

Armour ACBs & MCCBs

Life Saving Protection



Enriching life by ensuring safe and efficient use of electricity. It is through this vision that Indo Asian has become a renowned company specializing in manufacturing and marketing a wide range of Low Voltage Switchgear Products. Indo Asian products provide efficient distribution, protection, control and conservation of electrical energy.



The Armour range of Indo Asian consisting of Air Circuit Breakers (ACBs) & Moulded Case Circuit Breakers (MCCBs) ensure that your electrical distribution system is protected against deadly fault conditions.



Indo Asian Armour ACBs come with a whole host of innovative features like moulded case design, high level endurance, microprocessor based trip unit and in-built test facility. The Armour MCCBs are compact, user friendly & efficient in protection and are available in both fix & adjustable setting releases. Thus, Armour ACBs & MCCBs offer a large variety of solutions for different levels of installation as per customer's need.

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Armour ACBs



INA1 - ACB Range



Frame Size	Breaking Capacity @415V	Rating Amp.	Version
INA1-2000	Icu=80kA Ics=50kA Icw=50kA 1s	630-2000	3P/4P
INA1-4000	Icu=80kA Ics=65kA Icw=65kA 1s	2000-4000	3P/4P*
INA1-6300	Icu=120kA Ics=100kA Icw=100kA 1s	4000-6300	3P/4P**

* In 4000A, only 3 Pole

** In 4000A, only 4 Pole and In 6300A only 3 Pole



Salient Features

Intelligent Technology

- The new IndoAsian entire ACB range is equipped with microprocessor based control units. The latest technology enables high speed of response, small size of memories and advances in miniaturisation, making trip unit evolve into circuit breaker units offering increasingly powerful function.

Easy Installation

- With optimised sizes, the IndoAsian ACB range simplifies the design of switchboards and standardises the installation of devices.

Safety

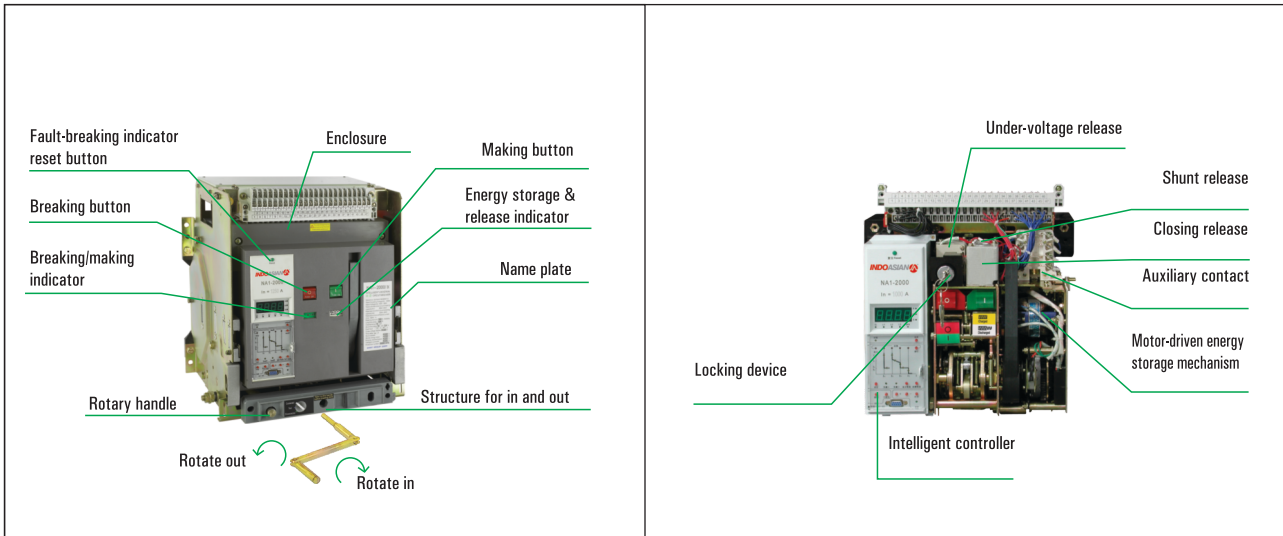
- Protection functions are separate from the measurement functions and are managed by an ASIC electronic component. This independence guarantees immunity from conducted or radiated disturbances and ensures a high degree of reliability.

Integration and Optimization

- IndoAsian INA1 ACB can be integrated in a general supervision system to optimize installation, operation and maintenance.



Structure



Characteristics

■ **Application scope**

□ INA1 series air circuit breaker is suitable for the circuit of AC 50Hz/60Hz with rated service voltage 415V, 690V and rated service current up to 6300A. It is mainly used to distribute electric energy and protect circuits and electric equipment against over-load, short-circuit and ground fault. With intelligence and selective protection functions, the breaker can improve the reliability of power supply, and avoid unnecessary power failure. The breaker is applicable for power stations, factories, mines (for 690V) and modern high-buildings, especially for the distribution system of intelligentized building.

■ **Standard:** IEC 60947-2

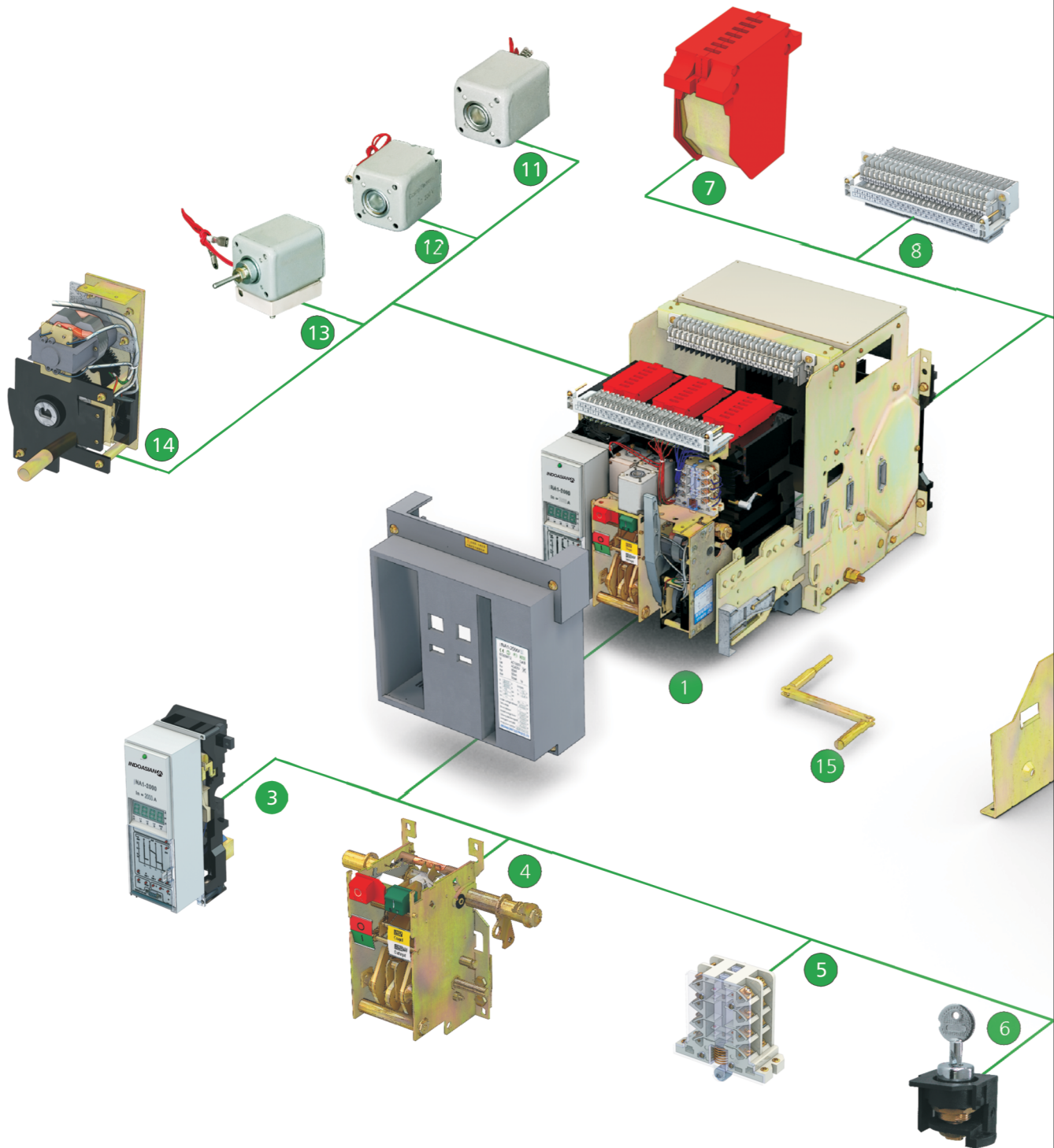
■ **Operation Conditions**

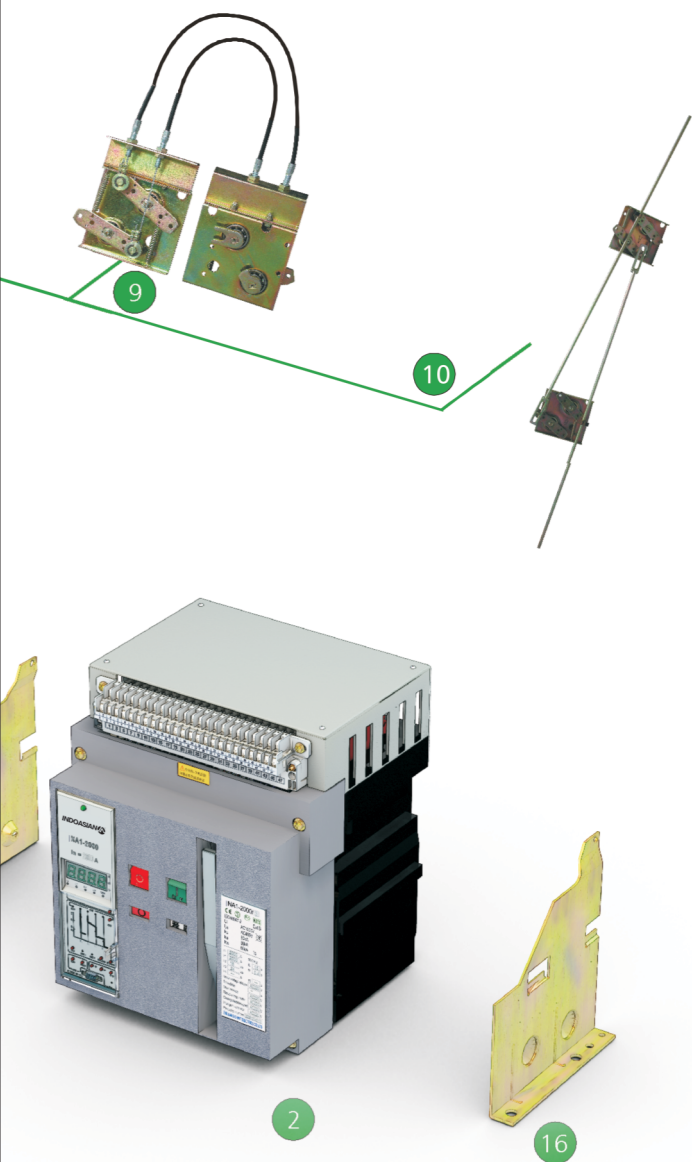
- Temperature Condition: -5°C ~ 40°C; the average value within 24h shall not exceed + 35°C(special situation excluded);
- Altitude: ≤2000m;
- Pollution Degree: Grade 3;
- At mounting site, relative humidity not exceed 50% at the max temperature of +40°C, higher relative humidity is allowable under lower temperature, RH could be 90% at +20°C, special measures should be taken to occurrence of dews;

Note: Without the intelligent controller, the breaker functions as a switch-disconnector.

ARMOUR PROTECTION POINT

- 690V Operation - suitable for use in mines
- $I_{cu} > = I_{cs} = I_{cw}$ (1 Sec.) = 50kA to 120kA @ 415V AC





INA1 Air Circuit Breaker

- 1 Drawout type
- 2 Fixed type
- 3 Intelligent controller
- 4 Operating mechanism
- 5 Auxiliary contact
- 6 Locking-device
- 7 Arcing chamber
- 8 Secondary connecting part
- 9 Wire-cable mechanical interlock
- 10 Connecting-rod type mechanical interlock
- 11 Shunt electromagnet
- 12 Closing release
- 13 Under-voltage release
- 14 Motor-driven energy-storage mechanism
- 15 Rotary handle
- 16 Fixed plate

INA1-2000 to INA1-6300

Common Characteristics		
No. of Poles		3P / 4P
Rated Insulation Voltage (V)	Ui	1000
Impulse Withstand Voltage (kV)	Uimp	12
Rated Operational Voltage (V)	Ue	415, 690
Suitability for isolation	IEC 60947-2	yes
Degree of Pollution		Grade 3
Utilization category		B

Circuit breaker characteristics as per IEC 60947-2		INA1-2000			
Rated Current (A)	at 40°C	630	800	1000	
Rating of N-Pole (100% as Default)		50%In , 100%In			
Rated Ultimate short circuit breaking capacity, Icu	415V AC	80kA	80kA	80kA	
	690V AC	50kA	50kA	50kA	
Rated service short circuit breaking capacity, Ics	415V AC	50kA	50kA	50kA	
	690V AC	40kA	40kA	40kA	
Rated short-time withstand current, Icw (for 1Sec.)	415V AC	50kA	50kA	50kA	
	690V AC	40kA	40kA	40kA	
Disconnection Time	ms	23 ~ 32	23 ~ 32	23 ~ 32	
Connection Pattern		Vertical/Horizontal			

Mechanical and electrical durability as per IEC 60947-2					
Mechanical	with Maint.	20,000	20,000	20,000	
	W/O Maint.	10,000	10,000	10,000	
Electrical	at 415V AC	5000	5000	5000	

Weight					
Draw-out	3P	68	70	70	
	4P	77	80	80	
Fixed	3P	42	43	43	
	4P	51	52	52	



INA1-2000



INA1-4000



INA1-6300

			INA1-4000				INA1-6300		
1250	1600	2000	2000	2500	3200	4000 (3P)	4000	5000	6300 (3P)
			50%In , 100%In				50%In , 100%In		
80kA	80kA	80kA	80kA	80kA	80kA	80kA	120kA	120kA	120kA
50kA	50kA	50kA	65kA	65kA	65kA	65kA	85kA	85kA	85kA
50kA	50kA	50kA	65kA	65kA	65kA	65kA	100kA	100kA	100kA
40kA	40kA	40kA	65kA	65kA	65kA	65kA	75kA	75kA	75kA
50kA	50kA	50kA	65kA	65kA	65kA	65kA	100kA	100kA	100kA
40kA	40kA	40kA	50kA	50kA	50kA	50kA	75kA	75kA	75kA
23 ~ 32	23 ~ 32	23 ~ 32	23 ~ 32	23 ~ 32	23 ~ 32	23 ~ 32	23 ~ 32	23 ~ 32	23 ~ 32
			Vertical/Horizontal				Vertical/Horizontal		
20,000	20,000	20,000	20,000	20,000	20,000	20,000	10,000	10,000	10,000
10,000	10,000	10,000	10,000	10,000	10,000	10,000	5,000	5,000	5,000
5000	5000	5000	5000	5000	5000	5000	2500	2500	2500
70	70	74	94.5	94.5	94.5	119	210	210	233
80	80	81	117	117	117		233	233	
43	43	45	52.5	52.5	52.5				
52	52	53	65.5	65.5	65.5				

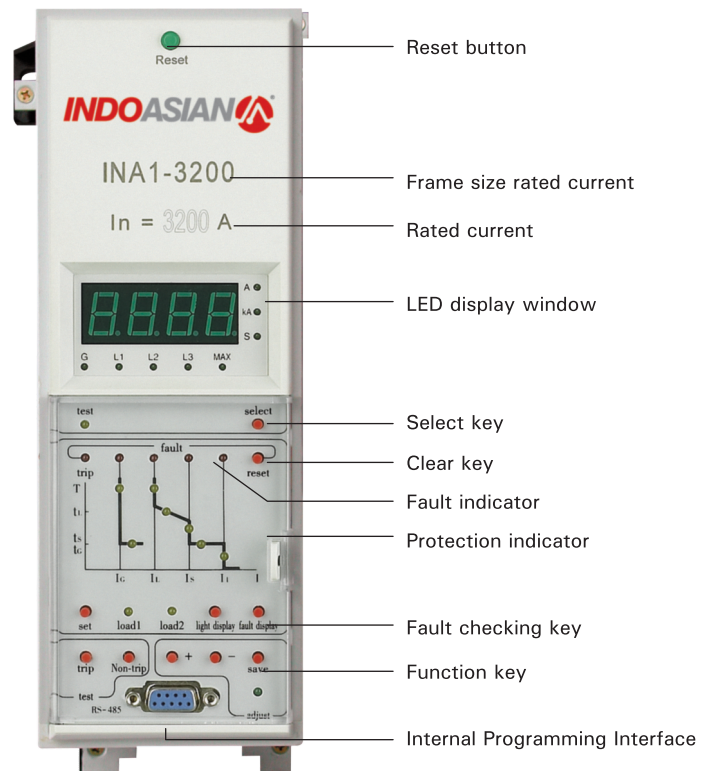
M-Type

- The intelligent controller of INA1-2000, 3200, 4000, 6300
- The standard M- type intelligent controller (INA1-2000, 3200, 4000, 6300) is the core part of the INA1 Air Circuit Breaker to protect the electric circuit and the power supply against the dangers such as overload, short circuit and single-phase earthing fault. The controller adopts a highly-integrated and high-performance digital signal processor that features power functions and reliable performance to perform real-time processing to the signal so as to achieve various protection and numerous auxiliary functions.

ARMOUR PROTECTION POINT

Sensing through -

- Rogowsky CT - To see true fault level
- In-Built release testing facility



Appearance and panel illustration

Types of Protection & Setting Range

Overload long time-delay protection

Current Ratings Range(Ir1)	Error	Current	Action Time					Time Error	
(0.4 ~ 1)In	±10%	≤1.05Ir1	< 2h Non-trip						
		> 1.30Ir1	< 1h trip						
		1.51Ir1(setting time)	15	30	60	120	240	480	±10%
		2.0Ir1	8.4	16.9	33.7	67.5	135	270	±10%
Phase N Overload and Over-Current Characteristic			100% or 50% (Applicable to 3P+N or 4P)						

Short-circuit short-delay protection

Current Ratings Range(Ir2)	Error	Current	Action Time				Time Error
(1 ~ 15)Ir1 + OFF (OFF Position)	±10%	≤0.9Ir2	Non-trip				
		> 1.10Ir2	Delayed-trip				
		Time setting (ts)	0.1	0.2	0.3	0.4	±15%
		Returnable Time	0.06	0.14	0.23	0.35	±15%

Short circuit instantaneous protection

Current Ratings Range(Ir3)	Error	Current	Action Characteristic
1.0 In ~ 50kA/ 75kA/100kA + OFF (OFF Position)	±15%	≤0.85Ir3	Non-trip
		> 1.15Ir3	trip

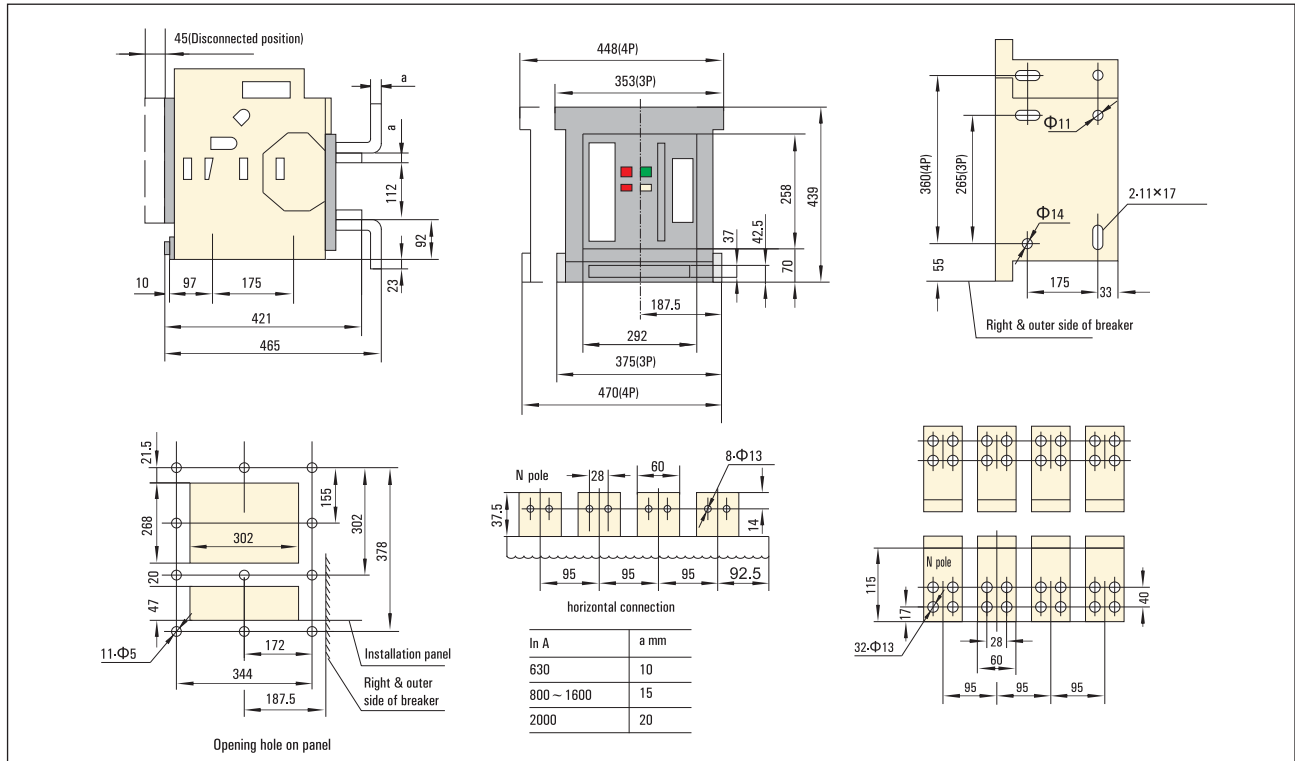
Note: When the controller is of structure I (Inm=2000A), the instantaneous protection setting is 1.0 In ~ 50 KA + OFF; when the controller is of structure II (Inm=3200A) and structure III (Inm=6300A), the instantaneous protection setting is 1.0 In ~ 75 KA + OFF; the special order can achieve 100kA + OFF.

Single phase earth fault protection technical data:

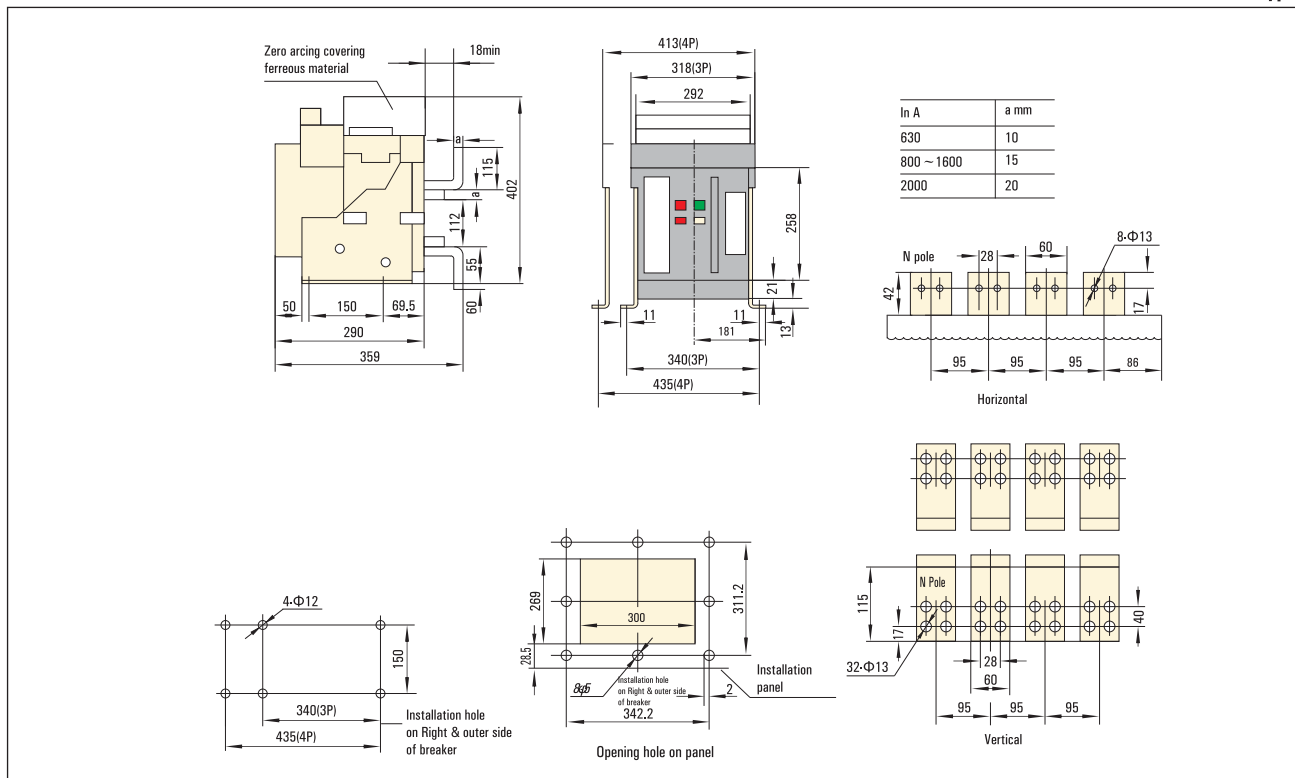
Current Ratings Range(Ir4)	Error	Current	Action Time				Time Error
(0.2 ~ 0.8)In + OFF (OFF position) (NA1-2000, min160A)	±10%	≤0.8 Ir4	Non-tripping				
		> 1.0 Ir4	Tripping				
		Setting time (Tg)	0.1	0.2	0.3	0.4	±15%
		Returnable time	0.06	0.14	0.23	0.35	±15%

Dimensions and Connection

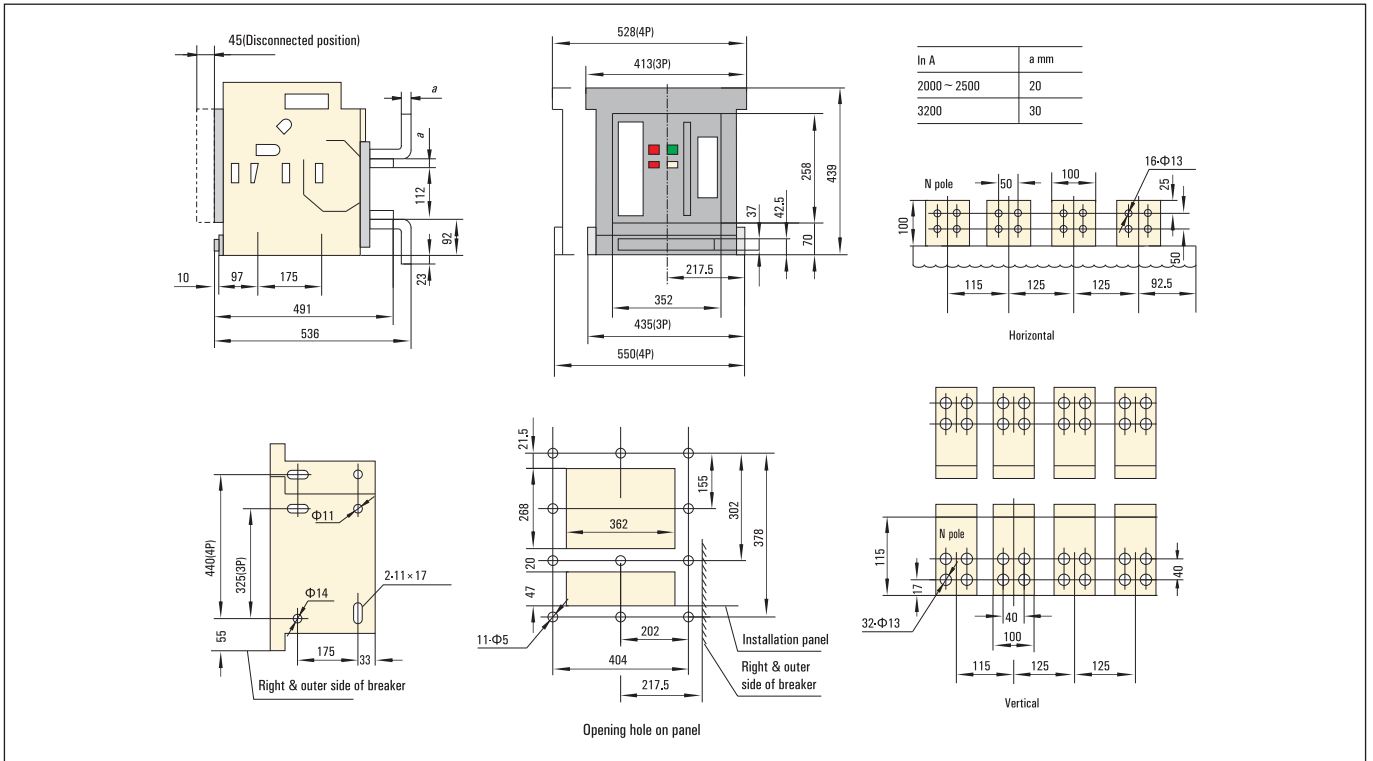
INA1-2000 Drawout-type



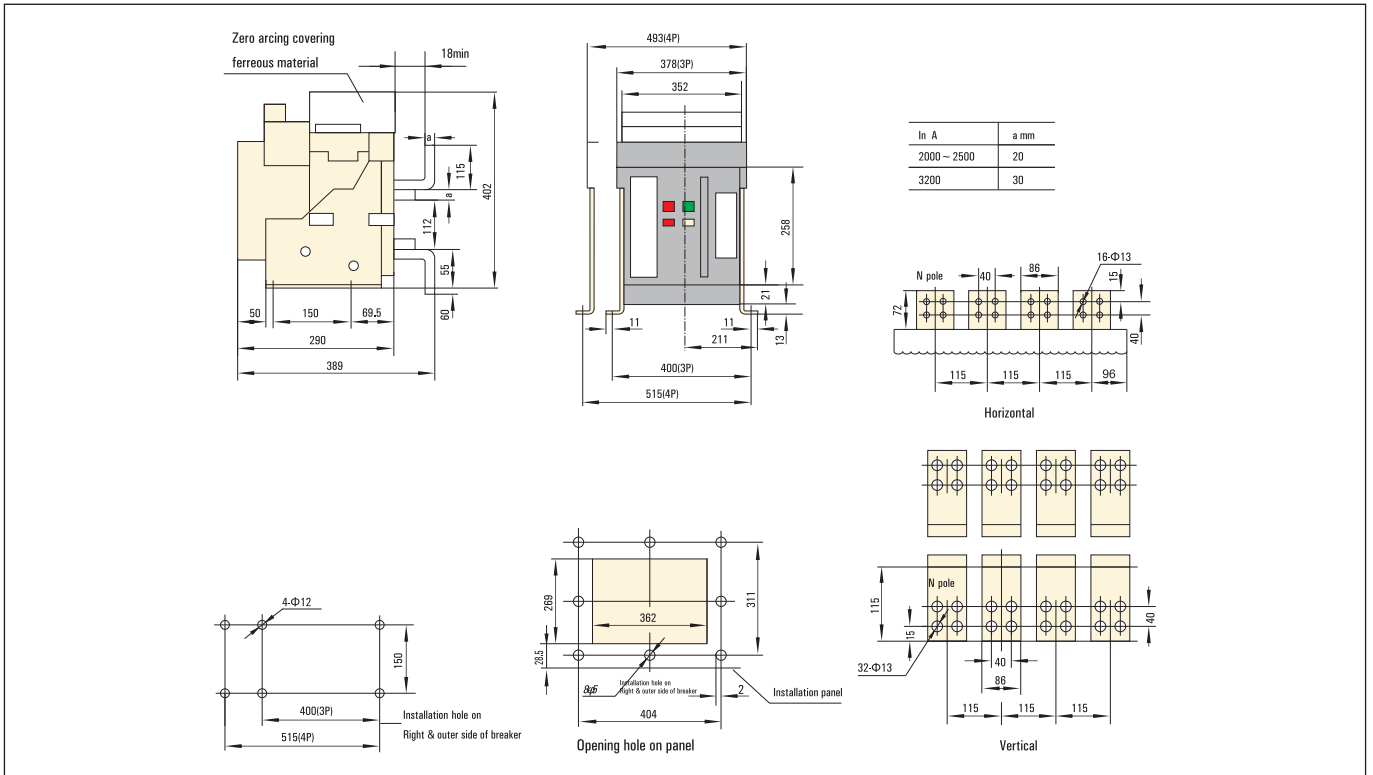
INA1-2000 Fixed-type



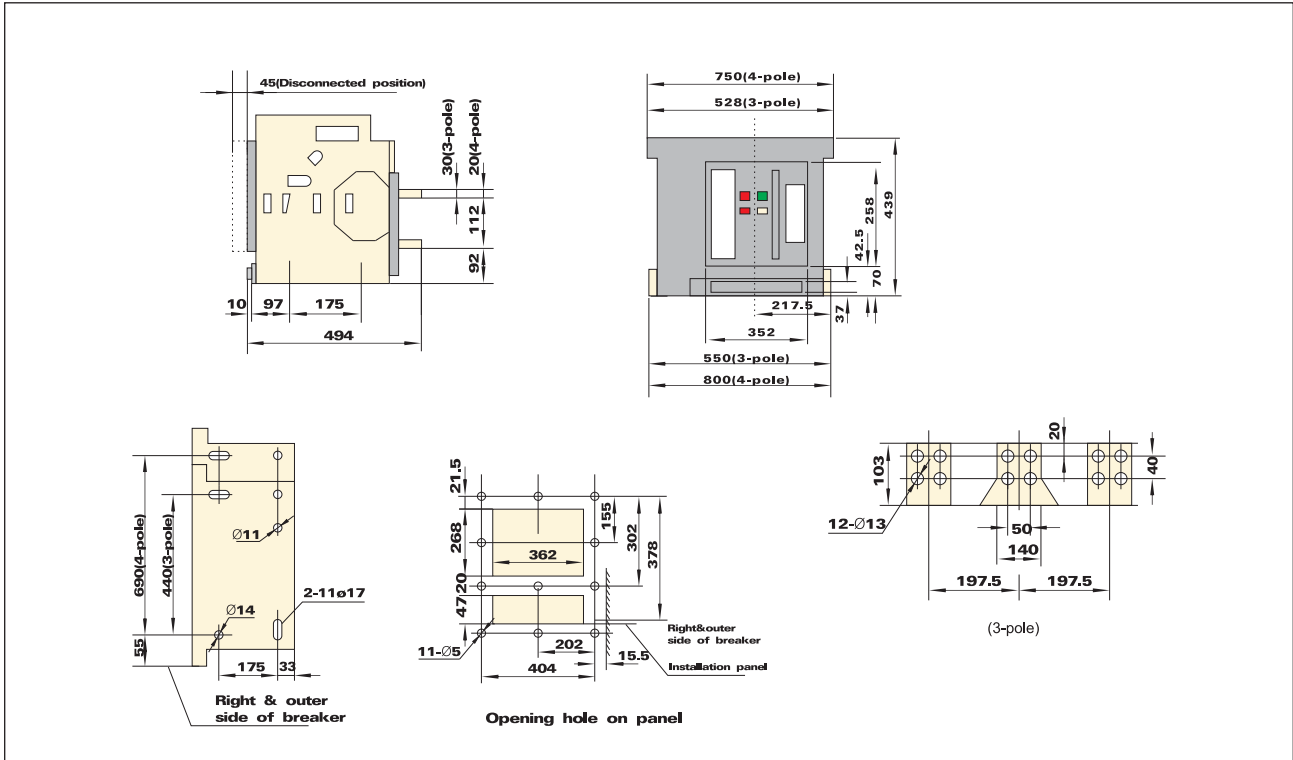
INA1-3200 Drawout-type



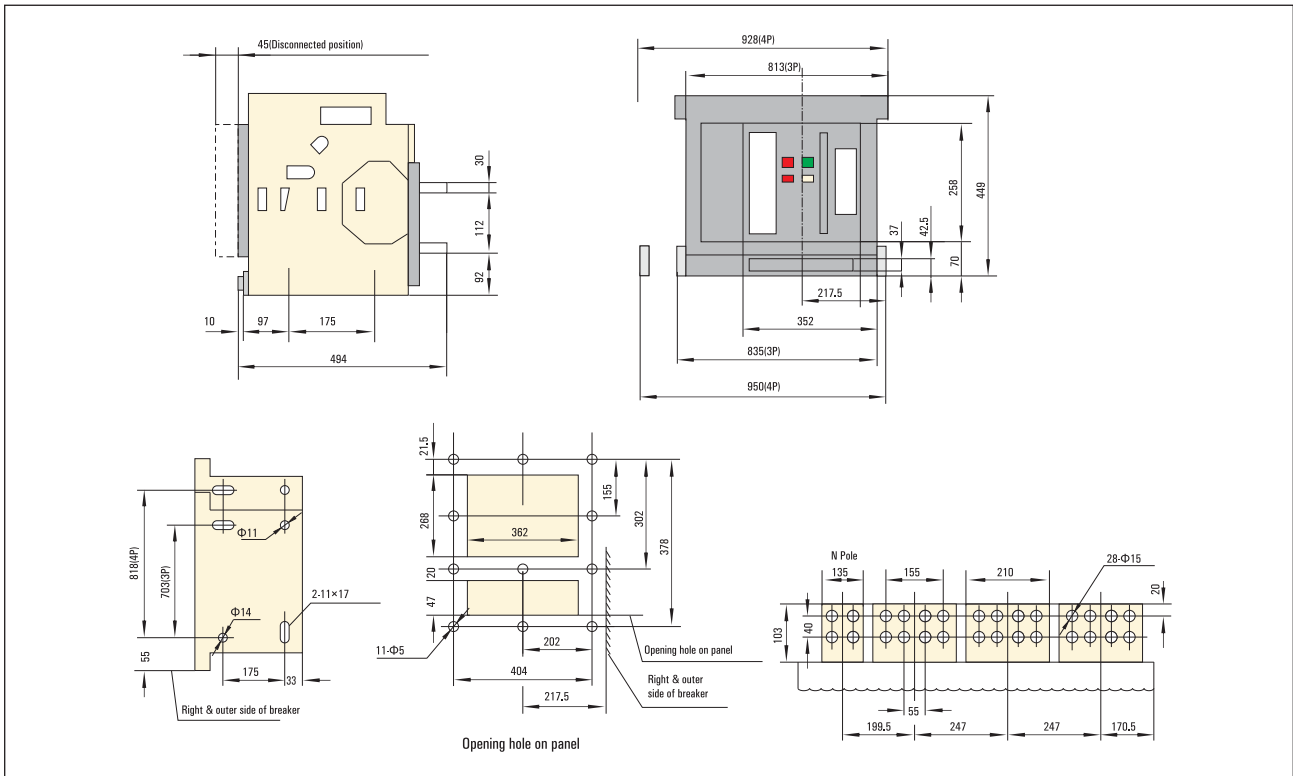
INA1-3200 Fixed-type



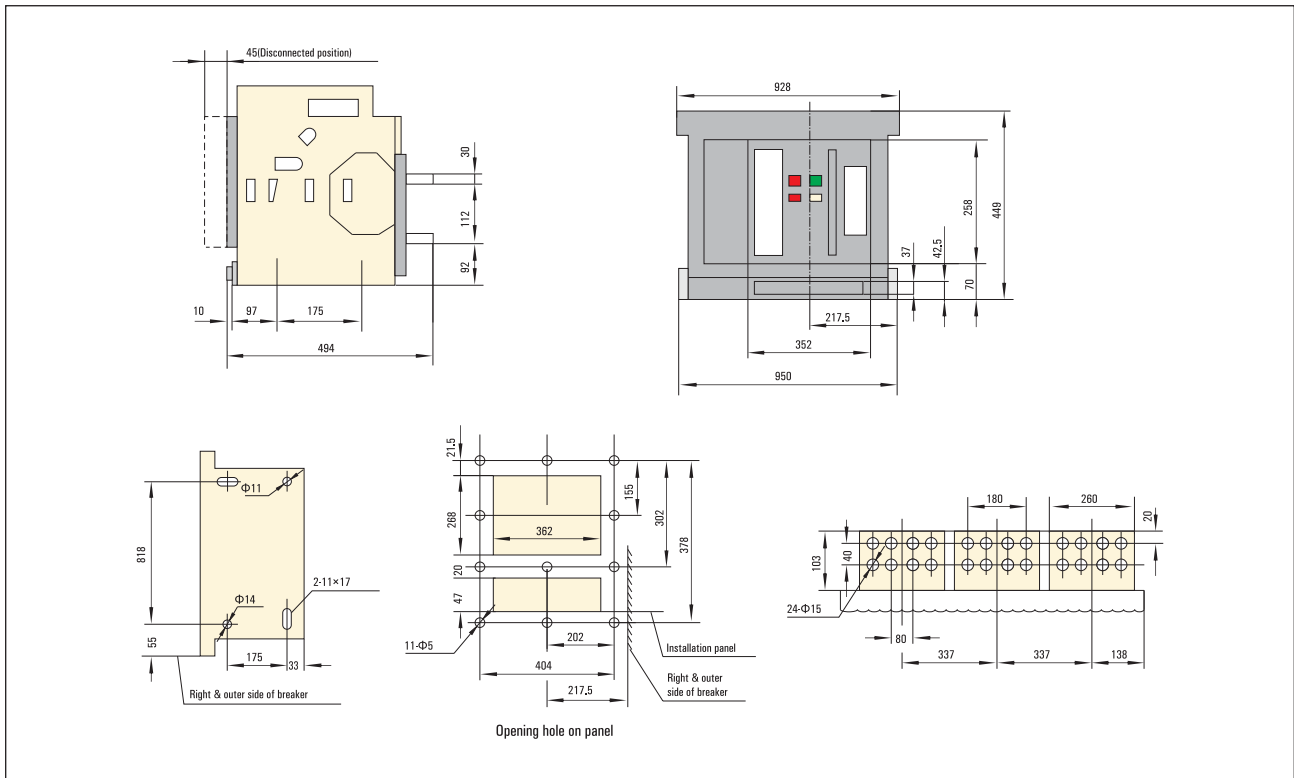
INA1-4000 Drawout-type



INA1-6300 (In=4000A,5000A) Drawout-type



INA1-6300 (In=6300A) Drawout-type (3P)





Armour MCCBs



Fixed Release - V-Tec



Adjustable Release - X-Tec

Fixed Thermal Magnetic Release - V-Tec

COMPLIANCE TO STANDARD

- IEC 60947-2
- **MCCB - Range**
 - 25A - 800A (Fixed Version)
 - No. of Frame Size - 5
 - Breaking Capacity 10/16/25/35/50 kA
 - $I_{cs} = 50\% I_{cu}$
 - No. of Poles - DP/TP/FP (FP without neutral protection)
- **Accessories / Auxiliary**
 - Rotary Handle - Extended
 - Shunt Trip
 - Alarm Contact
 - Auxiliary Contact
 - Under Voltage Trip
- **Special Features :**
 - Spreaders suitable for Al. / Cu.
 - Protection - Fixed Thermal Overload
 - Magnetic - 10 I_n



Technical Data

V-Tec Circuit Breaker Thermal Magnetic Release (Fixed)		N2-125							
5 Frames		Frame 1							
Electric characteristics as per IEC 60947-2									
Rated current(A)	I_n at 40°C	25, 32, 40, 50, 63, 80, 100, 125							
Rated insulation voltage (V)	U_i	800							
Rated impulse withstand voltage (kV)	U_{imp}	8							
Rated operational voltage (V)	U_e AC 50/60Hz	415							
Number of poles		2	3/4				2		
Breaking capacity code		D	C*	D	S	M	H	D	
Rated ultimate short-circuit breaking capacity (kA RMS) I_{cu}	AC 380V/400V/415V	16	10	16	25	35	50	16	
	AC 690V	8	-	3	3	8	8	8	
Rated service breaking capacity $I_{cs} = (\%I_{cu})$		50							
Suitability for isolation		■							
Utilization category		A							
Protection		Thermal-magnetic							
Over-load protection (Fixed-1x I_n)		■							
Short-circuit protection (Fixed- 10x I_n)		■							
Mounting and connection									
Fixed	Front connection	■							
	Rear connection	■							
Mounting and connection accessories									
Front connection plate (Spreader)		■							
Rear connection plate		■							
Manual Rotary Operated Handle		■							
Motor-driven mechanism		■							
Shunt and under-voltage release		■							
Auxiliary and alarm contact		■							
Pad locking system		■							
Terminal covers		■							
Interphase barrier		■							

* On request only 100A 3P
■ Available



ARMOUR PROTECTION POINT

Positive Isolation

ALARM CONTACT :

- Gives tripping indication once the MCCB trips, through O/L, S/C
- It does not act when the MCCB is at normal open close status

AUXILIARY CONTACT :

- Used for remote signaling and control purposes
- It indicates the breaker status - whether open or closed

UNDER VOLTAGE TRIP :

- The release act to switch off the breaker, when voltage decreases to 70-35% of rated voltage

SHUNT TRIP :

- Used for remote tripping

ROTARY HANDLE OPERATION MECHANISM :

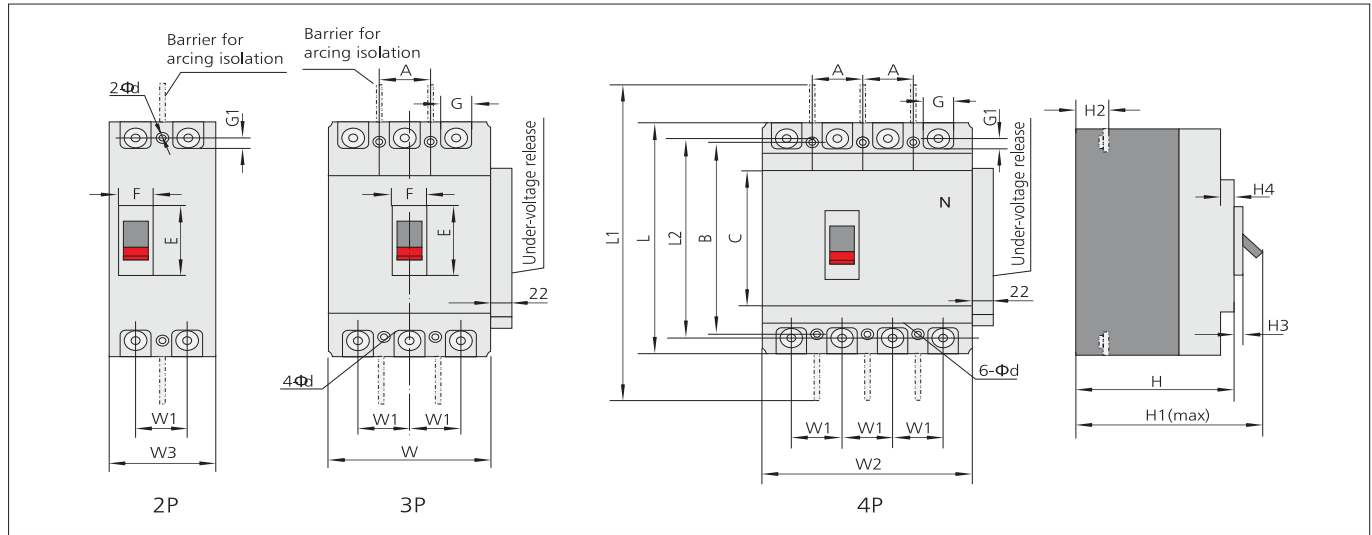
- It facilitates operation of MCCB when panel door is closed and also serves as switching position indicator - ON, OFF or trip
- Pad - locking is possible (The diameter of Padlock should be 5-8 mm)

MECHANICAL INTERLOCKING :

- It is used for mechanical interlocking of two MCCBs with toggle in the same distribution panel
- This is available with N2-N5 frames

N3-250					N4-400			N5-630		N6-800
Frame 2					Frame 3			Frame 4		Frame 5
160, 180, 200, 225, 250					315, 350, 400			500, 630		700, 800
800					800			800		500
8					8			8		8
415					415			415		415
3/4					3/4			3/4		3/4
D	S	M	H		S	M	H	M	H	H
16	25	35	50		25	35	50	35	50	50
5	5	8	8		10	10	12	12	13	35
50					50			50		50
■					■			■		■
A					A			A		A
Thermal-magnetic					Thermal-magnetic			Thermal-magnetic		Thermal-magnetic
■					■			■		■
■					■			■		■
■					■			■		■
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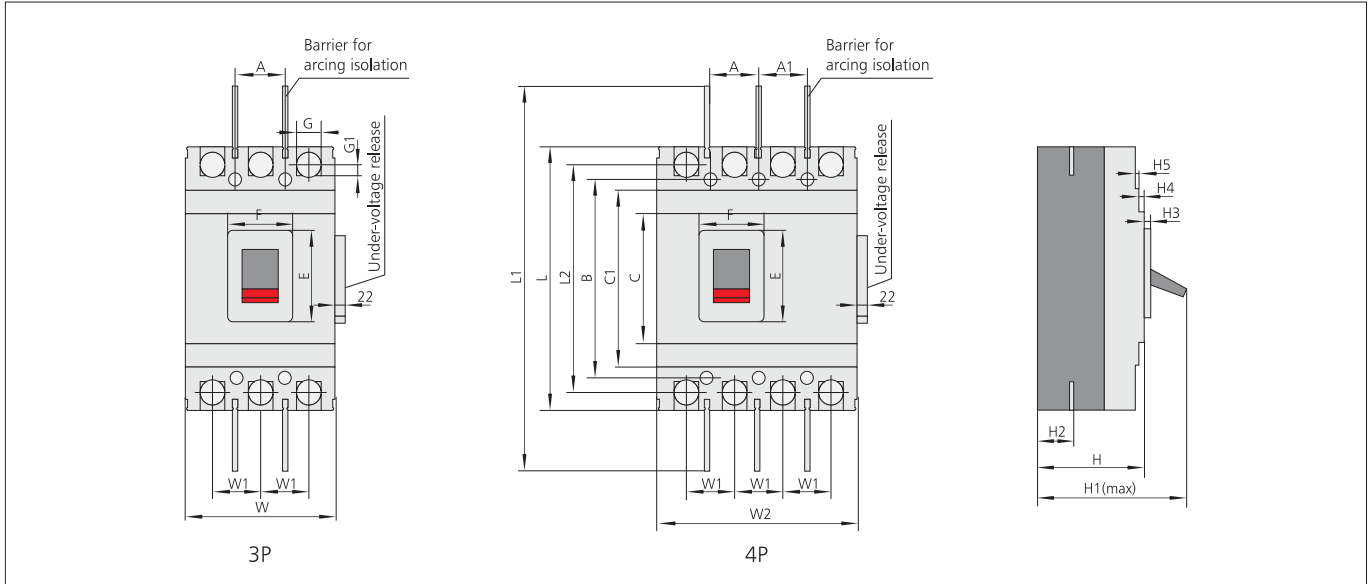
V-TEC 125, 250 (FIXED RELEASE)



(mm)

PARAMETERS		125A 16kA 2POLE	125A 16/25kA 3POLE	125A 35/50kA 3POLE	125A 16/25/35/50kA 4POLE	250A 16/25kA 3POLE	250A 35/50kA 3POLE	250A 16/25/35/50kA 4POLE
OVERALL DIMENSION	C	84	84	84	84	102	102	102
	E	50	50	50	50	50	50	50
	F	22	22	22	22	22	22	22
	G	17.5	17.5	17.5	17.5	23	23	23
	G1	7.5	7.5	7.5	7.5	11.5	11.5	11.5
	H	86	68	86	86	86	103	103
	H1	102	86	102	102	110	127	127
	H2	24	24	24	24	24	24	24
	H3	4	4	4	4	4	4	4
	H4	7	7	7	7	5	5	5
	L	155	155	155	155	165	165	165
	L1	255	255	255	255	360	360	360
	L2	136	136	136	136	144	144	144
	W	90	90	90	90	105	105	105
	W1	30	30	30	30	35	35	35
W2	-	-	-	120	-	-	140	
W3	64.4	-	-	-	-	-	-	
MOUNTING DIMENSION	A	-	30	30	30	35	35	35
	B	129	129	129	129	126	126	126
	ød	4.5	4.5	4.5	4.5	5.5	5.5	5.5

V-TEC 400, 630, 800, 1250 (FIXED RELEASE)



(mm)

PARAMETERS		400A 35kA 3POLE	400A 50kA 3POLE	400A 35/50kA 4POLE	630A 35kA 3POLE	630A 50kA 3POLE	630A 35/50kA 4POLE	800A 50kA 3POLE	800A 50kA 4POLE
OVERALL DIMENSION	C	102	129	129	134	134	134	154	135.5
	C1	179	175	175	184	184	184	204	206.5
	E	90	89	89	89	89	89	106	91
	F	62	65	65	65	65	65	66	52
	G	28	30.5	30.5	40	44	44	44	45
	G1	13	10.5	10.5	13.5	13.5	13.5	12.5	12
	H	104	107	107	111	111	111	107	109
	H1	155	150	150	160	160	160	148	156
	H2	38	39	39	44	44	44	33	36.5
	H3	6	6	6	6	6	6	4.5	5
	H4	6	4.5	4.5	3.5	3.5	3.5	4.5	6
	H5	2.5	4.5	4.5	4.5	4.5	4.5	8	7
	L	257	257	257	270	270	270	280	276
	L1	457	457	457	470	470	470	470	485
L2	225	225	225	234	234	234	243	243	
W	140	150	-	182	182	-	210	-	
W1	44	44	44	58	58	58	70	70	
W2	-	-	198	-	-	240	-	280	
MOUNTING DIMENSION	A	44	44	44	58	58	58	70	70
	A1	50	-	-	58	-	-	-	-
	B	194	194	194	200	200	200	243	243
	ød	7	7	7	7	7	7	7	7



125 (16A – 125A)



250 (100A – 250A)



630 (250A – 630A)



1250 (630A – 1250A)

Adjustable Thermal Magnetic and Electronic Release (Microprocessor based) - X-Tec

Simplified 4 Frames Sizes From 16A to 1250A

High Performance

- Icu upto 150kA at 415V AC
- Ics = 100% Icu (upto 630A)

Conformity to standard

- IEC 60947-2

Operating Conditions

- Temperature: -5°C ~ +40°C ; the average value within 24 hours shall not exceed +35°C ; for the circuit breaker with thermal-magnetic release, +40°C is set to be the standard temperature for ratings.
- Altitude: ≤2000m;
- Pollution Degree: Grade 3;

Suitable for wide range of applications

- Line Protection
- Transformer Protection
- Generator Protection
- DC Network Protection upto 500V
- 400Hz system
- Earth leakage Protection

Different Connections Possible

- Front Connection
- Rear Connection
- Plug - in type connection

Isolation function

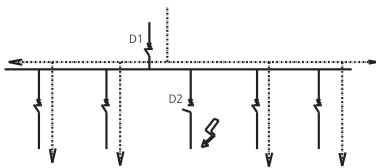
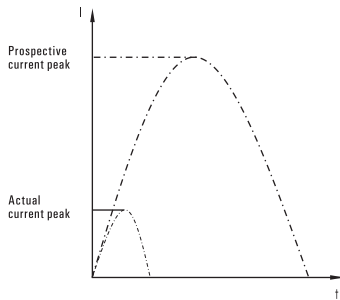
X-Tec MCCBs are suitable for isolation as defined in IEC 60947-2. Operation of isolation functions will realize following points:

- Contacts operation correctly indicates operating reliability of interior mechanism.
- Residual Current protection as per IEC 60947-2.
- Higher impulse withstands voltage for terminals at the power supply side and load side.

ROTO-ACTIVE DOUBLE BREAK MECHANISM

X-Tec MCCB design is equipped with double-break contact system placed in a rotary configuration which provides high interrupting capacity in a very compact size. Thus when the breaker reacts under short-circuit conditions, the speed & force of breaker is much more than twice that of a conventional breaker, providing exceptional current limitations. This provides a very low peak and energy value in the circuit breaker, which leads to lower electrodynamic forces, and thermal stress values in the protected electrical conductors and equipments. This unique design feature allows use of cost effective down stream devices while maintaining overall system protection.





Line Load Reversibility

- X-Tec MCCBs have no bias of Line-Load Connection. Thus power supply can be connected from either top or bottom which has no effect on normal operation of the breaker.

Current-limiting Capacity

- The current-limiting capacity of a circuit breaker is its aptitude to limit short-circuits. When a short-circuit occurs, the breaker is able to limit I^2t in time so as to protect circuits and switchgear at downstream.
- The exceptional limiting capacity of X-Tec MCCB is due to the rotating double-break technique, which is characterized by very rapid repulsion of contacts and the appearance of two arc voltages in series with a very steep wave front.
- Exceptional current-limiting capacity greatly reduces peak caused by fault current so as to enhance breaking capacity of breaker to $I_{cs} = 100\%I_{cu}$.
- This keeps the rise in temperature very low so as to prolong the service life of the cable.
- Current limiting greatly reduces arcing time so as to lessen distortion of contacts and bus bar.
- This greatly enhances safety of down stream equipments.

Protection Discrimination

- Protection co-ordination is a must factor for LV power distribution design so as to ensure reliability and continuity of energy. This ensures that fault appearing at a given point of network is cleared by the protection device installed immediately upstream of the fault and only by that device only.
- X-Tec range of MCCBs ensure TOTAL discrimination between two circuit breakers installed in a series in an installation.

Temperature Compensation

- When the ambient temperature changes, tripping characteristics will change as well, please refer to the table below for temperature compensation correction.
- Temperature compensation coefficient of breaker with thermal-magnetic release is as follows:

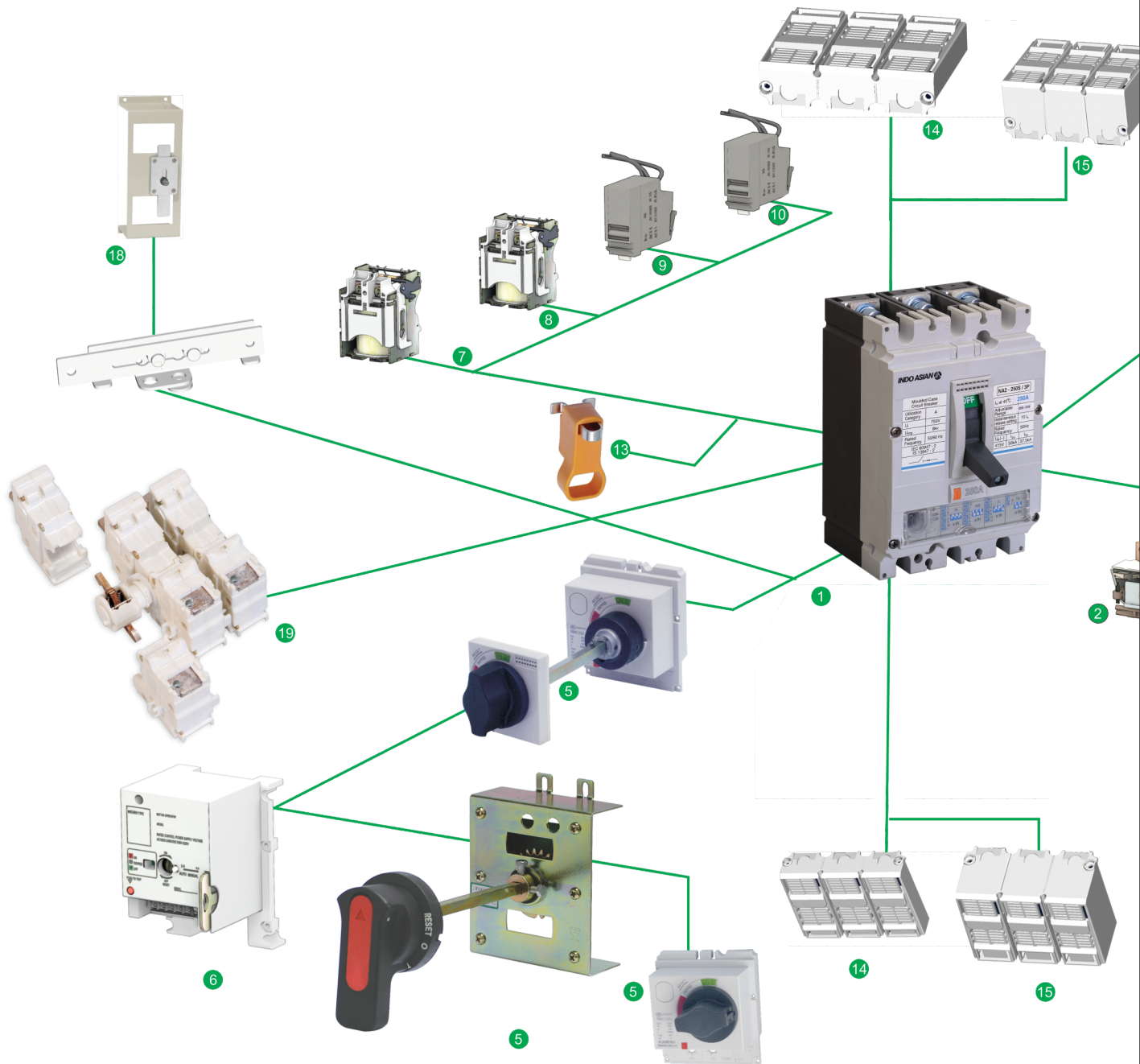
Ambient Temperature	30°C	35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C
Temperature Compensation Coefficient	1.05	1.025	1.0	0.975	0.95	0.925	0.90	0.875	0.85

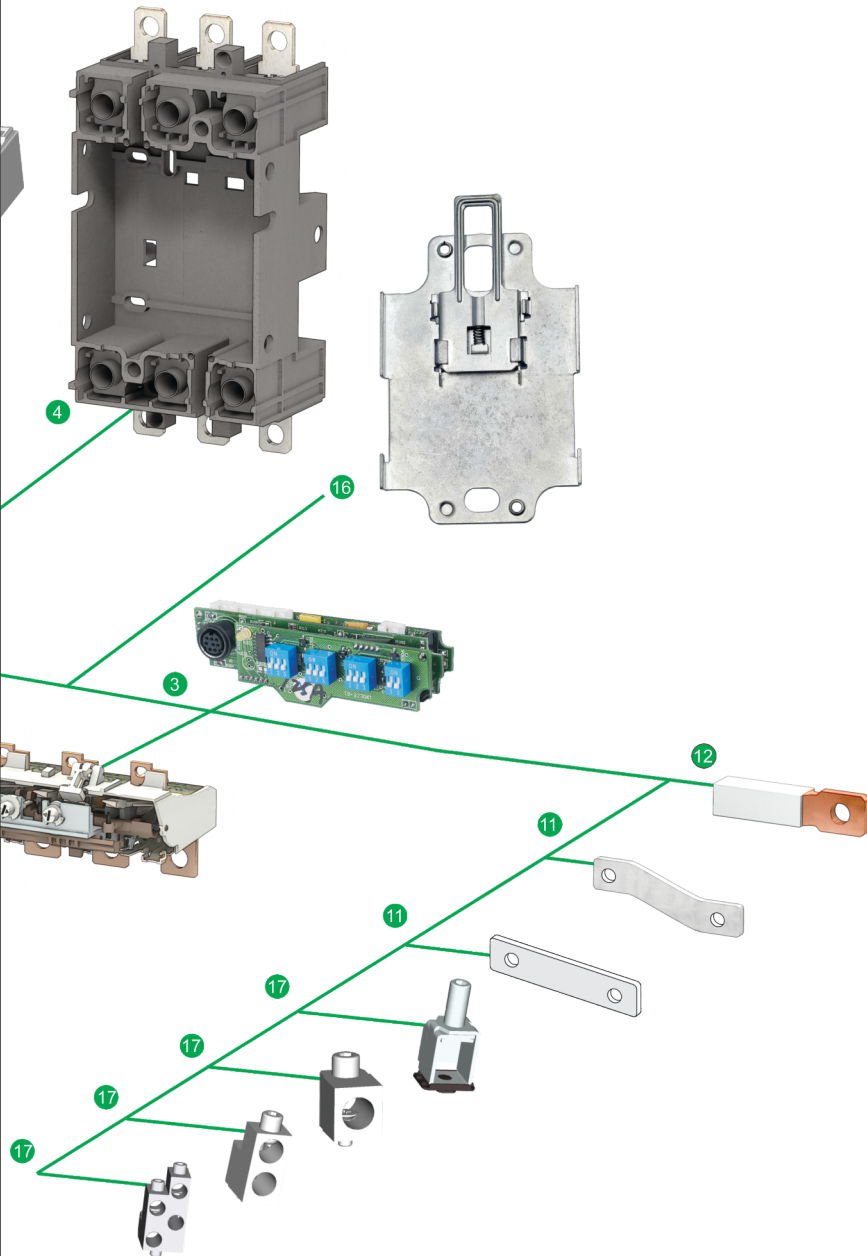
- Temperature compensation coefficient of breaker with electronic release is as follows:

Frame Level Rated Current	30°C	35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C
X1/X2 (40 - 160A)	1	1	1	1	1	1	1	1	1
X2 (200 - 250A)	1	1	1	1	1	0.95	0.95	0.90	0.90
X2/X3 (250 - 400A)	1	1	1	1	1	0.98	0.95	0.93	0.90
X3 (500 - 630A)	1	1	1	0.98	0.95	0.93	0.90	0.88	0.85
X5 (630 - 800A)	1	1	1	0.975	0.975	0.95	0.95	0.925	0.925
X6 (1000 - 1250A)	1	1	1	0.95	0.90	0.875	0.80	0.80	0.80

ARMOUR PROTECTION POINT

- Current limiting
- Total discrimination
- Cascading





Product Overview

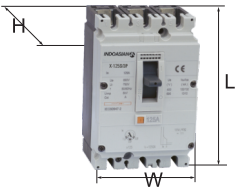


X-Tec Moulded Case Circuit Breaker

- 1 Body
- 2 Thermo Magnetic Release
- 3 Electronic release
- 4 Plug-in Base
- 5 Rotary Manual Operating Handle
- 6 Motor Driven Operating Mechanism
- 7 Under-voltage Release
- 8 Shunt Release
- 9 Alarm Contact
- 10 Auxiliary Contact
- 11 Spreader Terminals
- 12 Rear Connection Plate
- 13 Locking System (padlock)
- 14 Short Terminal Cover
- 15 Extended Terminal Cover
- 16 DIN Rail Adaptor
- 17 Cage Clamp Terminal
- 18 Mechanical Interlock
- 19 Double Break Roto Active Contact

ARMOUR PROTECTION POINT




- Roto Active Double Break Contact System - For exceptional Current Limitation

Technical Data


X-Tec Circuit Breaker Thermal Magnetic Release		X-1					X-2		
4 Frames		Frame 1					Frame 2		
Electric characteristics as per IEC 60947-2									
Rated current(A) I_n at 40°C		16, 20, 25, 32, 40, 50, 63, 80, 100, 125					100, 125, 160, 180, 200		
Rated insulation voltage (V) U_i		750					750		
Rated impulse withstand voltage (kV) U_{imp}		8					8		
Rated operational voltage (V) U_e	AC 50/60Hz	690					690		
	DC	500					500		
Number of poles		3/4					3/4		
									
Breaking capacity code		S	M	H	L	R	S	M	H
Rated ultimate short-circuit breaking capacity (kA RMS) I_{cu}	AC 220V/230V/240V	40	60	85	100	150	40	60	85
	AC 380V/400V/415V	25	35	50	100	150	25	35	50
	AC 440V	25	35	50	100	130	25	35	50
	AC 500V	15	20	30	50	70	15	20	30
	AC 690V	5	5	5	6	8	6	6	6
	DC 250V (1P)	25	25	25	35	50	25	25	25
DC 500V (2P)	25	25	25	35	50	25	25	25	
Rated service breaking capacity I_{cs} = (% I_{cu})		100					100		
Suitability for isolation		■					■		
Utilization category		A					A		
Safety of insulation		■					■		
Endurance	Mechanical	20,000					20,000		
	Electrical at 415V AC	20,000					20,000		
Protection		Thermal-magnetic					Thermal-magn		
Release units		■					■		
Over-load protection		■					■		
Short-circuit protection		■					■		
Mounting and connection	Fixed	■					■		
	Plug-in	■					■		
Manual	Front connection	■					■		
	Rear connection	■					■		
Motor-driven mechanism	Handle	■					■		
	Direct or extended rotary handle	■					■		
Manual, remote operated automatic source changeover systems		■					■		
Shunt and under-voltage release		■					■		
Auxiliary and alarm contact		■					■		
Pad locking system		■					■		
Mounting and connection accessories		■					■		
Connection terminal		■					■		
Front connection plate		■					■		
Rear connection plate		■					■		
Plug-in type connection accessories		■					■		
Terminal covers		■					■		
Interphase barrier		■					■		
Dimension and weight									
Dimension(mm) W×H×D 3P		90×140×79					105×157×79		
Dimension(mm) W×H×D 4P	Fixed type- front connection	120×140×79					140×157×79		
Weight(kg) 3P/4P		1.2 / 1.6					2.1 / 2.8		

Note: ① When U_e is $\geq 660V$, I_{cs} = 50% I_{cu} .

■ Available

		X-3						X-5		X-6	
		Frame 3						Frame 4			
00, 225, 250		250, 315, 350, 400, 500						630, 700, 800		800, 1000, 1250	
		750						750		750	
		8						8		8	
		690						690		690	
		500						500		500	
		3/4						3/4		3/4	
											
	L	R	S	M	H	N	L	R	H	L	
	100	150	40	60	85	85	100	150	65	100	
	100	150	25	35	50	70	100	150	50	70	
	100	130	25	35	50	50	85	130	35	65	
	50	70	15	20	30	35	50	70	30	50	
	8	10	10	10	10	10	12	15	10	20	
	35	50	25	25	25	25	35	50			
	35	50	25	25	25	25	35	50			
		100 ^①						50		50	
		■						■		■	
		A						A		A	
		■						■		■	
		15,000						10,000		10,000	
etic		6000 (upto 400A) / 4000						4,000		4,000	
		Thermal-magnetic						Thermal-magnetic		Thermal-magnetic	
		■						■		■	
		■						■		■	
		■						■		■	
		■						■		■	
		■						-		-	
		■						-		-	
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		■						■		■	
		■						■		■	
		■						-		-	
		■						■		■	
		■						■		■	
		■						-		-	
		■						■		■	
		■						■		■	
88		140×255×113						210×370×196			
88		185×255×113						280×370×196			
		7.5 / 10						17.5 / 23			

Technical Data

X-Tec Circuit Breaker Electronic Release (Microprocessor based)		X-2			
3 Frames		Frame 1			
Electric characteristics as per IEC 60947-2					
Rated current(A)	In at 70°C	40, 100, 125, 160, 200, 250			
Rated insulation voltage (V)	Ui	750			
Rated impulse withstand voltage (kV)	Uimp	8			
Rated operational voltage (V)	Ue	AC 50/60Hz	690		
Number of poles		3/4			
					
Breaking capacity code		M	H	N	L
Rated ultimate short-circuit breaking capacity (kA RMS) Icu	AC 220V/230V/240V	60	85	100	150
	AC 380V/400V/415V	35	50	70	100
	AC 440V	35	50	70	100
	AC 500V	20	30	50	70
	AC 690V	6	6	8	10
Rated service breaking capacity Ics= (%Icu)		100			
Suitability for isolation		■			
Utilization category		A			
Safety of insulation		■			
Life(CO recycle)	Mechanical	20,000			
	Electrical	20,000			
Protection		Electronic			
Release units		■			
Over-load protection		■			
Short-circuit protection		■			
Mounting and connection					
Fixed	Front connection	■			
	Rear connection	■			
Plug-in	Front connection	■			
	Rear connection	■			
Manual	Handle	■			
	Direct or extended rotary handle	■			
Motor-driven mechanism		■			
Manual, remote operated automatic source changeover systems		■			
Shunt and under-voltage release		■			
Auxiliary and alarm contact		■			
Pad locking system		■			
Mounting and connection accessories					
Connection terminal		■			
Front connection plate		■			
Rear connection plate		■			
Plug-in type connection accessories		■			
Terminal covers		■			
Interphase barrier		■			
Dimension and weight					
Dimension(mm) W×H×D 3P		105×157×88			
Dimension(mm) W×H×D 4P		Fixed type-front connection		140×157×88	
Weight(kg) 3P/4P		2.1 / 2.8			

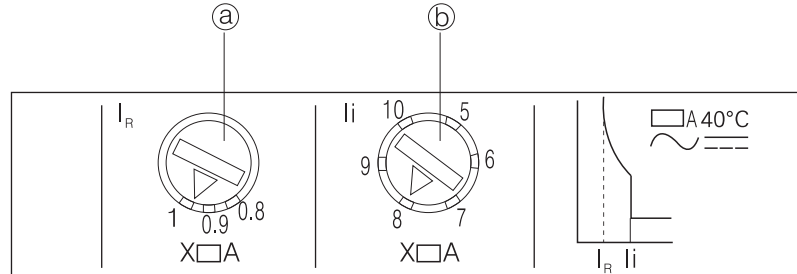
Note: ① The rated current of X-630 plug-in type up to 570A.

■ Available

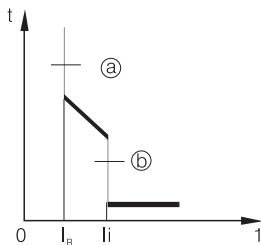
Characteristics

Thermal-magnetic Release

Thermal-magnetic release of X1, X2, X3, X6 breakers can be set to meet protection requirements.



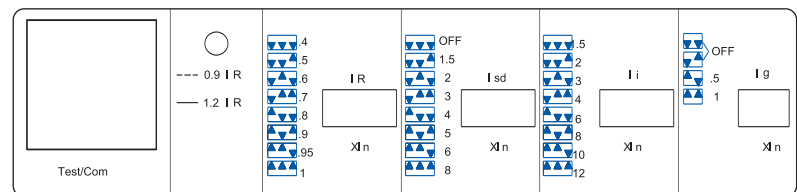
Adjustable setting of over-load protection (a)
Adjustable setting of short-circuit protection (b)



Thermal-Magnetic Release	X-1	X-2	X-3	X-6
Rated Value(A) I_n 40°C	16A -125A	100A -250A	250A - 630A	630A -1250A
Over-load Protection	Thermal protection			
Tripping Current I_R (A)	Adjustable range 0.8 to 1 $X I_n$	Adjustable range 0.8 to 1 $X I_n$		
N-Pole protection 4C, 4D	with Protection 1.0 $X I_n$			
Short-circuit protection	Magnetic Protection			
Tripping Current I_i (A)	10 I_n	Adjustable range 5 to 10 $X I_n$		

Electronic Release (Microprocessor Based)

X-2 electronic release is an universal module. It is of 6 current specifications: 40A, 100A, 125A, 160A, 200A and 250A to adjust setting values and to meet protection requirements.

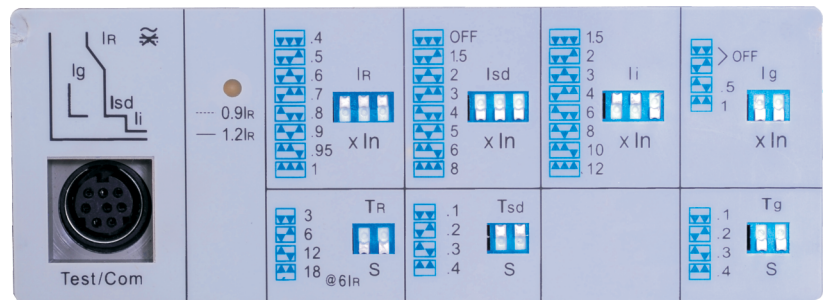


Electronic Release (Microprocessor based)	X-2
Rated value I_n (A) 20 ~ 70°C	40, 100, 125, 160, 200, 250
Over-load protection (Long Time)	
Current Setting $I_R = I_n \times \dots$	0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 0.95, 1
Time Delay	1.5 I_R 96s 6 I_R 6s
Short - Circuit Protection (Short Time)	
Pick-up (A) $I_{sd} = I_R \times \dots$	OFF, 1.5, 2, 3, 4, 6, 8, 10, 12
Time Delay (ms)	Fixed
Short - Circuit Protection (Instantaneous)	
Pick-up (A) $I_{sd} = I_i$	OFF, 1.5, 2, 3, 4, 6, 8
Protection of Neutral Pole	
Neutral Protection at I_n	OFF, 0.5, 1,



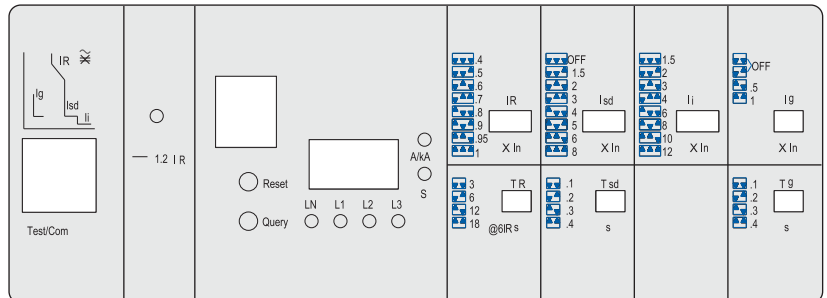
■ X-3 Electronic Release (Microprocessor based)

X-3 electronic release is an universal module. It is of 6 current specification: 250A, 315A, 350A, 400A, 500A and 630A to adjust setting values and to meet protection requirements. The release is of wide setting range and multi-functional modules can be selected.



■ X-5 and X-6 Electronic Release (Microprocessor based)

X-5 and X-6 electronic release is an universal module. It is of 5 current specification: 630A, 700A, 800A, 1000A and 1250A to adjust setting values and to meet protection requirements. The release is of wide setting range and multi-functional modules can be selected.

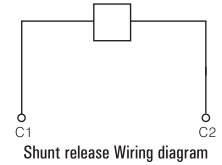


Electronic Release (Microprocessor based)	X-3	X-5 and X-6
Rated value A In 20 ~ 50°C	250, 315, 350, 400, 500, 630	630, 700, 800, 1000, 1250
Over-load protection (long time)		
Current Setting $I = I_n \times \dots$	0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 0.95, 1	
Time Delay $6I_r$ (s)	Adjustable range 3, 6, 12, 18	
Short - Circuit Protection (Short Time)		
Pick-up (A) $I_{sd} = I_r \times \dots$	OFF, 1.5, 2, 3, 4, 6, 8	
Time Delay (s)	Adjustable range 0.1, 0.2, 0.3, 0.4	
Short - Circuit Protection (Instantaneous)		
Pick-up (A) $I_{sd} = I_i$	OFF, 1.5, 2, 3, 4, 6, 8, 10, 12	
Protection of Neutral Pole		
Neutral Protection at In	OFF, 0.5, 1	
Time Delay (s)	Adjustable range 0.1, 0.2, 0.3, 0.4	



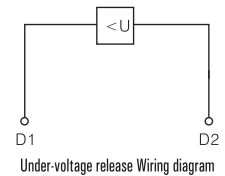
Shunt Release

- Trips the circuit breaker when control voltage increase above $0.7 \times U_n$
- Control single can be of the impulse type ($\geq 20\text{ms}$)



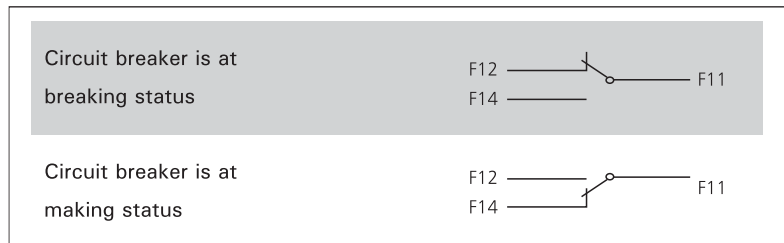
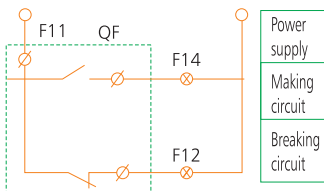
Under Voltage Release

- Tripping threshold between $0.35 \sim 0.70$ times of the rated voltage
- Circuit breaker closing is possible only if the voltage exceed 0.85 times of rated voltage



Auxiliary Contact

Indicate the position (ON/OFF) of the circuit breaker contacts

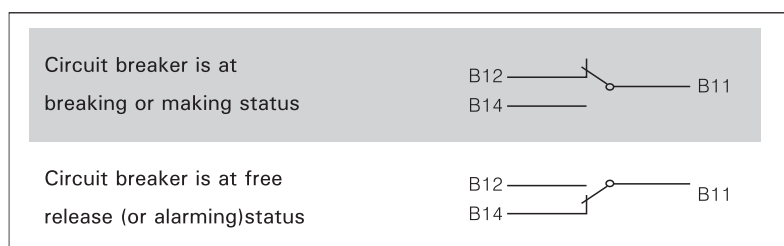
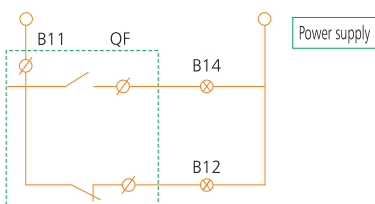


Alarm Contact

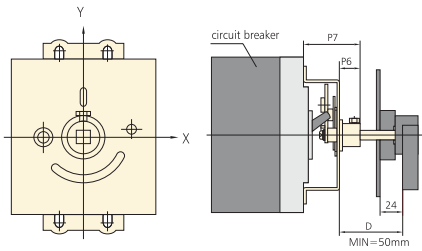
Indicate the circuit breaker has tripped due to

- Over-load
- Short-circuit
- Ground fault
- Operation of free-tripping

When circuit breaker normally makes and breaks, alarm contact does not operate. After tripping (or tripping due to failure), alarm contact operates and after the circuit breaker again normally operates, alarm contact recovers original status.



Direct Rotary Handle



Economic Extended Rotary Handle

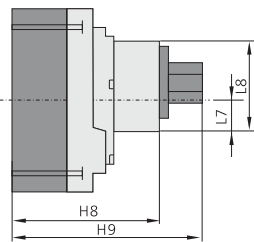
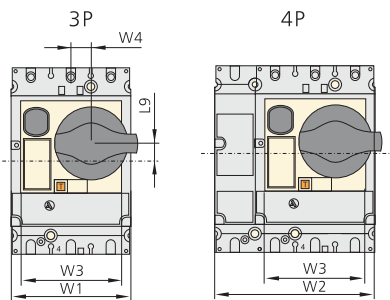
Protection degree :IP30

- Isolation function indication;
- O(breaking), I (making) and trip indication
- At "OFF" status, the breaker can b fitted with 1-3 padlocks with a diameter of 5-8mm.This prevents the door of switchgear being opened unwantedly.

	X-1/X-2	X-2	X-3
P6	14	14	20
P7	56	56	60

(All dimensions are in mm)

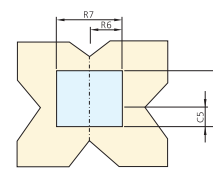
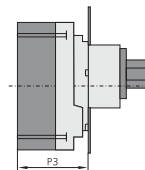
Front Mounting (fixed or plug-in circuit breaker)



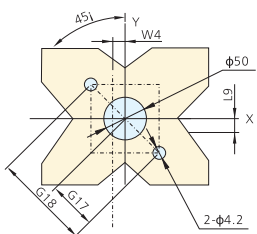
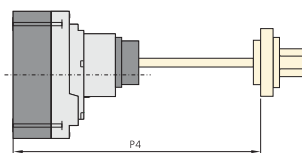
Direct Rotary Handle

Protection degree :IP40

- Reliable insulation
- Isolation function indication
- O(breaking), I (making) and trip indication
- Realize free tripping of circuit breaker



Front Mounting (fixed or plug-in circuit breaker)(mm)



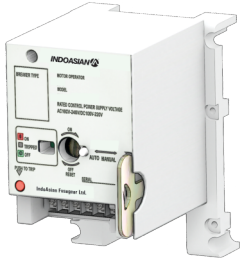
Extended Rotary Handle

Protection degree :IP55

- Reliable insulation
- Isolation function indication
- O(breaking), I (making) and trip indication
- When the door is open, the release can be set and the breaker will not make.

	W1	W2	W3	W4	L7	L8	L9	H8	H9	P3	P4	R6	R7	C5	C6	G17	G18
X-1/X-2	30	90	76	15.25	37	70	13.3	114	148	80	≥175 ≤600	39	78	38	72	36	72
X-2	35	105	93	9.25	39	73	9	125	159	90	≥175 ≤600	48	96	40.5	76	36	72
X-3	45	140	122	5	69	121	24.5	148	198	115	≥175 ≤600	62	124	70.5	124	36	72

(All dimensions are in mm)



Motor-driven Mechanism

Protection degree :IP40

- Reliable insulation
- Isolation function indication
- O(breaking), I(making) and trip indication
- Free releasing of circuit breaker
- Making and breaking the breaker manually or automatically

Manual Operation

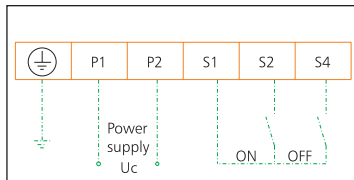
- Turn "manual/auto" switch to "auto" position and then turn the handle to make and break the breaker.

Automatic operation

- Turn "manual/auto" switch to "manual" position and then push the button to make and break the breaker remotely.
- The make/break operation is carried out via pulse or self-retaining type signal control.

Operational Range:
85% Un - 110% Un

Wiring Diagram



X-Tec Circuit Breaker	Rated Control voltage	Electrical Life (Operation)	Operational Current	Power Consumption
X-1/X-2	100-240V AC/DC, 24V DC	10,000	≤0.5 A	14VA/14W, 14W
X-2	100-240V AC/DC, 24V DC	10,000	≤0.5 A	14VA/14W, 14W
X-3	110-230V AC/DC, 24V DC	5,000	≤2 A	35VA/35W, 35W
X-6	230V/400V AC	3,000	≤7.5 A	200W

Overall and Mounting Dimensions of Fixed Release for Front Connection

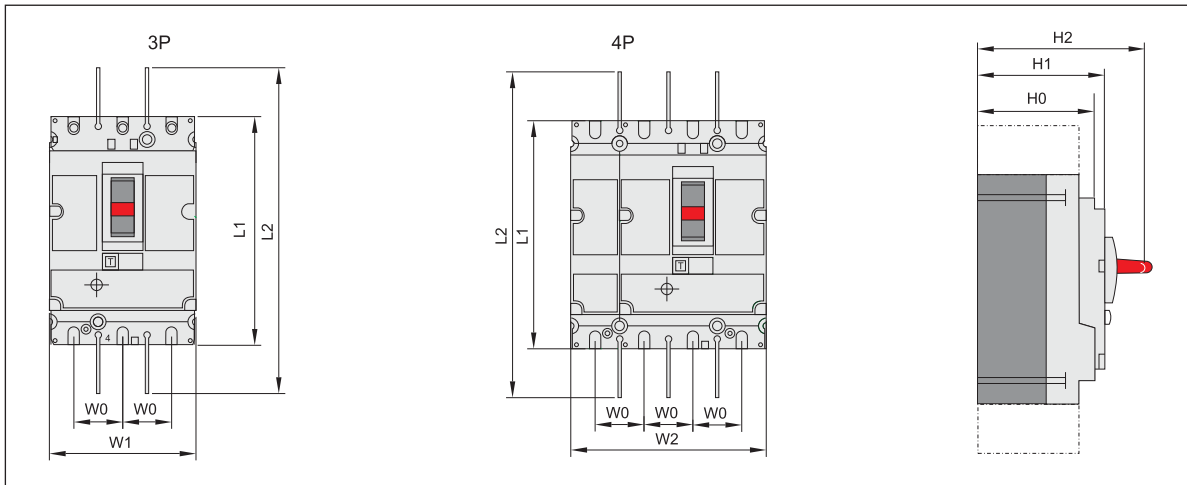
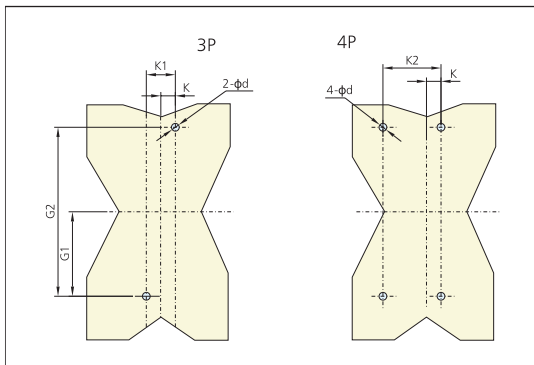
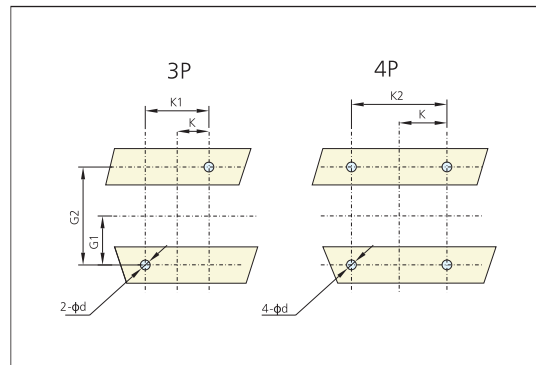


Plate Mount



Bar Mount



Frame	L1	L2	H0	H1	H2	K	K1	K2	G1	G2	W0	W1	W2	W3	d
X-1/X-2	140	240	72	79	103	15	30	60	56	112	30	90	120	62	6
X-2	157	357	82	88	126	17.5	35	70	62.5	125	35	105	140	70	6
X-3	255	474	95	113	168	22.5	45	90	100	200	45	140	185	-	6
X-5/X-6	370	570	132	144	206	35	70	140	120	240	70	210	280	-	7

(All dimensions are in mm)

CORPORATE OFFICE: B-24, Phase - II, Noida - 201305, U.P., India Ph.: +91-120-3853000 Fax: +91-120-3853002 E-mail: sales@indoasian.com, international@indoasian.com Website: www.indoasian.com

CONSUMER CARE CELL: B-24, Phase - II, Noida - 201305, U.P., India Ph.: +91-120-3042222 E-mail: feedback@indoasian.com

NORTH

CHANDIGARH

S.C.O.-11, 2nd Floor,
Madhya Marg, Sector-26,
Chandigarh-160002
Ph.: 0172-3934651-64
Telefax: 0172-3934656
E-Mail: in-chandigarh-office@indoasian.com

DELHI

721-722, 7th Floor,
DLF Tower B,
Jasola District Centre,
New Delhi-110044
Ph.: 011-30821773-74
E-Mail: in-delhi-office@indoasian.com

JAIPUR

433, Ganpati Plaza,
M. I. Road,
Jaipur-302001
Ph.: 0141-4113528
E-Mail: in-jaipur-office@indoasian.com

LUCKNOW

301, Chintel House,
Station Road,
Lucknow-226001
Ph.: 0522-4013210
TeleFax: 0522-4013210
E-Mail: in-lucknow-office@indoasian.com

SOUTH

BANGALORE

402, 4th Floor, Blue Cross Chambers,
Infantry Road Cross,
Bangalore-560001
Ph.: 080-25585043, 25591677
Fax: 080-25591546
E-Mail: in-bangalore-office@indoasian.com

COCHIN

35/1403 B, 1st Floor,
M. K. M. Building, Palarivattom,
Cochin-682025
Ph.: 0484-4055581-88
Fax: 0484-4055589
E-Mail: in-cochin-office@indoasian.com

COIMBATORE

D. No. 83,
Dr. Nanjappa Road,
Coimbatore-641018
Ph.: 0422-2302715
Fax: 0422-2302715
E-Mail: in-coimbatore-office@indoasian.com

CHENNAI

Ambal Building,
1st Floor, 727,
Anna Salai,
Chennai-600006
Ph.: 044-28297527, 28297143
E-Mail: in-chennai-office@indoasian.com

HYDERABAD

312, 3rd Floor,
Amrutha Estates,
Himayath Nagar,
Hyderabad-500029,
Ph.: 040-66742425-29
E-Mail: in-secunderabad-office@indoasian.com

WEST

AHMEDABAD

203-204, Shreedhar Avenue,
11, Sardar Patel Colony,
Near Sardar Patel Statue,
Naranpura, Ahmedabad-380014
Ph.: 079-30002092-94
Fax: 079-27680439
E-Mail: in-ahmedabad-office@indoasian.com

GOA

No. 606, 6th Floor,
Unitech City Center,
M.G. Road, Panjim,
Goa-403501
Ph.: 0832-2420934, 9422445501
E-Mail: in-go-a-office@indoasian.com

INDORE

C-18, Block B,
New Siyaganj Market,
Indore-452007
Ph.: 0731-4064064, 8889211108
Fax: 0731-4064064
E-Mail: in-indore-office@indoasian.com

MUMBAI

G-6, Nahar & Seth Industrial Estate,
Chakala, Andheri East,
Mumbai-400099
Ph.: 022-28390072, 28301987
Fax: 022-66922831
E-Mail: in-mumbai-office@indoasian.com

PUNE

Rajadwar Building, 4th Floor,
1307, Shivaji Nagar,
Off. J. M. Road,
Pune-411005
Ph.: 020-30116638-39, 60501144
Fax: 020-25520659
E-Mail: in-pune-office@indoasian.com

SURAT

306, Golden Point,
Ring Road,
Surat-395003
Ph.: 0261-3990890, 9825224054
E-Mail: in-surat-office@indoasian.com

EAST

JAMSHEDPUR

9, Rustomji Mansion
Main Road, Near Signal Light,
Bistupur, Jamshedpur-831001
Ph.: 09830893435
E-Mail: in-jamshedpur-office@indoasian.com

KOLKATA

61/B, Palm Avenue,
Kolkata-700019
Ph.: 033-32934121, 32609475
E-Mail: in-kolkata-office@indoasian.com