



ETIBREAK

Moulded Case Circuit Breakers And Switch Disconnectors

Mining Circuit Breakers EB2 **108**

f @ in v
/etigroup

ETI
SWITCH TO
A SAFE FUTURE

ETIBREAK

Low Voltage Moulded Case Circuit Breakers - MCCBs

Mining Circuit Breakers



Product series	description	unit	condition	EB2 125	EB2 250	EB2 400	EB2 630	EB2 800	EB2 1250
Model-type				V	V	VE	VE	VE	VE
Number of poles				3	3	3	3	3	3
Nominal current ratings									
	I_n	(A)	45°C	20, 32, 50, 63, 100, 125	160, 250	400	630	800	800, 1250
Electrical characteristics									
Rated operational voltage	U_e	(V)	AC 50/60 Hz	1100	1100	1100	1100	1100	1100
Rated insulation voltage	U_i	(V)		1100	1100	1100	1100	1100	1100
Rated impulse withstand voltage	U_{imp}	(kV)		8	8	8	8	8	8
Ultimate breaking capacity (IEC, JIS, AS/NZS)	I_{cu}	(kA)	1100V AC	4*/6**	6	12,5	18	18	30
			1000V AC	4*/6**	6	18	20	20	30
Service breaking capacity (IEC, JIS, AS/NZS)	I_{cs}	(kA)	1100V AC	4	4	6,3	13,5	13,5	20
			1000V AC	4	4	13,5	15	15	20
Rated short-time withstand current	I_{cw}	(kA)	0.3 s	-	-	-	-	-	15
Protection									
Adjustable thermal, adjustable magnetic				■	■			-	-
Fixed thermal, fixed magnetic								-	-
Microprocessor						■	■	■	■
Utilisation category				A	A	A	A	A	B
Installation									
Front connection				■	■	■	-	-	-
Extension bar				•	•	•	■	■	■
Solderless terminal (cable clamp)				-	-	-	-	-	-
Rear connection				•	•	•	•	•	•
Plug-in				•	•	•	•	•	•
Draw-out				-	-	-	-	-	-
DIN rail mounting				-	-	-	-	-	-
Dimensions	h	(mm)		155	165	260	273	273	370
	w	(mm)	3 pole	90	105	140	210	210	210
	d	(mm)		68	68	103	103	103	120
Weight		(kg)	3 pole	1,1	1,5	4,8	9,6	9,7	19,8
Operation									
Direct Opening Action				■	■	-	-	-	■
Toggle operation				■	■	■	■	■	■
Variable depth / direct mount operating handle				•	•	•	•	•	•
Motor operator				•	•	•	•	•	•
Endurance	Electrical	cycles	1100V AC	10.000	10.000	1000	1000	500	4000
	Mechanical	cycles		30.000	30.000	5000	5000	3000	5000
Standards				IEC 60947-2, EN 60947-2					

■ Standard • Optional - Not Available

*20, 32A

**50, 63, 100, 125A

ETIBREAK EB2 1100 V

AF	Type	I_n [A]	Code No.	Poles	I_{cu}/I_{cs} 1100V [kA]	Adjustment thermal/magnetic xI_n		
125	EB2 125/3V 20A 3p 1100V	20	004671371	3	4/4	0,63-1/ 6-12	1,1	1
	EB2 125/3V 32A 3p 1100V	32	004671372	3				
	EB2 125/3V 50A 3p 1100V	50	004671373	3				
	EB2 125/3V 63A 3p 1100V	63	004671374	3				
	EB2 125/3V 100A 3p 1100V	100	004671375	3				
	EB2 125/3V 125A 3p 1100V	125	004671376	3				
250	EB2 250/3V 160A 3p 1100V	160	004671377	3	6/4	0,63-1/ 6-10	1,5	1
	EB2 250/3V 250A 3p 1100V	250	004671378	3				
400	EB2 400/3VE 400A 3p 1100V	400	004671379	3	12,5/6,3	0,63-1/adjustable	4,8	1
630	EB2 630/3VE 630A 3p 1100V	630	004671380	3	18/13,5	0,63-1/adjustable	9,6	1
800	EB2 800/3VE 800A 3p 1100V	800	004671381	3	18/13,5	0,63-1/adjustable	9,7	1
1250	EB2 1250/3VE 800A 3p 1100V	800	004671382	3	30/20	0,4-1/adjustable	19,8	1
	EB2 1250/3VE 1250A 3p 1100V	1250	004671383	3				



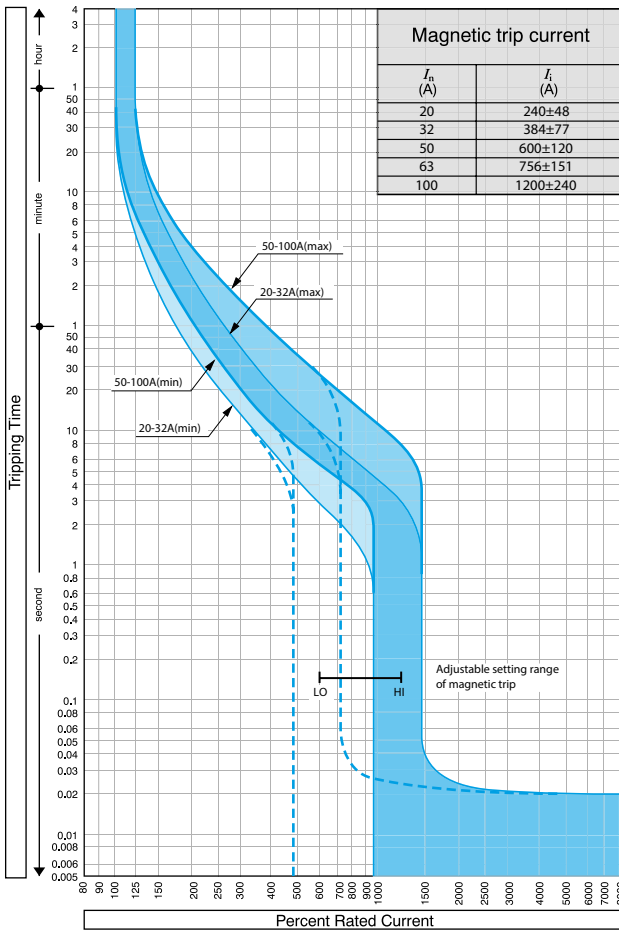
V - Thermal Magnetic MCCB

VE - Microprocessor MCCB

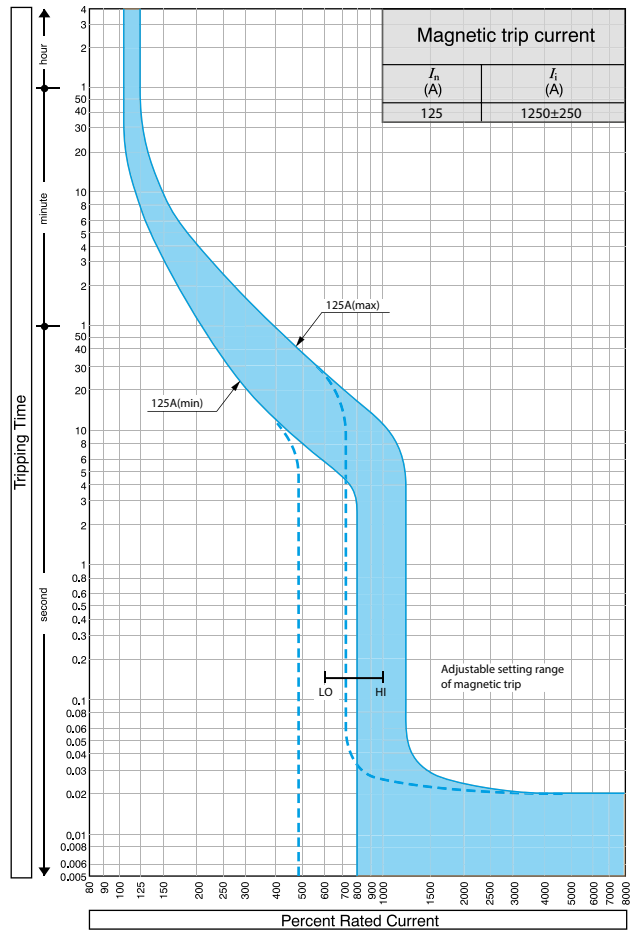
No external or internal accessories available for 400AF, 630AF & 800AF

**THERMAL MAGNETIC CHARACTERISTICS
125A Frame**

Time/current characteristic curves
EB2 125-V



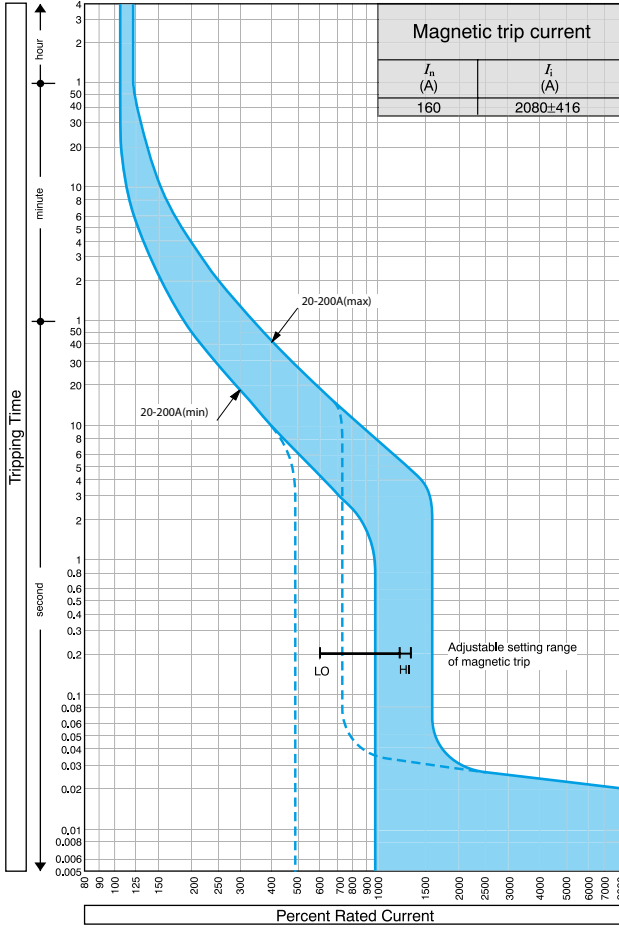
Time/current characteristic curves
EB2 125-V



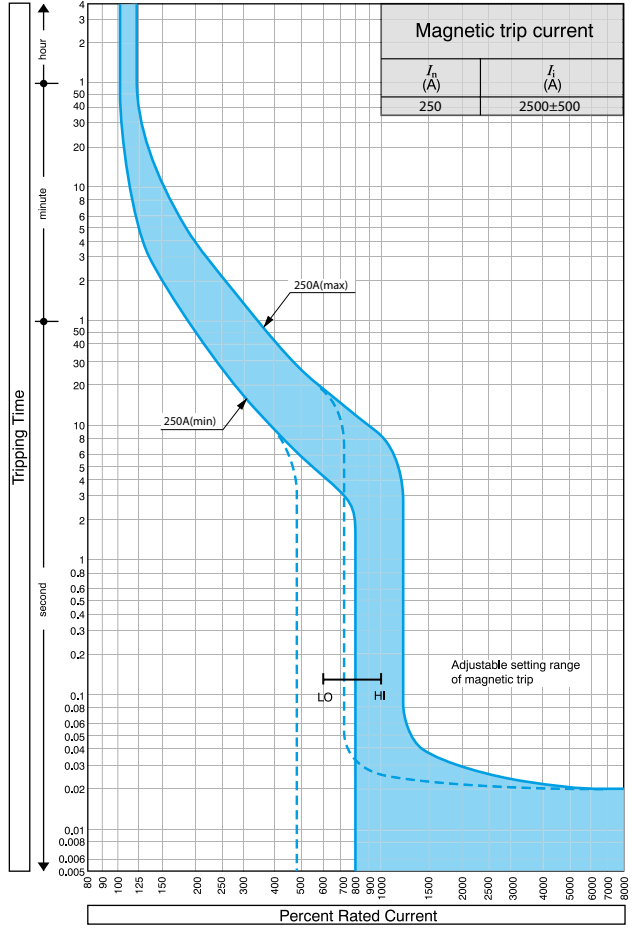
THERMAL MAGNETIC CHARACTERISTICS

160A and 250A Frames

Time/current characteristic curves
EB2 250-V



Time/current characteristic curves
EB2 250-V



Characteristics for 400AF, 630AF & 800AF

In addition to the standard overload and short circuit protection, there are a number of options available to meet specific applications.

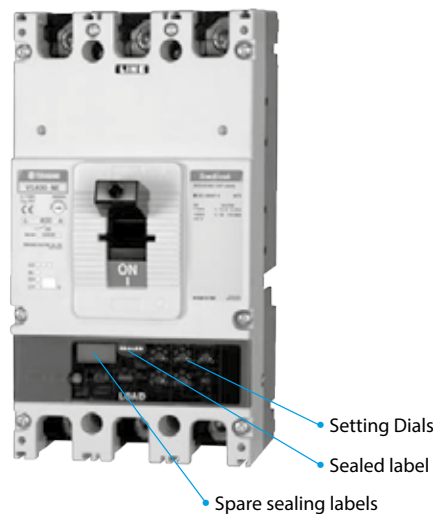
MCCB Type	LTD	STD	INST	PICK-UP LED	TEST PORT	GFT
EB2 400-VE	●	●	●	●	●	-
EB2 630-VE	●	●	●	●	●	○
EB2 800-VE	●	●	●	●	●	○

- Standard
- Optional
- Not available

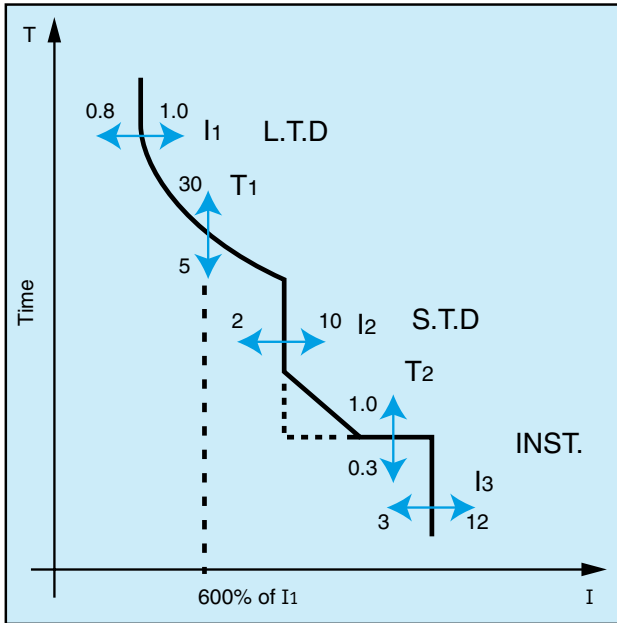
Legend	Application
LTD Long Time Delay	: Overload protection, True R.M.S.
STD Short Time Delay	: Short circuit protection and selectivity
INST Instantaneous	: Short circuit protection, fast acting
Pick-up LED	: Lights on LTD overload, flashes on PTA pick-up
Test Port	: Facility for TNS-1 OCR checker for calibration checking
GFT Ground Fault Trip	: Protection against ground faults

Access to Setting Dials

To adjust the settings on the microprocessor EB2, the sealed label must be broken and the covering fixing screws removed. To adjust the individual trip settings, turn the setting dial with a flat bladed screw driver. Align the setting required between the black dots marked on the dial.

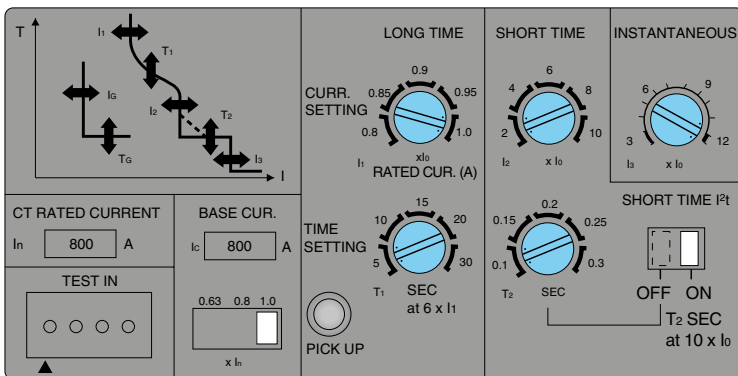


Standard Time Currents Curves for 400AF, 630AF & 800AF



Each part of the characteristic curve can be independently adjusted.

Standard Microprocessor Adjustments



Setting Dial

Available Adjustments

Setting Dial	Available Adjustments
Base Current Setting	I_0 0.63 - 0.8 - 1.0 x I_n Amps
LTD Pick up	I_1 0.8 - 0.85 - 0.9 - 0.95 - 1.0 x I_0 Amps
LTD Setting	T_1 5 - 10 - 15 - 20 - 25 - 30 (at $I_1 \times 600\%$) Secs
STD Pick up	I_2 2 - 4 - 6 - 8 - 10 x I_0 Amps
STD Setting	T_2 0.1 - 0.15 - 0.2 - 0.25 - 0.3 Secs
INST Pick up	I_3 3 - 12 x I_0 (continuously adjustable) Amps

Overload Adjustment for 400AF, 630AF & 800AF

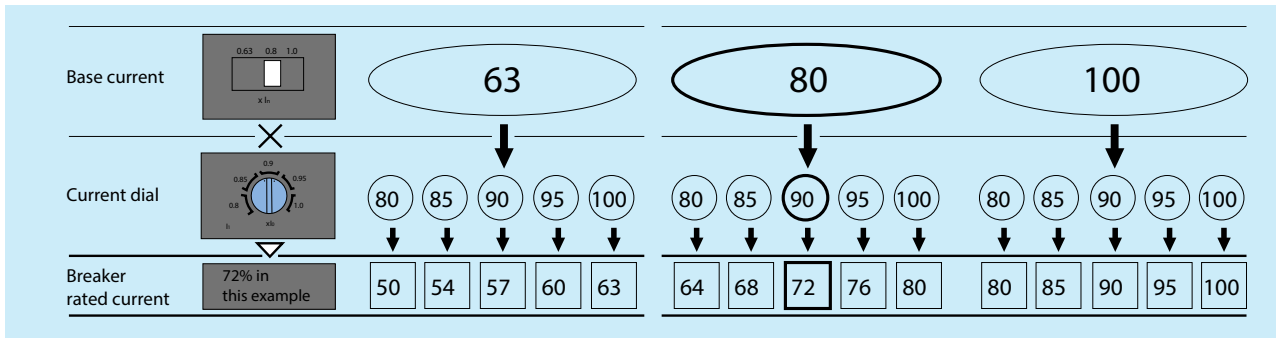
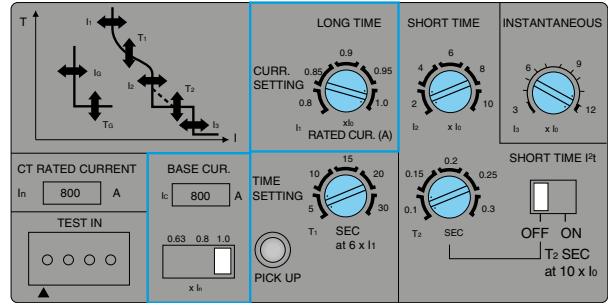
The rated current of the microprocessor based EB2 is adjusted using two current multipliers. This process achieves high accuracy adjustment from 50% to 100%. These are the LTD pickup dial I_1 and the Base Current I_0 selector switch. The rated current (LTD pickup) is achieved as follows:

$$I_{RATED} = I_n \times I_0 \times I_1$$

In the example shown on the right the rating would be:

$$I_{RATED} = 1250 \times 1.0 \times 1.0 = 1250A$$

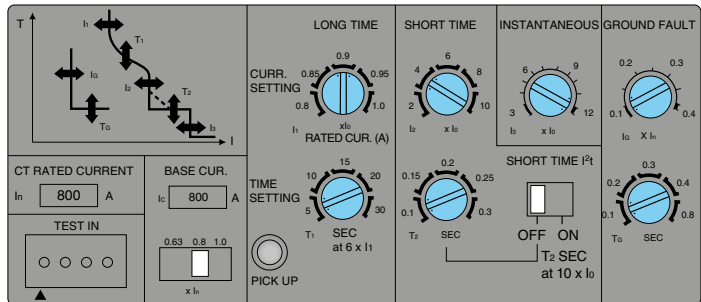
In total there are 15 possible increments of adjustment between 50 and 100% as shown below.



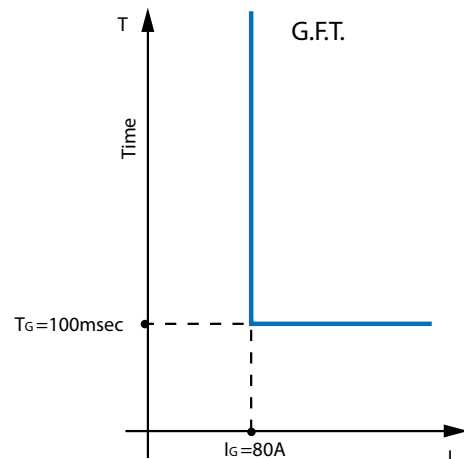
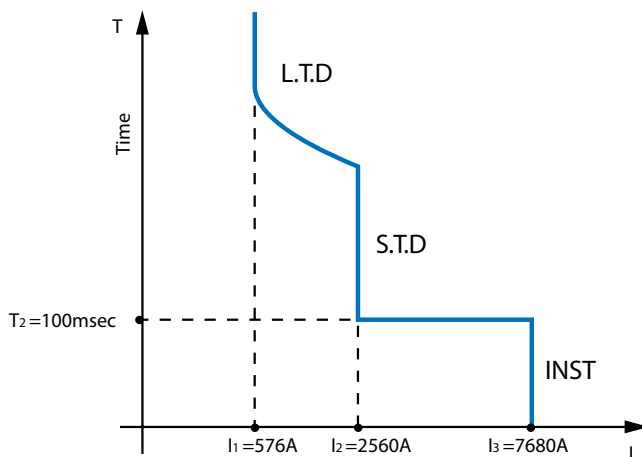
Example - Settings

In the example shown on the right what are all the settings in Amps?

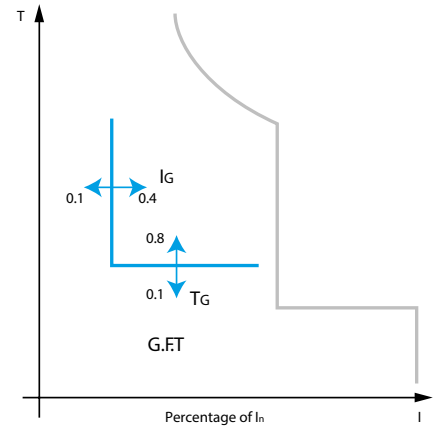
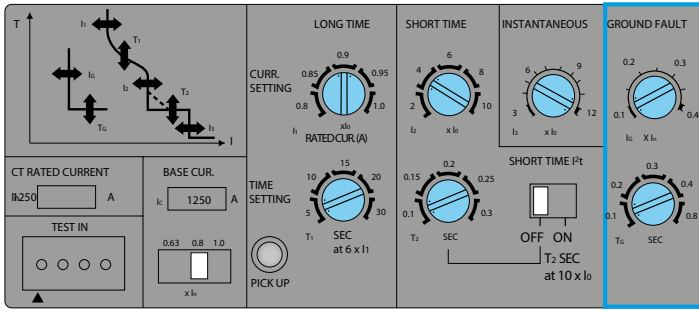
- Solution**
- $I_{RATING} \text{ LTD pickup} = I_n \times I_0 \times I_1$
 $800 \times 0.8 \times 0.9 = 576A$
 - STD pickup = $I_n \times I_0 \times I_2$
 $800 \times 0.8 \times 4 = 2560A$
 - INST pickup = $I_n \times I_0 \times I_3$
 $800 \times 0.8 \times 12 = 7680A$
 - GFT pickup = $I_n \times I_G$
 $800 \times 0.1 = 80A$
- (Note that GFT is a function of I_n and not I_0)



Example - Time/Current Curves



Ground Fault Adjustments



Setting Dial Available Adjustments

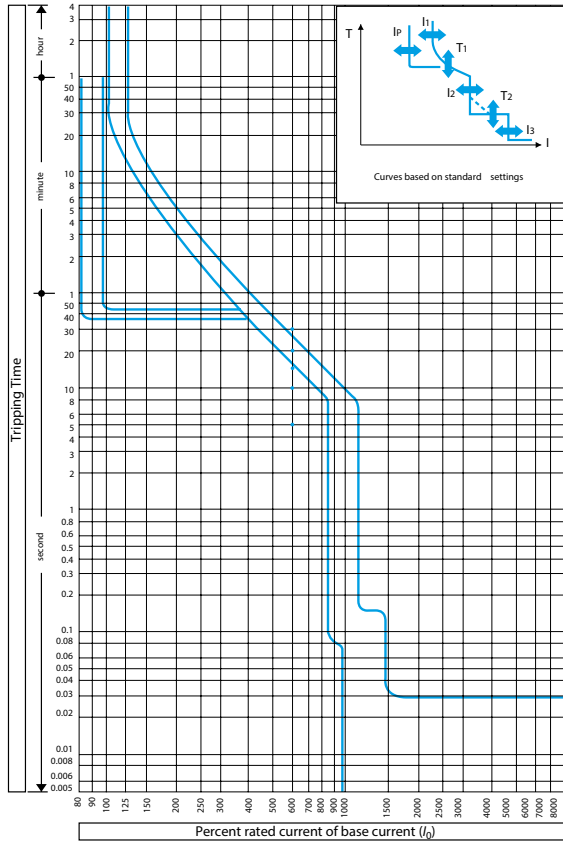
Setting	Symbol	Adjustment Range	Unit
GFT Pickup	I_G	0.1 to 0.4 continuously adjustable $\times I_n$	Amps
GFT Setting	T_G	0.1 - 0.2 - 0.3 - 0.4 - 0.8	seconds

When a 3 pole MCCB is used on a 3 phase 4 wire system a separate CT is required for the neutral line. No control power is required for this option.

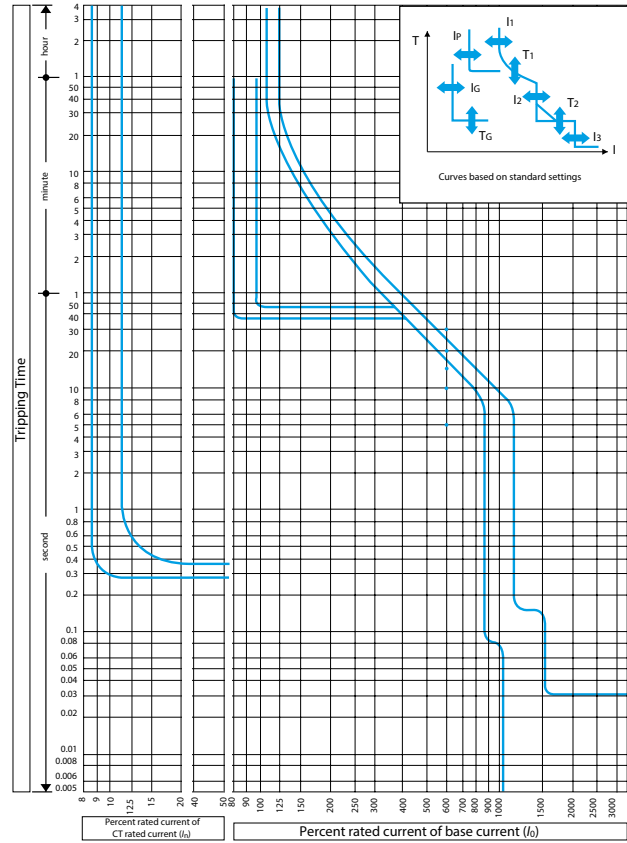
THERMAL MAGNETIC CHARACTERISTICS

400A, 630A and 800A Frames

Time/current characteristic curves
EB2 400-VE



Time/current characteristic curves
EB2 630-VE, EB2 800-VE



Overcurrent tripping characteristics

CT rated current (A) (I_n)	63, 125, 250, 400
Base current setting (A): (I_b)	$(I_n) \times (0.63-0.8-1.0)$
Long time-delay pick-up current (A): (I_1)	$(I_b) \times (0.8-0.85-0.9-0.95-1.0)$ Non-tripping at (I_1) setting $\times 105\%$ and below. Tripping at 125% and above.
Long time-delay time settings (S) (T_1)	(5-10-15-20-30) at (I_1) $\times 600\%$ current. Setting tolerance $\pm 20\%$
Short time-delay pick-up current (A): (I_2)	$(I_b) \times (2-4-6-8-10)$ Setting tolerance $\pm 15\%$
Short time-delay time settings (S) (T_2)	Opening time (0.1, 0.15, 0.2, 0.25, 0.3) in the definite time-delay. Total clearing time is + 50 mS and resettable time -20mS for the time-delay setting
Instantaneous trip pick-up current (A) (I_3)	Continuously adjustable from $(I_b) \times (3 \text{ to } 12)$ Setting tolerance $\pm 20\%$

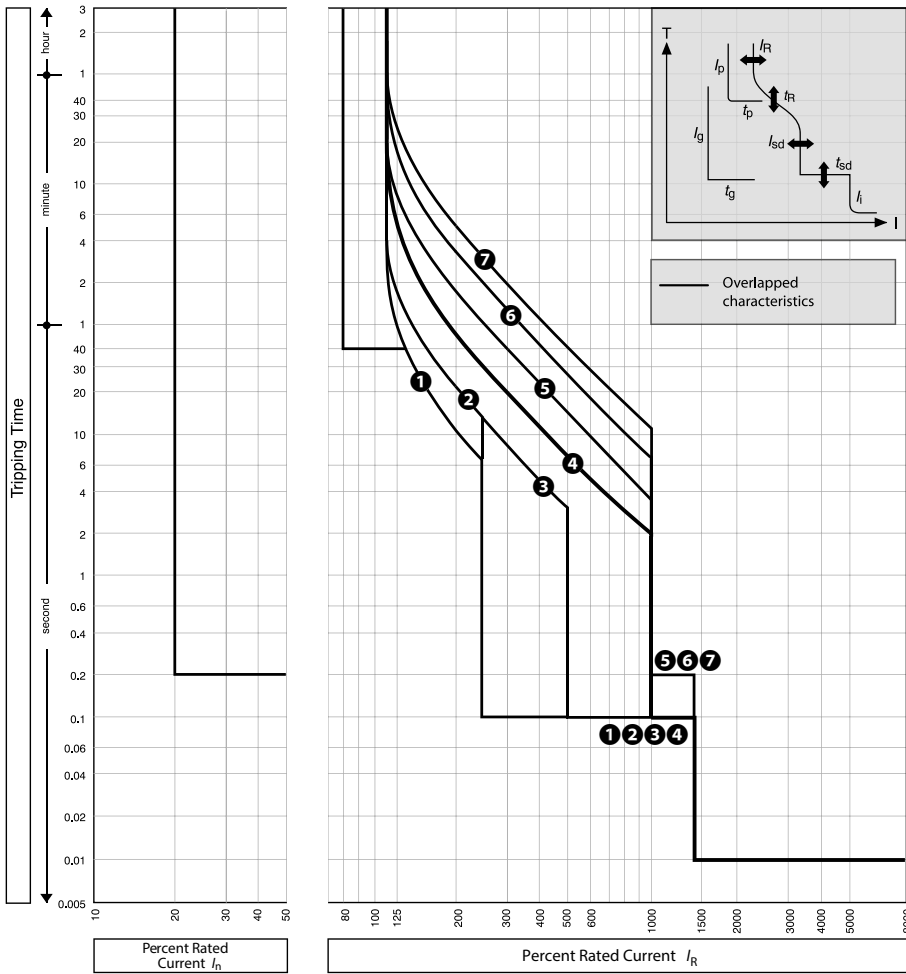
Note: * Optional
Note: The underlined values will be applied as standard ratings unless otherwise specified when ordering.

Overcurrent tripping characteristics

CT rated current (A) (I_n)	630, 800
Base current setting (A): (I_b)	$(I_n) \times (0.63-0.8-1.0)$
Long time-delay pick-up current (A): (I_1)	$(I_b) \times (0.8-0.85-0.9-0.95-1.0)$ Non-tripping at (I_1) setting $\times 105\%$ and below. Tripping at 125% & above.
Long time-delay time settings (S) (T_1)	(5-10-15-20-30) at (I_1) $\times 600\%$ current. Setting tolerance $\pm 20\%$
Short time-delay pick-up current (A): (I_2)	$(I_b) \times (2-4-6-8-10)$ Setting tolerance $\pm 15\%$
Short time-delay time settings (S) (T_2)	Opening time (0.1, 0.15, 0.2, 0.25, 0.3) in the definite time-delay. Total clearing time is + 50 mS and resettable time -20mS for the time-delay setting.
Instantaneous trip pick-up current (A) (I_3)	Continuously adjustable from $(I_b) \times (3 \text{ to } 12)$ Setting tolerance $\pm 20\%$
* Ground fault trip pick-up current (A): (I_G)	Continuously adjustable from $(I_b) \times (0.1 \text{ to } 0.4)$ Setting tolerance $\pm 15\%$
* Ground fault trip time setting (S): (T_G)	Opening time (0.1-0.2-0.3-0.4-0.8) in the definite time-delay. Total clearing time is + 50mS and resettable time is - 20mS for the time-delay settings

Note: * Optional
Note: The underlined values will be applied as standard ratings unless otherwise specified when ordering.

ELECTRONIC CHARACTERISTICS (STANDARD TYPE)
EB2 1250-VE



$I_n = 800A; 1250A$

		I_R (A)									
		LTD Pick-up current	I_R	$\times I_n$	0.4	0.5	0.63	0.8	0.9	0.95	1.0
Standard	LT	t_R	(s)	1	2	3	4	5	6	7	
				11	21	21	5	10	19	29	
	ST	I_{sd}	$\times I_R$	at 200% $\times I_R$			at 600% $\times I_R$				
				2.5	5	10					
		t_{sd}	(s)	0.1			0.2				
	INST	I_i	$\times I_R$	14(Max: 12 $\times I_n$) Note (1)							
Option	GF Note (3)	I_g	$\times I_n$	0.2							
		t_g	(s)	0.2							

Note:

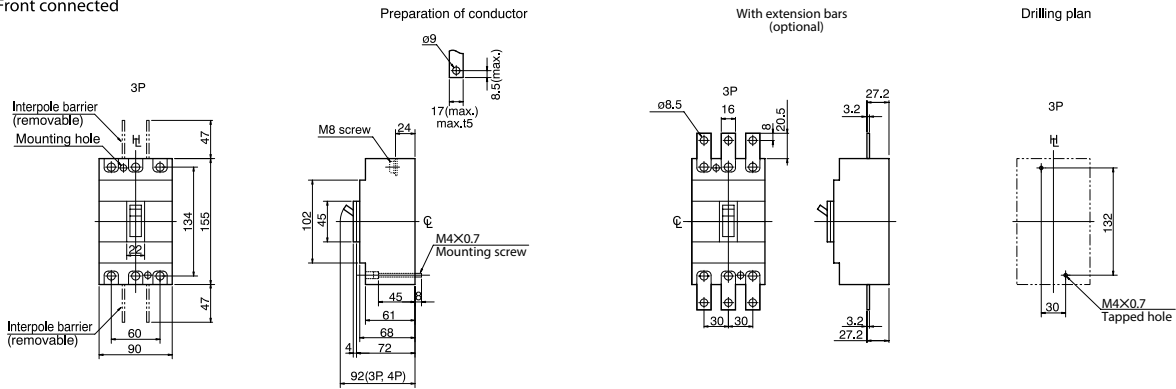
(1) I_i max. = 12 $\times I_n$. (2) When you specify GF on MCCBs with 3 poles the terminal block is automatically fitted to connect with the external neutral CT for 3 phases 4 wires system.

Dimensions

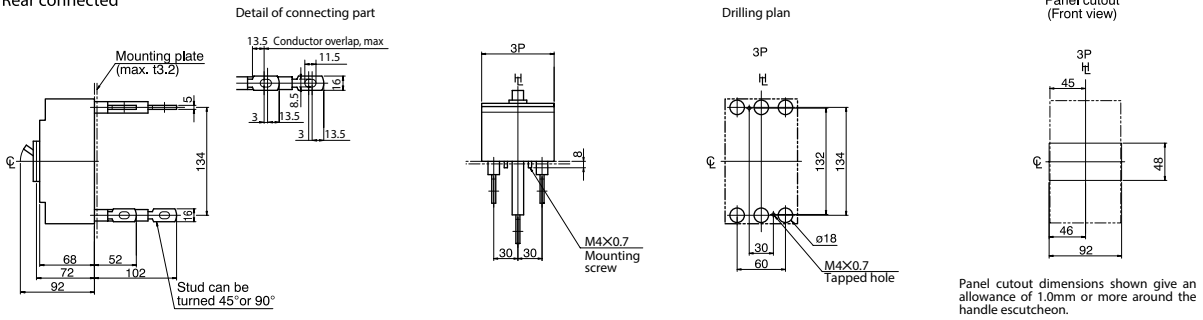
EB2 125 1100V

ASL : Arrangement Standard Line
 H₁ : Handle Frame Centre Line

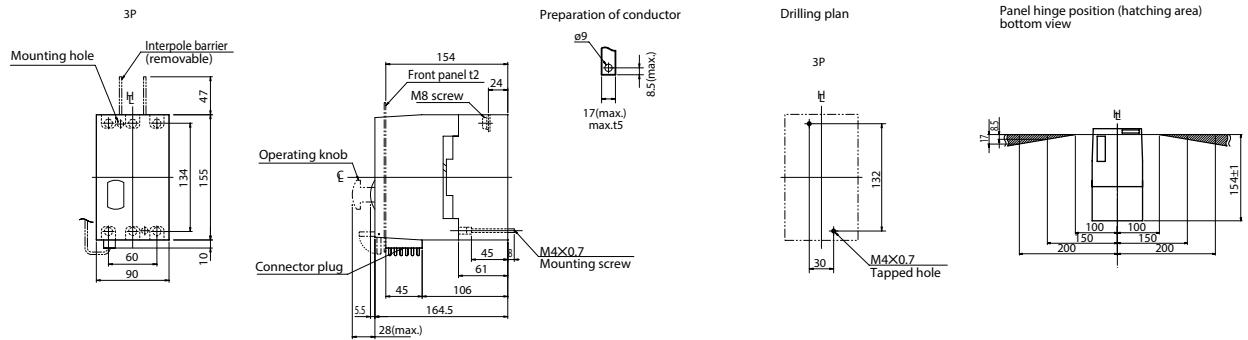
Front connected



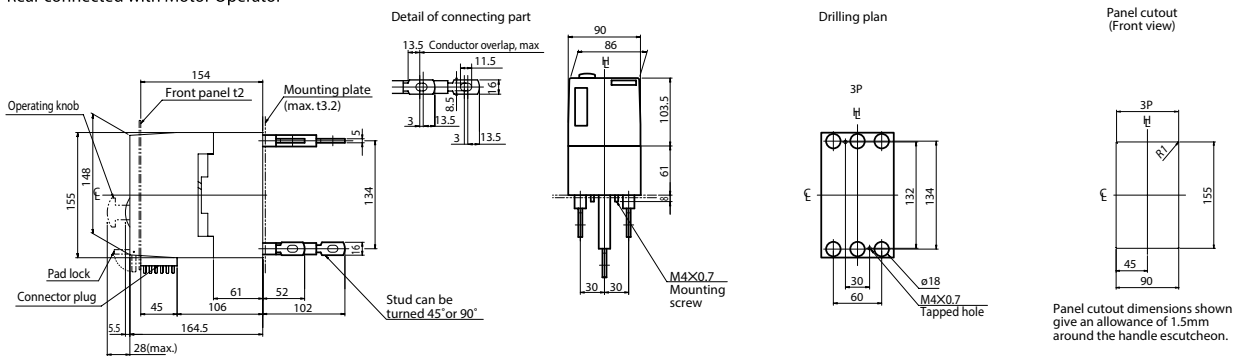
Rear connected



Front connected with Motor Operator



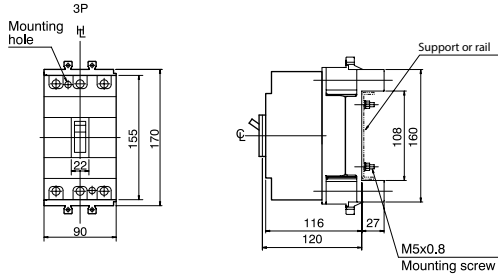
Rear connected with Motor Operator



ETIBREAK / Low Voltage Moulded Case Circuit Breakers

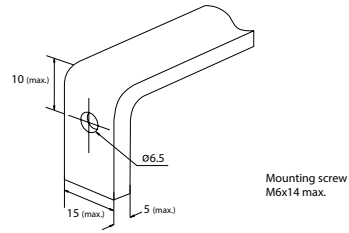
ASL : Arrangement Standard Line
 H : Handle Frame Centre Line

Plug-in connected

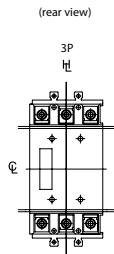
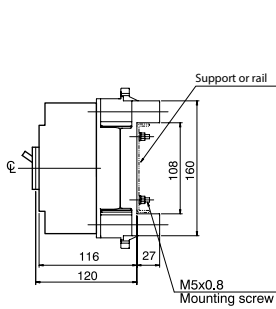


Termination of Busbar

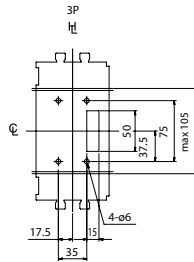
Preparation of conductor



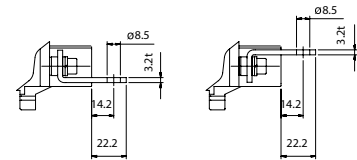
Mounting on a support or rails (shown with optional connection bars oriented for rear access)



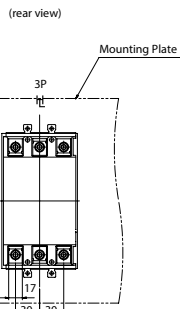
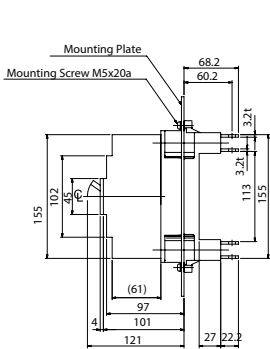
Drilling plan (front view)



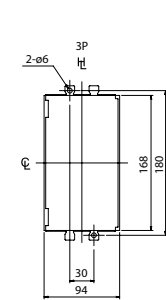
Detail of connecting part
 Oriented for rear access



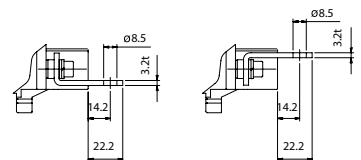
Mounting through the backplate (shown with optional connection bars oriented for rear access)



Drilling plan (front view)



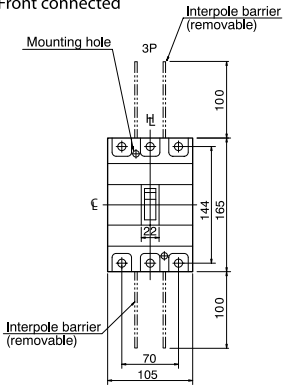
Detail of connecting part
 Oriented for rear access



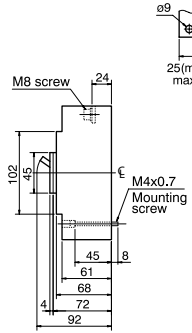
EB2 250 1100V

ASL : Arrangement Standard Line
 Ht : Handle Frame Centre Line

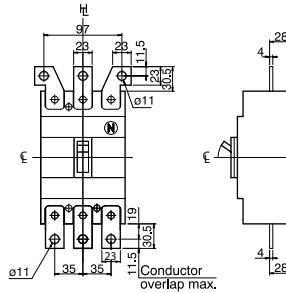
Front connected



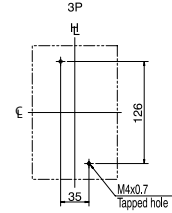
Preparation of conductor



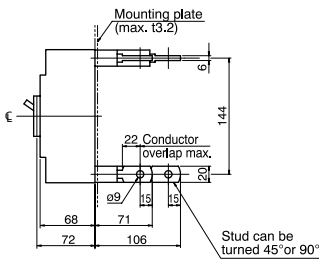
With extension bars (optional)



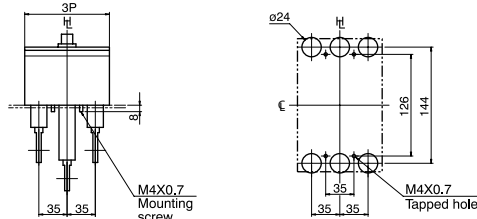
Drilling plan



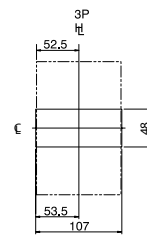
Rear connected



Drilling plan

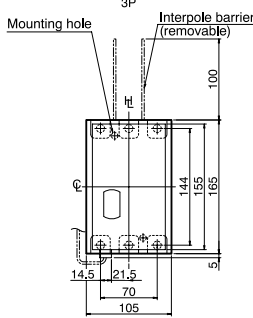


Panel cutout (Front view)

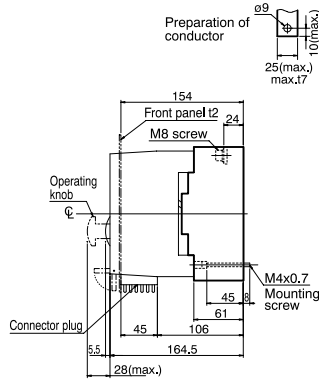


Panel cutout dimensions shown give an allowance of 1.0mm or more around the handle escutcheon.

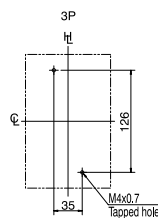
Front connected with Motor Operator



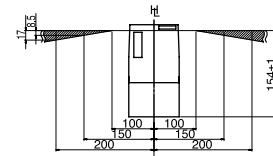
Preparation of conductor



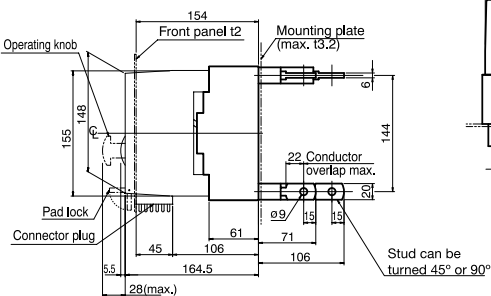
Drilling plan



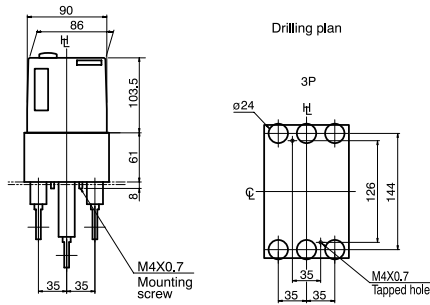
Panel hinge position (hatching area) bottom view



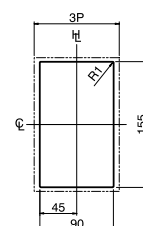
Rear connected with Motor Operator



Drilling plan



Panel cutout (Front view)

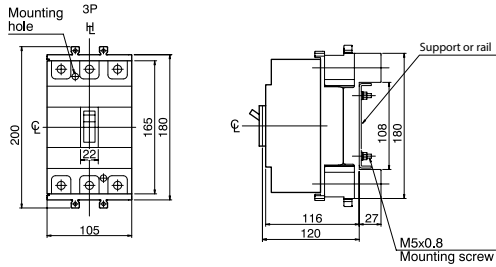


Panel cutout dimensions shown give an allowance of 1.5mm around the handle escutcheon.

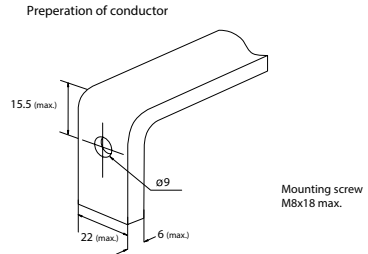
ETIBREAK / Low Voltage Moulded Case Circuit Breakers

ASL: Arrangement Standard Line
 H: Handle Frame Centre Line

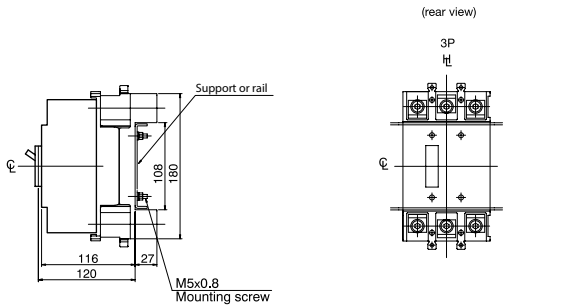
Plug-in connected



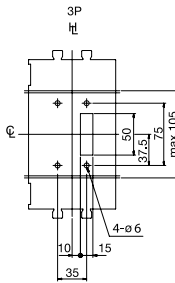
Termination of Busbar



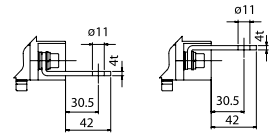
Mounting on a support or rails (shown with optional connection bars oriented for rear access)



Drilling plan (front view)

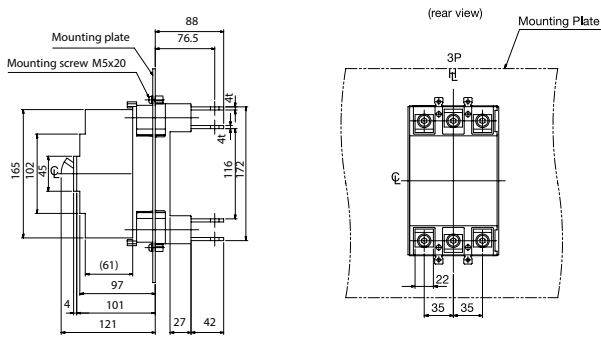


Detail of connecting part
 Oriented for rear access

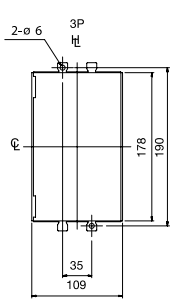


Terminal bars should be connected alternately on adjacent poles.

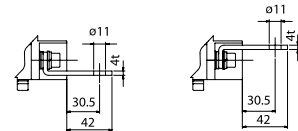
Mounting through the backplate (shown with optional connection bars oriented for rear access)



Drilling plan (front view)



Detail of connecting part
 Oriented for rear access

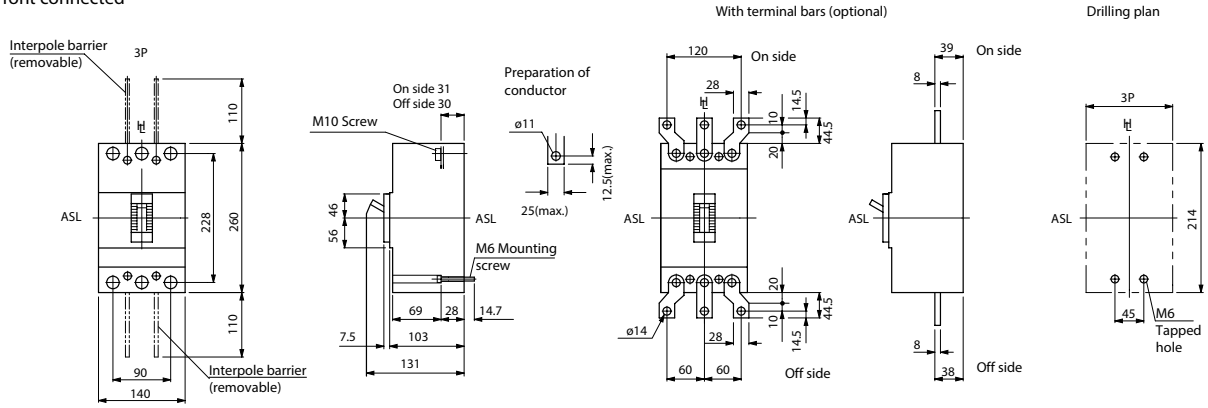


Terminal bars should be connected alternately on adjacent poles.

EB2 400 1100V

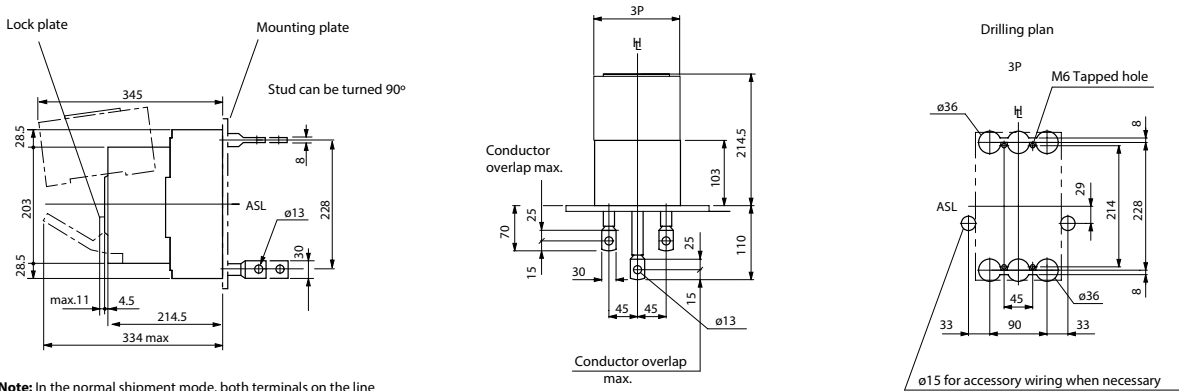
ASL : Arrangement Standard Line
 \overline{H} : Handle Frame Centre Line

Front connected



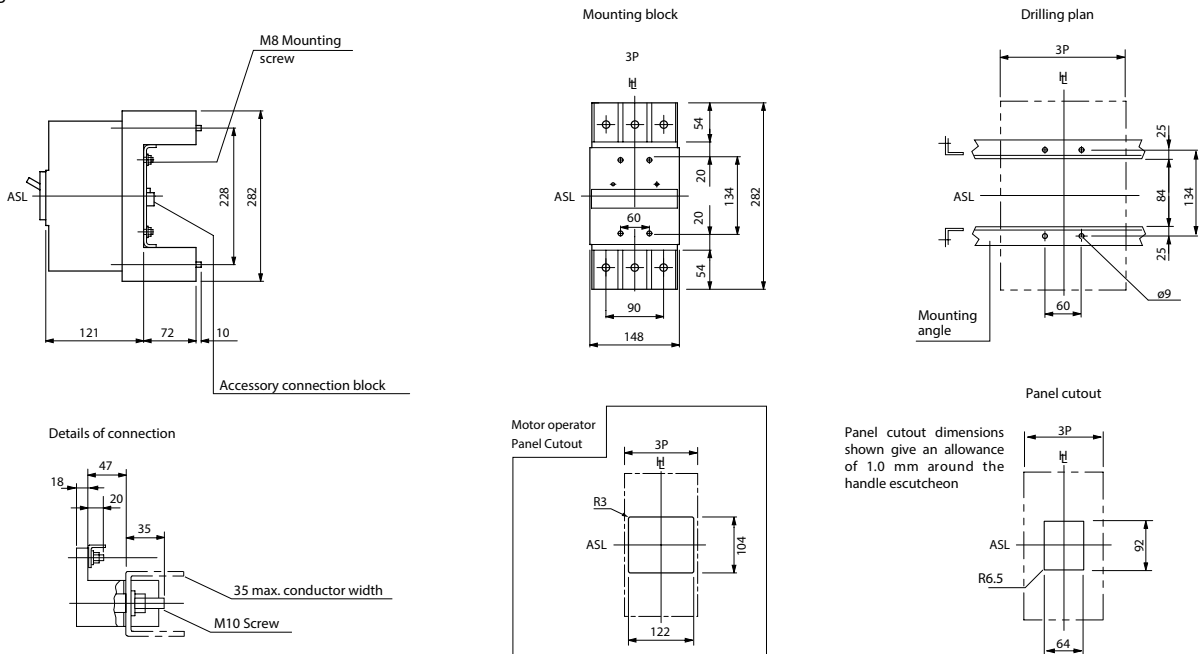
Note: Breakers with terminal bars available on request

Rear connected with motor operator



Note: In the normal shipment mode, both terminals on the line side and the load side are in the horizontal direction.

Plug-in connected

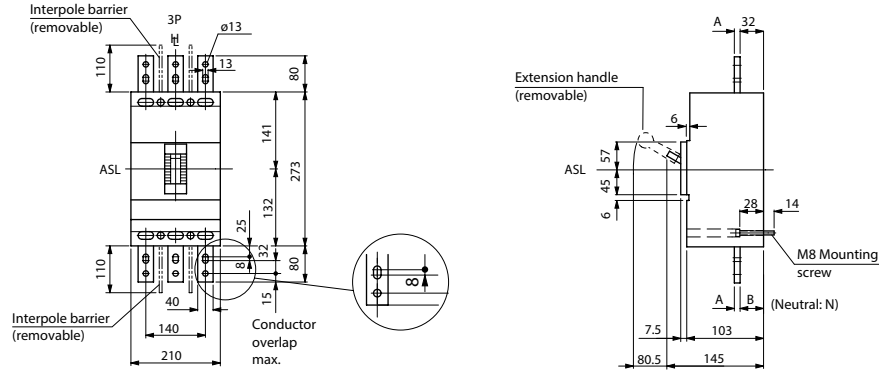


ETIBREAK / Low Voltage Moulded Case Circuit Breakers

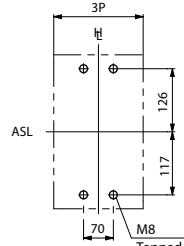
EB2 630 & 800 1100V

ASL: Arrangement Standard Line
 H: Handle Frame Centre Line

Front connected



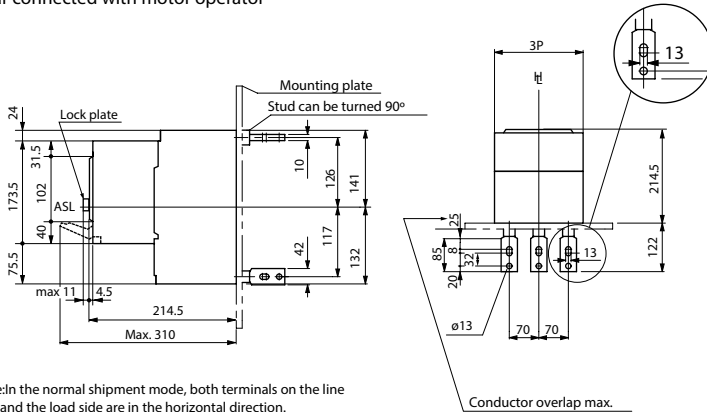
Drilling plan



Breaker type	A	B	N
VS630-NE	8	36	36
VS800-NE	10	36	36

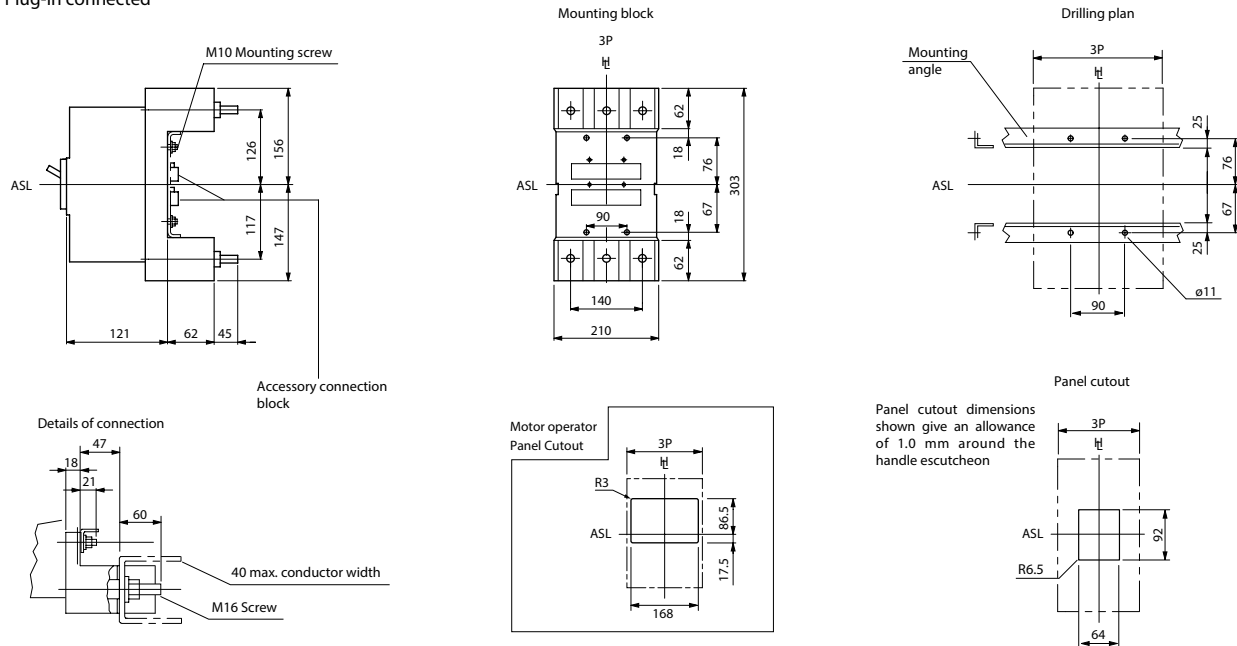
Note: Breakers with terminal bars available on request

Rear connected with motor operator



Note: In the normal shipment mode, both terminals on the line side and the load side are in the horizontal direction.

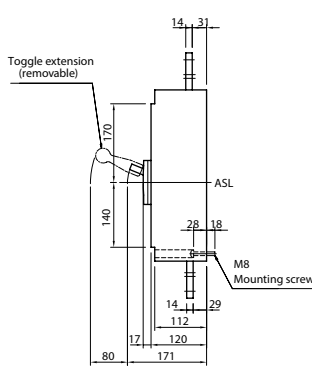
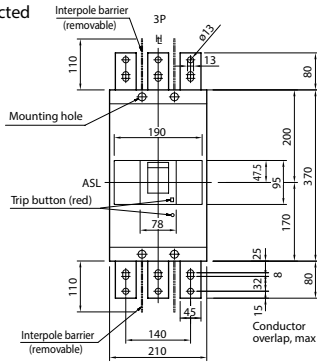
Plug-in connected



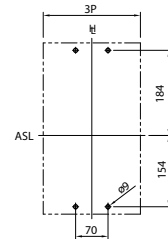
EB2 1250 1100V

ASL : Arrangement Standard Line
 H : Handle Frame Centre Line

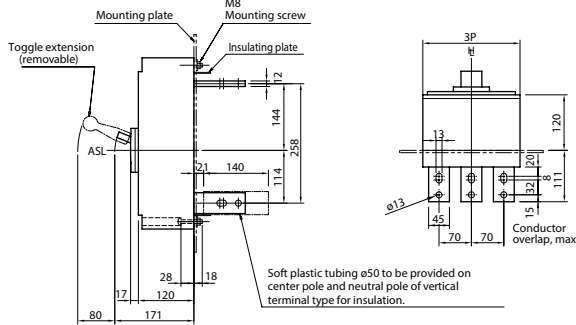
Front connected



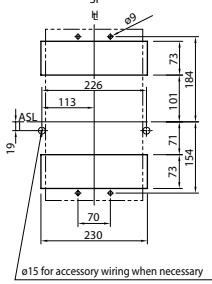
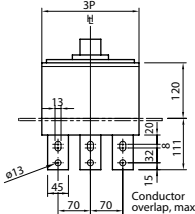
Drilling plan (front view)



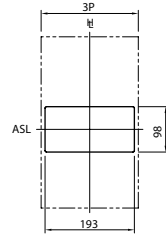
Rear connected



Drilling plan (front view)



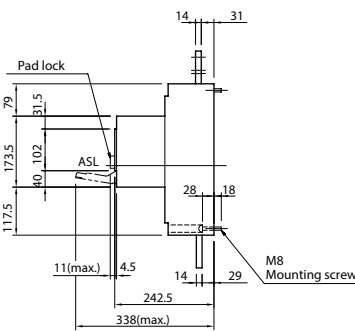
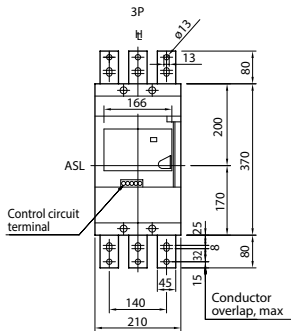
Panel cutout (front view)



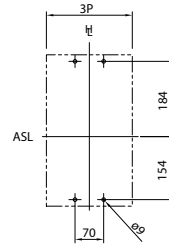
Panel cutout dimensions shown give an allowance of 1.5mm around the handle escutcheon.

Note: Studs are factory installed in horizontal direction both on the line and load sides.

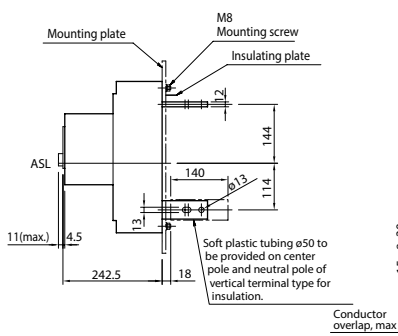
Front connected with Motor Operator



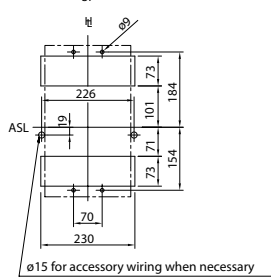
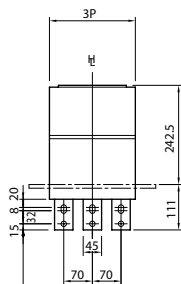
Drilling plan (front view)



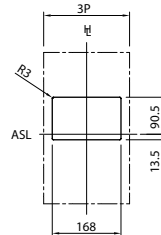
Rear connected with Motor Operator



Drilling plan (front view)



Panel cutout (front view)



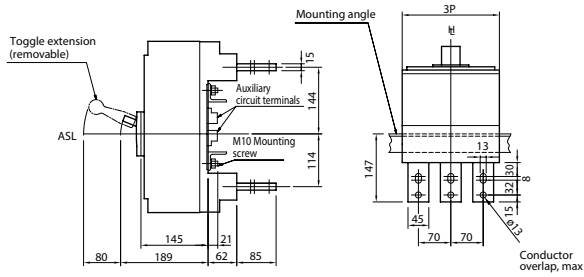
Panel cutout dimensions shown give an allowance of 1.0mm around motor operator.

Note: Studs are factory installed in horizontal direction both on the line and load sides.

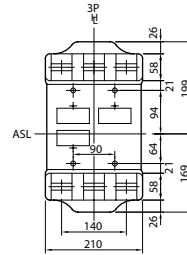
ETIBREAK / Low Voltage Moulded Case Circuit Breakers

ASL : Arrangement Standard Line
 H₁ : Handle Frame Centre Line

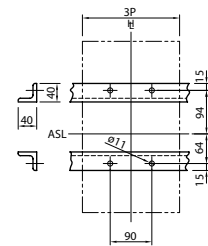
Plug-in connected



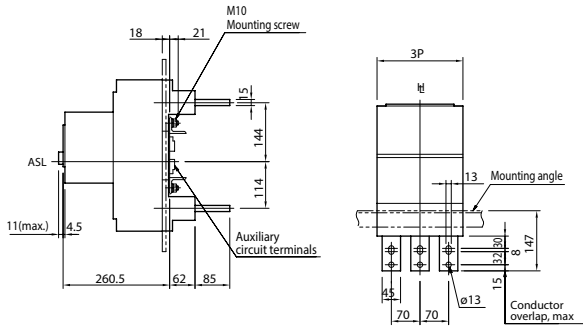
Mounting base (rear view)



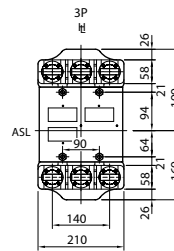
Drilling plan (front view)



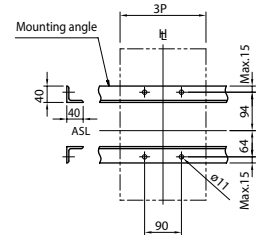
Plug-in connected with Motor Operator



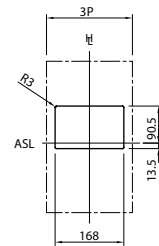
Mounting base (rear view)



Drilling plan (front view)



Panel cutout (front view)



Panel cutout dimensions shown give an allowance of 1.0mm around motor operator.