sub>cs</sub> % (1)		25	25	25	50	50	75	75	75	75	75	75	75	75
<b>Associated fuses, if required</b> if I <sub>sc</sub> > breaking capacity I <sub>cu</sub> conforming to IEC 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 I<sub>cu</sub>.

★ Fuse not required. Breaking capacity I<sub>cu</sub> > I<sub>sc</sub>.

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Circuit-breaker type				GB2												
				●●05	●●06	●●07	●●08	●●09	●●10	●●12	●●14	●●16	●●20	●●21	●●22	
<b>Breaking capacity (I<sub>cu</sub>)</b> conforming to IEC 60947-2 ---	24 V	<b>kA</b>		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	<b>kA</b>		1	1	1	1	1	1	1	1	–	–	–	–	
<b>Operational current</b> conforming to IEC 60947-5-1 ---	DC-12	24 V	<b>A</b>	0.5	1	2	3	4	5	6	8	10	12	16	20	
		48 V	<b>A</b>	0.5	1	2	3	4	5	6	8	10	12	16	20	
	DC-13	24 V	<b>A</b>	0.5	1	2	3	4	5	6	8	10	12	16	20	
		48 V	<b>A</b>	0.5	1	2	3	4	5	6	8	–	–	–	–	
		<b>Circuit-breaker type</b>														
		<b>Rating</b>														
<b>Breaking capacity (I<sub>cu</sub>)</b> conforming to IEC 60947-2 ~ 50/60 Hz	110 V	I <sub>cu</sub>	<b>kA</b>	50								50				
		I <sub>cs</sub> % (1)		100								100				
	230/240 V	I <sub>cu</sub>	<b>kA</b>	50								50				
		I <sub>cs</sub> % (1)		25								25				
	400/415 V (2)	I <sub>cu</sub>	<b>kA</b>	50								50				
		I <sub>cs</sub> % (1)		25								25				
<b>Breaking capacity (I<sub>cu</sub>)</b> conforming to IEC 60947-2 ---	24 V	<b>kA</b>		1.5								1.5				
	48 V	<b>kA</b>		1								1				
<b>Operational current</b> conforming to IEC 60947-5-1 ---	DC-12	24 V	<b>A</b>	0.5								1				
		48 V	<b>A</b>	0.5								1				
	DC-13	24 V	<b>A</b>	0.5								1				
		48 V	<b>A</b>	0.5								1				
		<b>Maximum permissible line length for star-delta starting</b> (length of cable containing 2 or more conductors)														
		With contactors LC● D09 ...D18	Operational voltage	<b>V</b>		<b>48</b>		<b>110</b>		<b>230</b>		<b>48</b>		<b>110</b>		<b>230</b>
C.s.a.	060 mm <sup>2</sup>			<b>m</b>	(3)		31		365		6		85		230	
	0.75 mm <sup>2</sup>		<b>m</b>	(3)		39		460		8		110		290		
	1 mm <sup>2</sup>		<b>m</b>	(3)		52		610		10		145		380		
	1.5 mm <sup>2</sup>		<b>m</b>	(3)		78		910		15		220		570		
	2.5 mm <sup>2</sup>		<b>m</b>	(3)		130		1520		26		360		950		
	4 mm <sup>2</sup>		<b>m</b>	(3)		200		2400		41		580		1500		
With contactors LC● D25...D32	Operational voltage		<b>V</b>		<b>48</b>		<b>110</b>		<b>230</b>		<b>48</b>		<b>110</b>		<b>230</b>	
			C.s.a.	0.60 mm <sup>2</sup>	<b>m</b>	(3)		(3)		230		(3)		56		230
			0.75 mm <sup>2</sup>	<b>m</b>	(3)		(3)		290		(3)		70		290	
			1 mm <sup>2</sup>	<b>m</b>	(3)		(3)		390		(3)		95		380	
			1.5 mm <sup>2</sup>	<b>m</b>	(3)		(3)		580		(3)		140		570	
			2.5 mm <sup>2</sup>	<b>m</b>	(3)		(3)		970		(3)		230		950	
			4 mm <sup>2</sup>	<b>m</b>	(3)		(3)		1500		(3)		375		1500	
	With contactors LC● D40...D80		Operational voltage	<b>V</b>		<b>48</b>		<b>110</b>		<b>230</b>		<b>48</b>		<b>110</b>		<b>230</b>
				C.s.a.	0.60 mm <sup>2</sup>	<b>m</b>	(3)		(3)		46		(3)		13	
				0.75 mm <sup>2</sup>	<b>m</b>	(3)		(3)		60		(3)		17		130
			1 mm <sup>2</sup>	<b>m</b>	(3)		(3)		80		(3)		22		170	
		1.5 mm <sup>2</sup>	<b>m</b>	(3)		(3)		120		(3)		34		250		
		2.5 mm <sup>2</sup>	<b>m</b>	(3)		(3)		190		(3)		56		420		
		4 mm <sup>2</sup>	<b>m</b>	(3)		(3)		310		(3)		90		680		

(1) As % of I<sub>cu</sub>.  
 (2) One **GB2 CS** circuit-breaker on each live conductor.  
 (3) Use relays.