



# TECHNICAL CATALOGUE FOR **C-POWER AIR CIRCUIT BREAKER**

# —ABOUT US—

Lauritz Knudsen Electrical & Automation, formerly known as L&T Switchgear, is a leading player in the electrical industry owing to its 70+ years of strong legacy and commitment to the nation's growth. The brand is dedicated to providing a wide range of electrical and automation products and solutions to vital sectors of the economy, including industries, utilities, infrastructure, buildings, and agriculture. Our extensive portfolio includes low-voltage and medium-voltage switchgear, automation solutions, tailored software, and services.

With manufacturing operations in Ahmednagar, Vadodara, and Coimbatore, we adhere to global standards of excellence. Our operations are supported by well-equipped, in-house design and development centers, as well as tooling facilities, ensuring precision in manufacturing.

We proudly operate six Switchgear Training Centers (STCs) across Pune, Lucknow, Coonoor, Vadodara, Delhi, and Kolkata. These centers offer tailor-made classroom courses and lab learning experiences for technicians, customers, engineers, professionals, and students.

With a deep national presence and one of the largest electrical distribution networks, comprising over 1500 partners across the country, we are committed to driving excellence and delivering superior products and solutions that power India's growth journey.

# C-POWER Air Circuit Breakers

**Lauritz Knudsen Electrical & Automation** Air Circuit Breakers (ACBs) are specially designed for extreme tropical conditions and have a proven track record of more than 45 years. Presently more than 5,00,000 Air Circuit Breakers are being used for diverse applications. The C-POWER Air Circuit Breakers provide technologically driven solutions to meet customer needs.



## Complete Selectivity

Unique feature of  $I_{cu}=I_{cs}=I_{cw}$  for 1 second across the entire range. This ensures complete selectivity for system with time based discrimination.

## Perfect for Indian Conditions

Inherent design to perform in extreme tropical conditions. Typical site conditions like high ambient temperature, humidity and dusty environment are best handled by C-POWER ACBs without compromising on performance and safety.

## Optimal Compactness

Designed to ensure

- › Low inherent temperature rise
- › Adequate interface clearances

## Widest Choice of over Current Protection Releases

- › Advance micro-controller based with option of communication & metering-SR71
- › Micro processor based releases-SR18/SR18G/SR18G with Display and SR18Gi with display & current metering
- › Thermo-magnetic release-DN1

## Elegant Design & Rugged Construction

- › Common door cutout for entire range
- › Left aligned cutout for all ratings

## Range to Meet Every Customer's Need

Various options to choose from

- › Breaking capacity from 50kA to 100kA
- › 3 Pole or 4 Pole configuration
- › Fixed or Drawout version
- › Auto reset mechanism
- › Independent manual or stored energy type, manual or electrically operated mechanism
- › Different terminal orientations : Flat, Horizontal and Vertical

## New User Friendly Feature

- › Operational Counter will be standard offering from rating 4000A and above

## User Friendly Features

- › **Front accessible** over current release settings, telescopic racking handle and various racking interlocks; no need to open the panel door
- › Unique '**Maintenance position**' in drawout type ACBs to facilitate maintenance & inspection without removing ACB from the panel
- › **Multitap CTs** for enhancing protection range in DN1 release
- › **Wide variety** of Amperemetric and Voltmetric releases
- › **Fully rated neutral pole** for the entire range
- › Lockable **sliding shutters** to prevent unauthorized access to "TRIP" and "CLOSE" push buttons
- › Can be used as an **ON / OFF Load Isolator**

## Safety

- › Superior quality engineering grade plastics used for insulation purpose; conforms to Glow wire test(Ref: IEC 60695-2-1)
- › In-built mechanical anti-pumping to prevent auto-reclosing of ACB on persisting faults
- › In-built rating error preventor in drawout ACBs ensure correct rating of drawout portion in corresponding cradle
- › Safety shutters prevent accidental contact with live cradle terminals

## Conformance to Standards

- › IEC - 60947 (Part 1 & 2)
- › IS/IEC - 60947 (Part 1 & 2)
- › IEC 60695 - 2 - 1
- › BS EN 60947 - 2

- › Extendable **Electrical Life**:
  - » By replacing the arcing contacts at site, for all ratings
  - » With changing pole assembly
- › **Programmable SICs:** Auxiliary contacts in drawout ACBs are programmable for only Service, Only Test, Test and Service, and All Positions
- › Protection releases are easily **interchangeable** at site
- › Facility for site conversion of **manually operated** ACBs to **electrically operated** ACBs
- › Jaws on breaker facilitate ease of maintenance & replacement of contact jaws

- › Variety of Safety Interlocks
- › Easily removable arc chutes without use of any tool
- › Operating voltage ranges from 10% Un to 110% Un for shunt release ensures intentional tripping even at high voltage drops during short-circuit
- › Transparent safety shutter offers easy inspection of cradle contacts & reduces the maintenance time

## Special Applications

### 690V Application for C-Power ACB

Solution for 690V application available in C-Power Family. For further details please consult our nearest branch office.

### Breakers for Corrosive Environment

Solution for harsh/corrosive environment available in C-Power Family. For further details please consult our nearest branch office.

# C-POWER Range



## Breaking Capacities

Icu = Ics = Icw for 1 sec																	
Rated Current	400A	630A	800A	1000A	1250A	1600A	2000A	2500A	3200A	4000A	5000A	6300A					
CN-CS : E	50kA	50kA	50kA	50kA	50kA	50kA	50kA	50kA	50kA	50kA	50kA	50kA					
Frame-1																	
CN-CS : S1	50kA	50kA	50kA	50kA	50kA	50kA	50kA	60kA	60kA								
Frame-1							Frame-2										
CN-CS : C	50kA    50kA    50kA    50kA    55kA    60kA						95kA    95kA										
CN-CS : H	65kA    65kA    65kA    65kA    75kA    75kA						75kA    75kA										
CN-CS : H2							100kA    100kA										
CN-CS : H1/H							Frame-1		Frame-2		Frame-3						
							Frame-4										

Note: 3200A H2 / 4000A H2 will replace 3200A H0 / 4000A H0. Spares for 3200 / 4000 A H0 will be available.

# Technical Data Sheet



Rating (A)			400	630	400/ 630	800				1000										
Type Designation			E#	E#	S1	E#	S1	C	H	E#	S1	C	H	E#						
Rated current (A) at 50°C	I <sub>n</sub>		400	630		800				1000										
Rated operational voltage (V), 50/60Hz	U <sub>e</sub>		415	415		415				415										
Rated insulation voltage (V), 50/60Hz	U <sub>i</sub>		1000	1000		1000				1000										
No. of poles			3	3	3/4	3	3/4			3	3/4			3						
Rated ultimate short circuit breaking capacity 50/60Hz (kA rms)	I <sub>cu</sub>	380/415/500V	50	50	50	50	50	50	65	50	50	50	65	50						
		690V	-	-	-	-	-	35	50	-	-	35	50	-						
Rated service short circuit breaking capacity 50/60Hz (kA rms)	I <sub>cs</sub>	380/415/500V	50	50	50	50	50	50	65	50	50	50	65	50						
		690V	-	-	-	-	-	35	50	-	-	35	50	-						
Rated short time withstand capacity 50/60Hz (kA rms)	I <sub>cw</sub>	0.5 sec	50	50	50	50	50	50	65	50	50	50	65	50						
		1 sec	50	50	50	50	50	50	65	50	50	50	65	50						
		3 sec	-	-	25	-	25	35	50	-	25	35	50	-						
Rated making capacity 50/60Hz (kA peak)	I <sub>cm</sub>	380/415/500V	105	105	105	105	105	105	143	105	105	105	143	105						
		690V	-	-	-	-	-	73.5	105	-	-	73.5	105	-						
Rated impulse withstand voltage of main circuit (kV)	U <sub>imp</sub>		8	8	12	8	12			8	12			8						
Rated impulse withstand voltage of aux. circuit (kV)	U <sub>imp</sub>		4	4		4				4										
Typical opening time (ms)			40	40		40				40										
Typical closing time (ms)			60	60		60				60										
Utilization category			B	B		B				B										
Suitability for isolation			✓	✓		✓				✓										
Fixed			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						
Draw out			✗	✗	✓	✗	✓	✓	✓	✗	✓	✓	✓	✗						
Manual			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						
Electrical			✗	✗	✓	✗	✓	✓	✓	✗	✓	✓	✓	✗						
Electrical & Mechanical life (operating cycles) ‡			15000	15000	20000	15000	20000			15000	20000									
Electrical life without maintenance			6000	6000	8000	6000	8000	8000	8000	6000	8000	8000	8000	6000						
Dimensions (in mm)	Fixed	H		385	385	394	385	394			385	394								
		W	3 Pole	316	316	326	316	326			316	326								
		4 Pole	-	-	414	-	414			-	414			-						
		D		449	449	443	449	443	431		449	443	431	449						
	Draw out	H		-	-	468	-	468			-	468			-					
		W	3 Pole	-	-	399	-	399			-	399			-					
		4 Pole	-	-	487	-	487			-	487			-						
	D		-	-	587	-	587			-	587			-						

\* Please consult us for application at dc voltages & higher operational voltage upto 690V AC.

# Available in Control Box version

5 • Tolerance is +20ms

‡ Electrical life = Mechanical life. However, arcing contacts need to be replaced depending upon wear & tear.

△ Please consult us.

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1250			1600			2000				2500			3200				4000			5000	6300		
S1	C	H	E#	S1	C	H	E#	S1	C	H	S1	C	H	S1	D	H2	H1	H2	H	C	C		
1250			1600			2000				2500			3200				4000			5000	6300		
415			415			415				415			415				415			415	415		
1000			1000			1000				1000			1000				1000			1000	1000		
3/4			3	3/4			3	3/4			3/4			3/4				3/4			3/4	3/4	
50	50	65	50	50	50	65	50	50	55	75	60	60	75	60	70	75	100	75	100	70	95	95	
-	35	50	-	-	35	50	-	-	40	65	-	40	65	-	Δ	65	85	65	85	Δ	Δ	Δ	
50	50	65	50	50	50	65	50	50	55	75	60	60	75	60	70	75	100	75	100	70	95	95	
-	35	50	-	-	35	50	-	-	40	65	-	40	65	-	Δ	65	85	65	85	Δ	Δ	Δ	
50	50	65	50	50	50	65	50	50	55	75	60	60	75	60	70	75	100	75	100	70	95	95	
50	50	65	50	50	50	65	50	50	55	75	60	60	75	60	70	75	100	75	100	70	95	95	
25	35	50	-	35	35	50	-	45	50	65	50	55	65	55	Δ	70	85	70	85	70	Δ	Δ	
105	105	143	105	105	105	143	105	105	121	165	132	132	165	132	154	165	220	165	220	154	209	209	
-	73.5	105	-	-	73.5	105	-	-	84	143	-	84	143	-	Δ	143	187	143	187	Δ	Δ	Δ	
12			8	12			8	12			12			12				12			12	12	
4			4			4				4			4				4			4	4		
40			40			40				40			40				40			40	40		
60			60			60				60			60				60			60	60		
B			B			B				B			B				B			B	B		
✓			✓			✓				✓			✓				✓			✓	✓		
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✓	✗	✓	✗	✗	
✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
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20000			20000			20000				20000			10000				10000			5000	5000	5000	
7000	7000	7000	6000	7000	7000	7000	4500	6000	6000	6000	5000	5000	5000	5000	2500	2500	5000	5000	2500	2500	2500	2500	
394			385	394			385	-	394			-	394			-	509	Δ			509	-	-
326			316	326			316	-	482			-	482			-	636	Δ			636	-	-
414			-	414			-	-	628			-	628			-	838	Δ			838	-	-
443	431	437	431	431			437	-	431			-	431			-	518	Δ			518	-	-
468			-	468			-	468	468			-	468			-	583	468			583	583	583
399			-	399			-	399	555			-	555			-	711	701			701	711	913
487			-	487			-	487	701			-	701			-	913	909			909	913	1182
587			-	587			-	587	587			-	587			-	652	607			607	678	691

New H2 range has replaced old HO range

# Protection Releases

## Thermo-magnetic Release Type - DN1

DN1 thermo-magnetic release offers reliable protection against overload, short-circuit and earth faults via multitap CTs. with ambient temperature compensation from -5°C to 50°C.

### Overload Protection (Phase)

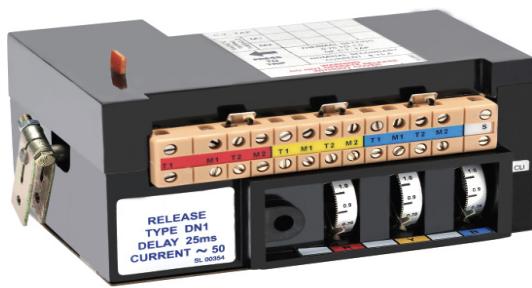
Unique individual phase O/L setting adjustment helps to avoid the nuisance tripping of ACBs in unbalance load condition (due to single phase loads) on distribution transformer. Overload pick-up range: 0.75 to 1 times In

### Short-Circuit Protection

Two taps on CTs (working as rating plug) help in selecting operating threshold. Short-Circuit pickup range: 5.5 and 7.5 times In with minimum impulsion time of 25 ms to prevent nuisance tripping due to transients

### Earth Fault Protection

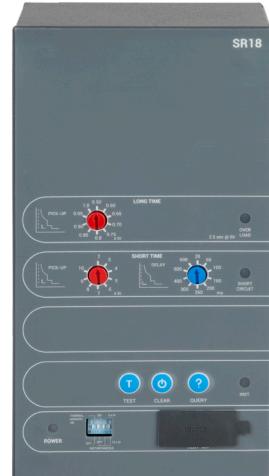
Offered with auxiliary earth fault release module. Earth-fault pick-up range: 0.2 to 0.5 times In



## Microprocessor Based Release - SR18

### Salient Features

- › Self-powered & true RMS sensing
- › Comprehensive protection
  - » Overload (Phase), Instantaneous and Short-Circuit
- › True Hot & Cold characteristics & switchable thermal memory
- › Multi-state LED to indicate
  - » Power ON condition
  - » Test mode
- › Individual fault annunciation through LEDs
- › AN1 module for remote fault indication through LEDs with changeover contact for each kind of fault
- › Provision for Self-diagnostic test (without tripping the breaker)
- › Universal Test kit available for testing the release
- › Conformance to EMI/EMC standards

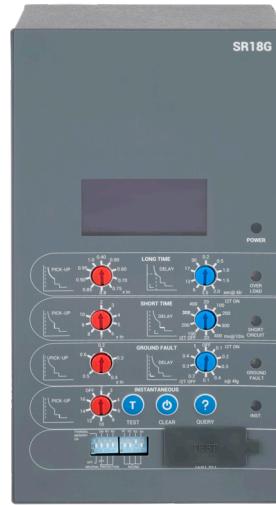


Type of Protection	Setting Range	
	Pick-up Current	Time Delay
Overload (Phase)	Ir - 0.5 to 1.0 times In Steps : 0.50, 0.60, 0.65, 0.70, 0.75, 0.80, 0.85, 0.9, 0.95, 1	2.5 sec at 6 times Ir
Short-Circuit	2 to 10 times In Steps : 2, 3, 4, 5, 6, 7, 8, 9, 10	20 ms to 600 ms Steps : 20, 60, 100, 160, 200, 260, 300, 400, 500, 600 ms
Instantaneous	6 & 12 In	-

## Micropocessor Based Release - SR18G

### Salient Features

- › Self - powered & True RMS sensing
- › True Hot & Cold characteristics & switchable Thermal Memory
- › Offers comprehensive protection against Overload - Phase & Neutral, Short-Circuit, Instantaneous, Earth Fault
- › Settable Overload delay
- › Settable Instantaneous setting with provision of "OFF"
- ›  $I^2t$  ON/OFF for Short-Circuit and Earth Fault protection
- › Individual Fault LED indication
- › Provision for Self-diagnostic test
- › Conformance to EMI/EMC standards
- › Testing through Universal Test kit



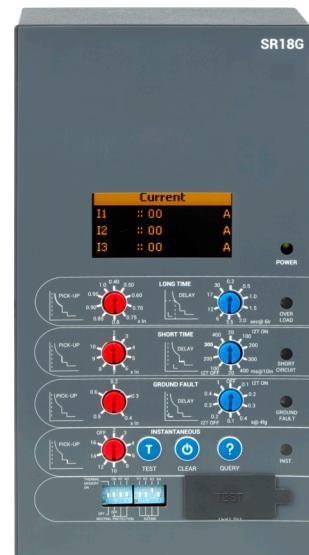
Type of Protection	Setting Range	
	Pick-up Current	Time Delay
Overload (Phase)	Ir - 0.4 to 1.0 times In Steps : 0.40, 0.50, 0.60, 0.70, 0.75, 0.80, 0.85, 0.90, 0.95, 1	0.2 to 30 sec at 6 times Ir Steps : 0.2, 0.5, 1, 1.5, 2, 3.5, 6, 12, 17, 30 sec
Overload (Neutral)	In - 50% to 200% times Ir Steps : 50%, 100%, 150%, 200%	Same as Overload (Phase)
Short-Circuit	2 to 10 times In Steps : 2, 3, 4, 5, 6, 7, 8, 9, 10	$I^2t$ ON = 0.02, 0.1, 0.2, 0.3, 0.4 sec $I^2t$ OFF = 0.02, 0.1, 0.2, 0.3, 0.4, sec-
Instantaneous	2 to 16 times In Steps : 2, 3, 4, 6, 8, 10, 12, 14, 16, OFF	
Earth fault*	0.2 to 0.6 times In Steps : 0.2, 0.3, 0.4, 0.5, 0.6	$I^2t$ ON = 0.1, 0.2, 0.3, 0.4 sec $I^2t$ OFF = 0.1, 0.2, 0.3, 0.4, 1 sec

\*In 3 phase, 4 wire system, Neutral CT is required for earth fault protection

## Microprocessor Based Release - SR18G with display

### Salient Features

- › Self - powered & True RMS sensing
- › True Hot & Cold characteristics & switchable Thermal Memory
- › Unique 3 line O-LED display (Organic LED)
- › Offers comprehensive protection against Overload - Phase & Neutral, Short-Circuit, Instantaneous, Earth Fault
- › Settable Overload delay
- › Settable Instantaneous setting with provision of "OFF"
- ›  $I^2t$  ON/OFF for Short-Circuit and Earth Fault protection
- › Individual Fault LED indication
- › Provision for Self-diagnostic test
- › Conformance to EMI/EMC standards
- › Testing through Universal Test kit
- › Separate version with Zone Selective Interlocking (ZSI) - SR18Gi with display



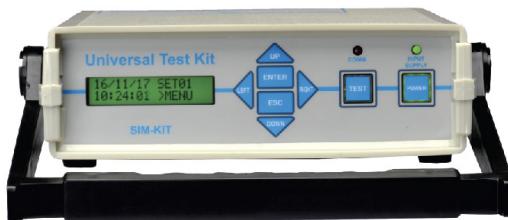
Type of Protection	Setting Range	
	Pick-up Current	Time Delay
Overload (Phase)	Ir - 0.5 to 1.0 times In Steps : 0.50, 0.60, 0.65, 0.70, 0.75, 0.80, 0.85, 0.90, 0.95, 1	0.2 to 30 sec at 6 times Ir Steps : 0.2, 0.5, 1, 1.5, 2, 3.5, 6, 12, 17, 30 sec
Overload (Neutral)	IN -50% to 200% times Ir Steps : 50%, 100%, 150%, 200%	Same as Overload (Phase)
Short-Circuit	2 to 10 times In Steps : 2, 3, 4, 5, 6, 7, 8, 9, 10	$I^2t$ ON = 0.02, 0.1, 0.2, 0.3, 0.4 sec $I^2t$ OFF = 0.02, 0.1, 0.2, 0.3, 0.4, sec
Instantaneous	2 to 16 times In Steps : 2, 3, 4, 6, 8, 10, 12, 14, 16, OFF	
Earth fault*	0.2 to 0.6 times In Steps : 0.2, 0.3, 0.4, 0.5, 0.6	$I^2t$ ON = 0.1, 0.2, 0.3, 0.4 sec $I^2t$ OFF = 0.1, 0.2, 0.3, 0.4, 1 sec

\*In 3 phase, 4 wire system, Neutral CT is required for earth fault protection

## Universal Test Kit

### Salient Features

- › Compatible with following E&A Protection Releases:
  - » SR protection releases of C-Power ACB family
  - » UNRS protection releases of U-Power ACB family
  - » MTX and RC releases of D-Sine MCCB family
- › Operates from 240V AC supply & generates single-phase voltage test signals
- › Tests the release for
  - » Phase fault i.e. for overload, short-circuit, instantaneous and Earth Fault protection
- › ACB test current multiples
  - » For O/L, S/C and Inst - 2.5 In to 13 In in steps of 0.05
  - » For E/F - 0.25 In to 0.70 In in steps of 0.05
- › MCCB test current multiples
  - » For O/L - 2In, 4In, 6In and 8In
  - » For S/C and Inst - 2.5 In to 13 In in steps of 0.05
  - » For E/F - 0.25 In to 0.70 In in steps of 0.05
- › LCD display indicated the trip time (three places after decimal)



## Microprocessor-based Communication-capable Release - SR71

### Salient Features

- › True RMS sensing
- › Offers comprehensive protection for overload, short-circuit, instantaneous, earth fault and neutral overload
- › High resolution backlit LCD display
- › Intelligent Pre-trip alarm to prevent system shutdown
- › Password protected settings and commands
- › MODBUS RTU protocol with intrinsic RS 485 port
- › LED indication for POWER ON, different faults and Pre-trip alarm
- › 2 sets of storable protection settings
- › Last 5 trips & 128 Event records with time & date stamping
- › 3 programmable contacts-1 for micro controller failure, 2 for basic fault annunciation
- › 4 relay contacts for indication of exceeding maximum demand, Pre-trip alarm and control on breaker (closing and opening)
- › Rating-plug for precise protection at lower load currents
- › Auto-doubling features to prevent nuisance tripping 2
- › Selectable I<sup>2</sup>t based current for short-time and earth fault zones
- › Thermal reflectivity enables faster tripping on recurrent overloads
- › Inbuilt Zone Selective Interlocking
- › Provision for Self-diagnostic test
- › Conformance to EMI/EMC standards



## Microprocessor-based Communication-capable Release - SR71

Parameter			Screen Abbreviation	Details	Factory Settings
Overload (Phase)	Current Settings (A), $I_r = I_n \times \dots$		PICK-UP	0.4 to 1.0 In in steps of 0.05 In	1.0 In
	Time Delay, $T_r$ (sec) at $6 \times I_r$		TMS-Tr	0.5-1-2-4-6-12-18-24-30	30 sec
	Pre-trip Alarm Settings		PREALAR	0.5 to 0.95 $I_r$ in steps of 0.05 $I_r$	0.95 $I_r$
	Thermal Reflectivity		THM-MEM	ON / OFF	OFF
	Function		FUNC	Enable / Disable	
Neutral Fault	Current Settings (A), $I_n = I_{rx} \dots$		PICK-UP	0.5-1.0	1.0 $I_r$
	Time Delay (sec)		DELAY	Same as 'Overload (Phase)'	30 sec
Short-Circuit	Current Settings (A), $I_{sd} = I_n \times \dots$		PICK-UP	2 to 10 In in steps of 0.5 In	10 In
	Time Delay, $t_{sd}$ (msec) at $10 \times I_n$	$I^2t$ OFF	DELAY	20-100-200-300-400	400 msec
		$I^2t$ ON	DELAY	20-100-200-300-400	400 msec
	Pre-trip Alarm Settings		PREALAR	0.5 to 0.95 $I_s$ in steps of 0.05 $I_s$	0.95 $I_s$
	$I^2t$		$I^2t$	ON / OFF	
	Cold-load Pick-up		COLDPIC	Enable / Disable	Disable
	Cold-load Pick-up Delay		CP-DLY	0.1 to 10 sec in steps of 0.1 sec	0.1 sec
Instantaneous	Function		FUNC	Enable / Disable	Enable
	Current Settings (A), $I_i = I_n \times \dots$		PICK-UP	2 to 16 In in steps of 0.1 In	16 In
Earth Fault	Function		FUNC	Enable / Disable	Enable
	Current Settings (A), $I_g = I_n \times \dots$		PICK-UP	0.1 to 0.6 in steps of 0.05 In for $I^2t$ ON	0.6 In
				0.1 to 0.6 in steps of 0.01 In for $I^2t$ OFF	
	Time Delay (sec), $t_g$		DELAY	100 to 400 msecs in steps of 100 msec for $I^2t$ ON	3 sec
				0.1 to 5 sec in steps of 100 msec for $I^2t$ OFF	
	Pre-trip Alarm Settings		PREALAR	0.5 to 0.95 $I_g$ in steps of 0.05 $I_g$	0.95 $I_g$
	$I^2t$		$I^2t$	ON / OFF	OFF
Cold-load Pick-up		COLDPIC	Enable / Disable	Disable	

**Note:** Both Protection Groups 1 & 2 carry the same factory settings.

# Additional Protections

Parameter		Screen Abbreviation	Details	Factory Settings
Under Current	Function	FUNC	Enable / Disable	Disable
	Current Setting (A) x In	PICK-UP	15% to 80% in steps of 5% In	0.8 In
	Time Delay (secs)	DELAY	1 to 255 in steps of 1 second	1 second
	Trip / Alarm	MODE	Either / Both	Alarm
Current Unbalance	Function	FUNC	Enable / Disable	Disable
	Current Setting (A) x In	PICKUP	10% to 95% in steps of 5% In	0.2 In
	Time Delay (secs)	DELAY	1 to 10 in steps of 5 secs	2.0 secs
Over Voltage #	Function	FUNC	Enable / Disable	Disable
	Voltage Setting (V) Vs = Vn x ..	PICK-UP	105% to 150% in steps of 5% Vn	1.2 Vn
	Time Delay (secs)	DELAY	0.1 to 100 in steps of 0.1 secs	5.0 secs
	Reset Voltage	RSTSET	85% to 98% in steps of 1% Vs	0.95 Vs
	Trip / Alarm	MODE	Either / Both	Alarm
Under Voltage #	Function	FUNC	Enable / Disable	Disable
	Voltage Setting (V) Vn x ..	PICK-UP	45% to 65% in steps of 5% Vn	0.6 Vn
	Time Delay (secs)	DELAY	0.1 to 5 in steps of 0.1 secs	1 second
	Reset Voltage	RSTSET	102% to 115% in steps of 1% Vs	1.02 Vs
	Trip / Alarm	MODE	Either / Both	Alarm
Over Frequency #	Function	FUNC	Enable / Disable	Disable
	Frequency Setting (Hz)	PICK-UP	50 to 55Hz for 50Hz in steps of 0.01Hz	52.0Hz
			60 to 62Hz for 60Hz in steps of 0.01Hz	61.0Hz
	Time Delay (secs)	DELAY	0.1 to 100 secs in steps of 0.1 second	0.2 secs
	Drop Off Frequency	DRPOFF	0.02 to 0.10Hz in steps of 0.1Hz	0.1Hz
Reverse Power #	Trip / Alarm	MODE	Either / Both	Alarm
	Function	FUNC	Enable / Disable	Disable
	Settings (kW)	PICK-UP	0.02 to 0.4 in steps of 0.01 Pn	0.2 Pn
	Time Delay (secs)	DELAY	1 to 100 in steps of 0.1 secs	2.0 secs
Phase Sequence #	Trip Alarm	MODE	Either / Both	Alarm
	Function	FUNC	Enable / Disable	Disable
	Settings	PICK-UP	123 - 132	123
	Time Delay (secs)	DELAY	0 to 5 in steps of 0.5 secs	2 secs
Breaker Failure	Trip / Alarm	MODE	Either / Both	Alarm
	Function	FUNC	Enable / Disable	Disable
Maximum Demand	Time Delay (secs)	DELAY	0.05 to 2 secs in steps of 0.01 secs	1.0 second
	Function	FUNC	Enable / Disable	Disable
	Exceed	PICK-UP	40 kW - 1600 kW	100 kW
i - Discrimination	Step	DELAY	10 kW - 1000 kW	10 kW
	i - Discrimination	i - Discrimination	Enable / Disable	Disable

# Requires SR71-PM module

# Metering

Parameter	Screen Abbreviation	Details
Current	I	Phase, Earth and Neutral
	Imax	Maximum running Current per Phase
	%Load	Percent Loading
Voltage#	V	Phase-Neutral
	Vph-Vph	Phase-Phase
Frequency #	F	System Frequency
Power Factor #	PF	System Power Factor
Power #	kW	Active Power per Phase and Total (kW)
	kVAr	Reactive Power per Phase and Total (kVAr)
	kVA	Apparent Power per Phase and Total (kVA)
	kW	Maximum Demand (kW)
Energy #	kWh	Total Active Energy (kWh)
	kVArh	Total Reactive Energy (kVArh)
	kVAh	Total Apparent Energy (kVAh)
Harmonic-Current	I1HAR	R-Phase Current Harmonics
	I2HAR	Y-Phase Current Harmonics
	I3HAR	B-Phase Current Harmonics
Harmonic-Voltage #	V1HAR	R-Phase Voltage Harmonics
	V2HAR	Y-Phase Voltage Harmonics
	V3HAR	B-Phase Voltage Harmonics
Display		High Resolution Backlit LCD

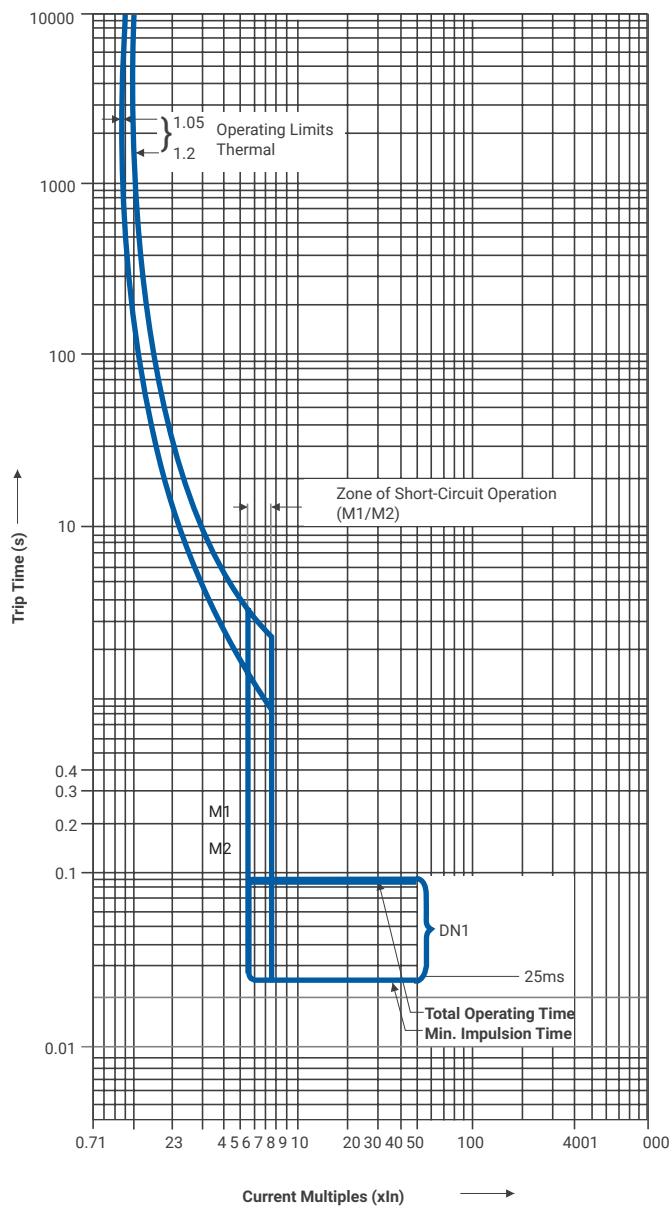
# Requires SR71-PM module

# Additional Features

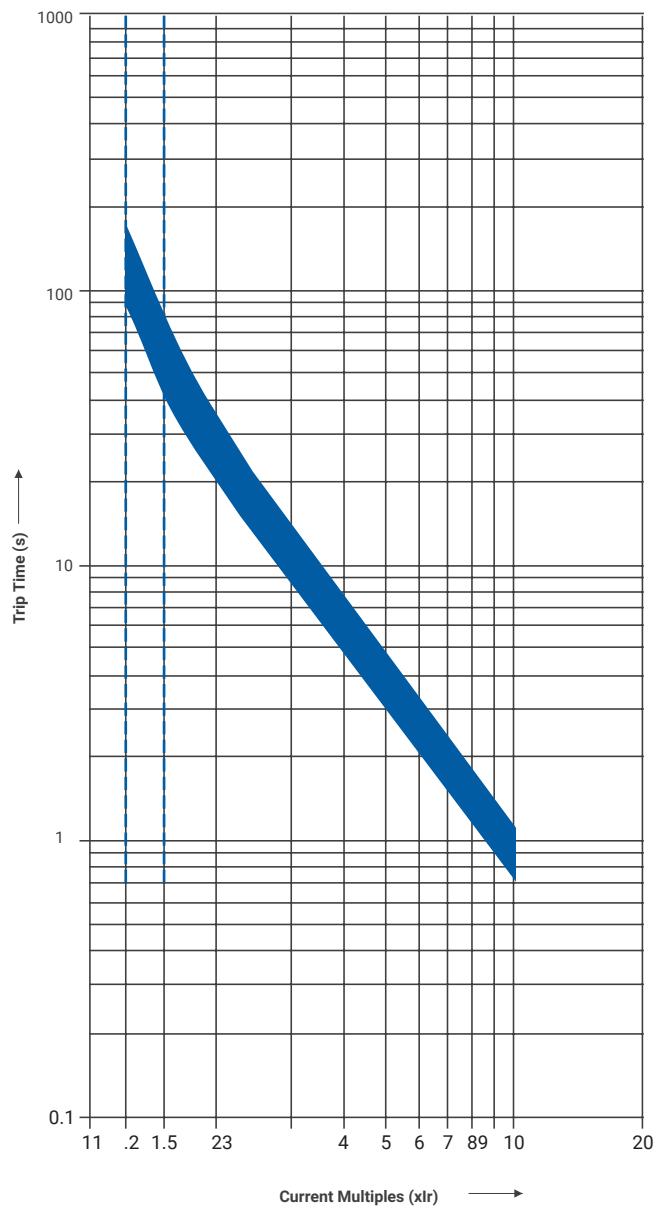
Parameter	Screen Abbreviation	Details
LED Indications	Auxiliary Power ON	✓
	Overload	✓
	Short-Circuit	✓
	Instantaneous	✓
	Earth Fault	✓
	Neutral Fault	✓
	Trip	✓
	Alarm	✓
Auxiliary Supply		24V DC
Digital Inputs		4 Nos.
Output Relays		3 Internal + 4 External Relays
		240V AC / 5A, 30V DC / 5A (resistive load)
Rating Plug	In Multiplier	630-800-1000-1250-2000-3200-5000
Communication	Protocol	MODBUS RTU
	Link used	RS 485
Maintenance Indication		I <sup>2</sup> t based
Event Records (128)		Pick-up, Alarm, Trip, Date, Time and Cause of Event, voltage and current readings in all phases
Trip Records		Last 5 records with date and time stamping,
Testing	Self-Diagnostic Test	P
Supplementary Modules	Communication Module (SR71-COM)	MODBUS RTU using RS 485
	Power Supply Module (UN-PS)	Input : 26V to 60V DC, 90 to 300V AC/DC Output : 24V DC
	Power Metering Module (SR71-PM)	240V AC, 415V AC
	Relay Module (SR71-REL)	4 Relay Outputs (Breaker OPEN, Breaker CLOSE, Pre Trip alarm and MD Exceed)
No. of Storable Settings		2

# Protection Characteristic

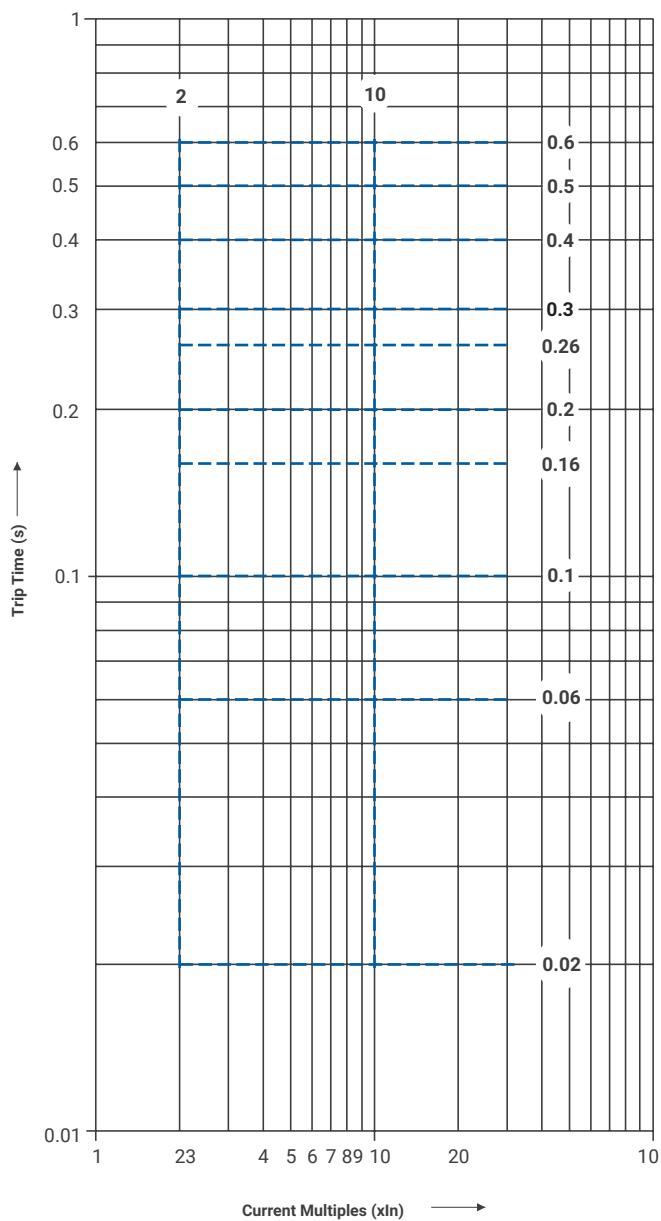
Time-current (DN1)



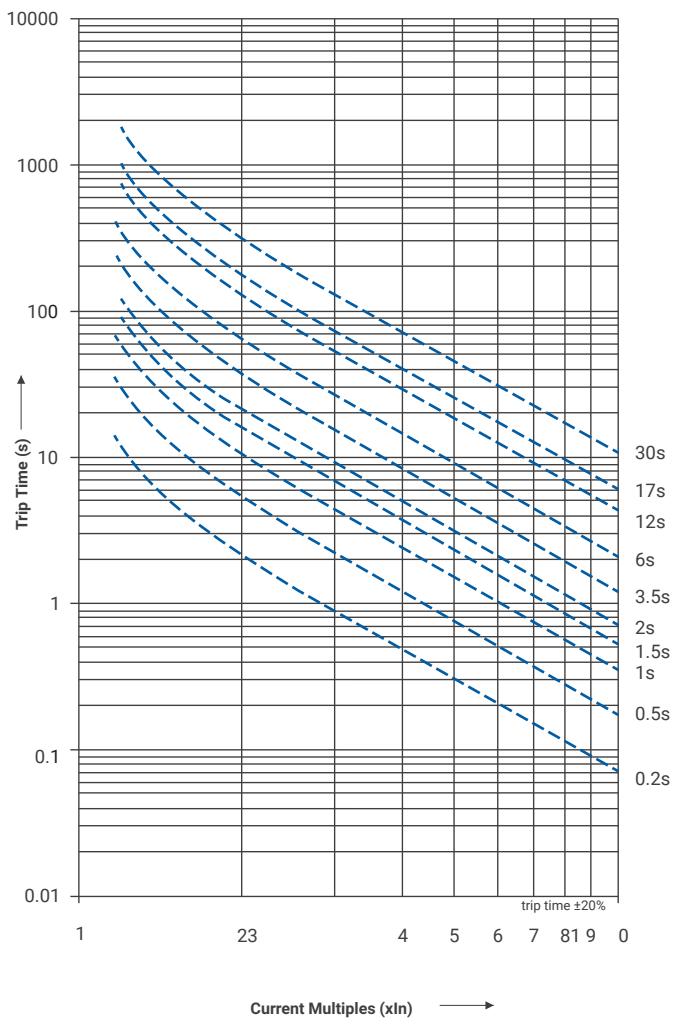
Overload (SR18)



## Short-Circuit (SR18)

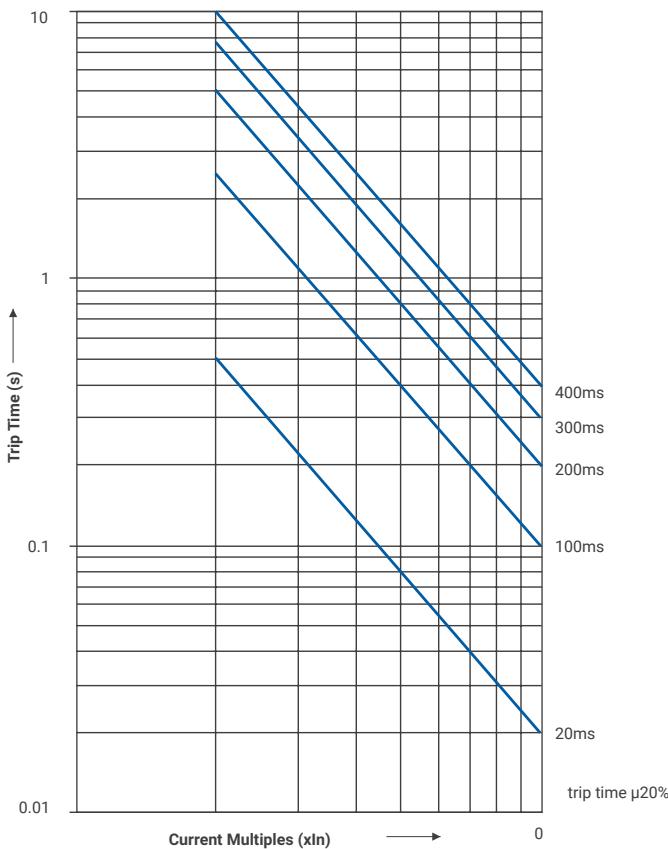


## Overload (SR18G, SR18G with display/SR18Gi with display)



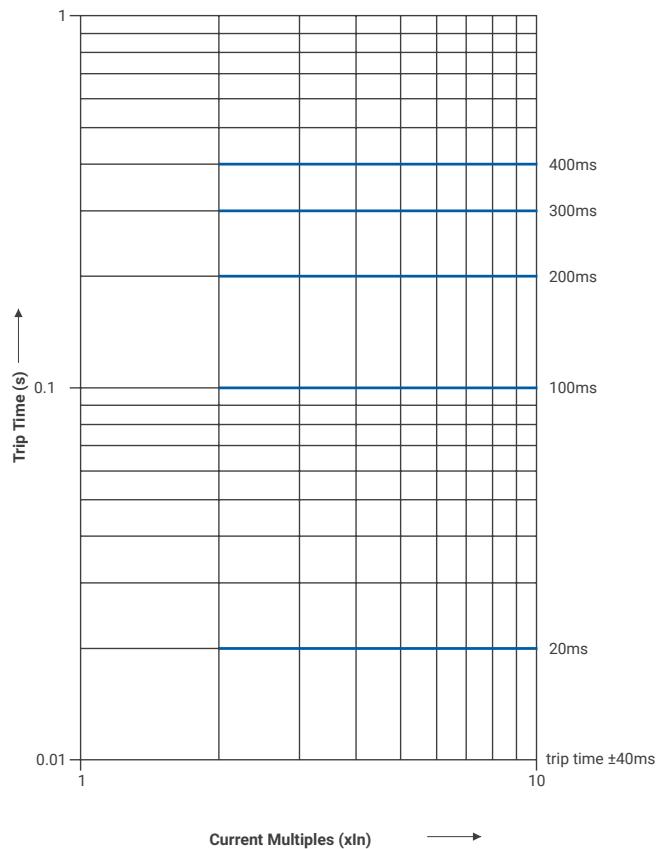
### Short-Circuit I<sup>2</sup>t ON

(SR18G, SR18G with display/SR18Gi with display)



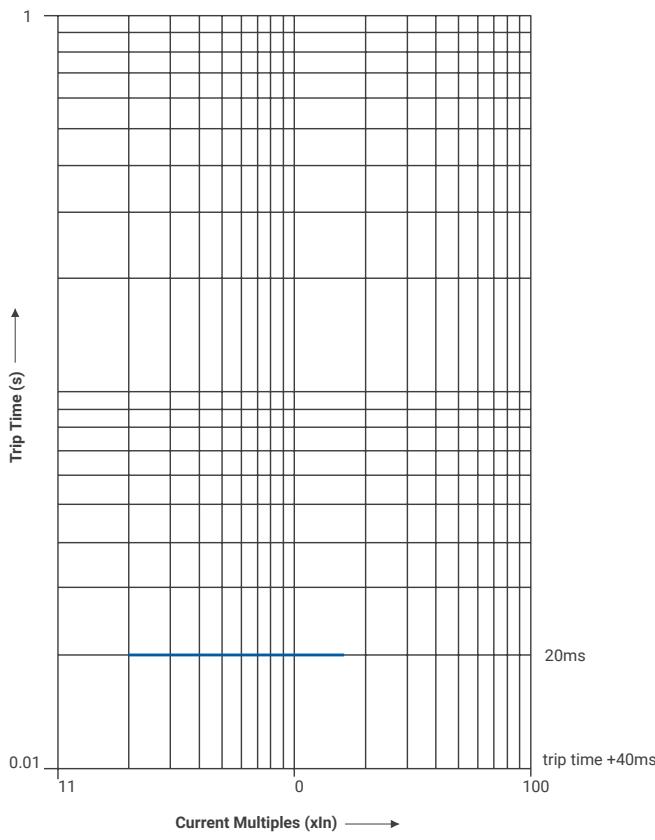
### Short-Circuit I<sup>2</sup>t OFF

(SR18G, SR18G with display/SR18Gi with display)



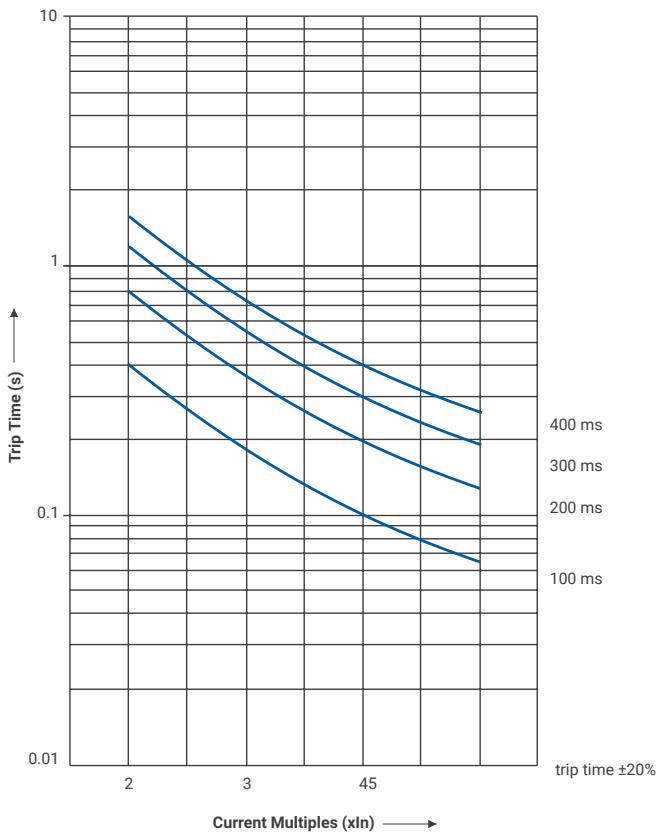
### Instantaneous

(SR18G, SR18G with display/SR18Gi with display)

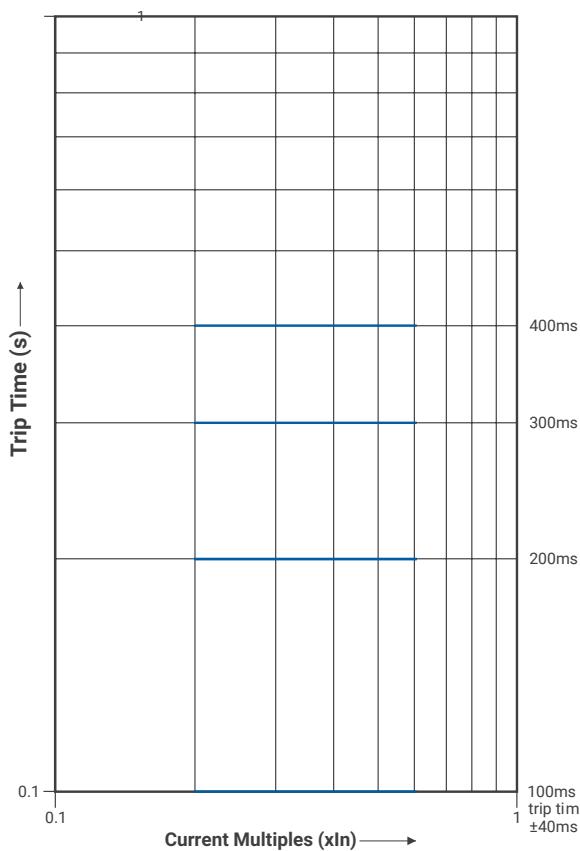


### Earth Fault I<sup>2</sup>t ON

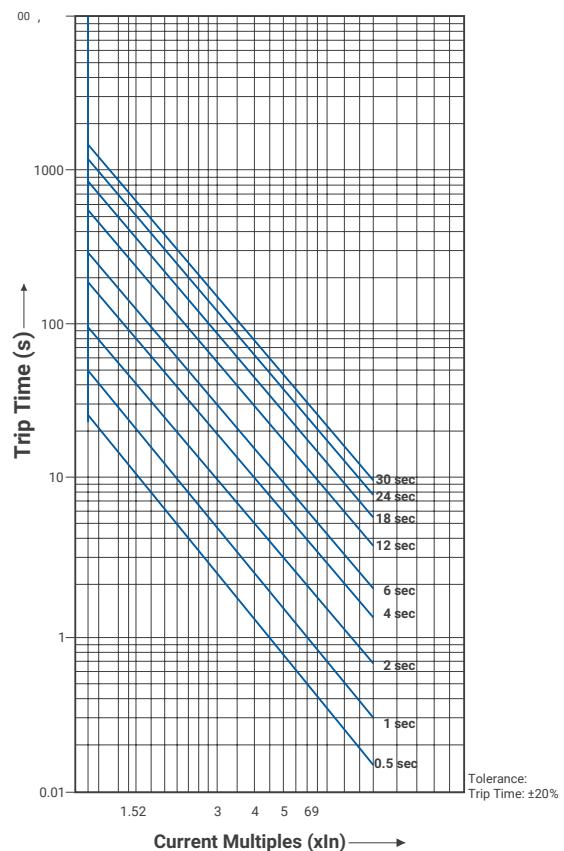
(SR18G, SR18G with display/SR18Gi with display)



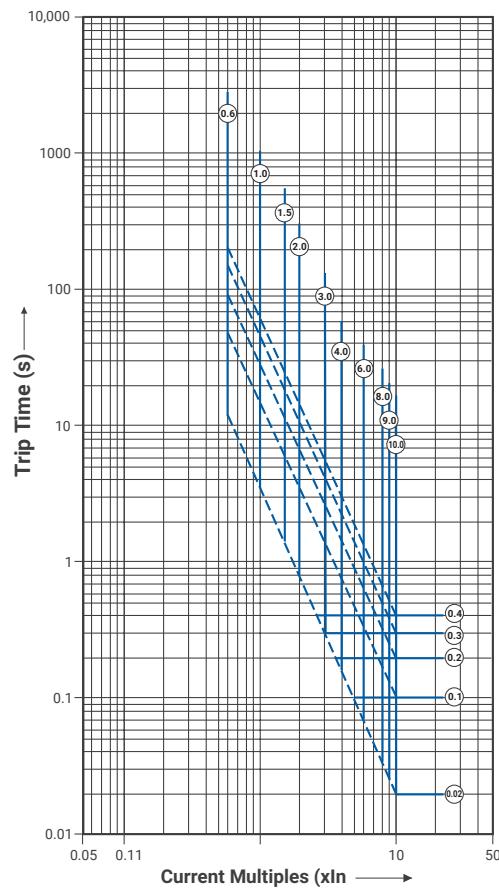
## Earth Fault I<sup>2</sup>t OFF (SR18G, SR18G with display/SR18Gi with display)



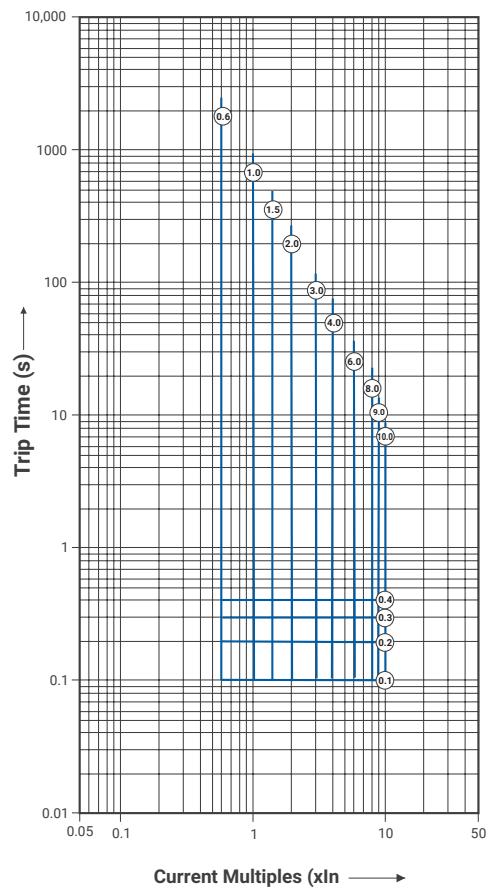
## Overload Curve (SR71)



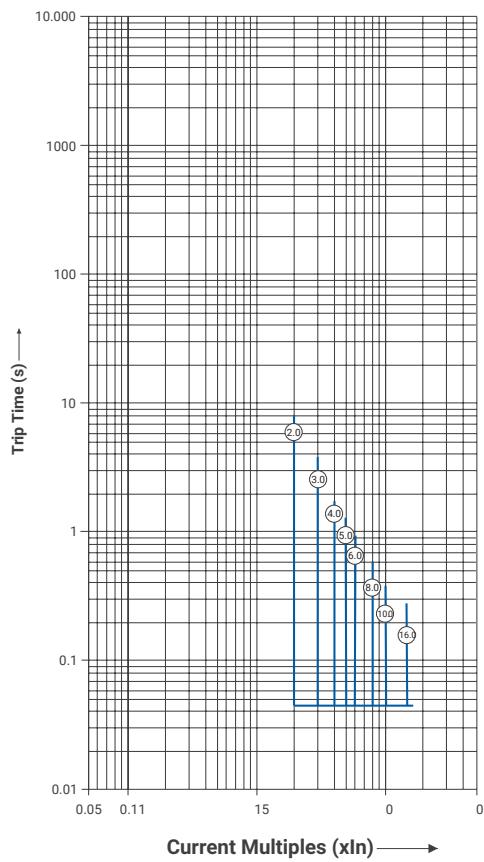
## Short-Circuit - I<sup>2</sup>t ON (SR71)



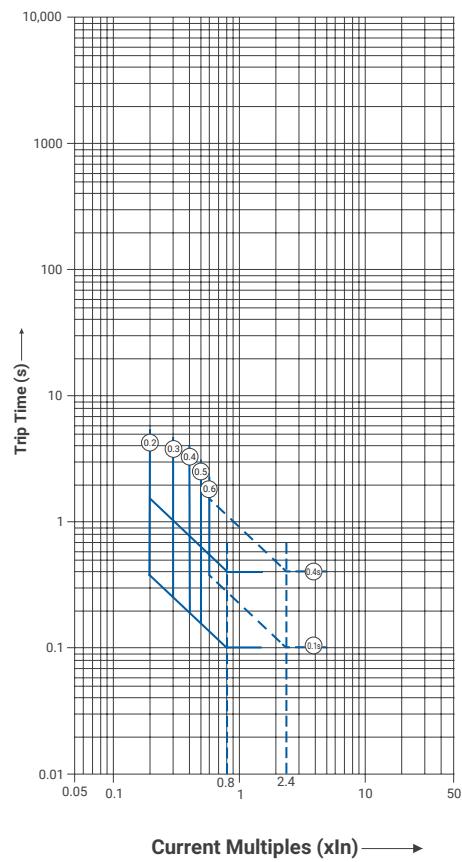
## Short-Circuit - I<sup>2</sup>t OFF (SR71)



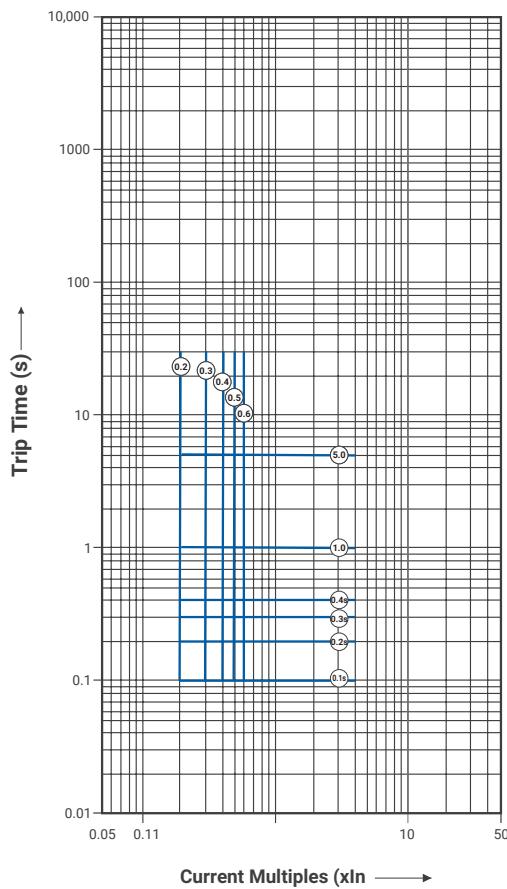
### Instantaneous (SR71)



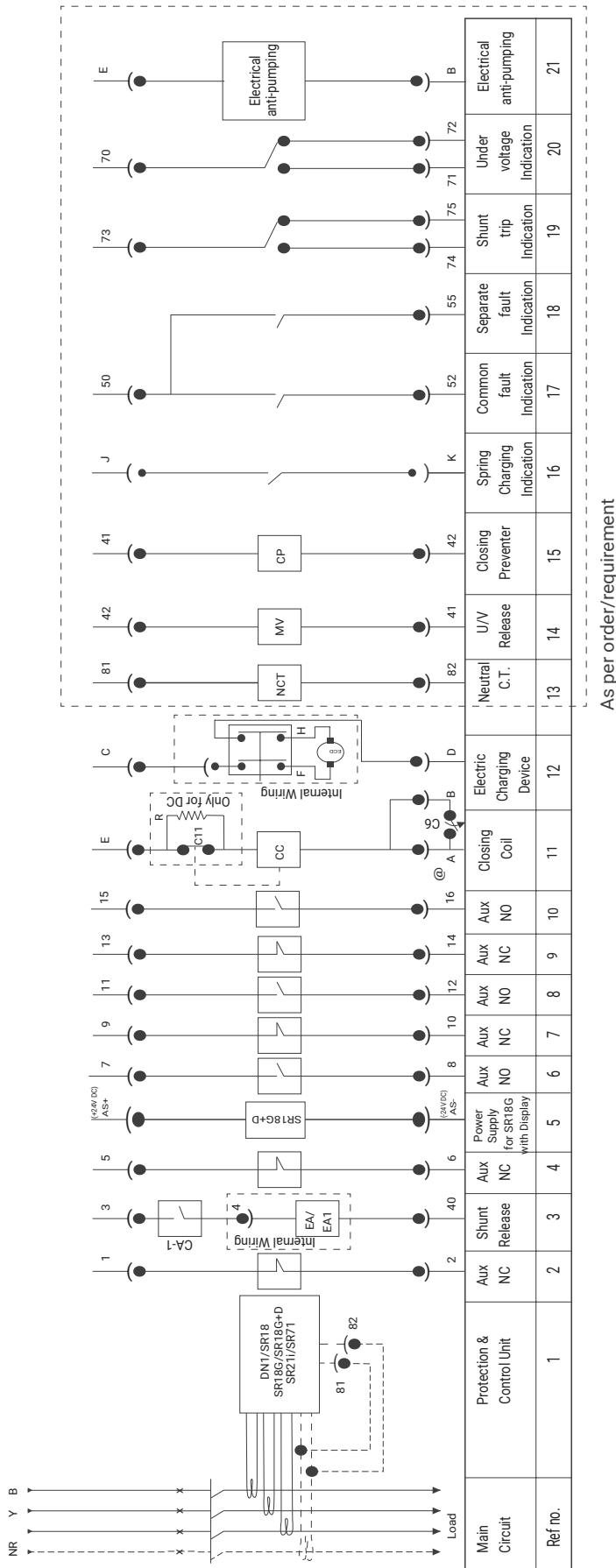
### Earth Fault - $I^2t$ ON (SR71)



### Earth Fault - $I^2t$ ON (SR71)



# Wiring Diagram



The above drawing is for EDO breakers.

1) For MDO/MF versions

Ref no. 3, 10, 11 are not applicable  
E, B, C, D, A, 15 are applicable only in electrical breakers.

2) For EF versions

The ref. no. 12, 13, 14, 15, 16, 17, 18, 19, 20, 21 are provided as per customer requirement.

3) When using AN1 Announcer Module with SR18G/18Gi (with display releases)

A) AS+ & AS- always appear after 5,6 nos. of the SIC.

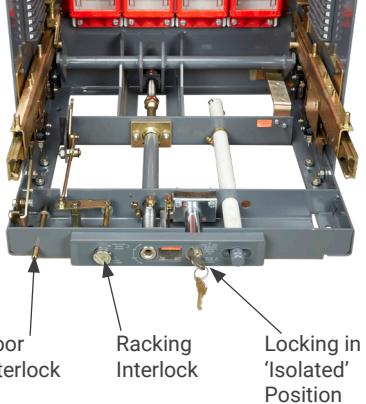
B) If 1,2,3,4,5,6 nos. of SICs are not there, AS+ & AS- will appear first.

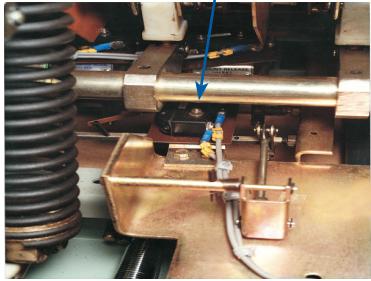
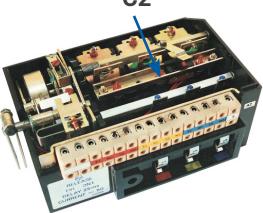
C) SIC 13 and 14 Nos. are not offered in 3P EDO and 3P MDO standard breakers.

FCA Limit switch(Shown in breaker reset condition)  
R Economy Resistor  
C11 Limit switch operates when closing electromagnet is held on  
C6 'Service' position microswitch for withdrawable circuit breakers  
(shown in 'test' position)

For SR18Gi+D & SR21i release (P&C unit)  
SI, SO i discrimination  
GI, G i discrimination  
G Short circuit i/p & o/p  
Earth fault i/p & o/p  
Earth

# Accessories

Type	Data
<b>Lockable Trip Push Button (LTPB)</b>  	<p>Mounted in place of normal trip push button. With this, ACB can be locked in trip condition. For interlocking, LTPBs are offered in the following combinations:</p> <ul style="list-style-type: none"> <li>› 4 different types of keys i.e. AA, BB, CC and DD suitable for 2 I/C &amp; 1 B/C schemes</li> <li>› Combination of L, M, N, LM and MN locks, which are suitable for 3 I/C &amp; 2 B/C schemes</li> <li>› Combination of K, L, M, N, KL, LM and MN locks, which are suitable for 4 I/C &amp; 3 B/C schemes</li> <li>› Combination of J, K, L, M, N, JK, KL, LM and MN locks, which are suitable for 5 I/C &amp; 4 B/C schemes</li> </ul>
<b>View of the Cradle</b>   <p>Door Interlock      Racking Interlock      Locking in 'Isolated' Position</p>	<p><b>Locking in Isolated Position (LIP)</b> The facility of locking the ACB in Isolated position is available in Drawout ACBs. This is useful to achieve interlocking between Main &amp; Standby source. Similar lock is available as LOCK IN ANY POSITION.</p> <p><b>Door Interlock</b> This ensures:</p> <ul style="list-style-type: none"> <li>› Unless the panel door is closed, breaker cannot be racked in or out</li> <li>› Unless the breaker is in Isolated Position, it is not possible to open the panel door</li> </ul> <p><b>Racking Interlock</b> This ensures that breaker cannot be racked in/out unless the ACB is in tripped/open condition.</p>
<b>Mechanical Interlock</b>  	<p>It is possible to provide "Mechanical Interlock" between two breakers of the same or different ratings in vertical or horizontal configurations. Mechanical interlock is available for ACBs upto 4000A by flexible cables of 2 metres.</p>

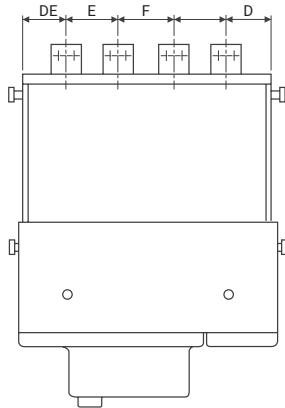
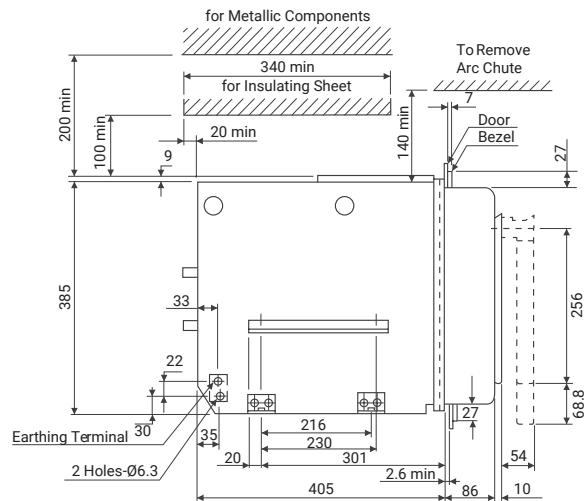
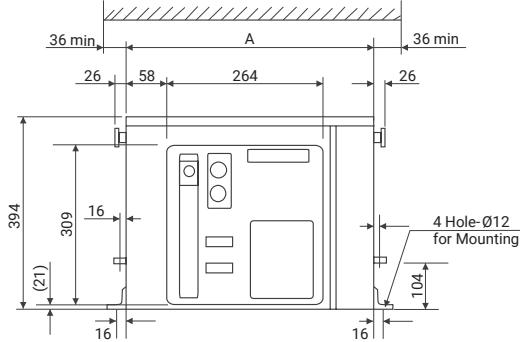
Type	Data
 C1	<b>Common indication of tripping due to overload, short-circuit and earth faults.</b> <ul style="list-style-type: none"> <li>› Provided by micro-switch C1 fitted inside the ACB</li> <li>› Available as an option in all releases</li> </ul>
 C2	<b>Separate indication of tripping due to overload, short-circuit and earth faults.</b> <ul style="list-style-type: none"> <li>› For release type DN1, this is provided by micro-switch C1 &amp; C2 (C2 fitted inside release)</li> </ul>
<b>AN1-Annunciator Module</b>	<b>Remote indication of tripping due to overload, short-circuit and earth faults.</b> <ul style="list-style-type: none"> <li>› Can be used with releases type SR18/SR18G/SR21i/SR18G &amp; SR18Gi with display</li> <li>› Individual fault indication provided by three separate LEDs for           <ul style="list-style-type: none"> <li>» Long time faults</li> <li>» Short time/instantaneous fault</li> <li>» Earth fault</li> </ul> </li> <li>› One potential free contact rated 5A at 230V AC available for each type of fault</li> <li>› Flush mounting on panel (H-W-D=92mm x 46mm x 105mm)</li> <li>› Operating voltage: 240V AC</li> </ul>
 C5	<b>Indication for operation of shunt release or undervoltage release.</b> <ul style="list-style-type: none"> <li>› Provided by micro-switch C5 fitted on the shunt release or undervoltage release</li> </ul>

Type	Data	Technical Data				
<b>Shunt Release</b>	<ul style="list-style-type: none"> <li>&gt; For remote tripping of the breaker</li> <li>&gt; Shunt release coil is short time rated and is disconnected from the circuit by an auxiliary contact when the ACB trips (Refer to wiring diagram)</li> <li>&gt; Low power consumption</li> <li>&gt; Two types available:           <ul style="list-style-type: none"> <li>» EA for DC application</li> <li>» EA1 for AC application</li> </ul> </li> </ul>	<b>Type of Release</b> EA1 EA	Nominal Voltage Use (V)	Power consumption at pick-up	Operation Limit	
			110 AC	800 VA	10-130% V	
			240 AC	800 VA		
			415 AC	800 VA		
	<p><b>Type MV</b> With no intentional time delay</p> <p><b>Notes:</b> When under voltage release is provided, the ACB can be closed only when supply is available to the under voltage release.</p>		24V DC	32 W	65-130% V	
			48V DC	125 W		
			110 DC	45 W		
			220 DC	30 W		
<b>Note:</b> Other voltages available on request						
<b>Under Voltage Release</b>	<ul style="list-style-type: none"> <li>&gt; <b>Type MV</b> With no intentional time delay</li> </ul> <p><b>Notes:</b> When under voltage release is provided, the ACB can be closed only when supply is available to the under voltage release.</p>	<b>Parameter</b>		<b>Specification</b>		
	Closing release remotely closes the circuit breaker if the mechanism spring is already charged.	Nominal voltage		240V & 415V 50Hz AC, 220V & 415V 60Hz AC, & 24V DC		
		Pick up (V)		80% Ue		
		Drop off (V)		35-65% Ue		
		VA Consumption		Pick up - 23 VA Hold on - 8.5 VA		
		Watt loss		6 W		
<b>Closing Release</b>		<b>Rated voltage (Us)</b>	<b>Power consumption</b>		<b>Range of operation</b>	
		110V, 50Hz 240V, 50Hz 220V, 60Hz	320 VA		85-110% Us	
		110V DC, 220V DC 24V, 30V, 48V DC	300 W			
<b>Spring Charging Motor</b>	Electrical charging device automatically charges the mechanism spring of the circuitbreaker. After circuit-breaker closing, the geared motor immediately recharges the closing spring. Thus instantaneous reclosing of the circuit-breaker is possible following opening operation.	<b>Rated operational voltage (Ue)</b>	<b>Power consumption</b>	<b>Range of operation</b>		
	Two combinations available: <ul style="list-style-type: none"> <li>&gt; 2 NO + 2 NC</li> <li>&gt; 6 NO + 6 NC</li> </ul>	240V AC	320 VA	85-110% Ue		
		110V DC	154 W			
		220V DC				
<b>Auxiliary Contacts</b>		<b>Electrical circuit</b>	<b>Voltage (V)</b>	<b>Rated current (A)</b>		
		Resistive	24 to 415 AC 250V DC	16 1.2		
		Nonresistive	24 to 415 AC 250V DC	16 1.0 #		
# L/R = 15 ms with 2NO or 2NC contacts in series						

# OVERALL DIMENSIONS

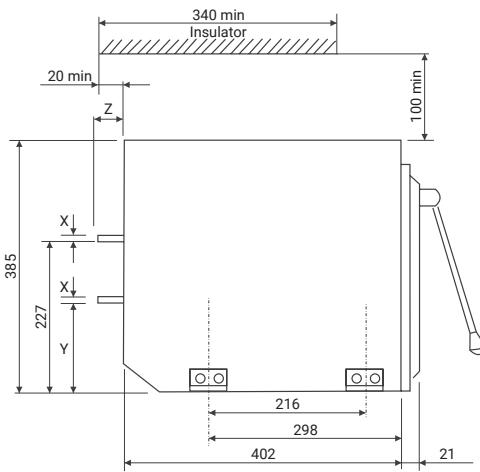
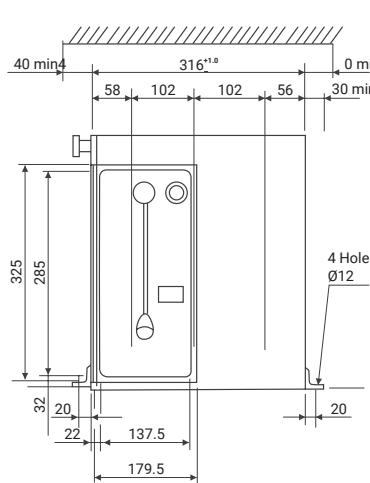
## Fixed Breakers

For 800A to 2500A 3P/4P C/H & 400A to 1600A 3P/4P S1



Ratings CN - CS			Dimensions (mm)			
	A	D	E	F		
400/630A	326	57	102	-		
800/1000A	414	56	98	98		
1250/1600A	482	83	154	-		
2000/2500A	628	82	150	156		

For CN-CS...E 400A-2000A 3P

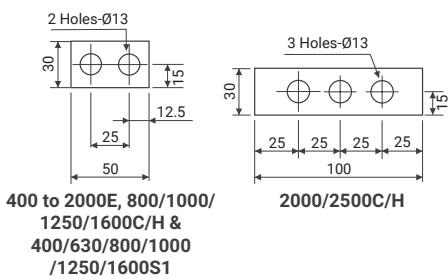


Rating Type	X	Y	Z
400E -1250E	5	150	35.5
1600E	10	145	23.5
2000E	15	140	23.5

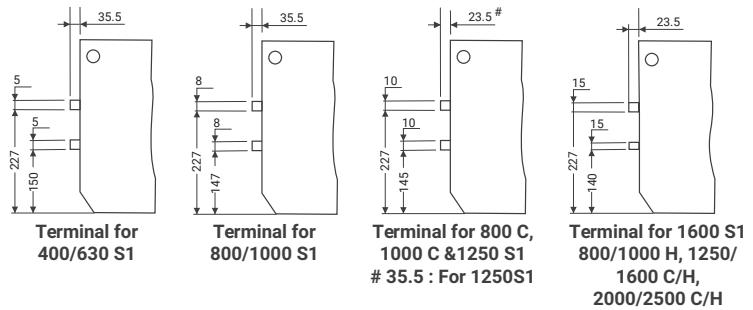
Note: All Dimensions are in mm.

## Fixed Breakers

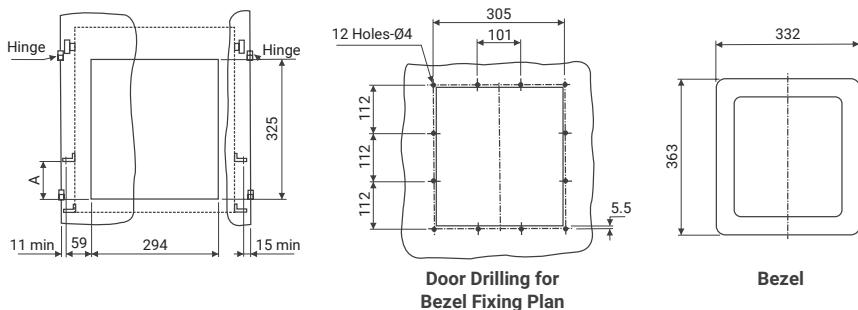
## Terminal



## Terminal Connections

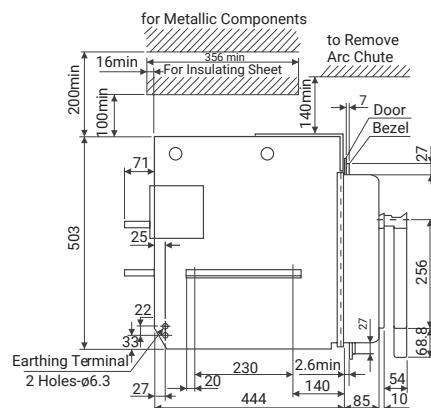
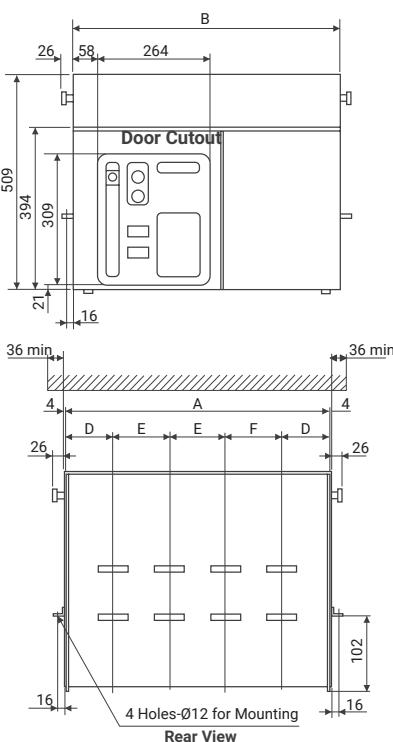


## Bezel Fixing Plan for all Fixed Breakers

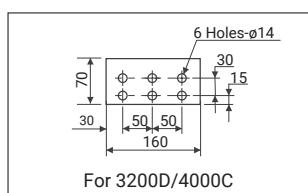


**Note:**  
A = 89 for 4000C/3200D  
A = 91 for other fixed ACBs

**For 3200D/4000C 3P/4P**



# Terminal Connections

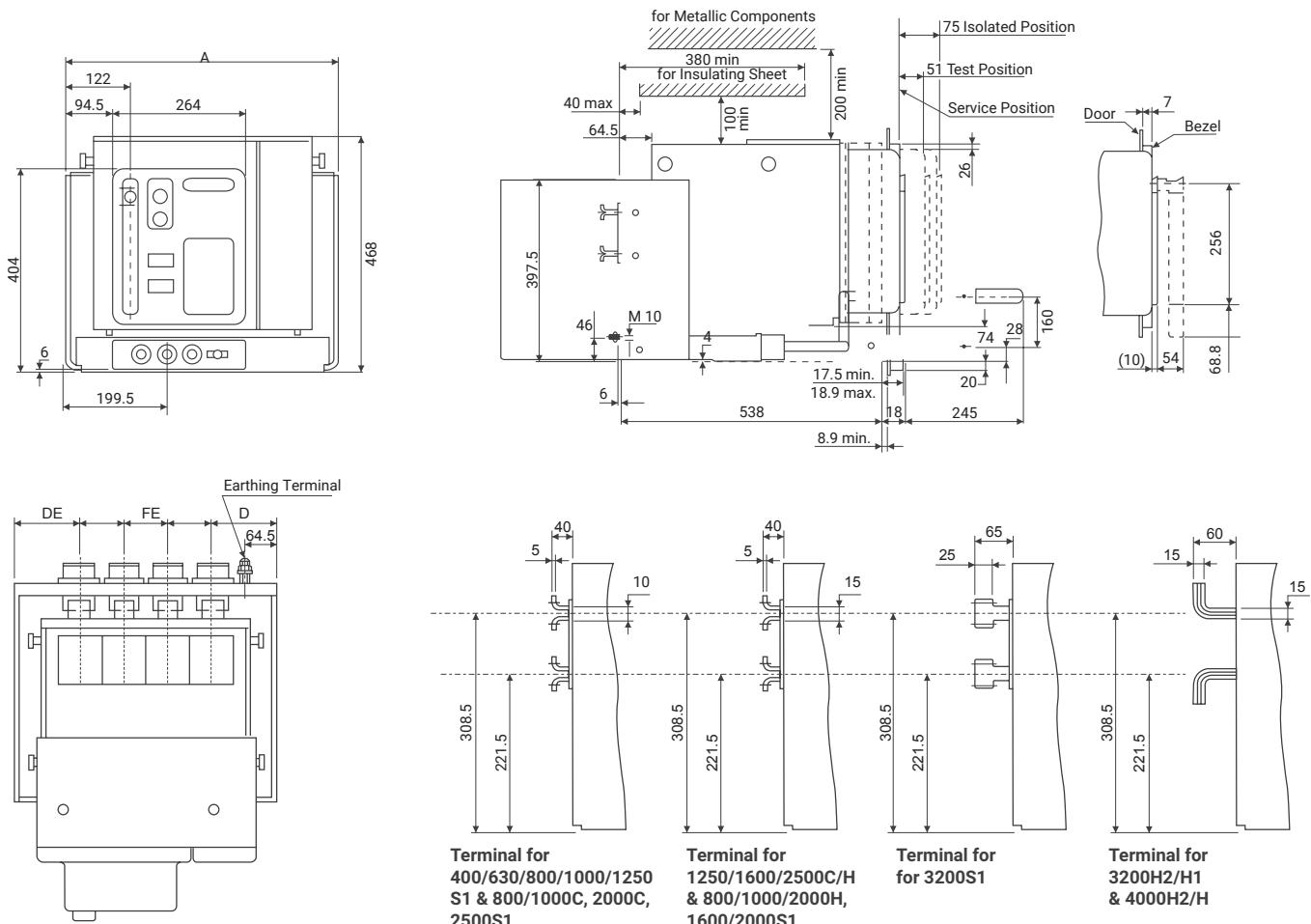


Rating CN-CS	Dimensions (mm)				
	A	B	C	E	F
3200D/4000A C 3P	628	636	112	202	-
3200D/4000A C 4P	830	838	112	202	202

**Note:** All Dimensions are in mm.

## Drawout Breakers

For 800A to 2500A C/H, 3200A H2/H1, 4000A H2/H, 400A to 3200A S1 3P/4P

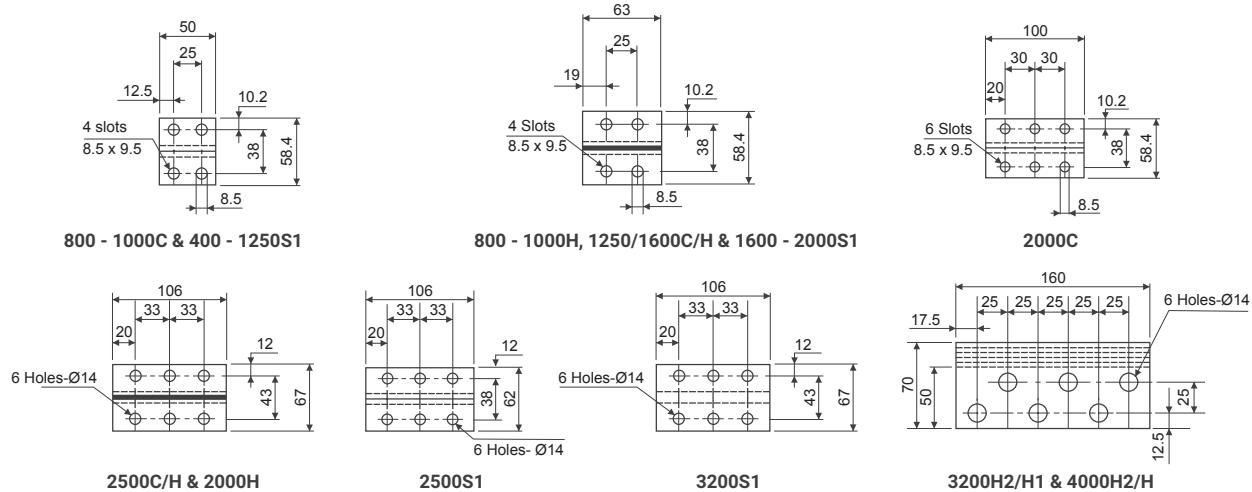


Ratings CN - CS			Dimensions (mm)			
	A	D	E	F		
400/630/800/1000A	C/H/S1	3P	399	97.5	102	-
2000A		3P				
1250/1600A		3P				
400/630/800/1000A	C/H/S1	4P	487	96.5	98	98
2000A		4P				
1250/1600A		4P				
2000/2500A	C/H	3P	555	123.5	154	-
2500/3200A	S1	3P				
2000/2500A	C/H	4P	701	122.5	150	156
2500/3200A	S1	4P				
3200A	H2/H1	3P	701	148.5	202	-
4000A	H2/H	3P				
3200A	H2/H1	4P	909	151.5	202	202
4000A	H2/H	4P				

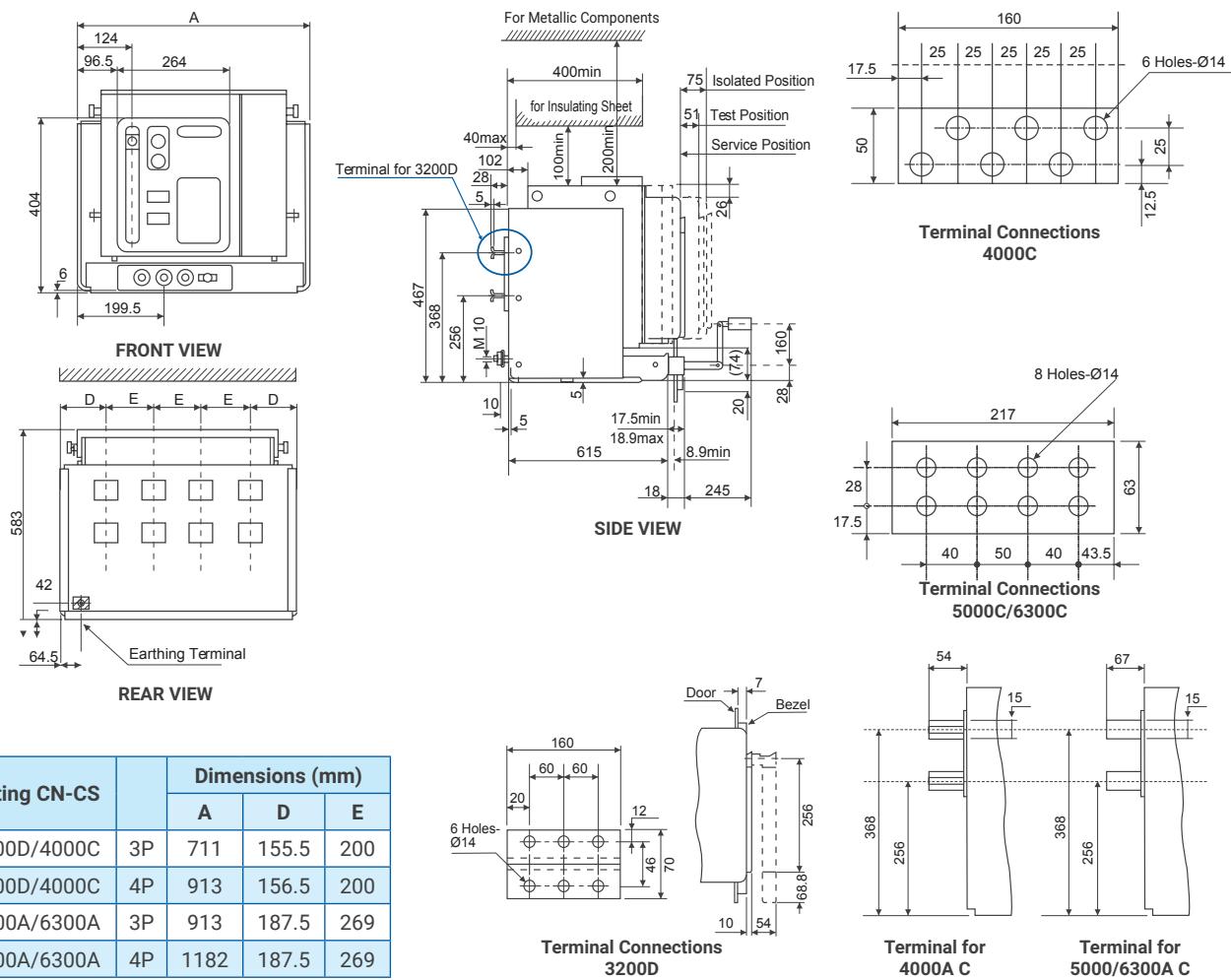
**Note:** All Dimensions are in mm.

## Drawout Breakers

### Flat Terminal Connections



### For 3200D/4000/5000/6300C 3P/4P



**Note:** All Dimensions are in mm.

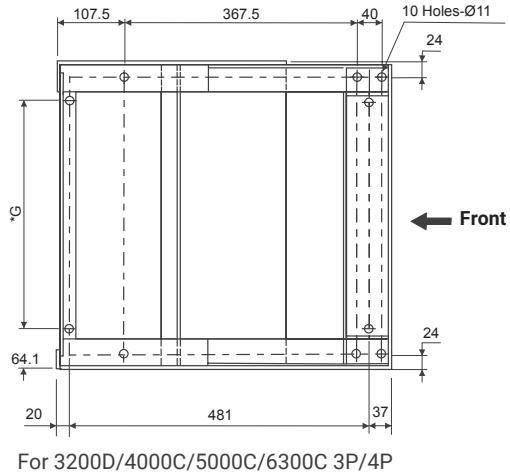
Rating CN-CS		Dimensions (mm)		
		A	D	E
3200D/4000C	3P	711	155.5	200
3200D/4000C	4P	913	156.5	200
5000A/6300A	3P	913	187.5	269
5000A/6300A	4P	1182	187.5	269

# Overall Dimensions

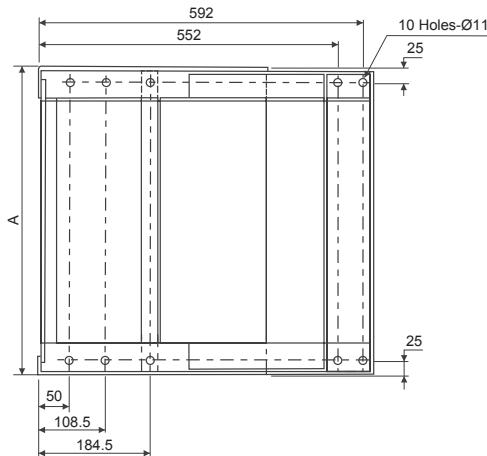
## Mounting Details

### For Horizontal Mounting of all Draw-out Breakers

For 400A to 3200A C/H/ S1 3P/4P 3200 H2/H1, 4000 H2/H 3P/4P

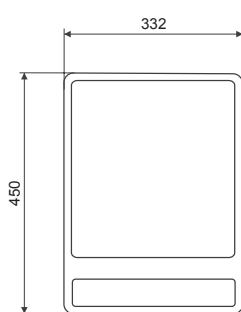
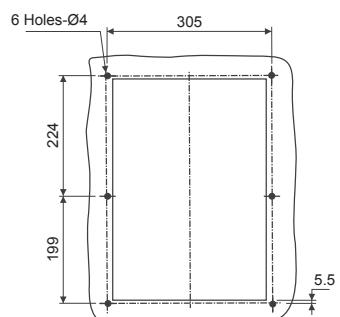
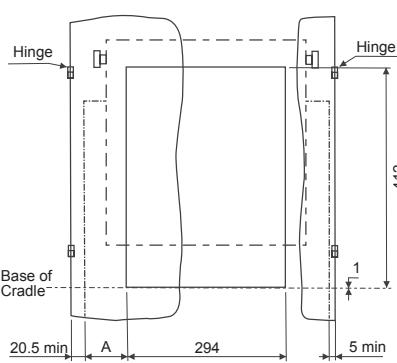


Ratings	Type	G (mm)	
800A - 1600A	3P	C/H	280.3
400A - 2000A	3P	S1	280.3
800A - 1600A	4P	C/H	368.3
400A - 2000A	4P	S1	368.3
2000 / 2500A	3P	C/H	436.3
2000 / 2500A	4P	C/H	582.3
2500 / 3200A	3P	S1	436.3
2500 / 3200A	4P	S1	582.3
3200A	3P	H2 / H1	582.3
3200A	4P	H2 / H1	790.3
4000A	3P	H2 / H	582.3
4000A	4P	H2 / H	790.3



Ratings CN-CS	Dimensions
	A
3200D/4000C	711
3200D/4000C	913
5000C/6300C	913
5000C/6300C	1182

### Bezel Fixing Plan for all Draw-out Breakers

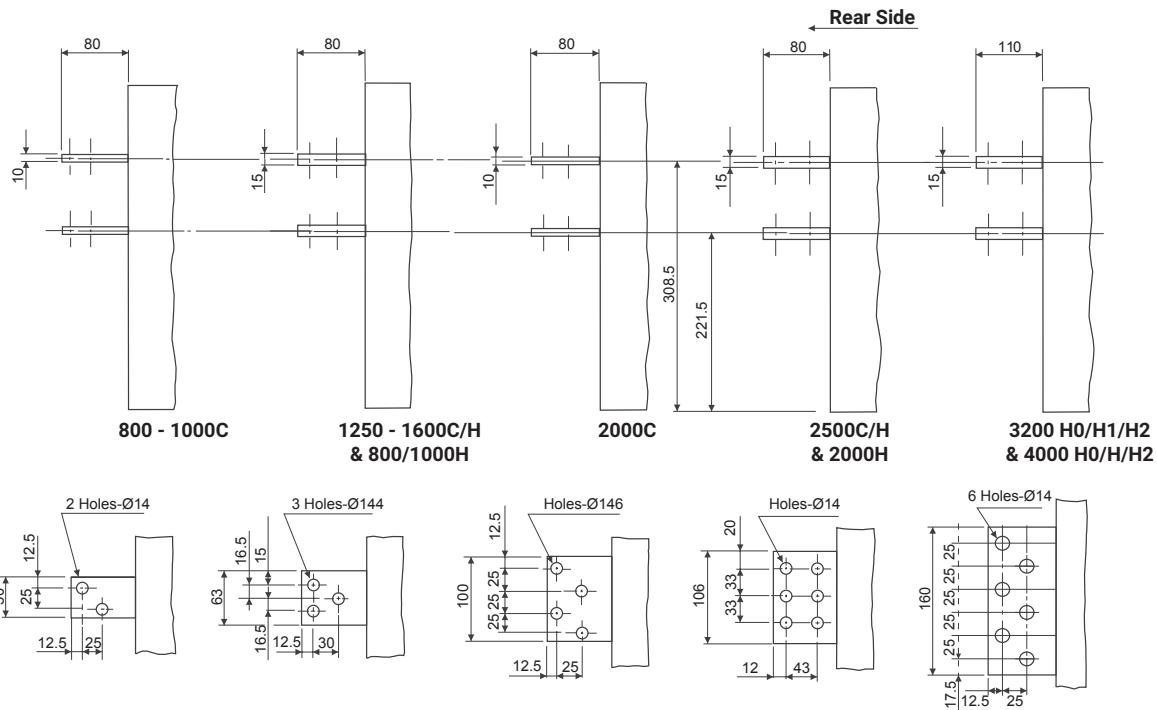


Note: All Dimensions are in mm.

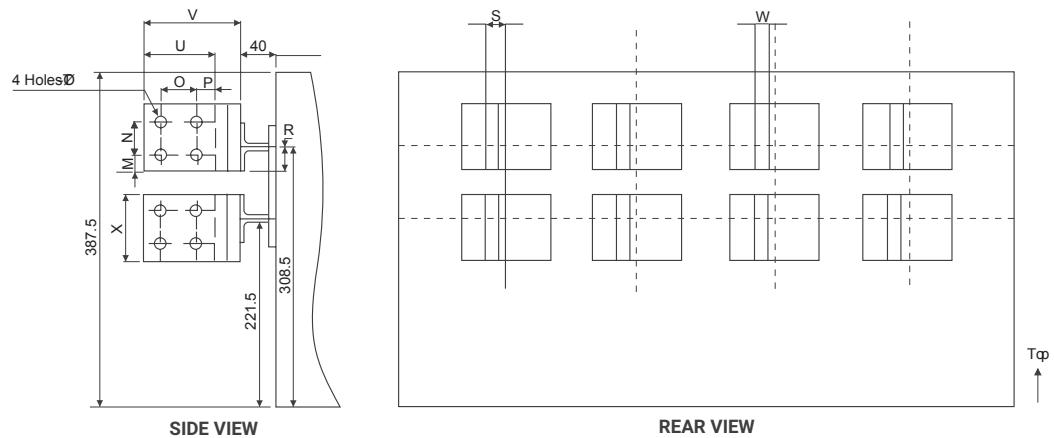
Note: For 3200A D 3P/4P, 4000A C 3P/4P, 5000C/6300C 3P/4P ACB, A=81.5  
For other Drawout Breakers A=79.5

## Terminals

### Horizontal Terminals



### Vertical Terminals

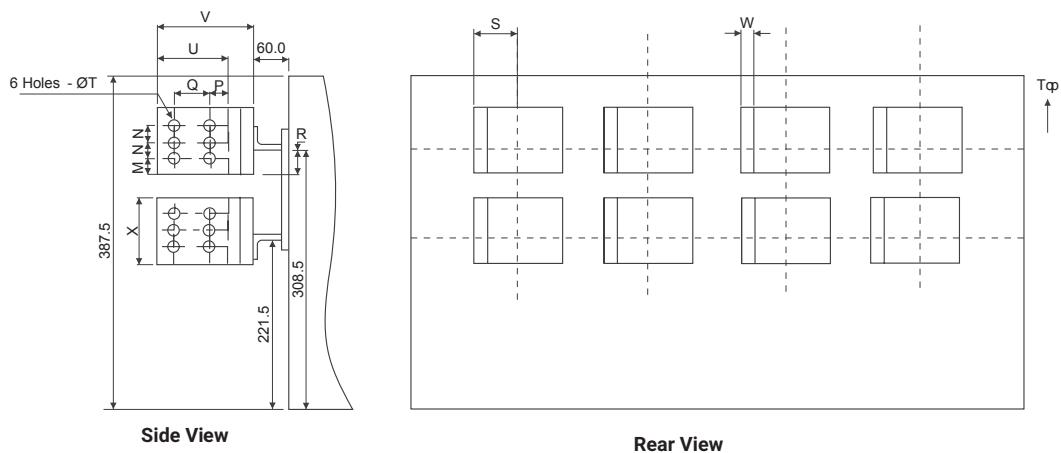


Ratings	M	N	P	Q	R	S	T	U	V	W	X
400-1250 S1 & 800-1000 C	10.2	38	20	25	29.2	5	9	65	95	10	58.4
1600-2000 S1 & 1250-1600 C/H	20	40	20	25	29.2	5	9	65	95	10	80
800-1000 H											
2000 C	20	40	20	40	29.2	22.5	14	80	110	15	80
2500 S1/ C/H	20	40	20	40	33.5	7.5	14	80	110	15	80
2000 H											
3200 S1	30	60	20	40	33.5	7.5	14	80	110	15	120

Note: 1) All Dimensions are in mm. 2) Consult us for other Terminal Orientations.

## Terminals

### Vertical Terminals 3200 H2/H1, 4000 H2/H



The dimensions for 3200 H2/H1 and 4000 H2/H are as under:

Ratings	M	N	P	Q	R	S	T	U	V	W	X
3200 H2/H1, 4000A H2/H	30	50	45	40	22.5	95	14	105	135	15	160

## Notes

# Switchgear Training Centres



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