ULTRA POWER

Air Circuit Breakers

AIR CIRCUIT BREAKERS

BHARTIA BCH

BCH ELECTRIC LIMITED

www.bchindia.com

ULTRA POWER
Air Circuit Breakers

ULTRA POWER Air Circuit Breakers Range of Air Circuit Breakers

- Complete range conforms to IS/IEC 60947-2.
- Current rating from 800A to 5000A in 3 frame sizes.
- Available in 3 Pole & 4 Pole, Manually & Electrically operated, Fixed / Draw-out version.
- Common Height & Depth across the complete range.
- High short time fault withstand capacity, Icu = Ics = Icw for 1 sec for total selectivity.
- High mechanical and electrical operating life.
- Neutral pole is 100% rated.
- In-built Electrical & Mechanical Anti - Pumping.
- Modular & snap-fit accessories.
- Ease of on-site conversion from Fixed to Draw-out version.
- Pollution Degree 4 suitability.
- Best in Class Overlap with Bus bars.
- Break Time of 25msec.
- RoHS Compliant.

Breaking Capacities: Icu = Ics = Icw

Rated current	800A	1000A	1250A	1600A	2000A	2500A	3200A	4000A	5000A
N : 50kA									
S : 65kA									
H : 80kA									
V : 100kA									
	BU1-08	BU1-10	BU1-12	BU1-16	BU1-20	BU2-25	BU2-32	BU2-40	BU3-50
	Frame-1					Frame-2			Frame-3

Technical Data Sheet

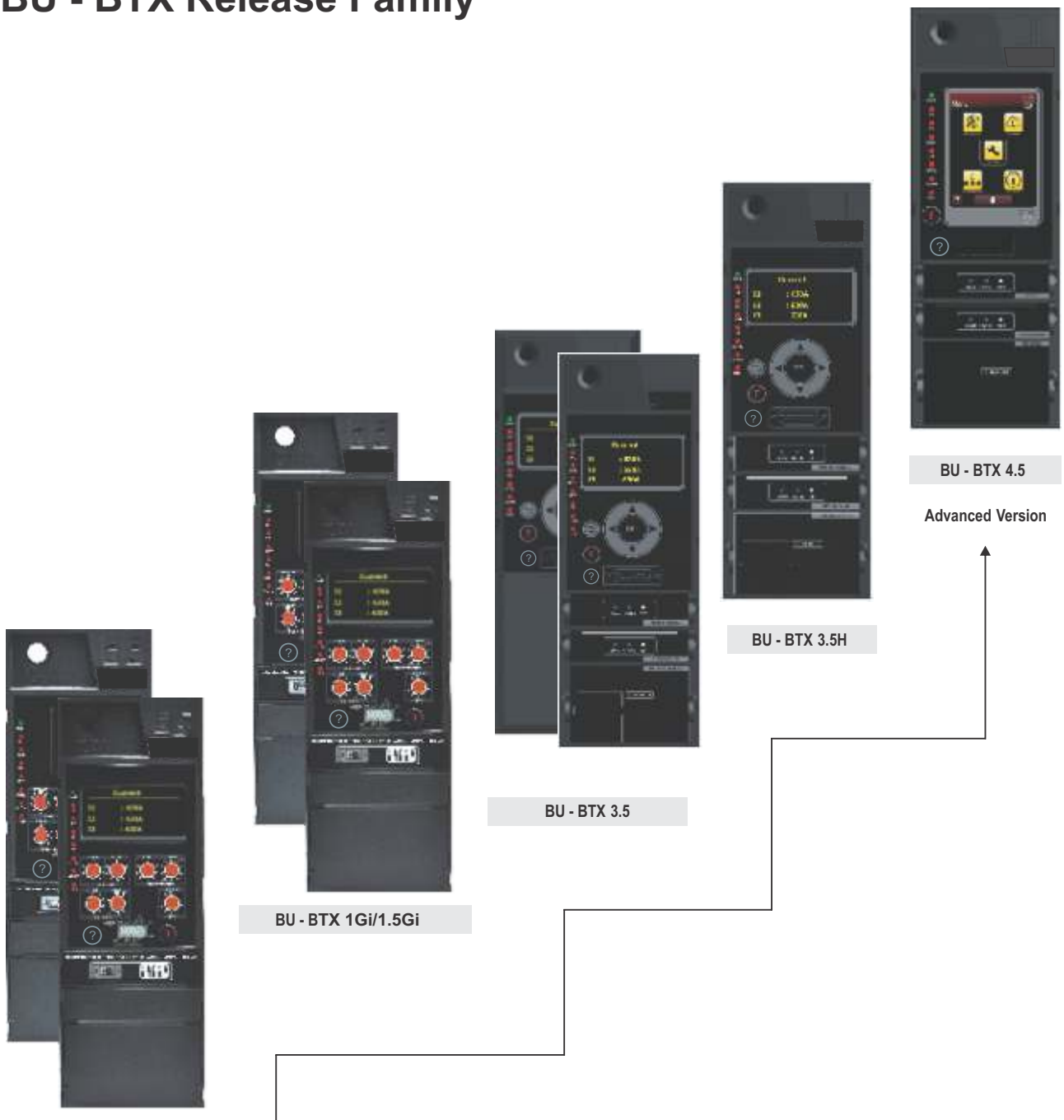
Circuit Breaker upto 690V AC :

Frame				1		2			3
Rated Uninterrupted Current (In) (A) at 50°C				800-2000		2500-4000[1]			5000
Version				N	S	N[2]	S	H	V
Rated Operational Voltage at 50/60 Hz.		Ue		upto 690V AC					
Rated Insulation Voltage at 50/60 Hz.		Ui		1000V AC					
Rated Impulse withstand Voltage		Uimp		12kV (Main Circuit) & 4kV (Auxiliary Circuit)					
Suitability for Isolation				Yes					
Degree of Protection on Breaker front				IP53 Standard, IP54 Optional					
Degree of Impact Protection on Breaker front				IK08 Standard, IK10 Optional					
Pollution Degree Suitability				4					
Utilization Category				B					
Compliance				IS / IEC 60947 (Part-2), EN 60947-2, IEC 60947-2					
Operational Temperature Range (As per IEC 60068-2-1/ IEC 60947-1-Q)				-25°C to 70°C					
Storage Temperature Range (As per IEC 60068-2-1/2)				-40°C to 85°C					
Rated Ultimate S.C. Breaking Capacity	Icu (kA)		415/440V AC	50	65	50	65	80	100
			500/550V AC	42	55	42	55	70	85
			660/690V AC	36	50	36	50	65[3]	75
Rated Service S.C. Breaking Capacity	Ics (kA)		415/440V AC	100% Icu					
			500/550V AC						
			660/690V AC						
Rated Short-time Withstand Capacity	Icw (kA)		0.5sec	50	65	50	65	80	100
			1.0sec	50	65	50	65	80	100
			3.0sec	26	36	26	44	50	75
Rated S.C. Making Capacity	Icm (kA)		415/440V AC	105	143	105	143	176	220
			500/550V AC	88	121	88	121	154	187
			660/690V AC	76	105	76	105	143[4]	165
Break Time (ms)				25					
Closing Time (ms)				60					
Mechanical Life[5]	With Routine maintenance			20000		15000			10000
Electrical Life[5]	With Specific maintenance			20000		15000			10000
	With Routine maintenance			10000		5000			5000
Dimensions	Fixed ACB	W (mm)	Width 3P	347		447			647
			Width 4P	447		581			847
		D (mm)	Depth	324					334
		H (mm)	Height	430					
	Draw-out ACB	W (mm)	Width 3P	347		447			647
			Width 4P	447		581			847
		D (mm)	Depth	421					431
		H (mm)	Height	433					

(1) Frame-2 4000A available in H Version only
(2) Available till 3200A
(3) 65kA upto 3200A & 55kA for 4000A
(4) 143kA upto 3200A & 121kA for 4000A
(5) Value corresponds operating cycle

Refer Users' Manual for Routine/Specific maintenance

BU - BTX Release Family



BU - BTX 1.0/1G/1.5G

Basic Version

BU - BTX 1Gi/1.5Gi

BU - BTX 3.5

BU - BTX 3.5H

BU - BTX 4.5

Advanced Version

BU-BTX Release “A basket of benefits”

1) State-of-the-art touch-screen technology in BU-BTX 4.5 releases offer ease of navigation

2) Unique withdrawable power metering & communication modules offer ease of flexibility, scalability & customization of electrical systems

3) Option of both Modbus & Profibus industrial communication protocols

4) Wide range of Overload protection curves (such as I^2t, I^4t, SI & LI/VI) offer precise co-ordination with large variety of electrical loads

5) Option of Enabling/Disabling each protection function offers greater flexibility in designing the overall protection system

6) Directional & Double Short-circuit protection

7) Password protection in releases prevents unauthorized access to protection release

8) Unique O-LED display offers better contrast & wider-viewing angle

9) Ease of parameterisation through Configurator modules

10) Dual time-based set group protection provides the option of setting two sets of protection curves

11) Front connector for hand-held testing of release

12) Soft-rating plug offers precise protection of electrical system at lower value of system currents

13) Query button for last trip information furnishes the “Trip Info” details such as cause of tripping, date and time stamping of tripping

14) Test button for self-diagnostic test

15) 20 trip & 128 event records stored in the protection release*

16) Elimination of relays & measurement devices
- Less time required for switchboard assembly (no wiring or cut-outs on the front panel)
- Fewer devices required and less time spent on their selection, purchase, storage and installation

17) Harmonics metering up to 27th order of fundamental frequency along with display of THD

18) Oscillograph of fault current waveforms (10 cycles before pick-up/Trip & 5 cycles after pick-up/Trip)

19) Tested for Electromagnetic Compatibility (EMC) as per IEC-60947-2

20) Inbuilt & Optional Zone Selective Interlocking (ZSI)

* a : 20 trip and 10 events can be accessed on Release display.
b : 20 Trip and 128 events can be accessed through communication.

BU - BTX1.0

BU - BTX1G/1Gi

BU - BTX1.5G/1.5Gi

Features :

- Overload, Short-circuit & Instantaneous protection with adjustable current & time - delay settings
- Inbuilt Earth-Fault & neutral protection in BTX1G/1Gi & BTX1.5G/1.5Gi
- Switchable thermal memory for cable protection on repetitive overloads
- I^2t ON curve for Short-circuit & Earth-fault protection
- Current Metering in BTX1.5G/1.5Gi through 3-line O-LED display
- Local fault annunciation through LED indication & pre-trip alarm
- Front accessible test port
- Query button for last trip record
- Inbuilt rating-plug through DIP switches
- Test button to check the health of protection release
- Self-powered protection
- Inbuilt Zone Selective Interlocking (ZSI) in BTX1Gi & BTX1.5Gi

Protection parameters:

Parameters		BTX1.0	BTX1G	BTX1Gi	BTX1.5G	BTX1.5Gi
Overload (Phase)	Protection: Enable/Disable	✓	✓	✓	✓	✓
	Pick-up (Ir)=In x... for I^2t	OFF- 0.4-0.5-0.6-0.7-0.8-0.85-0.9-0.95-1				
	Delay (tr) in sec	10	0.5-1-2-4-6-12-18-24-30			
	Pre-alarm	0.9 Irx (fixed)				
	Thermal Memory ON/OFF	✓	✓	✓	✓	✓
Overload (Neutral)	Protection: Enable/Disable	-	✓	✓	✓	✓
	Pick-up (In)=Ir x...	-	50%-100%-150%-200%			
	Pre-alarm	-	0.8 x (fixed)			
	Delay (tr) in s	-	Same as Overload Phase			
Short-Circuit	Protection: Enable/Disable	-	-	-	-	-
	I^2t ON/OFF	✓	✓	✓	✓	✓
	Pick-up (Is)=Inx...	0.6-1-1.5-2-3-4-6-8-10-12				
	Delay (ts)	20-100-200-300-400 ms				
	Pre-alarm	0.5 x Is (fixed)				
Instantaneous	Protection: Enable/Disable	✓	✓	✓	✓	✓
	Pick-up (Ip)=In x...	OFF-1.5-2-3-4-6-8-10-12-15				
Earth-Fault	Protection: Enable/Disable	-	✓	✓	✓	✓
	I^2t : ON/OFF	-	✓	✓	✓	✓
	Pick-up (Ig)=In x...	-	OFF-0.2-0.3-0.4-0.5-0.6			
	I^2t OFF (tg)	-	0.1-0.2-0.3-0.4-1			
	I^2t ON (tg)	-	0.1-0.2-0.3-0.4			
	Pre-alarm	-	0.8 x Ig (fixed)			
Inbuilt-ZSI	Short Circuit Enable/Disable	-	-	✓	-	✓
	Earth Fault Enable/Disable	-	-	✓	-	✓

BTX Release - Protection & Control Units

BU-BTX3.5

BU-BTX3.5H

BU-BTX4.5

Features	Parameter	BTX3.5	BTX3.5H	BTX4.5
Basic Protection	Overload - Phase	✓	✓	✓
	Overload - Neutral	✓	✓	✓
	Short-Circuit	✓	✓	✓
	Directional Short-Circuit	✓	✓	✓
	Instantaneous	✓	✓	✓
	Earth-Fault	✓	✓	✓
Additional Protection	Current	✓	✓	✓
	Voltage	*	✓	✓
	Frequency	*	✓	✓
	Reverse Power	*	✓	✓
	Maximum Demand	*	✓	✓
Trip Records	Last 20 trip data	✓	✓	✓
Event Records	Last 10 Event Data	✓	✓	✓
Smart Card		*	*	*
Communication	Modbus	*	*	✓
	Profibus	*	*	*
	Zigbee (wireless)	*	*	*
Advanced Protection	Trip Circuit Supervision (TCS)	*	*	*
	Zone Selective Interlocking (ZSI)	*	*	*
	Temperature Rise (TM)	*	*	*
	Earth Leakage (EL)	*	*	*
	Restricted Earth-Fault (REF)	*	*	*
Additional Features	Relay Output	*	*	*
	Load Management (Pre Trip Alarm)	✓	✓	✓
	Digital Input & Output	*	*	*
	Analog Output	*	*	*
Metering	Current	✓	✓	✓
	% Loading	✓	✓	✓
	Voltage	*	✓	✓
	Power & Energy	*	✓	✓
	Harmonics	-	✓	✓
Storable Settings (2 sets)		✓	✓	✓
Auxiliary Supply (24V DC)		*	*	✓

* - Optional feature

✓- Standard

BU-BTX3.5

- Overload, Short-circuit and Earth-fault protection with variable current & time delay setting
- Instantaneous protection
- I^2t, I^4t, SI, LI/VI protection curves
- Directional & Double Short circuit protections
- Reverse power and phase sequence protection
- Selectable I^2t based curves for short-circuit and earth-fault protection
- Switchable neutral overload protection (50%-200%) in step of 5%
- Additional current & voltage based protections
- Protection against temperature rise
- Advance protection - ZSI, TCS, REF & EL
- Communication through Modbus, Profibus & wireless Zigbee
- Smart Configurator module for easy parameterisation of the release
- Local & remote fault annunciation & pre-trip alarm
- Current, Voltage, Power, Energy & THD metering & % loading
- Earth Fault Protection from 10%In
- Dual time-based protection set groups
- Thermal reflectivity & soft rating-plug
- Self-powered protection
- Trip & Event recording

BU-BTX3.5H

- Overload, Short-circuit and Earth-fault protection with variable current & time delay setting
- Instantaneous protection
- I^2t, I^4t, SI, LI/VI protection curves
- Current & Voltage harmonics metering
- Directional & Double Short circuit protections
- Reverse power and phase sequence protection
- Selectable I^2t based curves for short-circuit and earth-fault protection
- Switchable neutral overload protection (50%-200%) in step of 5%
- Additional current & voltage based protections
- Protection against temperature rise
- Advance protection - ZSI, TCS, REF & EL
- Optional communication through Modbus, Profibus & wireless Zigbee
- Smart Configurator module for easy parameterisation of the release
- Local & remote fault annunciation & pre-trip alarm
- Current, Voltage, Power, Energy & THD metering & % loading
- Dual time-based protection set groups
- Thermal reflectivity & soft rating-plug
- Self-powered protection
- Trip & Event recording

BU-BTX4.5

- Overload, Short-circuit and Earth-fault protection with variable current & time delay setting
- I^2t, I^4t, SI, LI/VI protection curves
- Navigation through Touch - Screen
- Bar-graph representation of current, voltage & power parameters
- Directional & Double Short-circuit protection
- Instantaneous protection
- Selectable I^2t based curves for Short-circuit and Earth-fault protection
- Switchable neutral overload protection (50%-200%) in step of 5%
- Harmonics metering up to 27th order of fundamental frequency along with display of THD percentage
- Oscillograph of fault current waveforms (10 cycles before pick-up/Trip & 5 cycles after pick-up/Trip)
- Metering of sequence components of current waveform, form factor, peak factor avigation through Touch-Screen
- Additional current & voltage based protections
- Protection against temperature rise
- Advance protection - ZSI, TCS, REF & EL
- Communication through Modbus, Profibus & wireless Zigbee
- Local & remote fault annunciation & pre-trip alarm
- Dual time-based protection set groups
- Thermal reflectivity & soft rating-plug
- Self-powered protection
- Trip & Event recording

Simulation Kit for BU-BTX releases

- Universal test kit for all versions of BU-BTX releases
- Generates 3 phase current and voltage with adjustable phase angles
- Graphical display & smart GUI with multi-functional key operation
- Portable & hand held device to simulate faults
- Dual Power ON-battery & external supply
- Auto sensing of release connectivity
- Stores 10 test records

Basic protection in BU-BTX 3.5/3.5H/4.5 Series

		BU-BTX3.5	BU-BTX3.5H	BU-BTX4.5
Overload (Phase)	Protection : Enable/Disable	✓	✓	✓
	Pick-Up (Ir)=In x ...for I^2t, I^4t, SI, LI/VI	0.4 to 1 In in step of 0.05		
	Delay(tr) in s	0.5-1-2-4-6-12-18-24-30		
	Pre-alarm	0.5 to 0.95 in step of 0.05 x Ir		
	Thermal Memory ON/OFF	✓	✓	✓
Overload (Neutral)	Protection: Enable/Disable	✓	✓	✓
	Pick-up (In)=Ir x...	0.5 to 2 in step of 0.05		
	Pre-alarm	0.5 to 0.95 in step of 0.05 x I_N		
	Delay(tr) in s	same as Overload Phase		
Short-Circuit	Protection: Enable/Disable	✓	✓	✓
	Double S/C ON/OFF	✓	✓	✓
	I^2t : ON/OFF	✓	✓	✓
	Pick-Up Lo, Is=In x ...	0.6 to 12 In in step of 0.05		
	Pick-Up Hi, Is=In x ...	0.6 to 12 In in step of 0.05		
	Delay Hi (ts)	20-100-200-300-400 ms		
	Delay Lo (ts)	20-100-200-300-400 ms		
	Pre-alarm	0.5 to 0.95 in step of 0.05 x Is		
	Cold Pick-Up ON/OFF	✓	✓	✓
	Cold Delay	100 ms to 10s in step of 100ms		
Directional Short-Circuit	Protection: Enable/Disable	✓	✓	✓
	Direction: Top/Bottom	✓	✓	✓
	I^2t : ON/OFF	✓	✓	✓
	Pick-up(Is): In x ...	0.6 to 12 In in step of 0.05		
	Delay(ts)	20-100-200-300-400 ms		
	Pre-alarm	0.5 to 0.95 in step of 0.05 x Is		
	Cold Pick-Up ON/OFF	✓	✓	✓
	Cold Delay	100 ms 10s in step of 0.05 x Is		
Instantaneous	Protection: Enable/Disable	✓	✓	✓
	Pick-up(Ip)=In x ...	1.5 to 10 in step of 0.1; 10 to 15 in step of 1		
Earth-Fault	Protection: Enable/Disable	✓	✓	✓
	I^2t : ON/OFF	✓	✓	✓
	Pick-Up(Ig)=In x ...	0.1-0.2-0.3-0.4-0.5-0.6		
	I^2t : OFF (tg)	100 ms to 1s in step of 100 ms		
	I^2t : ON (tg)	100-200-300-400 ms		
	Pre-alarm	0.5 to 0.95 in step of 0.05 x Ig		
	Cold Pick-Up: ON/OFF	✓	✓	✓
	Cold Delay	100ms to 5sec in step of 100 ms		

Advanced protection in BU -BTX 3.5/3.5H/4.5 Series

	Parameter	BU-BTX3.5*	BU-BTX3.5H	BU-BTX 4.5
Under Current	Protection: Enable/Disable	✓	✓	✓
	Pick-Up=Ir x ...	0.2 to 0.8 in step of 0.05		
	Delay	1 to 255sec in step of 1sec		
	Mode: Trip/Alarm/Both	✓	✓	✓
Current Unbalance	Protection: Enable/Disable	✓	✓	✓
	Pick-Up=In x ...	10 to 90% in step of 5%		
	Delay	500 ms to 60s in step of 0.5s		
	Mode: Trip/Alarm/Both	✓	✓	✓
Under Voltage	Protection: Enable/Disable	✓	✓	✓
	Pick-Up(Vs)=Vn x ...	0.7 to 0.95 in steps of 0.01		
	Delay	100 ms to 5s in step of 100 ms		
	Vs reset	1.01/1.02/1.03/1.04 x Vs		
	Mode: Trip/Alarm/Both	✓	✓	✓
Over Voltage	Protection: Enable/Disable	✓	✓	✓
	Pick-Up(Vs)=Vn x ...	1.05 to 1.5 Vn in step of 0.01		
	Delay	100 ms to 5s in steps of 100 ms		
	Vs reset	0.95 to 0.99 Vs in step of 0.01		
	Mode: Trip/Alarm/Both	✓	✓	✓
Voltage Unbalance	Protection: Enable/Disable	✓	✓	✓
	Pick-Up(Vs)=Vn x ...	5 to 20% in step of 1%		
	Delay	500ms to 60s in step of 0.5s		
	Vs reset	0.95 to 0.99 Vs in step of 0.01		
	Mode: Trip/Alarm/Both	✓	✓	✓
Residual Voltage	Protection: Enable/Disable	✓	✓	✓
	Pick-Up (Vs)=Vn x ...	0.15/0.2/0.25/0.3/0.4		
	Delay	100ms to 5s in step of 100 ms		
	Vs Reset	0.95 to 0.99 Vs in step of 0.01		
	Mode: Trip/Alarm/Both	✓	✓	✓
Under Frequency	Protection: Enable/Disable	✓	✓	✓
	Pick-Up (Fn)	45-50 Hz in step of 0.1Hz		
	Delay	1-30sec in step of 0.1sec		
	Reset Freq	1.01 to 1.05 Fn in step of 0.01		
	Mode: Trip/Alarm/Both	✓	✓	✓
Over Frequency	Protection: Enable/Disable	✓	✓	✓
	Pick-Up (Fn)	50-55 Hz in step of 0.1 Hz		
	Delay	1-30sec in step of 0.1sec		
	Reset Freq	0.95 to 0.99 Fn in step of 0.01		
	Mode: Trip/Alarm/Both	✓	✓	✓
Rev Power	Protection: Enable/Disable	✓	✓	✓
	Pick-Up=Pn x ...	0.05 to 0.4 in step of 0.01		
	Delay	100ms-20s in step of 0.1s		
	Mode: Trip/Alarm/Both	✓	✓	✓
Earth Leakage**	Mode: Trip/Alarm/Both	✓	✓	✓
	Protection: Enable/Disable	✓	✓	✓
	Pick-Up(Ir)	0.3 to 30A in step of 0.1 A		
	Delay	100-200-300-400-500 ms		
Restricted EF**	Protection: Enable/Disable	✓	✓	✓
	I^2t: OFF/ON	✓	✓	✓
	Pick-Up(Ig)=In x ...	0.1 to 0.6 in step of 0.1		
	I^2t OFF (tg)	100 ms to 5sec in step of 0.1s		
	I^2t ON (tg)	100-200-300-400 ms		
	Pre-alarm	0.5 to 0.95 in step of 0.05 x Ig		
	Cold Pick-Up: ON/OFF	60 ms to 10s in step of 20ms		
	Mode: Trip/Alarm/Both	✓	✓	✓

✓ Available

* Requires Power Metering module for advanced Voltage based Protection

** Requires additional modules

Advanced Protection in BU -BTX 3.5/3.5H/4.5 Series

	Parameter	BU-BTX3.5*	BU-BTX3.5H	BU-BTX4.5
Leading PF	Protection: Enable/Disable	✓	✓	✓
	Pick-Up=Pf x ...	0.5 to 0.99 in step of 0.01		
	Delay	1/2/3/4/5 s		
	Mode: Trip/Alarm/Both	✓	✓	✓
Lagging PF	Protection: Enable/Disable	✓	✓	✓
	Pick-Up=Pf x ...	0.5 to 0.99 in step of 0.01		
	Delay	1/2/3/4/5 s		
	Mode: Trip/Alarm/Both	✓	✓	✓
MD Active	Protection: Enable/Disable	✓	✓	✓
	Type	Deliver/Receive		
	Pick-Up=En x ...	0.4 to 1 in step of 0.01		
	Mode: Trip/Alarm/Both	✓	✓	✓
MD Reactive	Protection: Enable/Disable	✓	✓	✓
	Type	Deliver/Receive		
	Pick-Up=En x ...	0.4 to 1 in step of 0.01		
	Mode: Trip/Alarm/Both	✓	✓	✓
MD Apparent	Protection: Enable/Disable	✓	✓	✓
	Type	Deliver/Receive		
	Pick-Up=En x ...	0.4 to 1 in step of 0.01		
	Mode: Trip/Alarm/Both	✓	✓	✓
Phase Sequence	Protection: Enable/Disable	✓	✓	✓
	Delay	100ms to 5s in step of 100ms		
	Mode: Trip/Alarm/Both	✓	✓	✓
Breaker Failure	Protection: Enable/Disable		✓	
	Delay	50ms to 2sec in step of 0.05sec		

✓ Available * Requires Power Metering module for Advanced protections

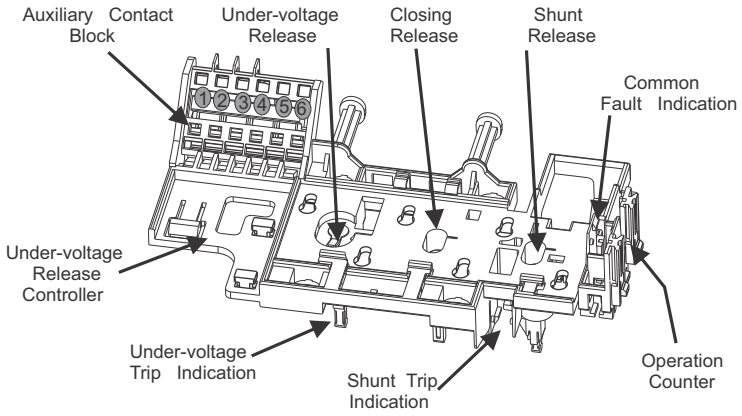
Metering Functions

Parameter	Screen abbreviation	Details	BTX 3.5	BTX3.5H	BTX4.5
Current	I	Phase, Neutral and Earth	✓	✓	✓
	I_{Δ}, IREF$^{\$}$	Earth Leakage, Restricted EF Current	✓	✓	✓
	I max	Maximum Running Current Per Phase	✓	✓	✓
	% Load	Percentage Loading Per Phase	✓	✓	✓
	Avg.I	Average Phase Current	✓	✓	✓
Voltage	V	Phase-Neutral Voltage	*	✓	✓
	Max V	Maximum Voltage Per Phase	*	✓	✓
	V12	Ph-Ph Voltage	*	✓	✓
	Max V12	Maximum Ph-Ph Voltage	*	✓	✓
	Avg. Vp-p	Average Ph-Ph Voltage	*	✓	✓
	Avg Vp-n	Average Ph-N Voltage	*	✓	✓
Frequency	F	System Frequency	*	✓	✓
Power Factor	PF	System Power Factor	*	✓	✓
Power	W	Active Power Per Phase and Total (kW)	*	✓	✓
	VAr	Reactive Power Per Phase and Total (kVar)	*	✓	✓
	VA	Apparent Power Per Phase and Total (kVA)	*	✓	✓
Energy	Wh	Active Energy Per Phase and Total (kwh)	*	✓	✓
	VArh	Reactive Energy Per Phase and Total (kVArh)	*	✓	✓
	VAh	Apparent Energy Per Phase and Total (kVAh)	*	✓	✓
Max Demand	Wh	Active Energy	*	✓	✓
	VArh	Reactive Energy	*	✓	✓
	VAh	Apparent Energy	*	✓	✓
Temperature$^{\#}$	Ø	Temperature Per Phase & Neutral (^{0}C)	✓	✓	✓
Harmonics Metering	THD, Current & Voltage components	Phase-1, 2 & 3-Total, Fundamental, THD	-	✓	✓

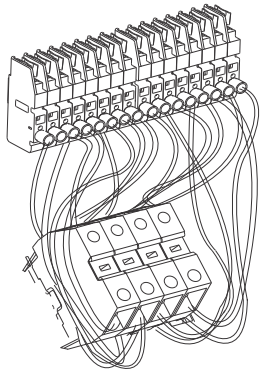
* Requires Power Metering module # Requires Temperature module
✓ Available
$ requires additional REF module

Breaker Accessories:

Modularity, the key design aspect of Ultra Power ACBs facilitates the quick fixing & removal of several breaker mounted accessories such as CR, SR, UVR, Auxiliary contact blocks & various indicating micro-switches. These accessories are located on the front top-side of breaker mechanism & have specified positions.



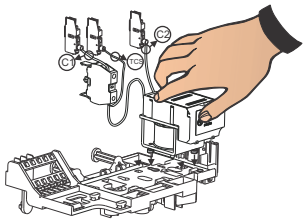
1) Auxiliary Contact Block: Auxiliary Contact Block contains the changeover switch contacts in combination of 4 units of 1NO+1NC each. Auxiliary contact block reflects the breaker ON/OFF state in control circuit.



Operational voltage (Ue)	upto 24V	110V	220/230V	400V
In (AC-12) at 50/60 Hz	10A	10A	10A	10A
In (AC-15) at 50/60 Hz	6A	6A	6A	4A

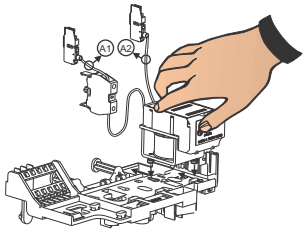
Operational voltage (Ue)	24V	40V	110V	220V
In (DC-12)	10A	8A	3.5A	1A
In (DC-13)	10A	4A	1.2A	0.4A

2) Shunt Release (SR): Shunt Release when energized opens the breaker instantaneously. Ultra Power ACBs offer general purpose Shunt Release which can reliably trip the Circuit Breaker through external trip command.



Operational voltage (Ue)	Power consumption	Operating range
110, 240, 415V AC at 50/60Hz	200VA for 0.5 sec	70-110% of Ue
24, 30, 48, 60, 110, 125, 220, 250V DC	200W for 0.5 sec	70-110% of Ue

3) Closing Release (CR): remotely closes the Circuit Breaker if the spring mechanism is already charged. Closing Releases in Ultra Power Air-circuit breakers come with inbuilt Electrical anti-pumping feature. Inbuilt electrical anti-pumping feature prevents auto-reclosing of Circuit Breaker on faults. Anti-pumping relay cancels the persistent closing signal after successful completion of the closing operation.

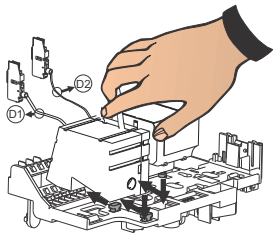


Operational voltage (Ue)	Power consumption	Operating range
110, 240, 415V AC at 50/60Hz	200VA for 0.5 sec	85-110% of Ue
24, 30, 48, 60, 110, 125, 220, 250V DC	200W for 0.5 sec	85-110% of Ue

4) Under-voltage Release + Delay Module (UVR):

The Under- voltage Release causes the Circuit Breaker to open if the operational voltage falls to a value between 35% and 70% of its rated voltage or not applied. UV Release mechanically locks the closing of breaker & it makes it impossible to close the Circuit breaker, either manually or electrically. The Circuit breaker can be closed with operation voltage of 85-110% of its rated value.

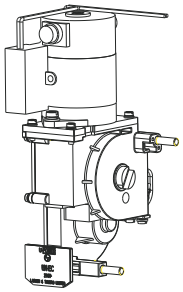
UV Release can be used for monitoring the voltage in the primary (power circuit) or secondary (control circuits) circuits or can be used for electrical interlocking scheme (for DG synchronization, paralleling of transformers etc). In order to avoid the nuisance tripping of the circuit breaker during short voltage dips, UV release comes with the UV-delay module. Operation of UVR can be delayed between 0 to 5 secs. in steps of 0-1-3-5 sec.



Type	Normal Voltage	Short-time Power Consumption	Operating Limit
UVR (Delay Setting - 0,1, 3 & 5 sec)	110, 220, 240, 415 V AC 50Hz / 60Hz	200 VA max, 3s	85 - 110%
	24, 30, 48, 110, 220 V DC	200 W max, 3s	

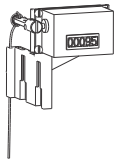
5) Electrical Charging Device (ECD):

Electrical Charging Device automatically charges the closing springs of the circuit breaker operating mechanism. After Circuit Breaker closing operation, the geared motor immediately recharges the closing spring. Thus instantaneous re-closing of the circuit breaker is possible following opening operation. The closing springs can also be charged in the event of an auxiliary power supply failure manually (using the spring-mechanism charging handle) or during maintenance work.



Operational voltage (Ue)	Power consumption	Operating range
110, 240, 415V AC at 50/60Hz	300VA for 1 sec	85-110% of Ue
24, 30, 48, 60, 110, 220, 250V DC	300W for 1 sec	85-110% of Ue

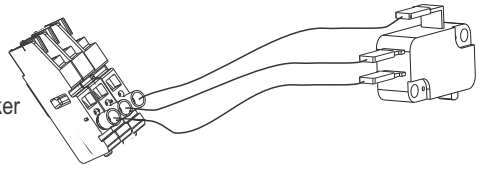
Operation Counter: The Operation Counter indicates the number of operating cycles the Circuit breaker has been subjected to and it is visible on the Circuit breaker front-facia. It is compatible with manual and electrical control functions. Counter readings serve as a guide for maintenance & inspection.



7) Micro-switches for electrical indications:

a. Common Fault Indication (CFI): CFI provides the electrical indication of circuit breaker tripping due to operation of protection & control unit.

b. Under-Voltage Release Trip Indication: Under-voltage Release Trip Indication micro-switch provides electrical indication of circuit breaker tripping with the operation of under-voltage release.



c. Shunt Release Trip Indication: Shunt Release Trip Indication micro-switch provides electrical indication of circuit breaker tripping with operation of shunt release.

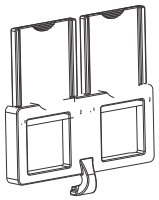
d. Spring Charging Indication: Spring Charging Indication micro-switch provides the electrical indication whether main mechanism spring is charged or not.

e. Ready-To-Close Indication (RTC): RTC takes into account all the safety parameters that are part of the control & monitoring system of electrical installation. Ultra Power ACB RTC allows the circuit breaker to close only if following conditions are met:

- ✓ Main spring is charged
- ✓ Circuit Breaker is OFF
- ✓ Shunt release is de-energized
- ✓ Under-Voltage release is energized
- ✓ All Arc-chutes are properly placed
- ✓ Mechanical trip indication lever on release is reset
- ✓ Racking shutter is closed

8) **Lockable Trip Push Button (LTPB/LOB):** LOB locks the breaker in OFF position by continuously pressing the OFF push button. Lock defeats all the positive closing signals (mechanical or electrical) coming to the breaker and thus prevents the nuisance closing of the breaker. Locking 'OFF' button (LOB) can be implemented using C-Type / R-Type of locks. The locks are designed in such a way that the keys cannot be removed out till the breaker is locked (OFF button pressed). Locking of the breaker in OFF position ensures person working on downstream equipment. Locking 'OFF' button (LOB) can be used to design the interlocking schemes with other devices in the system.

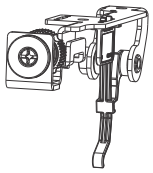
9) **Shroud for ON-OFF Button:** Transparent shroud blocks the access to the ON/OFF push-buttons used to open and close the breaker. It prevents inadvertent or unauthorized operation of the ON or OFF button. It's possible to independently lockthe ON/OFF push button with the help of ON-OFF button shroud & mechanical lock. It can be pad-locked with lock hasp of 6mm diameter.

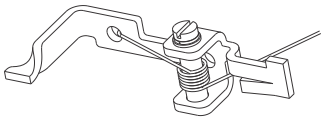


Cradle Accessories:

1) **Electrical Position Indication (EPI):** Secondary Isolating Contact (SIC) blocks on ACB cradle assembly facilitates the electrical indication for the exact position of the breaker within the cradle. 3 SIC contacts electrically indicates the Connected / Test / Disconnected positions of breaker.

2) **Door-interlock:** Door-interlock inhibits the opening of door if ACB is in Test or Service position. Door-interlock can be mounted on either side of the cradle (LHS or RHS).



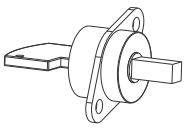


3) **Door-racking interlock:** Door-racking interlock prevents the racking-in operation of the breaker if panel door is open.

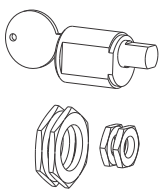
4) **Racking Shutter Pad-lock:** Racking Shutter Pad-lock inhibits the access to the racking mechanism such that racking handle cannot be inserted to rack-in/rack-out the breaker. Racking Shutter Pad-lock is an inbuilt feature with Ultra Power ACBs. It can be pad-locked with lock hasp of 6mm diameter.

5) **Safety Locks:** Any of C-Type, R-Type locks can be used for locking the ACB in "Any position"/"Isolated position" & locking "OFF" push button, for interlocking with other electrical devices in the control scheme of the system.

C-Type



R-Type

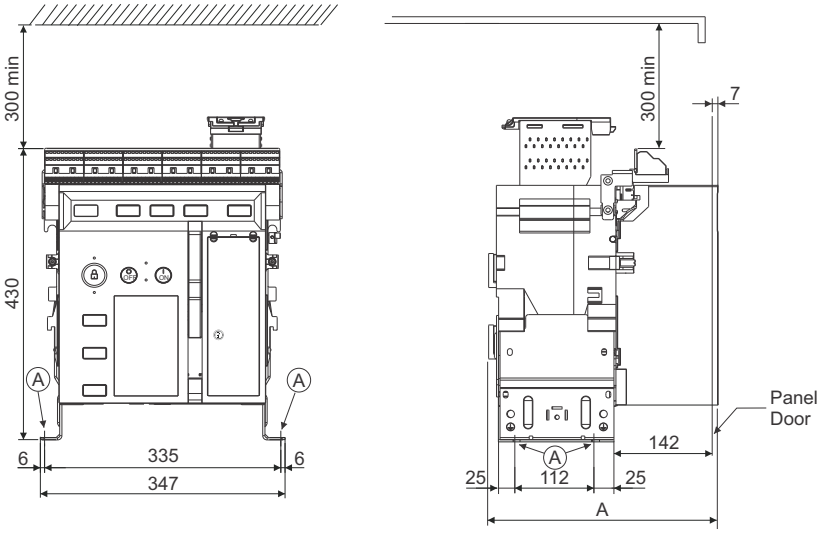


Dimensional details :

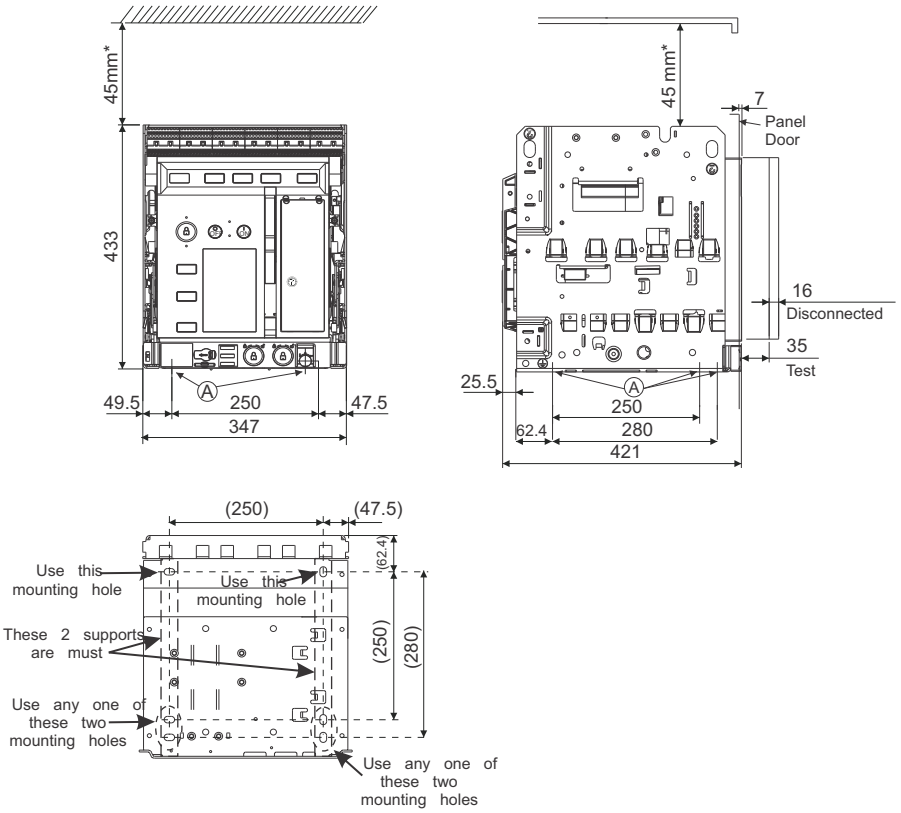
800-1600A N & 800-2500A S/H Fr.1 3P

Fixed Circuit Breaker

Frame 1	A
400-2000 N/S	326
2500 S	324
400-2500 H	324



Draw-out Circuit Breaker



All Dimensions in mm

Ⓐ Mounting holes suitable for M10 / Equivalent BS bolt

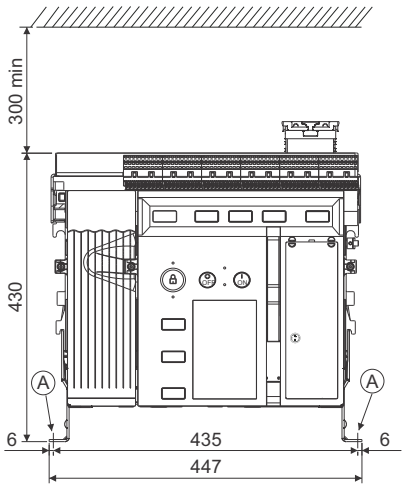
* In case of Temperature Module mounted on the Cradle this dimension should be 70mm.

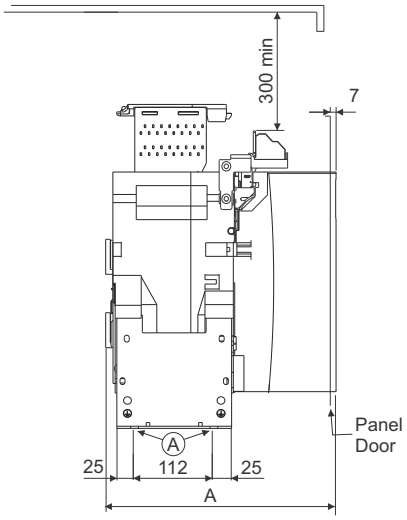
All Dimensions in mm

800-1600A N & 800-2500A S/H Fr.1 4P (100% N)

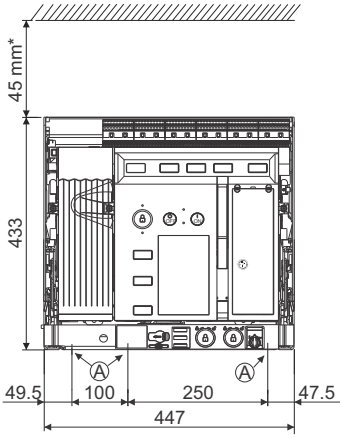
Fixed Circuit Breaker

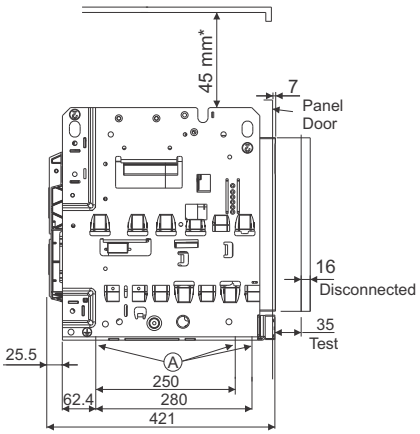
Frame 1	A
400-2000 N/S	326
2500 S	324
400-2500 H	324

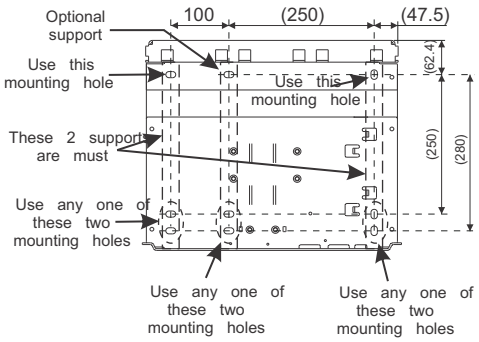




Draw-out Circuit Breaker







All Dimensions in mm

Ⓐ Mounting holes suitable for M10 / Equivalent BS bolt

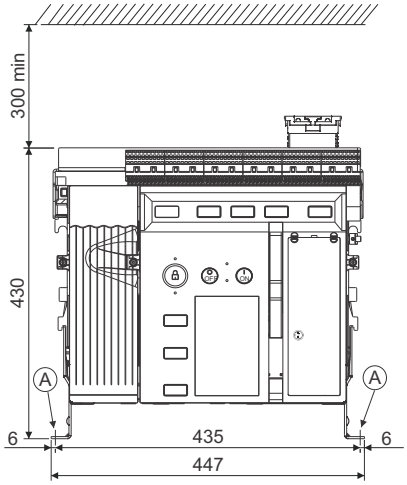
* In case of Temperature Module mounted on the Cradle this dimension should be 70mm.

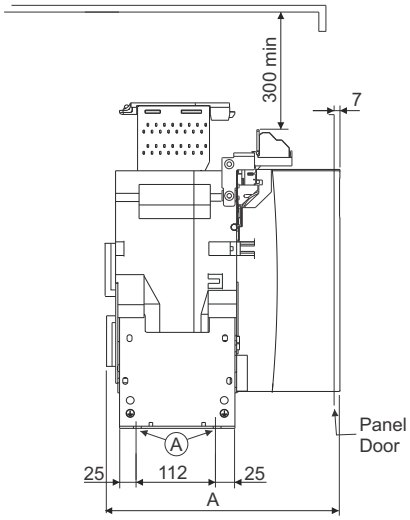
All Dimensions in mm

2500-3200A N & 2500-4000A S/H Fr.2 3P

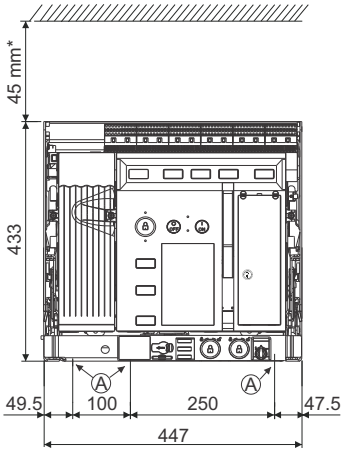
Fixed Circuit Breaker

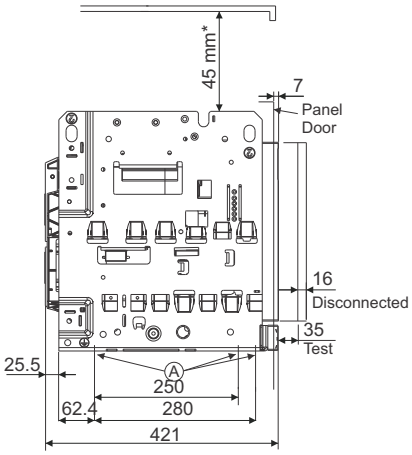
Frame 2	A
400-2500 N/S	326
3200 N/S	324
400-3200 H	324
4000 S/H	324

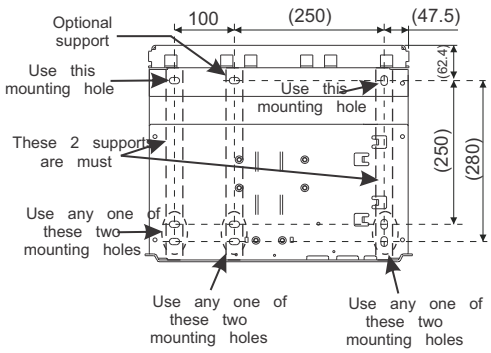




Draw-out Circuit Breaker







All Dimensions in mm

Ⓐ Mounting holes suitable for M10 / Equivalent BS bolt

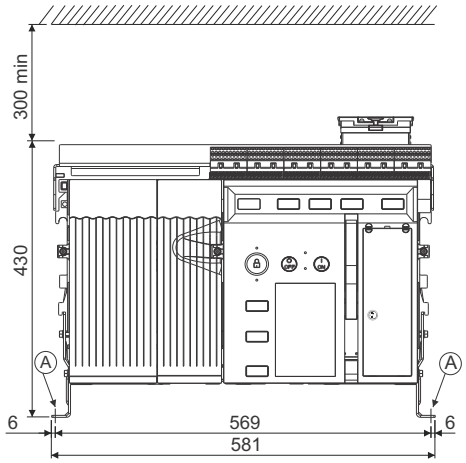
* In case of Temperature Module mounted on the Cradle this dimension should be 70mm.

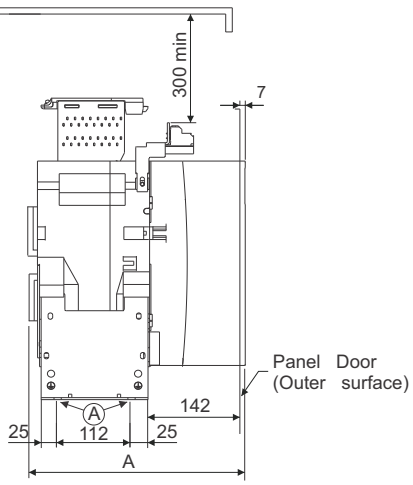
All Dimensions in mm

2500-3200A N & 2500-4000A S/H Fr .2 4P (100% N)

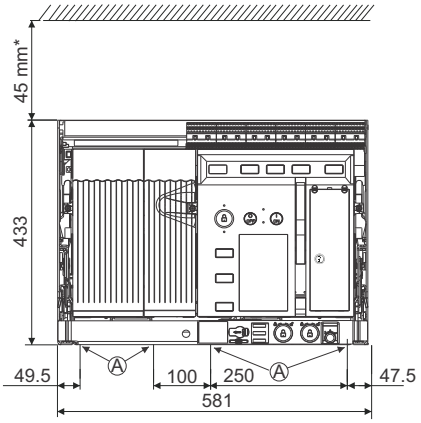
Fixed Circuit Breaker

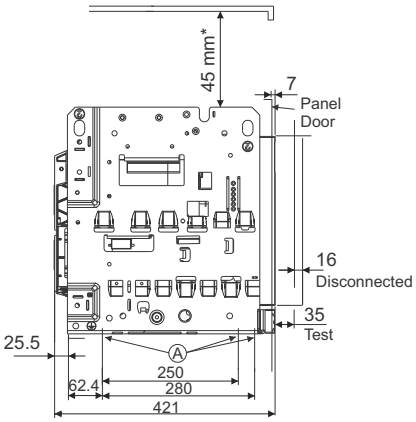
Frame 2	A
400-2500 N/S	326
3200 N/S	324
400-3200 H	324
4000 S/H	324

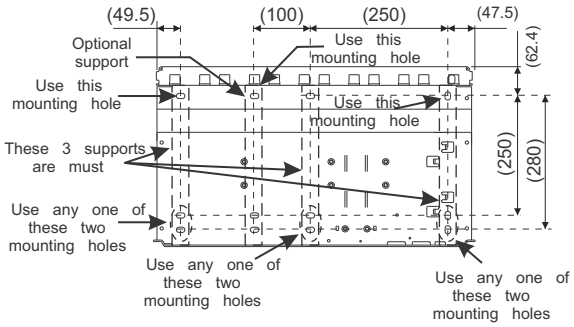




Draw-out Circuit Breaker







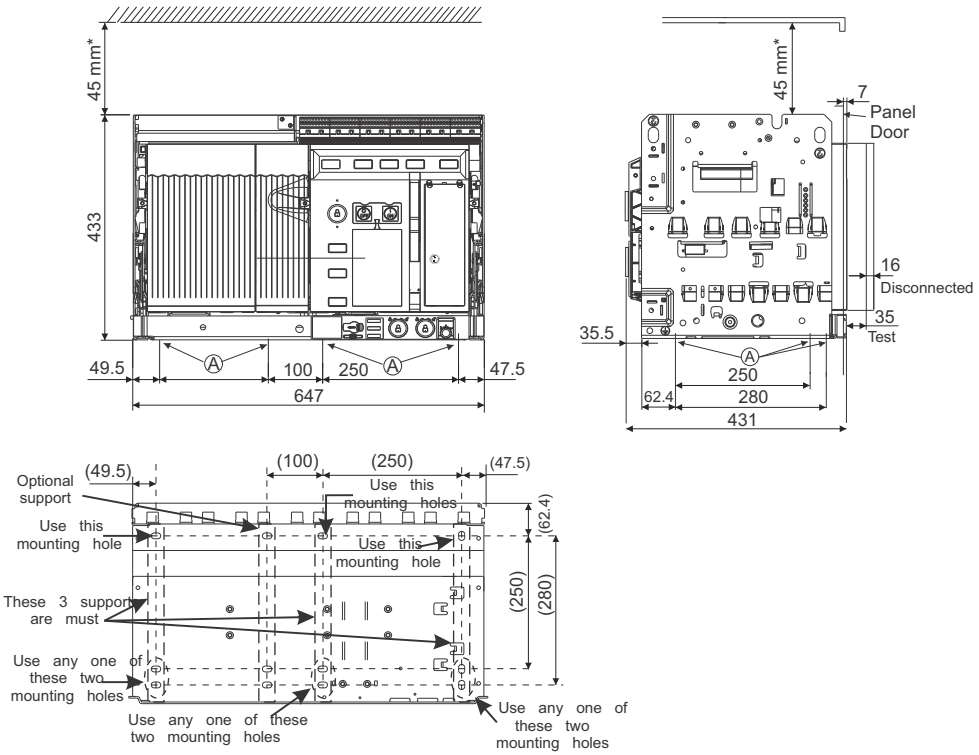
All Dimensions in mm

Ⓐ Mounting holes suitable for M10 / Equivalent BS bolt

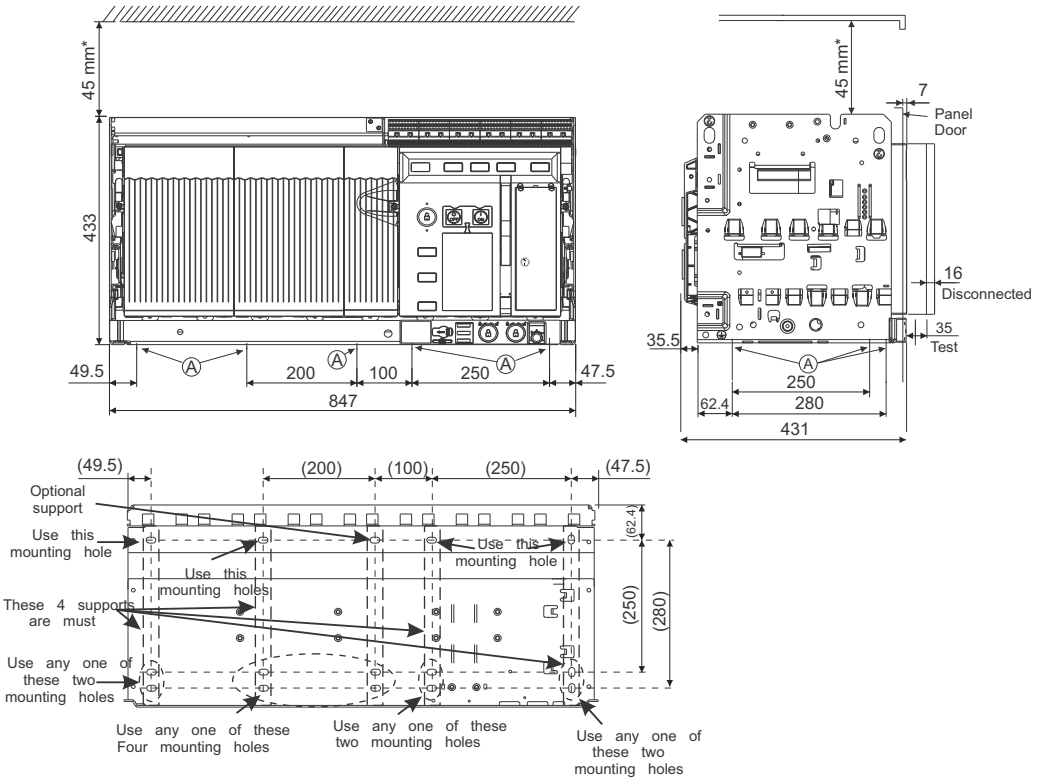
* In case of Temperature Module mounted on the Cradle this dimension should be 70mm.

All Dimensions in mm

5000A V Fr.3 3P
Draw-out Circuit Breaker



5000A V Fr.3 4P (100% N)
Draw-out Circuit Breaker



All Dimensions in mm

Ⓐ Mounting holes suitable for M10 / Equivalent BS bolt

* In case of Temperature Module mounted on the Cradle this dimension should be 70mm.

All Dimensions in mm

- Power Control Products
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Babylon Capital, Near Oswal
Petrol Pump, VIP Chowk,
G.E. Road, Raipur - 492 006
Tel. : 0771- 4045053
E-mail : raipur@bchindia.com

Trichy
2B, Kannagi Street,
Ayyappa Nagar, K.K.Nagar
Trichy - 620 021, Tamilnadu
Tel.: 0431-4040497
E-mail.: trichy@bchindia.com

Vadodara
301, Third Floor, "Florence Classic",
10, Ashapuri Co-Op. Hsg. Soc. Ltd., Opp. VUDA Housing,
Near Cow Circle, Akota, Vadodara - 390 020
Tel. : 0265-2345068/2345069
Telefax : 0265-2345068,
E-mail : vadodara@bchindia.com

Other Branch Locations

Cochin : cochin@bchindia.com, **Guwahati** : guwahati@bchindia.com, **Vishakapatnam** : vizag@bchindia.com, **Surat** : surat@bchindia.com

Resident Engineer Locations

Anantapur	Kanpur	Nashik	Salem	Yamunanagar
Bhopal	Katni	Patna	Siliguri	
Calicut	Karimnagar	Puducherry	Surat	
Gurgaon	Kota	Rajkot	Tirunelveli	
Jalandhar	Midnapur	Ranchi	Udaipur	
Jalgaon	Muzaffarnagar	Rourkela	Vapi	
Jodhpur	Nagpur	Rudrapur	Vijayawada	

Switchgearcontrolgear/ACB-Ultrapower/Rev.1.0/December2021