Product Profile: 5SJ4...-.HG4. Miniature Circuit Breakers for North American and International Applications according to UL, CSA and IEC



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#### **Certifications and Standards**

- UL Listed, Certified to Canadian Standards, CE
- UL 489
- CSA 22.2 No. 5-02
- HACR
- IEC 60 898

#### Features – UL 489

- Suitable for Branch Circuit Protection Applications
  - -.HG40: up to 240 VAC, and 60 VDC (1-pole);
  - -.HG41: up to 240 VAC, and 60 VDC (1-pole); and, up to 240 VAC, and 125 VDC (2- and 3-pole)
  - -.HG42: up to 277 VAC, and 60 VDC (1-pole); and, up to 480Y/277 VAC and 125 VDC (2- and 3-pole).
- cULus: UL Listed and Certified to Canadian Standards. File E243414
- HACR Rated
- Thermal Magnetic Protection
- High Interrupting Rating:
  - VAC: up to 14,000 (Type HSJ) or 10,000 (Type NSJ) Maximum RMS Symmetrical Amps
  - VDC: up to 10,000 Amps (Type HSJ and Type NSJ) at 60/125 VDC
- 40°C (104°F) Calibration Base (Industrial Applications)
- Can be used for "field wiring" applications, AWG 14 to AWG 4, Copper (Cu) Only
- -.HG40: suitable for "Same Polarity" connections only. Not suitable for "Reverse Feed" Applications
- -.HG41 & -.HG42: suitable for "Reverse Feed" Applications. No "Same Polarity" restrictions.

5SJ4 miniature circuit breakers are also CE marked according to EN/IEC 60 898 making them suitable for use in International applications.

#### Features – EN/IEC 60 898

- CE Marked
- 30°C (86°F) Calibration Base
- Meets Trip Characteristics
  - o -.HG40: B, C and D
  - -.HG41 & -.HG42: C and D
- Rated Voltage
  - VAC/DC: 24 minimum
  - VDC/pole: 60 maximum
  - VAC: 440 maximum

• High Interrupting Rating (I<sub>cn</sub>) acc. to IEC 60898-1 of up to 10,000 A AC

#### Features – Common

- Available with
  - **-.HG40**: 1-pole
  - o **-.HG41 & -.HG42**: 1-, 2- or 3-poles
- Available from
  - -.HG40 & -.HG41: 0.3 to 63 Amps depending on the device selected
  - -.HG42: 0.3 to 40 A (C Characteristic); 0.3 to 32A (D Characteristic)
- Visible Indicator for ON and OFF/Trip
- Finger-Safe Design
- DIN Rail Mounting (35 mm)
- Identical Wire Screw Connections on Line and Load Sides
- CFC and Silicone Free

#### Description

5SJ4...-.HG4. Miniature Circuit Breakers (mCB) are 1-, 2- and 3-pole thermal / magnetic overcurrent protection devices that are intended for general industrial use such as Branch Circuit Protection. They are UL Listed (File No. E243414, Volume 1, Section 1) in accordance with UL 489, 10<sup>th</sup> edition, "Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures" and Certified to Canadian Standards (CSA 22.2 No. 5.02). They are provided with a manual means for opening the circuit and they are not ambient compensated.

5SJ4...-.HG4. Miniature Circuit Breakers are rated

- -.HG40: 240 VAC max. and 60 VDC max. for 1-pole devices
- -.HG41: 240 VAC max. and 60 VDC max. for 1-pole devices; 240 VAC max. and 125 VDC max. for 2- and 3-pole devices.
- -.HG42: 277 VAC max. and 60 VDC max. for 1-pole devices; 480Y/277 VAC max. and 125 VDC max. for 2- and 3-pole devices.
- The load current ranges form 0.3 to 63 A depending on the device selected with interrupting ratings stated in the following table for 1-, 2- and 3-pole devices.

Designation	Characteristic	Current A	Rated switching capacity (operational voltage 240 V AC) kA AC	Rated switching capacity (operational voltage 480Y/277 V AC) kA AC
5SJ4HG40	B C C	6 63 0.3 40 45 63	14 14 10	
	D D	0.3 20 25 63	14 10	
5SJ4HG41	C C D	0.3 40 45 63 0.3 20 25 63	14 10 14 10	
5SJ4HG42	C D D	0.3 40 0.3 20 25 32	14 14 10	10 10 10

Type descriptions are:

- Type HSJ: VAC: 14,000 Maximum RMS Symmetrical Amps VDC: 10,000 Amps
- Type NSJ: VAC: 10,000 Maximum RMS Symmetrical Amps VDC: 10,000 Amps

Tripping Characteristics according to EN 60 898 are defined as follows.







#### **Catalog Number Nomenclature**

### $\frac{5SJ4}{a} \frac{1}{b} \frac{10}{c} - \frac{7}{d} \frac{HG41}{e}$

а	Frame	Style
	Code	Description
	5SJ4	Standard Frame

а	Frame Style			
	Code	Description		
	5SJ4	Standard Frame		
b	Poles			
	Code	Description		
	1	1-Pole		
	2	2-Pole		
	3	3-Pole		

С	Rated 0	Current
	Code	Rated Current (In)
	14	0.3
	05	0.5
	01	1
	15	1.6
	02	2
	03	3
	04	4
	11	5
	06	6
	08	8
	10	10
	13	13
	18	15
	16	16
	20	20
	25	25
	30	30
	32	32
	35	35
	40	40
	45	45
	50	50
	60	60
	63	63

d	Trip Curve (Characteristic)					
	Code	Trip	Magnetic Trip	Thermal Trip		
		Curve	Point	Point		
	6	В	3 to 5 <i>I</i> n	1.13 to 1.45		
	7	С	5 to 10 <i>I</i> <sub>n</sub>	Breaker Rating		
	8	D	10 to 20 <i>I</i> <sub>n</sub>			

е	Version	1		
	Code Description			
	HG40	240 VAC Same		
	Polarity			
	HG41	240 VAC Opposite		
		phase		
	HG42	480Y/277 VAC		

#### Product Selection – 5SJ41..-.HG40



**Type HSJ**: Interrupting rating:

240 VAC: 14,000 Maximum RMS Symmetrical Amps 60 VDC: 10,000 Amps

Type NSJ: Interrupting rating: 240 VAC: 10,000 Maximum RMS Symmetrical Amps 60 VDC (1-pole) / 125 VDC (2- & 3-pole): 10,000 Amps

TYPE	E→	HSJ	HSJ	NSJ	HSJ	NSJ
No. of	<b>I</b> n	Characteristic B	Characteristic C	Characteristic C	Characteristic	Characteristic D
Poles	(A)	Order No.	Order No.	Order No.	D Order No.	Order No.
1	0.3		5SJ4114-7HG40		5SJ4114-8HG40	
1	0.5		5SJ4105-7HG40		5SJ4105-8HG40	
1	1		5SJ4101-7HG40		5SJ4101-8HG40	
1	1.6		5SJ4115-7HG40		5SJ4115-8HG40	
1	2		5SJ4102-7HG40		5SJ4102-8HG40	
1	3		5SJ4103-7HG40		5SJ4103-8HG40	
1	4		5SJ4104-7HG40		5SJ4104-8HG40	
1	5		5SJ4111-7HG40		5SJ4111-8HG40	
1	6	5SJ4106-6HG40	5SJ4106-7HG40		5SJ4106-8HG40	
1	8		5SJ4108-7HG40		5SJ4108-8HG40	
1	10	5SJ4110-6HG40	5SJ4110-7HG40		5SJ4110-8HG40	
1	13	5SJ4113-6HG40	5SJ4113-7HG40		5SJ4113-8HG40	
1	15	5SJ4118-6HG40	5SJ4118-7HG40		5SJ4118-8HG40	
1	16	5SJ4116-6HG40	5SJ4116-7HG40		5SJ4116-8HG40	
1	20	5SJ4120-6HG40	5SJ4120-7HG40		5SJ4120-8HG40	
1	25	5SJ4125-6HG40	5SJ4125-7HG40			5SJ4125-8HG40
1	30	5SJ4130-6HG40	5SJ4130-7HG40			5SJ4130-8HG40
1	32	5SJ4132-6HG40	5SJ4132-7HG40			5SJ4132-8HG40
1	35	5SJ4135-6HG40	5SJ4135-7HG40			5SJ4135-8HG40
1	40	5SJ4140-6HG40	5SJ4140-7HG40			5SJ4140-8HG40
1	45	5SJ4145-6HG40		5SJ4145-7HG40		5SJ4145-8HG40
1	50	5SJ4150-6HG40		5SJ4150-7HG40		5SJ4150-8HG40
1	60	5SJ4160-6HG40		5SJ4160-7HG40		5SJ4160-8HG40
1	63	5SJ4163-6HG40		5SJ4163-7HG40		5SJ4163-8HG40

#### Product Selection – 5SJ4...-.HG41



**Type HSJ**: Interrupting rating:

240 VAC: 14 kA Maximum RMS Symmetrical 60 VDC (1-pole) / 125 VDC (2- & 3-pole): 10kA

Type NSJ: Interrupting rating: 240 VAC: 10kA Maximum RMS Symmetrical 60 VDC (1-pole)/125 VDC (2- & 3-pole): 10 kA

TYP	E→	HSJ	NSJ	HSJ	NSJ
No. of Poles	/n (A)	Characteristic C Order No.	Characteristic C Order No.	Characteristic D Order No.	Characteristic D Order No.
*	0.3	5SJ4*14-7HG41		5SJ4*14-8HG41	
*	0.5	5SJ4*05-7HG41		5SJ4*05-8HG41	
*	1	5SJ4*01-7HG41		5SJ4*01-8HG41	
*	1.6	5SJ4*15-7HG41		5SJ4*15-8HG41	
*	2	5SJ4*02-7HG41		5SJ4*02-8HG41	
*	3	5SJ4*03-7HG41		5SJ4*03-8HG41	
*	4	5SJ4*04-7HG41		5SJ4*04-8HG41	
*	5	5SJ4*11-7HG41		5SJ4*11-8HG41	
*	6	5SJ4*06-7HG41		5SJ4*06-8HG41	
*	8	5SJ4*08-7HG41		5SJ4*08-8HG41	
*	10	5SJ4*10-7HG41		5SJ4*10-8HG41	
*	13	5SJ4*13-7HG41		5SJ4*13-8HG41	
*	15	5SJ4*18-7HG41		5SJ4*18-8HG41	
*	16	5SJ4*16-7HG41		5SJ4*16-8HG41	
*	20	5SJ4*20-7HG41		5SJ4*20-8HG41	
*	25	5SJ4*25-7HG41			5SJ4*25-8HG41
*	30	5SJ4*30-7HG41			5SJ4*30-8HG41
*	32	5SJ4*32-7HG41			5SJ4*32-8HG41
*	35	5SJ4*35-7HG41			5SJ4*35-8HG41
*	40	5SJ4*40-7HG41			5SJ4*40-8HG41
*	45		5SJ4*45-7HG41		5SJ4*45-8HG41
*	50		5SJ4*50-7HG41		5SJ4*50-8HG41
*	60		5SJ4*60-7HG41		5SJ4*60-8HG41
*	63		5SJ4*63-7HG41		5SJ4*63-8HG41

1Substitute the "\*" with:

1 for 1-pole mCBs

2 for 2-pole mCBs

3 for 3-pole mCBs

### Product Selection – 5SJ4...-.HG42







**Type NSJ**: Interrupting rating:

- 480Y/277 VAC 10,000 Maximum RMS Symmetrical Amps
- 60 VDC (1-pole) / 125 VDC (2- & 3-pole) 10,000 Amps

TYP	E→	HSJ	NSJ	HSJ	NSJ
No. of Poles	/ <sub>n</sub> (A)	Characteristic C Order No.	Characteristic C Order No.	Characteristic D Order No.	Characteristic D Order No.
*	0.3		5SJ4*14-7HG42		5SJ4*14-8HG42
*	0.5		5SJ4*05-7HG42		5SJ4*05-8HG42
*	1		5SJ4*01-7HG42		5SJ4*01-8HG42
*	1.6		5SJ4*15-7HG42		5SJ4*15-8HG42
*	2		5SJ4*02-7HG42		5SJ4*02-8HG42
*	3		5SJ4*03-7HG42		5SJ4*03-8HG42
*	4		5SJ4*04-7HG42		5SJ4*04-8HG42
*	5		5SJ4*11-7HG42		5SJ4*11-8HG42
*	6		5SJ4*06-7HG42		5SJ4*06-8HG42
*	8		5SJ4*08-7HG42		5SJ4*08-8HG42
*	10		5SJ4*10-7HG42		5SJ4*10-8HG42
*	13		5SJ4*13-7HG42		5SJ4*13-8HG42
*	15		5SJ4*18-7HG42		5SJ4*18-8HG42
*	16		5SJ4*16-7HG42		5SJ4*16-8HG42
*	20		5SJ4*20-7HG42		5SJ4*20-8HG42
*	25		5SJ4*25-7HG42		5SJ4*25-8HG42
*	30		5SJ4*30-7HG42		5SJ4*30-8HG42
*	32		5SJ4*32-7HG42		5SJ4*32-8HG42
*	35		5SJ4*35-7HG42		
*	40		5SJ4*40-7HG42		
*	45				
*	50				
*	60				
*	63				

1Substitute the "\*" with:

1 for 1-pole mCBs

- 2 for 2-pole mCBs
- 3 for 3-pole mCBs

#### Accessories

Picture	Brief Description	Contact Arrangement	Abbrev.	Catalog No.
a la la la	Signals the mCB's Trip Mechanism Position	1NO + 1 NC 2 NO 2 NC	AS	5ST3010-0HG 5ST3011-0HG 5ST3012-0HG
	Signals the automatic tripping of the mCB & the Trip Mechanism's Position	1NO + 1 NC 2 NO 2 NC	FC	5ST3020-0HG 5ST3021-0HG 5ST3022-0HG
A REAL AND	Used for the Remote Tripping of a mCB	110 – 480 VAC 24 – 60 V AC/DC	ST	5ST3030-0HG 5ST3031-0HG

AS = Auxiliary Switch FC = Fault Signal Contact ST = Shunt Trip



Applies to all products on this page

#### Accessories

		Pin spacing	Length	DT	Order No.
		MW	mm		
	Busbars acc. to UL 489 for use with 5SJ4HG fixed lengths, cannot be cut <sup>1)</sup> Single-Pole				
	For 6 MCB 1P For 12 MCB 1P For 18 MCB 1P	1 1 1	100 205 310	A A A	5ST3 663-0HG 5ST3 663-1HG 5ST3 663-2HG
11111	Two-Pole For 3 MCB 2P For 6 MCB 2P For 9 MCB 2P	1 1 1	100 205 310	A A A	5ST3 664-0HG 5ST3 664-1HG 5ST3 664-2HG
	Three-Pole For 2 MCBs 3P For 4 MCBs 3P For 6 MCBs 3P	1 1 1	100 205 310	A A A	5ST3 665-0HG 5ST3 665-1HG 5ST3 665-2HG
	Connection terminals acc. to UL489 for use only with 5SJ4HG Infeed - MCBs 35 mm <sup>2</sup>			A	5ST3 666-0HG
Î	Infeed - busbars 50 mm²			A	5ST3 666-2HG
VVV	Touch protection covers for busbars acc. to UL489 <sup>(1)</sup> 3 x 1 pin			A	5ST3 666-1HG

<sup>1)</sup> To maintain UL Listing, ALL unused busbar terminals must be covered



**Typical Device Markings** 



Typical Device Markings (Continued)

### Left Side Markings



### **Right Side Markings**



#### **Current Ratings at Ambient Temperatures Other than 40°C**

Use the following table to determine the mCBs  $I_{n}$  current rating for ambient temperatures other than 40°C.

Device Marked	In (A) at different Ambient Temperatures								
Current Rating in (A) @ 40C	15°C	20°C	25°C	30°C	40°C	50°C	55°C		
0.3	0.33	0.32	0.32	0.31	0.30	0.29	0.28		
0.5	0.55	0.54	0.53	0.52	0.50	0.48	0.47		
1	1.1	1.1	1.1	1.0	1.0	1.0	0.9		
1.6	1.8	1.7	1.7	1.7	1.6	1.5	1.5		
2	2.2	2.2	2.1	2.1	2.0	1.9	1.9		
3	3.3	3.3	3.2	3.1	3.0	2.9	2.8		
4	4.6	4.4	4.3	4.2	4.0	3.8	3.6		
5	5.7	5.6	5.4	5.3	5.0	4.7	4.5		
6	6.8	6.7	6.5	6.3	6.0	5.6	5.4		
8	9.1	8.9	8.7	8.5	8.0	7.5	7.3		
10	11.1	10.9	10.7	10.5	10.0	9.5	9.3		
13	14.5	14.2	13.9	13.6	13.0	12.4	12.0		
15	16.7	16.4	16.0	15.7	15.0	14.3	13.9		
16	17.8	17.5	17.1	16.7	16.0	15.2	14.8		
20	22.3	21.8	21.4	20.9	20.0	19.0	18.5		
25	27.8	27.3	26.7	26.2	25.0	23.8	23.1		
30	33.4	32.7	32.1	31.4	30.0	28.5	27.8		
32	35.6	34.9	34.2	33.5	32.0	30.4	29.6		
35	39.9	38.2	37.4	36.6	35.0	33.3	32.4		
40	44.5	43.6	42.8	41.9	40.0	38.0	37.0		
45	51.2	50.0	48.8	47.6	45.0	42.3	40.8		
50	56.9	55.6	54.2	52.9	50.0	47.0	45.4		
60	66.8	65.5	64.1	62.8	0.6	57.1	55.5		
63	71.7	70.0	68.3	66.6	63.0	59.2	57.2		

5SJ4 miniature circuit breakers are "Non 100 percent rated" as specified in UL 489, paragraph 7.1.4.2. When selecting a miniature circuit breaker for continuous loads no more than 80% of the device's marked current should be used.

Characteristic curves 5SJ4 ...-. HG40, 5SJ4 ...-. HG41, 5SJ4 ...-. HG42

Let-through I<sup>2</sup>t values

#### Characteristic B







#### Characteristic C



#### **Power Loss**

Rated current	Characteristic B		Characteristic C		Characteristic D	
I <sub>n</sub>	R <sub>i</sub>	Pv	Ri	Pv	R <sub>i</sub>	Pv
A	mΩ	W	mΩ	W	mΩ	W
0.3			12900	1.2	12600	1.1
0.5			4900	1.2	4600	1.2
1			1650	1.7	1480	1.5
1.6			620	1.6	570	1.5
2			440	1.8	435	1.8
3			197	1.8	190	1.7
4			115	1.8	100	1.6
5			115	2.9	100	2.5
6	85	3.1	74	2.7	73	2.6
8			40	2.6	39	2.5
10	16.5	1.7	13.5	1.4	11.9	1.2
13	11.7	2.0	10.2	1.7	10.2	1.7
15	8.5	1.9	7.8	1.8	7.7	1.7
16	8.5	2.2	7.8	2.0	7.7	2.0
20	6.7	2.7	5.5	2.2	5.5	2.2
25	4.3	2.7	4.2	2.6	4.2	2.6
30	3.4	3.1	3.5	3.2	3.0	2.7
32	3.4	3.5	3.5	3.6	3.0	3.1
35	2.8	3.4	2.8	3.4	2.7	3.3
40	2.8	4.5	2.8	4.5	2.5	4.0
45	2.8	5.7	2.7	5.5	2.5	5.1
50	2.1	5.3	2.1	5.0	2.0	5.0
60	1.7	6.1	1.7	6.1	1.7	6.1
63	1.7	6.7	1.7	6.7	1.7	6.7

### **Specifications**

Miniature circuit breakers			5SJ4HG40	5SJ4HG41	5SJ4HG42	
Standards			EN 6898; UL 489; CSA C22.2 No. 5-02			
Approved acc. to			UL 489; CSA C22.2 No. 5-02, UL File No. E243414			
Tripping characteristic			B, C, D	C, D		
Operational voltage	min.	V AC/DC	24			
• Acc. to IEC 60898	max. max.	V DC/pole V AC	60 440			
• Acc. to UL 489 and CSA C22.2 No. 5-02	max.	V AC V DC/1P V DC/2P	240/120 60 	240 60 125	480Y/277 60 125	
Rated breaking capacity						
• I <sub>on</sub> acc. to IEC 60898-1		kA AC	10			
<ul> <li>Acc. to UL 489 and CSA C22.2 No. 5-02</li> </ul>		kA AC	14/10 <sup>1)</sup>	14/10 <sup>1)</sup>	10 <sup>1)</sup>	
Insulation coordination						
<ul> <li>Rated insulation voltage</li> </ul>		V AC	250	250/440		
<ul> <li>Degree of pollution for overvoltage category</li> </ul>			3/111			
Touch protection acc. to EN 50274			Yes			
Handle end position, sealable			Yes			
Degree of protection acc. to EN 60529			IP20, with connected conductors			
CFC and silicone-free			Yes			
Mounting			On standard mounting rail			
Terminals						
Combined terminals at both ends		Yes				
<ul> <li>Terminal tightening torque, only for Cu, 60/75 °C</li> <li>Nm</li> </ul>		Nm	3.5			
Ib/in		31				
Conductor cross-sections     Solid and stranded, top and bottom terminal, AW     acc to LIL 489 and CSA C22 2 No. 5-02		AWG	14 4			
AWG conductors, solid and stranded acc. to IEC 60898-1 mm <sup>2</sup>		0.75 35				
Mains connection			Any			
Mounting position			Any			
Average service life, with rated load			20000 actuations			
Ambient temperature °C		-25 +45, occasionally +55, max. 95 % humidity, storage temperature: -40 +75				
Resistance to climate acc. to IEC 60068-2-30			6 cycles			
Resistance to vibrations acc. to IEC 60068-2-6 m/s <sup>2</sup>		60 at 10 150 Hz				

Busbars		5ST3 663 5ST3 664 5ST3 665	5ST3 666-0	5ST3 666-2	
Standards		UL 489			
Approved acc. to	UL 489; UL File Nr. E321559				
Operational voltage					
Acc. to IEC     Acc. to UL 489	V AC 690 V AC 480Y/277 and 240				
Rated conditional short-circuit current Dielectric strength Surge strength	kA kV/mm kV	15 kA with NH3 355A gL/gG 500 V 30 >9.5			
Rated current at 40 °C ambient temperature A		115			
Insulation coordination <ul> <li>Degree of pollution</li> <li>Overvoltage category</li> </ul>		2 111			
Busbar cross-section mm <sup>2</sup> Cu		16			
Infeed		Any			
Conductor cross-sections	AWG mm²		14 2 1.5 35	14 1 1.5 50	
Terminals – terminal tightening torque	Nm Ib/in		3.5 30	3.5 30	
Temperature resistance	°C	200 – UL94-V0/0.4 mm			

#### **Specifications - Preliminary**

	<b>AS</b> 5ST3010-0HG 5ST3011-0HG 5ST3012-0HG	FC 5ST3020-0HG 5ST3021-0HG 5ST3022-0HG	<b>S</b> 5ST3030-0HG	T 5ST3031-0HG			
Standards	UL489, CSA22.2 No.5-02						
	IEC/EN 62019, IEC/EN	IEC/EN 60947-1					
Approved acc. to	UL489, CSA, UL-File No.321559						
Rated voltages/-load	IEC AC V 400   230 AC A 2   6 (N	110 415 -	24 60 -				
	DC V 220 110  DC A 1   1	110 -	24 60 -				
	UL AC V 480   277   AC A 1.5   3	110 480 -	24 60 -				
	DC V 125   50 DC A 1   3		-	24 60 -			
Short-circuit protection	Circuit breaker or fuse 6A						
Contact load	min. 50mA, 24V	-	-				
Response limit	_		0.7 1.1U <sub>n</sub>				

Using this mounting concept, all additional 5ST3 components can be combined with circuit breakers of the 5SJ4...HG.. series.

The chart shows which additional components can be mounted on the right.



#### Dimensions



The information provided in this product profile contains descriptions or characteristics of performance which in case of actual use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract. Availability and technical specifications are subject to change without notice.

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