

Etibreak range

ETIBREAK 2 MOULDED CASE CIRCUIT BREAKERS

Rated current (In) from 20A to 630A. Breaking Capacity (Icu) from 25kA to 70kA at 400V AC.



ETIBREAK MOULDED CASE CIRCUIT BREAKERS

Rated current (In) from 630A to 1600A.
Breaking Capacity (Icu) from 65kA to 100kA
at 400V AC.

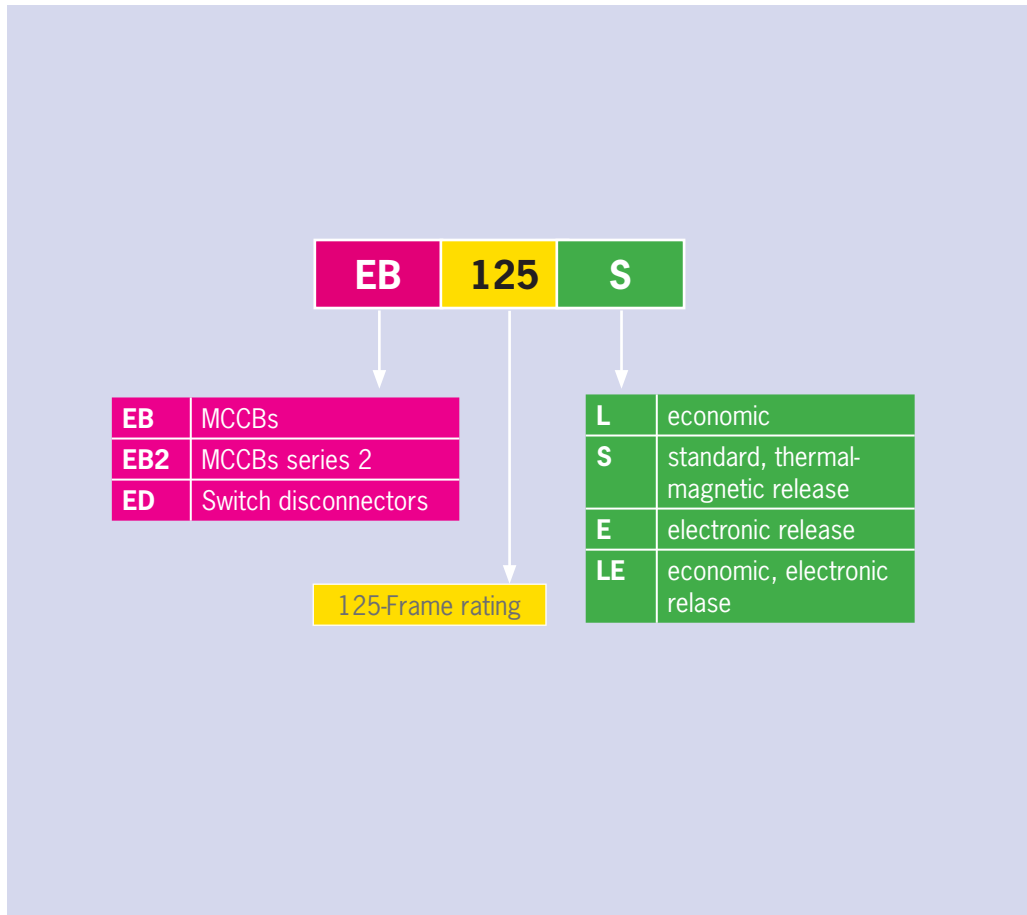


Easy selection guide

The Etibreak range of products includes:

- Moulded Case Circuit Breakers (MCCBs)
- Switch-Disconnectors in the same compact moulded case frame sizes as MCCBs
- A comprehensive range of accessories which are common to MCCBs and Switch-Disconnectors. All internal accessories for series 2 are common to all sizes.

Key to Model and Type Designations



*All Etibreak 2 MCCBs limit short-circuit faults by opening in less than 5ms.

Advantages

1. Field-installable accessories

- Accessories can be fitted by the switchboard builder or added by the end-user. All internal accessories are common for Etibreak 2 MCCBs.
- Handles and motor operators can be rapidly fitted using the locking pegs. It takes less than 10 seconds to secure a handle or motor to the MCCB – a great time saving compared to alternative products.
- All accessories are endurance tested to the same level as the host MCCB.



2. Modular Sizes

All current ratings up to 630A can be supplied in 2 sizes: the 250A and 630A sizes.



The compact 125A size offers the same features and performance but with reduced dimensions and cost.



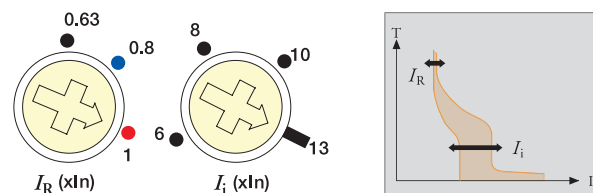
3. Direct Opening

Under the heading “Measures to minimise the risk in the event of failure”, IEC 60204-1 Safety of Machinery-Electrical Equipment of Machinery includes the following recommendation: “the use of switching devices having positive (or direct) opening operation.”



4. Unsurpassed Flexibility

Overload protection is adjustable between 63% and 100% of the rating. Short-circuit protection is adjustable on all thermal magnetic models. Short-circuit protection settings are suitable for motor starting on all models, including the compact 125A frame.



5. Visual safety

Coloured indicators display the ON or OFF status. The indicators are fully covered if the breaker trips, and black is the only visible colour.

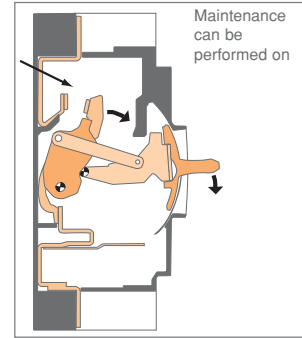
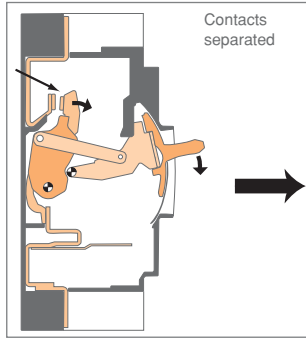
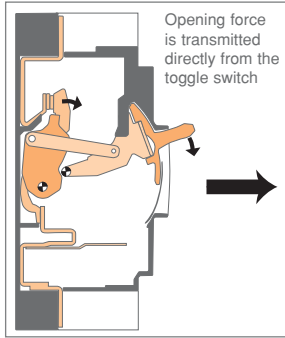


Some more advantages



Safety plus

Machine Safety



Etibreak MCCBs are marked with IEC symbol indicating Direct Opening Action.

Etibreak MCCBs help you to comply with the world's most stringent safety standards. It is one of the safest switching devices for machinery.

The robust mechanism ensures that the force you apply to the toggle is transmitted directly to the contacts.

Under the heading "Measures to minimise risk in the event of failure", IEC 60204-1 Safety of Machinery - Electrical Equipment of Machines includes the following recommendation:

" - the use of switching devices having positive (or direct) opening operation."



Visual Safety

You can easily see if a breaker is open, closed or tripped. **SAFETY+** coloured indicators boldly display the ON or OFF status. The indicators are fully covered if a breaker trips, and black is the only visible colour. This is a unique safety feature. You can identify faulty circuits at a glance. The toggle position always matches the position of the main contacts.



Some more advantages

Touch Safety

The risk of touching live parts has been minimised by design. These features reduce the risk of touching live parts:

- There are no exposed metal screws on the front face
- IP20 protection at the terminals
- IP30 protection at the toggle
- If the toggle is broken by accident or misuse, no live part is exposed
- No live parts are exposed when fitting accessories
- Double Insulation

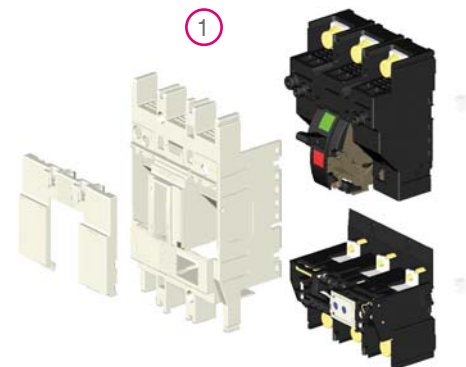


Reducing Environmental Impact

Longer Life Cycle

It makes good environmental sense to install a product with a long life expectancy. If you install an Etibreak 2 MCCB, you can expect it to stay in service for at least 30,000 mechanical operations (250A Frame). This is 22,000 more operations than recommended by IEC 60947-2, the international standard for circuit breakers. If a system must be upgraded in future, we have made the following provisions for recycling:

- 1 The modular design of Etibreak 2 allows component parts and accessories to be easily disassembled and separately disposed of. Moulded parts do not contain any embedded metal parts.
- 2 Materials are clearly marked to allow future identification for easy recycling.



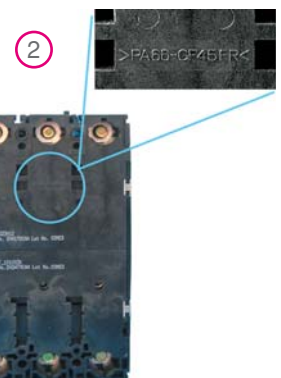
Uses Eco-friendly Materials

The following materials are used in most Etibreak 2 circuit breakers:

- Thermoplastic resin not containing PBBs or PBDEs
- Lead-free solder
- Cadmium-free contacts

Lighter and Smaller

Components with low weight and volume make life easy for users, but high performance from smaller products also means less material used and less waste produced.



Standards

IEC 60947-2, EN 60947-2, JIS C 8201-2-1 ANN.1,
AS/NZS 3947-2, NEMA AB-1

Etibreak

■ ■ ■ ■ ■ Moulded Case Circuit Breaker Etibreak EB

Thermal magnetic

Thermal magnetic MCCBs are available from 125 AF to 800 AF. All frame sizes have adjustable both thermal and magnetic trip settings. Thermo protection is adjustable between 63 % and 100 % of I_n , meanwhile magnetic between 6-13 x I_n -> more details in technical part of catalogue.



ETIBREAK EB2 125 AF

Type	I_n [A]	code No	poles	I_{cu}/I_{cs} 400V(kA)	adjustment thermal/magnetic	weight [kg]	packaging [pcs]
EB2 125/3L 20A 3p	20	004671021	3	25/19	0,63-1/ 6-12	1,1	1
EB2 125/3L 32A 3p	32	004671022	3	25/19	0,63-1/ 6-12	1,1	1
EB2 125/3L 50A 3p	50	004671023	3	25/19	0,63-1/ 6-12	1,1	1
EB2 125/3L 63A 3p	63	004671024	3	25/19	0,63-1/ 6-12	1,1	1
EB2 125/3L 100A 3p	100	004671025	3	25/19	0,63-1/ 6-12	1,1	1
EB2 125/3L 125A 3p	125	004671026	3	25/19	0,63-1/ 6-12	1,1	1
EB2 125/4L 20A 4p	20	004671027	4	25/19	0,63-1/ 6-12	1,4	1
EB2 125/4L 32A 4p	32	004671028	4	25/19	0,63-1/ 6-12	1,4	1
EB2 125/4L 50A 4p	50	004671029	4	25/19	0,63-1/ 6-12	1,4	1
EB2 125/4L 63A 4p	63	004671030	4	25/19	0,63-1/ 6-12	1,4	1
EB2 125/4L 100A 4p	100	004671031	4	25/19	0,63-1/ 6-12	1,4	1
EB2 125/4L 125A 4p	125	004671032	4	25/19	0,63-1/ 6-12	1,4	1

ETIBREAK EB2 125 AF

Type	I_n [A]	code No	poles	I_{cu}/I_{cs} 400V(kA)	adjustment thermal/ magnetic	weight [kg]	packaging [pcs]
EB2 125/3S 20A 3p	20	004671041	3	36/36	0,63-1/ 6-12	1,1	1
EB2 125/3S 32A 3p	32	004671042	3	36/36	0,63-1/ 6-12	1,1	1
EB2 125/3S 50A 3p	50	004671043	3	36/36	0,63-1/ 6-12	1,1	1
EB2 125/3S 63A 3p	63	004671044	3	36/36	0,63-1/ 6-12	1,1	1
EB2 125/3S 100A 3p	100	004671045	3	36/36	0,63-1/ 6-12	1,1	1
EB2 125/3S 125A 3p	125	004671046	3	36/36	0,63-1/ 6-12	1,1	1
EB2 125/4S 20A 4p	20	004671047	4	36/36	0,63-1/ 6-12	1,4	1
EB2 125/4S 32A 4p	32	004671048	4	36/36	0,63-1/ 6-12	1,4	1
EB2 125/4S 50A 4p	50	004671049	4	36/36	0,63-1/ 6-12	1,4	1
EB2 125/4S 63A 4p	63	004671050	4	36/36	0,63-1/ 6-12	1,4	1
EB2 125/4S 100A 4p	100	004671051	4	36/36	0,63-1/ 6-12	1,4	1
EB2 125/4S 125A 4p	125	004671052	4	36/36	0,63-1/ 6-12	1,4	1

Legend:

- EB -> series 1;
- EB2 -> series 2;
- L -> economic, lower short-circuit breaking capacity;
- S -> standard short-circuit breaking capacity

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ETIBREAK EB2 160/250 AF

Type	I_n [A]	code No	poles	Icu/Ics 400V(kA)	adjustment thermal/ magnetic	weight [kg]	packaging [pcs]
EB2 250/3L 200A 3p	200	004671072	3	25/19	0,63-1/ 6-13	1,5	1
EB2 250/3L 250A 3p	250	004671073	3	25/19	0,63-1/ 6-13	1,5	1
EB2 250/4L 200A 4p	200	004671075	4	25/19	0,63-1/ 6-13	1,9	1
EB2 250/4L 250A 4p	250	004671076	4	25/19	0,63-1/ 6-13	1,9	1
EB2 160/3S 160 3p	160	004671061	3	36/36	0,63-1/ 6-13	1,5	1
EB2 250/3S 200A 3p	200	004671082	3	36/36	0,63-1/ 6-13	1,5	1
EB2 250/3S 250A 3p	250	004671083	3	36/36	0,63-1/ 6-13	1,5	1
EB2 160/3S 160 4p	160	004671062	4	36/36	0,63-1/ 6-13	1,9	1
EB2 250/4S 200A 4p	200	004671085	4	36/36	0,63-1/ 6-13	1,9	1
EB2 250/4S 250A 4p	250	004671086	4	36/36	0,63-1/ 6-13	1,9	1

ETIBREAK EB2 400 AF

Type	I_n [A]	code No	poles	Icu/Ics 400V(kA)	adjustment thermal/magnetic	weight [kg]	packaging [pcs]
EB2 400/3L 250A 3p	250	004671091	3	25/25	0,63-1/ 6-12	4,2	1
EB2 400/3L 400A 3p	400	004671092	3	25/25	0,63-1/ 6-12	4,2	1
EB2 400/4L 250A 4p	250	004671093	4	25/25	0,63-1/ 6-12	5,6	1
EB2 400/4L 400A 4p	400	004671094	4	25/25	0,63-1/ 6-12	5,6	1
EB2 400/3S 250A 3p	250	004671101	3	50/50	0,63-1/ 6-12	4,3	1
EB2 400/3S 400A 3p	400	004671102	3	50/50	0,63-1/ 6-12	4,3	1
EB2 400/4S 250A 4p	250	004671103	4	50/50	0,63-1/ 6-12	5,7	1
EB2 400/4S 400A 4p	400	004671104	4	50/50	0,63-1/ 6-12	5,7	1



ETIBREAK EB 630/800 AF

Type	I_n [A]	code No	poles	Icu/Ics 400V(kA)	adjustment thermal/magnetic	weight [kg]	packaging [pcs]
EB630/3 630A 3p	630	004625102	3	65/33	(0.63-1) / (5-10)	9,0	1
EB800/3 800A 3p	800	004626101	3	65/33	(0.63-1) / (5-10)	9,4	1
EB630/4 630A 4p	630	004625202	4	65/33	(0.63-1) / (5-10)	11,5	1
EB800/4 800A 4p	800	004626201	4	65/33	(0.63-1) / (5-10)	12,2	1

Microprocessor's MCCBs

Microprocessor MCCBs are available from 250AF up to 1600 AF, with rated current from 40 A up to 1600 A. All frame sizes have adjustable both protections. Protection against overload can be adjusted between 0,4 – 1 x I_n, meanwhile short-circuit protection has already preset different curves, which can be easily selected according to the type of load – up to 630 AF.



ETIBREAK EB2 250 AF

Type	I _n [A]	code No	poles	Icu/Ics 400V(kA)	adjustment thermal/magnetic	weight [kg]	packaging [pcs]
EB2 250/3E 40A 3p	40	004671301	3	70/70	0,4-1/adjust.	2,5	1
EB2 250/3E 125A 3p	125	004671302	3	70/70	0,4-1/adjust.	2,5	1
EB2 250/3E 160A 3p	160	004671303	3	70/70	0,4-1/adjust.	2,5	1
EB2 250/3E 250A 3p	250	004671304	3	70/70	0,4-1/adjust.	2,5	1
EB2 250/4E 40A 4p	40	004671305	4	70/70	0,4-1/adjust.	3,3	1
EB2 250/4E 125A 4p	125	004671306	4	70/70	0,4-1/adjust.	3,3	1
EB2 250/4E 160A 4p	160	004671307	4	70/70	0,4-1/adjust.	3,3	1
EB2 250/4E 250A 4p	250	004671308	4	70/70	0,4-1/adjust.	3,3	1

*Available at the end of July

ETIBREAK EB2 400 AF

Type	I _n [A]	code No	poles	Icu/Ics 400V(kA)	adjustment thermal/magnetic	weight [kg]	packaging [pcs]
EB2 400/3E 250A 3p	250	004671111	3	50/50	0,4-1/adjust.	4,3	1
EB2 400/3E 400A 3p	400	004671112	3	50/50	0,4-1/adjust.	4,3	1
EB2 400/4E 250A 4p	250	004671113	4	50/50	0,4-1/adjust.	5,7	1
EB2 400/4E 400A 4p	400	004671114	4	50/50	0,4-1/adjust.	5,7	1

ETIBREAK EB2 630 AF

Type	I _n [A]	code No	poles	Icu/Ics 400V(kA)	adjustment thermal/magnetic	weight [kg]	packaging [pcs]
EB2 630/3LE 630A 3p	630	004671121	3	36/36	0,4-1/adjust.	3,75	1
EB2 630/4LE 630A 4p	630	004671122	4	36/36	0,4-1/adjust.	4,95	1
EB2 630/3E 630A 3p	630	004671127	3	50/50	0,4-1/adjust.	3,75	1
EB2 630/4E 630A 4p	630	004671128	4	50/50	0,4-1/adjust.	4,95	1

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ETIBREAK EB 1250/1600 AF							
Type	I_n [A]	code No	poles	Icu/Ics 400V(kA)	adjustment thermal/magnetic	weight [kg]	packaging [pcs]
EB1250/3 1000A 3p E	1000	004627101	3	85/64	$(0,5-1) \cdot I_n / (2,5-10) \cdot I_n$	22	1
EB1250/3 1250A 3p E	1250	004627102	3	85/64	$(0,5-1) \cdot I_n / (2,5-10) \cdot I_n$	22	1
EB1600/3 1600A 3p E	1600	004627103	3	100/75	$(0,5-1) \cdot I_n / (2,5-10) \cdot I_n$	27	1
EB1250/4 1000A 4p E	1000	004627201	4	85/64	$(0,5-1) \cdot I_n / (2,5-10) \cdot I_n$	28	1
EB1250/4 1250A 4p E	1250	004627202	4	85/64	$(0,5-1) \cdot I_n / (2,5-10) \cdot I_n$	28	1
EB1600/4 1600A 4p E	1600	004627203	4	100/75	$(0,5-1) \cdot I_n / (2,5-10) \cdot I_n$	35	1

LEGEND:
LE - microprocessor based version, economic
E - microprocessor based version

Low voltage switch disconnecter ETIBREAK ED



ETIBREAK ED2 125/630 AF							
Type	I_n [A]	code No	poles	peak/kA	U_r (AVC/DVC)	weight [kg]	packaging [pcs]
ED2 125/3	125	004671271	3	3,6	690/600	1	1
ED2 160/3	160	004671272	3	6	690/600	1,5	1
ED2 250/3	250	004671273	3	6	690/600	1,5	1
ED2 400/3	400	004671274	3	9	690/600	4,2	1
ED2 630/3	630	004671275	3	9	690/600	4,4	1
ED2 125/4	125	004671276	4	3,6	690/600	1,4	1
ED2 160/4	160	004671277	4	6	690/600	1,9	1
ED2 250/4	250	004671278	4	6	690/600	1,9	1
ED2 400/4	400	004671279	4	9	690/600	5,6	1
ED2 630/4	630	004671280	4	9	690/600	5,8	1



ETIBREAK ED 800/1000 AF							
Type	I_n [A]	code No	poles	peak/kA	U_r (AVC/DVC)	weight [kg]	packaging [pcs]
ED 800/3	800	004631200	3	15	690/250	9,4	1
ED 1250/3	1250	004631220	3	32	690/250	20,4	1
ED 1600/3	1600	004631225	3	45	690/250	24,9	1
ED 800/4	800	004631210	4	15	690/250	12,2	1
ED 1250/4	1250	004631230	4	32	690/250	26,4	1
ED 1600/4	1600	004631250	4	45	690/250	32,9	1

Etibreak

Internal accessories



Auxiliary switch



Alarm switch



Shunt trip unit



Shunt trip unit

Accessories for 125 - 630 AF, series 2 ETIBREAK

Internal accessories (can be mounted by customer)				packaging [pcs]
Auxiliary switch, PS2 125-630AF	004671141	1 changeover contact	3p, 4p	1/1
Auxiliary switch, heavy duty PS2-NO 125-630AF	004671142	1 contact, NO	3p, 4p	1/1
Auxiliary switch, heavy duty PS2-NC 125-630AF	004671143	1 contact, NC	3p, 4p	1/1
Alarm switch SS2 125-630AF	004671144	1 changeover contact	3p, 4p	1/1
Alarm switch, heavy duty SS2-NO 125-630AF	004671145	1 contact, NO	3p, 4p	1/1
Alarm switch, heavy duty SS2-NC 125-630AF	004671146	1 contact, NC	3p, 4p	1/1
Shunt trip unit DA2 125-630AF AC200-240V	004671147	AC 220-240 V	3p, 4p	1/1
Shunt trip unit DA2 125-630AF AC380-450V	004671148	AC 380-450 v	3p, 4p	1/1
Shunt trip unit DA2 125-630AF DC24V	004671149	DC 24 V	3p, 4p	1/1
Shunt trip unit DA2 125-630AF DC48V	004671150	DC 48 V	3p, 4p	1/1
Shunt trip unit DA2 125-630AF DC110-120V	004671151	DC 110-120 V	3p, 4p	1/1
Shunt trip unit DA2 125-630AF DC 200-240V	004671152	DC 200-240 V	3p, 4p	1/1
Undervoltage trip unit NA2 125-630AF AC200-240V	004671153	AC 200-240 V	3p, 4p	1/1
Undervoltage trip unit NA2 125-630AF AC380-450V	004671154	AC 380-50 V	3p, 4p	1/1
Undervoltage trip unit NA2 125-630AF DC24V	004671155	DC 24 V	3p, 4p	1/1
Undervoltage trip unit NA2 125-630AF DC100-120V	004671156	DC 100 - 120 V	3p, 4p	1/1
Undervoltage trip unit NA2 125-630AF DC200-240V	004671157	DC 200-240 V	3p, 4p	1/1

Important note: The Shunt Trip Unit DA and Undervoltage Trip Unit NA cannot be mounted in the same breaker.

Accessories for 800AF

Left side internal accessories (TRIP UNITS – factory fitted):				packaging [pcs]
Shunt trip unit AC 200-480V DA800	004625131	200-480VAC	3p, 4p	1/1
Undervoltage trip unit 200-240V NA800/240	004625141	200-240VAC	3p, 4p	1/1
Undervoltage trip unit 380-450V NA800/450	004625142	380-450VAC	3p, 4p	1/1
Undervoltage trip unit 200-240V NA800/240TD time delay	004625143	200-240VAC 0.5s	3p, 4p	1/1
Undervoltage trip unit 380-450V NA800/450TD time delay	004625144	380-450VAC 0.5s	3p, 4p	1/1

Important note: The Shunt Trip Unit DA and Undervoltage Trip Unit NA cannot be mounted in the same breaker.

Right side internal accessories (AUXILIARY and ALARM SWITCHES – factory fitted):				packaging [pcs]
Auxiliary switch PS800/3	004625121	1 changeover contact	3p, 4p	1/1
Auxiliary switch 2PS800/3	004625122	2 changeover contacts	3p, 4p	1/1
Auxiliary/Alarm switch PS800+SS800/3	004625123	2 changeover contacts	3p, 4p	1/1
Alarm switch SS800/3	004625124	1 changeover contact	3p, 4p	1/1



Undervoltage trip unit



Auxiliary/Alarm switch

Accessories for 1250/1600AF

Left side internal accessories (TRIP UNITS – factory fitted):				packaging [pcs]
Shunt trip unit AC 200-480 DA1600	004626131	200-480V	3p, 4p	1/1
Undervoltage trip unit 200-240 NA1600/240	004626141	200-240V	3p, 4p	1/1
Undervoltage trip unit 380-450 NA1600/450	004626142	380-450V	3p, 4p	1/1
Undervoltage trip unit 200-240 NA1600/240TD time delay	004626143	200-240V 0,5s	3p, 4p	1/1
Undervoltage trip unit 380-450 NA1600/450TD time delay	004626144	380-450V 0,5s	3p, 4p	1/1

Important note: The Shunt Trip Unit DA and Undervoltage Trip Unit NA cannot be mounted in the same breaker.

Right side internal accessories (AUXILIARY and ALARM SWITCHES – factory fitted):				packaging [pcs]
Auxiliary switch PS 1600/3	004626121	1 changeover contact	3p	1/1
Auxiliary switch 2PS 1600/3	004626122	2 changeover contacts	3p	1/1
Auxiliary/Alarm switch PS 1600+SS1600/3	004626123	2 changeover contacts	3p	1/1
Alarm switch SS1600/3	004626124	1 changeover contact	3p	1/1
Auxiliary switch PS 1600/4	004626221	1 changeover contact	4p	1/1
Auxiliary switch 2PS 1600/4	004626222	2 changeover contacts	4p	1/1
Auxiliary/Alarm switch PS 1600+SS1600/4	004626223	2 changeover contacts	4p	1/1
Alarm switch SS1600/4	004626224	1 changeover contact	4p	1/1

External accessories



Attach busbar

Accessories for 125 AF

	code No		packaging [pcs]
Attach busbar, ZB2 125/3	004671161	3p	3
Attach busbar, ZB2 125/4	004671162	4p	3
Solderless Terminal, SP2 125/3	004671163	3p	4
Solderless Terminal, SP2 125/4	004671164	4p	4



Motor Operator

Accessories for 125 AF

	code No		packaging [pcs]
Motor Operator, MO2 125 AC230-240V	004671165	3p, 4p	1
Motor Operator, MO2 125 AC100-110V	004671311	3p, 4p	1
Motor Operator, MO2 125 DC24V	004671313	3p, 4p	1
Motor Operator, MO2 125 DC48V	004671314	3p, 4p	1
Motor Operator, MO2 125 DC100V	004671315	3p, 4p	1
Motor Operator, MO2 125 AC230-240V, reset	004671166	3p, 4p	1
Motor Operator, MO2 125 AC100-110V, reset	004671316	3p, 4p	1
Motor Operator, MO2 125 DC24V, reset	004671318	3p, 4p	1
Motor Operator, MO2 125 DC48V, reset	004671319	3p, 4p	1
Motor Operator, MO2 125 DC100V, reset	004671320	3p, 4p	1

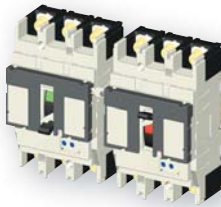
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Handle Operating Mechanism

Accessories for 125 AF

	code No		packaging [pcs]
Door Flange, PR2 125-250	004671167	3p, 4p	1
Door Flange, PR2 - mot 125-250	004671472	3p, 4p	1
Handle Operating Mechanism, RO2 125, black	004671168	3p, 4p	1
Handle Operating Mechanism, RO2 125, lock, black	004671169	3p, 4p	1
Handle Operating Mechanism, RO2 125, red	004671321	3p, 4p	1
Handle Operating Mechanism, RO2 125, lock, red	004671322	3p, 4p	1
External Handle Operating Mechanism, RO2 125P, black	004671170	3p, 4p	1
External Handle Operating Mechanism, RO2 125P, lock, black	004671171	3p, 4p	1
External Handle Operating Mechanism, RO2 125P, red	004671323	3p, 4p	1
External Handle Operating Mechanism, RO2 125P, lock, red	004671324	3p, 4p	1



Link mechanical interlock

Accessories for 125 AF

	code No		packaging [pcs]
Slide mechanical interlock, MS 125 3P	004671172	3p	1
Slide mechanical interlock, MS 125 4P	004671173	4p	1
Link mechanical interlock, MLR 125 right	004671174	3p, 4p	1
Link mechanical interlock, MLL 125 left 3p	004671175	3p	1
Link mechanical interlock, MLL 125 left 4p	004671176	4p	1
Wire mechanical interlock, MW 125, mechanism	004671177	3p, 4p	1
MW cable 1m	004671178	3p, 4p	1
MW cable 1,5m	004671179	3p, 4p	1



DIN rail adapter

Accessories for 125 AF

	code No		packaging [pcs]
Handle locks, ZA2 125-250	004671180	3p, 4p	1
Terminal cover, PRS2 125/3, front	004671181	3p	1
Terminal cover, PRS2 125/4, front	004671182	4p	1
Terminal cover, PRS2-SP 125/3, cable clamps	004671183	3p	1
Terminal cover, PRS2-SP 125/4, cable clamps	004671184	4p	1
Terminal cover, PRS2-NPF 125/3, plug-in	004671473	3p	1
Terminal cover, PRS2-NPF 125/4, plug-in	004671474	4p	1
Interpol barrier, IZ2 125	004671185	3p, 4p	1
DIN rail adapter, DIN 125	004671186	3p, 4p	1

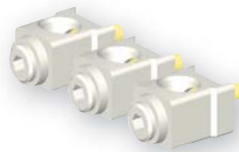


Plug-in

Accessories for 125 AF

	code No		packaging [pcs]
Fixed plug-in 3-p, NPF 125AF	004671451	3p	1
Fixed plug-in 4-p, NPF 125AF	004671452	4p	1
Plug-in Conversion 3-p, NPI 125AF	004671453	3p	1
Plug-in Conversion 4-p, NPI 125AF	004671454	4p	1
Extension terminal for fixed Plug-in 3-p, SK3 250AF	004671455	3p	3
Extension terminal for fixed Plug-in 4-p, SK4 250AF	004671456	4p	4
Plug for aux. and alarm switches SS 125-630AF, PSPSS 125-630AF	004671457	3p, 4p	1
Plug for shunt trips and underv. trips SHT and UVT 125-630AF, PSHUV 125-630AF	004671458	3p, 4p	1
Socket – for internal accessories 125-630AF, PIO 125-630AF	004671459	3p, 4p	1

- basic configuration: fixed plug-in + plug-in conversion
- extension terminals is used when fixed part of plug-in is under mounting plate - not used for basic configuration
- if additional accessories are installed in MCCB, plugs and sockets are required



Solderless Terminal SP2

Accessories for 160&250 AF			
	code No		packaging [pcs]
Attach busbar ZB2 250/3	004671191	3p	3
Attach busbar, ZB2 250/4	004671192	4p	3
Solderless Terminal, SP2 250/3	004671193	3p	4
Solderless Terminal, SP2 250/4	004671194	4p	4



Motor Operator

Accessories for 160&250 AF			
	code No		packaging [pcs]
Motor Operator, MO2 250 AC230-240V	004671195	3p, 4p	1
Motor Operator, MO2 250 AC100-110V	004671331	3p, 4p	1
Motor Operator, MO2 250 DC24V	004671333	3p, 4p	1
Motor Operator, MO2 250 DC48V	004671334	3p, 4p	1
Motor Operator, MO2 250 DC100V	004671335	3p, 4p	1
Motor Operator, MO2 250, AC230-240, reset	004671196	3p, 4p	1
Motor Operator, MO2 250 AC100-110V, reset	004671336	3p, 4p	1
Motor Operator, MO2 250 DC24V, reset	004671338	3p, 4p	1
Motor Operator, MO2 250 DC48V, reset	004671339	3p, 4p	1
Motor Operator, MO2 250 DC100V, reset	004671340	3p, 4p	1



Handle Operating Mechanism

Accessories for 160&250 AF			
	code No		packaging [pcs]
Handle Operating Mechanism, RO2 250, black	004671197	3p, 4p	1
Handle Operating Mechanism, RO2 250, lock, black	004671198	3p, 4p	1
Handle Operating Mechanism, RO2 250, red	004671341	3p, 4p	1
Handle Operating Mechanism, RO2 250, lock, red	004671342	3p, 4p	1
External Handle Operating Mechanism, RO2 250P, black	004671199	3p, 4p	1
External Handle Operating Mechanism, RO2 250P, lock P, black	004671200	3p, 4p	1
External Handle Operating Mechanism, RO2 250P, red	004671343	3p, 4p	1
External Handle Operating Mechanism, RO2 250P, lock, red	004671344	3p, 4p	1



Wire mechanical interlock

Accessories for 160&250 AF			
	code No		packaging [pcs]
Slide mechanical interlock, MS 250 3P	004671201	3p	1
Slide mechanical interlock, MS 250 4P	004671202	4p	1
Link mechanical interlock, MLR 250 right	004671203	3p, 4p	1
Link mechanical interlock, MLL 250 left 3p	004671204	3p	1
Link mechanical interlock, MLL 250 left 4p	004671205	4p	1
Wire mechanical interlock, MW 250, mechanism	004671206	3p, 4p	1
MW cable 1m	004671178	3p, 4p	1
MW cable 1,5m	004671179	3p, 4p	1



Terminal cover, plug-in

Accessories for 160&250 AF			
	code No		packaging [pcs]
Terminal cover, PRS2 250/3, front	004671207	3p	1
Terminal cover, PRS2 250/4, front	004671208	4p	1
Terminal cover, PRS2-SP 250/3, cable clamps	004671209	3p	1
Terminal cover, PRS2-SP 250/4, cable clamps	004671210	4p	1
Terminal cover, PRS2-NPF 250/3, plug-in	004671475	3p	1
Terminal cover, PRS2-NPF 250/4, plug-in	004671476	4p	1

Etibreak



Interpol barrier



Attach busbar



Motor Operator



External Handle Operating Mechanism



Wire mechanical interlock

Accessories for 160&250 AF

	code No		packaging [pcs]
Interpol barrier, IZ2 250	004671211	3p, 4p	1
Lateral block, LTBL 250, left	004671212	3p, 4p	1
Lateral block, LTBR 250, right	004671213	3p, 4p	1
Fixed plug-in 3-p, NPF 250AF	004671460	3p	1
Fixed plug-in 4-p, NPF 250AF	004671461	4p	1
Plug-in Conversion 3-p, NPI 250AF	004671462	3p	1
Plug-in Conversion 4-p, NPI 250AF	004671463	4p	1
Extension terminal for fixed Plug-in 3-p, SK3 250AF	004671464	3p	set = 3 pcs
Extension terminal for fixed Plug-in 4-p, SK4 250AF	004671465	4p	set = 4 pcs

Accessories for 400&630 AF

	code No		packaging [pcs]
Attach busbar, ZB2 400/3	004671221	3p	set = 3 pcs
Attach busbar, ZB2 400/4	004671222	4p	set = 4 pcs
Attach busbar, ZB2 630/3	004671223	3p	set = 3 pcs
Attach busbar, ZB2 630/4	004671224	4p	set = 4 pcs
Solderless Terminal, SP2 400/3	004671225	3p	set = 3 pcs
Solderless Terminal, SP2 400/4	004671226	4p	set = 4 pcs

Accessories for 400&630 AF

	code No		packaging [pcs]
Motor Operator, MO2 630, AC100-240V	004671227	3p, 4p	1
Motor Operator, MO2 630 DC24V	004671441	3p, 4p	1
Motor Operator, MO2 630 DC100-120V	004671442	3p, 4p	1
Motor Operator, MO2 630, AC100-240V, reset	004671228	3p, 4p	1
Motor Operator, MO2 630 DC24V, reset	004671443	3p, 4p	1
Motor Operator, MO2 630 DC100-120V, reset	004671444	3p, 4p	1

Accessories for 400&630 AF

	code No		packaging [pcs]
Handle Operating Mechanism, RO2 630, black	004671229	3p, 4p	1
Handle Operating Mechanism, RO2 630, lock, black	004671230	3p, 4p	1
Handle Operating Mechanism, RO2 630, red	004671445	3p, 4p	1
Handle Operating Mechanism, RO2 630, lock, red	004671446	3p, 4p	1
External Handle Operating Mechanism, RO2 630 P, black	004671231	3p, 4p	1
External Handle Operating Mechanism, RO2 630P, lock, black	004671232	3p, 4p	1
External Handle Operating Mechanism, RO2 630P, red	004671447	3p, 4p	1
External Handle Operating Mechanism, RO2 630P, lock, red	004671448	3p, 4p	1

Accessories for 400&630 AF

	code No		packaging [pcs]
Slide mechanical interlock, MS 630 3P	004671233	3p	1
Slide mechanical interlock, MS 630 4P	004671234	4p	1
Link mechanical interlock, MLR 630 right	004671235	3p, 4p	1
Link mechanical interlock, MLL 630 left 3p	004671236	3p	1
Link mechanical interlock, MLL 630 left 4p	004671237	4p	1
Wire mechanical interlock, MW 630, mechanism	004671238	3p, 4p	1
MW cable 1m	004671178	3p, 4p	1
MW cable 1,5m	004671179	3p, 4p	1



Interpol barrier



Plug-in



Solderless Terminal



Interpol barrier



Terminal cover

Accessories for 400&630 AF

	code No		packaging [pcs]
Handle locks, ZA2 400/630	004671239	3p, 4p	1
Terminal cover, PRS2 630/3, front	004671240	3p	1
Terminal cover, PRS2 630/4, front	004671241	4p	1
Terminal cover, PRS2-SP 630/3, cable clamps	004671242	3p	1
Terminal cover, PRS2-SP 630/4, cable clamps	004671243	4p	1
Interpol barrier, IZ2 630	004671244	3p, 4p	1
Lateral block, LTBL 630, left	004671245	3p, 4p	1
Lateral block, LTBR 630, right	004671246	3p, 4p	1
Door Flange , PR2 400-630	004671449	3p, 4p	1

Accessories for 400&630 AF

	code No		packaging [pcs]
Fixed plug-in 3-p, NPF 400-630AF	004671466	3p	1
Fixed plug-in 4-p, NPF 400-630AF	004671467	4p	1
Plug-in Conversion 3-p, NPI 400-630AF	004671468	3p	1
Plug-in Conversion 4-p, NPI 400-630AF	004671469	4p	1
Extension terminal for fixed Plug-in 3-p, SK3 400-630AF	004671470	3p	set = 3 pcs
Extension terminal for fixed Plug-in 4-p, SK4 400-630AF	004671471	4p	set = 4 pcs

Accessories for 800 AF

	code No		packaging [pcs]
Motor Operator AC 240V MO800	004625151	3p, 4p	1
Handle Operating Mechanism RO800	004625162	3p, 4p	1
Handle Operating Mechanism RO800P	004625163	3p, 4p	1
Door Flange PR400-800	004624164	3p, 4p	1
Handle lock ZA800	004625165	3p, 4p	1
Terminal cover PRS800/3	004625171	3p	set = 6 pcs
Terminal cover PS800/4	004625271	4p	set = 8 pcs
Interpol Barrier IZ400-1600/3	004624172	3p	set = 2 pcs
Interpol Barrier IZ400-1600/4	004624272	4p	set = 3 pcs
Solderless Terminal SP800/3	004625173	3p	set = 6 pcs
Solderless Terminal SP800/4	004625273	4p	set = 8 pcs

Accessories for 1250/1600AF

	code No		packaging [pcs]
Motor Operator AC240 MO1600	004626151	3p, 4p	1
Handle Operating Mechanism RO1600	004626162	3p, 4p	1
Handle Operating Mechanism RO1600P	004626163	3p, 4p	1
Door Flange PR1600	004626164	3p, 4p	1
Handle locks ZA1600	004626165	3p, 4p	1
Terminal cover PRS1250/3*	004626171	3p	set = 2 pcs
Terminal cover PRS1250/4*	004626271	4p	set = 2 pcs
Interpol Barrier IZ400-1600/3	004624172	3p	set = 2 pcs
Interpol Barrier IZ400-1600/4	004624272	4p	set = 3 pcs
Handle Operating Mechanism PRO630-1600	004625174	3p, 4p	1

* only for 1250 AF

Ratings and Specifications

Low voltage moulded case circuit breaker

Ampere Frame	description	unit	condition	EB2	EB2	EB2
Model				125L	125 S	160 S
Number of Poles				3, 4	3, 4	3, 4
Nominal current ratings						
	I_n	(A)	50°C	20,32,50, 63,100,125	20,32,50, 63,100,125	160
Electrical characteristics						
Rated operational voltage	U_e	(V)	AC 50/60 Hz DC	500 500	690 600	690 600
Rated insulation voltage	U_i	(V)		800	800	800
Rated impulse withstand voltage	U_{imp}	(kV)		8	8	8
Ultimate breaking capacity (IEC, JIS, AS/NZS)	I_{cu}	(kA)	690V AC 525V AC 440V AC 400/415V AC 220/240V AC 250V DC	- 8 15 25 35 25	6 22 25 36 50 25	7.5 25 25 36 65 40
Service breaking capacity (IEC, JIS, AS/NZS)	I_{cs}	(kA)	690V AC 525V AC 440V AC 400/415V AC 220/240V AC 250V DC	- 6 12 19 27 19	6 22 25 36/30 50 19	7.5 25 25 36 65 40
Rated breaking capacity (NEMA)		(kA)	480V AC 240VAC	8 35	22 50	22 65
Protection						
Adjustable thermal, adjustable magnetic				■	■	■
Fixed thermal, fixed magnetic						
Microprocessor						
Utilisation category				A	A	A
Installation						
Front connection				■	■	■
Attached flat bar				•	•	•
Solderless terminal (cable clamp)				•	•	•
Rear connection				•	•	•
Plug-in				•	•	•
Draw-out				-	-	-
DIN rail mounting				•	•	•
Dimensions	h	(mm)		155	155	165
	w	(mm)	3 pole 4 pole	90 120	90 120	105 140
	d	(mm)		68	68	68
Weight	W	(kg)	3 pole 4 pole	1.1 1.4	1.1 1.4	1.5 1.9
Operation						
Direct Opening Action				■	■	■
Toggle operation				■	■	■
Variable depth / direct mount operating handle				•	•	•
Motor operator				•	•	•
Endurance	Electrical Mechanical	cycles cycles	440V AC	30000 30000	30000 30000	20000 30000

■ Standard • Optional - Not Available

Ratings and Specifications

Ampere Frame	description	unit	condition	EB2	EB2	EB2
Model				250L	250S	250E
Number of Poles				3, 4	3, 4	3, 4
Nominal current ratings						
	I_n	(A)	50°C	200, 250	200, 250	40, 125, 160, 250
Electrical characteristics						
Rated operational voltage	U_e	(V)	AC 50/60 Hz	500	690	690
			DC	500	600	-
Rated insulation voltage	U_i	(V)		800	800	800
Rated impulse withstand voltage	U_{imp}	(kV)		8	8	8
Ultimate breaking capacity (IEC, JIS, AS/NZS)	I_{cu}	(kA)	690V AC	-	7.5	20
			525V AC	10	25	35
			440V AC	15	25	50
			400/415V AC	25	36	70
			220/240V AC	35	65	125
			250V DC	25	40	-
Service breaking capacity (IEC, JIS, AS/NZS)	I_{cs}	(kA)	690V AC	-	7.5	15
			525V AC	7.5	25	35
			440V AC	12	25	50
			400/415V AC	19	36	70
			220/240V AC	27	65	125
			250V DC	19	40	-
Rated breaking capacity (NEMA)		(kA)	480V AC	10	22	35
			240VAC	35	65	125
Rated short-time withstand current	I_{cw}	(kA)	0.3 seconds	-	-	-
Protection						
Adjustable thermal, adjustable magnetic				■	■	
Fixed thermal, fixed magnetic						
Microprocessor						■
Utilisation category				A	A	A
Installation						
Front connection				■	■	■
Attached flat bar				•	•	•
Solderless terminal (cable clamp)				•	•	•
Rear connection				•	•	•
Plug-in				•	•	•
Draw-out				-	-	-
DIN rail mounting				-	-	-
Dimensions	h	(mm)		165	165	165
	w	(mm)	3 pole	105	105	105
		(mm)	4 pole	140	140	140
	d	(mm)		68	68	103
Weight	W	(kg)	3 pole	1.5	1.5	2.5
			4 pole	1.9	1.9	3.3
Operation						
Direct Opening Action				■	■	■
Toggle operation				■	■	■
Variable depth / direct mount operating handle				•	•	•
Motor operator						
Endurance	Electrical	cycles	415V AC	10000	10000	10000
	Mechanical	cycles		30000	30000	30000

Ratings and Specifications

Ampere Frame	description	unit	condition	EB2	EB2	EB2	EB2	EB2
Model				400L	400S	400E	630LE	630E
Number of Poles				3, 4	3, 4	3,4	3,4	3, 4
Nominal current ratings								
	In	(A)	50°C	250, 400	250, 400	250, 400	630	630
Electrical characteristics								
Rated operational voltage	Ue	(V)	AC 50/60 Hz DC	500 500	690 600	690 -	690* -	690* -
Rated insulation voltage	Ui	(V)		800	800	800	800	800
Rated impulse withstand voltage	Uimp	(kV)		8	8	8	8	8
Ultimate breaking capacity (IEC, JIS, AS/NZS)	Icu	(kA)	690V AC 525V AC 440V AC 400/415V AC	- 15 22 25	20 30 45 50	20 30 45 50	10* 15 25 36	20* 30 45 50
			220/240V AC 250V DC	35 25	85 40	85 -	50 -	85 -
Service breaking capacity (IEC, JIS, AS/NZS)	Ics	(kA)	690V AC 525V AC 440V AC 400/415V AC	- 15 22 25	15 30 45 50	15 30 45 50	10* 15 25 36	15* 30 45 50
			220/240V AC 250V DC	35 19	85 40	85 -	50 -	85 -
Rated breaking capacity (NEMA)		(kA)	480V AC 240VAC	15 35	25 85	25 85	15 50	25 85
Rated short-time withstand current	Icw	(kA)	0.3 seconds	-	-	5	-	-
Protection								
Adjustable thermal, adjustable magnetic				■	■			
Fixed thermal, fixed magnetic								
Microprocessor						■	■	■
Utilisation category				A	A	B	A	A
Installation								
Front connection				■	■	■	■	■
Attached flat bar				•	•	•	•	•
Solderless terminal (cable clamp)				•	•	•	-	-
Rear connection				•	•	•	-	-
Plug-in				•	•	•	-	-
Draw-out				•	•	•	-	-
DIN rail mounting				-	-	-	-	-
Dimensions	h	(mm)		260	260	260	260	260
	w	(mm)	3 pole	140	140	140	140	140
		(mm)	4 pole	185	185	185	185	185
	d	(mm)		103	103	103	103	103
Weight	W	(kg)	3 pole	4.2	4.2	4.3	5.0	5.0
			4 pole	5.6	5.6	5.7	6.5	6.5
Operation								
Direct Opening Action				■	■	■	■	■
Toggle operation				■	■	■	■	■
Variable depth / direct mount operating handle				•	•	•	•	•
Motor operator								
Endurance	Electrical	cycles	415V AC	4500	4500	4500	4500	4500
	Mechanical	cycles		15000	15000	15000	15000	15000

* MCCB cannot be used in IT systems at this voltage.

■ Standard • Optional - Not Available

Ratings and Specifications

Ratings and specifications									
Ampere Frame Type		630/800 EB630		630/800 EB800		1250 EB1250		1600 EB1600	
Rated current I_n [A]		NRC	ASR	NRC	ASR	NRC	ASR	NRC	ASR
Calibrated at 45°C		630	Min 400 Max 630	800	Min 500 Max 800	1000 1250	Min 500 Max 1000 630 1250	1600	Min 800 Max 1600
Rated impulse withstand voltage U_{imp} [kV]		8		8		8		8	
AC Rated insulation voltage U_i [V]		690		690		690		690	
AC rated breaking capacity sym. r.m.s. [kA]									
IEC 947-2 (I_{cs})/IEC 947-2 (I_{cs})	690 V	20/10		20/10		25/19		35/35	
	500 V	35/18		35/18		45/34		65/49	
	440 V	50/25		50/25		65/49		85/64	
	415 V	50/25		50/25		65/49		85/64	
	400 V	65/33		65/33		85/64		100/75	
	380 V	65/33		65/33		85/64		100/75	
	240 V	85/43		85/43		100/75		125/94	
NEMA AB-1	600 V	30		30		42		65	
	480 V	50		50		65		85	
	240 V	85		85		85		125	
DC rated breaking capacity (kA)									
	250 V	50		50		-		-	
	125 V	50		50		-		-	
Outline dimensions (mm)									
	W (width)	210	280	210	280	210	280	210	280
	H (high)	273		273		370		370	
	D1 (depth)	103		103		120		140	
	D2 (depth with handle)	145		145		171		191	
Weight (kg)	9,0	11,5		9,4	12,2		22	28	
Connections	flat bar		flat bar		flat bar		flat bar		
Test button	yes		yes		yes		yes		
Protective functions									
Thermal unit	adjustable		adjustable		adjustable		adjustable		
Magnetic unit	adjustable		adjustable		adjustable		adjustable		

NRC: nominal rated current
ASR: adjustable setting range

Thermal magnetic adjustments and characteristics

Thermal adjustment

Low voltage moulded case circuit breakers have a wide thermal adjustment range, one of the largest on the market. The rated current 'Ir' is continuously adjustable from 63% to 100% of this nominal current 'In'. There are three main points of calibration marked at 63%, 80% and 100%.

Magnetic adjustment

An adjustable magnetic characteristics allows short-circuit protection to be matched to the load and supply characteristics, for example motor inrush current or generator short-circuit current.

Characteristics

Thermal Magnetic Protection

Etibreak MCCBs from 125A frame to 800A frame are available with thermal magnetic protection units. All 3 pole and 4 pole models have adjustable thermal and adjustable magnetic characteristics.



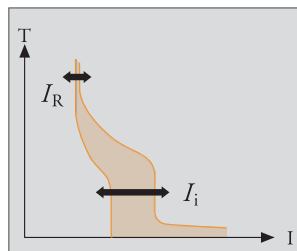
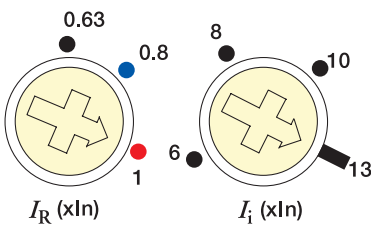
3 Pole MCCB with Adjustable Thermal and Adjustable Magnetic Characteristics

An adjustable magnetic characteristic allows short-circuit protection to be matched to the load and supply characteristics, for example motor inrush current or generator short-circuit current.

Lowering the short-circuit tripping threshold can allow a higher earth-loop impedance in an installation and provide end-of-cable protection with correct disconnection times.

Adjustment Dials

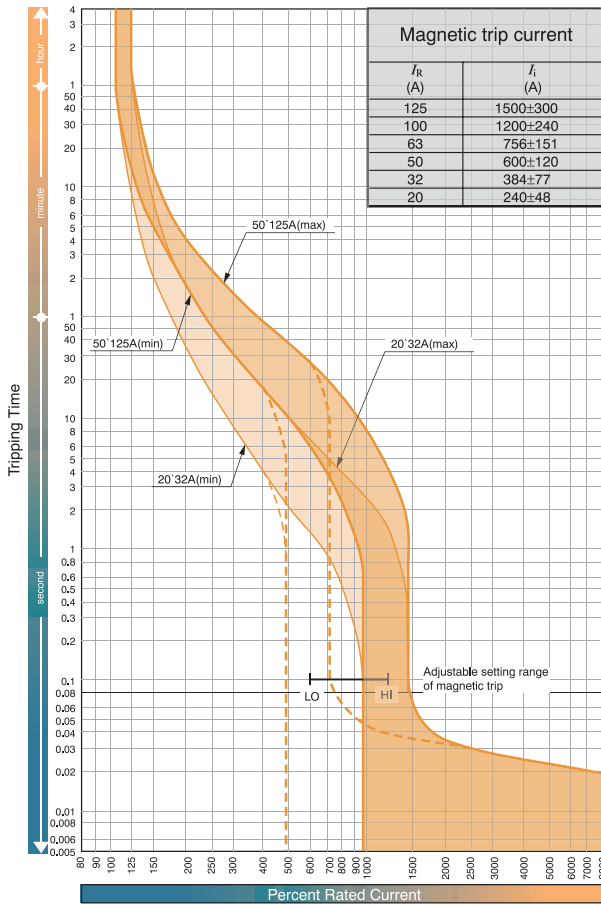
1. I_R is the thermal element adjustment dial and is used to set the rated current to match the conductor rating. I_R can be set between 0.63 and 1.0 times I_n .
2. I_i is the magnetic element adjustment dial and is used to set the short circuit tripping threshold to suit the application. I_i can be set between 6 and 12 times I_n on 125A and 400A frame models. I_i can be set between 6 and 13 times I_n on 250A frame models with ratings of 160A, 200A and 250A.



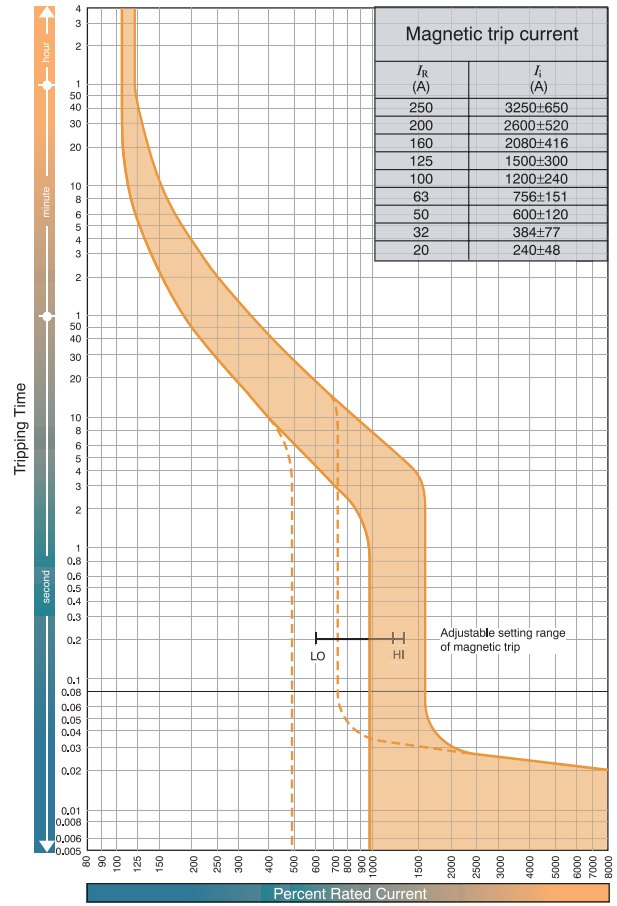
Characteristics

Operating characteristics

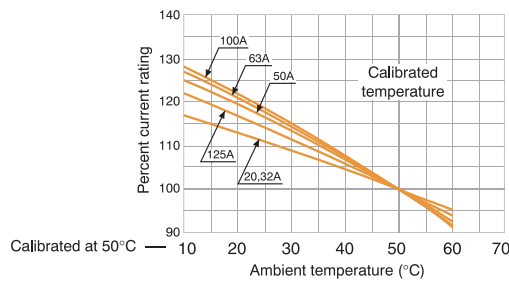
Time/current characteristic curves
EB2 125AF



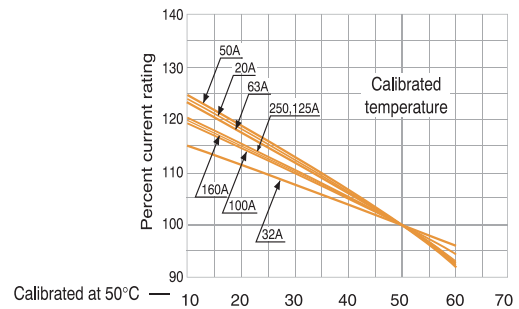
Time/current characteristic curves
EB2 160 and 250AF



Ambient compensating curves



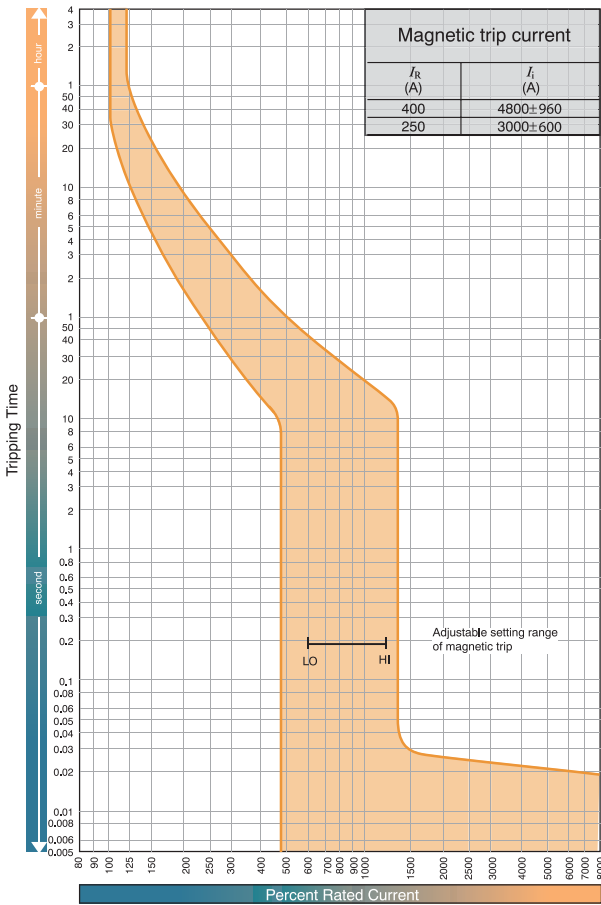
Ambient compensating curves



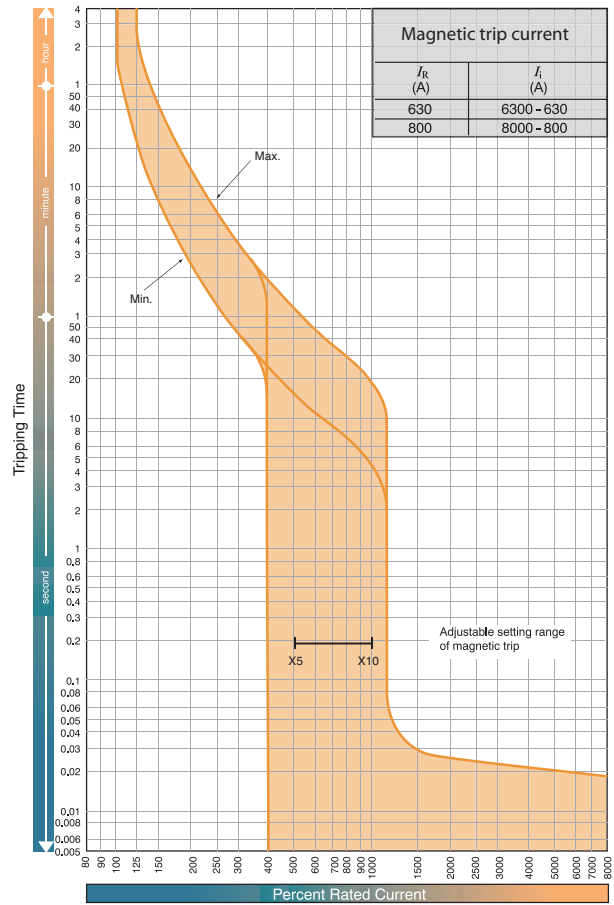
Characteristics

Operating characteristics

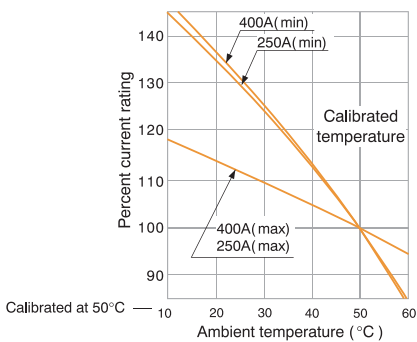
Time/current characteristic curves
EB2 400AF



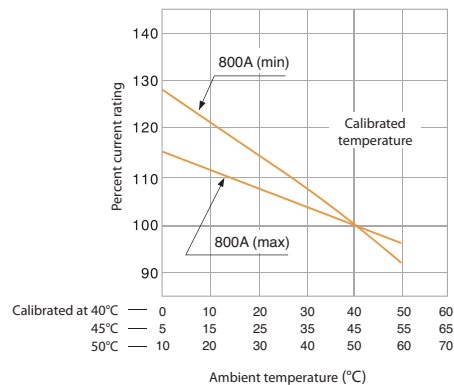
Time/current characteristic curves
EB800AF



Ambient compensating curves

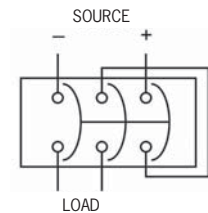


Ambient compensating curves



Special applications of thermal magnetic MCCBs

All standard thermal magnetic MCCBs are suitable for DC application up to 250 V DC.

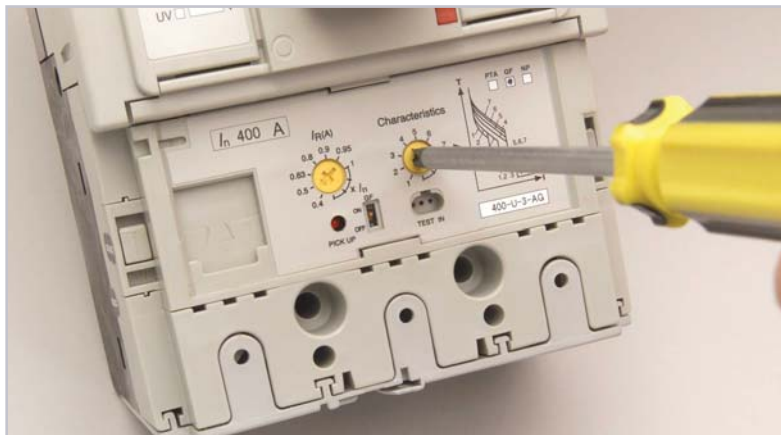


Characteristics

Microprocessor Protection

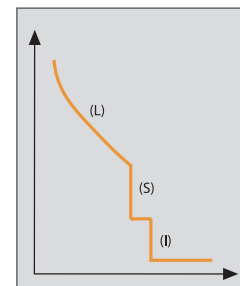
Etibreak 2 MCCBs from 250A frame to 630A frame are available with electronic protection units. Current ratings, I_n , of 40A, 125A, 160A, 250A, 400A and 630A are available. These offer great flexibility as their characteristics can be set to suit a wide range of application conditions. Overload protection can be set between 0.4 and 1.0 times I_n .

ETI offer one of the most adaptable protection units on the market:



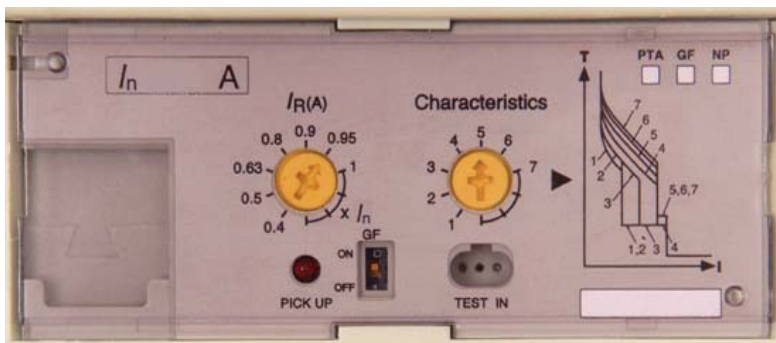
Selecting a Preset Characteristic for a 400A Etibreak MCCB with Electronic Protection

Every Etibreak electronic protection unit includes overload protection (L), delayed short-circuit protection (S) and instantaneous protection (I) as standard.



Electronic Protection Characteristic

Adjustment Dials



The left adjustment dial sets the rated current to match the conductor rating. The right adjustment dials select one of six on 630A models preset characteristics. The effects of the left adjustment dial (labelled $I_R(A)$), and the right adjustment dial (labelled Characteristics) are detailed in the tables shown underneath each time/current graph.

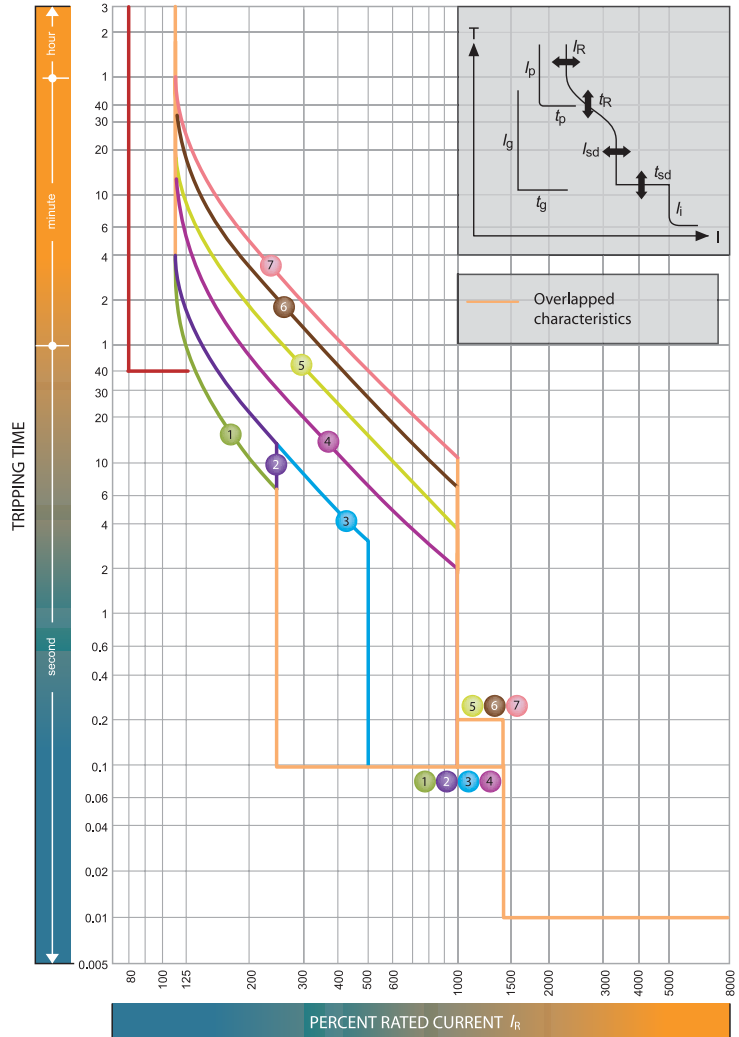
Tolerances of Characteristics

Characteristics		Tolerance
Long Time Delay	t_R	+/- 20%
Short Time Delay	I_{sd}	+/- 15%
	t_{sd}	Total clearing time +50ms, resettable time -20ms
Instantaneous	I_i	+/- 20%

Characteristics

Operating characteristics

EB2 250 E



$I_n = 40, 125, 160, 250$

I_R (A)								
LTD Pick-up current I_R	xI_n	0.4	0.5	0.63	0.8	0.9	0.95	1.0

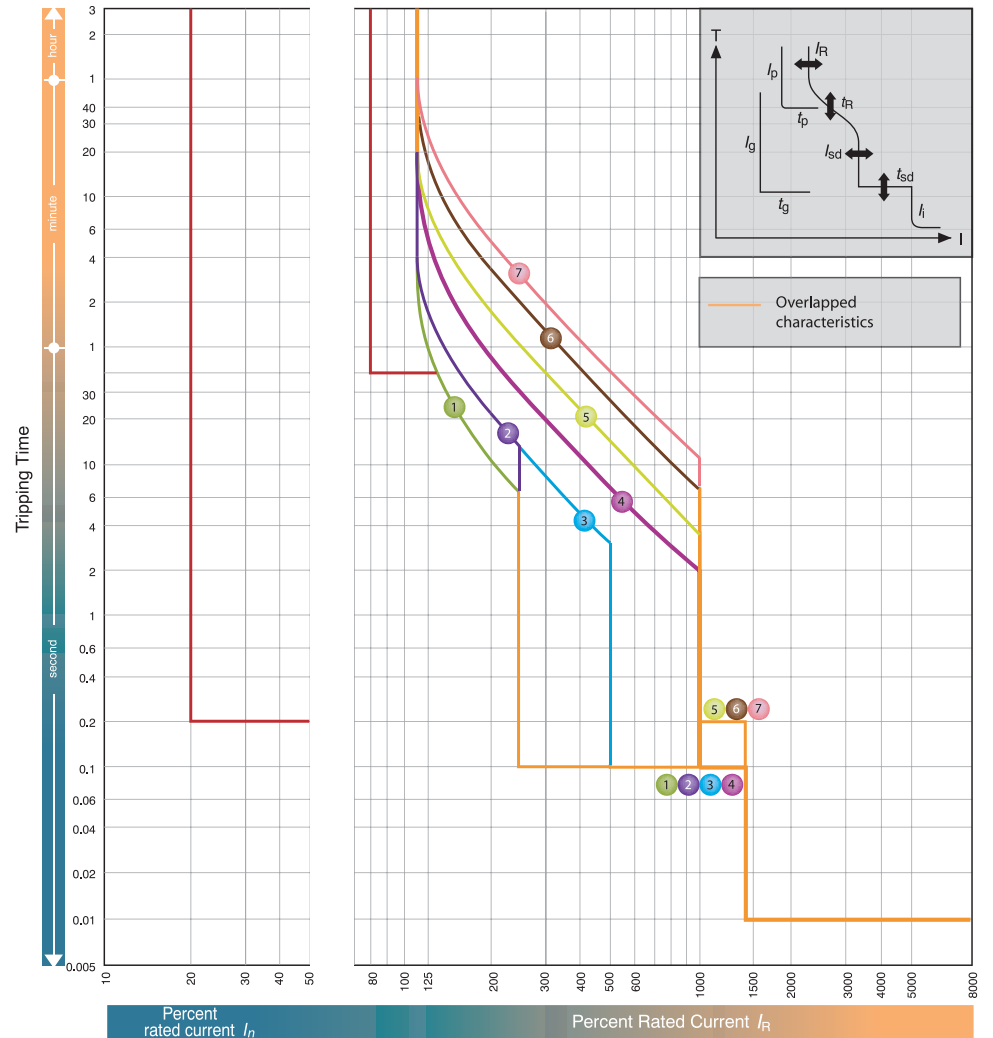
Characteristics		No.	1	2	3	4	5	6	7	
Standard	LTD	index t_R	index (s)	11	21	21	5	10	19	29
	STD	index I_{sd}	index xI_R	2.5			5			10
		index t_{sd}	index (s)	0.1				0.2		
	INST	index I_i	index xI_R	14 (Max: $13 \times I_n$)				Note (1)		

Note: (1) I_i max. = $12 \times I_n$.

Characteristics

Operating characteristics

EB2 400 E



$I_n = 250, 400$

I_R (A)								
LTD Pick-up current I_R	xI_n	0.4	0.5	0.63	0.8	0.9	0.95	1.0

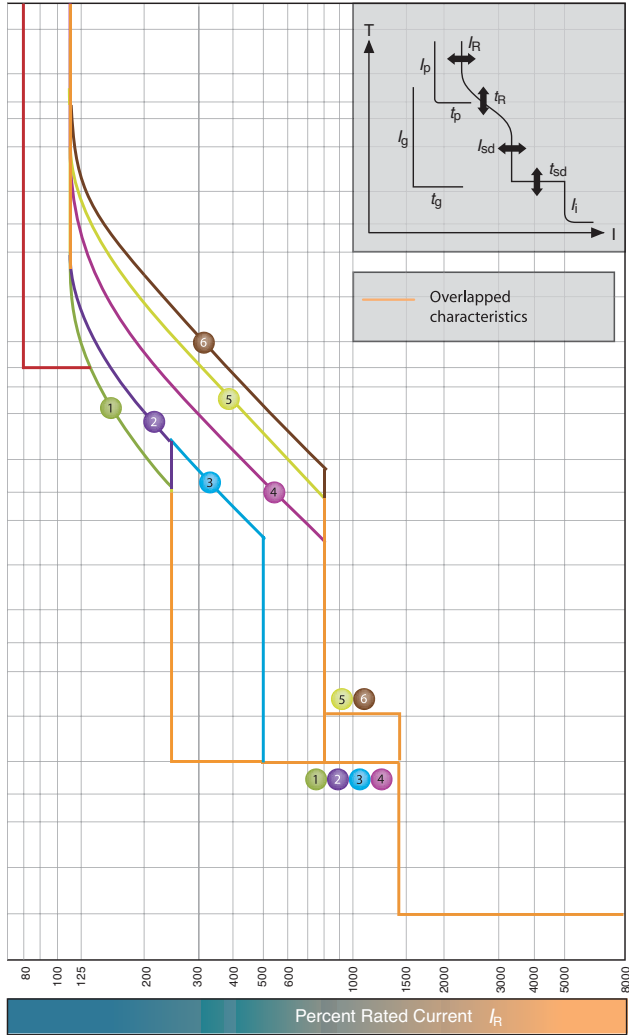
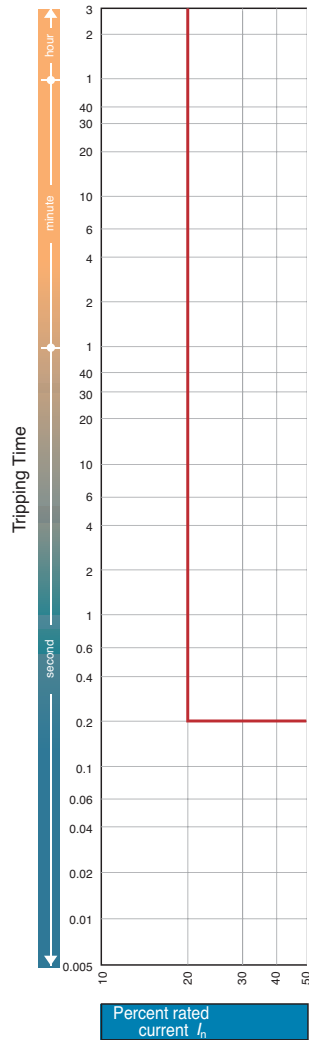
Characteristics		No.	1	2	3	4	5	6	7	
Standard	LTD	index t_R	index (s)	11	21	21	5	10	19	29
	STD	index I_{sd}	index xI_R	at 200% x I_R			at 600% x I_R			
		index t_{sd}	index (s)	2.5	5	10				
	INST	index I_i	index xI_R	0.1			0.2			
				14 (Max: 13 x I_n) Note (1)						

Note: (1) I_i max. = 13 x I_n .

Characteristics

Operating characteristics

EB2 630 E



$I_n = 630A$

I_R (A)									
LTD Pick-up current I_R	xI_n	0.4	0.5	0.63	0.8	0.85	0.9	0.95	1.0

Characteristics		No.	1	2	3	4	5	6
Standard	LTD	index t_R	11	21	21	5	10	16
	STD	index I_{sd}	at 200% $x I_R$			at 600% $x I_R$		
		index t_{sd}	2.5	5		8		
	INST	index I_l	0.1					
		index xI_R	14 (Max: 10 $x I_n$) Note (1)					

Note: (1) I_l max. = 10 $x I_n$.

Characteristics

Characteristics

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

MCCB type	LTD	STD	INST	I ² t RAMP	PICK-UP P LED	TEST PORT	PTA	GFT
EB 1250	S	S	S	S	S	S	0	0
EB 1600	S	S	S	S	S	S	0	0

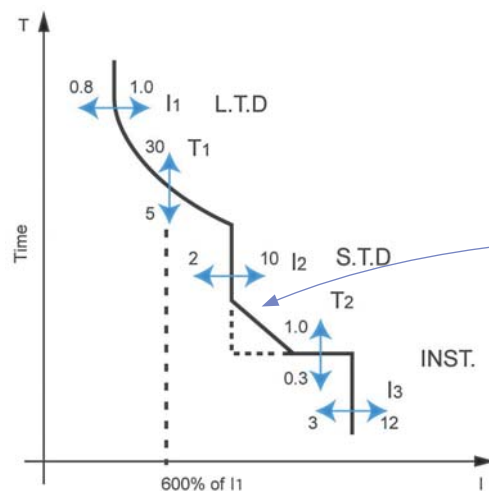
s - standard, o - optional

Each part of the curve can be independently adjusted. This unique adjustability of LTD, STD and INST enables the standard microprocessor MCCB to achieve more than 200,000 permutations of its time / current characteristic. This makes ETIBREAK microprocessor range one of the most flexible on the market.

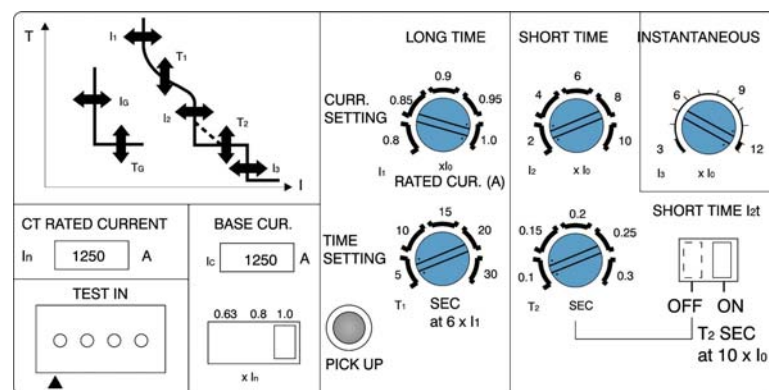
LEGEND

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 reaction
I ² t RAMP		:Provides easier grading with downstream fuse
Pick-up LED		:Lights on LTD overload, flashes on PTA pick-up
TEST report		:Facility for OCR checker for calibration checking
PTA	Pre-trip alarm	:Useful for loadshedding application
GFT	Ground Fault Trip	:Protection against ground faults

Standards Time Current Curves



The I²t RAMP switch, which is provided as standard, assists in discrimination with downstream fuses. With the switch off, the STD operates with a definite time characteristic. With the switch on, the characteristic shape is changing -> cutting off the corner which poses a potential selectivity problem.



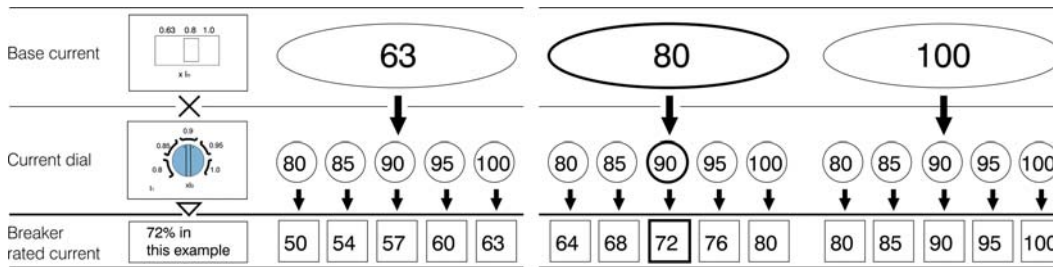
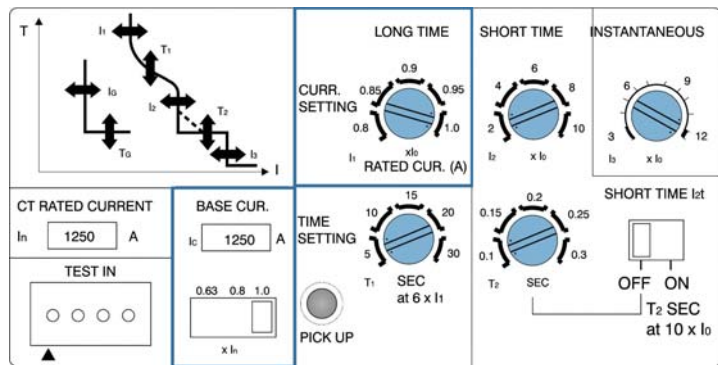
Characteristics

Setting dial	Available adjustments		
Base current settings	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 Settings	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 Settings	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

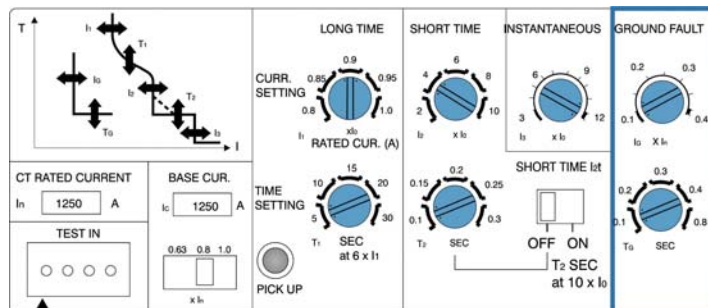
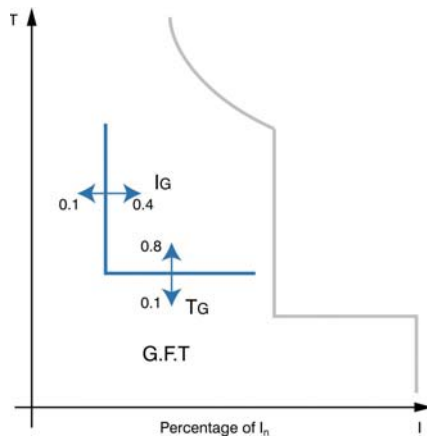
Overload adjustments

The rated current of the microprocessor based MCCB is adjusted using two current multipliers. This process achieves high accuracy adjustment from 50-100%. These are the LTD pickup dial I_1 and the Base current I_0 selector switch. The current (LTD pickup) is achieved as follows:
 $I_{rated} = I_n \times I_0 \times I_1$

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



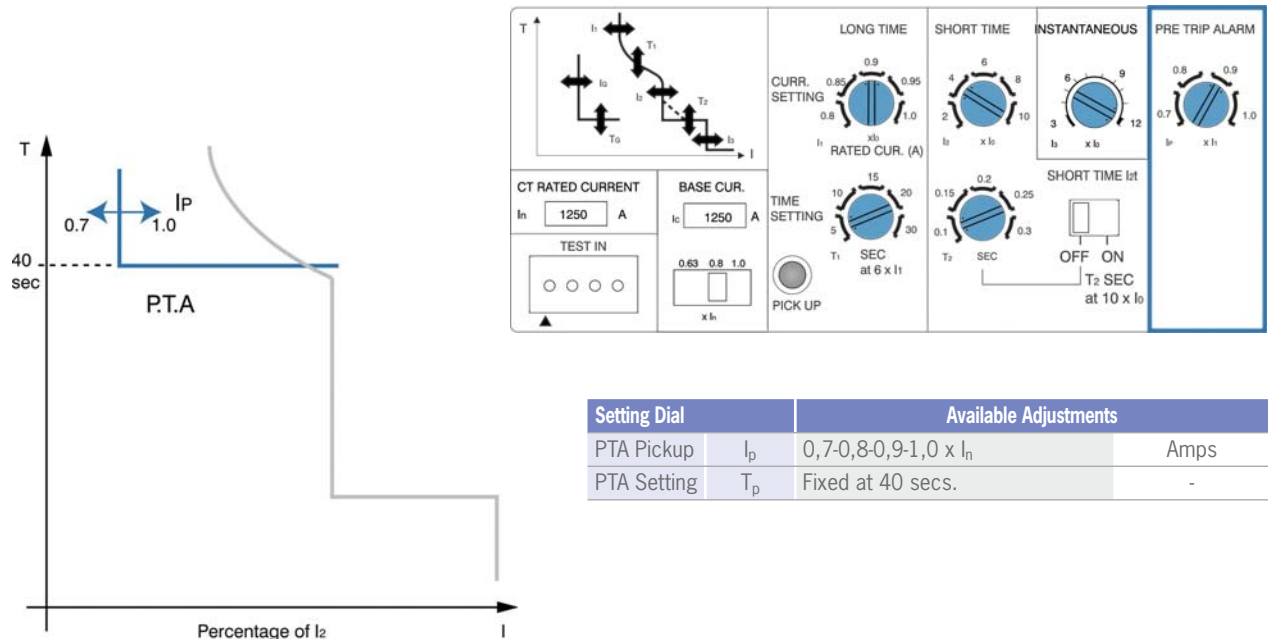
GROUND FAULT and PRE TRIP ALARM (special order) Ground fault adjustments



Setting dial	Available adjustments		
GFT Pickup	I_g	0,1 to 0,4 continuously adjustable x I_n	Amps
GFT Settings	T_g	0,1-0,2-0,3-0,4-0,8	Seconds

Characteristics

Pre trip alarm adjustments (special order)



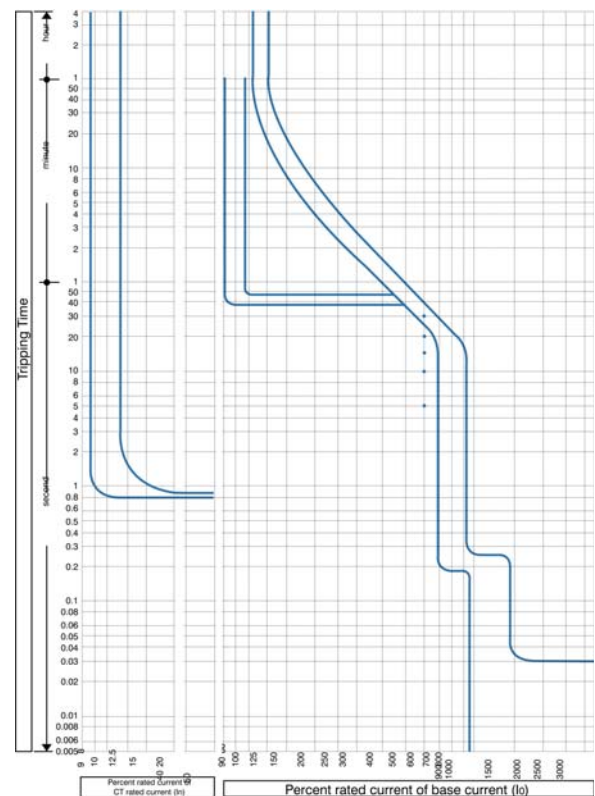
Time/current curves EB1250, EB1600

The PTA(Pre-trip alarm) option continuously monitors the true r.m.s. value of the load current. When the load current exceeds the present current value I_p the pick-up led "flashes" to provide a local alarm. If the current continues to exceed the I_p setting for 40 secs or more a volt free contact will close to provide a remote alarm. This volt free contact could also be used to trip non-essential load or start additional generator capacity. The volt free contact will only reset if the load current decrease to a value below I_p or the control voltage is interrupted. To operate the PTA function an OCR controller is required, this is supplied as standard with the option.

Output contact

Normally open contact, (1a) integral lead is standard length (450 mm)

Rating of contact	Resistive load		Inductive load
	250 V AC	125 V A(2 A max)	20 V A(2 A max)
220 V AC	60 W (2 A max)	10 W (2 A max)	
Tripped indication	Pick-up LED flickers		



Internal accessories

Internal accessories - series 2 up to 630AF

Electrical control accessories for Etibreak are designed with the installer in mind. Status and alarm contacts, remote tripping coils and undervoltage protection coils are of modular design and convenient to use.



(1) (2) (3) (4) (5) (6)

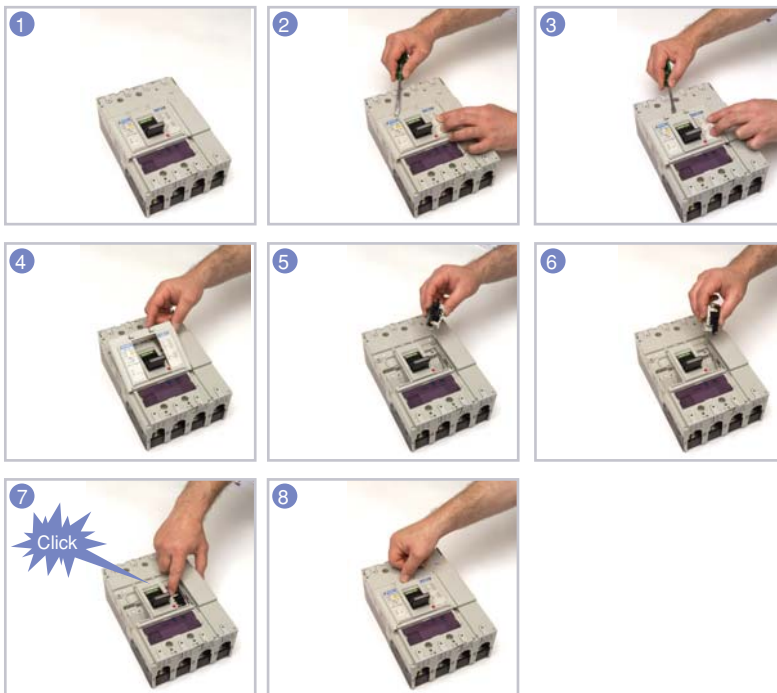
- 1) Heavy-duty auxiliary switch
- 2) Heavy-duty alarm switch
- 3) General-purpose auxiliary switch
- 4) General-purpose alarm switch
- 5) Shunt trip
- 6) Undervoltage trip

- Every accessory fits every MCCB and Switch-Disconnecter in the range up to 630 A.
- All accessories are endurance tested to the same level as MCCBs.
- Etibreak 2 internal accessories are easily field-installable.
- All accessories are individually packaged and are supplied with fitting instructions.
- Control wiring is terminated on the accessory screw terminal. Alternatively a terminal block which clips to the side of the MCCB is available.



Installing Accessories

The internal accessories can be easily installed in the field without special tools or product training.

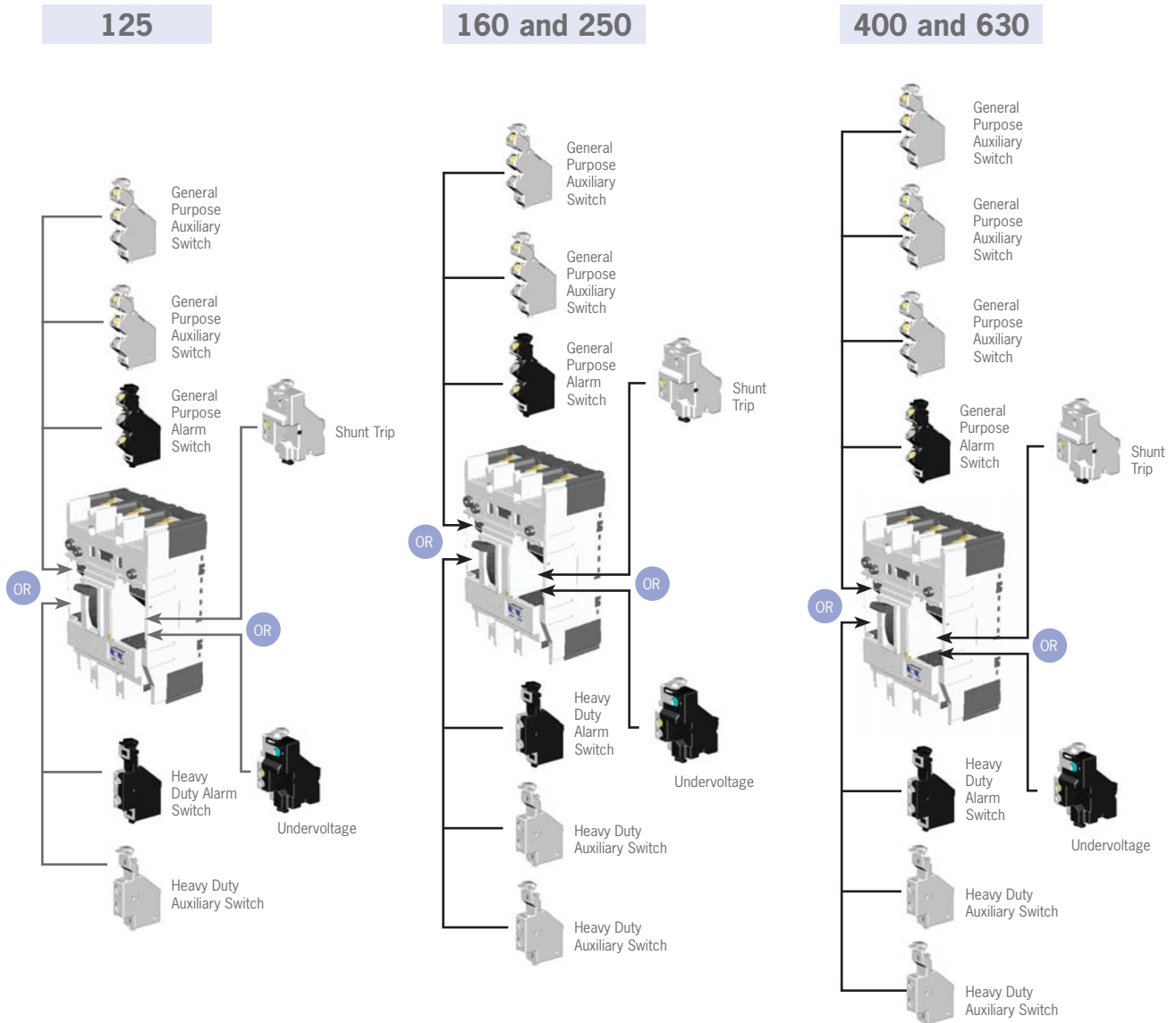


Easy field-Installation of Accessories

- Internal accessory can be simply plugged into position
- No tools are required for this, except a screwdriver to lift the MCCB front cover clips.
- Accessories fit with a firm click when installed correctly.
- Colour coding of accessories helps identification and installation Click

Internal accessories

Frame size (A)



- Status indication switches mount in the left side of the MCCB. General purpose and heavy duty status indication switches cannot be mixed in the same MCCB. Only one alarm switch can be fitted to an MCCB.
- Shunt trips and undervoltage trips mount in the right side of the MCCB.

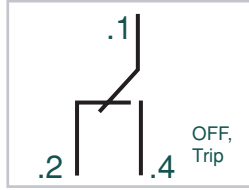
- It is not possible to install a shunt trip and an undervoltage trip in an MCCB as they occupy the same location. Undervoltage trips can provide remote tripping if necessary by wiring a normally closed contact or pushbutton in series with the protected supply.
- Undervoltage trips with time delays require an external time delay controller which clips to the side of the MCCB.

Internal accessories

Status Indication Switches



General Purpose Auxiliary Switch



Terminal Designations and Function of General Purpose Auxiliary Switch

General Purpose Auxiliary Switch (PS)

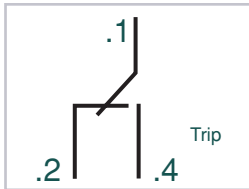
An auxiliary switch electrically indicates the ON or OFF status of the MCCB. The general purpose type is a changeover switch with 3 terminals.

Auxiliary switches are colour coded grey. The cable capacity of the terminals is 0.5 to 1.25mm².

The general purpose auxiliary switch meets the requirements of IEC 61058-1.



General Purpose Alarm Switch



Terminal Designations and Function of General Purpose Alarm Switch

General Purpose Alarm Switch (SS)

An alarm switch electrically indicates the TRIP status of the MCCB. The general purpose type is a changeover switch with 3 terminals.

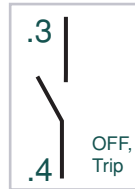
Alarm switches are colour coded grey and black. The cable capacity of the terminals is 0.5 to 1.25mm². The general purpose alarm switch meets the requirements of IEC 61058-1.

General purpose auxiliaries and alarm switch ratings						
Volts (V)	AC Amperes (A)		Volts (V)	DC Amperes (A)		Minimum Load
	Resistive Load	Inductive Load		Resistive Load	Inductive Load	
440	-	-	250	-	-	100mA at
240	3	2	125	0.4	0.05	15V DC.
110	3	2	30	3	2	

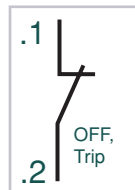
Internal accessories



Heavy Duty Auxiliary Switch



Terminal Designations and Function of Heavy Duty Auxiliary Switch, NO contact



Terminal Designations and Function of Heavy Duty Auxiliary Switch, NC contact

Heavy Duty Auxiliary Switch (PS)

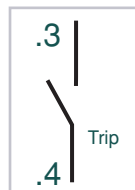
The heavy duty auxiliary switch has an impulse withstand voltage (U_{imp}) of 6kV and is suitable for isolating safety circuits. The auxiliary switch electrically indicates the ON or OFF status of the MCCB. The heavy duty type is a bridge switch with two terminals. It is available in either normally open or normally closed configurations.

Heavy duty auxiliary switches are colour coded grey. The cable capacity of the terminals is 1.25 to 2.5mm². The heavy duty auxiliary switch meets the requirements of IEC 60947-5-1.

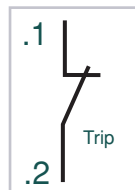
It has direct opening action, recommended by IEC 60204-1 Safety of Machinery - Electrical Equipment for Machines.



Heavy Duty Alarm Switch



Terminal Designations and Function of Heavy Duty Alarm Switch, NO contact



Terminal Designations and Function of Heavy Duty Alarm Switch, NC contact

Heavy Duty Alarm Switch (SS)

The heavy duty alarm switch has an impulse withstand voltage (U_{imp}) of 6kV and is suitable for isolating control circuits. The alarm switch electrically indicates the TRIP status of the MCCB. The heavy duty type is a bridge switch with two terminals. It is available in either normally open or normally closed configurations.

Heavy duty auxiliary switches are colour coded grey and black. The cable capacity of the terminals is 1.25 to 2.5mm². The heavy duty alarm switch meets the requirements of IEC 60947-5-1. It has direct opening action, recommended by IEC 60204-1 Safety of Machinery - Electrical Equipment for Machines.



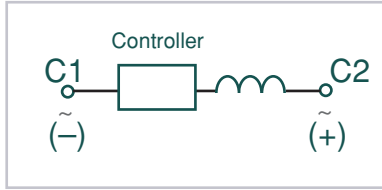
Ratings of Heavy Duty Auxiliary and Alarm Switches					
Volts (V)	AC Amperes (A)		Volts (V)	DC Amperes (A)	
	Resistive Load	Inductive Load		Resistive Load	Inductive Load
440	3	3	250	0.5	0.5
240	4	4	125	1	1
110	5	5	48	3	2.5
48	6	6	24	6	2.5

Internal accessories

Remote Tripping Devices



Shunt Trips



Terminal Designations of Shunt Trips

Shunt Trip (DA)

A shunt trip allows an MCCB to be tripped remotely on the application of the rated coil voltage across the shunt trip terminals. Etibreak 2 shunt trips have continuously rated coils and are suitable for use in electrical interlocking applications. The MCCB contacts and toggle will move to the tripped position when the shunt trip is operated.

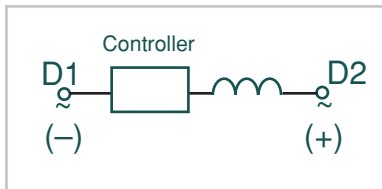
The permissible voltage range is 85% to 110% for AC or 75% to 125% for DC. The cable capacity of the terminals is 0.5 to 1.25mm². Shunt trips are colour coded grey.

Ratings of Shunt Trips

Rated Voltage	Voltage AC		Voltage DC			
	200-240	380-450	24	48	100-120	200-240
Excitation Current (A)	0.014	0.0065	0.03	0.03	0.011	0.011



Undervoltage Trips



Terminal Designations of Undervoltage Trips

Under Voltage Trip (UVT)

An undervoltage trip will trip the breaker automatically when the voltage applied to the terminals of the undervoltage coil drops to between 70% and 35% of its voltage rating. The undervoltage trip prevents the circuit breaker being closed unless a voltage corresponding to at least 85% of its voltage rating is applied across the terminals of the undervoltage coil. The MCCB contacts and toggle will move to the tripped position when the under-voltage trip operates.

Undervoltage trips with AC operating voltages are available with 500ms time delays. Time-delay units are fitted to the outside of MCCBs. The cable capacity of the terminals is 0.5 to 1.25mm². Undervoltage trips are colour coded grey and black.

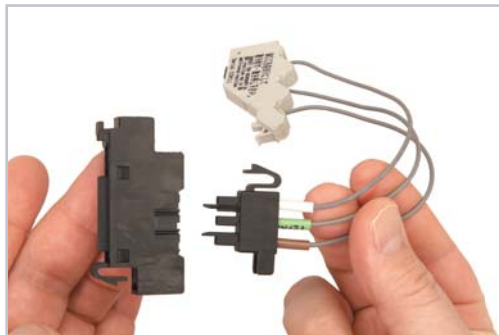
Ratings of Undervoltage Trips

Rated Voltage	Power supply capacity (VA)		Excitation current (mA)		
	Voltage AC		Voltage DC		
	200-240	380-450	24	100-120	200-240
Power Supply Capacity (VA)	1.4	2.28	23	10	10

Internal accessories

Termination of Control Wiring

Terminal blocks are for optional use with all types of internally mounted accessory.



Terminal Block for Plug-in MCCBs

Terminal Block for Plug-in MCCBs

The terminal block for a plug-in MCCB consists of:

- a male section pre-fitted with 3 cables with which clips easily to the back of the MCCB
- a female section with 3 user terminals which clips easily into the plug-in base.

Up to 4 terminal blocks can be installed on a 125A, 160A or 250A frame MCCB. Up to 5 terminal blocks can be installed on a 400A or 630A frame MCCB.



Terminal Block for Front-Connected and Rear-Connected MCCBs



Terminal Block for Front-Connected

A terminal block facilitates convenient and accessible control wiring to internally mounted accessories. It allows the use of control wiring cables with larger cross-sectional area than permitted by the internal accessories themselves. This terminal block can be clipped to either side of the MCCB. If mounted on the left incoming wiring will be fed vertically up to the terminals. If mounted on the right, the incoming wiring will be fed vertically down to the terminals. Terminal blocks are pre-fitted with outgoing wiring which can be terminated directly on each internal accessory. The maximum incoming cable size to the terminal block is 2.0mm². Terminal blocks have 11 terminals.

Internal accessories

Internal accessories - series 1 from 800AF up to 1600AF



Shunt trip unit DA
Remote tripping of the breaker

Undervoltage trip unit with controller NA
Automatically trips the breaker when the circuit breaker falls below pre-set value. Remote tripping of the breaker is also possible.
Note: The NA controller is installed externally, when provided with AC NA.

Auxiliary switch PS
Electrically indicates On/Off status of the breaker.

Alarm switch SS
Electrically indicates when the breaker is in the »tripped« state.

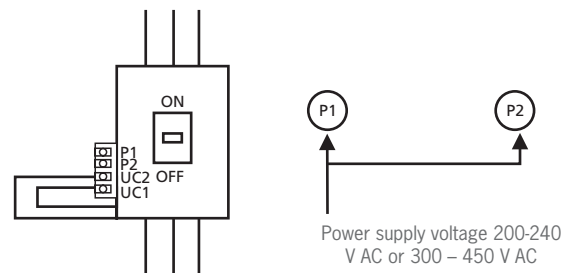
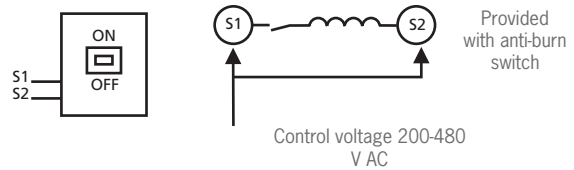
Internal accessories ratings

Shunt trip ratings (DA)

Breaker	Rated voltage [V]	Exciting current – peak value [A] - values at highest voltage
EB800	200-480 V AC	0,93
EB1250		
EB1600		

Undervoltage ratings (NA)

Breaker	Power supply, VA (with UTV controller)	
	220-240 V AC	300-450 V AC
EB800	5 VA	5 VA
EB1250		
EB1600		



Note: Tripping voltage is 35-70% of rated voltage. Resettable voltage is 85% or higher, of the rated voltage.

Note: Terminals UC1 and UC2 are already connected

Ratings of auxiliary switches (PS) and alarm switches (SS)

Applicable breaker		EB800 or larger		
AC Voltage [V]		480	250	125
Current [A]	Resistive load	3	5	5
	Lamp Load	0,3	1,5	2
	Inductive load	2	5	5
	Motor load	0,4	2	3
DC Voltage [V]		250	125	30
Current [A]	Resistive load	0,3	0,6	5
	Lamp Load	0,05	0,1	3
	Inductive load	0,3	0,6	4
	Motor load	0,05	0,1	3

Operation of auxiliary and alarm switch

Switch type	Breaker 'ON'	Breaker 'OFF'	Breaker 'TRIP'
PS			
SS			

External accessories

Externally mounted accessories

IZ – Interpole barrier. Installed between MCCB terminal, which increases the distance between poles to reduce the possibility of creepage.

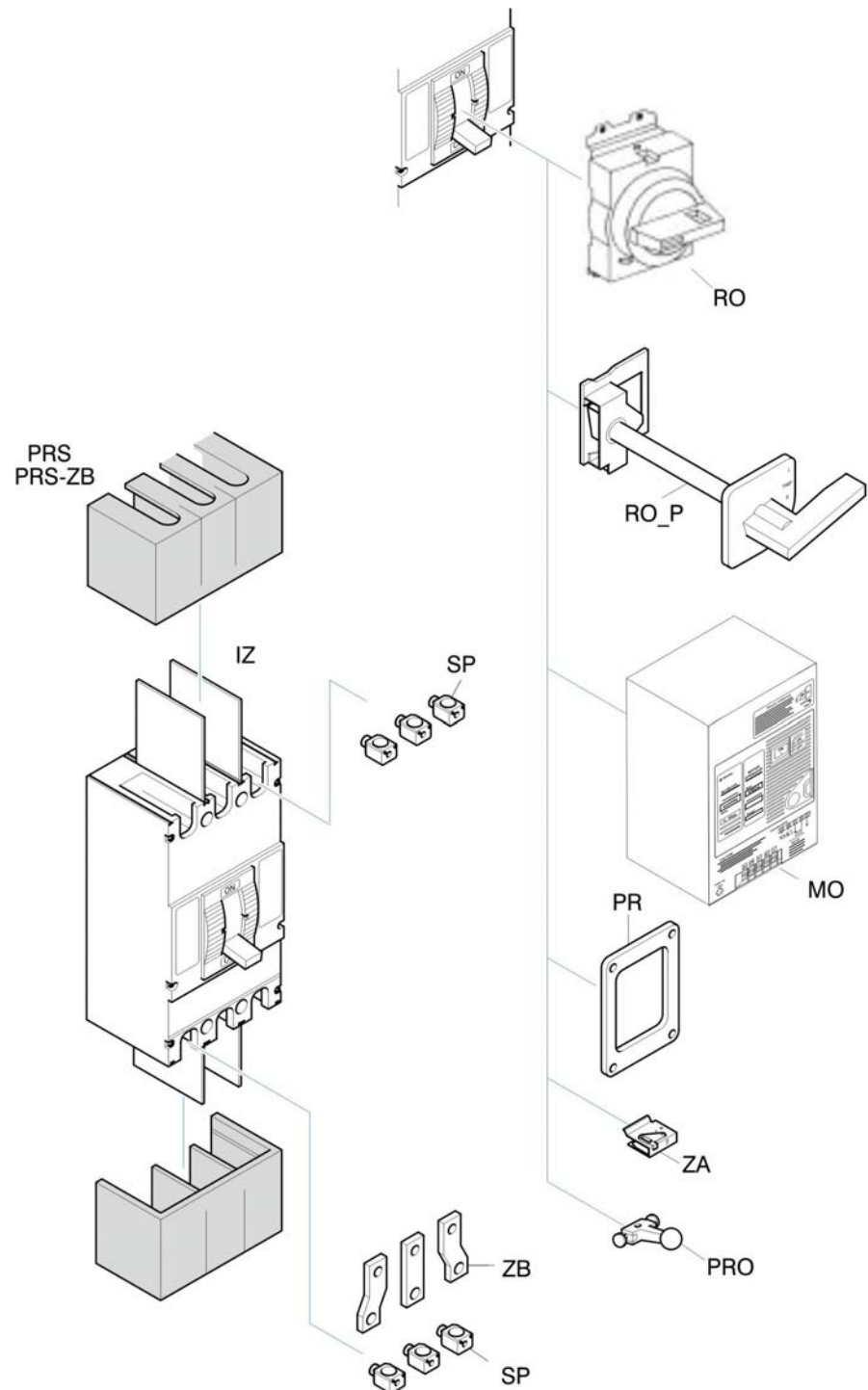
PRS – Terminal cover. The terminal covers are applied to the MCCB to prevent accidental contact with live parts and thereby protection against direct contact.

PRS-ZB – Terminal cover for attach busbar. The terminal covers are applied to the MCCB to prevent accidental contact with live parts and thereby protection against direct contact. The width is different because of attach busbar.

SP – Solderless terminal

RO – Operating handle, rear mounted it's used when MCCB is installed in control centre/ switchboard or when it's required to be manually operated from the outside of the door.

RO_P – Operating handle, panel mounted, variable depth. This consists of an operating mechanism mounted on the breaker, an operating handle mounted on the panel door and a square shaft to connect the mechanism with the handle.



MO – Motor operator. Enabling to switch MCCB ON or OFF remotely.

PR – Door flange. Accessorie for mounting on panel door.

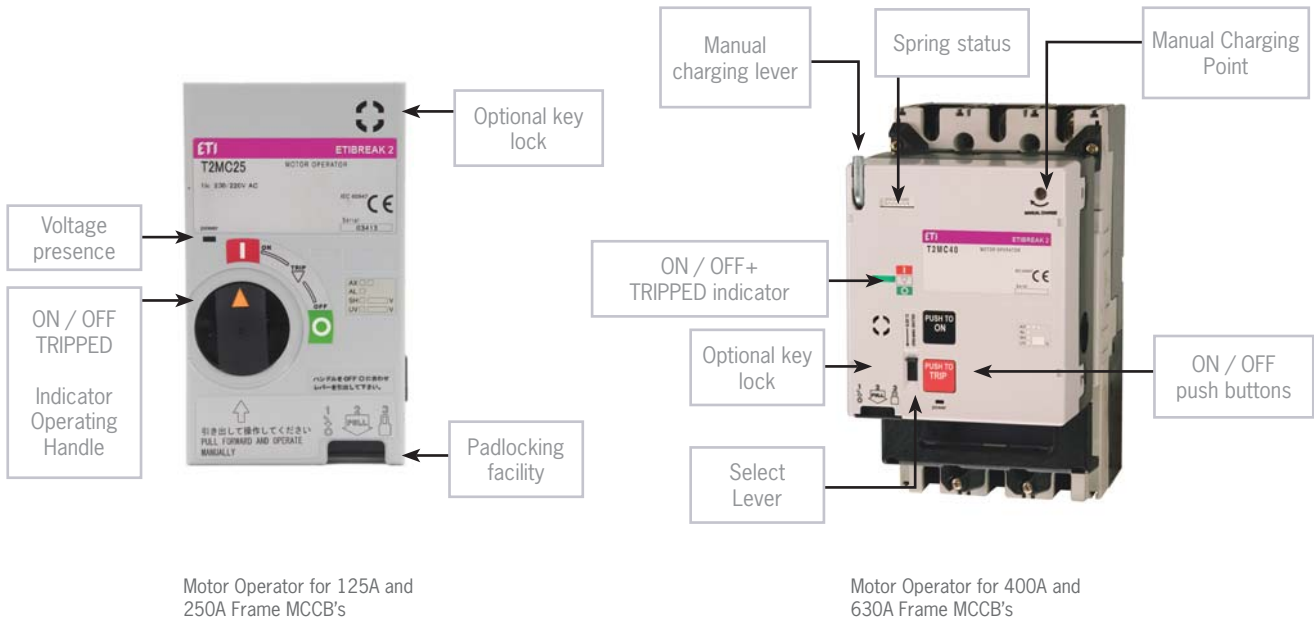
ZA – Handle lock. Enables the MCCB to be padlocked in neither the ON or OFF position.

ZB – Attach busbar. Used for easier instalation on busbar systems (widen terminals).

PRO – Handle extension. Used for easier manipulation ON/OFF at bigger MCCB's.

External accessories

Electrical Control Using Motorised operation Overview – Motor Operators (MO)

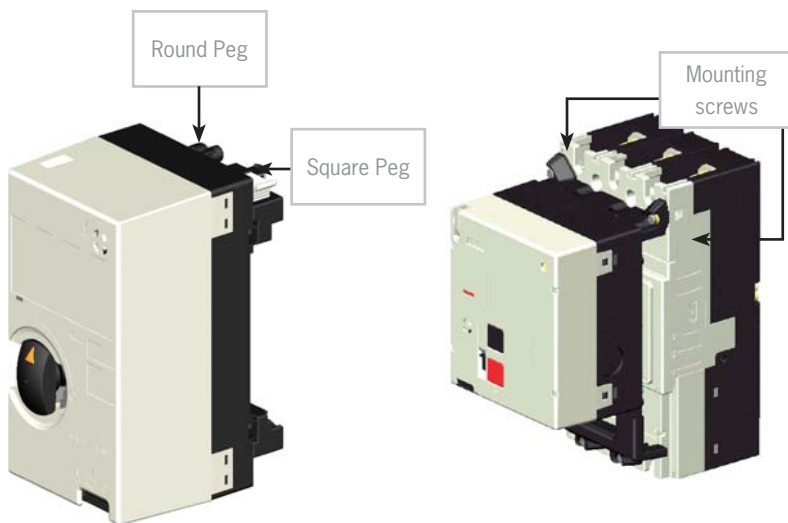


Motor Operator for 125A and 250A Frame MCCB's

Motor Operator for 400A and 630A Frame MCCB's

Motor operators provide the possibility of opening and closing an MCCB on application of electrical control signals. ETIBREAK 2 motor operators are extremely reliable, having been designed to endure the same switching duty as the host MCCB.

- Easy field-installation.
- Fast operation ($\leq 100\text{ms}$).
- Positive contact indication.
- Padlocking facility as standard (Maximum 3, hasp diameter 8mm).
- Optional keylock.
- Versions available with automatic reset function.
- Voltage presence indication.



Motor Operator for 125A and 250A frame MCCB's

Motor Operator for 400A and 630A frame MCCB's

Motor operators for 125A and 250A frame are mounted on the front of the breaker. They can be rapidly fitted by locating the round pegs and square pegs on the motor into corresponding round and square holes on the breaker. It takes less than 10 seconds to secure the motor to the MCCB. Two levers securely lock the motor into position. No tools are needed to fit the motor operator. 400A frame and 630A frame motor operators are held in place with mounting screws. They can be installed easily in the field.

External accessories

Electrical Control Using Motorised Operation Indication of ON, OFF or TRIPPED Status

The handle of 125A and 250A frame motor operators has dual functions:

1. Indication of ON, OFF or TRIPPED status as shown in the photographs below;
2. Manual operation when handle is pulled out. The supply to electrical control circuits inside the motor operator is cut when the handle is pulled out.



MCCB on



MCCB off



MCCB tripped



Motor operators for 400A and 630A frame MCCBs incorporate a mechanical flag which indicates the ON, OFF and TRIPPED status of the MCCB. They can be manually charged using the lever provided.

Ratings and Specifications

Frame size of host MCCB (A)		125, 160, 250	400, 630
Rated operating voltage	200-220 V AC	■	■
	230-240 V AC	■	■
	24 V DC	■	■
	48 V DC	■	■
	100-110 V DC	■	■
Operating current/ Starting current Peak value (A)	200-220 V AC	1.5 / 4.8	ON -/3.3; OFF, RESET 1.0/3.8
	230-240 V AC	1.3 / 4.3	ON -/3.3; OFF, RESET 1.0/3.8
	24 V DC	TBA	TBA
	48 V DC	TBA	TBA
	100-110 V DC	1.3 / 4.3	ON -/1.3; OFF/RESET 1.2/2.9
Operating method		Direct drive	Spring charging
Operating time (s)	ON	0.1	0.1
	OFF	0.09	1.5
	RESET	0.09	1.5
Operating switch rating	100V, 0.1 A, Opening voltage: 44V, current 4mA		
Power supply required		300 VA minimum	300VA minimum
Dielectric properties (1 min)	1500 V AC (1000V AC for 24V DC and 48V DC motors)		
Weight		1.4 kg	3.5kg

■ = Available

Note: Operating times shown in the above table apply only when the rated operational voltage is supplied to the motor operator. The voltage supplied to the motor operator must be within the range of 85% and 110% of the rated operating voltage.

External accessories

Electrical Control Using Motorised operation Motor Operator Control Circuits

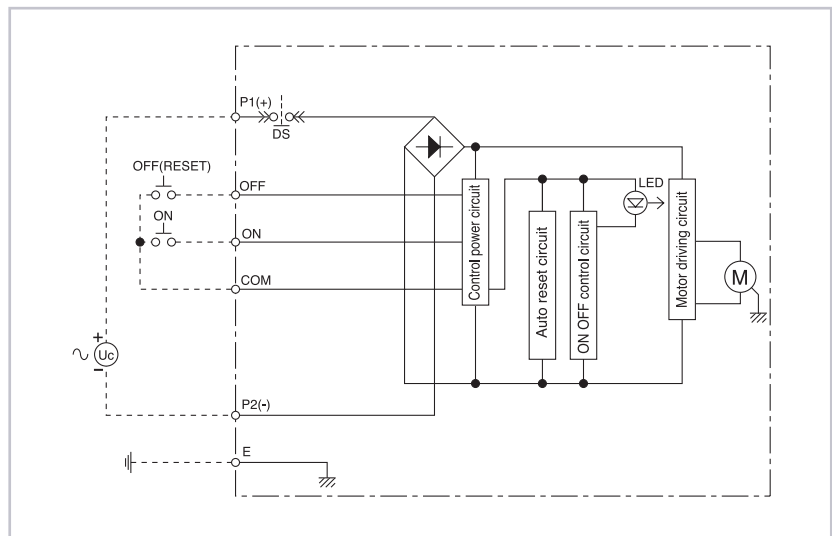


MCCB and Motor Operator Showing Control Wiring Socket



Control Wiring Plug

The Control circuits for Motor Operators are connected using a simple plug and socket system.



Control circuit for Motor Operators

Operation

The motor operator incorporates a self-hold circuit for the closing and opening signals. Therefore a momentary open or close signal will ensure a complete operation. When the breaker trips, the breaker is reset by applying a signal to the OFF terminals of the motor. When a NA is used with a motor operator, design the control circuit so that the NA is energised before a reset or close signal is sent to the motor operator. A 40ms time delay in the reset and close signals is sufficient to allow the NA (undervoltage trip) to energise.

When a shunt trip is used with a motor operator, design the control circuit so that the shunt trip is de-energised before a reset or close signal is sent to the motor operator.

When a mechanical interlock is used with motor operators, design the control circuit to provide electrical interlocking between the motor operators. The electrical interlocking should prevent a close signal being sent to a motor operator unless the other motor operator and circuit breaker are in the OFF position.

Auto- reset

Two types of motor operator are available: motor operators without auto-reset and motor operators with auto-reset. The correct type of motor operator should be selected for the application. MCCB auxiliary and alarm switches do not have to be used in the control circuits for motor operators whether they have auto-reset or not, saving cost and space.

External accessories

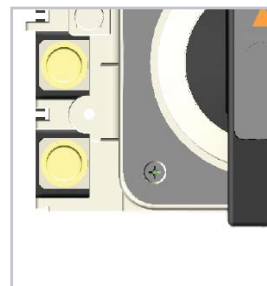
Operating handles & LOCKING DEVICES

ETIBREAK 2 handles are extremely reliable, having been designed to endure the same switching duty as the host MCCB. It is easy to fit the operating unit to the MCCB. Fitting involves three easy steps:

1. Align breaker toggle with operating mechanism
2. Push handle into position (the handle's round pegs locate securely in the breaker's round holes and the handle's* square pegs in the breaker's square holes).
3. Twist locking screws through 45 degrees.*



MCCB ON

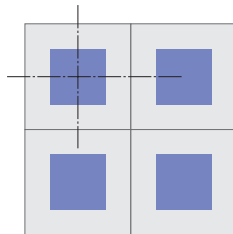


MCCB ON

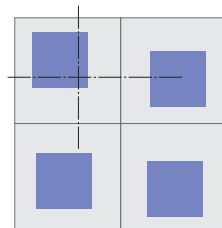
Safety Features

- Door interlock mechanism with override facility included as standard
- IP54 as standard (door mounted version), IP3X as standard (breaker mounted version)
- Locks OFF with up to 3 padlocks (8mm hasps)
- Optional keylock in OFF position
- Available in black or red and yellow
- A trip test can be performed with the handle fitted to the MCCB

Cubicle Door Cutouts



Using Etibreak 2 Operating Handles



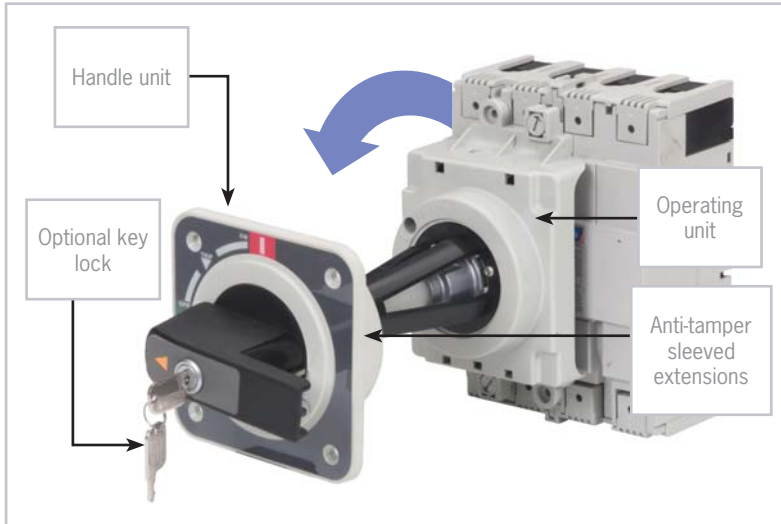
Using other MCCB Operating Handles

Orientation

To switch the breaker from OFF to ON the handle is rotated through 90 degrees in a clockwise direction. The ON (I) and OFF (O) indication of the handle can be re-oriented in steps of 90 degrees with respect to the operating mechanism. This allows the indication position to remain the same whether the breaker is mounted vertically (right side up or upside down) or horizontally (on its left side or on its right side). The hole cut-out dimensions for a panel or door will remain unchanged if the handle is re-oriented. The handle's axis of rotation is on the intersection of the centre lines of a 3P MCCB. This means that the positioning of the door cutouts is symmetrical for breakers mounted horizontally on either side of a vertical busbar system.

External accessories

Operating handles & LOCKING DEVICES



Door Mounted Handle with Optional Keylock

Door Mounted Handle

The door mounted operating handle is used to operate a circuit breaker mounted inside a cubicle from outside the door. It consists of an operating mechanism that is mounted on the breaker, an operating handle that is mounted on the door, and a shaft that transmits the turning force from the handle to the operating unit. The shaft can be cut to the required length.



Breaker Mounted Handle Padlocked in the OFF Position

Breaker Mounted Handle

This handle is used to operate a circuit breaker mounted just behind a compartment door with the door closed. The operating unit and the handle itself are mounted directly onto the circuit breaker. The handle protrudes through a cutout in the door. A moulded door flange is supplied with the handle which covers the cutout from the front.

Padlocking and keylocking is possible in the OFF position or both the ON and OFF position depending on the mounting direction.

Locking Devices

Toggle locking devices allow MCCBs to be locked ON or OFF using up to three padlocks. Locking devices for 125A, 160A and 250A frame models accept padlocks with 5mm hasp diameter. Locking devices for 400A and 630A frame models accept padlocks with 8mm hasp diameter.



S250 Locked OFF



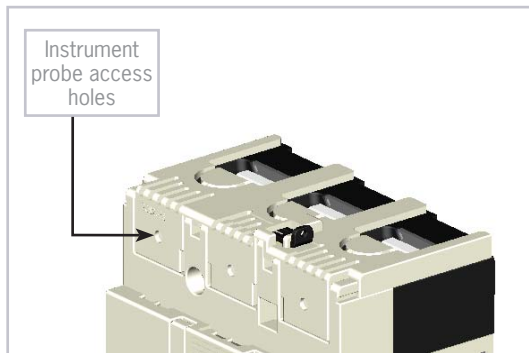
S400 Locked OFF

Fittings for Castell and Fortress locks are available. They are suitable for use on toggle-operated MCCBs, or on door mounted handles for MCCBs.

External accessories

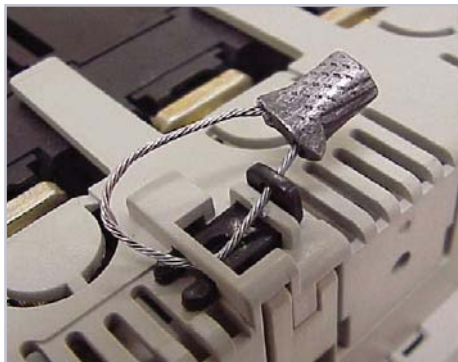
Terminal Covers

Terminal covers are used to prevent direct contact with live MCCB terminations. They also provide additional insulation to reduce the possibility of a short circuit between phases or to earth when large conductors are used.



General features

- Terminal covers require no tools for installation
- All terminal covers have an IP20 ingress protection rating
- **Terminal covers are ordered individually.** Two terminal covers are required to cover both the line and load terminals of an MCCB. Each cover can either be fitted to the top or bottom of the MCCB
- Terminal covers have an instrument probe access hole of 4mm diameter on each phase.



Terminal Cover Lock with Lead Seal

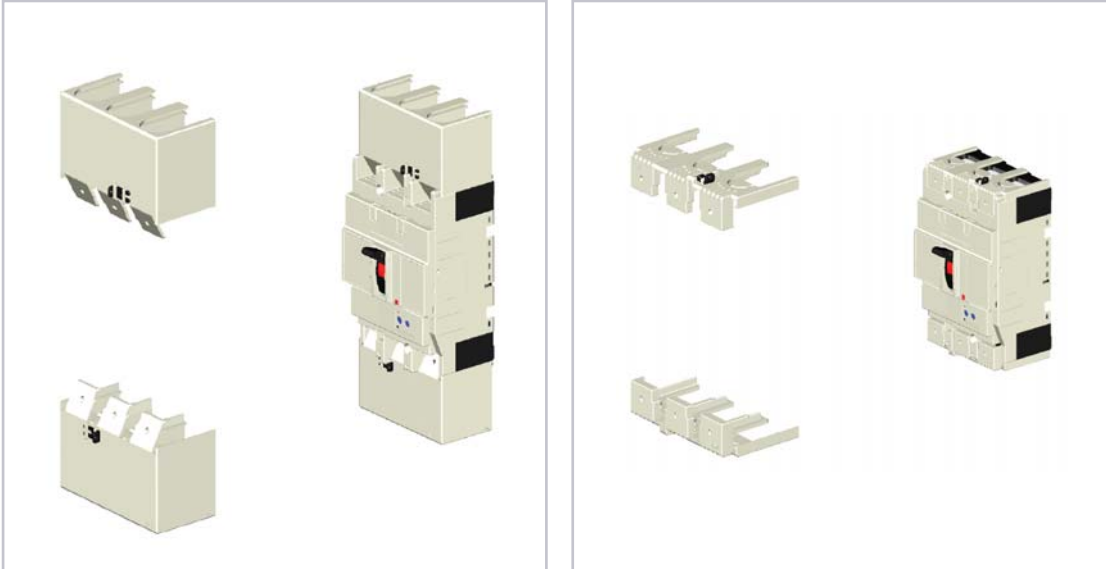
Options

- A terminal cover lock allows an anti-tampering seal to be added.
- An earth barrier can be added to terminal covers for front connection. The earth barrier provides insulation at the rear of the terminations.

External accessories

Terminal Covers for Front Connection

Terminal covers for front connection are suitable for covering the exposed live parts of conductors terminated on the MCCB.

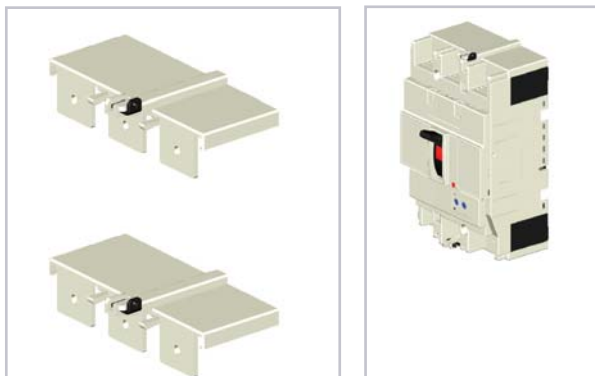


Terminal Covers for Front Connection

Flush Terminal Covers

Flush Terminal Covers

Flush terminal covers are useful for increasing the ingress protection rating at the terminals without increasing the overall length. They can be used with busbar and for direct entry of stranded cable (with solderless cable clamp terminals). The user can remove a section of the rear terminal cover using a tool to allow entry of the conductor.



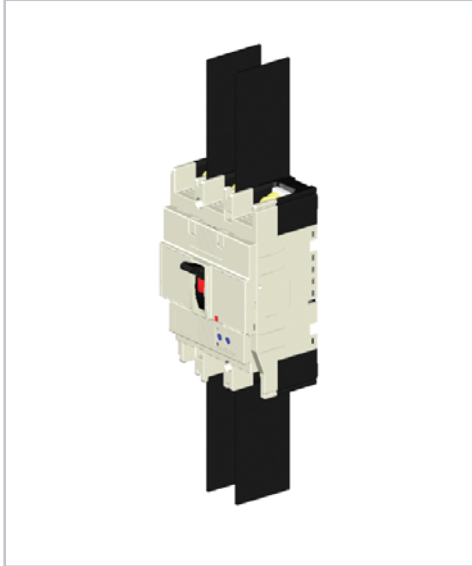
Terminal Covers for Rear Connection

Terminal covers for Rear Connection

Terminal covers for rear connection may be used on MCCBs fitted with rear connections or plug-in connections. They prevent access to the terminals from the front and top.

External accessories

Interpole Barriers (BA)



MCCB Fitted with Interpole Barriers on Both Ends



Interpole Barriers between Adjacent MCCBs

Interpole barriers provide maximum insulation between phases at the terminals of the MCCB. They cannot be fitted at the same time as any of the terminal covers.

Interpole barriers for use on one end of the MCCB are supplied as standard. Additional interpole barriers can be ordered individually. All interpole barriers can easily be fitted to either end of an MCCB. MCCB moulds have been designed to accept an additional interpole barrier between two adjacent MCCBs.

External accessories

Accessories for Dual Supply Changeover Systems

Where more than one AC voltage source is available to a distribution system it is often necessary to prevent multiple sources supplying the system at one time. Interlocking accessories are used together with two MCCBs to prevent both being in the ON state simultaneously. This provides a secure mechanical means of preventing the connection of two supply sources.

An automatic changeover controller can monitor the status of two supplies and control the switching of two MCCBs according to pre-programmed parameters. When an automatic changeover controller is interfaced to a pair of interlocked MCCBs fitted with remote control accessories, a secure, fully automatic changeover system is achieved.



Link Interlock

Link Interlock (ML)

Link interlocks consist of a mechanism mounted to each MCCB in an adjacently mounted pair. The link between each mechanism inhibits the closure of one MCCB unless the other is in the OFF position. Link interlocks can be used on a mixture of 3 and 4 pole breakers of the same frame size. The ETIBREAK 2 link interlock is an innovative design breakthrough which will save space, time and money for switchboard builders in that:

- Installation is extremely simple. Link interlocks are field-installable and only require a screwdriver to fit.
- Link interlocks replace the accessory cover on the front of the breaker
- Motor operators and operating handles are compatible with link interlocks
- The interlock is installed on the front of the MCCB and does not therefore interfere with copperwork or cables
- No need to buy factory-built backplates with MCCBs and interlocks pre-fitted
- An automatic changeover pair consisting of an interlocked pair of MCCBs with internal control accessories and motor operators can be assembled in a few minutes!



Changeover Pair with Link Interlock and Motor Operators



Viewed from Below

External accessories

Accessories for Dual Supply Changeover Systems

Wire Interlock (MW)

Wire interlocks consist of two mechanisms connected by a cable. The mechanisms are mounted on two MCCBs located at a distance from each other which is limited by the length and bend radius of the cable. The mechanisms and cable inhibit the closure of one MCCB unless the other is in the OFF position. Each mechanism is ordered separately. Cables of 1.0m or 1.5m length are also ordered as separate items.

Wire interlocks can be used on a mixture of 3 and 4 pole MCCBs of different frame sizes.

This allows potential cost savings by using lower rated MCCBs for the alternative power supply. MCCBs can be mounted in different switchboard compartment or on different planes.



Changeover Pair with Wire Interlock and Motor Operators



View from above

The ETIBREAK 2 wire interlock is an innovative design breakthrough which will save space, time and money for switchboard builders in that:

- Installation is extremely simple. Wire interlocks are field-installable.
- Wire interlocks replace the accessory cover on the front of the breaker
- Motor operators and operating handles are compatible with wire interlocks
- Interlocking of MCCBs mounted in different compartments is possible
- No need to buy factory-built backplates with MCCBs and interlocks pre-fitted
- An automatic changeover pair consisting of an interlocked pair of MCCBs with internal control accessories and motor operators can be assembled in a few minutes!

Slide Interlock (MS)

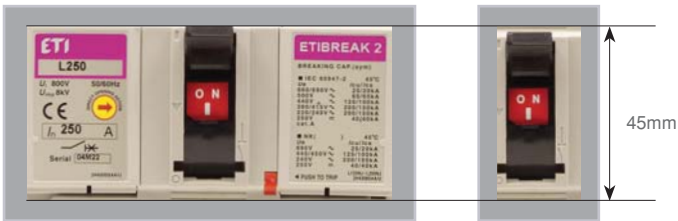
Slide interlocks are manually operated toggle locking devices which can be installed between two adjacent MCCBs (no possibility of motor operator mounting). Depending on the position of the slide, one or other of the MCCBs on either side of a slide interlock is inhibited from being in the ON position. Slide interlocks can be used between MCCBs of the same number of poles and of the same frame size. Slide interlocks can be installed in the field and are padlockable in both positions.



Slide Interlock Installed Between two MCCBs

Installation

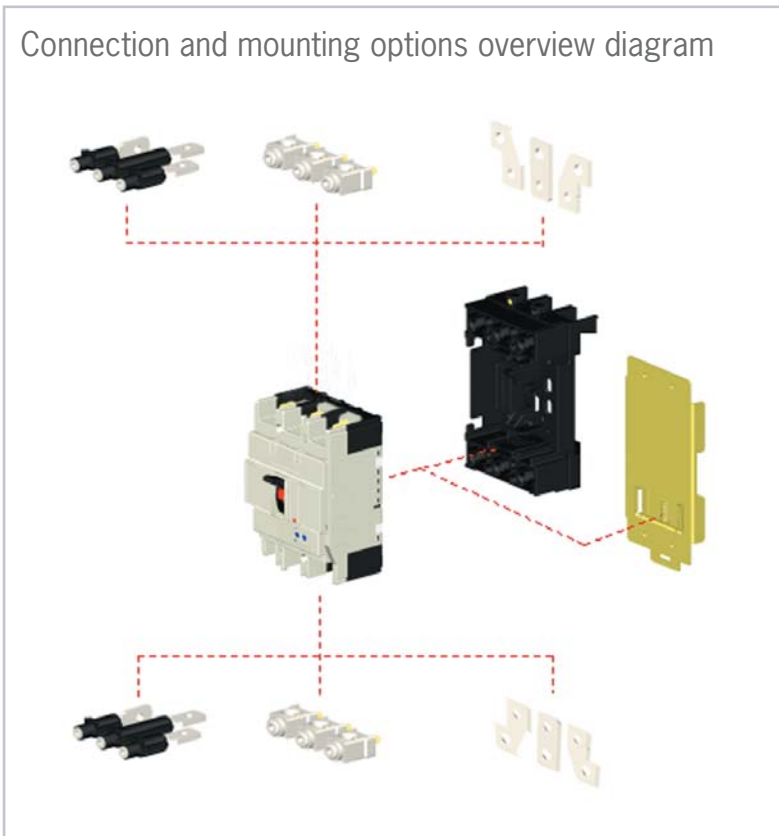
Connection and Mounting Options and Accessories



Optional 45mm Cutout Patterns

Etibreak 2 MCCBs connection and mounting accessories facilitate easy installation in any arrangement. Breakers and accessories are easy to fit. They are designed to provide safe and secure termination and mounting points. 125A and 160A/250A frame models have a choice of 45mm front cutout patterns

Connection and mounting options overview diagram



Overview of Connection and Mounting Accessories

Note that one set of mounting screws is supplied as standard with every circuit breaker or switch disconnector purchased.

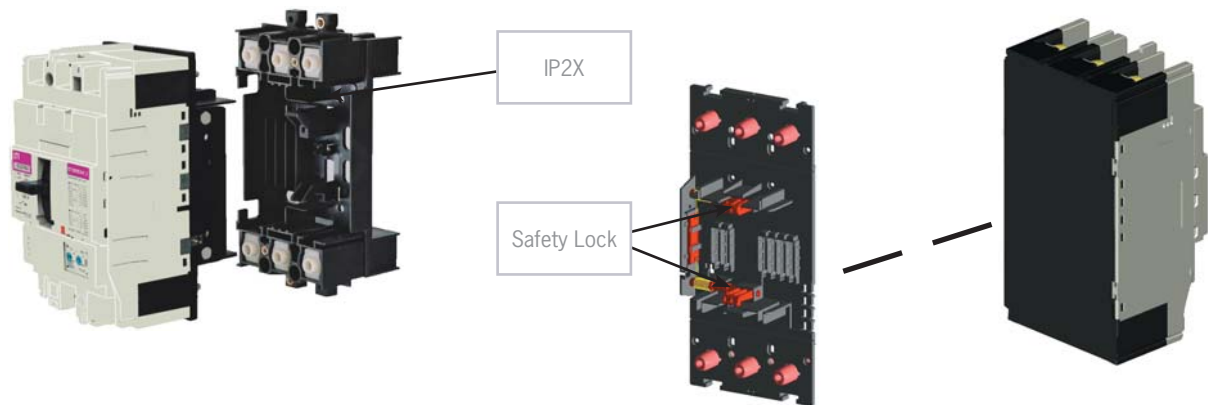
Installation

Plug-in Mounting

The plug in mounting system allows fast replacement of the MCCB body without the need to disturb the terminations. Solid conductors or cables terminated with compression terminals can be used.

Plug-In Safety Lock

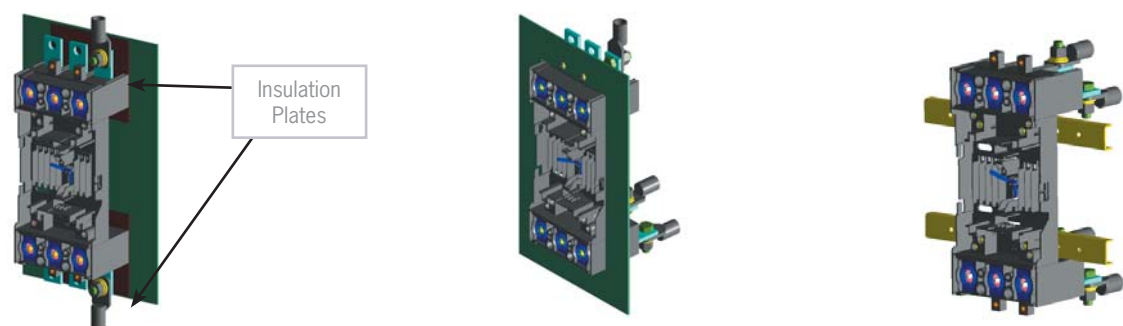
The plug-in MCCB body is automatically locked to the base when the contacts are closed (toggle ON). It cannot be removed unless the contacts are in the isolated position (toggle OFF or TRIPPED). This system ensures safe removal of the MCCB from the base.



Plug-in MCCB and base

Plug-in connections and safety lock are fitted to the back of the MCCB

The connection bars for plug-in bases are optional and can be configured in the field either for front or rear access. The illustrations below show possible mounting and connection options for plug in bases.



1. Mounted on base plate with connection bars mounted for front access. Insulation plates are supplied as standard and must be fitted.

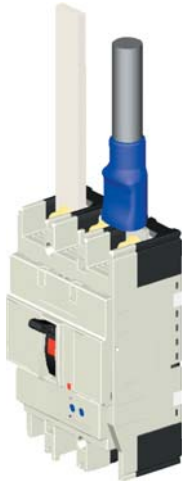
2. Terminations in separate compartment. Connection bars are mounted for top access at the top and rear access at the bottom.

3. Mounted on angle bars. Connection bars are mounted for rear access.

Installation

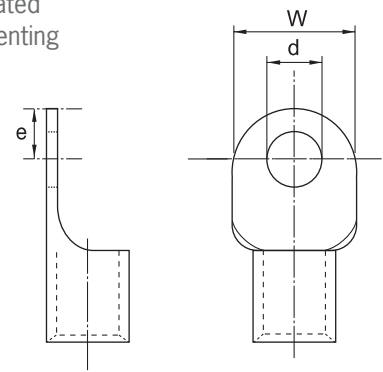
Connection of Busbars and Terminated Cables

This connection method is standard for all front connected MCCB models. Solid conductors or cables terminated with crimp lug terminals can be used.



Serrated Terminal Surface

Each terminal on 160A and 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)	125	160 & 250	400 & 630
Width, W (mm)	17	25	25
Diameter, d (mm)	9	9	11
Maximum from centre to tip, e(mm)	8.5	10	12



Connection of Large Conductors and Multiple Conductors

Flat bars are terminal extensions which can be fitted to line or load side terminals and are used to connect large conductors and multiple conductors. Available for field fitting in sets of 3 or 4 bars.

Installation

Direct Entry of Stranded Cable

Solderless clamp terminals can be used to secure stranded cable directly to the MCCB. Available for field fitting in sets of 3 or 4.



MCCB Model	Cable Capacity (mm ²)
125AF	1.5 to 50 (1 cable)
160 and 250 AF	35 to 120 (1 cable)
400 and 630 AF	80 to 240 (1 cable)
	60 to 120 (2 cables)

Mounting on 35mm DIN Rail

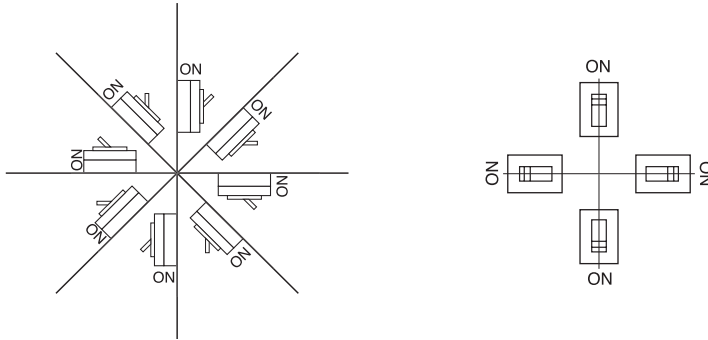
The DIN rail adaptor is easily fitted to the rear of 3 pole EB2 125A models to allow clip mounting of the MCCB to 35mm DIN rail. The 45mm cutout of Etibreak 2 devices makes them suitable for mounting alongside modular devices in distribution boards.



Installation

Mounting Angle

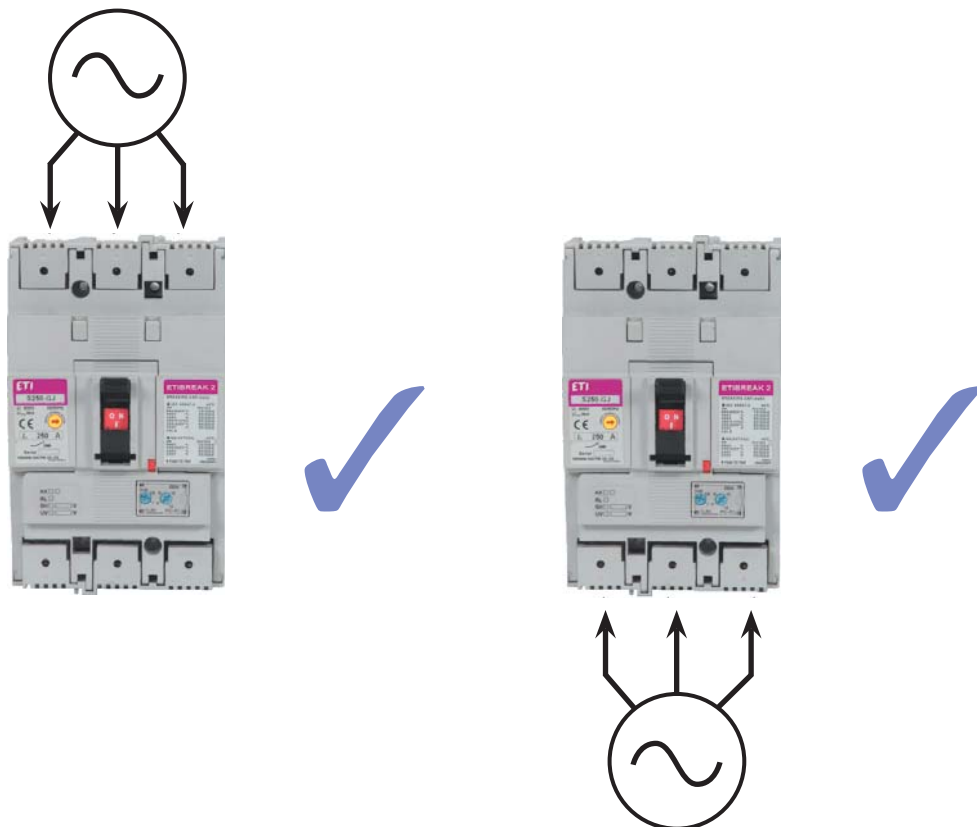
ETIBREAK 2 MCCBs may be mounted at any angle without affecting performance.



Mounting angle does not affect performance.

Direction of Power Supply

Power can be supplied through ETIBREAK 2 MCCBs in either direction without loss of performance.



Application Data

Selectivity

WHAT IS selectivity?

Discrimination, also called selectivity, is the co-ordination of protective devices such that a fault is cleared by the protective device installed immediately upstream of the fault, and by that device alone.

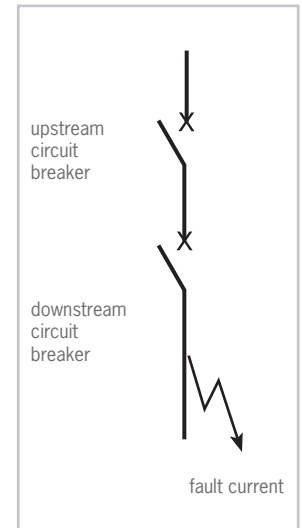
Total selectivity

Selectivity is said to be total if the downstream circuit breaker opens and the upstream circuit breaker remains closed. This ensures maximum availability of the system.

Partial selectivity

Selectivity is partial if the above condition is not fulfilled up to the prospective short-circuit current, but to a lesser value, termed the selectivity limit current (I_s).

Above this value both circuit breakers could open, resulting in loss of selectivity.



How to read the selectivity tables

Boxes containing the letter "T" indicate total selectivity between the relevant upstream and downstream circuit-breakers. Total selectivity applies for all fault levels up to the breaking capacity of the upstream or the downstream circuit breaker, whichever is the lesser. For the other boxes, selectivity is either partial or there is no selectivity.

If selectivity is partial then the value of the selectivity limit current, I_s , is shown in the box.

Worked Examples

Q (1) A Sub distribution board requires a 630A MCCB feeding a 250A MCCB. The fault level is 65kA. What combination of protective devices would provide total selectivity?

A (1) Using a ETIBREAK 2 S630 MCCB feeding a ETIBREAK 2 S250 would provide total selectivity up to 65kA.

Q (2) A final distribution board contains a 125A MCCB incomer feeding a 32A Type B MCB. Is discrimination between these devices possible?

A (3) A ETIBREAK 2 MCCB type S160/125A feeding a ETIMAT 32A type B MCB would provide total selectivity.

Alternatively ANY OTHER MCB can be used provided it has energy limiting ability of class 3 in accordance with EN 60898.

Application Data

Selectivity tables

Upstream: Etibreak 2 MCCB (thermal-magnetic)
 Downstream: MCB

Upstream MCCB

Downstream MCB	S125 (36kA) L125 (25kA)							S160 (36kA)						
	In	20A	32A	50A	63A	100A	125A	20A	32A	50A	63A	100A	125A	160A
	6A	260	T	T	T	T	T	T	260	T	T	T	T	T
10A	260	420	T	T	T	T	T	260	420	T	T	T	T	T
16A	260	420	650	T	T	T	T	260	420	650	T	T	T	T
20A	260	420	650	1000	T	T	T	260	420	650	1000	T	T	T
25A	260	420	650	1000	T	T	T	260	420	650	1000	T	T	T
32A	260	420	650	1000	1500	2000	2000	260	420	650	1000	1500	T	T
40A	260	420	650	1000	1500	2000	2000	260	420	650	1000	1500	2000	T
50A	260	420	650	1000	1500	2000	2000	260	420	650	1000	1500	2000	3000
63A	260	420	650	1000	1500	2000	2000	260	420	650	1000	1500	2000	3000

Upstream MCCB

Downstream MCB	S250 (36kA) L250 (25kA)							S400				
	In	20A	32A	50A	63A	100A	125A	160A	200A	250A	250A	400A
	6A	260	T	T	T	T	T	T	T	T	T	T
10A	260	420	T	T	T	T	T	T	T	T	T	T
16A	260	420	650	T	T	T	T	T	T	T	T	T
20A	260	420	650	1000	T	T	T	T	T	T	T	T
25A	260	420	650	1000	T	T	T	T	T	T	T	T
32A	260	420	650	1000	1500	2000	2000	T	T	T	T	T
40A	260	420	650	1000	1500	2000	2000	T	T	T	T	T
50A	260	420	650	1000	1500	2000	2000	3000	T	T	T	T
63A	260	420	650	1000	1500	2000	2000	3000	2600	T	T	T

T= Total Selectivity

- Notes:
1. MCBs can be of any manufacture provided they are Energy class three as defined in EN 60898.
 2. Table based on type B MCBs
 3. MCBs can be 6kA or 10kA at 400V
 4. The above table is in accordance with IEC 60947-2, Annex A.
 5. All values shown at 400V AC.
 6. I_n expressed in A.

Application Data

Upstream: ETIBREAK 2 MCCB (electronic).
Downstream: ETIBREAK 2 MCCB.

Downstream MCCB		Upstream MCCB						
		Frame	250A	400A	630A		1250A	1600A
		Model	E250	E400	LE630	E630	E1250	E1600
		Breaking Capacity	70kA	70kA	36kA	50kA	85kA	100kA
125A	L125	25kA	T	T	T	T	T	T
	S 125	36kA	T	T	T	T	T	T
160A/ 250A	S160	36kA	-	T	T	T	T	T
	L250	25kA	-	T	T	T	T	T
	S250	36kA	-	T	T	T	T	T
	E250	70kA	-	-	T	T	T	T
400A/ 630A	L400	25kA	-	-	10	10	T	T
	LE 630	36kA	-	-	-	-	T	T
	E 630	50kA	-	-	-	-	T	T

T= Total Selectivity

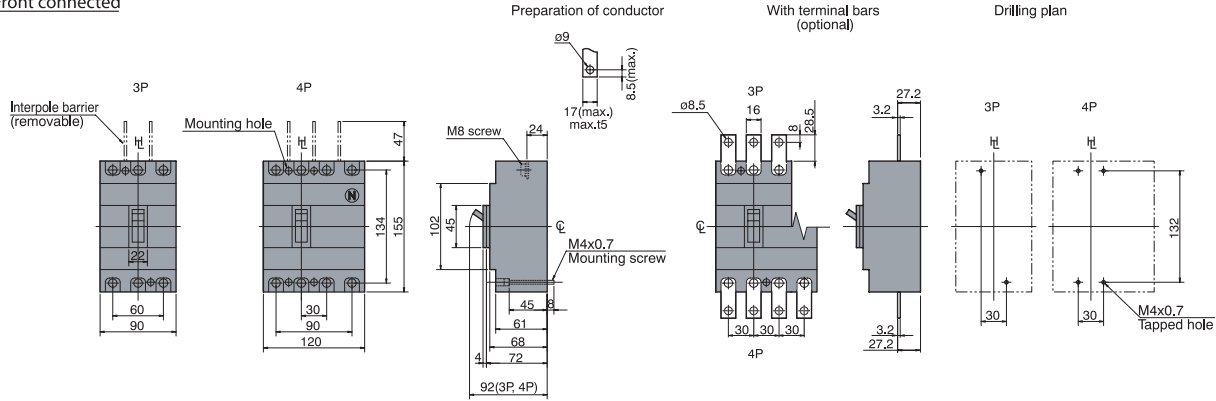
- Notes:
1. All pick-up current and time delay settings are to be set at maximum for upstream MCCBs.
 2. The above table is in accordance with IEC 60947-2, Annex A.
 3. All values shown at 400V AC.
 4. I_s expressed in kA.

Dimensions

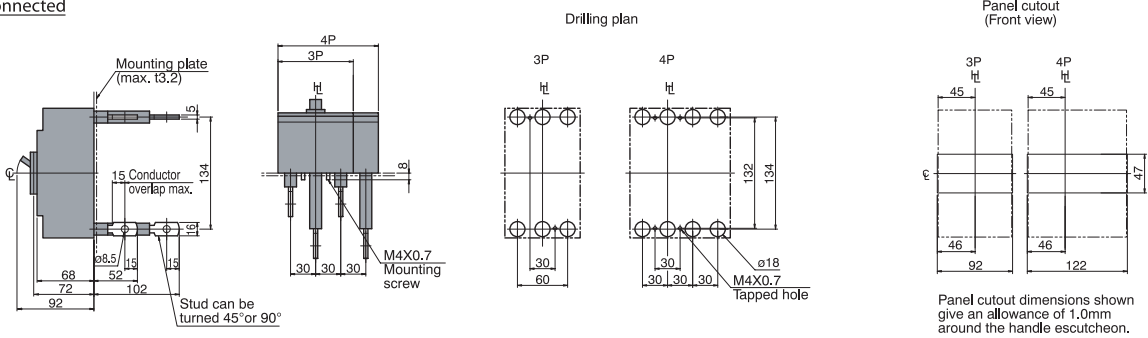
MCCB's dimensions

EB2 125

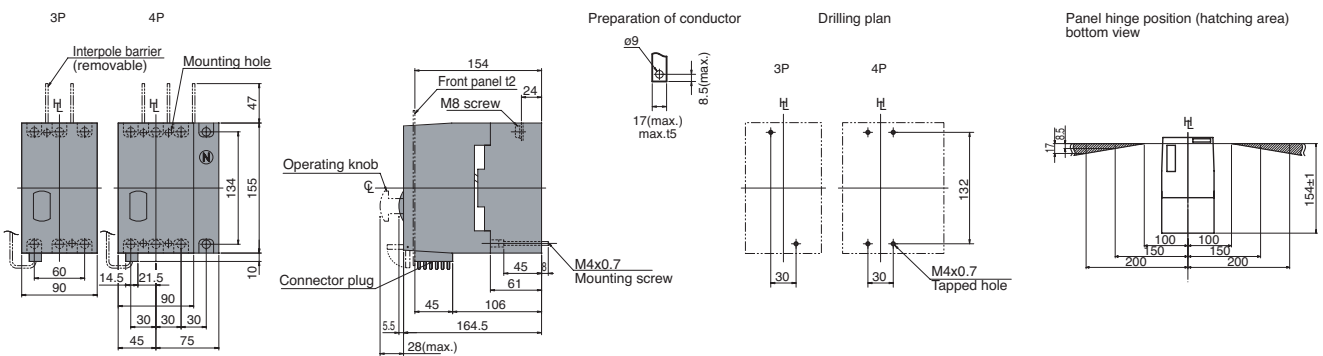
Front connected



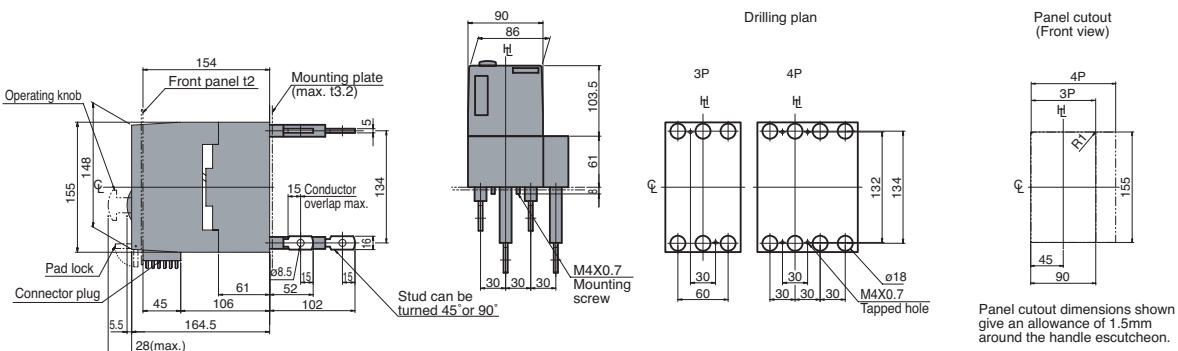
Rear connected



Front connected with Motor Operator



Rear connected with Motor Operator

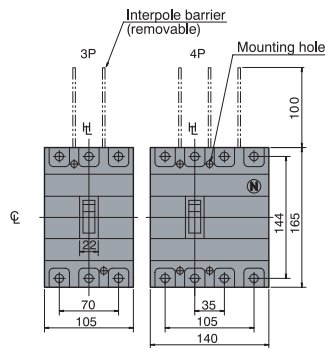


Dimensions

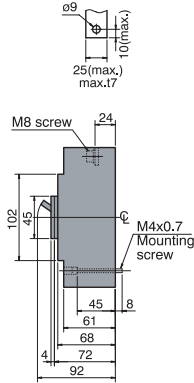
MCCB's dimensions

EB2 250

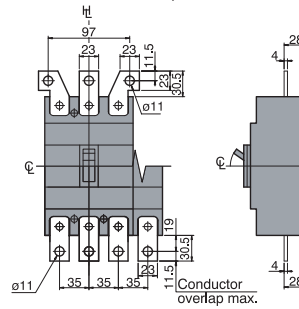
Front connected



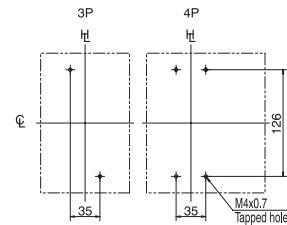
Preparation of conductor



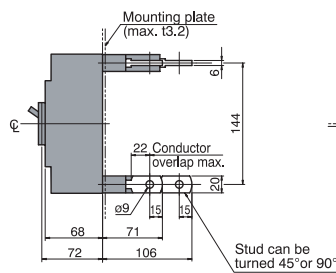
With terminal bars (optional)



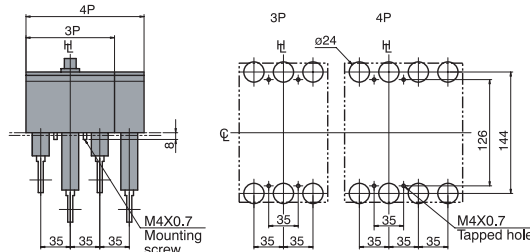
Drilling plan



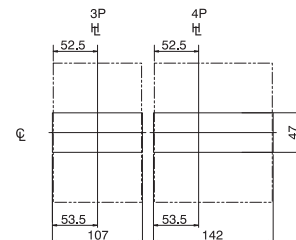
Rear connected



Drilling plan

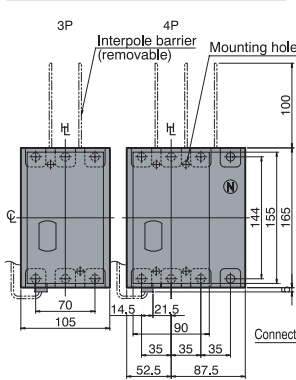


Panel cutout (Front view)

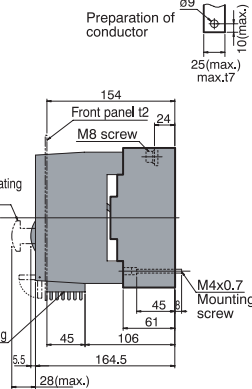


Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

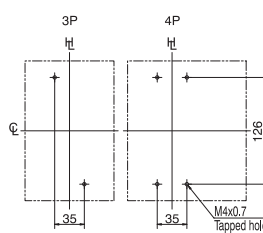
Front connected with Motor Operator



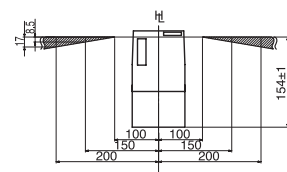
Preparation of conductor



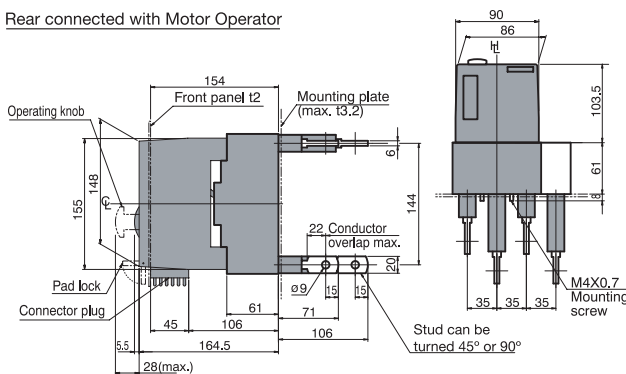
Drilling plan



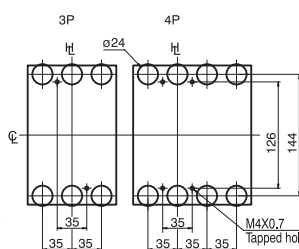
Panel hinge position (hatching area) bottom view



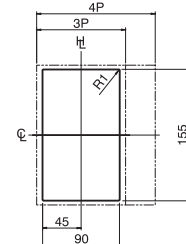
Rear connected with Motor Operator



Drilling plan



Panel cutout (Front view)



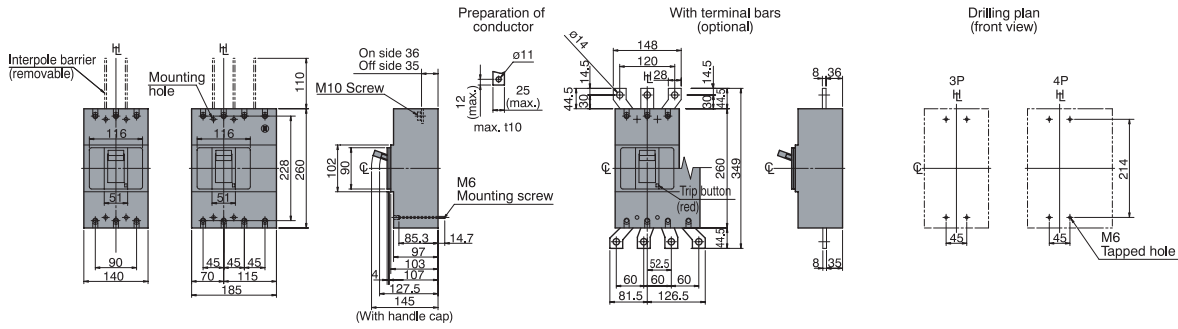
Panel cutout dimensions shown give an allowance of 1.5mm around the handle escutcheon.

Dimensions

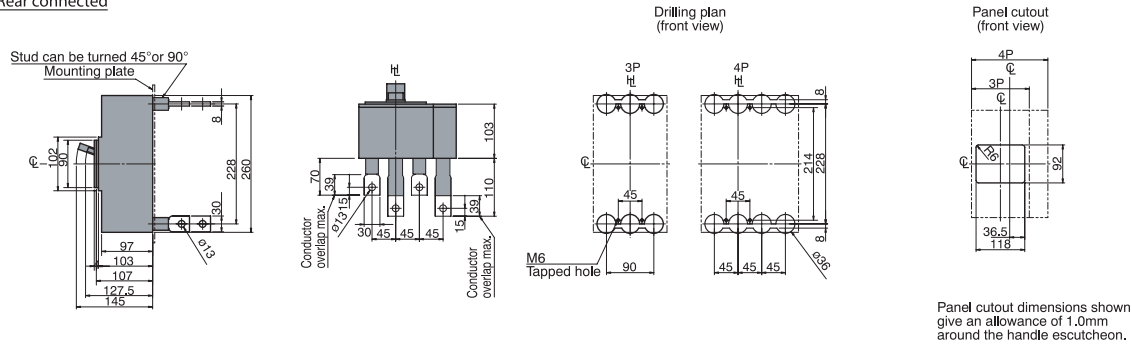
MCCB's dimensions

EB2 400

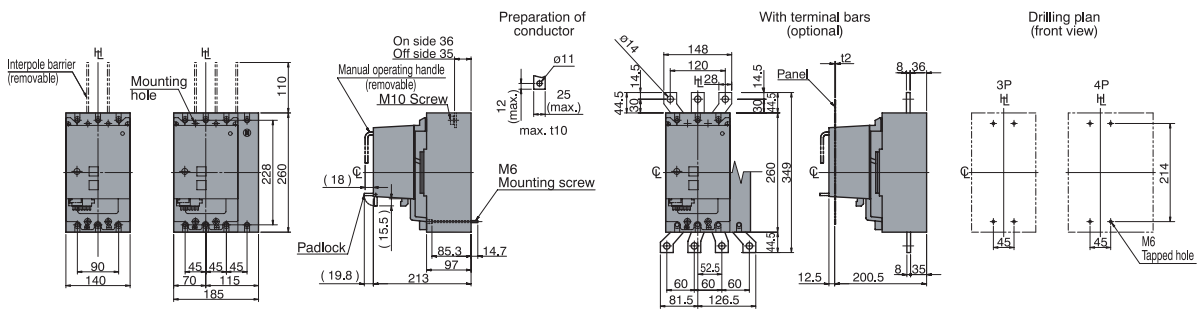
Front connected



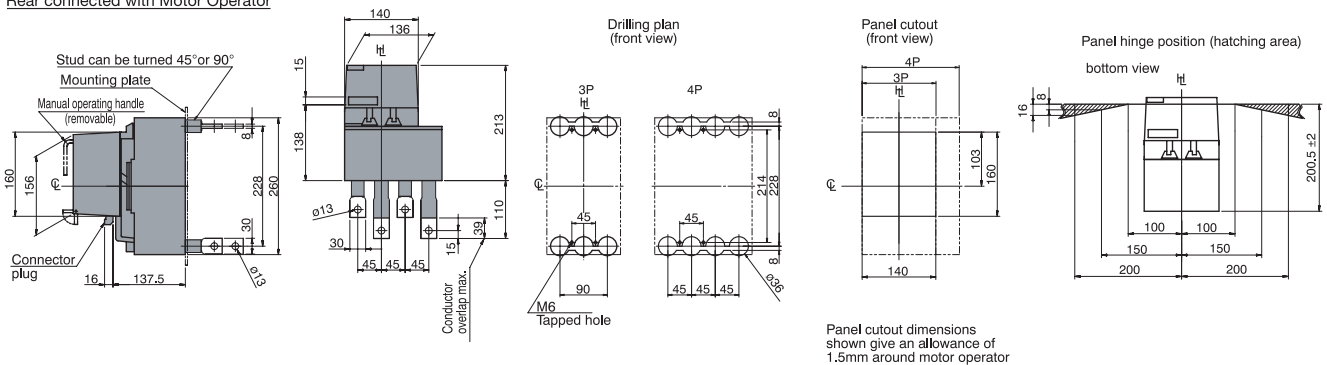
Rear connected



Front connected with Motor Operator



Rear connected with Motor Operator

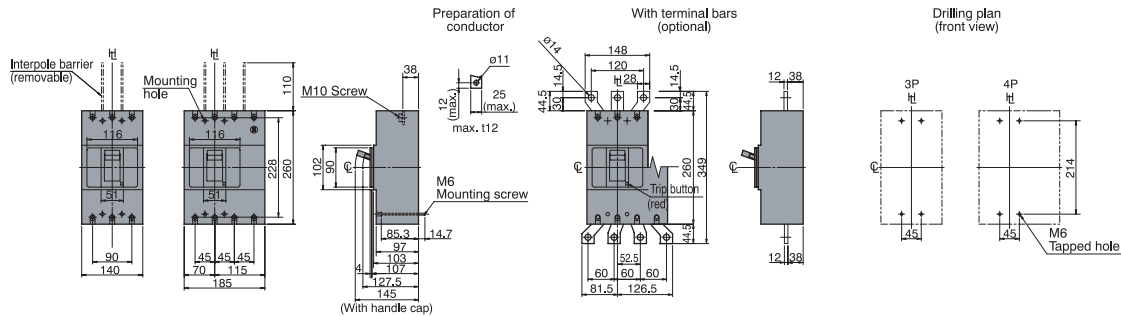


Dimensions

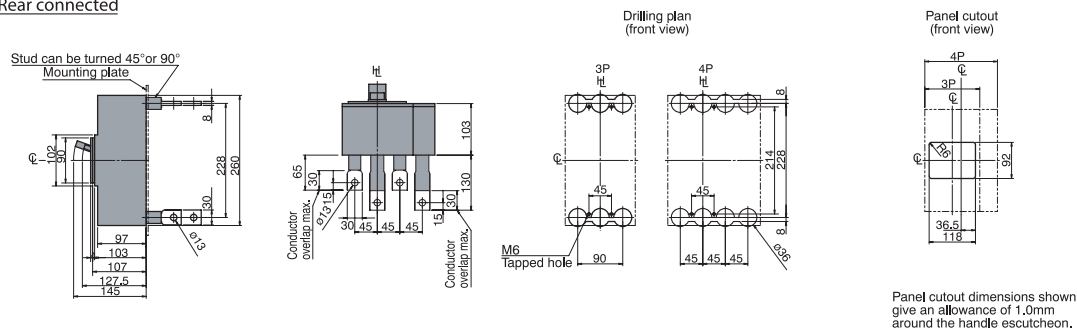
MCCB's dimensions

EB2 630

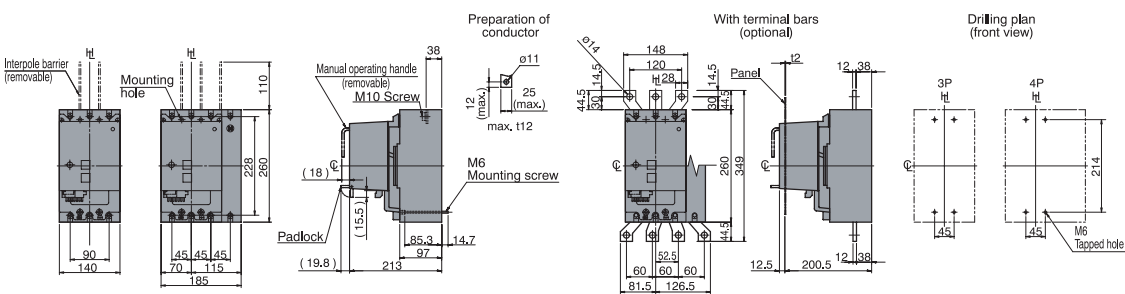
Front connected



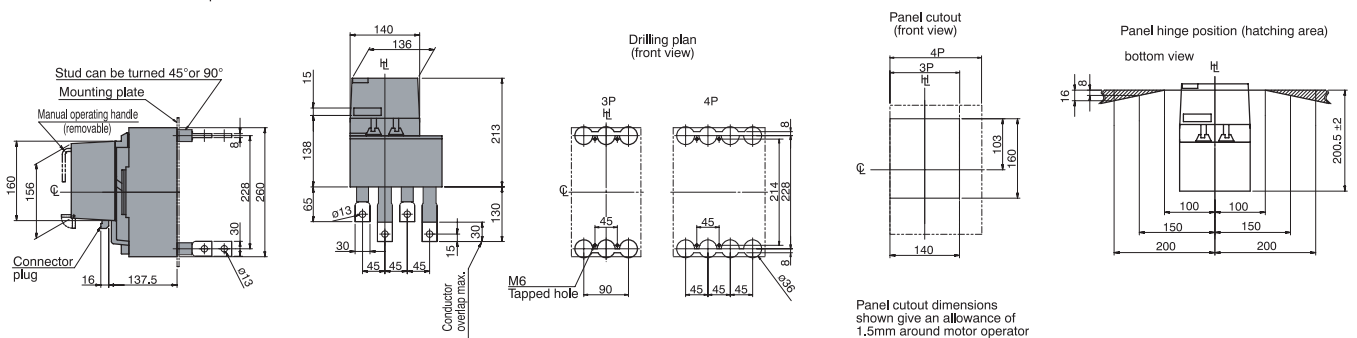
Rear connected



Front connected with Motor Operator



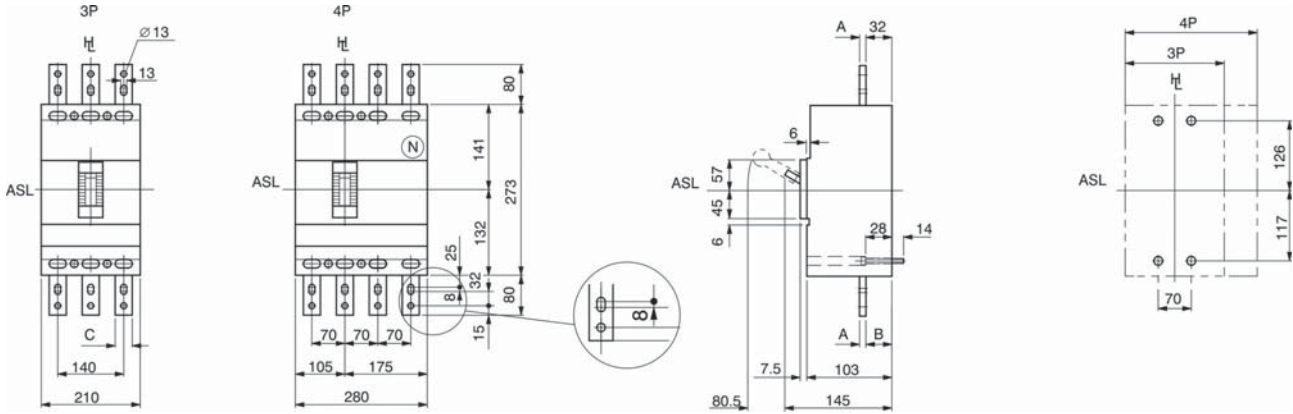
Rear connected with Motor Operator



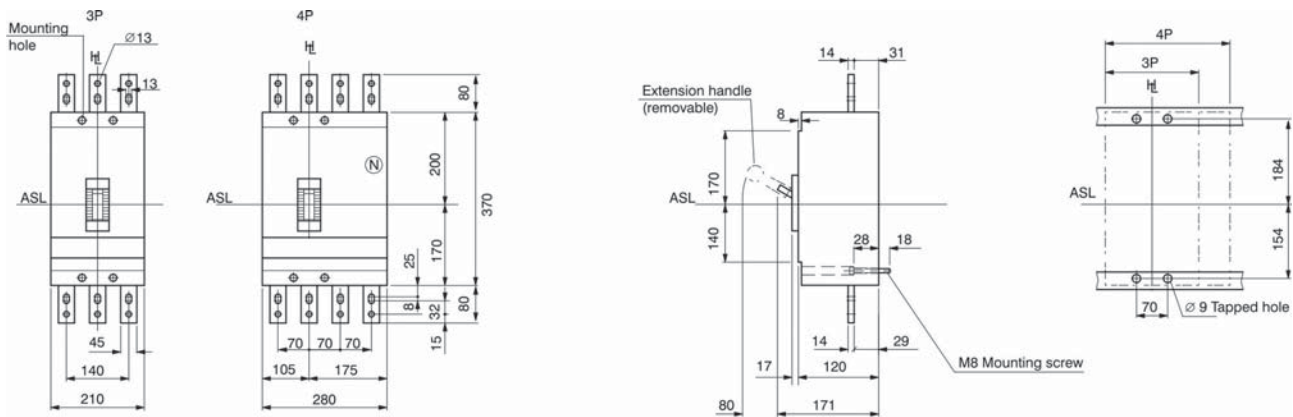
Dimensions

MCCB's dimensions

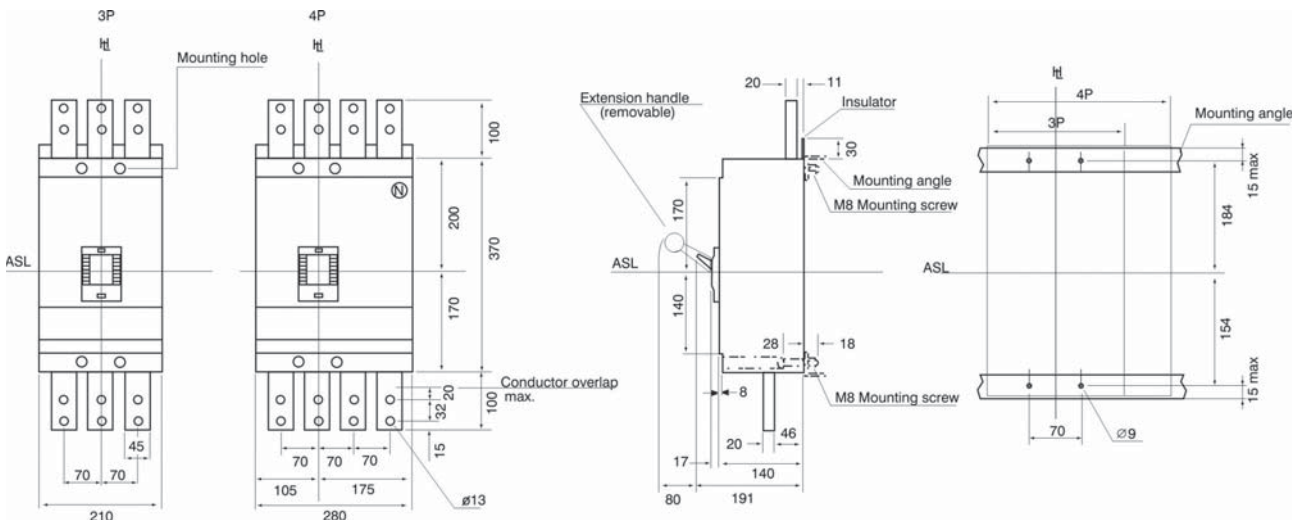
EB 800



EB 1250

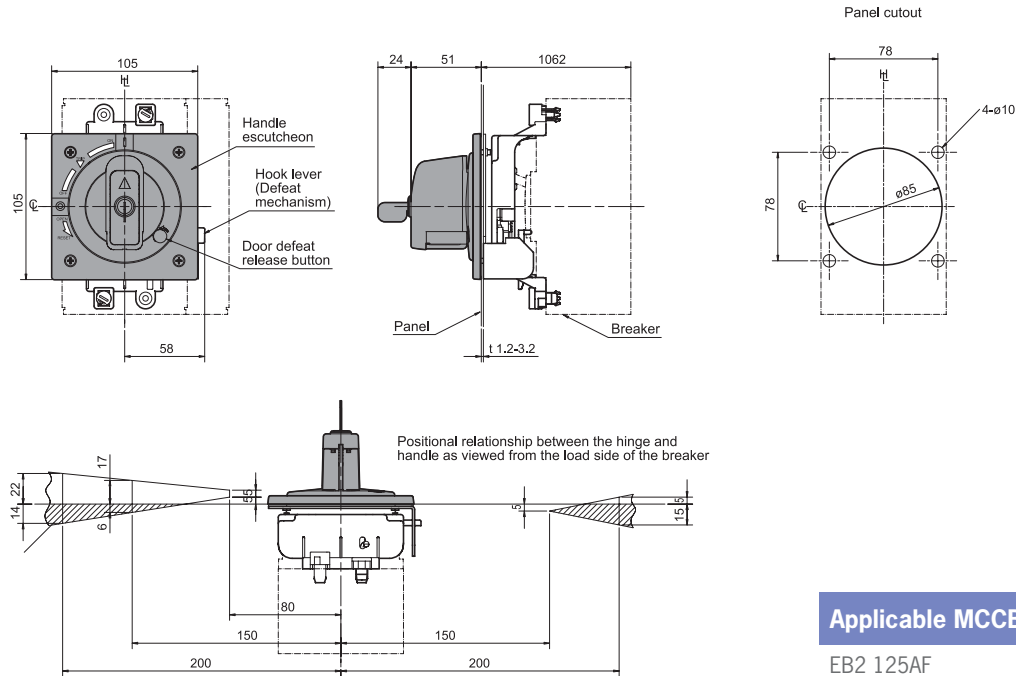


EB 1600

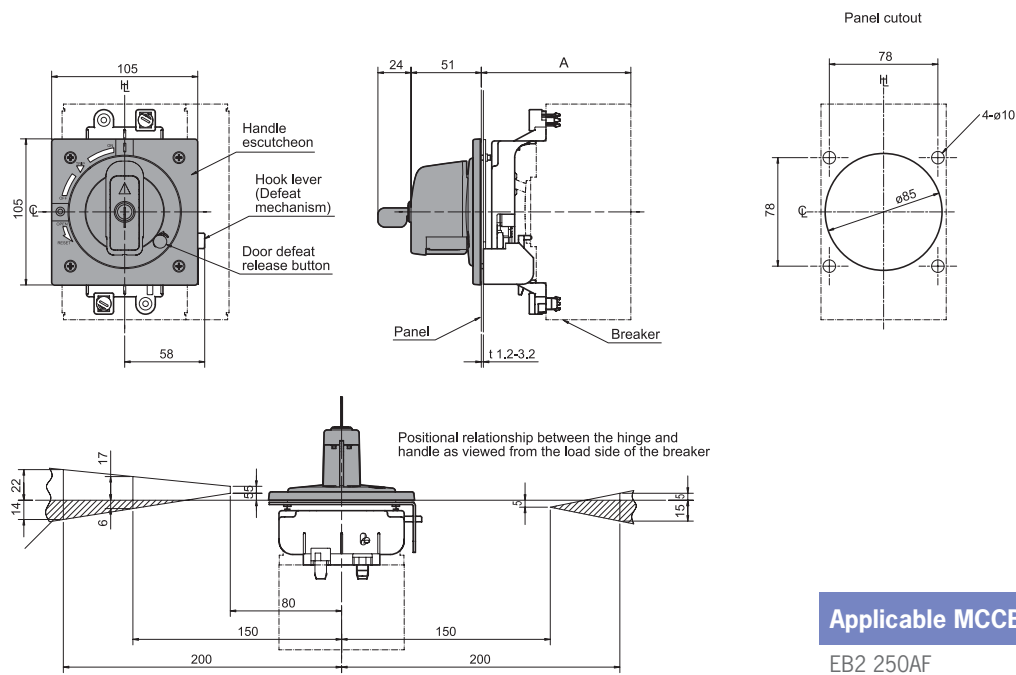


Dimensions

Breaker Mounted Handle



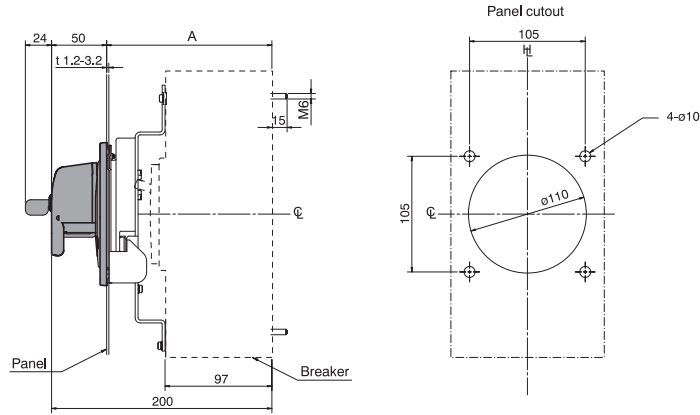
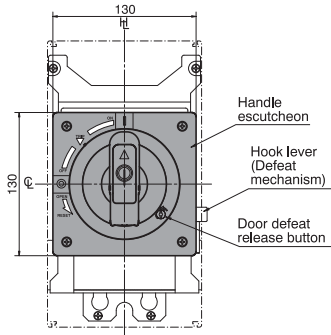
Applicable MCCB
EB2 125AF



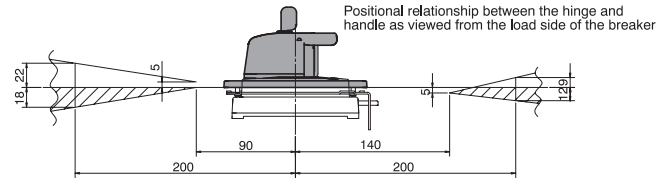
Applicable MCCB **A**
EB2 250AF 106±2

Dimensions

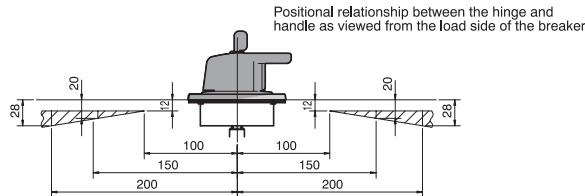
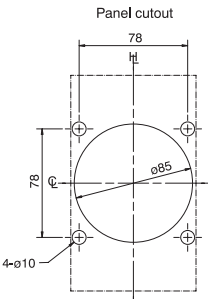
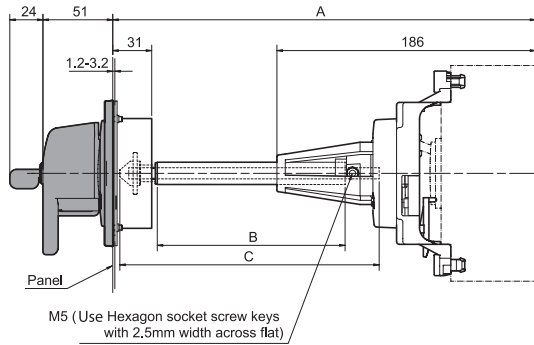
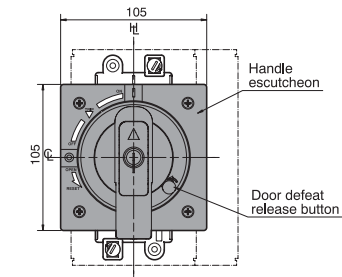
Breaker Mounted Handle



Applicable MCCB	A
EB2 400&630 AF	150±2

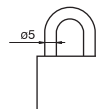


Door Mounted Handle



Applicable MCCB	A*1	B	C	Shaft support
EB2 125AF	540 max.	370	421	With +

Padlock dimensions (mm)

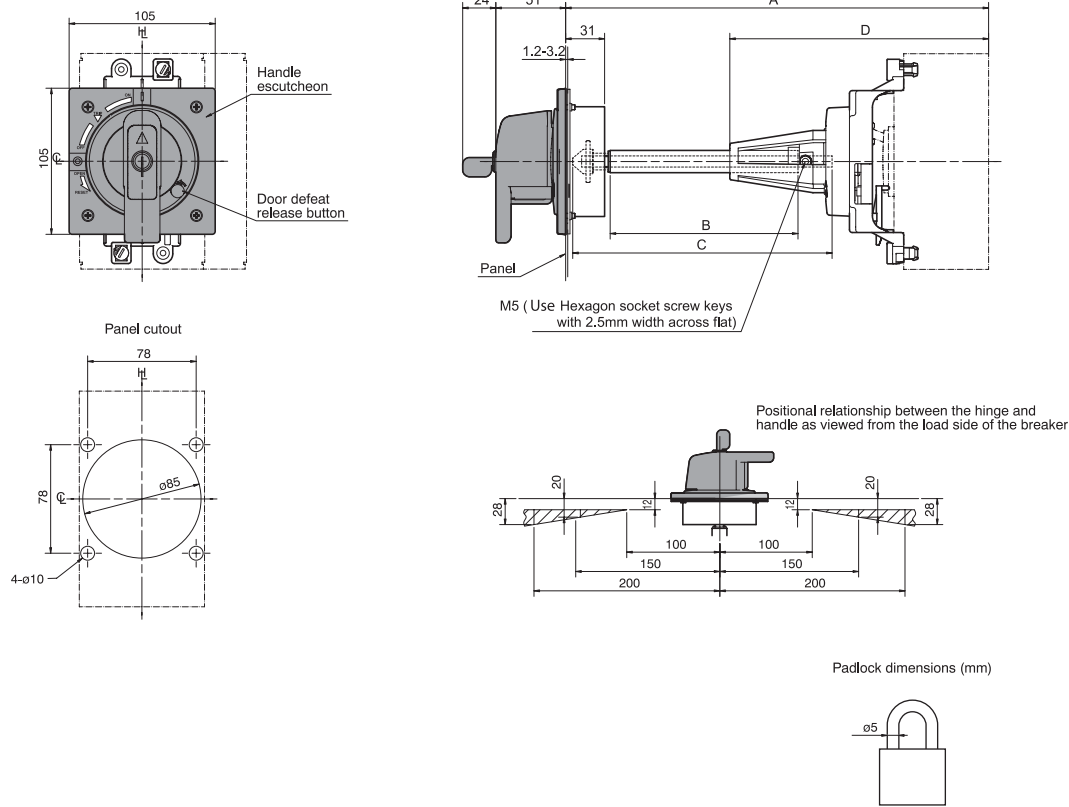


* 1: max. means the maximum length for A without cutting the shaft.

+ The shaft can be cut to the required length. If it is necessary to cut the shaft so short that it does not protrude beyond the shaft support, the shaft support may be removed.

Dimensions

Door Mounted Handle



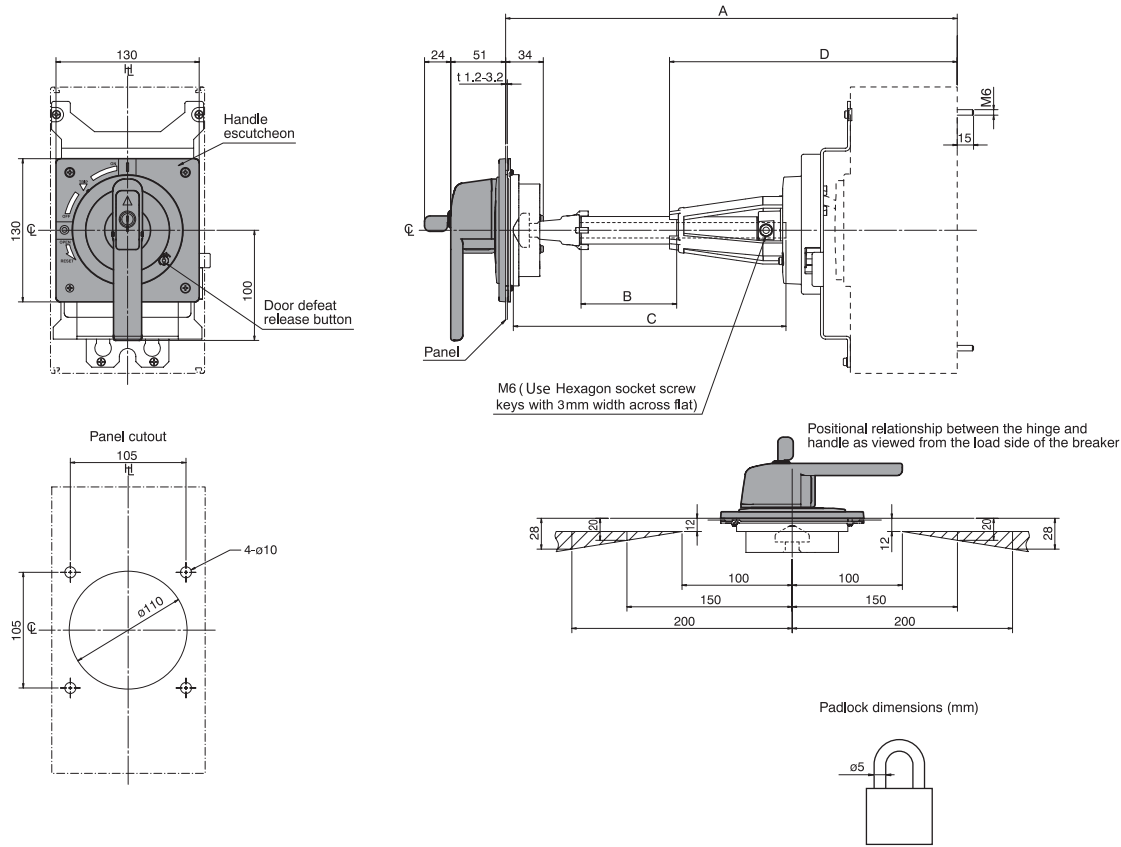
Applicable MCCB	A ^{*1}	B	C	D	Shaft support
EB2 250AF	540 max.	370	421	186	With +

* 1: max. means the maximum length for A without cutting the shaft.

+ The shaft can be cut to the required length. If it is necessary to cut the shaft so short that it does not protrude beyond the shaft support, the shaft support may be removed.

Dimensions

Door Mounted Handle



Applicable MCCB	A* ¹	B	C	D	Shaft support
EB2 400&630 AF	270 min.	12	107.5	—	Without
	610 max.	280	447.5	261	With +

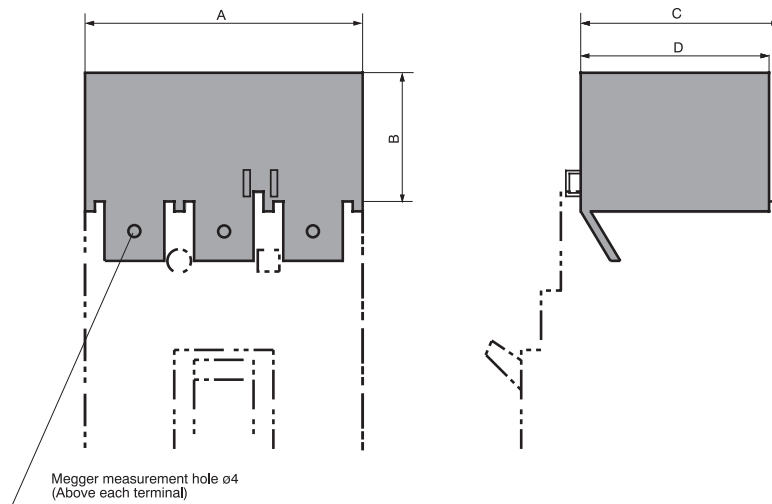
* 1: max. means the maximum length for A without cutting the shaft.

+ The shaft can be cut to the required length. If it is necessary to cut the shaft so short that it does not protrude beyond the shaft support, the shaft support may be removed.

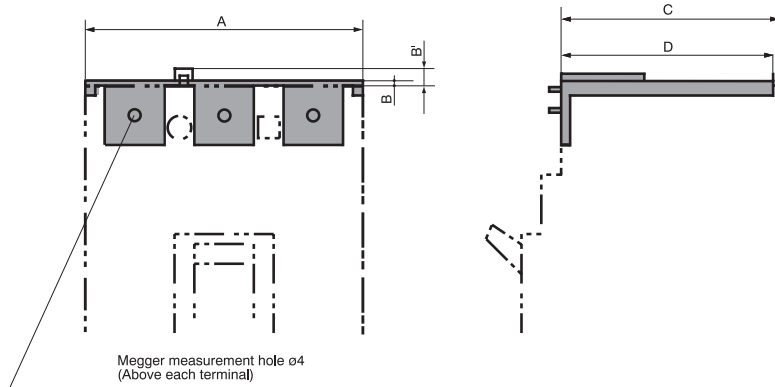
Dimensions

Terminal Covers

Terminal covers for Front connected MCCB's



Terminal covers for Solderless terminal type MCCB's



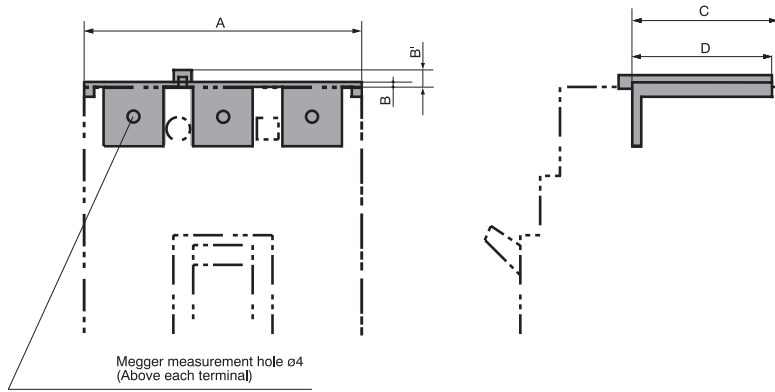
MCCB type	Connection	A			B			B ¹	C			D		
		1P	3P	4P	1P	3P	4P	3P, 4P	1P	3P	4P	1P	3P	4P
EB2 125AF	Front conn.	30	90	120	40	40	40	—	48	48	48	46	46	46
	Solderless Terminal	30	90	120	2.5	2.5	2.5	6	62.5	61	61	60	59.5	59.5
EB2 160&250AF	Front conn. (1)	35	105	140	55	55	55	—	54	54	54	52	52	52
	Solderless Terminal	35	105	140	2.5	2.5	2.5	6	63	61	61	49.5	59.5	59.5
EB2 400&630 AF	Front conn.	—	180	240	—	110	114	—	—	97	99	—	96	98
	Solderless Terminal	—	140	185	—	3	3	4.5	—	97	97	—	93	93

Notes: (1): Not applicable when flat bars (FB) are fitted.

Dimensions

Terminal Covers

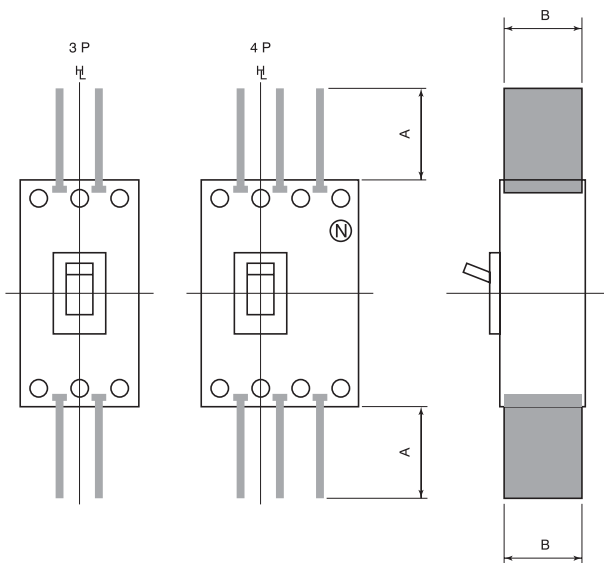
Terminal covers for Rear connected and Plug-in MCCB's



MCCB type	A		B	B ¹	C	D
	3 poles	4 poles				
EB2 125AF	90	120	2	6	41.5	40.5
EB2 160&250 AF	105	140	2	6	41.5	39.5
EB2 400AF	140	185	3	4.5	97	93

Interpole Barriers

Terminal Interpole Barriers



MCCB type	A	B
EB2 125AF	47	53
EB2 160&250 AF	100	53
EB2 400& 630 AF	110	95

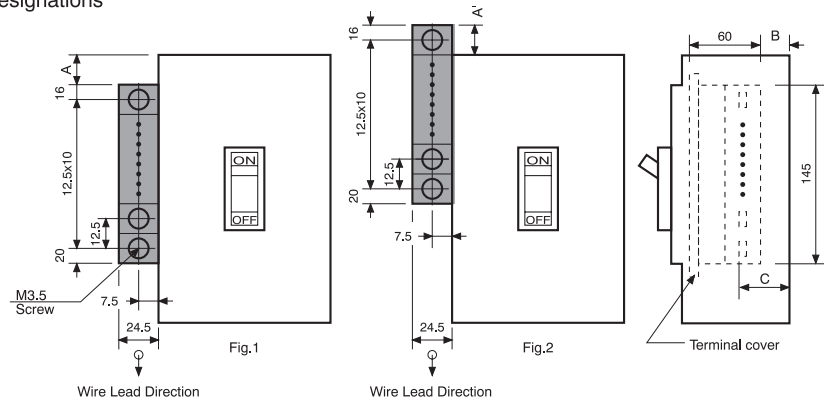
Dimensions

Terminal Blocks for Front-Connected and Rear-Connected MCCBs

Left terminal designations
Example

AXc1	AXc1
AXb1	AXb1
AXa1	AXa1
AXc2	AXc2
AXb2	AXb2
AXa2	AXa2
ALc1	ALc1
ALb1	ALb1
ALa1	ALa1
C1	D1
C2	D2

With SHT With UVT



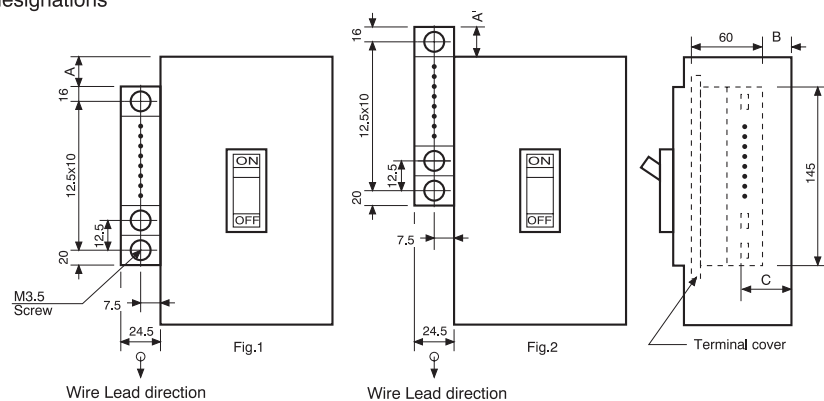
MCCB type	A	A ¹	B	C	Fig.
EB2 125AF	-	3	0.5	40	2
EB2 160&250AF	2	-	0.5	40	1

Comments:

1. The tightening torque for the M3.5 terminal screw is 0.9 to 1.2 Nm
2. Connection wire size is 2.5 mm² (max).

Left terminal designations
Example

AXc1	AXc1
AXb1	AXb1
AXa1	AXa1
AXc2	AXc2
AXb2	AXb2
AXa2	AXa2
ALc1	ALc1
ALb1	ALb1
ALa1	ALa1
C1	D1
C2	D2



MCCB type	A	B	C
EB2 400 F	39.5	30.5	70

Comments:

1. The tightening torque for the M3.5 terminal screw is 0.9 to 1.2 Nm
2. Connection wire size is 2.5 mm² (max).

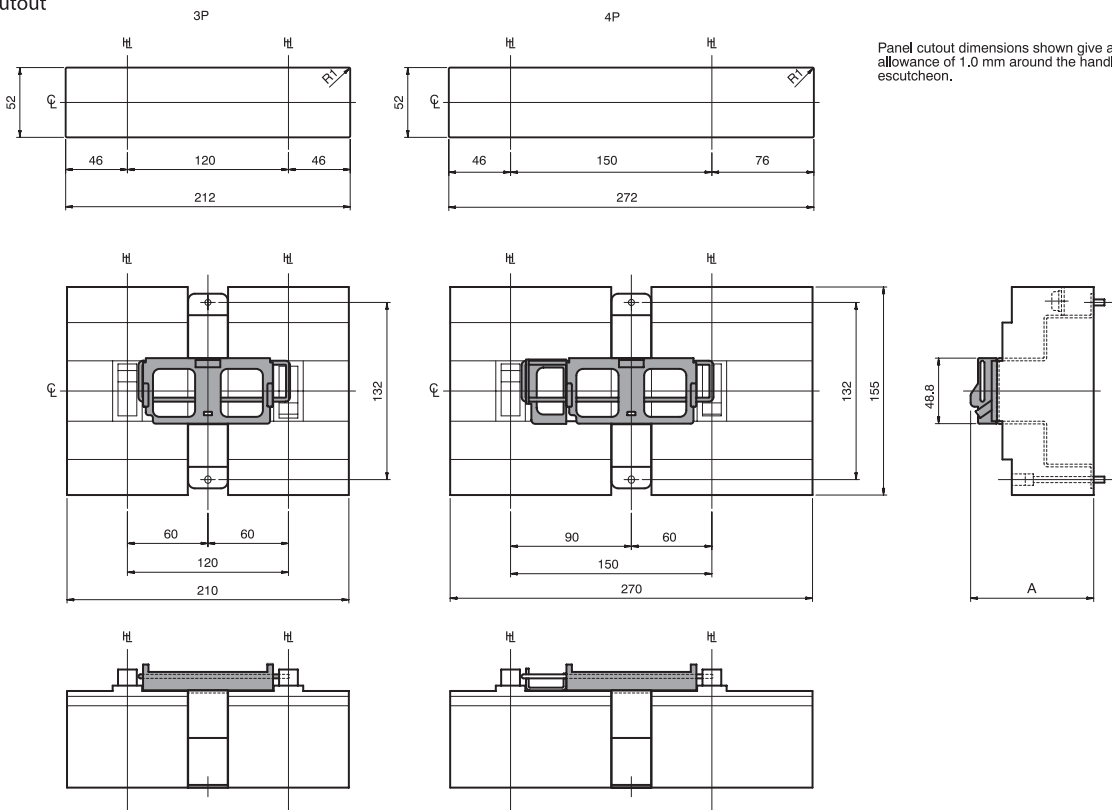
Dimensions

Slide Interlocks

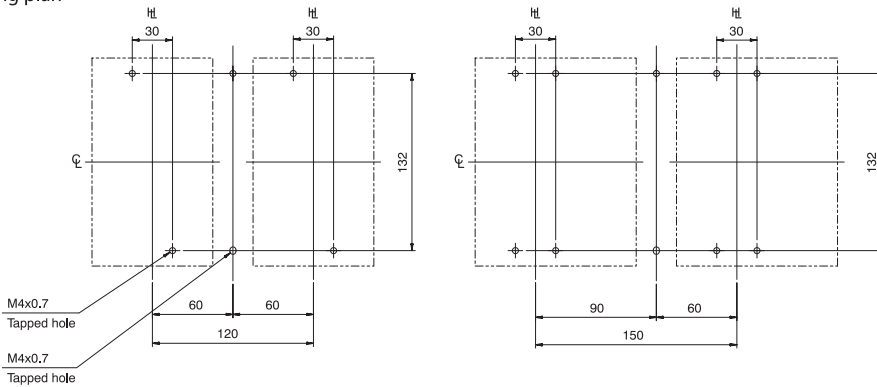
For 125A frame size

MCCB type	A
EB2 125 AF	91.7

Panel Cutout



Drilling plan

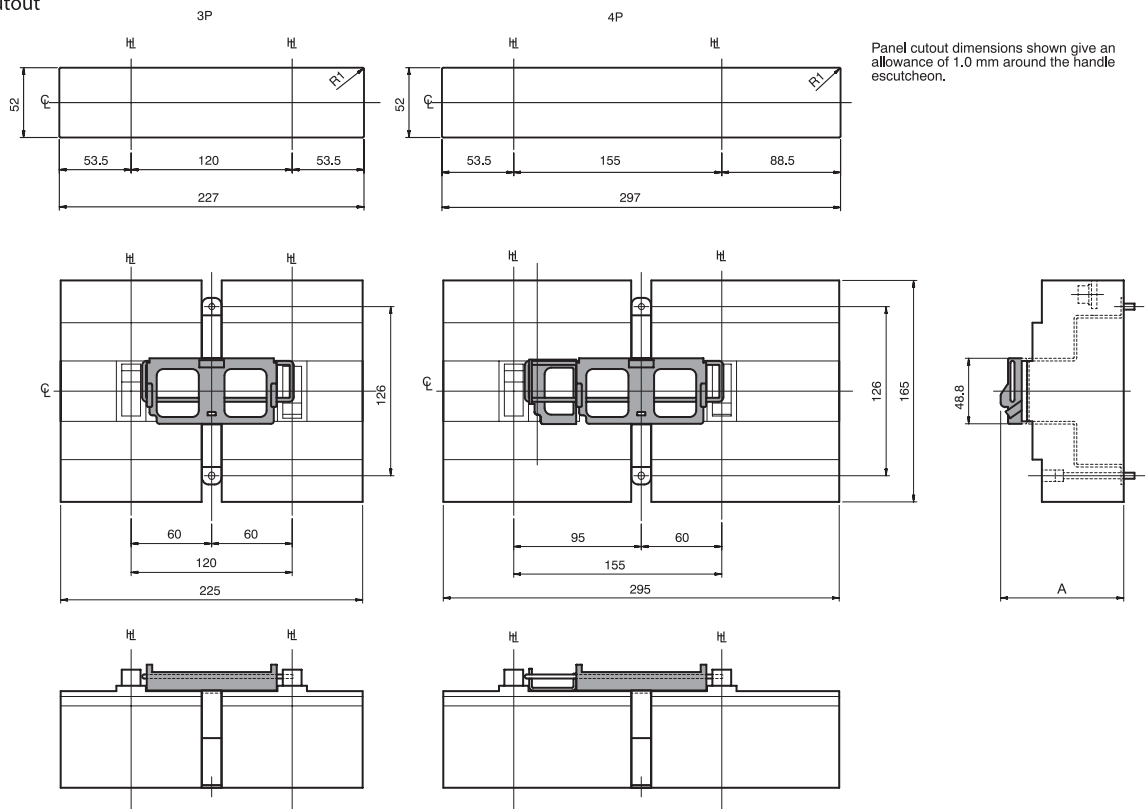


Dimensions

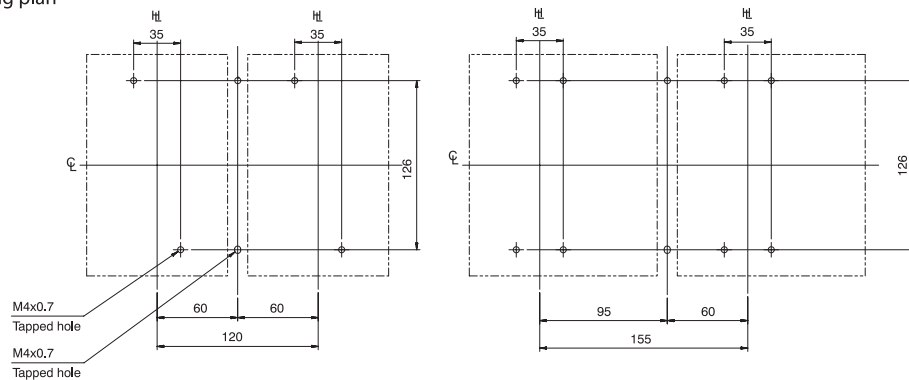
For 160A, 250A frame size

MCCB type	A
EB2 250 AF (except electronic)	91.7
EB2 250E	126.7

Panel Cutout



Drilling plan



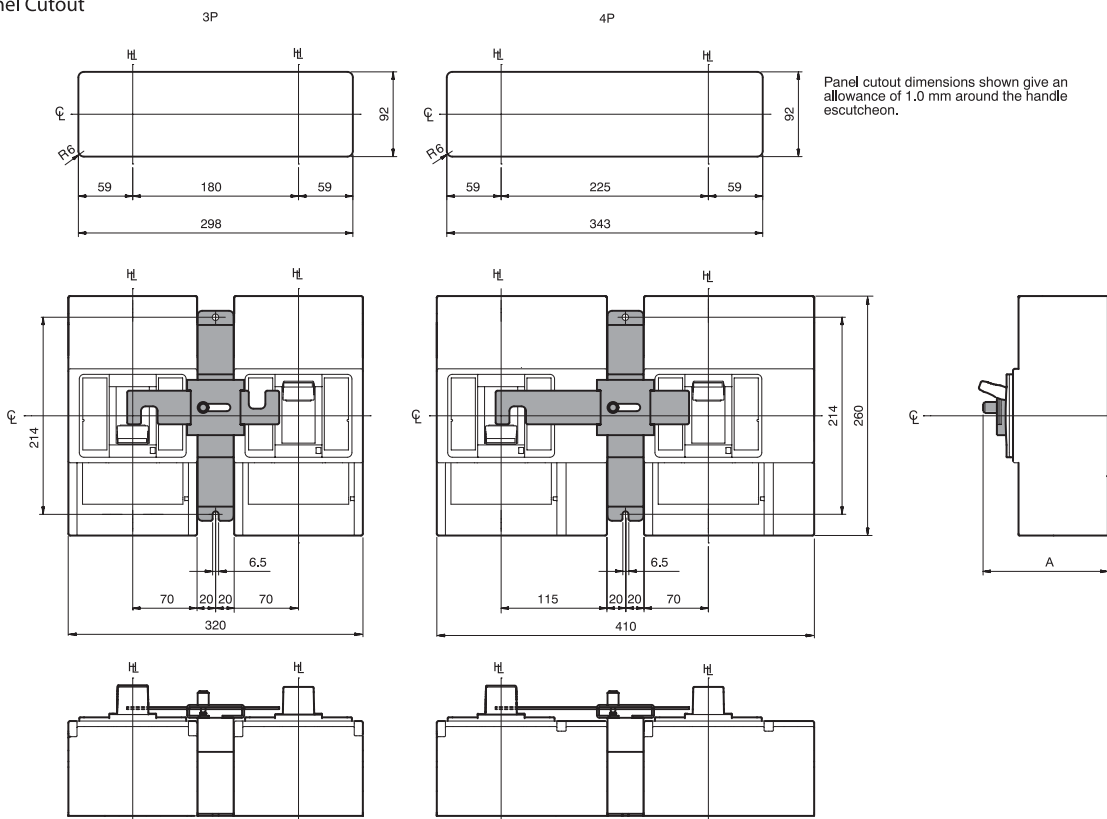
Dimensions

Slide Interlocks

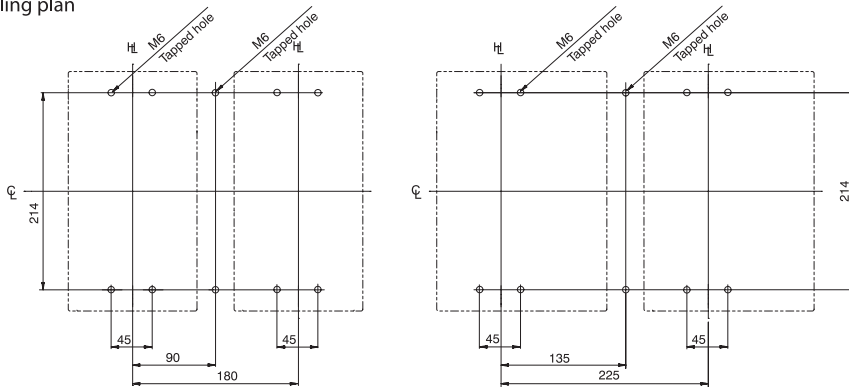
For 400A, 630A frame size

MCCB type	A
EB2 400AF	135.5
EB2 630 AF	135.5

Panel Cutout



Drilling plan

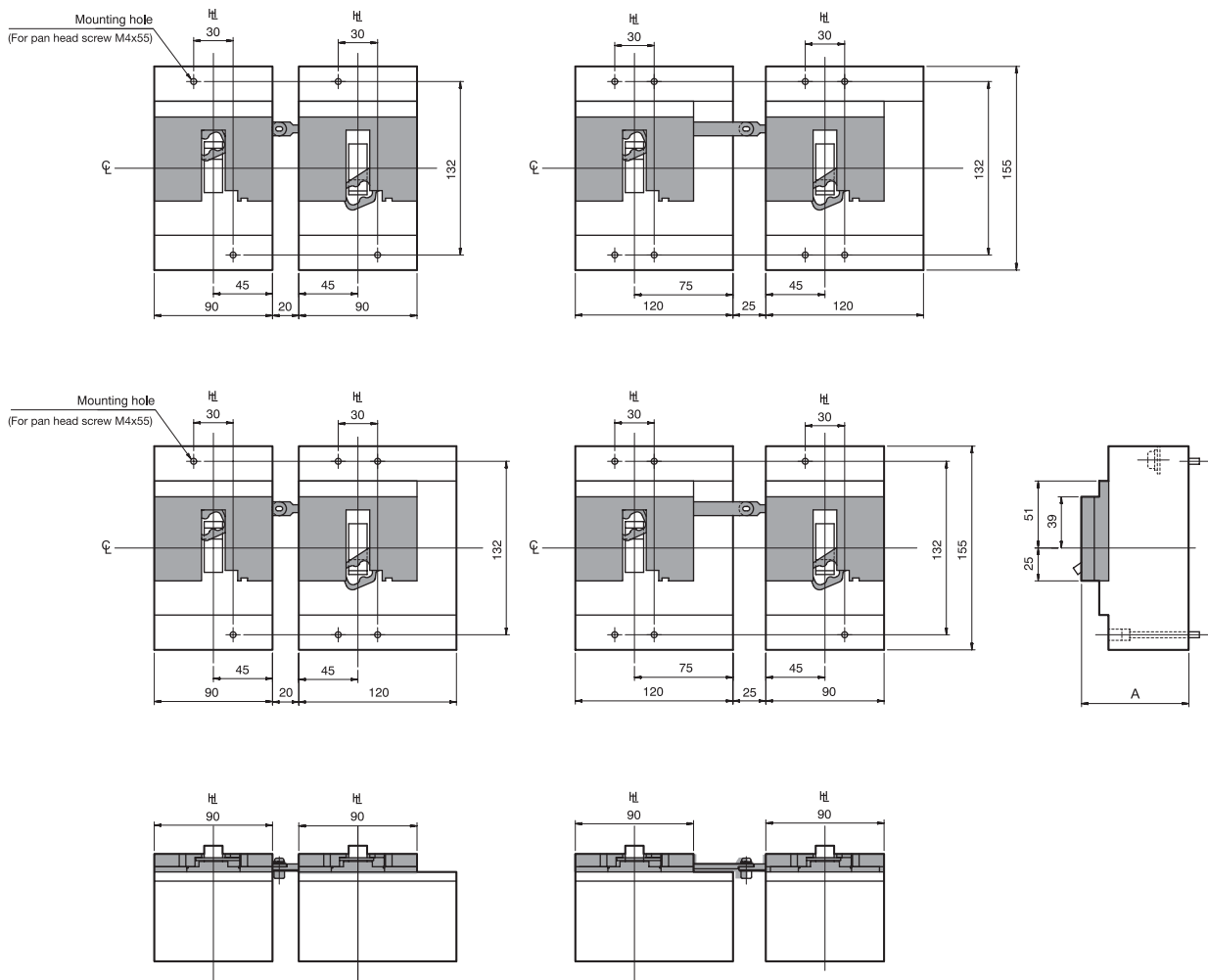


Dimensions

Link Interlocks

For 125A frame size

MCCB type	A
EB2 125AF	81.7

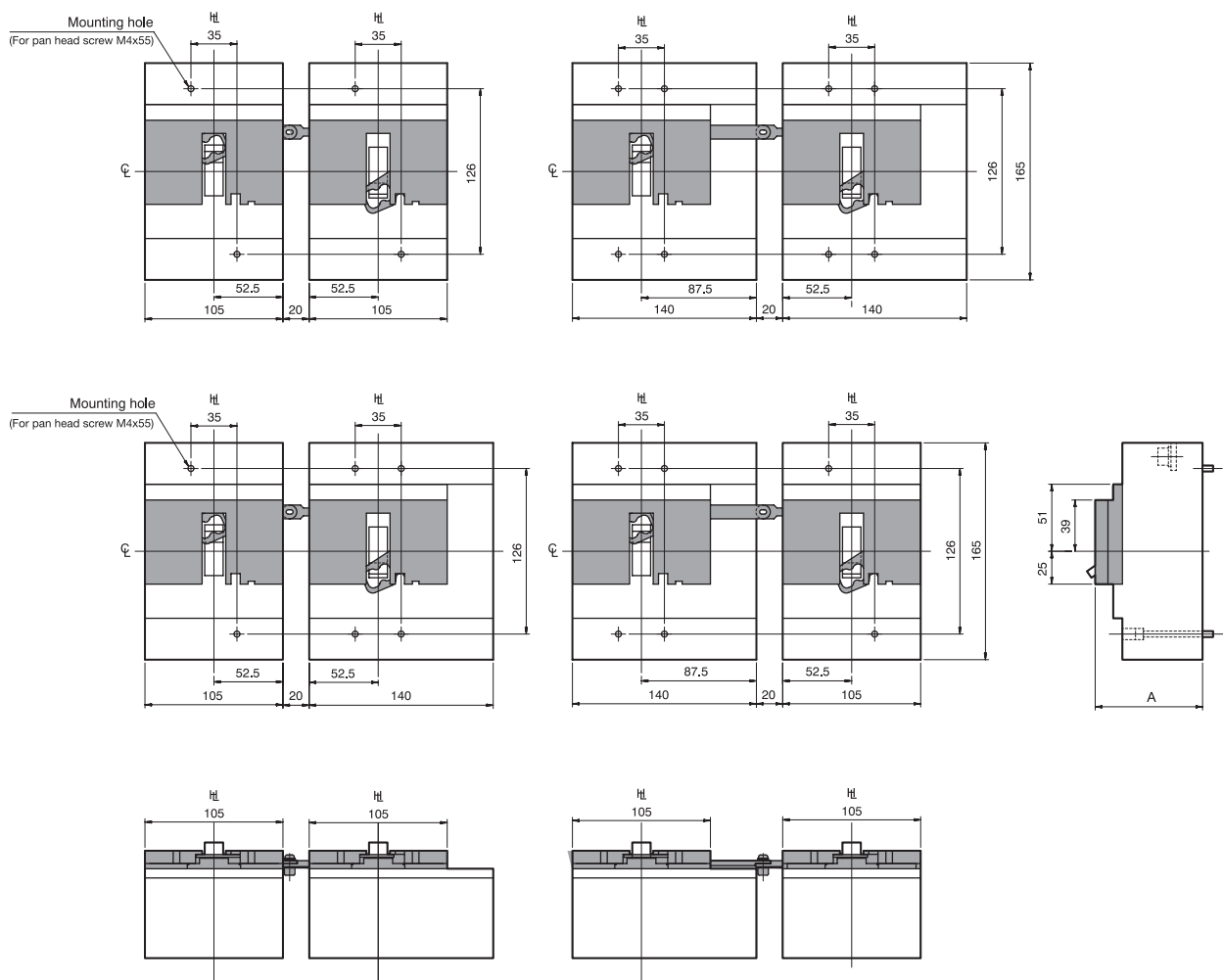


Dimensions

Link Interlocks

For 160A, 250A frame size

MCCB type	A
EB2 250AF (except electronic)	81.7
EB2 250E	116.7

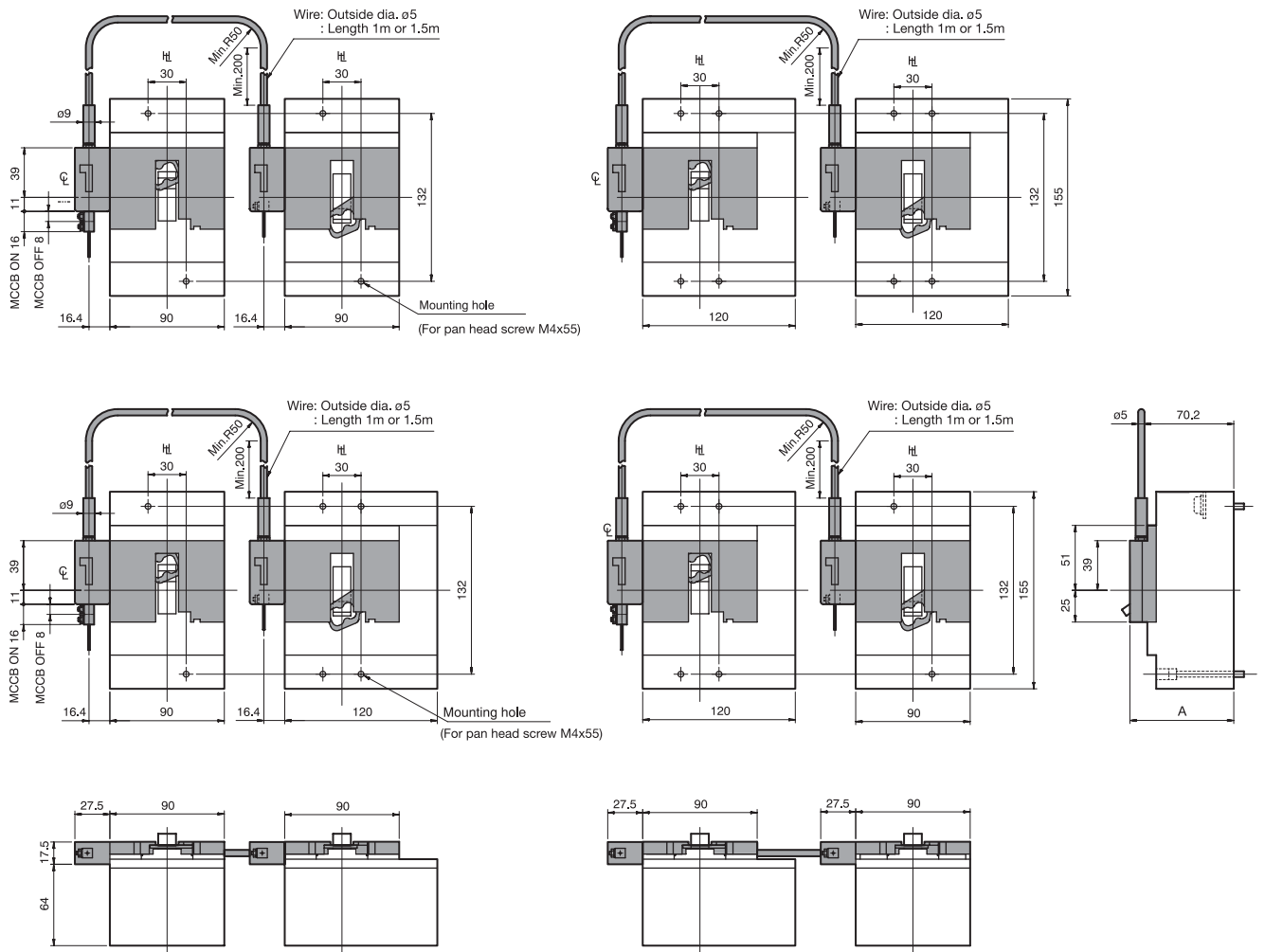


Dimensions

Wire Interlocks

For 125A frame size

MCCB type	A
EB2 125 AF	81.7

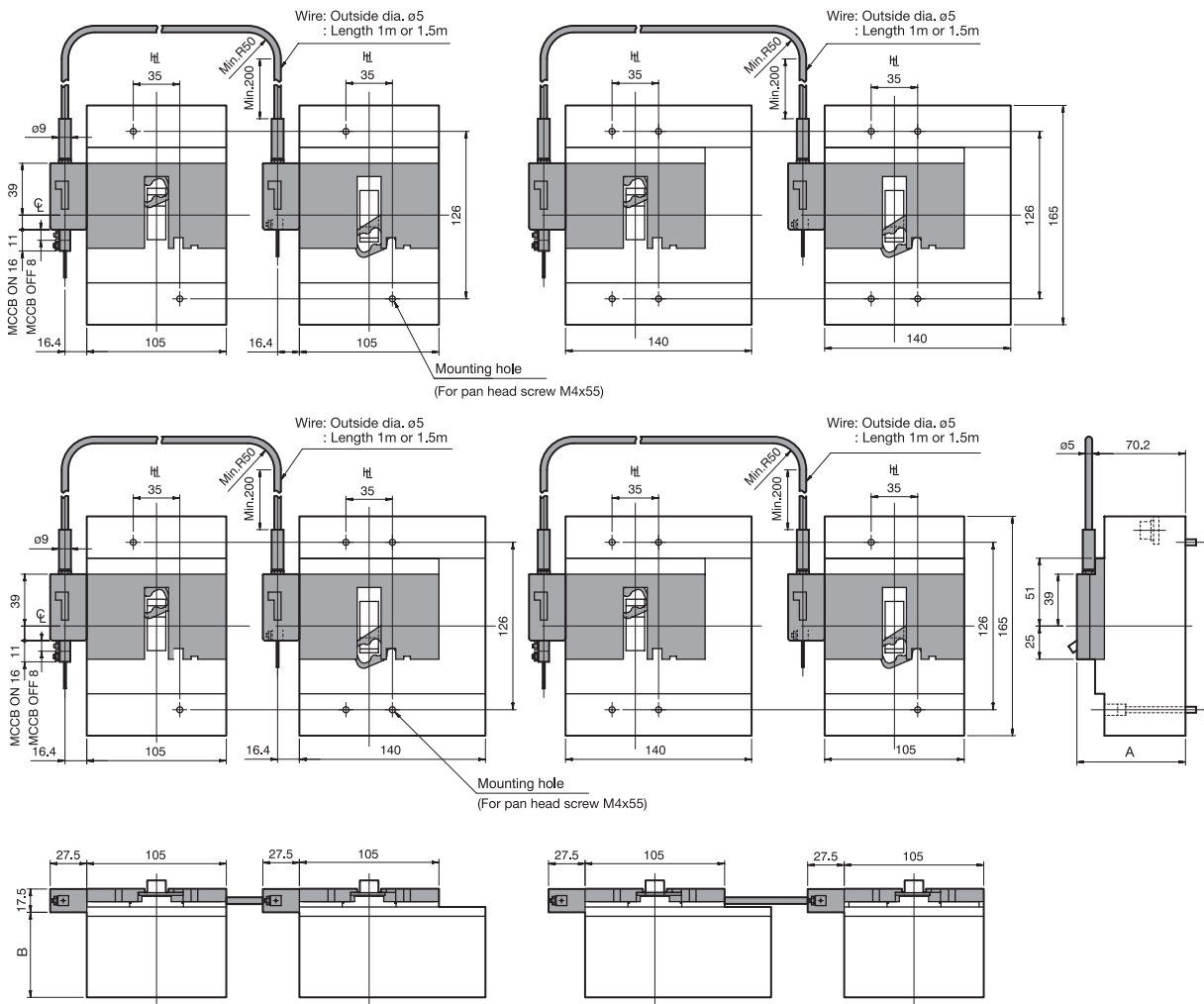


Dimensions

Wire Interlocks

For 160A, 250A frame size

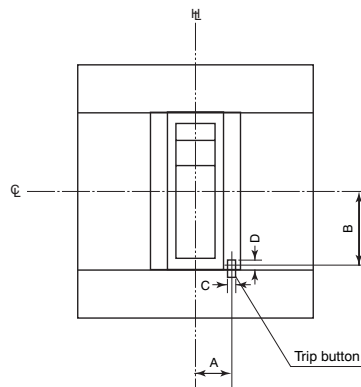
MCCB type	A	B
EB2 250AF (except electronic)	81.7	64
EB2 250E	116.7	99



Dimensions

Position of Trip Button

Positions of Trip Button



MCCB type	Poles	A	B	C	D
EB2 125AF	3,4	13.8	20.4	3.3	4.3
EB2 250 AF (except electronic)	3,4	17.2	20.4	3.3	4.3
EB2 250 E	3,4	17.2	20.4	3.3	4.3
EB2 400&630 AF	3,4	21.6	37.2	5.3	6.6

