

Ordering

Susol

ACB & Accessories

Type	Ampere * Frame	Frame sizes & phase array	No. of pole	Rated current (CT Spec.)	Connections
Circuit Breakers AH	06 630AF	D 630~2000AF 3P/4P Standard RST(N)	3 3P(D)	00 Without OCR & CT	Draw-out type A Automatic connection
	08 800AF		4 4P(D, W)		
Switch Disconnector DH	10 1000AF	W 630~2000AF 4P Reverse phase type (N)RST		02 200A	Fixed type H Horizontal type V Vertical type
	13 1250AF			04 400A	
	16 1600AF			06 630A	Mixed type M Horizontal Vertical
	20 2000AF			08 800A	
				10 1000A	Mixed type N Vertical Horizontal
				13 1250A	
				16 1600A	Front type P
				20 2000A	
				04 400A	
				06 630A	
				08 800A	
				10 1000A	
				13 1250A	
				16 1600A	
				20 2000A	
				25 2500A	
				32 3200A	
				40 4000A	
				04 400A	
				06 630A	
				08 800A	
				10 1000A	
				13 1250A	
				16 1600A	
				20 2000A	
				25 2500A	
				32 3200A	
				40 4000A	
				40 4000A	
				50 5000A	
				63 6300A	

* 2000AF only offers with vertical type mounting terminals (Busbar).

* 4000AF only offers with vertical type mounting terminals (Busbar).

* Please, refer to cradle installation instruction for draw-in/out types. (p.119-124)

Note) 1. AH-20D, AH-40E types are equipped with vertical-only terminals.

In case of F/Y/G/Z Frame size, front type & mixed type connection is not available.

2. In case of DH type Switch Disconnector, the rated current (CT Spec.) will be applied 00 (without OCR & CT)

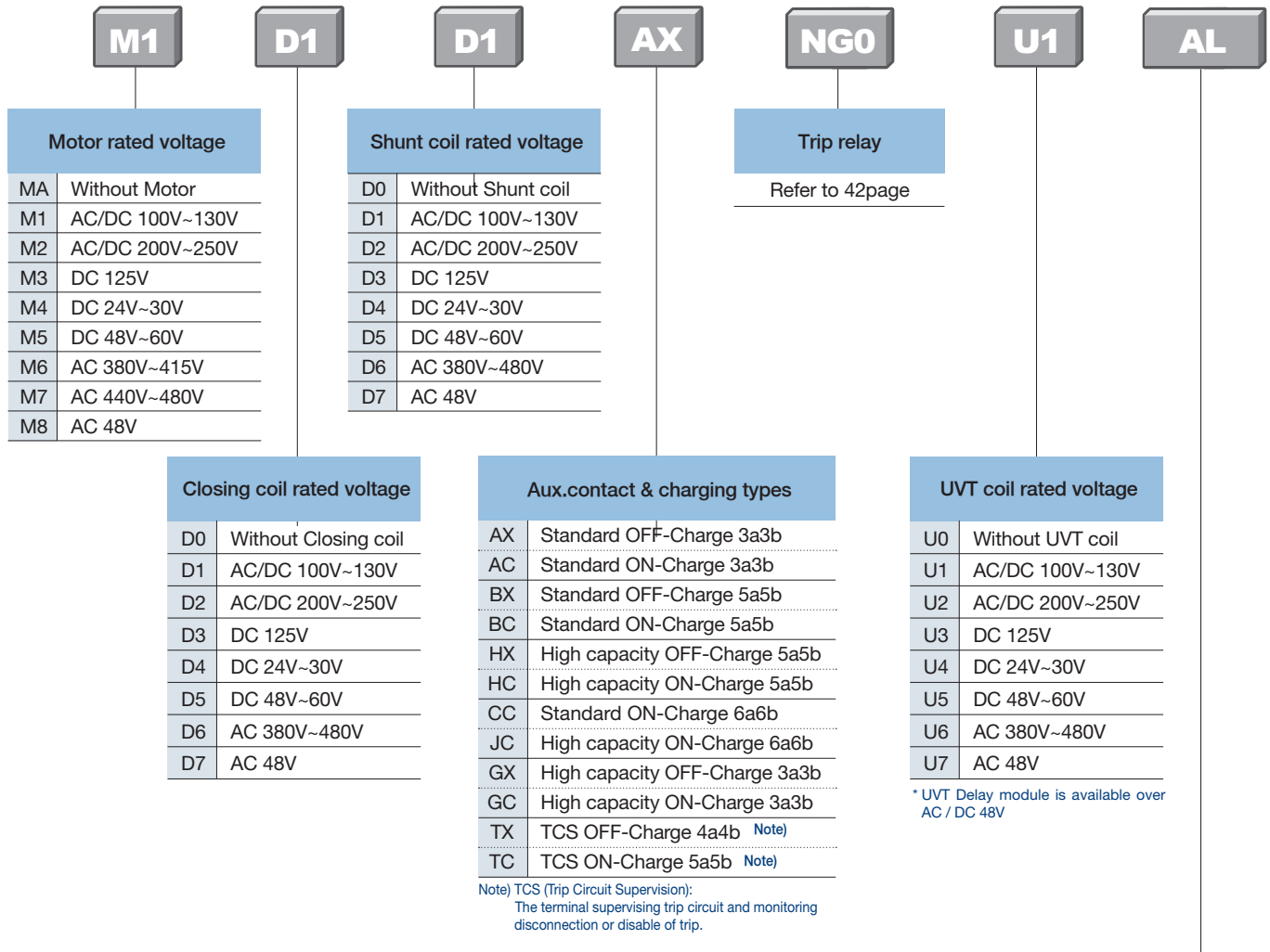
3. For the busbar installation method of draw-out type, please refer to the connection type of cradle which describes in page 20

4. Front connection terminals should be purchased separately (see Page 68).

Earthing product	Ampere * Frame	Frame sizes & phase array	No. of pole	Rated current (CT Spec.)	Connections
AT	20 2000AF	D RST(N)	3 3P	00	U Line earthed system L Load earthed system
		W Reverse NRST	4 4P		
AT	40 4000AF	E RST(N)			
		X Reverse NRST			

* Rated short-circuit withstand current of the protective circuit in earthing product : 60kA/1s

* Please contact us to get more detail information of earthing product.



Option	Type name	Option	Type name
AL	AL1+MRB	B	B On/Off Button lock
A1	AL1+MRB+RES (AC110~130V)	M	MI Mechanical interlock
A2	AL1+AL2+MRB	D	DI or MOC Door Interlock or MOC (Mechanism operated cell switch)
A3	AL1+MRB+RES (DC110~125V)		
A4	AL1+MRB+RES (AC200~250V)	K	K1 Key lock
A5	AL1+MRB+Auto reset	K2	K2 Key Interlock set
A6	AL1+AL2+MRB+Auto reset	K3	K3 Key lock double
A7	AL1+MRB+RES (DC110~125V)+Auto reset	R	RCS Ready to close switch
A8	AL1+MRB+RES (AC200~250V)+Auto reset	T	TM Temperature monitoring
A9	AL1+MRB+RES (AC110~130V)+Auto reset	H1~H7	SHT2 AC/DC 100~130V AC/DC 200~250V DC 125V DC 24~30V DC 48~60V AC 380~480V AC 48V Double shunt coil
Y2	AL1+AL2+MRB (2b contact)		
Y6	AL1+AL2+MRB+Auto reset (2b contact)		
Z2	AL1+AL2+MRB (1a1b contact)		
Z6	AL1+AL2+MRB+Auto reset (1a1b contact)		
C	C Counter		
S	CS2 Charge switch communication		

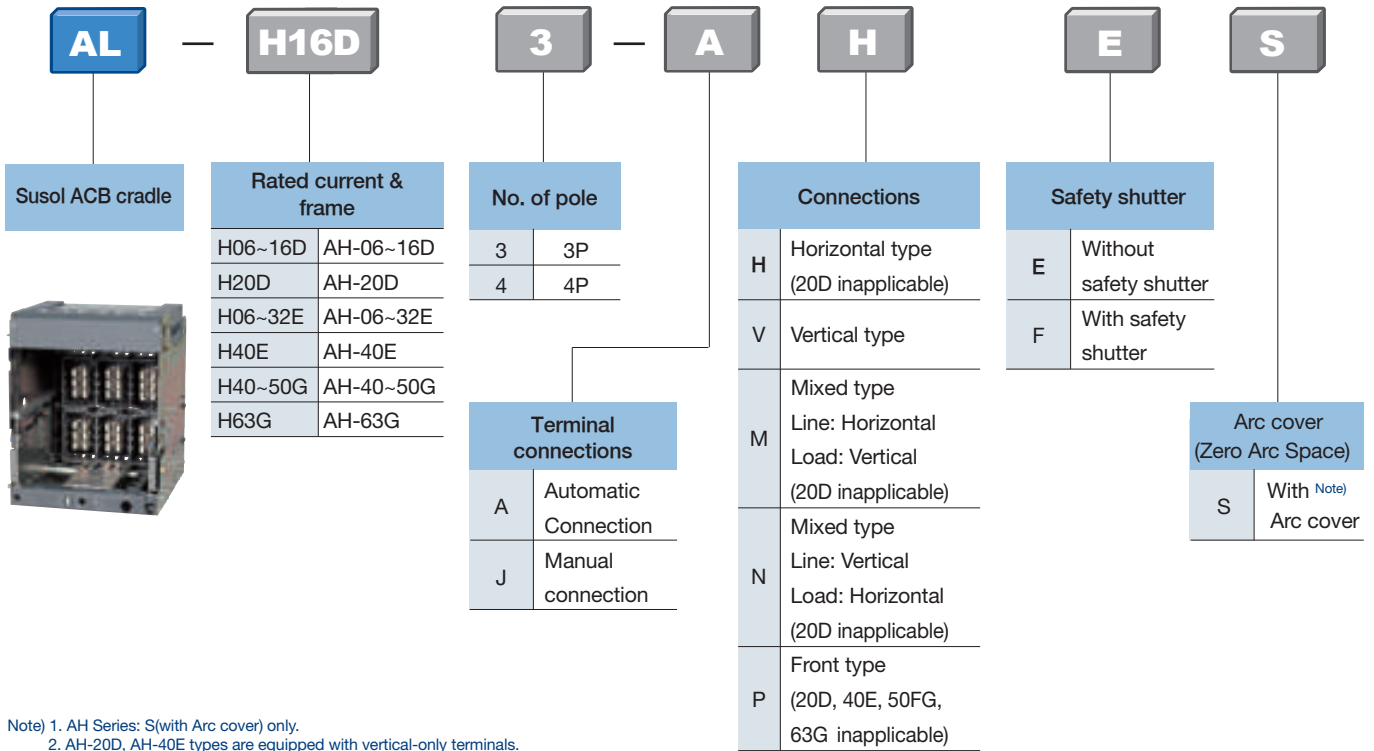
Note) 1. Reduplicate of AL is not available
 2. Reduplicate of Key lock is not available
 3. Reduplicate of Double shunt coil is not available. It can not be used simultaneously with UVT.

4. RCS and CS2 cannot be used simultaneously
 5. TM and auxiliary contacts TX, TC, CC, JC cannot be used simultaneously.
 6. MI, DI and MOC cannot be used simultaneously with SBC.

Ordering

Susol


Cradle



Ordering

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Trip relay



N

G

0

Trip relay type		Communication & protection		Control voltage & frequency		
N		G		0		
000	Without trip relay	G	Ground fault	0	Self-Power ^{Note1)}	60Hz
N	Normal	* L/S//G configuration as standard - with LED indicators - without output contacts * Ground fault system by vector sum		5	Self-Power ^{Note1)}	50Hz
A				G		0
A	Ammeter	G	Ground fault	0	Self-Power	60Hz
		Z	Earth Leakage(External CT, Earth Leakage below 30A)	1	AC/DC 100V~250V	60Hz
		E	Earth Leakage(External CT, Earth Leakage over 30A)	2	DC 15V~60V	60Hz
		C	Ground fault + Comm.	5	Self-Power	50Hz
		K	Earth Leakage(External CT, Earth Leakage below 30A) + Comm.	6	AC/DC 100V~250V	50Hz
		X	Earth Leakage(External CT, Earth Leakage over 30A) + Comm.	7	DC 15V~60V	50Hz
		N**	Ground fault (External NCT) + Comm.	* L/S//G(or EL) configuration as standard (Only. Unable to select ground fault and earth leakage, simultaneously) * Ground fault system by vector sum(G,C) * Earth leakage system - Z,K: External CT - LS ZCT applied(fault current 0.5~30A, 1600AF) - E,X: External CT - Private ZCT applied(fault current >30A) * Comm. And output contacts DO NOT work under self-power condition. (Only checking LED available)		
P		C				
P	Power meter	C	Ground fault + Comm.	1	AC/DC 100V~250V	60Hz
		K	Earth Leakage(External CT, Earth Leakage below 30A) + Comm.	2	DC 15V~60V	60Hz
		X	Earth Leakage(External CT, Earth Leakage over 30A) + Comm.	6	AC/DC 100V~250V	50Hz
		A	Pre-Trip Alarm + Comm.	7	DC 15V~60V	50Hz
		N**	Ground fault (External NCT) + Comm.	* L/S//G(or EL) configuration as standard (Only. Unable to select ground fault and earth leakage, simultaneously) * Ground fault system by vector sum * Earth leakage system - K: External CT - LS ZCT applied(fault current 0.5~30A, 1600AF) - X: External CT - Private ZCT applied(fault current >30A) * Applicable to generator protection purpose * Comm. And output contacts DO NOT work under self-power condition. (Only checking LED available)		
S		C				
S	Supreme meter	C	Ground fault + Comm.	1	AC/DC 100V~250V	60Hz
		K	Earth Leakag(External CT, Earth Leakage below 30A) + Comm.	2	DC 15V~60V	60Hz
		X	Earth Leakag(External CT, Earth Leakage over 30A) + Comm.	6	AC/DC 100V~250V	50Hz
		A	Pre-Trip Alarm + Comm.	7	DC 15V~60V	50Hz
		N**	Ground fault (External NCT) + Comm.	* L/S//G(or EL) configuration as standard (Only. Unable to select ground fault and earth leakage, simultaneously) * Ground fault system by vector sum * Earth leakage system - K: External CT - LS ZCT applied(fault current 0.5~30A, 1600AF) - X: External CT - Private ZCT applied(fault current >30A) * Applicable to generator protection purpose * Comm. And output contacts DO NOT work under self-power condition. (Only checking LED available)		

** AN, PN, SN provide the function to detect and protect the ground fault current by applying the NCT (Neutral CT) in the neutral wire when 3pole circuit breaker is used in 3-phase 4-wire system. Please use NCT with the secondary output of 5A rating. (NCT is not provided)

- Note) 1. L/S//G(or EL) configuration as standard (Only. Unable to select ground fault and earth leakage, simultaneously)
 2. Ground fault, earth leakage and pre-trip alarm functions are alternative.
 3. The functions like Metering, Communication, ZSI, Remote reset and Digital output are NOT available only under Self-power condition.
 4. Voltage module should be required for P and S types purchased separately

Ratings

Susol

Circuit Breaker



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 operational voltage(V)	(Ue)		
Rated impulse withstand voltage (kV)	(Uimp)		
Frequency(Hz)			
Number of poles (P)			
Rated breaking capacity (kA sym)	(Icu)	IEC 60947-2	
AC 50/60Hz		KS C 4620	
Rated service breaking capacity (kA)	(Ics)	... % × Icu	
Rated making capacity (kA peak)	(Icm)	IEC 60947-2	
AC 50/60Hz		KS C 4620	
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		
	Electrical		
Connections **	Draw-out / Fixed	Horizontal connection	
		Vertical connection	
		Front connection	
		Mixed connection	
Weight (kg) (3P/4P)	Draw-out type	Main body	Motor charging type
		(With cradle)	Manual charging type
		Cradle only	
	Fixed type	Motor charging type	
		Manual charging type	
External dimensions (mm) (H×W×D)		Draw-out	3P
		type	4P
		Fixed type	3P
			4P
Trip relay			
Certificate & Approval			
Marine classification			

Susol					
AH-06D	AH-08D	AH-10D	AH-13D	AH-16D	AH-20D
630	800	1000	1250	1600	2000
200	400				
400	630	1000	1250	1600	2000
630	800				
0.4 ~ 1.0					
400	400				
630	630	1000	1250	1600	2000
	800				
1,000					
690					
12					
50/60					
3/4					
85					
85					
65					
100%					
187					
187					
143					
65					
60					
50					
40					
80					
20,000					
5,000					
		●		-	
		○		●	
		○		-	
		○		-	
		63/74		70/85	
		61/72		68/83	
		29/32		33/40	
		34/44		38/47	
		32/42		36/45	
430×334×375					
430×419×375					
300×300×295					
300×385×295					
N, A, P, S type					
KS / KEMA / KERI / GOST / CCC					
LR, ABS, DNV, KR, BV, GL, RINA, NK					

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

Note) 1. Life time means not guarantee, but limitation.

Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee

2. In case of Marine ACB, please contact us.

3. The use of AN-D, AS-D, AH-D and AS-F in IT systems is limited to 500 V network voltage.

4. AH-20D, AH-40E types are equipped with vertical-only terminals.



Susol								
AH-06E	AH-08E	AH-10E	AH-13E	AH-16E	AH-20E	AH-25E	AH-32E	AH-40E
630	800	1000	1250	1600	2000	2500	3200	4000
400 630	800	1000	1250	1600	2000	2500	3200	4000
0.4 ~ 1.0								
630	800	1000	1250	1600	2000	2500	3200	4000
1,000								
690								
12								
50/60								
3/4								
100								
100								
85								
100%								
220								
220								
187								
85								
75								
65								
40								
80								
15,000								
5,000								
●								-
○								●
○								-
○								-
87/103								107/139
85/101								102/145
44/55								65/85
44/55								61/81
42/53								60/80
430×412×375								
430×527×375								
300×378×295								
300×493×295								
N, A, P, S type								
KS / KEMA / KERI / GOST / CCC								
LR, ABS, DNV, KR, BV, GL, RINA, NK								

Susol		
AH-40G	AH-50G	AH-63G
4000	5000	6300
4000	5000	6300
0.4 ~ 1.0		
4000	5000	6300
1,000		
690		
12		
50/60		
3/4		
150		
150		
100		
100%		
330		
330		
220		
100		
85		
75		
40		
80		
10,000		
2,000		
		○
		●
		-
		-
181/223		186/230
179/221		184/228
97/117		102/124
98/123		103/130
96/121		101/128
460×785×375		
460×1015×375		
300×751×295		
300×981×295		
N, A, P, S type		
KS / KEMA / KERI / GOST / CCC		
LR, ABS, DNV, KR, BV, GL, RINA, NK		

※ Derating of the rated current is required according to the ambient temperature around the breaker in a panel if it is higher than the reference value. (See pages 123 to 126)
 ※ It is possible to connect power and load side reversely, but please use it for normal connection for maintenance and safety.

Ratings

Susol

Switch-Disconnecter



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 operational voltage(V)	(Ue)		
Rated impulse withstand voltage (kV)	(Uimp)		
Frequency(Hz)			
Number of poles (P)			
Rated service breaking capacity (kA)	(Ics)	... % × Icu	
Rated making capacity (kA peak)	(Icm)	IEC 60947-3 AC ~ 690 V	
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		
	Electrical		
Connections **	Draw-out / Fixed	Horizontal connection	
		Vertical connection	
		Front connection	
		Mixed connection	
Weight (kg) (3P/4P)	Draw-out type	Main body	Motor charging type
		(With cradle)	Manual charging type
	Fixed type	Cradle only	
		Motor charging type	Manual charging type
External dimensions (mm) (H×W×D)	Draw-out type	3P	430×334×375
		4P	430×419×375
	Fixed type	3P	300×300×295
		4P	300×385×295



Susol					
DH-06D	DH-08D	DH-10D	DH-13D	DH-16D	DH-20D
630	800	1000	1250	1600	2000
200	400				
400	630	1000	1250	1600	2000
630	800				
0.4 ~ 1.0					
400	400				
630	630	1000	1250	1600	2000
	800				
1,000					
690					
12					
50/60					
3/4					
100%					
143					
65					
60					
50					
40					
80					
20,000					
5,000					
		●		-	
		○		●	
		○		-	
		○		-	
		63/74		70/85	
		61/72		68/83	
		29/32		33/40	
		34/44		38/47	
		32/42		36/45	
430×334×375					
430×419×375					
300×300×295					
300×385×295					

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

Note) 1. Life time means not guarantee, but limitation.

Quality guarantee: On/Off frequency on the basis of IEC60947-3 within the term of guarantee

2. In case of Marine ACB, please contact us.

3. DH-20D, DH-40E types are equipped with vertical-only terminals.



Susol								
DH-06E	DH-08E	DH-10E	DH-13E	DH-16E	DH-20E	DH-25E	DH-32E	DH-40E
630	800	1000	1250	1600	2000	2500	3200	4000
400 630	800	1000	1250	1600	2000	2500	3200	4000
0.4 ~ 1.0								
630	800	1000	1250	1600	2000	2500	3200	4000
1,000								
690								
12								
50/60								
3/4								
100%								
187								
85								
78								
65								
40								
80								
15,000								
5,000								
●								-
○								●
○								-
○								-
87/103								107/139
85/101								102/145
44/55								65/85
44/55								61/81
42/53								60/80
430x412x375								
430x527x375								
300x378x295								
300x493x295								

※ Derating of the rated current is required according to the ambient temperature around the breaker in a panel if it is higher than the reference value. (See pages 123 to 126)

Trip relay(OCR)

The trip relay of Susol ACB provides the additional protection functions for voltage, frequency, unbalance, and others 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.

Analog trip function interlocked with mechanism enhanced a durability of devices as well as the breaking capacity of ACB.

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







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Trip relays

Susol · Metasol

Trip relay types

Classification	N type	A type	P type	S type
Externals				
Current protection	• L / S / I / G / Thermal	• L / S / I / G(or EL) • Thermal • ZSI (Protective coordination)	• L / S / I / G(or EL) • Thermal (linear hot start) • ZSI (Protective coordination)	• L / S / I / G(or EL) • Thermal (linear hot start) • ZSI (Protective coordination)
Other protection	-	-	• Over/Under voltage • Over/Under frequency • Unbalance(Voltage/Current) • Reverse power	• Over/Under voltage • Over/Under frequency • Unbalance(Voltage/Current) • Reverse power
Measurement function	-	• Current (R / S / T / N)	• 3 Phase Voltage/Current RMS/Vector • Power(P, Q, S), PF(3-Phase) • Energy(Positive/Negative) • Frequency, Demand	• 3 Phase Voltage/Current RMS/Vector • Power(P, Q, S), PF(3-Phase) • Energy(Positive/Negative) • Frequency, Demand • Voltage/Current harmonics (1st~63th) • 3 Phase Waveforms • THD, TDD, K-Factor
Fine adjustment	-	-	• Fine adjustment for long/short time delay/instantaneous/ ground	• Fine adjustment for long/short time delay/instantaneous/ ground
Pre Trip Alarm	-	-	• Overload protection relays : DO (Alarm) (Ground fault is not available when using Pre trip alarm)	• Overload protection relays : DO (Alarm) (Ground fault is not available when using Pre trip alarm)
Digital Output	-	• 3DO (Fixed) • L, S/I, G Alarm	• 3DO (Programmable) • Trip, Alarm, General	• 3DO (Programmable) • Trip, Alarm, General
IDMTL setting	-	-	• Compliance with IEC60255-3 SIT, VIT, EIT, DT	• Compliance with IEC60255-3 SIT, VIT, EIT, DT
Communication	-	• Modbus/RS-485 • Profibus-DP	• Modbus / RS-485 • Profibus-DP	• Modbus / RS-485 • Profibus-DP
Power supply	• Self Power - Power source works over 20% of load current.	• Self Power - Power source works over 20% of load current - External power source are required for comm. • AC/DC 100~250V • DC 15~60V	• AC/DC 100~250V • DC 15~60V	• AC/DC 100~250V • DC 15~60V
RTC timer	-	• Available	• Available	• Available
LED for trip info.	• Long time delay • Short time delay/Instantaneous • Ground fault	• Long time delay • Short time delay/Instantaneous • Ground fault	• Long time delay • Short time delay/Instantaneous • Ground fault	• Long time delay • Short time delay/Instantaneous • Ground fault
Fault recording	-	• 10 records (Fault/Current/Date and Time)	• 256 records (Fault/Current/Date and Time)	• 256 records • Last fault wave form recording (Voltage, current are recorded in 3-phase, and can be read only by communication)
Event recording	-	-	• 256 records(Content, Status, Date)	• 256 records(Content, Status, Date)
Operating button	• Reset button	• Reset, Menu Up/Down, Tap, Enter	• Reset, Menu Up/Down, Tap, Enter	• Reset, Menu Up/Down, Tap, Enter

Each OCR type has Battery in itself.

1. Battery lifespan

- 1) When turned off: 14~28years
- 2) When using 1 LED consecutively or turned off: 7~14days

2. The display minimum range of OCR current

- 1) A type: When more 15% than rated current (In)
- 2) P/S type: When more 12% than rated current (In)

* L/S/I/G(or EL)configuration as standard (Only. Unable to select ground fault and earth leakage, simultaneously)