

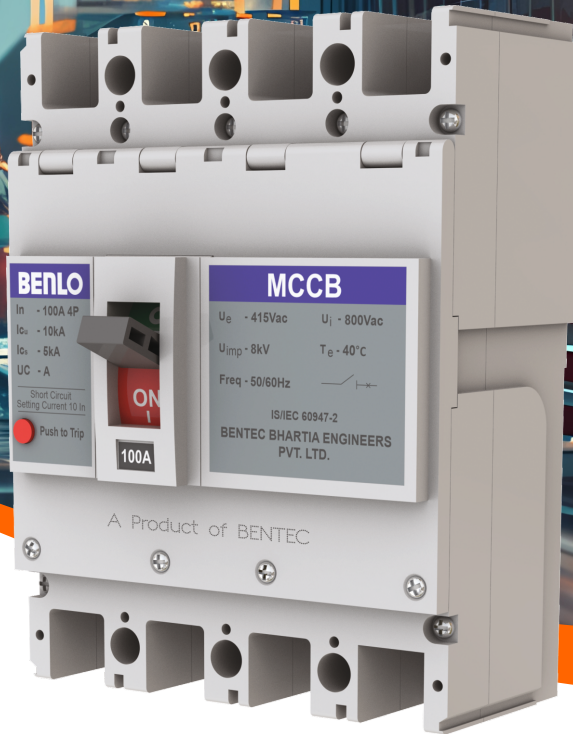
# BENTEC

# BENLO<sup>®</sup>

A PRODUCT OF BENTEC INDIA LTD.



YOUR  
**Safety** OUR  
Priority



IS / IEC 60947-2-2016



CM/L - 9600104510

ISO-9001-2015 COMPANY

# MCCB

**Molded Case  
Circuit Breaker**

## MOULDED CASE CIRCUIT BREAKER FIXED TYPE

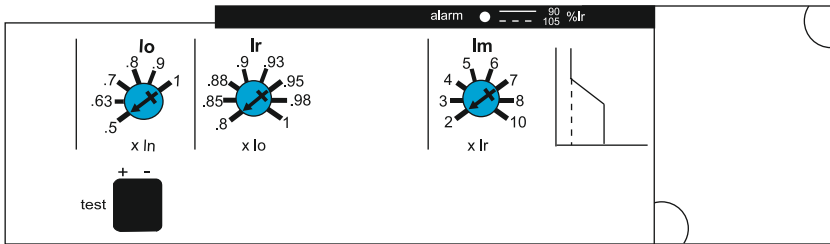
- Bentec group brings in latest technology ,MCCB's for the indian market for protection against short -circuit & overload (thermal-magnetic design)suitable for heavy duty usage.
- Bentec MCCB's comply to latest IS / IEC 60947-2-2016 in Six different frame sizes.
- Bentec offers a wide range of MCCB's -2/3/4 pole versions & current ratings from 16A to 800A with breaking capacities from 10 to 50 KA.
- MCCB Mechanism is Quick make -Quick break type and is trip free i.e. in case of short-circuit & overload conditions the contacts Open & MCCB cannot be switched to on Position under Fault conditions.
- The contact mechanism comprises of fixed and moving contacts made of silver alloy for reliability, long life and anti-welding properties.
- The arc extinguishing device comprises of arc chutes having grid plates mounted in parallel between supports of insulating material.The arc is divided between these grid plates which helps in its fast quenching.The arc is thus confined,divided and extinguished in the arc chute.
- The overload protection is provided by a combination of the heater element and the bimetal strip in each phase which activates the trip mechanism.
- Short circuit protection is provided by the magnetic circuit comprising of the fixed and moving core. In the event of short circuit the moving core is attracted towards the fixed core due to the high electro magnetic forces developed which actuates the trip mechanism.



### Main Technical specification

Frame Size	Breaking Capacity	Ultimate short Circuit Breaking Capacity	Service short Circuit Breaking Capacity	Rated Current (A)	Utilization Category	Frequency	Rated Operation Voltage	Rated Insulation Voltage	No Of Poles	Rated Impulse Voltage	Release Type	Overload Release Setting
F1	XS	10	5	6,10	A	50 HZ	415V AC	800V AC	3, 4	8 kV	Thermal Magnetic	Fixed
	S	16	8	16,25								
	M	25	12.5	32,40								
	H	35	17.5	63								
	L	50	25									
F2	XS	10	5	80,100								
	S	16	8									
	M	25	12.5									
	H	35	17.5									
	L	50	25									
F3	S	16	8	125,160 200,225								
	M	25	12.5									
	H	35	17.5									
	L	50	25									
F4	M	25	12.5	250,400								
	H	35	17.5									
	L	50	25									
F5	H	35	17.5	630								
	L	50	25									
F6	L	50	25	800								

**Protection of low-voltage distribution networks for for A-400/630**

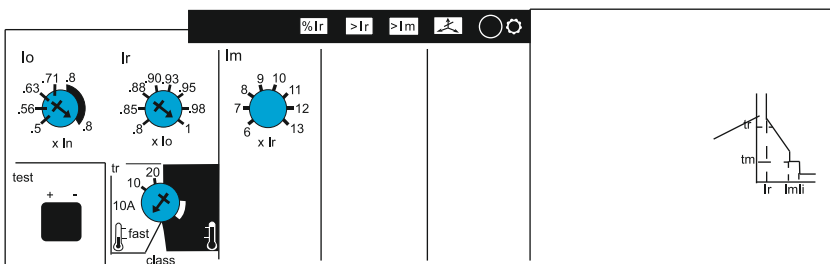


1. Overload protection with adjustable threshold
2. Short-circuit protection with adjustable threshold
3. Load indication :light at 90% of Ir setting threshold;  
Flashing at 105% or more of Ir setting threshold

Type	Rated current In(A)	Note
A-400	400	$I_r = 0.4 \dots 1 \times I_n$ (adjustable 48 setting) Tripping between $1.05 \dots 1.3 \times I_r$ (IEC60947-2) (Long-time overload protection) $I_m = 2-3-4-5-6-7-8-10 \times I_r$ (short-circuit protection)
A-630	630	



**Protection of motor for A - 400/630**



1. Overload protection with adjustable threshold, as defined by IS / IEC 60947-2-2016 tripping class 10A, 10 and 20
2. Short -circuit protection with adjustable threshold (6.....13xlr)
3. Phase failure protection (built-in electronic release :operates unbalanced single-phase current at 40% and more than ) (tripping time delay  $4s + 10\%$  ),as defined by IEC 60947-4.1
4. Load indication :Flashing more than Ir setting threshold
5. Fault indication

LEDs indication the type of fault that tripping

Overload (LT protection) or abnormal component temperature ( $< I_r$ );

Short -circuit (ST or instantaneous protection ) ( $< I_m$ );

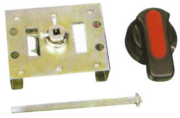
Phase failure (right LED);

Microprocessor malfunction ( ( $> I_r$ ) ( $> I_m$ ) and phase failure LEDs all go on)

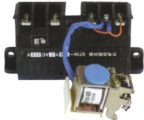
Battery powered. Spare battery are supplied in an adapter box. When a fault occurs, the LED indicating the type of fault ,lights for about 10 minutes. The information is however stored in memory. The LED can be illuminated by pressing the test push button. The LED automatically goes off and the memory is cleared when the circuit breaker is reset.

Type	Rated current In(A)	Note
A-400	400	$I_r = 0.4 \dots 1 \times I_n$ (adjustable 48 setting) Tripp degree: class 10A, 10, 20 (IEC60947-4) (Long-time overload protection) $I_m = 6-7-8-9-10-11-12-13 \times I_r$ (short-circuit protection)
A-630	630	





Rotary handle operation device



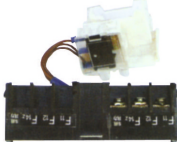
Under -voltage trip



Shunt trip



Alarm Contact



Auxilliary Contact

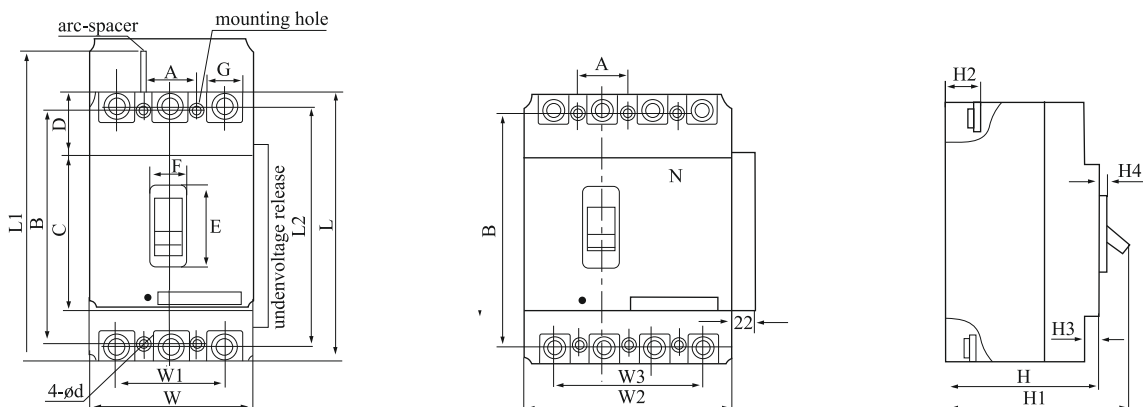
## Accessoris of the Circuit Breaker

### The External Accessoris of the Circuit Breaker

- **Rotary handle operation device** : The mechanism is used in moulded case cricuit breaker to operate the draw-out panel.Power distribution panel and supply box outside the panel by turning the handle,and to ensure the door of panel would not be opened when the breaker being ON
- **Under -voltage trip** : When the operation voltage is 35%-70%of the rated voltage, the under -voltage release should make the breaker trip correctly.When the operation voltage is 85%-110%of the rated voltage, the under -voltage release should make the breaker close. In case of the operation voltage less than 35% of the rated voltage,the under-voltage should prevent the breaker from closing.
- **Shunt trip** : Used for remote tripping.
- **Alarm contact** : Give tripping identification once the MCCB'tripps.It does not act when the relay is at normal open close status.
- **Auxilliary Contact** : Used for remote signalling and control purposes. It indicates the breakers status - where open or closed

Type	Outline Dimensons(mm)																
	W	W1	L	L1	L2	H	H1	H2	H3	H4	C	D	E	F	G	W2	W3
63A,10/16/25kA,3P	76	50	135	170	117	74	92	-	7	4	85	28.5	48	22	14	100	75
63A,35/50kA,3P	76	50	135	170	117	82	98.5	28	7	4	85	28.5	48	22	14	100	75
63A,10-50kA,4P	76	50	135	170	117	82	98.5	28	7	4	85	28.5	48	22	14	100	75
100A,10/16/25kA,3P	92	60	150	185	132	68	86	24	7	4	88	35.5	50	22	17.5	-	-
100A,35/50kA,3P	92	60	150	185	132	86	104	24	7	4	88	35.5	50	22	17.5	122	90
100A,10-50kA,4P	92	60	150	185	132	86	104	24	7	4	88	35.5	50	22	17.5	122	90
225A,10/16/25kA,3P	107	70	165	215	144	86	110	24	5	4	102	31.5	50	22	17	-	-
225A,35/50kA,3P	107	70	165	215	144	103	127	24	5	4	102	31.5	50	22	17	142	105
225A,10-50kA,4P	107	70	165	215	144	103	127	24	5	4	102	31.5	50	22	17	142	105
400A,35/50kA,3P	150	96	257	357	224	105	155	38	8	6	128	64.5	89	65	ø26	198	144
400A,35/50kA,4P	150	96	257	357	224	105	155	38	8	6	128	64.5	89	65	ø26	198	144
630A,35/50kA,3P	182	116	270	370	234	110	160	43	8	6	134	70	89	65	ø29	240	174
630A,35/50kA,4P	182	116	270	370	234	110	160	43	8	6	134	70	89	65	ø29	240	174
800A,50kA,3P	210	140	280	380	243	106	145	33	30	128	-	-	-	-	-	-	-

## Front panel connection



## 6. Accessories



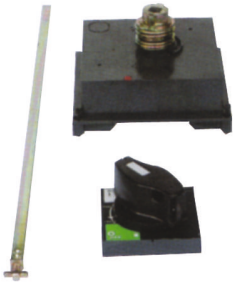
Under-voltage release  
Shunt release

Accessories	Rated operating voltage	Consumption		For type
		Pick-up	Seal-in	
Shunt release (MX)	24V	<10VA	<5VA	A-100-630
	100V			
Under-voltage release (UN)	220/230V	<10VA	<5VA	
	380/400V			



Auxiliary contact  
Alarm contact

Accessories	Rated operating voltage	Rated operating current		For type
		AC12	AC15	
Auxiliary contact (OF)	380/400V	6	3	A-100-630
Alarm contact (AL)	380/400V	6	3	



Rotary handle

### Rotary handle

#### ● Direct rotary handle

Degree of protection :IP40

Function :1)suitability for isolation

2)indication of three positions 0(OFF) I (ON) and tripped

3)press "push to trip"button,can trip-free

4)visibility of and access to trip unit settings

5)the circuit breaker can be locked in the off position by one to three padlocks, diameter 5 to 8 mm(not supplied)

#### ● Extended rotary handle

Degree of protection:IP55

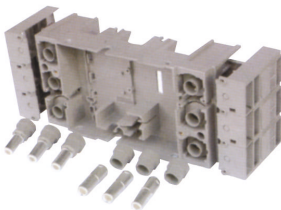
Function :1)Suitability for isolation

2)Indication of three positions0(OFF) I (ON) and tripped

3)Visibility of and access to trip unit settings when the door is open

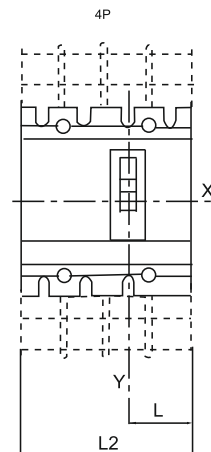
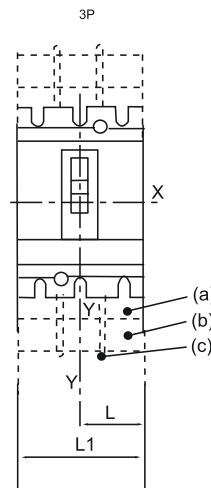
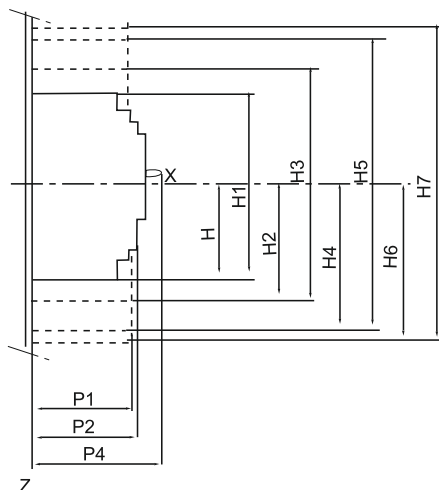
4)Door opening prevented when circuit breaker is on

5)The circuit breaker can be locked in the off position by one to three padlocks,diameter 5 to8mm (not supplied) .Locking prevents opening of the switchboard



Plug-in base

## Outline and installation dimension



## MOULDED CASE CIRCUIT BREAKER ADJUSTABLE TYPE

### 1.Features

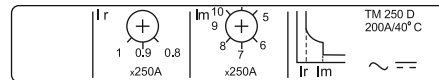
- Bentec adjustable type MCCB's are available in four frame sizes, from 16A - 1250A.
- MCCB's comply to IS / IEC 60947-2-2016
- Bentec MCCB's can be connected from either top or bottom which has no effect on normal operation of the breaker.
- Current limiting design.
- Ics=100% Icu
- Bentec circuit breaker can be mounted vertically, horizontally or flat on their back without any derating of characteristics.
- Mounting of bentec MCCB's can be done on back plate or on rails
- Connection : Front panel connection, back panel connection, plug-in connection,

### 2.Applications

Distribution Feeders	For Incoming & outgoing Feeder Circuits of distribution Boards
Transformers	Used on LT Side of Distribution Transformers for effective protection
DG sets	For protection of DG Sets against short Circuit Fault currents
Capacitors	Used for controlling LTCapacitors
UPS	For UPS Protection, including Components
Furnaces	For control & Protection of high frequency furnaces as well as Induction Furnaces.
Motors	Back-up Protection of motors

### 3.Trip units main technical parameter

Thermal magnetic release



Type	Rated current In(A)	Note
A-100	12.5,16,20,25,32,40,50,63,80,100	T adjustable (0.8~1 In) M adjustable (5~10 In)
A-250	160,180,200,225,250	
A-630	400,500,630	
A-1250	800,1000,1250	T adjustable (0.8~1 In) M Fixed

### 4.Main Technical Specification (Thermal Magnetic Type)

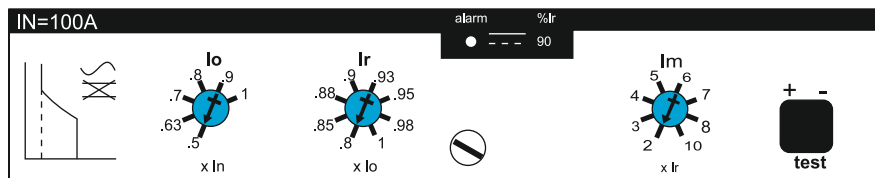
		As per IS / IEC 60947-2-2016					
A-Type Circuit Breaker (Adjustable) Thermal Magnetic Type		A-100	A-250	A-400	A-630	A-800	A-1250
4 Frames		Frame 1	Frame 2	Frame 3		Frame 4	
Rated Current In at 40°C		16, 20, 25, 32,40,63, 80,100	125,160,180,200,225,250	315,350,400	400,500,630	400,500,630,800	800,1000,1250
Rated Insulation Voltage(V)		750	750	750	750	750	750
Rated Impulse Voltage(kV)		8	8	8	8	8	8
Rated Operational Voltage	AC 50/60Hz	690	690	690	690	690	690
	DC	500	500	500	500	500	500
Numbers of poles		3,4	3,4	3,4	3,4	3,4	3,4
Breaking Capacity code		M H L	M H L	M H L	M H L	H	L
Ultimate short-circuit breaking capacity(Icu kA)		380/415V 25 70 150	35 70 150	50 70 150	50 70 150	50	70
Service Short Circuit Breaking Capacity Ics=(%Icu)		100	100	100	100	50	50
Utilization category		A	A	A	A	A	A
Endurance	Mechanical	20000	20000	15000	15000	10000	10000
	Electrical at 415v AC	20000	20000	6000	4000	4000	4000
Protection		Thermal Magnetic	Thermal Magnetic	Thermal- Magnetic		Thermal- Magnetic	

## 5.Main Technical Specification (Electronic Type)

		As per IS / IEC 60947-2-2016																		
A-Type Circuit Breaker (Adjustable) Electronic Type		A-100		A-250		A-400		A-630		A-800		A-1250								
4 Frames		Frame 1			Frame 2			Frame 3			Frame 4									
Rated Current In at 40°C		16, 20, 25, 32,40,63, 80,100			125,160,180,200,225, 250			315,350,400			400,500,630			400,500,630, 800			800,1000,1250			
Rated Insulation Voltage(V)		750			750			750			750			750			750			
Rated Impulses Voltage(kV)		8			8			8			8			8			8			
Rated Operational Voltage		AC 50/60Hz			690			690			690			690			690			
		DC			500			500			500			500			500			
Numbers of poles		3,4			3,4			3,4			3,4			3,4			3,4			
Breaking Capacity code		M H L			M H L			M H L			M H L			H L			L			
Ultimate short-circuit breaking capacity(Icu kA)		380/415V			25 70 150			35 70 150			50 70 150			50			70			
Service Short Circuit Breaking Capacity Ics=(%Icu)		100			100			100			100			50			50			
Utilization category		A			A			A			A			A			A			
Endurance		Mechanical			20000			20000			15000			10000			10000			
		Electrical at 415v AC			20000			20000			6000			4000			4000			4000
Protection		Electronic			Electronic			Electronic			Electronic			Electronic			Electronic			

### Electronic Release

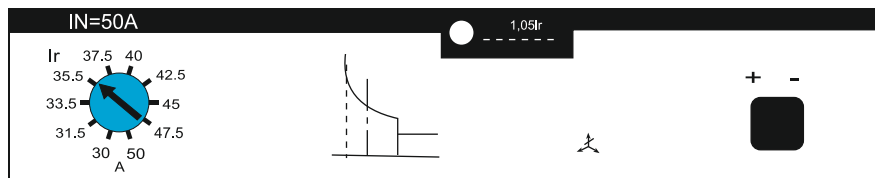
#### Protection of low voltage distribution networks for A - 100/160/250



1. Overload protection with adjustable threshold
2. Short-circuit protection with adjustable threshold
3. Load indication : light at 90% of Ir setting threshold;  
Flashing at 105% or more of Ir setting threshold

Type	Rated current In(A)	Note
A-100	40.100	Ir=0.4...1 x In(adjustable 48 setting) Tripping between 1.05...1.3 x Ir(IEC60947-2) (Long-time overload protection) Im=2-3-4-5-6-7-8-10 x Ir (short-circuit protection)
A-160	40.100.160	
A-250	40.100.160.250	

#### Protection of Motor for A-100/160/250

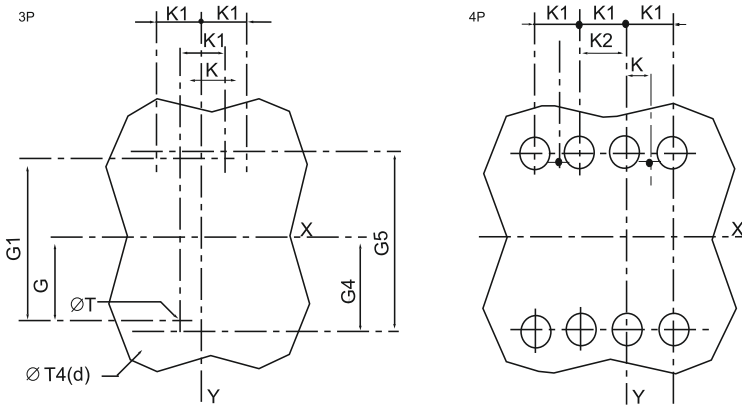


1. Overload protection with adjustable threshold, as defined by IEC 60947-4(2) tripping class 10
2. Short-circuit protection with fixed threshold (13xIr)
3. Phase failure protection (tripping time delay between 3.5s-6s)
4. Load indication: dark less than 105% of Ir setting threshold;  
Flashing at 105% or more of Ir setting threshold

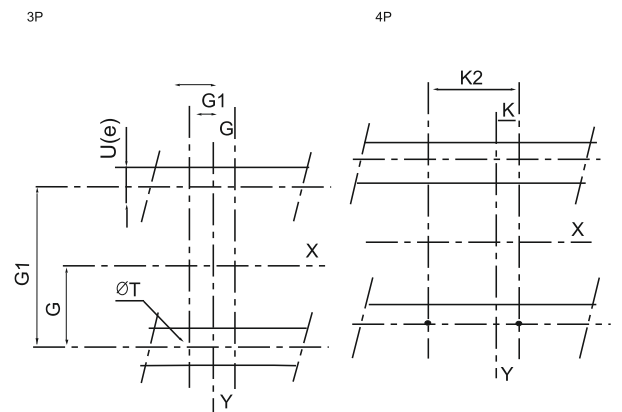
Type	Rated current In(A)	Note
A-100	40. 50. 80. 100	Ir =0.6-0.63-0.67-0.71-0.75-0.80-0.85-0.95-1 x In
A-160	40. 50. 80. 100. 150	
A-250	40. 50. 80. 100. 150. 220	



## Mounting on back plate

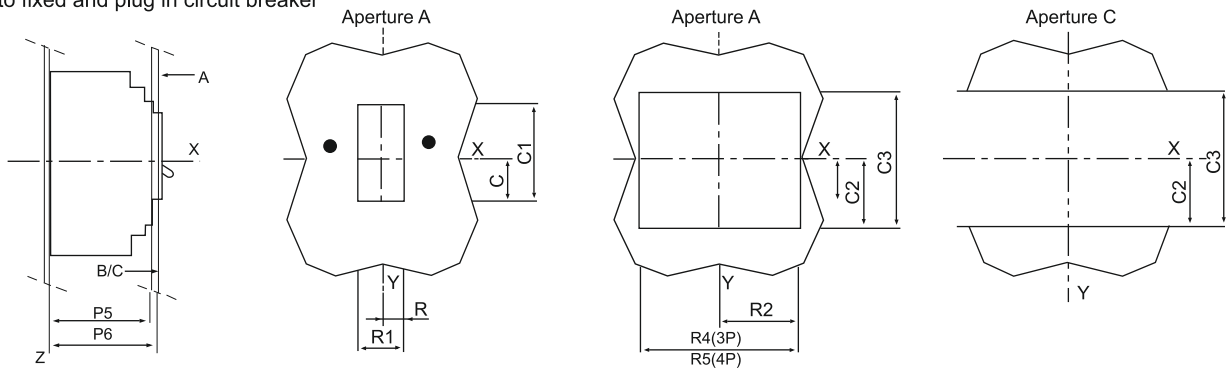


## Mounting on rails



## Aperture on a front panel

Fitting to fixed and plug in circuit breaker



mm	C	C1	C2	C3	G	G1	G4	G5	H	H1	H2				
A 100/160/250N/H/L	29	76	54	108	62.5	125	70	140	80.5	161	94				
A 400/630N/H/L	41.5	116	92.5	184	100	200	113.5	227	127.5	255	142.5				
mm	H3	H4	H5	H6	H7	K	K1	K2	L	L1	L2	P1	P2	P4	P5
A 100/160/250N/H/L	188	160.5	321	178.5	357	17.5	35	70	52.5	105	140	81	86	111	83
A 400/630N/H/L	285	240	480	237	474	22.5	45	90	70	140	185	95.5	110	168	107
mm	P6	R	R1	R2	R4	R5	ØT	ØT4	(Ue)						
A 100/160/250N/H/L	88	14.5	29	54	108	143	6	22	≤32						
A 400/630N/H/L	112	31.5	63	71.5	143	188	6	32	≤32						



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