



intelliPROTECT
intelligent protection

Ordering Code

1,2 TYPE	3,4 ACB/CT RATING	5 No. of POLES	6 Manual / Electrical FIXED/DRAW OUT	7,8,9,10,11,12 CODE			TYPE	Communication & Protection	CONTROL VOLTAGE & FREQUENCY
				MOTOR	CC	SHT			
BN/ AN	630A	3-POLE	MANUAL/ELECTRICAL FIXED	M0	D0	D0	NORMAL	Without Communication + I/S/I/G	SELF POWERED,50HZ
	800A	4-POLE		M1	D1	D1			SELF POWERED,60HZ
BN	1000A		MANUAL DRAW OUT	M2	D2	D2	AMMETER	Without Communication + Earth Leakage	SELF POWERED,50HZ
	1250A		ELECTRICAL DRAW OUT	M3	D3	D3			AC/DC 100-250V, 50 HZ
BS/ AS	1600A			M4	D4	D4	POWER METER	Communication + Earth Leakage	DC 24-60V, 50HZ
	2000A			M5	D5	D5			DC 24-60V, 60HZ
	2500A			M6	D6	D6		Communication + Earth Leakage	AC/DC 100-250V, 50 HZ
	3200A			M7	D7	D7			DC 24-60V, 50HZ
	2000A			M8	D8	D8		Communication + Earth Leakage	SELF POWERED,60HZ
	2500A								AC/DC 100-250V, 60 HZ
	3200A							Communication + Earth Leakage	DC 24-60V, 60HZ
	4000A								AC/DC 100-250V, 60 HZ
	5000A							Communication + Pre-Trip Alarm	AC/DC 100-250V, 50 HZ
	6300A								DC 24-60V, 50HZ
									AC/DC 100-250V, 60 HZ
									DC 24-60V, 60HZ

"NORMAL" type Release
* L/S/I/G configuration supplied as standard
- With LED Indicators
- Without output contacts
* Ground fault system is by vector sum

"AMMETER" type Release
* L/S/I/G configuration supplied as standard
* Ground fault system is by vector sum(G,C)
* Earth Leakage system
-Z, K: External CT- HPL ZCT to be used for fault current 0.5- 30A, 1600AF
-E, X: External CT- Customer has to use on his own for fault current > 30A
* Communication and output contacts DO NOT work under self power condition

"POWER METER" type Release
* L/S/I/G configuration supplied as standard
* Ground fault system is by vector sum(G,C)
* Earth Leakage system
-K: External CT- HPL ZCT to be used for fault current 0.5- 30A, 1600AF
-X: External CT- Customer has to use on his own for fault current > 30A
* Applicable for generator protection purpose

HPL ACB Cat. 05/20



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intelliPROTECT
intelligent protection RANGE



Air Circuit Breaker 400A - 6300A



Air Circuit Breaker

intelliPROTECT

intelligent protection

RANGE



Corporate Information

HPL's vision of creating a niche, as a major player in India Electrical Industry with commitment to state-of-the-art technology & world class products.

HPL Group possess 7 State-of-the-art Manufacturing Facilities, ISO 9001 : 2000; ISO 14001; OHSAS 18001 certified located at Gurgaon, Kundli, Panipat, Jabli Himachal Pradesh and Guwahati having 5,00,000 sq. feet covered area to manufacture products conforming to International and India standards.

HPL Products Profile has the following Strategic Business Units :

- LV Switchgears
- LV Protection Devices
- Metering and Energy Management Systems
- Lighting
- Luminaires
- Wires & Cables
- Solar Solutions
- Electrical Wiring Accessories

HPL Products are tested at CPRI, ERDA, ERTL, NPL etc. according to Indian Standards, whereas MCB's Rewireable Switches & Electronic Energy Meters carry ISI marking. Further HPL products have approvals from CPWD state PWD's, MES, BSNL & many more Institutional users.

HPL Group with Head Office at Noida (U.P.) has extensive Sales & Marketing Network of 90 Branch offices & Representative Offices, over 2000+ Authorised Dealers and 27000+ Retailers across country, who are committed to provide solutions and services to customer's delight. HPL is also exporting its products to Middle East, SAARC and European Countries.

HPL range of ACBs are in technical collaboration with **LS Industrial Systems Co. Ltd**, Korea, a US\$ 25 billion group. LS Industrial Systems is a leader in LV, MV & HV Switchgear, Circuit Breakers, Automation, Large scale systems, GIS and Green technologies solutions.



Air Circuit Breaker *intelliPROTECT*

intelligent protection

Range of HPL Air Circuit Breaker meets your demands for high breaking capacity and optimized panel size. Wide range of accessories and connection methods offerings meet the various installation needs & simplified switch board design.

It provides total solutions with an advanced trip relay for measurement, diagnosis, analysis and communication as well as protective functions for absolute protective coordination and electric power monitoring system.

HPL range of ACBs are in technical collaboration with **LSIS** Co. Ltd, Korea, a US\$ 25 billion group. **LSIS** is a leader in LV, MV & HV Switchgear, Circuit Breakers, Automation, Large scale systems, GIS and Green technologies solutions.



Overview

Product Introduction

Background Information on Development of intelliprotect series of ACB

It is developed to meet high breaking capacity required for elevated electricity demand, to satisfy compact distribution panel size demanded in markets, to achieve 100% N phase current conducting capacity on single phase load (3Ø4w line), and to increase users convenience by providing various accessories and connecting methods. Moreover, providing total solutions for customers by developing a relay, to achieve absolute protective coordination, and to correspond with IT system.

Product Offer :

Ics = 100%Icu at 500Vac

1600 AF	3200 AF	5000 AF	6300 AF
65kA	70kA / 85kA	85kA / 100kA	120kA



• Also, ACB with 50kA (Ics = Icu) available upto 3200A.



Characteristics

- Modularity & Compactness
- Various Accessories Possession.
- Comply with IEC / IS
- Acquire multi-rating (690Vac, 500Vac) standard for all models.
- Impulse Withstand Voltage (Uimp) : 12kV.
- Ics = 100%Icu.
- Icw Ratings :
 - 50kA (for 1 Sec.) to 100kA (for 1 sec.)
 - Also, Icw for 2sec. & 3 sec. available
- Enhanced Life
- Multiple terminal connection choice
- N phase current conducting capacity : 100%
- Suitable for installations with IT system
- Possess various customer oriented digital trips (N, A & P Type)
- The wide spectrum of protection functions with a flexibility of thresholds & trip times make it suitable to meet any type of installation need.
- Advanced measurement function, communication function & additional protection function over and above traditional made it a true choice for any application.

External Configuration

Terms

1. Trip relay
2. Counter
3. OFF button
4. ON button
5. Series name
6. Charge handle
7. Rated name plate
8. Charge / Discharge indicator
9. ON / OFF indicator
10. Company Logo
11. Arc cover
12. Terminal cover
13. Cradle
14. Handle storage space
15. Position indicator
16. Draw-out handle
17. Pad lock button
18. Arc chute
19. Control cover



Fixed type ACB

Available in Fixed and Draw out - Three pole & Four pole - manual & Electrical draw-out version through out the range.

Offers all the functions & characteristics of a power circuit breaker in a very compact volume.

Also standardization & optimisation of switchboard is simplified - result of innovative integration of components and performance. The uniform height & depth made it a perfect choice of switchboard Manufacturers.



Draw-out ACB

Overview

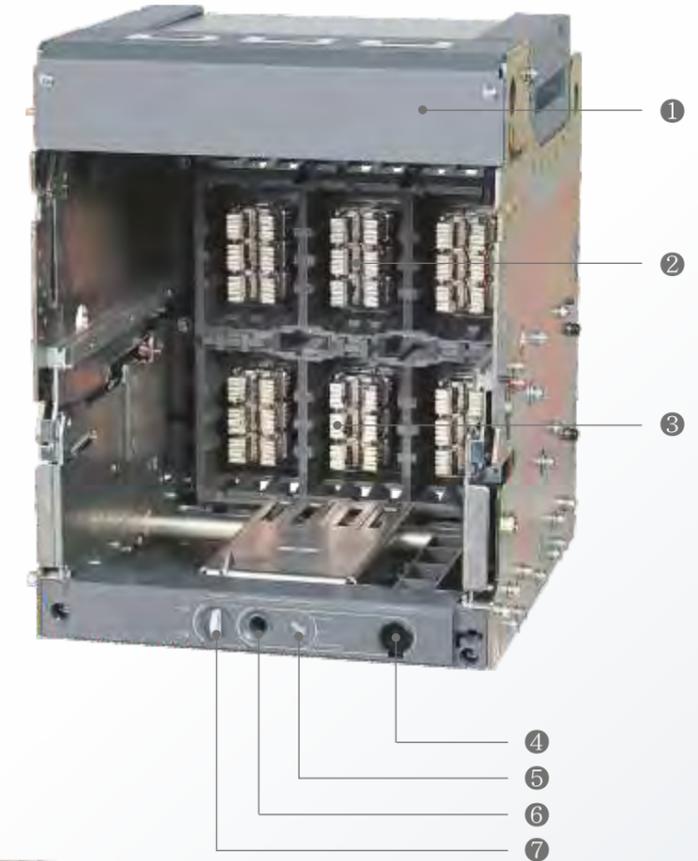
ACBs are built with very strong robust metal structure - can withstand very high level of thermal / dynamic stresses extending there by reliability and dependability along with safety for each installations.

The fixed part of drawout ACB have safety shutters & racking interlock features to extend safety when ACB is withdrawn.

Terms

1. Terminal cover of control circuit
2. Cradle finger (Line side)
3. Cradle finger (IOAD SIDE)
4. Draw-out handle
5. Position indicator
6. Handle storage space
7. Pad lock button
8. Connecting conductor (Line side)
9. Connecting conductor (Load side)

Cradle (Internal)

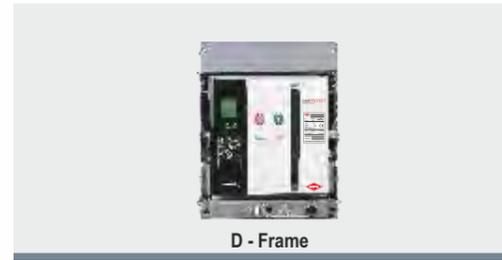


Cradle (Rear)

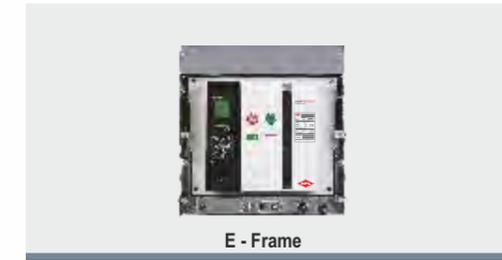


Provision for multiple connection options meets various installation needs and offers ease of termination while fabricating the switch board and during installation.

Ratings



	AN06	AN08	AN10	AN12	AN16
Ampere frame (AF)	630	800	1000	1250	1600
Rated current(A) (In max) at 40 °C	400 630	630 800	1000	1250	1600
Setting current (A) * Control trip relay (... × In max)	(0.4 ~ 1.0) × In max				
Rated current of neutral pole (A)	400 630	630 800	1000	1250	1600
Rated insulation voltage(V) (Ui)	1000				
Rated operating voltage(V) (Ue)	690				
Rated impulse withstand voltage (kV)(Uimp)	12				
Frequency (Hz)	50/60				
Number of poles (P)	3/4				
Rated breaking capacity (kA sym) AC 50/60Hz (Icu) IEC 60947-2 KS C 4620	220V/230V/380V/415V 460V/480V/500V 550V/600V/690V				
Rated service breaking capacity (kA) (Ics) ... % × Icu	100%				
Rated making capacity (kA peak) AC 50/60Hz (Icm) IEC 60947-2 KS C 4620	220V/230V/380V/415V 460V/480V/500V 550V/600V/690V				
Rated short-time withstand current (kA) (Icw)	1 sec 2 sec 3 sec				
Operating time (ms)	Maximum total breaking time Maximum closing time				
Life cycle (time)	Mechanical Without maintenance With maintenance Electrical Without maintenance With maintenance				
Connections **	Draw-out / Fixed Horizontal connection Vertical connection Front connection Mixed connection				
Weight (kg) (3P/4P)	Draw-out type Main body (With cradle) Cradle only Fixed type Motor charging type Manual charging type				
External dimensions (mm) (H×W×D)	Draw-out type 3P 4P Fixed type 3P 4P				
Trip relay	N, A, P type				



	AS20	AS25	AS32	AS40
Ampere frame (AF)	2000	2500	3200	4000
Rated current(A) (In max) at 40 °C	2000	2500	3200	4000
Setting current (A) * Control trip relay (... × In max)	(0.4 ~ 1.0) × In max			
Rated current of neutral pole (A)	2000	2500	3200	4000
Rated insulation voltage(V) (Ui)	1,000			
Rated operating voltage(V) (Ue)	690			
Rated impulse withstand voltage (kV)(Uimp)	12			
Frequency (Hz)	50/60			
Number of poles (P)	3/4			
Rated breaking capacity (kA sym) AC 50/60Hz (Icu) IEC 60947-2 KS C 4620	220V/230V/380V/415V 460V/480V/500V 550V/600V/690V			
Rated service breaking capacity (kA) (Ics) ... % × Icu	100%			
Rated making capacity (kA peak) AC 50/60Hz (Icm) IEC 60947-2 KS C 4620	220V/230V/380V/415V 460V/480V/500V 550V/600V/690V			
Rated short-time withstand current (kA) (Icw)	1 sec 2 sec 3 sec			
Operating time (ms)	Maximum total breaking time Maximum closing time			
Life cycle (time)	Mechanical Without maintenance With maintenance Electrical Without maintenance With maintenance			
Connections **	Draw-out / Fixed Horizontal connection Vertical connection Front connection Mixed connection			
Weight (kg) (3P/4P)	Draw-out type Main body (With cradle) Cradle only Fixed type Motor charging type Manual charging type			
External dimensions (mm) (H×W×D)	Draw-out type 3P 4P Fixed type 3P 4P			
Trip relay	N, A, P type			



	AS50	
Ampere frame (AF)	4000	5000
Rated current(A) (In max) at 40 °C	4000	5000
Setting current (A) * Control trip relay (... × In max)	(0.4 ~ 1.0) × In max	
Rated current of neutral pole (A)	4000	5000
Rated insulation voltage(V) (Ui)	1000	
Rated operating voltage(V) (Ue)	690	
Rated impulse withstand voltage (kV)(Uimp)	12	
Frequency (Hz)	50/60	
Number of poles (P)	3/4	
Rated breaking capacity (kA sym) AC 50/60Hz (Icu) IEC 60947-2 KS C 4620	220V/230V/380V/415V 460V/480V/500V 550V/600V/690V	
Rated service breaking capacity (kA) (Ics) ... % × Icu	100%	
Rated making capacity (kA peak) AC 50/60Hz (Icm) IEC 60947-2 KS C 4620	220V/230V/380V/415V 460V/480V/500V 550V/600V/690V	
Rated short-time withstand current (kA) (Icw)	1 sec 2 sec 3 sec	
Operating time (ms)	Maximum total breaking time Maximum closing time	
Life cycle (time)	Mechanical Without maintenance With maintenance Electrical Without maintenance With maintenance	
Connections **	Draw-out / Fixed Horizontal connection Vertical connection Front connection Mixed connection	
Weight (kg) (3P/4P)	Draw-out type Main body (With cradle) Cradle only Fixed type Motor charging type Manual charging type	
External dimensions (mm) (H×W×D)	Draw-out type 3P 4P Fixed type 3P 4P	
Trip relay	N, A, P type	

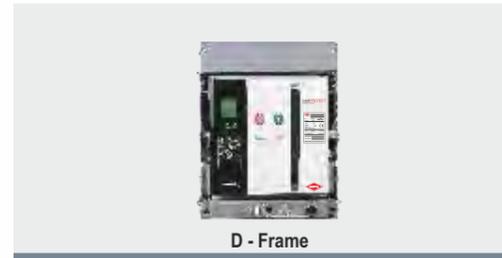


	AS40	AS50	AS63
Ampere frame (AF)	4000	5000	6300
Rated current(A) (In max) at 40 °C	4000	5000	6300
Setting current (A) * Control trip relay (... × In max)	(0.4 ~ 1.0) × In max		
Rated current of neutral pole (A)	4000	5000	6300
Rated insulation voltage(V) (Ui)	1,000		
Rated operating voltage(V) (Ue)	690		
Rated impulse withstand voltage (kV)(Uimp)	12		
Frequency (Hz)	50/60		
Number of poles (P)	3/4		
Rated breaking capacity (kA sym) AC 50/60Hz (Icu) IEC 60947-2 KS C 4620	220V/230V/380V/415V 460V/480V/500V 550V/600V/690V		
Rated service breaking capacity (kA) (Ics) ... % × Icu	100%		
Rated making capacity (kA peak) AC 50/60Hz (Icm) IEC 60947-2 KS C 4620	220V/230V/380V/415V 460V/480V/500V 550V/600V/690V		
Rated short-time withstand current (kA) (Icw)	1 sec 2 sec 3 sec		
Operating time (ms)	Maximum total breaking time Maximum closing time		
Life cycle (time)	Mechanical Without maintenance With maintenance Electrical Without maintenance With maintenance		
Connections **	Draw-out / Fixed Horizontal connection Vertical connection Front connection Mixed connection		
Weight (kg) (3P/4P)	Draw-out type Main body (With cradle) Cradle only Fixed type Motor charging type Manual charging type		
External dimensions (mm) (H×W×D)	Draw-out type 3P 4P Fixed type 3P 4P		
Trip relay	N, A, P type		

* Refer to trip relay specification. ** ● : Standard : Line=Vertical & Load=Horizontal | ○ : Option

Ratings

Ratings



Type			
Ampere frame	(AF)		
Rated current(A)	(In max)	at 40 °C	
Setting current (A) *	Control trip relay (... × In max)		
Rated current of neutral pole (A)			
Rated insulation voltage(V)	(Ui)		
Rated operating voltage(V)	(Ue)		
Rated impulse withstand voltage (kV)(Uimp)			
Frequency (Hz)			
Number of poles (P)			
Rated breaking capacity (kA sym)	IEC 60947-2 KS C 4620	220V/230V/380V/415V	
AC 50/60Hz		(Icu)	460V/480V/500V 550V/600V/690V
Rated service breaking capacity (kA) (Ics)		... % × Icu	100%
Rated making capacity (kA peak)	IEC 60947-2 KS C 4620	220V/230V/380V/415V	
AC 50/60Hz		(Icm)	460V/480V/500V 550V/600V/690V
Rated short-time withstand current (kA)		(Icw)	1 sec
Operating time (ms)	Maximum total breaking time		
	Maximum closing time		
Life cycle (time)	Mechanical	Without maintenance	
		With maintenance	
	Electrical	Without maintenance	
		With maintenance	
Connections **	Draw-out / Fixed	Horizontal connection	
		Vertical connection	
		Front connection	
		Mixed connection	
		External dimensions (mm)	Draw-out type Fixed type
(H×W×D)	4P		
	3P		
	4P		
Trip relay	N, A, P type		



D Frame	
BN16	
BN04~BN16	
400, 630, 800, 1000, 1250, 1600	
(0.4 ~ 1.0) × In max	
400, 630, 800, 1000, 1250, 1600	
1000	
690	
12	
50/60	
3/4	
-	
50	
-	
100%	
-	
105	
-	
50	
40	
80	
20,000	
30,000	
5,000	
10,000	
○	
○	
○	
●	
430 x 334 x 375	
430 x 419 x 375	
300 x 300 x 295	
300 x 385 x 295	
N, A, P type	

* Refer to trip relay specification. ** ● : Standard | ○ : Option

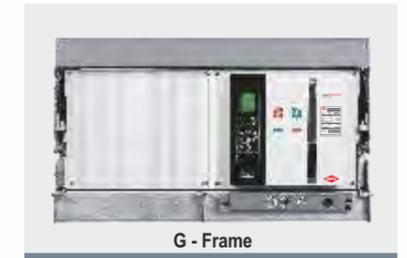
* Icw for 2 sec & 3 sec - available on request.



BN32		BS40	
BN20~BN32		BS20~B40	
2000 2500 3200		2000, 2500, 3200, 4000	
(0.4 ~ 1.0) × In max			
2000, 2500, 3200		2000, 2500, 3200, 4000	
1,000			
690			
12			
50/60			
3/4			
70			
50		70	
70			
100%			
154			
105		154	
154			
50		70	
40			
80			
15,000			
20,000			
5,000			
10,000			
○			
○			
○			
●			
430 × 412 × 375		430 × 527 × 375	
430 × 527 × 375		300 × 378 × 295	
300 × 378 × 295		300 × 493 × 295	
300 × 493 × 295		N, A, P type	



BS50	
4000	5000
4000	5000
(0.4 ~ 1.0) × In max	
4000	5000
1000	
690	
12	
50/60	
3/4	
85	
85	
85	
100%	
187	
187	
187	
85	
40	
80	
10,000	
15,000	
2,000	
5,000	
○	
○	
-	
●	
460 × 629 × 375	
460 × 799 × 375	
300 × 597 × 295	
300 × 767 × 295	
N, A, P type	



BS40	BS50	BS63
4000	5000	6300
4000	5000	6300
(0.4 ~ 1.0) × In max		
4000	5000	6300
1,000		
690		
12		
50/60		
3/4		
120		
120		
100		
100%		
264		
264		
220		
100		
40		
80		
10,000		
15,000		
2,000		
5,000		
○		
○		
-		
●		
460 × 785 × 375		
460 × 1015 × 375		
300 × 751 × 295		
300 × 981 × 295		
N, A, P type		

Ratings

Trip relay (OCR)

The trip relay of Intelliprotect provides the additional protection functions for voltage, frequency, unbalance, and other in addition to main protection functions for over current, short-circuit, ground fault. It supports the advanced measurement functions for voltage, current, power,

electric energy, harmonics, communication function, and others.

Zone selective interlocking function makes the protective coordination more simple and thermal memory can be applied to various loads.

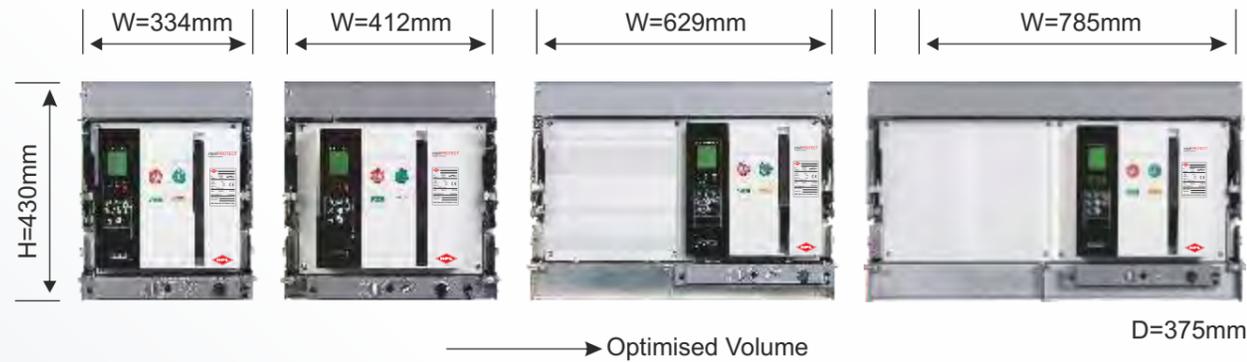


Trip relay types

	N Type	A Type	P Type
Externals			
Current protection	<ul style="list-style-type: none"> L / S / I / G 	<ul style="list-style-type: none"> L / S / I / G ZSI (Protective coordination) 	<ul style="list-style-type: none"> L / S / I / G (Continuous) ZSI (Protective coordination)
Other protection		<ul style="list-style-type: none"> Earth Leakage (Option) 	<ul style="list-style-type: none"> Earth leakage (Option) Over / Under current Over / Under frequency Unbalance (Voltage/Current) Reverse power
Measurement Function		<ul style="list-style-type: none"> Current (R / Y / B / N) 	<ul style="list-style-type: none"> 3 Phase voltage / Current RMS / Vector Power (P, Q, S), PF (3-phase) Energy (Positive / Negative) Frequency, Demand
Fine Adjustment			<ul style="list-style-type: none"> Fine adjustment for long/short time delay / instantaneous / ground
Pre Trip Alarm			<ul style="list-style-type: none"> Overload protection relays : DO (Alarm) (Ground fault is not available when using Pre trip alarm)
Digital Output		<ul style="list-style-type: none"> 3 DO (Fixed) L, S/I, G Alarm 	<ul style="list-style-type: none"> 3 DO (Programmable) Trip, Alarm, General
IDMTL setting			<ul style="list-style-type: none"> Compliance with IEC60255-3 SIT, VIT, EIT, DT
Communication		<ul style="list-style-type: none"> Modbus / RS - 485 Profibus - DP 	<ul style="list-style-type: none"> Modbus / RS-485 Profibus-DP
Power supply	<ul style="list-style-type: none"> Self Power - Power source works over 20% of load current 	<ul style="list-style-type: none"> Self Power - Power source works over 20% of load current. - External power source are required for comm. AC / DC 100~250V 	<ul style="list-style-type: none"> AC/DC 100~250V <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> Basic protection function (L/S/I/G) is still under normal operation without control power. </div>
RTC timer	<ul style="list-style-type: none"> Available 	<ul style="list-style-type: none"> Available 	<ul style="list-style-type: none"> Available
LED for Trip Info.	<ul style="list-style-type: none"> Long time delay Short time delay / Instantaneous Ground fault 	<ul style="list-style-type: none"> N type 	<ul style="list-style-type: none"> N type
Fault Recording		<ul style="list-style-type: none"> 10 records (Fault / Current / Date and Time) 	<ul style="list-style-type: none"> 256 records (Fault/Current/Date and Time)
Event Record			<ul style="list-style-type: none"> 256 records (Content, Status, Date)
Operating Button	<ul style="list-style-type: none"> Reset button 	<ul style="list-style-type: none"> Reset, Menu Up / Down, Left / Right, Enter 	<ul style="list-style-type: none"> A Type

**intelliprotect - intelligent enough
yet simple & user friendly**

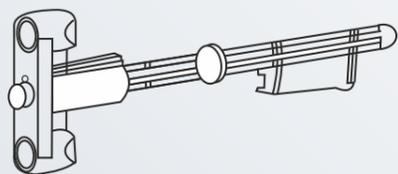
Modularity & Compactness



Suitability for copper & Aluminium termination



With optimised Volume & Flexibility in busbar terminations for different environmental condition made the switch board design, simple & effective.



Manual Reset Button (MRB)

It is a function which resets the circuit breaker when a circuit breaker is tripped by OCR.

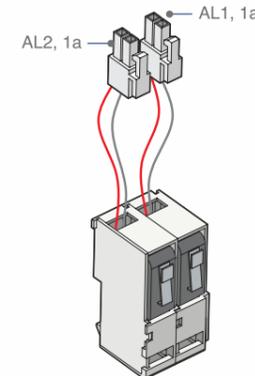


Ready to Close Switch (RCS)

It indicates that safety parameters are full filled & circuit Breaker is ready to do closing operation.



Under voltage trip device.



Trip Alarm Contact



Counter



Pad Lock / Position Lock



Vertical / Horizontal type connection

Various other designers friendly site fittable accessories.

- Shunt coil, double shunt coil – continuously rated.
- Under voltage trip device.
- Charge switch.
- Remote reset switch.
- Counter
- Vertical & Horizontal type terminals (can be rotated 90°).

Also availability of various accessories ensures complete safety / Reliability and very high performance level. Some of them are :

- Pad lock / position lock
- Key interlocks set, ON OFF button lock, mechanical interlock
- Temperature Alarm :
It shows the temperature (Inside of ACB) through a sensor. The output can be connected to control terminal block.
- Mechanical Operated cell switch :
It indicates ON / OFF condition of ACB. It operates only when breaker is in 'connected' position.
- Cell switch :
It indicates the present position of ACB (Connected / Test / Disconnect)
- Miss Insertion prevent device :
When the main body of ACB is inserted to the cradle, if the rating of ACB does not match with cradle, it mechanically prevents the insertion.

To summarize - availability of high performance connection accessories, accessories related to efficient, flexible, safe & better coordinated functioning of circuit breaker coupled with various indications & communication functions made Intelli protect an ideal choice for any application / installation.

Moreover, for change in power levels, installation change etc lead to extension of switchboard/upgradation of switchboard Intelli protect is designed to adapt the conditions.

A detailed Installation Manual is also available which provides informations required not only for Installation but also for periodic / routine maintenance.

Please contact our nearest sales office for any further clarification / Information