

SFM - Series Miniature Circuit Breakers - AC



1 pole
Surface mount

2 pole
Surface mount

3 pole
Surface mount

3 pole
Surface mount

Features

- AC circuit breaker
- Hydraulic-magnetic technology
- 100 % rating capability; independent of ambient temperature
- One, two, three, four pole, 1+N and 3+N
- AS/NZS 3111 approved
- Ratings 1 A to 100 A
- Available in various current ratings and time delays
- Precision tripping characteristics
- Can be switched on immediately after tripping
- Optional auxiliary switch
- Optional shunt trip (No approvals)

Auxiliary Switch: Features

- Single pole double throw
15 A @ 250 Vac

Applications

- AC Branch protection
- Telecom / datacom equipment
- Lighting control
- UPS equipment
- Mobile power generation equipment
- Railway equipment
- Industrial equipment
- Mining equipment

Optional Accessories

- Handle lock - 4474005
- Safety blank (1 Pole) - SFM1BLANK
- Safety blank (2 Pole) - SFM2BLANK
- Escutcheon blank - SFEB000

Approvals



AS/NZS 3111

Hydraulic-Magnetic Circuit Breakers 100% rated, unaffected by ambient temperature

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Technical Data

Product Type	Circuit Breaker				
Approvals	AS/NZS 3111				
Number of Poles	1	2 (1+N)	2	3	4 (3+N)
Operating Voltages	240 V ac		415 V ac		
Minimum Current Rating	4 A				
Maximum Current Rating	100 A				
Interrupting Capacity	6 kA				

Product Type	Switch Disconnecter			
Approvals	DIN / EN 60947-3			
Number of Poles	1	2	3	4
Operating Voltages	240 V ac	415 V ac		
Current Rating	63 A & 100 A			
Withstand Current	6 kA / 50 ms			

Product Type	SFM(26)
Ambient Operating Temperature	-40 °C to +85 °C
Mounting Options	Clip tray, Front & Surface mounting
Time Delay Curves	1, 2, 3
Endurance	500 mechanical operations (AS/NZS 3111 Clause 7.7)
Dielectric Strength	2 kV (AS/NZS 3111 Clause 7.5.2)
Weight	200 g per pole, 260 g with auxiliary (unpacked)
Altitude	Certification tests done at altitude ≈ 2000 metres. Will operate at higher altitudes.
Shock	50 g with pulse duration of 11 milliseconds
Vibration	5 g from 35 Hz to 200 Hz
Flammability	I3 - Ignition does not persist at 850 °C after glow wire is withdrawn with an oxygen index of ≥ 28
Toxicity	F1 - Smoke index of ≤ 20 which determines the fume class
Pollution Degree	PD2 - Normally only non-conductive pollution occurs. Temporary conductivity caused by condensation is to be expected.

	Circuit Breaker	Wire Size (IEC)	Torque (IEC)
Main terminals	Box Type	1 mm ² - 35 mm ²	4 Nm
	Lug & Rear Studs Type	1 mm ² - 50 mm ²	

Verify approvals for specific ratings in accordance with the relevant test certificates.

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Long Code

Example Code: SFM4-2G3/G1/G10-60A-2-96-250Vac - AC-3

Group	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Requirement	SFM	Four Pole	Two Pole First Set	Box Type Main Terminal	Overload Series Trip	One Pole Second Set	Box Type Main Terminal	Overload Series Trip WITH Aux switch	One Pole Third Set	Box Type Main Terminal	Shunt Trip (ST1), flexible leads	N/A	N/A	N/A	Current Rating	Time Delay	Shunt Trip Voltage Vac	AC/DC	AS/NZS 3111
Long Code	SFM	4	2	G	3	/	G	1	/	G	10	-	-	-	60 A	2	96-250	AC	3

Ordering Information

Group	Code	Description	Comments
First Set (s)	Group 1: Frame Type		
	SFM	SFM	
	Group 2: Total Number of Poles		
	1	Single pole	
	2	Double pole	2 pole or 1+N
	3	Triple pole	
	4	Four pole	3+N
	Group 3: Number of Poles		
	-	Not applicable	All poles are the same
	2	Two poles	
	3	Three poles	
	4	Four poles	
	Group 4: Termination		
	A	Rear studs "AC"	
	D	Screw terminal "AC"	
G	Box terminal "AC"		
Group 5: Pole Construction			
0	Switch Disconnecter with auxiliary switch fitted	No approvals	
1	Series trip overload with auxiliary switch fitted		
3	Overload series trip		
6	Shunt trip four terminals. (INTERNAL SHUNT)	No approvals	
10	Shunt trip (ST1), flexible leads. (EXTERNAL SHUNT)	No approvals	
11	Shunt trip (ST1), with auxiliary switched fitted. (EXTERNAL SHUNT)	No approvals	
13	Switch Disconnecter with auxiliary switch fitted	No approvals	
14	Shunt trip in series with a cut-off main contacts (ST1CO). With flexible leads. Occupies additional pole. (SERIES SHUNT)	No approvals	
15	Auxiliary switch with flexible leads (internal fitted). Occupies additional pole		
Second Set (s)	Group 6: Number of Poles		
	-	Not Applicable	
	/	One pole	
	/2	Two poles	
	/3	Three poles	
	/4	Four poles	
	Group 7: Terminal Type		
	A	Rear studs "AC"	
	D	Screw terminal "AC"	
	G	Box terminal "AC"	
	Group 8: Pole Construction		
	0	Switch Disconnecter with auxiliary switch fitted	
	1	Series trip overload with auxiliary switch fitted	
	3	Overload series trip	
	6	Shunt trip four terminals. (INTERNAL SHUNT)	
10	Shunt trips (ST1), flexible leads. (EXTERNAL SHUNT)		
11	Shunt trip (ST1), with auxiliary switch fitted. (EXTERNAL SHUNT)		
13	Switch Disconnecter with auxiliary switch fitted		
14	Shunt trip in series with a cut-off main contacts (ST1CO). With flexible leads. Occupies additional pole. (SERIES SHUNT)		
15	Auxiliary switch with flexible leads (internal fitted). Occupies additional pole		

Continues on page 4

SFM - Series Miniature Circuit Breakers - AC

Ordering Information

	Code	Description	Comments	
Third Set (s)	Group 9: Number of Poles			
	-	Not Applicable		
	/2	Two pole		
	/3	Three poles		
	/4	Four poles		
	Group 10: Terminal Type			Comments
	A	Rear studs "AC"		
	D	Screw terminal "AC"		
	G	Box terminal "AC"		
	Group 11: Pole Construction			Comments
	0	Switch Disconnecter with auxiliary switch fitted		
	1	Series trip overload with auxiliary switch fitted		
	3	Overload series trip		
6	Shunt trip four terminals. (INTERNAL SHUNT)			
10	Shunt trip (ST1), flexible leads. (EXTERNAL SHUNT)			
11	Shunt trip (ST1), with auxiliary switch fitted. (EXTERNAL SHUNT)			
13	Switch Disconnecter with auxiliary switch fitted			
14	Shunt trip in series with a cut-off main contacts (ST1CO). With flexible leads. Occupies additional pole. (SERIES SHUNT)			
15	Auxiliary switch with flexible leads (INTERNAL FITTED). Occupies additional pole			
Fourth Set (s)	Group 12: Number of Poles			Comments
	-	Not Applicable		
	/2	Two pole		
	/3	Three poles		
	/4	Four poles		
	Group 13: Terminal Type			Comments
	A	Rear studs "AC"		
	D	Screw terminal "AC"		
	G	Box terminal "AC"		
	Group 14: Pole Construction			Comments
	0	Switch disconnecter with auxiliary switch fitted		
	1	Series trip overload with auxiliary switch fitted		
	3	Overload series trip		
	6	Shunt trip four terminals. (INTERNAL SHUNT)		
	10	Shunt trips (ST1), flexible leads. (EXTERNAL SHUNT)		
	11	Shunt trip (ST1), with auxiliary switch fitted. (EXTERNAL SHUNT)		
	13	Switch Disconnecter with auxiliary switch fitted		
	14	Shunt trip in series with a cut-off main contacts (ST1CO). With flexible leads. Occupies additional pole. (SERIES SHUNT)		
	15	Auxiliary switch with flexible leads (internal fitted). Occupies additional pole		
	Group 15: Current Rating			Comments
		1, 2, 4, 6, 10, 15, 16, 20, 25, 30, 32, 40, 50, 63, 70, 80, 100 A		Ratings certification dependant

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Ordering Information

Code	Description	Comments
Group 16: Time Delay		
1	Long time delay	Orange handle
2	Medium time delay	White handle
3	Short time delay	White handle
Group 17: Shunt Trip Voltage (No approval)		
-	Not Applicable	
24 - 96	24 - 96 Vac or 12 - 48 Vdc	
96 - 250	96 - 250 Vac or 48 - 125 Vdc	
380 - 440	380 - 440 Vac	
Group 18: AC/DC		
AC	Single phase 240 Vac, Three phase 415 Vac	
Group 19: Approvals		
3	AS/NZS 3111	
Z	No approvals	

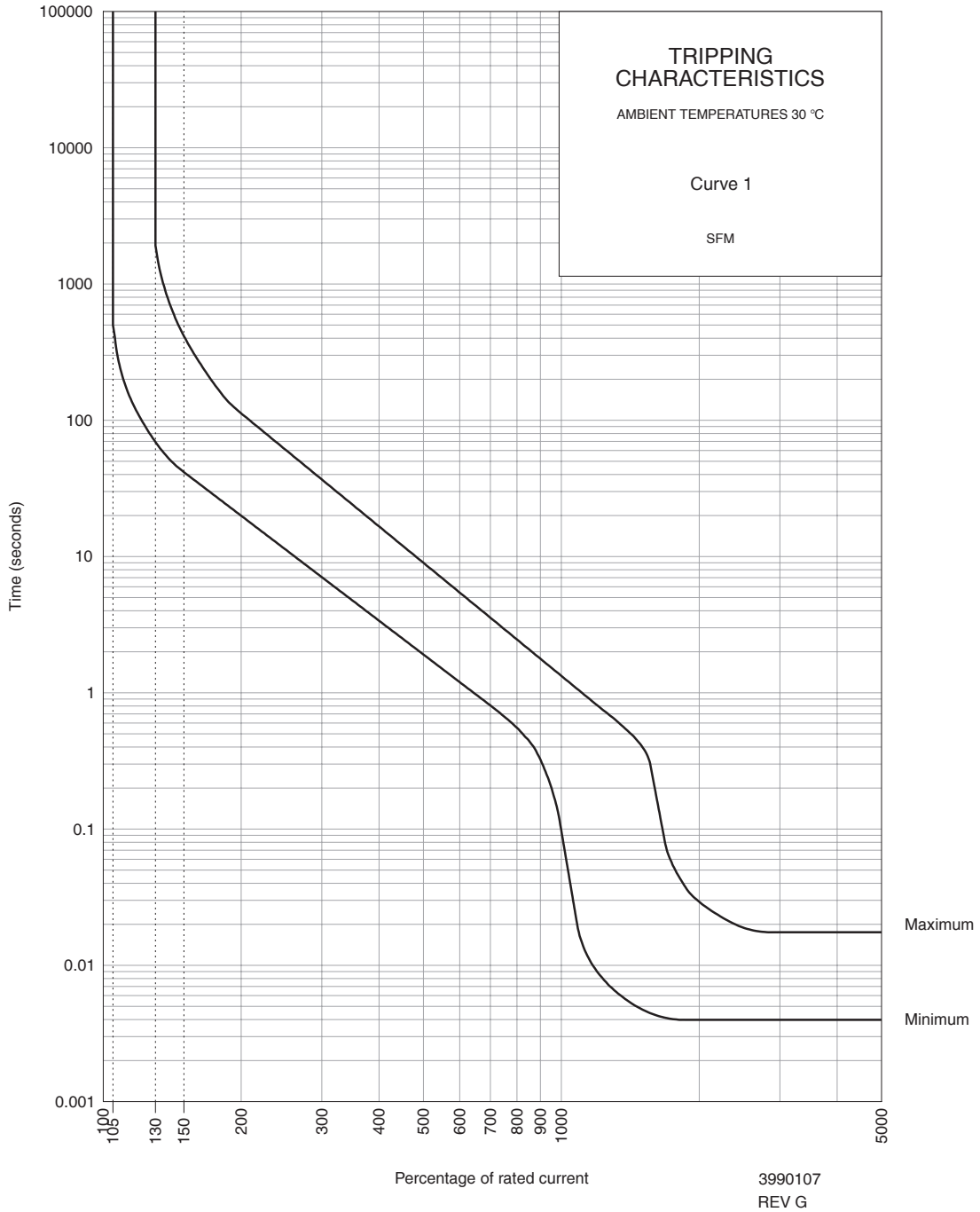
For options not listed, please contact CBI

Note:

- Ordering Information
 - Apply first set group's 3, 4 & 5 followed by group 15, 16, 17, 18 & 19 for when all the poles are of the same construction.
 - Make use of codes for groups 6 to 14 of the second set to the fourth set followed by groups 15, 16, 17, 18 & 19 for when all the poles are of a different construction.
- Auxiliary and Shunt Information
 - Auxiliary switch is fitted on the left hand side of the first pole of the unit.
 - Shunt trip is fitted on the left hand side of the unit.
 - If shunt trip with auxiliary switch (G11) is selected, then both auxiliary switch and shunt trip is fitted on the left hand side of the unit.

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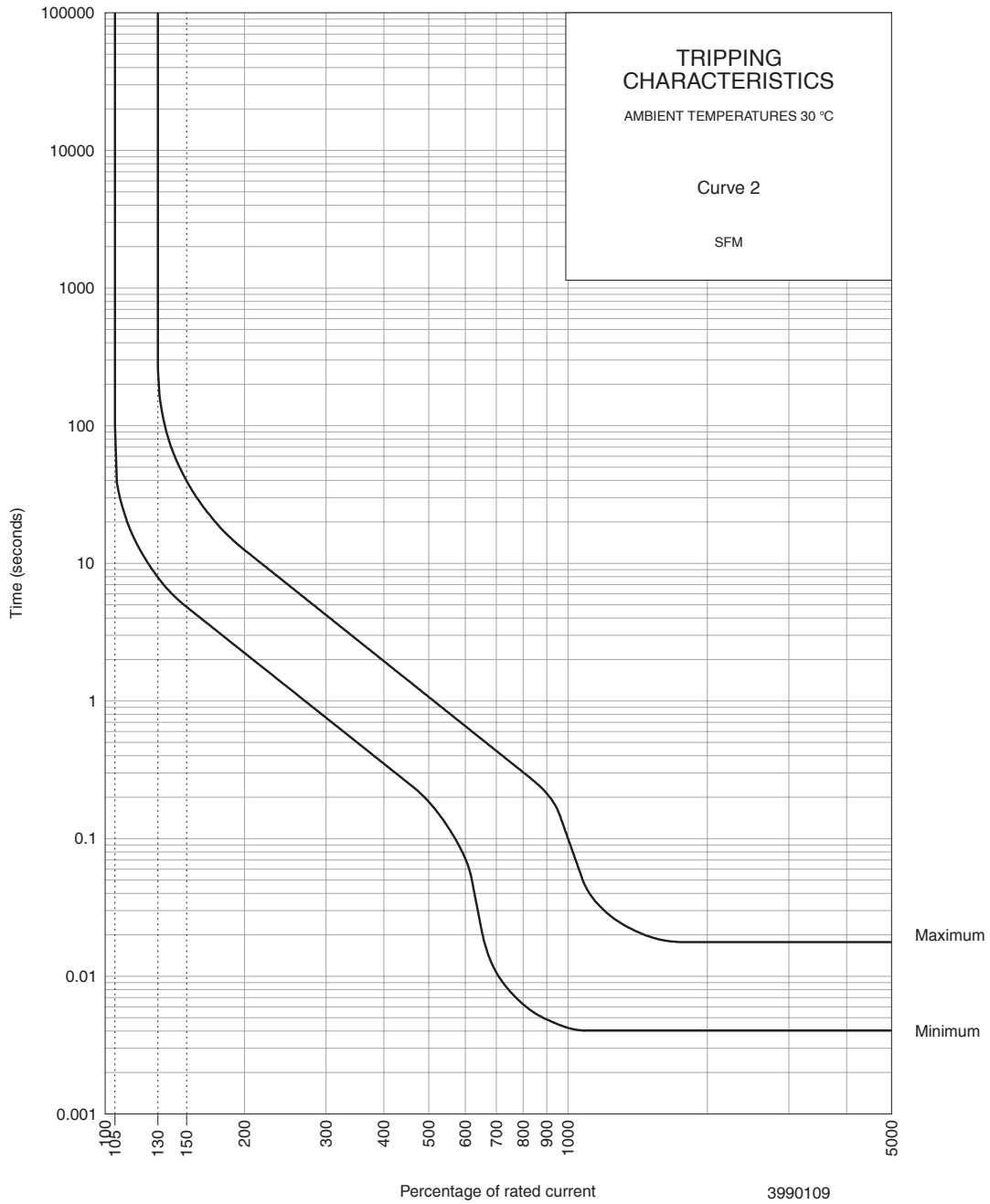
Time Delay Curves



PERCENTAGE OF RATED CURRENT	105%	130%	150%	200%	300%	400%	500%	600%	700%	800%	900%	1000%	1200%
MINIMUM TRIP TIME IN SECONDS	NO TRIP	66	40	20	7	3.5	1.8	1.3	0.8	0.55	0.33	0.1	-
MAXIMUM TRIP TIME IN SECONDS	NO TRIP	1920	408	115	39	18	9	5.4	3.6	2.5	1.8	1.5	0.8

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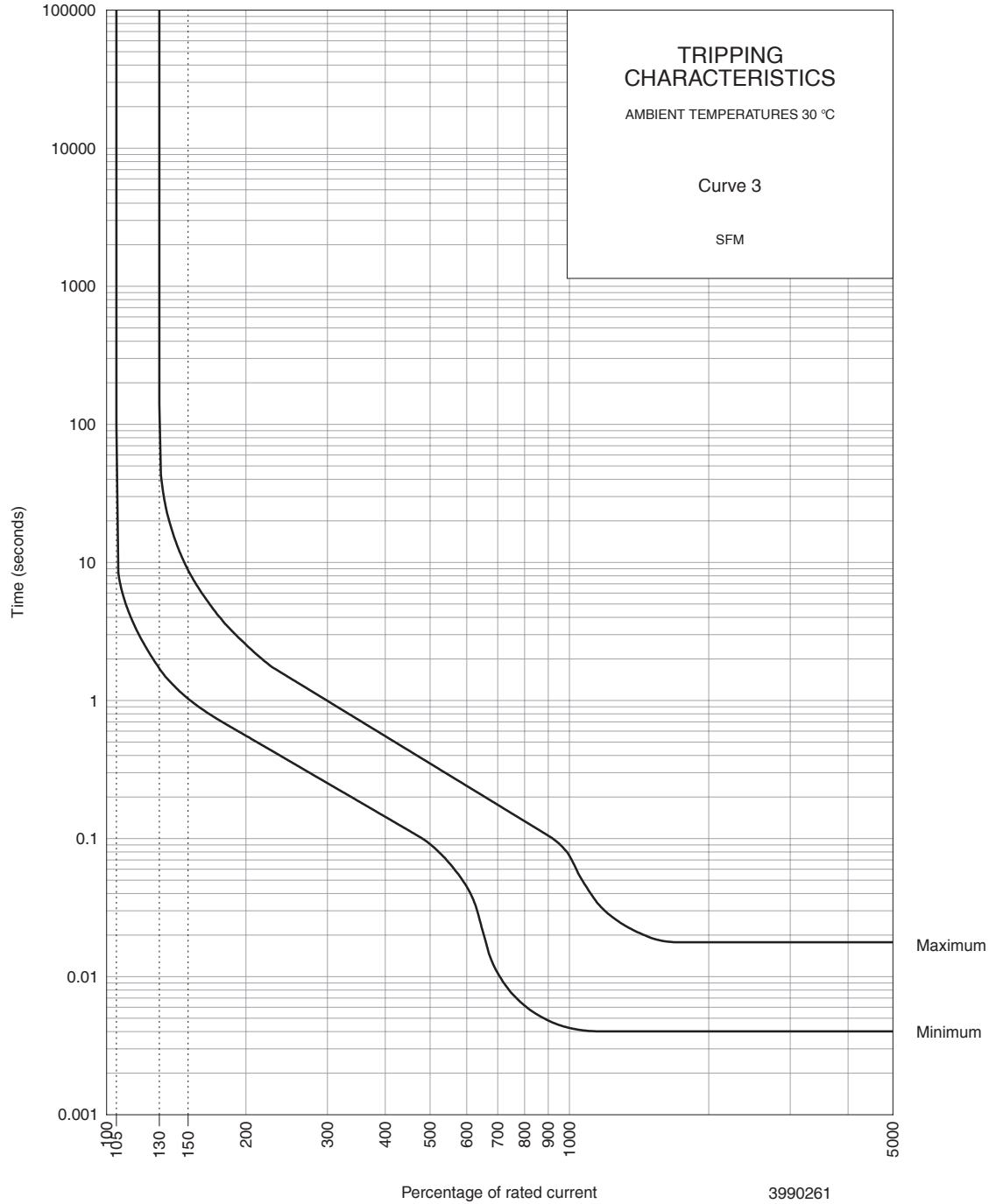
Time Delay Curves



PERCENTAGE OF RATED CURRENT	105%	130%	150%	200%	300%	400%	500%	600%	700%	800%	900%	1000%	1200%
MINIMUM TRIP TIME IN SECONDS	NO TRIP	7.9	4.8	2.2	0.75	0.35	0.19	0.07	0.01	0.006	0.005	0.004	-
MAXIMUM TRIP TIME IN SECONDS	NO TRIP	160	40	12.5	4.2	1.9	1.1	0.65	0.4	0.3	0.22	0.1	0.03

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Time Delay Curves

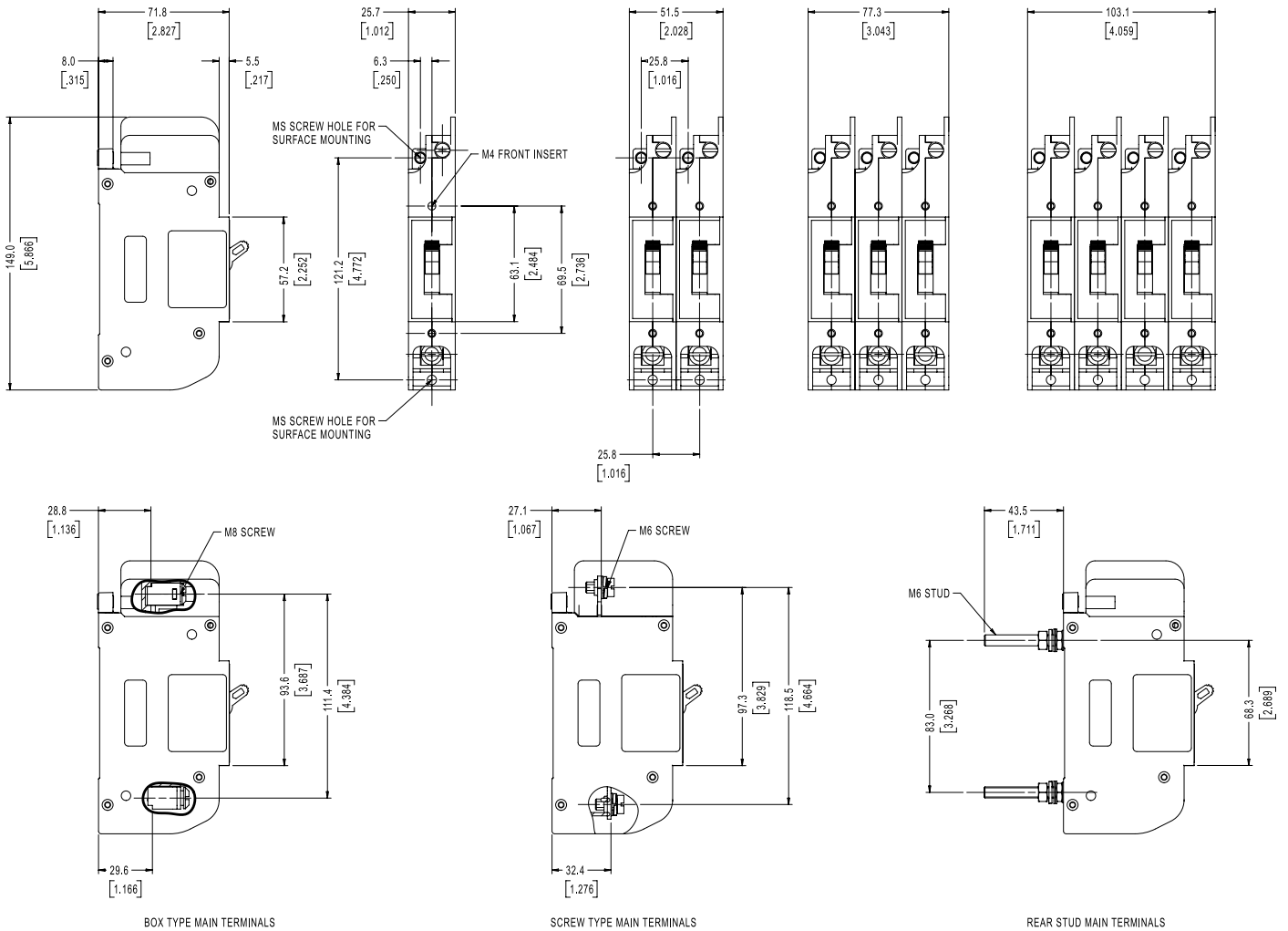


PERCENTAGE OF RATED CURRENT	105%	130%	150%	200%	300%	400%	500%	600%	700%	800%	900%	1000%	1200%
MINIMUM TRIP TIME IN SECONDS	NO TRIP	1.7	1	0.55	0.25	0.15	0.09	0.04	0.01	0.006	0.005	0.0043	0.0043
MAXIMUM TRIP TIME IN SECONDS	NO TRIP	40	8.8	2.5	1	0.55	0.35	0.24	0.018	0.13	0.1	0.0175	0.0175

* The published time delay curves are generated at 30°C ambient temperature with the circuit breaker mounted in the up-right position. The “must hold”, “must trip” and “instantaneous trip” current values are not affected by temperature, although delay time for the other operating current values may have to be adjusted using the temperature compensation curve which is available on request.

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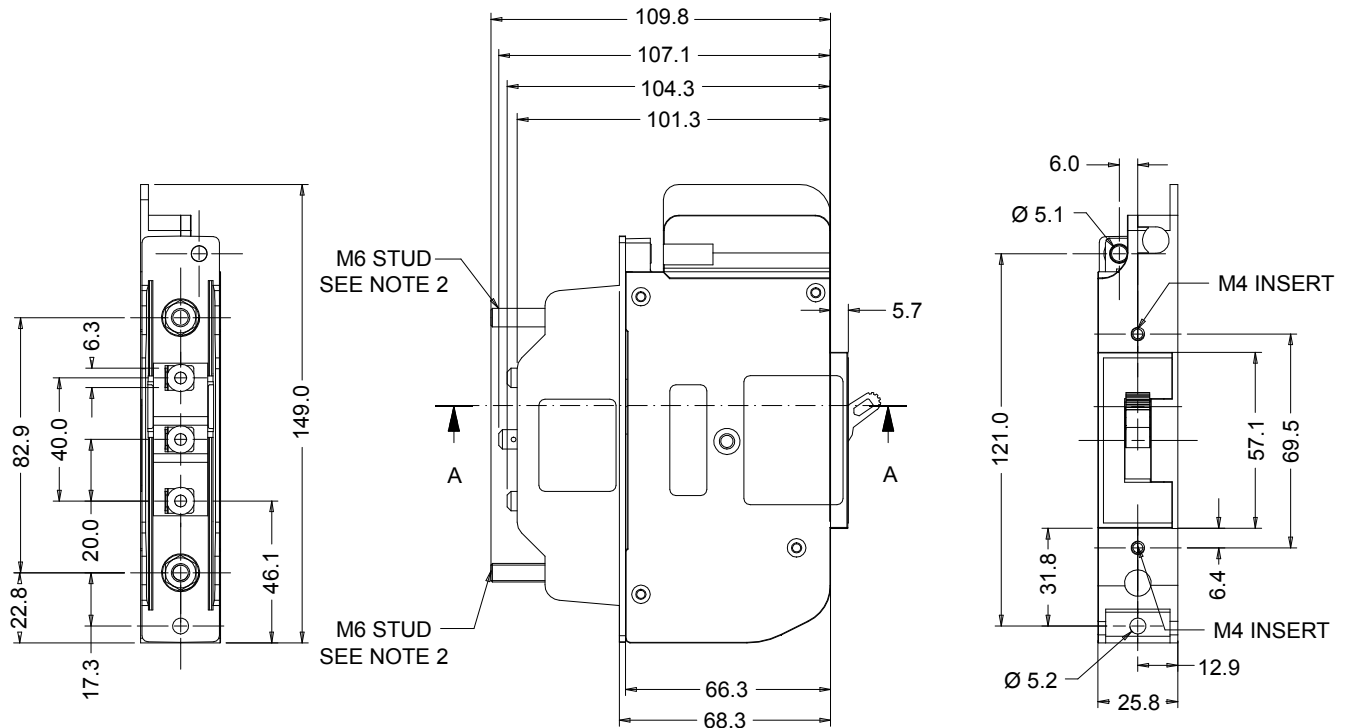
Outline Dimensions: Front & Surface Mount



TOLERANCE ± 0.4 UNLESS OTHERWISE SPECIFIED
(DIMENSION IN BRACKETS ARE IN INCH)

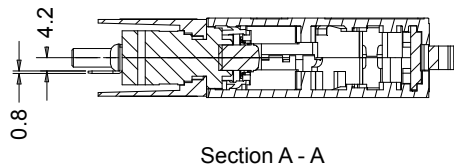
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Outline Dimensions: Auxiliary Switch



NOTES:

- 1 - GENERAL TOLERANCE 0.4 mm
- 2 - PRODUCT CAN BE OFFERED IN STUD TERMINALS (SHOWN), BOX TERMINALS AND LUG TERMINALS



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