RATINGS AND SPECIFICATIONS

TEMBREAK 2 LITE MOULDED CASE CIRCUIT BREAKERS

MCCB Electrical Characteristics to IEC 60947-2, EN60947-2, JIS C 8201-2-1 ANN.1, NEMA AB-1

Frame Reference	Quantity	Unit	Condition	TB2 Lite 160		
Max in (A) of Frame				**160**	**160**	
Model				E160	E160	
Number of Poles				1	3,4	
Type				SF	SF	
Nominal current ratings						
	I_n	(A)	50°C	16,20,25,32, 40,50,63,80, 100,125	16,20,25, 32,40,50, 63,80,100, 125,160	
Electrical characteristics						
Rated operational voltage	U_e	(V)	AC 50/60 Hz	240	525	
			DC	-	250	
Rated insulation voltage	U_i	(V)		690	690	
Rated impulse withstand voltage	U_{imp}	(kV)		8	8	
Ultimate breaking capacity (IEC, JIS, AS/NZS)	I_{cu}	(kA)	690V AC	-	-	
			525V AC	-	6	
			440V AC	-	10	
			400/415V AC	-	16	
			220/240V AC	25	25	
			250V DC	-	13	
Service breaking capacity (IEC, JIS, AS/NZS)	I_{cs}	(kA)	690V AC	-	-	
			525V AC	-	3	
			440V AC	-	5	
			400/415V AC	-	8	
			220/240V AC	13	13	
			250V DC	-	7	
Rated breaking capacity (NEMA)		(kA)	480V AC	-	6	
			240VAC	25	25	
Protection						
Fixed thermal, fixed magnetic				■	■	
Adjustable thermal, fixed magnetic				-	-	
Utilisation category				A	A	
Installation						
Front connection (FC)				■	■	
Extension bar (FB)				•	•	
Cable clamp (FW)				■ ①	-	
Rear connection (RC)				-	•	
Plug-in (PM)				-	-	
DIN rail mounting (DA)				-	•	
Dimensions	height	(mm)		130	130	
	width	(mm)	3 pole, (1 pole)	(25)	75	
			4 pole	-	100	
	depth	(mm)		68	68	
Weight	weight	(kg)	3 pole, (1 pole)	(0.3)	0.8	
			4 pole	-	1.0	
Operation						
Direct Opening Action				■	■	
Toggle operation				■	■	
Door mounted (HS) / Breaker mounted handle (HB)				-	•	
Motor operation				-	-	
Endurance	Electrical	cycles	415V AC	10,000	10,000②	
	Mechanical	cycles		20,000	20,000	

■ Standard • Optional - Not Available

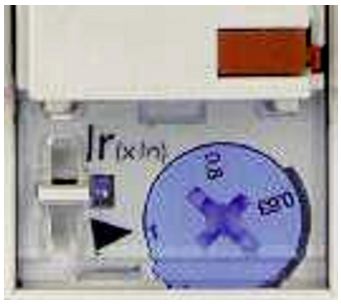
TB2 Lite 160					
	160				
	E160	S160	S160	S160	S160
	3, 4 SJ	3, 4 SCF	3, 4 SCJ	3, 4 SF	3, 4 SJ
	25,40,63,80 100,125,160	16,20,25,32 40,50,63,80, 100,125,160	25,40,63,80, 100,125,160	16,20,25,32 40,50,63,80, 100,125,160	25,40,63,80 100,125,160
	525 250 690 8	525 250 690 8	525 250 690 8	690 250 690 8	690 250 690 8
	- 6 10 16 25 13	- 7.5 15 25 35 20	- 7.5 15 25 35 20	6 10 25 40 50 25	6 10 25 40 50 25
	- 3 5 8 13 7	- 4 7.5 13 18 10	- 4 7.5 13 18 10	3 7.5 13 20 25 13	3 7.5 13 20 25 13
	6 25	7.5 35	7.5 35	10 50	10 50
	- ■ A	■ - A	- ■ A	■ - A	- ■ A
	■ • ■ ① • - • 130 75 100 68 0.8 1.0	■ • - • - • 130 75 100 68 0.8 1.0	■ • ■ ① • - • 130 75 100 68 0.8 1.0	■ • - • - • 130 75 100 68 0.8 1.0	■ • ■ ① • - • 130 75 100 68 0.8 1.0
	■ ■ • - 10,000② 20,000	■ ■ • - 10,000② 20,000	■ ■ • - 10,000② 20,000	■ ■ • - 10,000② 20,000	■ ■ • - 10,000② 20,000

① Factory-fit at time of order
② 14,000 ≤125A

PROTECTION CHARACTERISTICS

TEMBREAK 2 LITE ADJUSTABLE PROTECTION

3 Pole 160A MCCB with Adjustable Characteristics



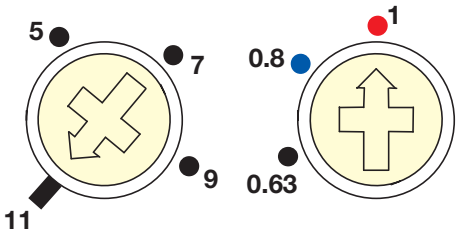
160A MCCB Adjustment Dial

The TemBreak 2 Lite range is available in 2 frame sizes, 160A and 250A. Interrupting capacities of 16kA, 25kA and 40kA are offered in 3 and 4 pole versions. MCCBs with adjustable thermal and magnetic protection characteristics offer bespoke solutions allowing the breaker settings to match the load and supply characteristics.

160A TemBreak 2 Lite MCCBs are extremely compact in size (W75 H130 D68) and offer space saving solutions for electrical power distribution where the installation size is critical. 160A TemBreak 2 Lite models have adjustable thermal and fixed magnetic settings. 250A TemBreak 2 Lite MCCBs have adjustable thermal and adjustable magnetic settings.

TEMBREAK 2 LITE ADJUSTABLE PROTECTION

Adjustment Dials



250A MCCB Adjusting Dials

1. I_R is the thermal element adjustment dial and is used to set the rated current to match the conductor rating.

   I_R can be set between 0.63 and 1.0 times I_n.

2. I_i is the magnetic element adjustment dial and is used to set the short circuit tripping threshold to suit the application. It is fixed on 160A frame.

Models, Ratings and Settings

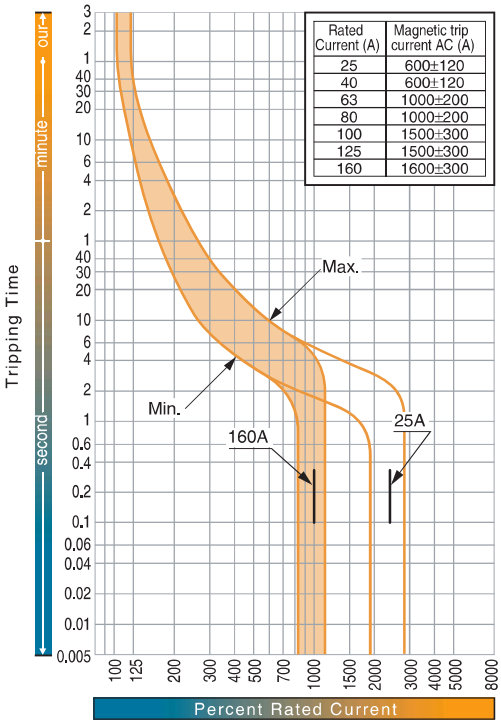
Model	Type	Rated current I_n (A)	Magnetic trip current I_i (A)
E160	-SJ	25, 40	600
		63, 80	1000
		100, 125	1500
		160	1600
S160	-SCJ	25, 40	600
		63, 80	1000
		100, 125	1500
		160	1600
S160	-SJ	25, 40	600
		63, 80	1000
		100, 125	1500
		160	1600
E250	-SCJ	100, 125, 160, 200	*5 - 13 x In*
		250	*5 - 11 x In*
E250	-SJ	100, 125, 160, 200	*5 - 13 x In*
		250	*5 - 11 x In*
S250	-SJ	160, 200	*5 - 13 x In*
		250	*5 - 11 x In*

Magnetic trip tolerance +/-20%

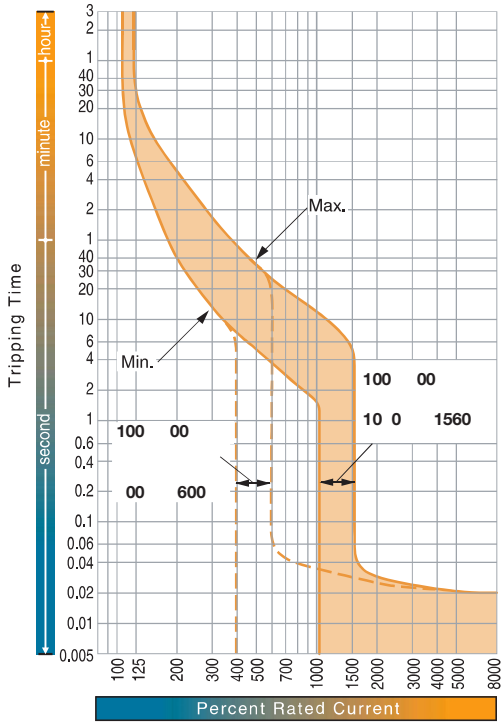
PROTECTION CHARACTERISTICS

TEMBREAK 2 LITE ADJUSTABLE PROTECTION

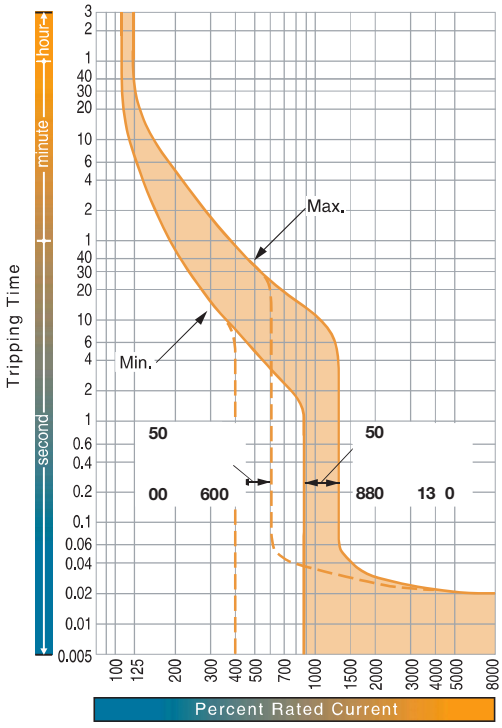
Time/Current Characteristic Curves
E160-SJ, S160-SCJ, S160-SJ



Time/Current Characteristic Curves
E250-SCJ, E250-SJ, S250-SJ (100 ~ 200A)



Time/Current Characteristic Curves
E250-SCJ, E250-SJ, S250-SJ (250A)



TEMBREAK 2 LITE MOULDED CASE CIRCUIT BREAKERS AND SWITCH DISCONNECTORS

Connections and Mountings

Connecting types (Abbreviation)		Front-connected (FC)		Rear-connected (RC)	
		With extension bars		Flat bar studs Stud can be turned 45° or 90°	Bolt studs
Outer view / Breaker					
160 **160** **160**	◉	○	—	○	—
160 **160** **160** **160**	◉	○	○	○	—
50 **50** **50** **50** **50** **50** **50**	◉	○	○	○	—
	• Connect compression terminals or flat bars directly to breaker terminals.	• Extension bars are attached to breaker terminals. Connect compression terminals or flat bars to the extension bars.	• Cable clamps are attached to breaker terminals. Connect wires directly to cable clamps.	• Flat bar studs will be factory installed in the horizontal position unless otherwise specified. • For E250, S250, the flat bar studs in the vertical position are available on request. Please select a position code from those shown in the table below: • For S160, the studs are horizontal direction only.	

171 .

◉ . .
○ . .
— .

SECTION 5

INSTALLATION

TEMBREAK 2 LITE MOULDED CASE CIRCUIT BREAKERS AND SWITCH DISCONNECTORS

Connections and Mountings

Bars For Front Connection

3	160 160 160 160 160		1	3	3	3	
	160 160		1				
3	50 50 50 50 50		1	3	3	3	
	50 50		1				
3	50 50 50 50 50		1	3	3	3	
	50 50		1				

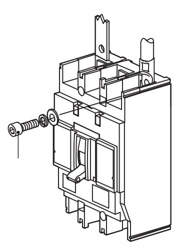
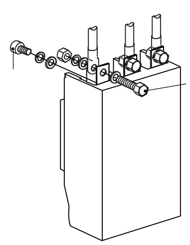
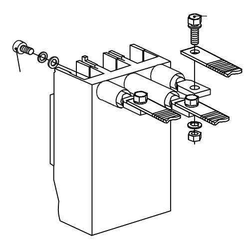
NOTE ① Two sets are required per breaker one for the line side and one for the load side.

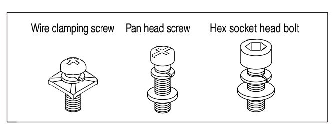
Rear Connection

3	160 160 160 160 160	1	3	3	3	
	160 160	1				
3	50 50 50 50 50	1	3	3	3	
	50 50	1				

NOTE ② The studs can be rotated to four angular positions. 0 (horizontal), 45, 90 (vertical) and 135 degrees.

Terminal Screws Sizes and Standard Torques

					Rear connection (RC) (Flat Bar stud)	
						
Frame size (A)	Breaker	Torque (N·m)	Torque (N·m)	Torque (N·m)	Torque (N·m)	Torque (N·m)
160	160 160 160 160 160 160 16～50	Wire clamping M5x14 .3～3.	Wire clamping M5x14 .3～3.	Hex head 8 11.8～18.6	Pan head 5 1 .3～ .8	Hex head 8 3 .7～ .5
	160 160 160 160 160 160 63～160	Pan head 8 1 .9～6.9	Pan head 8 1 .9～6.9	Hex head 8 11.8～18.6	Hex socket head M6x18 7.8～11.8	Hex head 8 3 11.8～18.6
	160	Pan head 8 1 .9～6.9	Pan head 8 1 .9～6.9	Hex head 8 11.8～18.6	Hex socket head M6x18 7.8～11.8	Hex head 8 3 11.8～18.6
50	50 50 50 50 50 50 50	Hex socket head M8x18 7.8～1 .7	Hex socket head M8x18 7 8～1 .7	Hex head 10 5 .5～37.	Hex socket head M6x18 7 8～11.8	Hex head 8 5 11.8～18.6



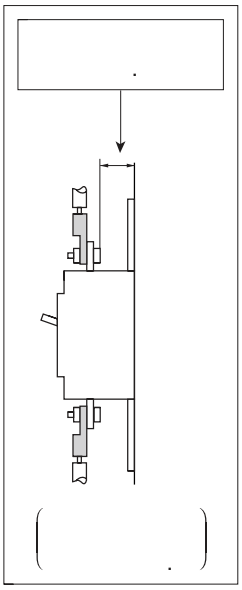
TEMBREAK 2 LITE MOULDED CASE CIRCUIT BREAKERS AND SWITCH DISCONNECTORS

Connections and Mountings

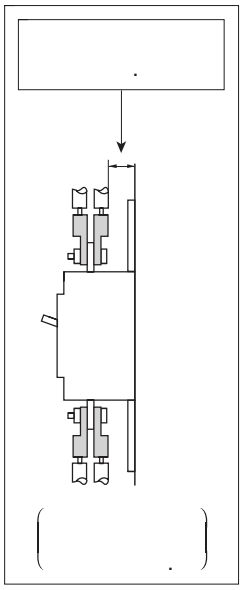
Connection of Busbar and Terminated Cable

Multiple Conductors

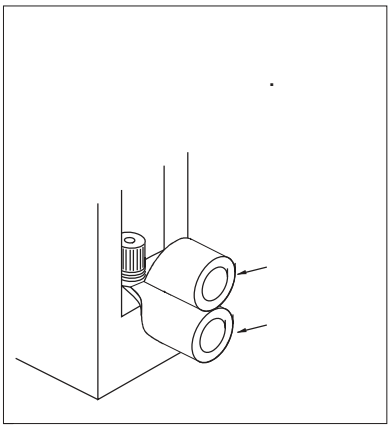
Connection (one electric cable)



Connection (two electric cables)

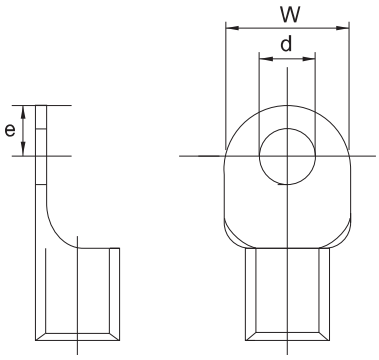


Connection (two terminals)



Compression Terminal

Each terminal on 250A models has a serrated surface. This provides excellent grip for heavy cables terminated with crimp lug terminals, thereby preventing sideways rotation of the lug.

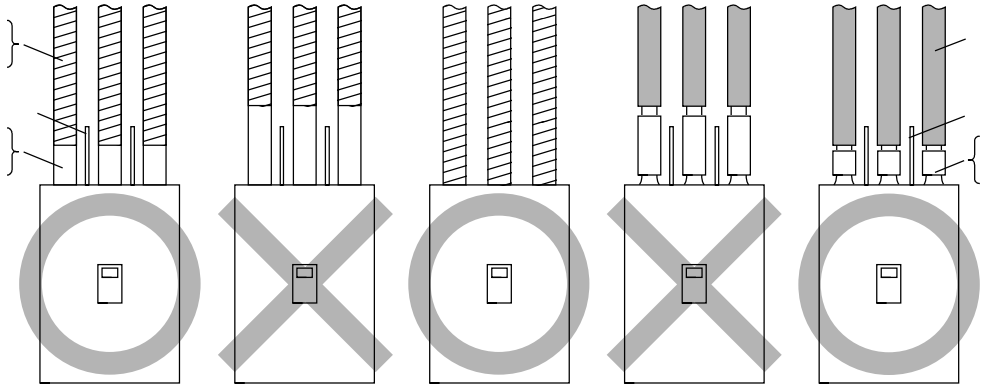


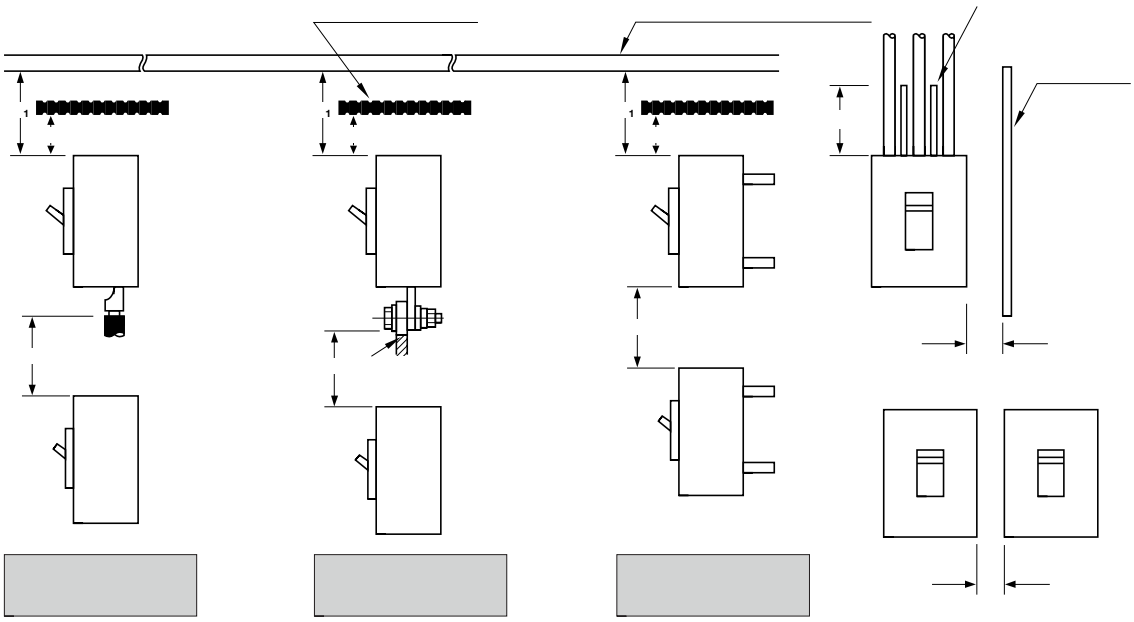
Maximum Dimensions of Compression Terminals		
Frame Size (A)	160	250
Width, W (mm)	17.2	25
Diameter, d (mm)	8.5	9
Maximum from centre to tip, e(mm)	9.5	11

TEMBREAK 2 LITE MOULDED CASE CIRCUIT BREAKERS AND SWITCH DISCONNECTORS

Insulation Distance from Line Side

The insulation distance between the breaker and earthed metal parts and insulators shown in the table on the next page must be maintained to prevent arcing faults occurring due to conductive ionised gas. In addition, completely cover exposed conductors, to their roots at the breaker or to below the height protected by interpole barriers, on the line side of the breaker using insulation tube or tape, in order to provide positive protection against short circuit or ground fault due to the metal chipping, surge voltage, dust particles or salt. Be sure to install the interpole barriers supplied with the breaker.





A Distance from lower breaker to exposed live part of upper breaker terminal (front connection) or distance from lower breaker to end face of upper breaker (rear connection).
B1 Distance from end face of breaker to top plate.
B2 Distance from end face of breaker to insulation plate.
C Gap between breakers.
D Distance from side of breaker to side plate (earthed metal).
E Dimension of insulation over exposed conductors.

TEMBREAK 2 LITE MOULDED CASE CIRCUIT BREAKERS AND SWITCH DISCONNECTORS

Insulation Distance from Line Side

Moulded Case Circuit Breakers

						Note②	1				E	
50	50	50	50			50	0	0	*	50		3
160	160	160	160	160	160	50	50	10	*	5		3
50	50					50	50	0	*	50		3

Notes:

① Required to allow free and uninterrupted flow of arc gases. Ensure additional clearance or insulation distance if required to perform wiring, barrier installation or electrical work or to meet the need for more insulation distance between bare live parts and grounded metal members in a switchboard or the like.

② The figures are for lower breakers.

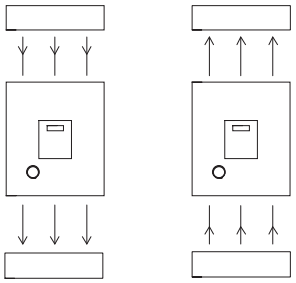
③ For front connection breakers, insulate all exposed conductors of the line side until the breaker end. If interpole barriers are packed, be sure to use the barriers; more over, insulate all exposed conductors by insulating tape or the like so that the tape overlaps with the barriers.

* If using extension bars (optional), ensure the insulation distance specified for the application.

Reverse Connection

The breakers are available for normal connection by default. Reverse connection is optional. See tables below.

					0	15	50
160	160	160	160	160			
160	160						
50	50	50	50				
50	50	50					



TEMBREAK 2 LITE MOULDED CASE CIRCUIT BREAKERS AND SWITCH DISCONNECTORS

Temperature Ratings

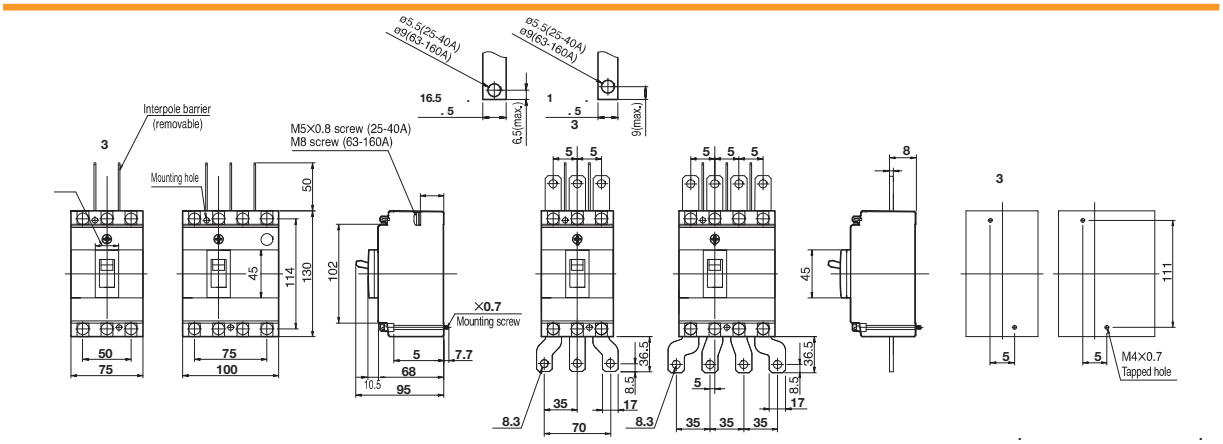
MCCB Type	Connection Type	Rating at Calibration temperature (50°C)	Rated current (A)		
			(55°C)	(60°C)	(65°C)
E160-SF, S160-SCF S160-SF	Front Rear	16A	15	14	13
		20A	19	18	17
		25A	24	24	23
		32A	30	28	27
		40A	39	37	36
		50A	48	47	45
		63A	61	59	57
		80A	76	73	70
		100A	97	94	91
		125A	122	118	115
		160A	156	152	149
E160-SJ, S160-SCJ, S160-SJ	Front Rear	25A	24	24	23
		40A	39	37	36
		63A	61	59	57
		80A	77	73	70
		100A	97	94	91
		125A	122	118	115
		160A	156	152	149
E250-SCF, E250-SF S250-SF	Front Rear	125A	120	116	111
		150A	146	143	139
		175A	168	164	159
		200A	194	189	184
		225A	216	211	204
		250A	243	236	229
E250-SCJ, E250-SJ S250-SJ	Front Rear	100A	98	96	94
		125A	122	119	115
		160A	156	152	148
		200A	195	189	183
		250A	243	236	229

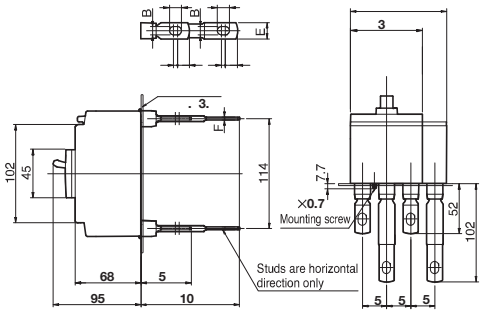
DIMENSIONS

TEMBREAK 2 LITE MOULDED CASE CIRCUIT BREAKERS & SWITCH DISCONNECTORS

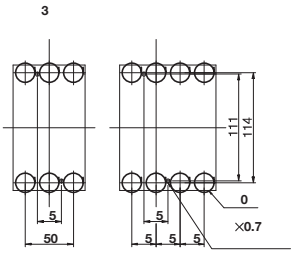
E160-SJ, S160-SCJ, S160-SJ, S160-SN

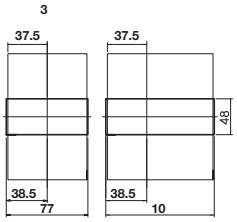
ASL: Arrangement Standard Line ℍ: Handle Frame Centre Line ℄: Handle Centre Line





16 50	10.5	6.5	4	13	16	4
63 160	12.5	8.5	4	13	16	5





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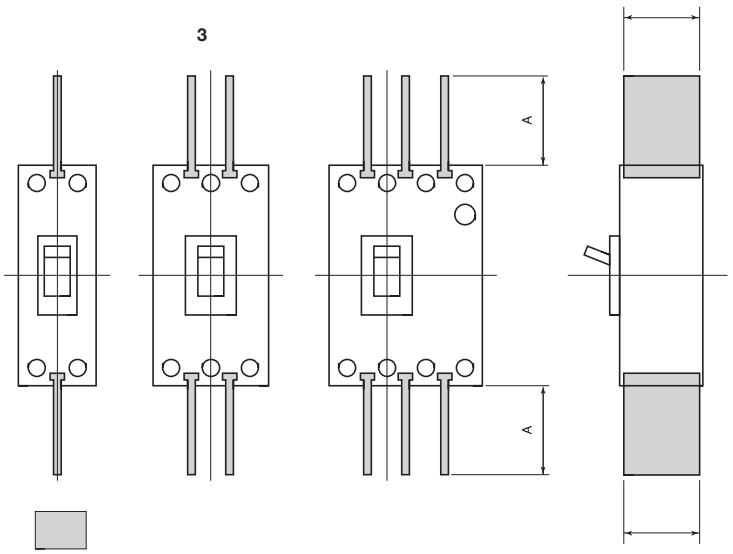
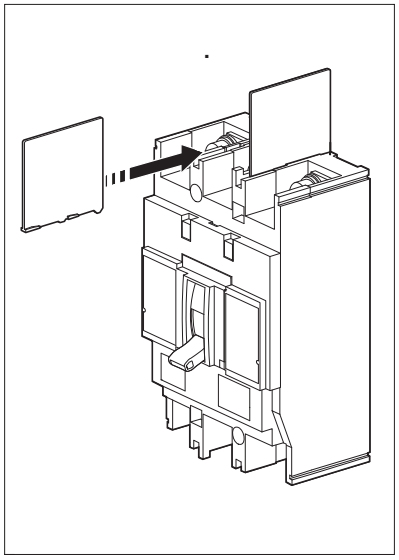
DIMENSIONS

INTERPOLE BARRIERS

Tembreak 2 Lite MCCBs & Switch Disconnectors

Interpole barriers serve to enhance electrical insulation between pole and prevent short-circuit due to electrically conductive foreign matter. Combined use of interpole barriers and terminal covers (standard type) is not possible.





160 160	160 160	160 160	160	50	55
50 50	50 50	50 50	50	101	53

Note: