



Mitsubishi Low Voltage Air Circuit Breaker AE-SS AE-SH

Super AE



**99
A**

Super AE

Introduction of the new advanced Super AE series, heralding a new age of Air Circuit Breakers

With the highly advanced information technologies, dependability as well as safety and ease of handling of the electrical power supply are ever-growing requirements. The recent introduction of systemized and intelligent buildings, upgrading, and space-saving, and severe safety standard of power distribution has become a major subject within the electrical power supply industry. To cope with all these circumstances, Mitsubishi now presents the Super AE series Low Voltage Air Circuit Breakers.

This catalogue is intended for managers, engineers and working staffs to understand the outline of Mitsubishi Super AE series.

For further details of operation and maintenance please examine the "instruction manual" that comes along with the product.

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Easier Operation

Plenty Type Composition

- The addition of 4000A, 5000A and 6300A frame to the universal series makes applicable for a wide range of types from 630A to 6300A.
- The addition of high breaking capacity (AE-SH) series (630A-3200A frame) has enabled the design of economic sequences.

Expanded selective interruption range

- With the increased short-time current rating, the selective interruption range can be expanded with the use of the electronic trip relays with MCR function.

AE630-SS ~ AE3200-SS 65kA

AE4000-SSC 75kA

AE4000-SS
AE5000-SS 85kA
AE6300-SS

Full moulding

- Since the breaker is fully insulated with mouldings, it is safe to use for a wide range of applications.

Long service life

- 10,000 mechanical open/close operations for all types. (Except for AE4000-SS~AE6300-SS, AE4000-SSC)

Zero arc space

- Arc exhaust space to the outside of the breaker is drastically reduced for safer operation. (AE630-SS ~ AE3200-SS, AE4000-SSC ≤ 600VAC)

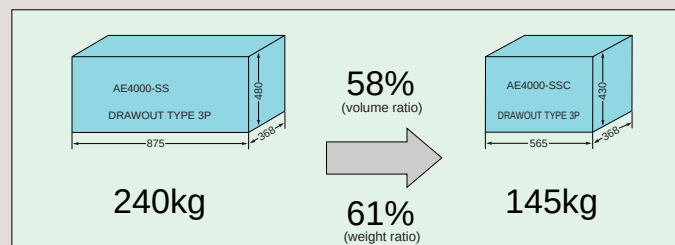
Reverse connection available

- Line and Load is not defined on the Main circuit terminals. Therefore reverse connection is available without any limitation.



More complete New AE4000-SSC

- The new AE4000-SSC which is smaller and economical makes fill up the AE-SS series.
- AE4000-SSC has realized smaller and lighter than AE4000-SS.



- Number of Operating cycles has been increased (2000 cycles→5000 cycles).

note 1: Only 3-pole type is available.

note 2: The Max. rated current is 3600A on JIS C8372.

Electronic trip relay features (1/2)

Multi functions available

1 Electronic trip relay series

Grouped electronic trip relays for easier selection

Control Method	Application	Relay type	Remarks	Function
Digital	General use	US	Provides transmission and monitoring functions for adaptation to networking systems as well as various characteristics for facilitating protection coordination.	C type - Overcurrent protection - Maximum phase current indication - Test functions S, S.L, M type - Ground fault/Earth Leakage protection - Trip indication US, UM type - Display of each phase current - Maintenance information - Transmission - Zone interlock - Measurement
	Generator use	UM		
Analog	General use	C	A standard type that provides the basic functions of a circuit breaker (long time delay tripping, short time delay tripping, instantaneous tripping).	
	General use	S	A multi-function type that provides all the characteristics required for the main circuit (special "long time delay" type).	
	Generator use	M	Provided with characteristics for protecting generators for private power generation and marine vessels.	

- Meets with a wide range of need depending on the application.
- Contributes to selective co-ordination, and ensures fine characteristic setting.
- Inquire for the details of digital relay.

2 Common features

Option Pre-alarm function (PAL)

The load current exceeds the value of the setting, before the breaker trips, the PAL operates, it contributes electrical continuity and easy maintenance.

Option Trip indicator (TI)

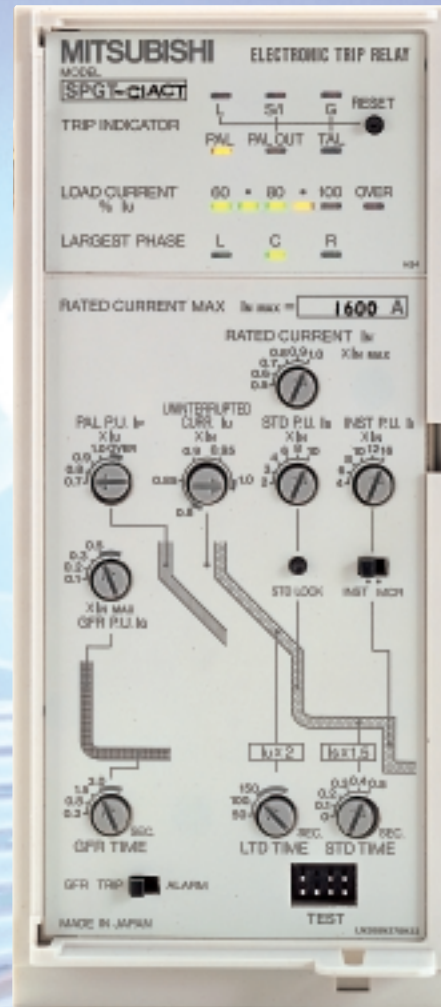
The trip indicator (TI) is operated simultaneously with the OCR alarm (AL), when the breaker trips because of Long time delay, short time delay/instantaneous and Ground fault or Earth leakage. The relevant cause of tripping will be displayed on the appropriate indication LED and a relay contact will provide an output signal.

Option Temperature alarm (TAL)

The TAL is operated by an unusual temperature of the breaker contacts.

Option Earth leakage protection (ER)

A choice of earth leakage alarm or earth leakage tripping function is available improving the discrimination and the safety in circuit design.



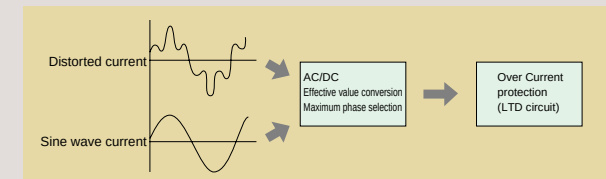
Meets Many Needs

Option Overcurrent protection on the neutral pole (NP)

In a 3-phase 4-wire circuit such that as provided to a computer, DC power unit or other load devices, higher harmonics are liable to be generated which could cause damage as more load current flows in the neutral pole. NP will eliminate such a possibility.

More secure protection owing to detection of effective value (RMS)

Effective value detection that is most suitable for the protection of electronic devices. Effective value detection independently provided for each phase, which is effective for distorted wave forms, is used to cope with the increasing use of electronics devices, including inverters.



Option Ground fault protection (GFR)

Either a ground fault trip or alarm function can be selected by a change-over switch. A control supply is not necessary.

Load current indication LEDs

The load current can be easily checked with the indication LEDs on the electronic trip relay.

Option Load current measurement (LM)

The largest phase current can be measured. The ammeter should be a DC voltage type 0-10V.

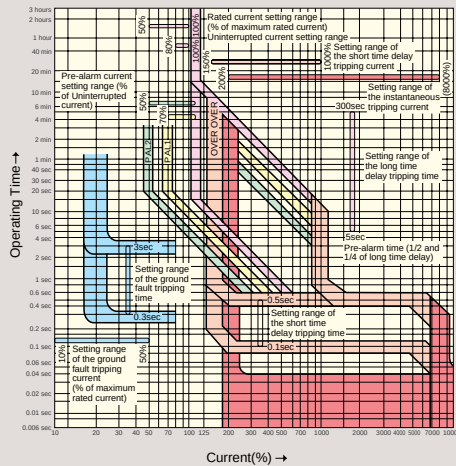
■ Electronic trip relay features (2/2)



Enhanced Further with a Wide Variety of Functions

Wide-Range High Accuracy Protection Characteristics

- Operating characteristics

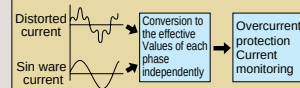


- The setting range of the instantaneous tripping current has been extended to allow setting of values equivalent to the rated breaking current.

(Max 50 kA)

- A Wide range of long time delay operation time can be set.

- A method for detecting the effective values of each phase independently has been adapted as a powerful monitoring method for distorted waveforms to meet with inverters and other electronic devices that are becoming increasingly popular.



Advanced Fault Information Management

- The faulty phase and the fault currents of each phase are monitored and displayed.
- Records of the causes of faults, fault currents and fault current levels are stored in the EEPROM ; these records remain even if the control power supply fails.
- The fault current level records contribute to the understanding of past fault conditions and the stress levels on the breaker.

Monitoring and Displayed Information

- The effective values of the current of each phase, the maximum phase current and ground fault/earth leakage current are monitored and displayed.
- The measured data of watt, watt hour, etc. can be transmitted to B/NET by using the power measurement control unit (option).

Multi-function pre-alarm

- Equipped with a double pre-alarm and an earth leakage pre-alarm.
- Functions for the remote setting of pre-alarm characteristics and alarms for the upper/lower limit of the monitored current enable detailed monitoring of the circuit.



Realization of Advanced Circuit Monitoring and User-Friendly Networking

Incorporation of Transmission Function

- Connection to the Mitsubishi Distribution Control Network (B/NET) System is facilitated by incorporating transmission interface.

Function	Contents
Monitoring (ordinary)	Breaker status (ON,OFF,TRIP) Circuit condition (pickup, alarm outputs) Measured current value Fault information Preset characteristic values Status of self-diagnosis
Alarms (emergency)	Changes in the status of the breaker Changes in the status of the circuit Load current (upper/lower limit) alarm
Control	Remote control of circuit breaker Remote setting of pre-alarm characteristics

Substantiation of Test Function

- The characteristics of all zones can be confirmed with simulated currents provided by the internal testing circuit.
- Independent testing of each phase is possible with a field tester.

Neutral Pole Protection

- The long time delay tripping characteristics of the neutral pole can be set at 50% or 100% of the main pole.
- Designation of the short time delay and instantaneous tripping characteristics are also possible.

Substantiation of Self-Diagnosis

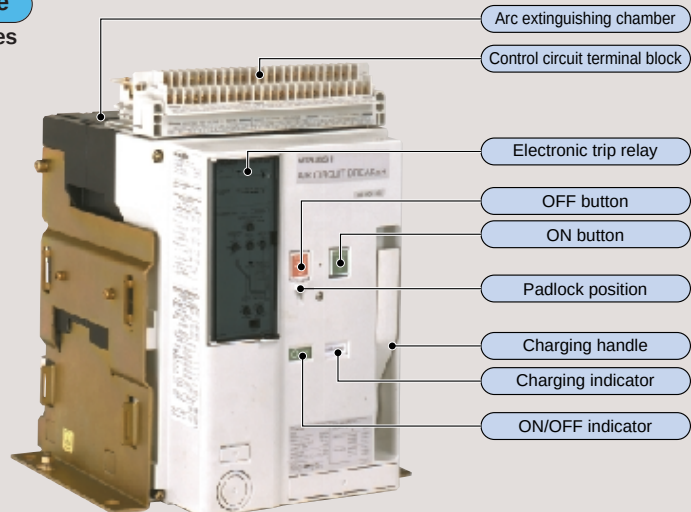
- Substantial self-diagnosis features, including monitoring of the switching and breaking operation, monitoring of the temperature of the around contact and the controlled circuit, provide higher reliability for continuous supply distribution.

Improved selective co-ordination

- Selective co-ordination is improved by the zone interlock functions for ground fault/earth leakage protection and the ramp characteristics immediately prior to the instantaneous tripping zone.

External view and Internal construction

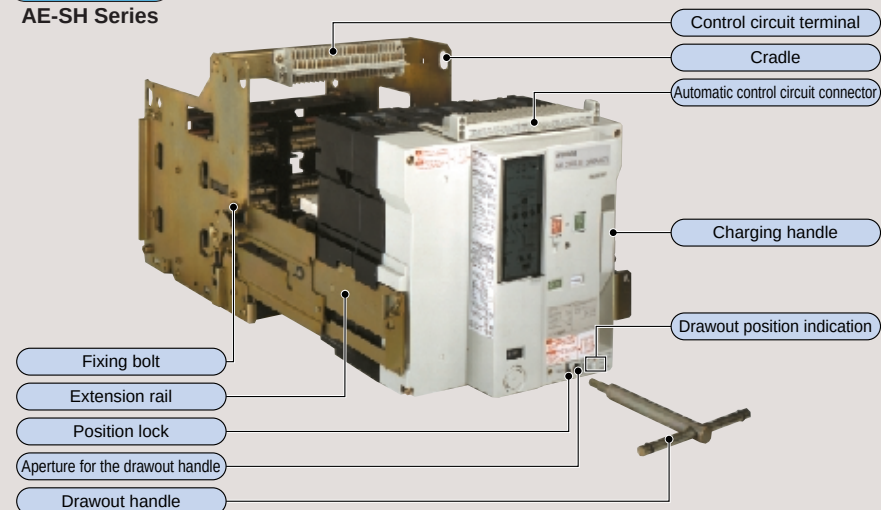
Fixed type AE-SS Series



Lifting hooks (HP) is supplied in the case of a fixed type AE-SS series.

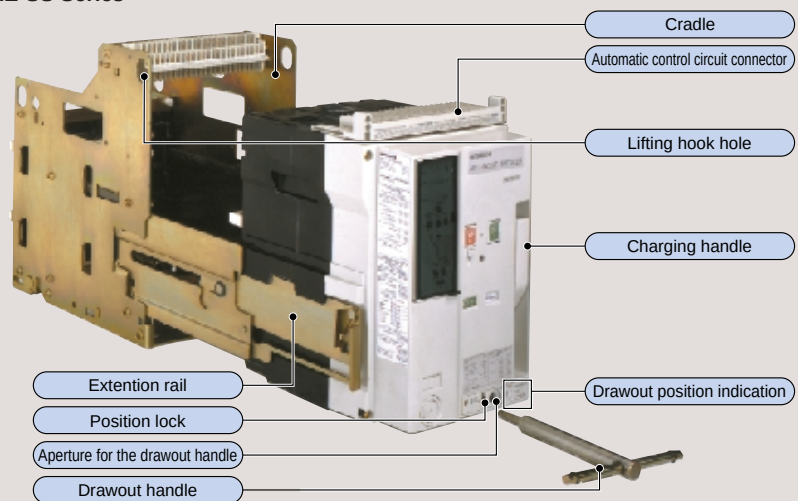
AE1600-SS 3P

Drawout type AE-SH Series



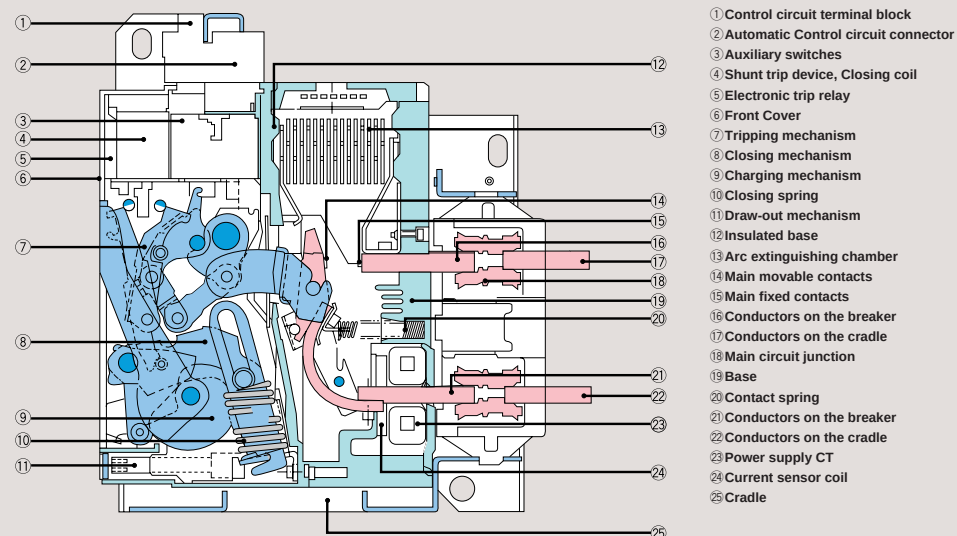
AE3200-SH 3P

Drawout type AE-SS Series



AE1600-SS 3P

Internal Construction AE-SS Series



Super AE series allows easier customer selection

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Type	Page
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High breaking model AE630-SH AE1000-SH AE1250-SH AE1600-SH AE2000-SH AE2500-SH AE3200-SH	

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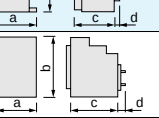
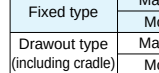
Electromagnetic Compatibility

	Description	Standard
Emission	Conducted RF disturbances	EN55011:1991 (Class A, Group 1)
	Radiated RF disturbances	EN55011:1991 (Class A, Group 1)
Immunity	Electrostatic discharge	IEC61000-4-2 (contact Level 4)
	Electromagnetic field	IEC61000-4-3 (Level 3)
	Fast transients / burst	IEC61000-4-4 (Level 4)
	Surge	IEC61000-4-5 (Level 4)
	Conducted radio frequency	IEC61000-4-6 (Level 3)

Tests are certified by TÜV Rheinland Product Safety GmbH köln.
Earthleakage protection is not applicable for these tests.

Product Specification(SS)

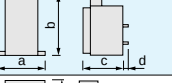
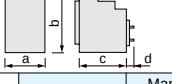
● Specification <IEC 60947-2, BS EN60947-2, VDE0660 Ics/Icu>

Type			SS type (standard model)																						
Type			AE630-SS		AE1000-SS		AE1250-SS		AE1600-SS		AE2000-SS		AE2500-SS		AE3200-SS		AE4000-SSC		AE4000-SS		AE5000-SS		AE6300-SS		
Frame size (A)			630		1000		1250		1600		2000		2500		3200		4000		4000		5000		6300		
Rated insulation voltage (VAC)			1000		1000		1000		1000		1000		1000		1000		1000		1000		1000		1000		
Rated operating voltage (VAC)			690		690		690		690		690		690		690		690		690		690		690		
Number of poles (P)			3	4	3	4	3	4	3	4	3	4	3	4	3	4	3		3	4	3	4	3	4	
Rated current (I _N)	General use (Current rating adjustable)		315-378-441 504-567-630 250-300-350 400-450-500 157-189-220 252-284-315		500-600-700 800-900-1000		625-750-875 1000-1125-1250		800-960-1120 1280-1440-1600		1000-1200-1400 1600-1800-2000 800-960-1120 1280-1440-1600 625-750-875 1000-1125-1250		1250-1500-1750 2000-2250-2500		1600-1920-2240 2560-2880-3200		3200-3600-4000		2000-2400-2800 3200-3600-4000		2500-3000-3500 4000-4500-5000		3150-3780-4410 5040-5670-6300		
	(A)	Generator protection use (Current rating fixed)	315≤I _N ≤630 200≤I _N ≤315		500≤I _N ≤1000		625≤I _N ≤1250		800≤I _N ≤1600		1000≤I _N ≤2000 625≤I _N ≤1000		1250≤I _N ≤2500		1600≤I _N ≤3200		3200≤I _N ≤4000		2000≤I _N ≤4000		2500≤I _N ≤5000		3150≤I _N ≤6000		
Rated current of neutral pole (A)			630		1000		1250		1600		2000		2500		3200		—		3200		3200		3200		
Rated breaking capacity I _{cs} / I _{cu} (RMS kA)	With instantaneous trip	690VAC	50/50		50/50		50/50		50/50		50/65		50/65		50/65		50/50		50/50		50/50		50/50		
		600VAC	50/50		50/50		50/50		50/50		65/65		65/65		65/65		65/65		85/85		85/85		85/85		
		500VAC	65/65		65/65		65/65		65/65		85/85		85/85		85/85		85/85		130/130		130/130		130/130		
		240VAC	65/85		65/85		65/85		65/85		85/85		85/85		85/85		85/85		130/130		130/130		130/130		
	With MCR	690VAC	42/42		42/42		42/42		42/42		50/50		50/50		50/50		50/50		50/50		50/50		50/50		
		600VAC	50/50		50/50		50/50		50/50		65/65		65/65		65/65		65/65		85/85		85/85		85/85		
		500VAC	65/65		65/65		65/65		65/65		65/65		65/65		65/65		75/75		85/85		85/85		85/85		
		240VAC	65/65		65/65		65/65		65/65		65/65		65/65		65/65		75/75		85/85		85/85		85/85		
	Without instantaneous (Note2)	690VAC	25/25		25/25		25/25		25/25		45/45		45/45		45/45		45/45		50/50		50/50		50/50		
		500VAC	25/25		25/25		25/25		25/25		45/45		45/45		45/45		45/45		65/65		65/65		65/65		
Rated making capacity I _{cm} (Peak kA)	With instantaneous trip	690VAC	105		105		105		105		143		143		143		105		105		105		105		
		600VAC	105		105		105		105		143		143		143		143		187		187		187		
		500VAC	143		143		143		143		187		187		187		187		286		286		286		
		240VAC	187		187		187		187		187		187		187		187		286		286		286		
	With MCR	690VAC	88.2		88.2		88.2		88.2		105		105		105		105		105		105		105		
		600VAC	105		105		105		105		143		143		143		143		187		187		187		
		500VAC	143		143		143		143		143		143		143		165		187		187		187		
		240VAC	143		143		143		143		143		143		143		165		187		187		187		
	Without instantaneous (Note2)	690VAC	52.5		52.5		52.5		52.5		94.5		94.5		94.5		94.5		105		105		105		
		500VAC	52.5		52.5		52.5		52.5		94.5		94.5		94.5		94.5		143		143		143		
Rated short time current I _{cw} (RMS kA)		1sec	65		65		65		65		65		65		65		75		85		85		85		
		2sec	40		40		40		60		65		65		65		65		65		65		65		
		3sec	30		30		30		50		65		65		65		65		65		65		65		
Maximum total breaking time (sec)		0.04		0.04		0.04		0.04		0.04		0.04		0.04		0.04		0.05		0.05		0.05			
Closing time (sec)		0.08		0.08		0.08		0.08		0.08		0.08		0.08		0.08		0.08		0.08		0.08			
Number of operating cycles. (Note 1)		With rated current	5000		5000		5000		5000		1500		1500		1000		500		500		500		500		
		Without rated current	10000		10000		10000		10000		10000		10000		10000		5000		2000		2000		2000		
Outline dimension (mm)		Fixed type	a	340	425	340	425	340	425	340	425	475	605	475	605	475	605	605	—	—	—	—	—	—	
			b	410	410	410	410	410	410	410	410	410	410	410	410	410	410	414	—	—	—	—	—	—	
			c	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	—	—	—	—	—	—
			d	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	136	—	—	—	—	—	—
		Drawout type	a	300	385	300	385	300	385	300	385	435	565	435	565	435	565	565	875	1005	875	1005	875	1005	
			b	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	480	480	480	480	480	480	
			c	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368
			d	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	151	123	123	123	123	123	123
Weight (kg)	Fixed type	Manual charging type	40	50	41	51	41	51	42	52	60	72	61	73	63	75	109	—	—	—	—	—	—		
		Motor charging type	43	53	44	54	44	54	45	55	63	75	64	76	66	78	112	—	—	—	—	—	—		
	Drawout type (including cradle)	Manual charging type	63	77	64	78	64	78	65	79	92	113	93	114	95	116	145	240	263	240	263	240	263		
		Motor charging type	66	80	67	81	67	81	68	82	95	116	96	117	98	119	148	244	267	244	267	244	267		
	Cradle only		26	30	26	30	26	30	26	30	35	43	35	43	36	44	75	125	140	125	140	125	140		

Note 1 : The number of operating cycles without rated current also include the number of operating cycles with rated current.

Note 2 : The columns for "without instantaneous tripping" are the values when the bare (without electronic trip relay) main body and the external relay are combined. Please apply for further detail.

● Specification <IEC 60947-2, BS EN60947-2, VDE0660 Ics/Icu>

Type			SH type (High breaking model)															
Type			AE630-SH		AE1000-SH		AE1250-SH		AE1600-SH		AE2000-SH		AE2500-SH		AE3200-SH			
Frame size (A)			630		1000		1250		1600		2000		2500		3200			
Rated insulation voltage (VAC)			1000		1000		1000		1000		1000		1000		1000			
Rated operating voltage (VAC)			690		690		690		690		690		690		690			
Number of poles (P)			3	4	3	4	3	4	3	4	3	4	3	4	3	4		
Rated current (I _N)		General use (Current rating adjustable)	315-378-441 -504-567-630		500-600-700 -800-900-1000		625-750-875 -1000-1125-1250		800-960-1120 -1280-1440-1600		1000-1200-1400 -1600-1800-2000		1250-1500-1750 -2000-2250-2500		1600-1920-2240 -2560-2880-3200			
		(A) Generator protection use (Current rating fixed)	315≤I _N ≤630		500≤I _N ≤1000		625≤I _N ≤1250		800≤I _N ≤1600		1000≤I _N ≤2000		1250≤I _N ≤2500		1600≤I _N ≤3200			
Rated current of neutral pole (A)			630		1000		1250		1600		2000		2500		3200			
Rated breaking capacity I _{cs} / I _{cu} (RMS kA)			With instantaneous trip		690VAC		65/65	65/65	65/65	65/65	65/65	65/65	65/65	65/65	65/65	65/65		
					600VAC		85/85	85/85	85/85	85/85	85/85	85/85	85/85	85/85	85/85	85/85		
					500VAC		130/130	130/130	130/130	130/130	130/130	130/130	130/130	130/130	130/130	130/130		
					240VAC		130/130	130/130	130/130	130/130	130/130	130/130	130/130	130/130	130/130	130/130		
			With MCR		690VAC		—		—		—		—		—		—	
					600VAC		—		—		—		—		—		—	
					500VAC		—		—		—		—		—		—	
					240VAC		—		—		—		—		—		—	
			Without instantaneous (Note2)		690VAC		—		—		—		—		—		—	
					500VAC		—		—		—		—		—		—	
Rated making capacity I _{cm} (Peak kA)			With instantaneous trip		690VAC		65/65	65/65	65/65	65/65	65/65	65/65	65/65	65/65	65/65	65/65		
					600VAC		85/85	85/85	85/85	85/85	85/85	85/85	85/85	85/85	85/85	85/85		
					500VAC		130/130	130/130	130/130	130/130	130/130	130/130	130/130	130/130	130/130	130/130		
					240VAC		130/130	130/130	130/130	130/130	130/130	130/130	130/130	130/130	130/130	130/130		
			With MCR		690VAC		—		—		—		—		—		—	
					600VAC		—		—		—		—		—		—	
					500VAC		—		—		—		—		—		—	
					240VAC		—		—		—		—		—		—	
			Without instantaneous (Note2)		690VAC		—		—		—		—		—		—	
					500VAC		—		—		—		—		—		—	
Rated short time current I _{cw} (RMS kA)			1sec		—		—		—		—		—		—			
			2sec		—		—		—		—		—		—			
			3sec		—		—		—		—		—		—			
Maximum total breaking time (sec)			0.04		0.04		0.04		0.04		0.04		0.04		0.04			
Closing time (sec)			0.08		0.08		0.08		0.08		0.08		0.08		0.08			
Number of operating cycles. (Note 1)			With rated current		3000		3000		3000		2000		1500		1000			
			Without rated current		10000		10000		10000		10000		10000		10000			
Outline dimension (mm)   Fixed type Drawout type			a	475	605	475	605	475	605	475	605	475	605	475	605	475	605	
			b	410	410	410	410	410	410	410	410	410	410	410	410	410	410	410
			c	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290
			d	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68
			a	485	615	485	615	485	615	485	615	485	615	485	615	485	615	485
			b	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430
			c	398	398	398	398	398	398	398	398	398	398	398	398	398	398	398
			d	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61
Weight (kg)			Fixed type		Manual charging type		66	79	66	79	66	79	66	79	66	79		
					Motor charging type		69	82	69	82	69	82	69	82	71	84		
			Drawout type (including cradle)		Manual charging type		105	127	105	127	105	127	105	127	105	127	107	129
					Motor charging type		108	130	108	130	108	130	108	130	108	130	110	132
			Cradle only		42	50	42	50	42	50	42	50	42	50	42	50	43	51

Note 1 : The number of operating cycles without rated current also include the number of operating cycles with rated current.

Note 2 : The columns for "without instantaneous tripping" are the values when the bare (without electronic trip relay) main body and the external relay are combined. Please apply for further detail.

Product Specification(SS)

● Specification <JIS C 8372 (o-co-co duty) /JIS C 8370 (o-co duty)>

Type				SS type (standard model)																					
Type				AE630-SS		AE1000-SS		AE1250-SS		AE1600-SS		AE2000-SS		AE2500-SS		AE3200-SS		AE4000-SSC		AE4000-SS		AE5000-SS		AE6300-SS	
Frame size (A)				630		1000		1250		1600		2000		2500		3200		4000		4000		5000		6300	
Rated insulation voltage (VAC)				600		600		600		600		600		600		600		600		600		600		600	
Rated operating voltage (VAC)				550		550		550		550		550		550		550		550		550		550		550	
Number of poles (P)				3	4	3	4	3	4	3	4	3	4	3	4	3	4	3		3	4	3	4	3	4
Rated current (I _N)		General use (Current rating adjustable)		315-378-441 504-567-630 250-300-350 400-450-500 157-189-220 252-284-315		500-600-700 -800-900-1000		625-750-875 -1000-1125-1250		800-960-1120 -1280-1440-1600		1000-1200-1400 -1600-1800-2000 800-960-1120 -1280-1440-1600 625-750-875 -1000-1125-1250		1250-1500-1750 -2000-2250-2500		1600-1920-2240 -2560-2880-3200		3200-3600		2000-2400-2800 -3200-3600-4000		2500-3000-3500 -4000-4500-5000		3000-3600-4200 -4800-5400-6000	
				315<I _N ≤630 200≤I _N ≤315		500≤I _N ≤1000		625≤I _N ≤1250		800≤I _N ≤1600		1000<I _N ≤2000 625≤I _N ≤1000		1250≤I _N ≤2500		1600≤I _N ≤3200		3200≤I _N ≤3600		2000≤I _N ≤4000		2500≤I _N ≤5000		3150≤I _N ≤6300	
Rated current of neutral pole (A)				630		1000		1250		1600		2000		2500		3200		—		3200		3200		3200	
Rated breaking capacity (kA RMS symmetrical)	JIS C8372 O-CO-CO	With instantaneous trip	550VAC	50/105	50/105	50/105	50/105	65/143	65/143	65/143	65/143	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	130/299	130/299	130/299	130/299	130/299	130/299	130/299	
			460VAC	65/143	65/143	65/143	65/143	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5		
		With MCR	550VAC	50/105	50/105	50/105	50/105	65/143	65/143	65/143	65/143	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	75/165	75/165	75/165	75/165	75/165	75/165	
			460VAC	65/143	65/143	65/143	65/143	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	
Rated making capacity (kA peak value) Breaking duty O-CO-CO	JIS C8370 O-CO	With instantaneous trip	550VAC	50/105	50/105	50/105	50/105	65/143	65/143	65/143	65/143	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	
			460VAC	65/143	65/143	65/143	65/143	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5		
		With MCR	550VAC	50/105	50/105	50/105	50/105	65/143	65/143	65/143	65/143	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	
			460VAC	65/143	65/143	65/143	65/143	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	85/195.5	
Rated short time current (RMS kA)			1sec	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	
			2sec	40	40	40	40	60	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	
			3sec	30	30	30	30	50	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Maximum total breaking time			(sec)	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	
Closing time			(sec)	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	
Number of operating cycles. (Note 1)			With rated current	5000	5000	5000	5000	1500	1500	1000	1000	500	500	500	500	500	500	500	500	500	500	500	500	500	
			Without rated current	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000

Note 1 : The number of operating cycles without read current also include the number of operating cycles with rated current.

Note 2 : The columns for "without instantaneous tripping" are the values when the bare (without electronic trip relay) main body and the external relay are combined. Please apply for further detail.

● Shipping Standard <LR, AB, GL, DNV, BV, NK >

* DNV:Under application

Type				SS type (standard model)										
Type				AE630-SS	AE1000-SS	AE1250-SS	AE1600-SS	AE2000-SS	AE2500-SS	AE3200-SS	AE4000-SSC	AE4000-SS	AE5000-SS	AE6300-SS
Frame size (A)				630	1000	1250	1600	2000	2500	3200	4000	4000	5000	6300
Rated insulation voltage (VAC)				1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Number of poles (P)				3	3	3	3	3	3	3	3	3	3	3
Rated current (I _N) (A)		General use (Fixed rated current)		315<I _N ≤630 200≤I _N ≤315	500≤I _N ≤1000	625≤I _N ≤1250	800≤I _N ≤1600	1000<I _N ≤2000 625≤I _N ≤1000	1250≤I _N ≤2500	1600≤I _N ≤3200	3200≤I _N ≤3800 3200≤I _N ≤3500 (for NK)	2000≤I _N ≤4000	2500≤I _N ≤5000	3150≤I _N ≤6300 3150≤I _N ≤700 (for NK)
Rated breaking capacity (kA RMS Symmetrical)	LR	With instantaneous trip	690VAC	50/106	50/106	50/106	50/106	50/106	50/106	50/106	—	—	—	—
			600VAC	—	—	—	—	65/143	65/143	65/143	—	87/211	87/211	87/211
			500VAC	65/151	65/151	65/151	65/151	85/196	85/196	85/196	—	133/330	133/330	133/330
	AB	With instantaneous trip	690VAC	50/105	50/105	50/105	50/105	50/105	50/105	50/105	—	—	—	—
			600VAC	—	—	—	—	65/143	65/143	65/143	—	—	—	—
			500VAC	65/143	65/143	65/143	65/143	85/187	85/187	85/187	—	—	—	—
	GL	With instantaneous trip	690VAC	50/106	50/106	50/106	50/106	50/106	50/106	50/106	—	—	—	—
			600VAC	—	—	—	—	65/143	65/143	65/143	—	—	—	—
			500VAC	65/151	65/151	65/151	65/151	85/196	85/196	85/196	—	—	—	—
	DNV	With instantaneous trip	690VAC	50/106	50/106	50/106	50/106	50/106	50/106	50/106	—	—	—	—
			600VAC	—	—	—	—	65/143	65/143	65/143	—	—	—	—
			500VAC	65/151	65/151	65/151	65/151	85/196	85/196	85/196	—	—	—	—
Rated making capacity (kA peak value) Breaking duty O-CO-CO	BV	With instantaneous trip	690VAC	50/105	50/105	50/105	50/105	50/105	50/105	50/105	—	—	—	—
			600VAC	—	—	—	—	65/143	65/143	65/143	—	—	—	—
			500VAC	65/143	65/143	65/143	65/143	85/187	85/187	85/187	—	—	—	—
	NK	With instantaneous trip	600VAC	50/112	50/112	50/112	50/112	65/143	65/143	65/143	65/143	87/211	87/211	87/211
			500VAC	65/147	65/147	65/147	65/147	85/196	85/196	85/196	85/196	133/330	133/330	133/330
			—	—	—	—	—	—	—	—	—	—	—	—

● Specification <JIS C 8372 (o-co-co duty) /JIS C 8370 (o-co duty)>

Type				SH type (High breaking model)													
Type				AE630-SH		AE1000-SH		AE1250-SH		AE1600-SH		AE2000-SH		AE2500-SH		AE3200-SH	
Frame size (A)				630		1000		1250		1600		2000		2500		3200	
Rated insulation voltage (VAC)				600		600		600		600		600		600		600	
Rated operating voltage (VAC)				550		550		550		550		550		550		550	
Number of poles (P)				3	4	3	4	3	4	3	4	3	4	3	4	3	4
Rated current (I _N)		General use (Current rating adjustable)		315-378-441 -504-567-630		500-600-700 -800-900-1000		625-750-875 -1000-1125-1250		800-960-1120 -1280-1440-1600		1000-1200-1400 -1600-1800-2000		1250-1500-1750 -2000-2250-2500		1600-1920-2240 -2560-2880-3200	
				315≤I _N ≤630		500≤I _N ≤1000		625≤I _N ≤1250		800≤I _N ≤1600		1000≤I _N ≤2000		1250≤I _N ≤2500		1600≤I _N ≤3200	
Rated current of neutral pole (A)				630		1000		1250		1600		2000		2500		3200	
Rated breaking capacity (kA RMS symmetrical)	JIS C8372 O-CO-CO	With instantaneous trip	550VAC	85/195.5		85/195.5		85/195.5		85/195.5		85/195.5		85/195.5		85/195.5	
			460VAC	130/299		130/299		130/299		130/299		130/299		130/299		130/299	
		With MCR	550VAC	—		—		—		—		—		—		—	
			460VAC	—		—		—		—		—		—		—	
Rated making capacity (kA peak value) Breaking duty O-CO-CO	JIS C8370 O-CO	Without instantaneous (Note2)		550VAC	—		—		—		—		—		—		
		With instantaneous trip	550VAC	85/195.5		85/195.5		85/195.5		85/195.5		85/195.5		85/195.5		85/195.5	
			460VAC	130/299		130/299		130/299		130/299		130/299		130/299		130/299	
			220VAC	130/299		130/299		130/299		130/299		130/299		130/299		130/299	
		With MCR	550VAC	—		—		—		—		—		—		—	
			460VAC	—		—		—		—		—		—		—	
			220VAC	—		—		—		—		—		—		—	
		Rated short time current (RMS kA)			1sec	—		—		—		—		—		—	
2sec	—				—		—		—		—		—				
3sec	—				—		—		—		—		—				
Maximum total breaking time			(sec)	0.04		0.04		0.04		0.04		0.04		0.04		0.04	
Closing time			(sec)	0.08		0.08		0.08		0.08		0.08		0.08		0.08	
Number of operating cycles. (Note 1)			With rated current	3000		3000		3000		2000		1500		1500		1000	
			Without rated current	10000		10000		10000		10000		10000		10000		10000	

Note 1 : The number of operating cycles without rated current also include the number of operating cycles with rated current.

Note 2 : The columns for "without instantaneous tripping" are the values when the bare (without electronic trip relay) main body and the external relay are combined. Please apply for further detail.

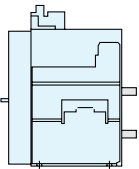
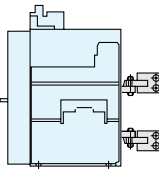
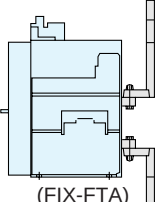
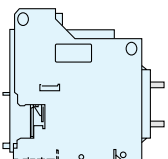
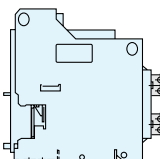
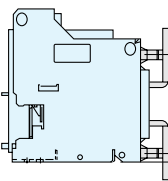
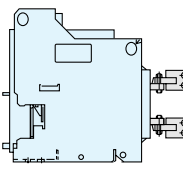
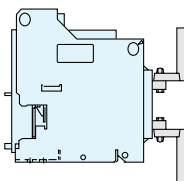
● Shipping Standard <LR, AB, GL, DNV, BV, NK > * DNV:Under application

Type				SH type (High breaking model)							
Type				AE630-SH	AE1000-SH	AE1250-SH	AE1600-SH	AE2000-SH	AE2500-SH	AE3200-SH	
Frame size (A)				630	1000	1250	1600	2000	2500	3200	
Rated insulation voltage (VAC)				1000	1000	1000	1000	1000	1000	1000	
Number of poles (P)				3	3	3	3	3	3	3	
Rated current (I _N) (A)				315≤I _N ≤630	500≤I _N ≤1000	625≤I _N ≤1250	800≤I _N ≤1600	1000≤I _N ≤2000	1250≤I _N ≤2500	1600≤I _N ≤3200	
Rated breaking capacity (kA RMS Symmetrical) Rated making capacity (kA peak value) Breaking duty O-CO-CO	LR	With instantaneous trip	690VAC	68/173	68/173	68/173	68/173	68/173	68/173	68/173	
			600VAC	87/211	87/211	87/211	87/211	87/211	87/211	87/211	
			500VAC	133/330	133/330	133/330	133/330	133/330	133/330	133/330	
	AB	With instantaneous trip	690VAC	—	—	—	—	—	—	—	
			600VAC	—	—	—	—	—	—	—	
			500VAC	—	—	—	—	—	—	—	
	GL	With instantaneous trip	690VAC	—	—	—	—	—	—	—	
			600VAC	—	—	—	—	—	—	—	
			500VAC	—	—	—	—	—	—	—	
	DNV	With instantaneous trip	690VAC	—	—	—	—	—	—	—	
			600VAC	—	—	—	—	—	—	—	
			500VAC	—	—	—	—	—	—	—	
	BV	With instantaneous trip	690VAC	—	—	—	—	—	—	—	
			600VAC	—	—	—	—	—	—	—	
			500VAC	—	—	—	—	—	—	—	
	NK	With instantaneous trip	600VAC	—	—	—	—	—	—	—	
			500VAC	130/317	130/317	130/317	130/317	130/317	130/317	130/317	

Connecting methods

Connection arrangements

The following connecting methods are available for the AE type air circuit breaker.

Mounting method \ Connecting method	Horizontal connection (Standard)	Vertical connection (VT)	Front connection (FT)	Vertical terminal adapter (VTA)	Front terminal adapter (FTA)
Fixed type (FIX)		—	—	 (VTA)	 (FIX-FTA)
Draw-out type (DR)		 (DR-VT)	 (DR-FT)	 (VTA)	 (DR-FTA)

Connecting Methods

Type		AE630-SS	AE1000-SS	AE1250-SS	AE1600-SS	AE2000-SS	AE2500-SS	AE3200-SS	AE4000-SSC	AE4000-SS	AE5000-SS	AE6300-SS
Connecting method												
Fixed type (FIX)	Horizontal terminal (Standard)	●	●	●	●	●	●	●	—	—	—	—
	Vertical terminal	—	—	—	—	—	—	—	●	—	—	—
	Options											
	(VTA)	○	○	○	○	○	○	○	—	—	—	—
Draw-out type (DR)	(FIX-FTA)	○	○	○	○	○	○	○	—	—	—	—
	Horizontal terminal (Standard)	●	●	●	●	●	●	●	—	—	—	—
	(DR-VT) (Note 1)	○	○	○	○	○	○	○	●	●	●	●
	(DR-FT)	○	○	○	○	○	○	○	—	—	—	—
	Options											
	(VTA)	○	○	○	○	○	○	○	—	—	—	—
	(DR-FTA)	○	○	○	○	○	○	○	—	—	—	—

Type		AE630-SH	AE1000-SH	AE1250-SH	AE1600-SH	AE2000-SH	AE2500-SH	AE3200-SH
Connecting method								
Fixed type (FIX)	Horizontal terminal (Standard)	●	●	●	●	●	●	●
	Options							
	(VTA)	○	○	○	○	○	○	○
Draw-out type (DR)	(FIX-FTA)	○	○	○	○	○	○	○
	Horizontal terminal (Standard)	●	●	●	●	●	●	●
	(DR-VT)	○	○	○	○	○	○	○
	(DR-FT)	○	○	○	○	○	○	○
	Options							
	(VTA)	○	○	○	○	○	○	○
	(DR-FTA)	○	○	○	○	○	○	○

Note1: The terminal for AE4000-SSC, AE4000-SS~AE6300-SS shall be vertical terminal.

(Remarks) The white circle "○" indicates that the product can be manufactured, while the blue "●" indicates the standard connecting method.

Manual charging

The spring is charged by the manual charging handle. The breaker is closed when the ON button is pressed, and opened when the OFF button is pressed.

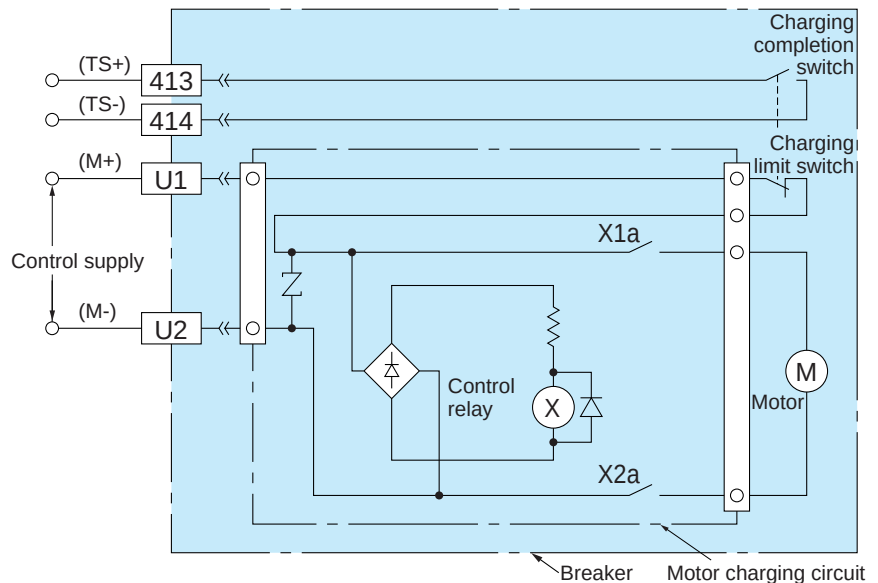
- When the closing spring charging is completed, the charging indicator displays CHARGED.
- The indicator displays ON or OFF state of the main contacts.
- The breaker cannot be closed while the OFF button is being pressed. (Safety feature)
OFF lock is available by padlock (See P9, P24) as standard.

Option

Motor charging device (MD)

The closing spring is charged by an electric motor. When the breaker is closed, the spring is charged automatically (ON-charge method.) The closing coil (CC) is required to remotely close, and the shunt trip device is required to remotely open the breaker.

- Manual charging is also available.
- Pumping prevention is assured both electrically and mechanically.
- As the charging completion contact is separate from the electrical charging circuit, its function in the control scheme can be arranged as desired.



Apply for further details of 24V DC and 48V DC.

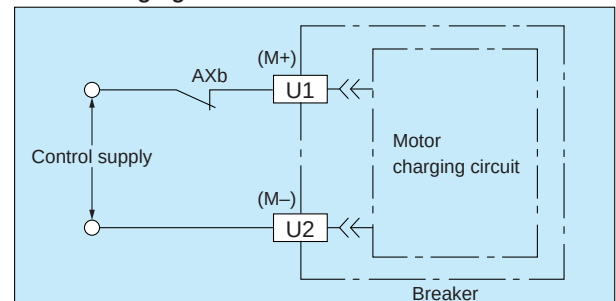
● Motor charging rating

Rated voltage	Applicable voltage range (V)	Applied voltage (V)	Inrush current (peak value)(A)	Steady current (A)	Charging time (sec.)
DC24V	20.4~26.4	24	22	6	≦5
DC48V	36~52.8	48	14	3	≦5
AC-DC 100~125V	85~137.5	100	10(10)	3(4)	≦5
		125	12(12)	3(4)	≦5
AC-DC 200~250V	170 ~275	200	5(7)	1(2)	≦5
		250	6(8)	1(2)	≦5

(): AE4000-SS~AE6300-SS

DC24, DC48V is not available for AE4000-SS~AE6300-SS

● OFF charging method



A OFF charging method is also available. The closing spring is charged automatically when the breaker is opened. This is available only by externally connecting in series b contact (AXb) of the auxiliary switch to the motor charging circuit.

In case of DC power supply, please use high capacity auxiliary switch (HAX).

Accessories (for Breaker unit 1/2)

Super AE

Option

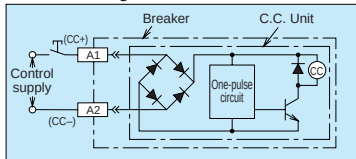
Closing coil (CC)

The closing coil is a device to close the breaker by remote control.
● An interlock to prevent pumping is provided electrically.

Rated voltage (Applicable voltage range)	Operating voltage • Operating inrush current (VA)		Closing time
	AC	DC	
DC24-48V (18 ~ 52.8)	—	DC24V 3.5A (100W) DC48V 7.0A (200W)	0.08 sec. or less
AC • DC common 100-250V (75-275)	AC100V 0.5A (100VA)	DC100V 0.6A (100W)	
	AC250V 1.0A (150VA)	DC250V 1.3A (200W)	

- Closing time is from the initial energization of the closing coil to the completion of the closing of the main contacts.
- Because of pumping prevention is not performed, do not use AXb contact for a cut-off switch.

● CC circuit diagram



Diode rectifier is not used for control source 24-48V DC.

Option

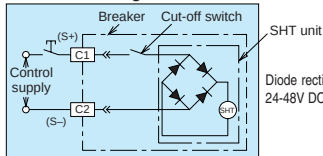
Shunt trip device (SHT)

This is the switch used to open the breaker by remote control. A cut-off switch is included.

Rated voltage (Applicable voltage range)	Operating voltage • Operating inrush current (VA)		Operating time
	AC	DC	
DC24 ~ 48V (16.8 ~ 52.8)	—	DC24V 3.5A (100W) DC48V 7.0A (200W)	0.04sec. or less
AC • DC common 100 ~ 250V (75 ~ 275)	AC100V 0.6A (100VA)	DC100V 0.8A (100W)	
	AC250V 1.7A (150VA)	DC250V 2.0A (250W)	
AC380 ~ 500V (266 ~ 550)	AC460V 0.6A (200VA)	—	

Operating time AE4000-SS-AE6300-SS is 0.05 sec. or less.

● SHT circuit diagram



Diode rectifier is not used for control source 24-48V DC.

Option

Motor charging device (MD)

The closing spring is charged electrically, and the breaker will be ready to be closed.

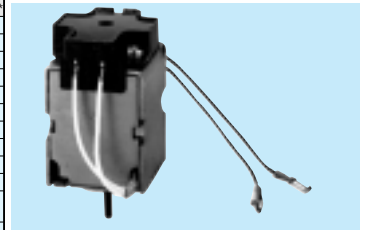
- When specifying the motor charging device, be sure to order the closing coil (CC) and the shunt trip device (SHT) for remote operation.
- Refer to page 18 for details.

Option

Under voltage trip device (UVT)

This device is used to trip the breaker if the supply voltage is reduced below its nominal value, and consists of a UVT coil and UVT controller. Two types are available: the instantaneous type which trips the breaker instantly, and a time delay type which trips the breaker after a delay of 0.5 or 3 seconds from when the supply voltage has reduced below its nominal value. The UVT controller can be mounted on the lefthand side of the breaker looking from the front.

Type	UVT-SSB*	UVT-05SSB*	UVT-30SSB*
Operation	Instantaneous	Time delay	
Operation time (Note 3)	0.1 sec max.	0.5 sec min.	3 sec min.
Rated voltage (+10% -15%)	100-120/200-240/380-460VAC		
	24VDC		
	48VDC		
	100-110VDC		
Frequency	50/60 Hz (AC)		
Pick-up voltage	65 ~ 85% (Note 1)		
Drop-out voltage	45 ~ 70% (Note 1)		
Trip function (Note 2)	With open circuit of terminals (DT1, DT2) operation time 0.1 sec max.		
Power consumption	20 VA		



(Note 1) If dual rated voltages are used, a lower value is applied.

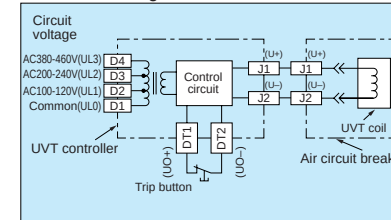
(Note 2) If a remote trip function is required remove the wire shorting terminals DT1 DT2 and connect a normally closed switch, rated 1mA at 100VDC across them.

(Note 3) The operating time is a guarantee value when it drops from 85% or more of the rated voltage.

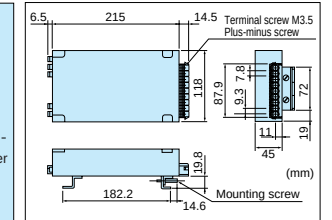
● The following delay should be allowed between applying the voltage to the UVT, and closing the breaker.

UVT-SSB* : 1.5 sec., UVT-05SSB* : 1.5 sec., UVT-30SSB* : 3 sec.

● UVT circuit diagram



● UVT controller



Option

Auxiliary switch (AX-standard, HAX-high capacity type)

This is the contact that is used to remotely indicate the ON or OFF status of the breaker.

Type			AX(standard)		HAX (high capacity type)	
			Resistance load	Inductive load	Resistance load	Inductive load
Contact capacity (A)	A C	460V	5	2	5	2.5
		250V	10	10	10	10
		125V	10	10	10	10
	D C	250V	0.3	0.3	3	1.5
		125V	0.6	0.6	10	6
		30V	10	6	10	10
			Maximum contacts		5 a 5 b	
Change-over sequence		Breaker state	a-contact (NO)		b-contact (NC)	
		ON	ON		OFF	
		OFF	OFF		ON	

- The a and b contacts may turn simultaneously to ON instantaneously at the time of changing the contact; Pay attention to the contact state when designing circuits.
- The chattering time at the time of contact ON-OFF is below 0.025 sec.
- For special environment specification, the contact capacity gets deteriorated. Apply for further detail.

Accessories (for Breaker unit 2/2)

Option

Push button cover

The cover is to prevent careless manual operation (ON, OFF) of the push buttons.
BC-L can be locked by a padlock (The padlock being supplied by the customer.)
For the size of the a suitable padlock, refer to Page 24.

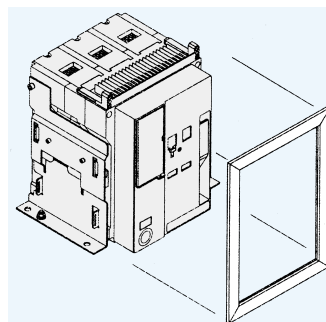


Push button cover

Option

Door frame (DF)

The door frame improves the appearance, after cutting out the panel door to install the breaker.



Option

Counter (CNT)

The open/close operations of the breaker are shown on a 5 digit counter.

Option

Cylinder lock (CYL)

The breaker is locked OFF with the cylinder lock.

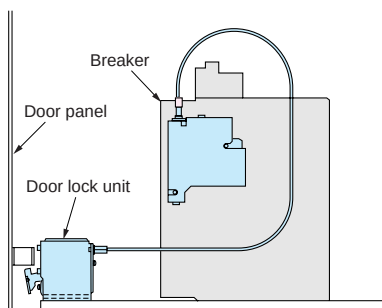
- Since it is an interlock which only allows the key to be removed when the breaker is locked off, it can be used for interlocking two or more breakers.

Option

Door interlock (DI)

The panel door cannot be opened unless the breaker is open.

- A wire type mechanical interlock is used to allow flexibility in positioning breakers in the switchboard.
- The parts of the Door panel should be supplied by customer.



Option

Terminal cover (TTC)

The transparent terminal cover prevents from careless touching to the live control terminals.
Protection degree IP20.

Option

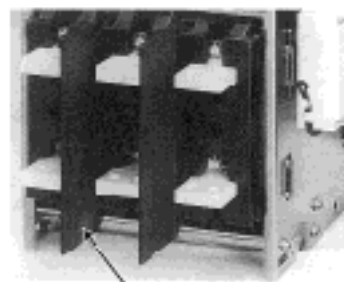
Dust cover

Dust cover prevents the dust or water entering into the panel board from the breaker panel cut.
Protection degree IP 54.

Option

Interphase Barrier (BA)

The interphase insulation of the circuit breaker has been intensified to prevent the shortcircuit due to conductive matters or dust. Easily detachable, in design, the barrier is applicable to fixed type, draw-out type, horizontal terminal or vertical terminal. (For further detail, see the "Table of Mountable Barriers" given below.



Interphase barrier (BA) 2 pcs (3-pole), 3pcs (4-pole)

●Table of Mountable Barriers

	Connecting method	AE630-SS~ AE1600-SS	AE2000-SS~ AE3200-SS	AE-SH Type
Fixed type	Horizontal terminal (standerd)	○	○	—
	Vertical terminal adapter	—	—	—
	Front terminal adapter	—	—	—
Draw-out type	Horizontal terminal (standerd)	○	○	○
	Vertical terminal	○	—	—
	Front terminal	—	—	—
	Vertical terminal adapter	—	—	—
	Front terminal adapter	—	—	—

Not available for AE4000-SSC, AE4000-SS~AE6300-SS

Option

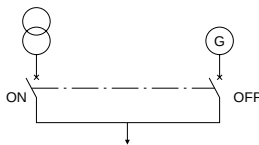
Mechanical interlock (MI)

The mechanical interlock is a secure interlock prohibiting the parallel closing of two or three breakers.

- Any combination between AE630-SS~AE3200-SH and AE4000-SSC is possible. Please apply for further details of AE4000~6300-SS.
- It can be simply installed on either fixed or drawout type breakers.
- With the drawout type, the interlock operates at the connecting point and can be released at other positions, providing secure maintenance and inspections of the breaker.
- There are restrictions on ordering MI and DI together, please apply for further details.
- It is impossible to secure interlock among 3 pcs of AE4000-SS~AE6300-SS.

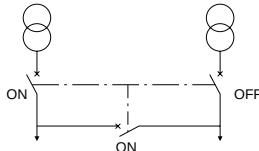
The following interlocks are available.

Change over of two power supplies

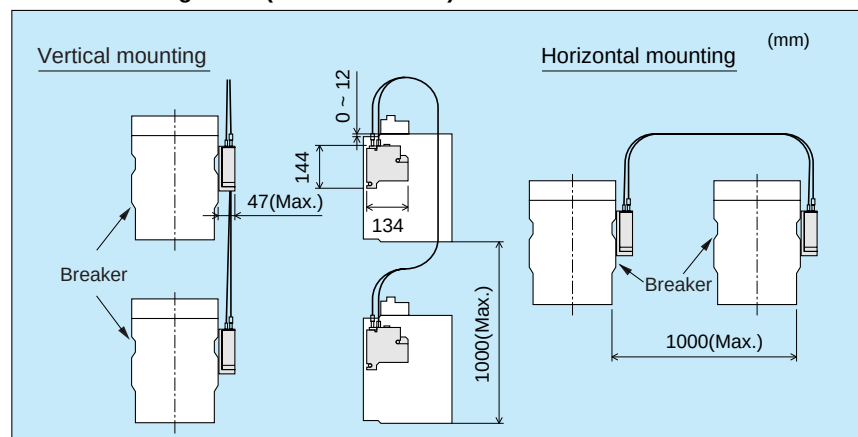


Change over of two supply systems

Up to any two breakers can be closed. (Please apply for further details)



Breaker arrangement (630AF ~ 3200AF)



Option

Condenser trip device (COT)

Even if the power supply fails, the breaker can be electrically opened by remote operation within a definite time. This device is combined with the shunt trip device (SHT).

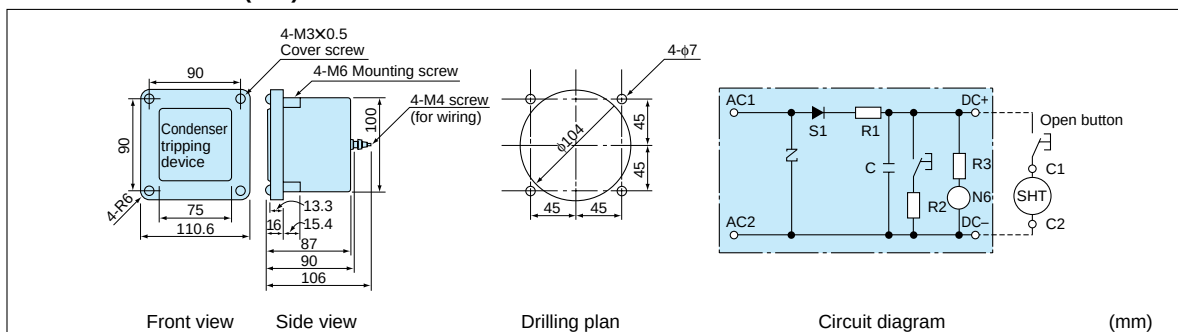
Note 1: The rated charging voltage is the voltage stored during capacitor saturation. It is continuously supplied by the rectified voltage of the rated AC input voltage.

Note 2: The charging time starts when the capacitor begins to supply power at 85% of the rated AC input voltage and continues until the capacitor charging voltage reaches 60% of rating.

Note 3: The time period in which the shunt trip device can perform its one operation starts from when the capacitor is charge to 100% the supply voltage is removed.

Outline dimensions (mm)

Type	KF-100	KF-200
Rated input voltage	100/110VAC	200/220VAC
Rated frequency	50 ~ 60Hz	50 ~ 60Hz
Rated charging voltage (Note1)	140/155V	280/310V
Condenser capacity	660μF	150μF
Voltage range	60 ~ 125%	60 ~ 125%
Power supply capacity	1VA	1VA
Charging time (Note 2)	0.5 sec max.	0.5 sec max.
Trip limit time (Note 3)	15 minutes min.	5 minutes min.
Paint colour	Black (N1.5)	Black (N1.5)
Withstand voltage (1 minute)	2000VAC	2000VAC
Applicable shunt trip voltage	100 ~ 250VAC+DC	100 ~ 250VAC+DC

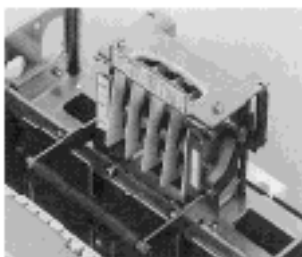


Accessories (for Drawout frame)

Option

Cell switch (CL)

The switch is used to indicate the drawout positions (CONNECTED, TEST, DISCONNECTED).



● Operating sequence and contact rating

Drawout position of breaker		Disconnected		Connected
Display position of drawout operation		DISCON	TEST	CONNECT
Switch function	CL-C (CONNECTED)	OFF		ON
	CL-T (TEST)	OFF	ON	
	CL-D (DISCONNECTED)	ON		OFF

Contact capacity (A)	Voltage (V)		Resistive load	Inductive load
	AC	DC		
	460		5	2.5
	250		10	10
	125		3	1.5
	250		10	6
	125		10	10
	30			

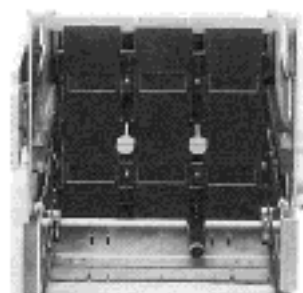
Number that may be installed Total 4c max.

Option

Safety shutters (SST)

The safety shutters cover the conductors (cradle side) and prevent contact with them when the breaker is drawn out.

● When checking the main circuit, supply and load sides of the shutters can be kept OPEN independently. (they are released automatically when the breaker is pushed in.)



Option

Safety shutter lock (SST-LOCK)

This kit is used to lock the safety shutters using 2 padlocks (the padlocks to be customer's supply). The safety shutters close when the breakers drawn out to prevent accidental contact with the main contacts.

Option

Shorting b-contact (SBC)

When moving the breaker from the connected to the test positions, use this contact to short circuit auxiliary switch (Axb) thus maintaining the correct sequence of operation of the external control circuit.

When ordered, the same number of shorting b-contacts as auxiliary switches (Axb) will be provided.

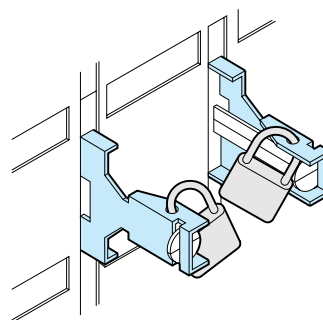
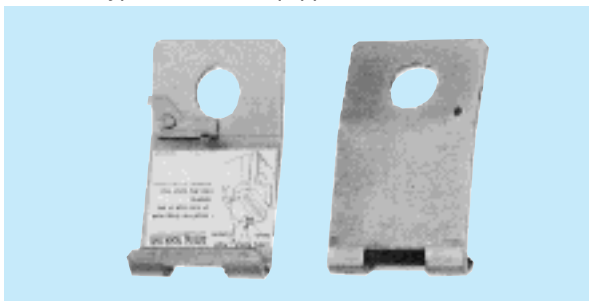
Option

Lifting hooks (HP)

This is used to remove the drawout type breaker from the cradle.

The option is not necessary when the special lifter (bucket type) for AE-SS-SH is used.

The fixed type breaker is equipped with HP as standard.



Option

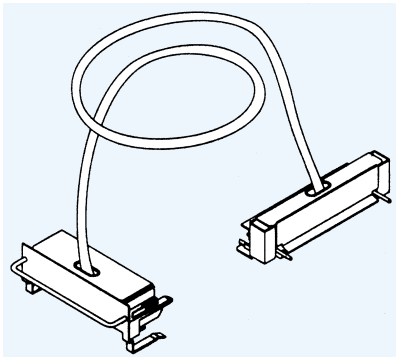
Mis-insertion preventor (MIP)

This option prevents any other circuit breakers except those specified from being inserted into the cradle, 5 settings are available.
(Note) It is not available for AE4000-SS-AE6300-SS.

Option

Test jumper (TJ)

With the breaker taken out of its cradle, this device will enable the breaker to be electrically opened and closed, and the operating sequence to be checked.
Note 1: Remove the breaker out of its cradle before using this device.



Option

Lifting truck

Lifting truck for transferring AE-SS, AE-SH breakers.
Apply for further details.

Standard equipment

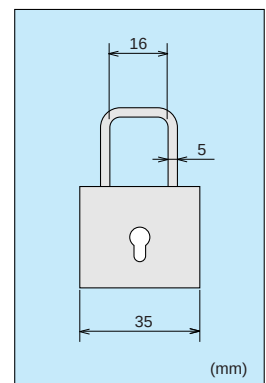
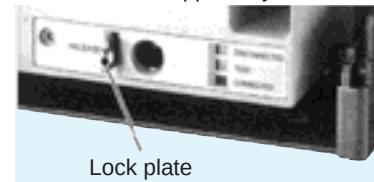
Drawout interlock

A safety device prohibits push-in and drawout when the breaker is ON. The drawout handle cannot be inserted unless the OFF button is pressed.

Position lock

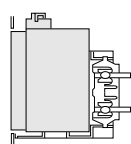
This device is for locking the drawout mechanism at the TEST position this then indicates the "TEST position". The lock can be used during either the drawing out or pushing in operation.
The lock is released when the lock plate is pushed in, and the next operation becomes possible.
Padlocking is possible at the CONNECTED, TEST, and DISCONNECTED positions. Use this lock to prevent unauthorized changing of positions.

The padlock should be supplied by customer.



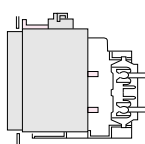
Operating position of drawout type

CONNECTED position



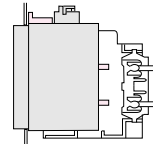
- Both main and control circuits are connected.
- Normal in use condition.

TEST position



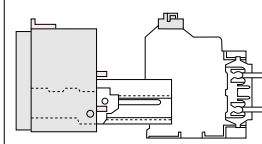
- Main circuit is disconnected, but the control circuit is connected.
- The breaker operation can be tested with the door closed.

DISCONNECTED position



- Both main and control circuits are disconnected.
- The door can be closed.

DRAWOUT position



- This is the position for removing the breaker.
- The breaker is drawn out of the cradle on the extension rails.

• The earthing points are located on both sides of the cradle, and they make contact between the breaker and the cradle at CONNECTED, TEST, and DISCONNECTED positions.

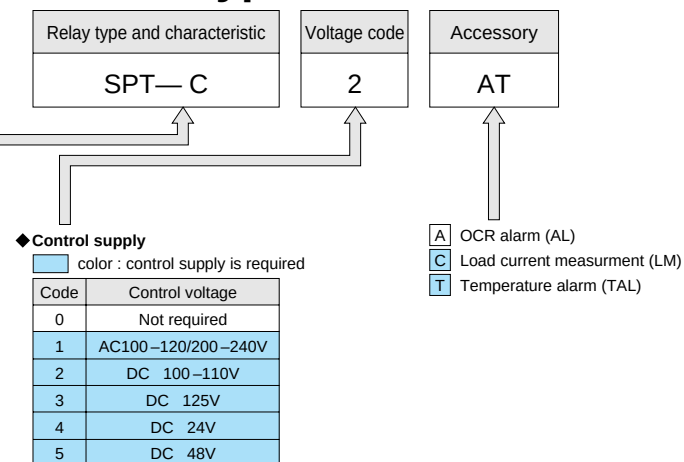
Electronic trip relay specifications table

Type	Operating characteristics			Accessory (possible combinations)			Referred page
	Standard LTD STD INST	With MCR [C] (Note1) LTD STD INST MCR	With NP [N] (Note2) LTD STD INST	OCR alarm (AL) [A]	Load current measurement (LM) [C]	Temperature alarm (TAL) [T]	
General use C type (Note 5)	C	—	—	○	—	—	29,30
General use S type	S	S—C	—	○	—	—	31,32
	ST [TI]	ST—C [TI]	ST—N [TI]	○	—	—	
	SPT [TI] [PAL]	SPT—C [TI] [PAL]	—	○	○	○	
	SPGT [TI] [PAL] [GFR]	SPGT—C [TI] [PAL] [GFR]	—	○	○	○	
	SPET [TI] [PAL] [ER]	SPET—C [TI] [PAL] [ER]	—	○	○	○	
General use special LTD SL type	SL	SL—C	—	○	—	—	31,32
	SLT [TI]	SLT—C [TI]	—	○	○	○	
	SLPT [TI] [PAL]	SLPT—C [TI] [PAL]	—	○	○	○	
	SLPGT [TI] [PAL] [GFR]	SLPGT—C [TI] [PAL] [GFR]	—	○	○	○	
	SLPET [TI] [PAL] [ER]	SLPET—C [TI] [PAL] [ER]	—	○	○	○	
Generator protection use M type	M	—	—	○	—	—	33,34
	MT [TI]	—	—	○	—	—	
	MPT [TI] [PAL]	—	—	○	—	○	
	MPGT [TI] [PAL] [GFR]	—	—	○	—	○	
Special use B type	B-C (Note 5) (Only INST/MCR characteristic)			○ (Standard)	—	—	
Non	BARE: without electronic trip relay (Not available for AE-SH)						

“○” Available
“—” Not available

LTD	Long-time delay
STD	Short-time delay
INST	Instantaneous
INST/MCR	Selectable Inst. or Making current release
TI	Trip indicator (LED and contact)
PAL	Pre-alarm (LED and contact)
GFR	Ground fault (Note 3)
ER	Earth leakage (Note 4) (External ZCT and SHT are required)

Classification of types



Standard function

- 1) Load current indicator.....The load state is indicated by the color of the LED
- 2) Test terminal.....For characteristics check. M type relay can be checked each pole.
- 3) STD lock buttonConvenient checking of the INST. operation

(Note1) [C] MCR function is not available for AE-SH.

(Note2) [N] Neutral protection for 4 pole breaker

(Note3) [GFR] Not available for AE-SS series with maximum rated current ($I_{N\ MAX}$) coming to 315A or 500A, nor AE630-SH

(Note4) [ER] The earth leakage alarm facility is provided by using a electronic trip relay with earth leakage protection (E characteristics) and a external ZCT (see page 37 and 38.)

Should the breaker be required to trip on earth leakage, the above should be used with a SHT.

(Note5) B-CO relay is not available for AE-SH.

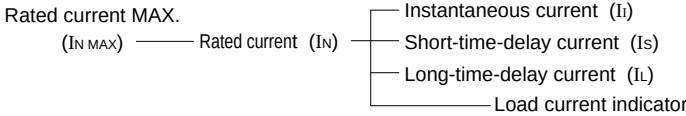
(Note6) C type relay is not available for AE4000-SSC and AE4000-SS~AE6300-SS.

Electronic trip relay(Characteristics setting table)

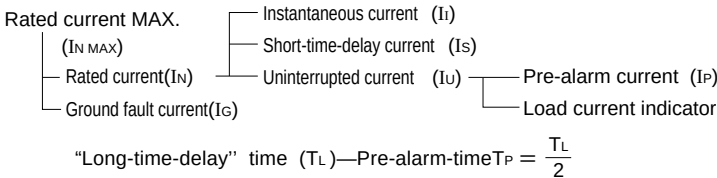
		General use		
		C type	S type	SL type
Rated current Max. (I _N MAX)		Refer to table 1 (I _N MAX=CT rating)		
Rated current(I _N)		0.5-0.6-0.7-0.8-0.9-1.0×I _N MAX 0.8-0.9-1.0×I _N MAX (AE4000-SSC) steps		
Uninterrupted current(I _U)		—	0.8~1.0×I _N continuously	
LTD	Current	1.15×I _N ±10% (Note 1) FIX	1.15×I _U ±10% (Note 1) FIX	
	Time (T _L)	150 sec. ±20% (at I _N ×2) FIX	50-100-150 sec. ±20% (at I _U ×2) steps	10-15-20-25-30 sec. (at I _U ×5) steps
STD	Current (I _S)	2-3-4-6-8-10×I _N ±15% steps		
	Time (T _S)	0-0.1-0.2-0.3-0.4-0.5 sec. ±20% (at 1.5×I _S) (note) Operating time is less than 0.05 sec when "0" setting. steps		
INST	Current (I _I)	4-6-8-10-12-16×I _N steps	4-6-8-10-12-16×I _N ±15% 4-6-8-10-12×I _N ±15% (AE5000-SS) 4-6-8-10×I _N ±15% (AE6300-SS) steps	
PAL (self-hold type)	Current (I _P)	—	0.7-0.8-0.9-1.0-OVER×I _U ±0% steps	
	Time (T _P)	—	0.5×T _L ±20%	
GFR	Current (I _G)	—	0.1-0.2-0.3-0.5×I _N MAX ±20% 0.2-0.3-0.5×I _N MAX ±20% (AE4000-SSC, AE4000-SS~AE6300-SS) steps	
	Time (T _G)	—	0.3-0.8-1.5-3 sec. ±20% (at I _G ×1.5) steps	
ER	Current (I _E)	—	1-2-3-5A ±20% steps	
	Time (T _E)	—	0.3-0.8-1.5-3 sec. ±20% (at I _E ×1.5) steps	

●Unless specified when ordering the electronic relay will be set to in blue.
Note 1 : 105% Non trip, 125% Pick up

C type setting dial operation schematic



S, SL type setting dial operation schematic



		Generator protection use
		M type
Rated current Max. (I _{N MAX})		Refer to table 1 (I _{N MAX} = CT rating)
Rated current (I _N)		0.5 ~ 1.0X I _{N MAX} 0.8 ~ 1.0X I _{N MAX} (AE4000-SSC) (Adjusted to the required current when shipped from the factory) FIX
LTD	Current (I _L)	1-1.05-1.1-1.15-1.2X I _N ± 5% Steps
	Time (T _L)	15-20-25-30-40-60sec. ± 20% (at 1.2X I _L) Steps
STD	Current (I _S)	2-2.5-3-3.5-4-4.5X I _N ± 15% Steps
	Time (T _S)	0-0.1-0.2-0.3-0.4-0.5 sec. ± 20% (at 1.5X I _S) Steps
INST	Current (I _I)	4-6-8-10-12-16X I _N ± 15% 4-6-8-10-12 X I _N ± 15% (AE5000-SS) 4-6-8-10 X I _N ± 15% (AE6300-SS) Steps
PAL (auto reset type)	Current (I _P)	0.84-0.88-0.92-0.96-1.0X I _L ± 5% Steps
	Time (T _P)	0.5XT _L ± 20%
GFR	Current (I _G)	0.1-0.2-0.3-0.5X I _{N MAX} ± 20% 0.2-0.3-0.5X I _{N MAX} ± 20% (AE4000-SSC, AE4000-SS ~ AE6300-SS) Steps
	Time (T _G)	0.3-0.8-1.5-3 sec. ± 20% Steps

M type setting dial operation schematic

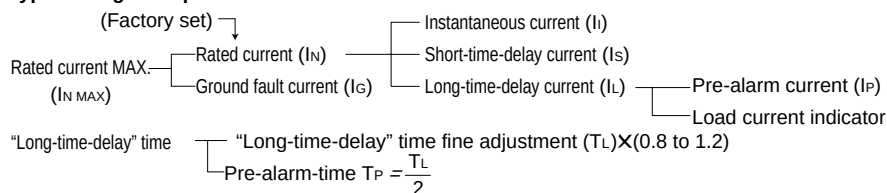


Table 1 CT ratings (Rated current MAX.)

(A)

AE630-SS	AE1000-SS	AE1250-SS	AE1600-SS	AE2000-SS	AE2500-SS	AE3200-SS	AE4000-SSC	AE4000-SS	AE5000-SS	AE6300-SS
630 500 } Low 315 } rating	1000	1250	1600	2000 1600 } Low 1250 } rating	2500	3200	4000	4000	5000	6300 6000 (JIS)

AE630-SH	AE1000-SH	AE1250-SH	AE1600-SH	AE2000-SH	AE2500-SH	AE3200-SH
630	1000	1250	1600	2000	2500	3200

Electronic trip relay (General use C type)



Note: AE4000-SSC, AE4000-SS to AE6300-SS are not available

B Load Current

Indicates the percentage of rated current (I_N)
60-70-80-90-100-OVER
Display method:
LED colour
☐ 60 to 80%=Green
☐ 90 to 100%=Yellow
☐ OVER=Red
The LEDs goes out when the breaker trips.

Overload Protection

I Rated Current (I_N) Setting Dial

Rated current MAX. (I_N MAX.) X Setting (A)
0.5-0.6-0.7-0.8-0.9-1.0 Changing this setting changes the following values proportionally:
☐ Short-time-delay current (I_S)
☐ Instantaneous current (I_I)

1. The actual tripping range is $I_N \times 1.05$ - 1.25
2. The load current is displayed as a percentage of the rated current.

Long-Time-Delay (T_L)

150 sec. fixed
This value specifies the operating time when the current flowing is the rated current set value X 2.

This overview lists the maximum possible functionality of the units.

The following functions are included as standard equipment:

1. Displays
☐ Load current indicator
2. Protective functions
☐ Overload protection (long-time-delay)
☐ Short-circuit protection (short-time-delay)
☐ Short-circuit protection (instantaneous)
3. Peripherals
☐ Short-time-delay operation inhibit button
☐ Test terminal

OCR Alarm Contact (AL)

1. An alarm signal is output to the contact when the breaker is tripped by one of the following causes:
☐ Long-time-delay (L)
☐ Short-time-delay (S)
☐ Instan. trip (I)
2. An external self-hold circuit is required, as the alarm signal pulse has a duration of only 0.03 sec.

Short-Circuit Protection

Short-Time-Delay

Q STD P.U. Current (I_S) Setting Dial

Rated current (I_N) X Setting (A)
2-3-4-6-8-10
Current threshold value setting for short-time-delay tripping.

P STD Time(T_S) Setting Dial

- Time-delay setting (sec.)
0-0.1-0.2-0.3-0.4-0.5
1. The setting value is the operating time when the current flowing is the short-time-delay current setting (I_S) X 1.5.
 2. If the dial is set to 0 second the breaker will trip in 0.05 seconds.

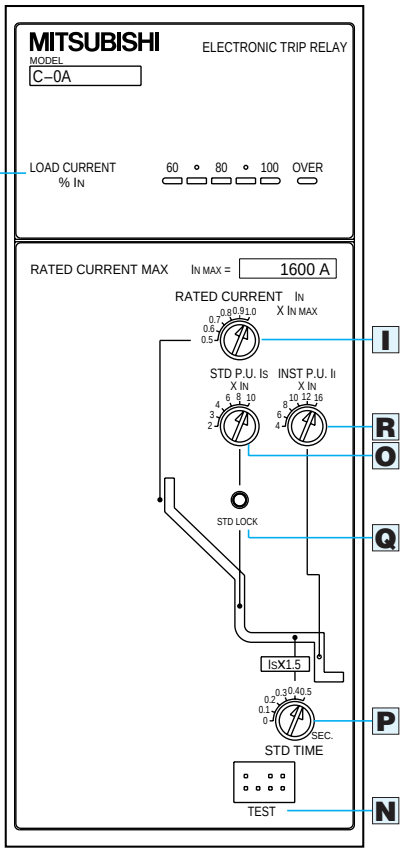
Q STD Lock Button

When measuring the instantaneous tripping current, press the short-time-delay operation inhibit button (STD LOCK) in order to disable the short-time-delay tripping function.

Instantaneous

R INST. P.U. Current (I_I) Setting Dial

Rated current (I_N) X Setting (A)
4-6-8-10-12-16
Sets the threshold current value for instantaneous tripping.



N TEST Terminal Test functions

1. Tripping characteristics
☐ Long-time-delay (L)
☐ Shot-time-delay (S)
☐ Instantaneous (I)
A field test device is required (see p.39)

Unless otherwise specified in your order the electronic trip relays will be delivered set to the values shown in blue letter.

Electronic trip relay (General use S, SL types)

A Trip Indicator (TI)

- Displays:
- ☐ Long-time-delay (L)
 - ☐ Short-time-delay (S)/Instantaneous (I)
 - ☐ Ground fault (G) or Earth leakage (E)
- Display method:
- Both an LED display (red) and a relay output are provided. Contact rating (A)*
- A control power supply is required. **
 - The LED will go out when the control power supply is switched off or when the reset button is pressed.

B Load Current

- Indicates the percentage of uninterrupted current (Iu)
- 60-70-80-90-100-OVER
- Display method:
- LED colour
- ☐ 60 to 80%=Green
 - ☐ 90 to 100%=Yellow
 - ☐ OVER=Red
- The LEDs goes out when the breaker trips.

D Reset

- Pressing this button resets the displays.
 - The button resets both the LEDs and the relay output of signals:
- ☐ Trip indicator
 - ☐ Temperature alarm
 - ☐ Pre-alarm

C Pre-Alarm Display (PAL)

- Display method: Both an LED display (yellow) and a relay output is provided.
- Contact rating (A)*
- The "PAL" LED lights up when the preset value is exceeded (the relay is not activated when this happens).
 - The relay output is activated when the "PAL OUT" LED lights up.
 - A control power supply is required. **
 - The LED goes out when the control power supply is turned off or when the reset buttons pressed.
 - Even if the load current decreases to less than the pre-alarm current, the "PAL-OUT" LED will not go out.

E Temperature Alarm (TAL)

- Display method: Both an LED indicator (red) and a relay output are provided.
- Contact rating (A)*
- A signal is generated when the unusual temperature of the main contacts rises above the threshold level.
 - A control power supply is required. **
 - The LED will go out when the control power supply is interrupted or when the reset button is pushed.

OCR Alarm Contact (AL)

- Contact rating (A)*
- An alarm signal is output to the contact when the breaker is tripped by one of the following causes:
- ☐ Long-time-delay (L)
 - ☐ Short-time-delay (S)/Inst. trip (I) or MCR
 - ☐ Ground fault (G)
- An external self-hold circuit is required, as the alarm signal pulse has a duration of only 0.03 sec.

F Largest Phase

- Display method: LED (green)
- LED indicators are provided for the left, central and right poles. One LED is always on when current is flowing through the breaker.
 - The LED goes out when the breaker trips.
 - This function is included in the Load current measurement (LM) option.

Load Current Measurement (LM)

- The load current can be measured at terminal LM. At twice the max. current (I_{N MAX.}) a signal of 10 V DC is output (see p.36 for further details).
- A control power supply is required. **

Ground Fault Protection (GFR)

G GFR P.U. Current (I_G) Setting Dial

- Rated current MAX. (I_{N MAX.}) X Setting (A) 0.1-0.2-0.3-0.5
- This function is not available for rated current MAX. values (I_{N MAX.}) 315A, 500A and AE630-SH.

H GFR Time (T_G) Setting Dial

- GFR time setting (sec.) 0.3-0.8-1.5-3
- The setting specifies the operating time when the current flowing is the ground fault current value setting X 1.5 (see p.42 for further details)

Earth Leakage Protection (ER)

ER P.U. Current (I_E) Setting Dial

- Current setting (A) 1-2-3-5
- A control power supply is required.
 - Both external ZCT and SHT are required (see p.41 for further details)

ER Time (T_E) Setting Dial

- ER time setting (sec.) 0.3-0.8-1.5-3
- The setting represents the operating time when the current flowing is the earth leakage current value setting X 1.5. The earth leakage protection facility is not illustrated because it is only possible to have either earth leakage or ground fault protection.

I Rated Current (I_N) Setting Dial

- Rated current MAX. (I_{N MAX.}) X Setting (A) 0.5-0.6-0.7-0.8-0.9-1.0 Changing this setting changes the following values proportionally:
- ☐ Uninterrupted current (I_u)
 - ☐ Short-time-delay current (I_s)
 - ☐ Instantaneous current (I_i)
 - ☐ Pre-alarm (I_p)

J Pre-Alarm Current (I_p) Setting Dial

- Rated current (I_N) X setting (A) 0.7-0.8-0.9-1.0-OVER
- Current setting for pre-alarm activation.
- If the setting value is exceeded the "PAL" LED will light up.

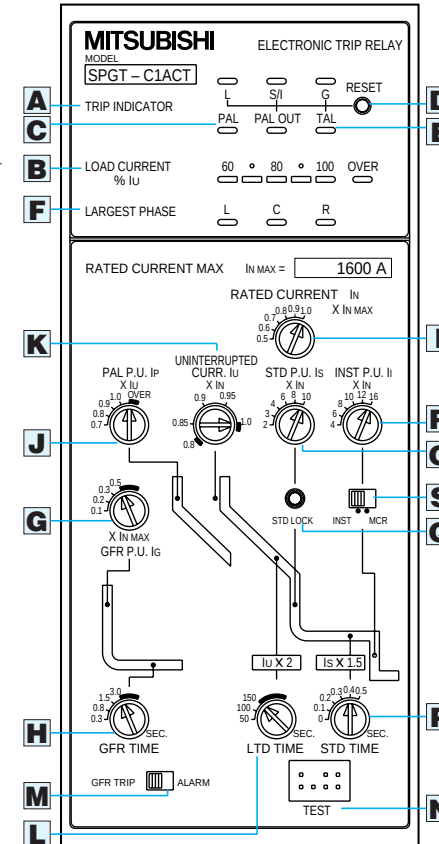
Overload Protection

K Uninterrupted Current (I_u) Setting Dial

- Rated current (I_N) X Setting (A) 0.8-1.0
- Used for setting the continuous uninterrupted current value.
 - The actual tripping range is I_u X 1.05-1.25.
 - The load current is displayed as a percentage of the uninterrupted current and thus changes proportionally when the uninterrupted current setting is changed.
 - The pre-alarm also changes proportionally.
 - Neutral pole protection (NP) is possible to either ST-N relay. (see p.42 for further details).

L LTD Time (T_L) Setting Dial

- Long-time-delay time setting (sec.)
- S type 50-100-150
- SL type 10-15-20-25-30
- This value specifies the operating time when the current flowing is the uninterrupted current set value X2 (S type) and X5 (SL type).
 - The pre-alarm operating time is half of the long-time-delay time setting.



M Ground Fault TRIP/ALARM Switch

- The breaker will trip when the switch is set to the "TRIP" position.
- When the switch is set to the "ALARM" position a red trip indicator LED will light up and the relay output will be activated when a ground fault occurs; the breaker will not trip, however.
- The switch must be set to the "TRIP" position when the overcurrent tripping characteristic is activated.

N TEST Terminal Test functions

- Tripping characteristics
- ☐ Long-time-delay (L)
 - ☐ Short-time-delay (S)
 - ☐ Instantaneous (I)
 - ☐ Pre-alarm (P)
 - ☐ Ground fault (G)
- A field test device is required (see p.39)

Short-Circuit Protection

Short-Time-Delay

Q STD P.U. Current (I_s) Setting Dial

- Rated current (I_N) X Setting (A) 2-3-4-6-8-10
- Current threshold value setting for short-time-delay tripping.

P STD Time(T_s) Setting Dial

- Time-delay setting (sec.) 0-0.1-0.2-0.3-0.4-0.5
- The setting value is the operating time when the current flowing is the short-time-delay current setting (I_s) X 1.5.
 - If the dial is set to 0 second the breaker will trip in 0.05 seconds.

Q STD Lock Button

- When measuring the instantaneous tripping current, press the short-time-delay operation inhibit button (STD LOCK) in order to disable the short-time-delay tripping function.

Instantaneous

R INST. P.U. Current (I_i) Setting Dial

- Rated current (I_N) X Setting (A) 4-6-8-10-12-16
- Sets the threshold current value for instantaneous tripping.

S INST/MCR Switch

- Setting this switch to "INST" selects the instantaneous operation characteristic.
 - The "MCR" setting selects the MCR characteristic.
- The MCR characteristics the abbreviation for Making Current Release. With this characteristic, instantaneous tripping is only possible if a short circuit occurs during switch-ON. After the initial switch-ON, the time delay tripping characteristic is active but the instantaneous tripping is not possible.

This overview lists the maximum possible functionality of the units.

The following functions are included as standard equipment:

- Displays
- ☐ Trip indicator (TI)
 - ☐ Load current indicator
 - ☐ Display reset button
- Protective functions
- ☐ Overload protection (long-time-delay)
 - ☐ Short-circuit protection (short-time-delay)
 - ☐ Short-circuit protection (instantaneous)
- Peripherals
- ☐ Short-time-delay operation inhibit button
 - ☐ Test terminal

*Contact rating (A)			
Voltage (V)		Resistive load	Inductive load
AC	120	2	2
	250		
DC	30	0.2	0.1
	125		

**Control supply (V)	
AC 100-120/200-240 (50-60Hz)	
DC 100-110	
DC 125	
DC 24	
DC 48	

Control supply capacity : more than 5VA

Unless otherwise specified in your order the electronic trip relays will be delivered set to the values shown in blue letter.

Electronic trip relay (Generator protection use M type)

Super AE

A Trip Indicator (TI)

- Displays:
- ☐ Long-time-delay (L)
 - ☐ Short-time-delay (S)/Instantaneous (I)
 - ☐ Ground fault (G)
- Display method:
Both an LED display (red) and a relay output are provided. Contact rating (A)*
- A control power supply is required. **
 - The LED will go out when the control power supply is switched off or when the reset button is pressed.

B Load Current

- Indicates the percentage of long time delay current (IL) 50-60-70-80-90-100
- Display method:
LED colour
- ☐ 50 to 70%=Green
 - ☐ 80 to 90%=Yellow
 - ☐ 100%=Red
- The LEDs go out when the breaker trips.

D RESET

- Pressing this button resets the displays.
 - The button resets both the LEDs and the relay outputs of the following signals:
- ☐ Trip indicator
 - ☐ Temperature alarm
 - ☐ Pre-alarm

C Pre-Alarm Display (PAL)

- Display method: Both an LED display (yellow) and a relay output is provided. Contact rating (A)*
- The "PAL" LED lights up when the preset value is exceeded; the relay is not activated when this happens, however.
 - The relay output is activated when the "PAL OUT" LED lights up.
 - A control power supply is required. **
 - The LED will go out when the control supply is interrupted or when the reset buttons pressed.
 - Even if the load current, decreases to less than the pre-alarm current, the "PAL-OUT" LED will go out.

E Temperature Alarm (TAL)

- Display methods: Both an LED indicator (red) and a relay output are provided. Contact rating (A)*
- A signal is generated when the unusual temperature of the main contacts rises above the threshold level.
 - A control power supply is required. **
 - The LED will go out when the control power supply is interrupted or when the reset button is pushed.

OCR Alarm Contact (AL)

- Contact rating (A)*
- An alarm signal is output to the contact when the breaker is tripped by one of the following causes:
- ☐ Long-time-delay (L)
 - ☐ Short-time-delay (S)
 - ☐ Instantaneous trip (I)
 - ☐ Ground fault (G)
- An external self-hold circuit is required, as the alarm signal pulse has a duration of only 0.03 sec.

Ground Fault Protection (GFR)

G GFR P.U. Current (IG) Setting Dial

- Rated current MAX. (IN MAX.) X Setting (A)
0.1-0.2-0.3-0.5
- This function is not available for max. rated current values (IN MAX.) 315A, 500A and AE630-SH.

H GFR Time (TG) Setting Dial

- GFR time setting (sec.)
0.3-0.8-1.5-3
- The setting specifies the operating time when the current flowing is the ground fault current value setting (IG) X 1.5 (see p.42 for further details)

I Rated Current (IN) Setting Dial

- The rated current must be preset to a fixed value (select a value between 0.5 and 1 X the Rated current MAX(IN MAX.)). The value is stamped on the front of the unit.

J Pre-Alarm Current (IP) Setting Dial

- Long-time-delay current value. (IL) X Setting (A)
0.84-0.88-0.92-0.96-1.0
- Threshold value for pre-alarm operation. If the setting value is exceeded the "PAL" LED will light.

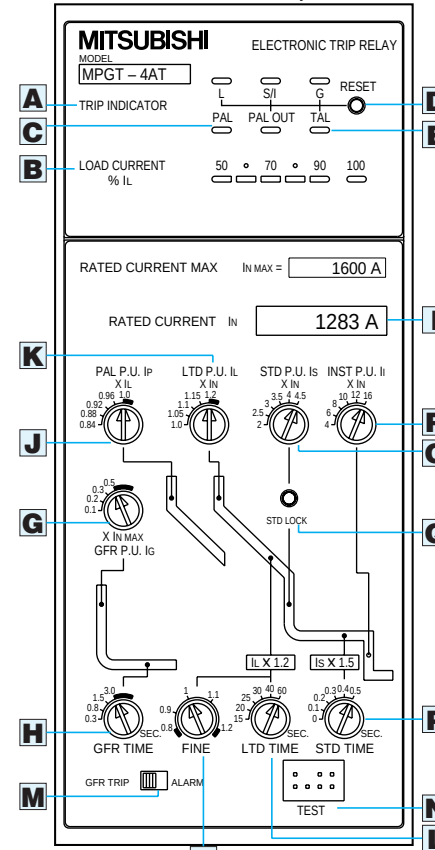
Overload Protection

K Long-Time-Delay Current (IL) Setting Dial

- Rated current (IN) X Setting (A)
1-1.05-1.1-1.15-1.2
- The breaker trips within a range from (IL) X 0.95 to 1.05.
 - The load current is displayed as a percentage of the long-time-delay current (IL).
 - The pre-alarm set value varies proportionally to the long-time-delay current setting.

L LTD Time (TL) Setting Dial

- Long-time-delay setting (sec.)
15-20-25-30-40-60
- This value specifies the operating time when the current flowing is the long-time-delay current set value (IL) X 1.2.
 - The pre-alarm operating time is half of the long-time-delay setting.



M Ground Fault TRIP/ALARM Switch

- The breaker will trip when the switch is set to the "TRIP" position.
- When the switch is set to the "ALARM" position a red trip indicator LED will light up and the relay output will be activated when a ground fault occurs; the breaker will not trip, however.
- The switch must be set to the "TRIP" position when the overcurrent tripping characteristic is activated.

N TEST Terminal Test functions

- Tripping characteristics
- ☐ Long-time-delay (L)
 - ☐ Short-time-delay (S)
 - ☐ Instantaneous (I)
 - ☐ Pre-alarm (P)
 - ☐ Ground fault (G)
- A field test device is required (see p.39)

Short-Circuit Protection

Short-Time-Delay

O STD P.U. Current (IS) Setting Dial

- Rated current (IN) X Setting (A)
2-2.5-3-3.5-4-4.5
- Current threshold value setting for short-time-delay tripping.

P STD Time (TS) Setting Dial

- Time-delay setting (sec.)
0-0.1-0.2-0.3-0.4-0.5
- The setting value is the operating time when the current flowing is the Short-time-delay current setting (IS) X 1.5.
 - If the dial is set to 0 second the breaker will trip in 0.05 seconds.

Q STD Lock Button

- When measuring the instantaneous tripping current, press the short-time-delay operation inhibit button (STD LOCK) in order to disable the Short-time-delay tripping function.

Instantaneous

R INST. P.U. Current (II) Setting Dial

- Rated current (IN) X Setting (A)
4-6-8-10-12-16
- Sets the threshold current value for instantaneous tripping.

T LTD (TL) Fine Adjustment Dial

- Fine adjustment is available from 0.8-1.0-1.2 of the Long-time-delay setting value (TL).
- This setting has no influence on the pre-alarm time.
- Continuous adjustable.

The numbers coloured blue from O to T will be set in factory side, without any indication.

This overview lists the maximum possible functionality of the units. The following functions are included as standard equipment:

- Displays
 - ☐ Trip indicator (TI)
 - ☐ Load current indicator (LCI)
 - ☐ Display reset button
- Protective functions
 - ☐ Overload protection (long-time-delay)
 - ☐ Short-circuit protection (short-time-delay)
 - ☐ Short-circuit protection (instantaneous)
- Peripherals
 - ☐ Short-time-delay operation inhibit button
 - ☐ Test terminal

*Contact rating (A)			
Voltage (V)		Resistive load	Inductive load
AC	120	2	2
	250		
DC	30	0.2	0.1
	125		

**Control supply (V)	
AC 100-120/200-240 (50-60Hz)	
DC 100-110	
DC 125	
DC 24	
DC 48	

Control supply capacity : more than 5VA

Unless otherwise specified in your order the electronic trip relays will be delivered set to the values shown in blue letter.

Electronic trip relay accessories

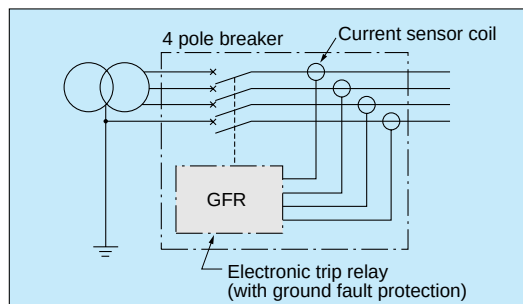
Option

Ground fault protection (GFR)

Sometimes the Long-time-delay or Short-time-delay functions will not protect a circuit even if there is a ground fault of several hundred amps. In which case, the ground fault protection function (GFR) is used. The sensitivity is selectable in the range of 0.1-0.2-0.3-0.5 times the Rated current MAX. ($I_{N\ MAX}$), and the operating time is selectable from the range of 0.3-0.8-1.5-3 seconds. A control supply is not required for the operation of the ground fault protection.

Note 1: In a 3-phase, 4-wire circuit, ground fault protection is also possible with a 3 pole breaker and a Neutral-pole CT (NCT) see page 37.

Note 2: The ground fault protection (G) is not available for AE-SS series with the Rated current MAX. ($I_{N\ MAX}$) coming to 315 A or 500 A, or for AE630-SH.



Option

Earth leakage protection (ER)

The earth leakage alarm facility is provided by using a electronic trip relay with earth leakage protection (E characteristics) and a external ZCT (see page 37.)

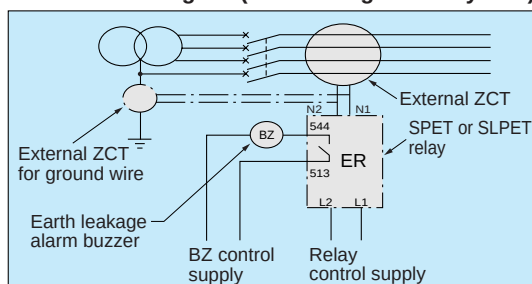
Even if several amperes of earth leakage current flow, the alarm alone operates but the breaker does not trip. This is therefore suitable when a continuous power supply is required. Should the breaker be required to trip on earth leakage, the above should be used with a SHT.

Note 1: The shunt tripping device (SHT) is suitable for 100-250V AC/DC or less.

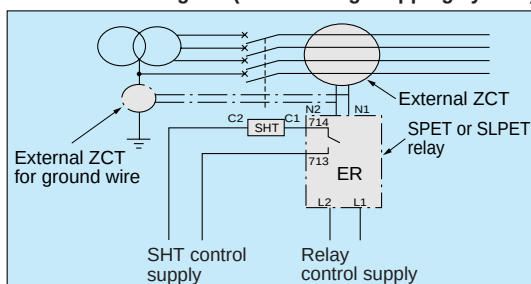
Note 2: Output contact is self-hold type.

The output contact is turned off when the reset button is pressed or control supply is turned off.

● Connection diagram (Earth leakage alarm system)



● Connection diagram (Earth leakage tripping system)



Option

Neutral pole overcurrent protection (NP)

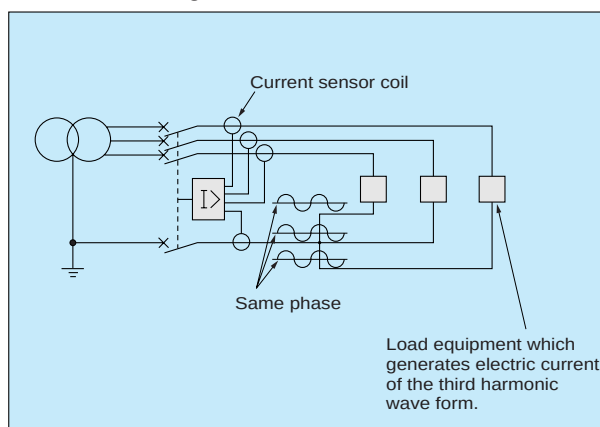
This function protects the neutral pole (4 pole) of the circuit breaker from overcurrent. Neutral overcurrent protection can be set to operate at 50% or 100% of the rated current (not changeable). Load equipment (for example: computer equipment, DC power supplies, etc) which is liable to generate third harmonic wave forms that may cause more load current to flow in the neutral pole, which may cause damage, the neutral pole overcurrent protection will prevent damage from occurring.

Note 1: The ST type electronic trip relay can be selected when the 4 pole breaker is used.

When order NP, identify "50% protection" or "100% protection"

Note 2: Not available for AE4000-SS~6300-SS

● Connection diagram

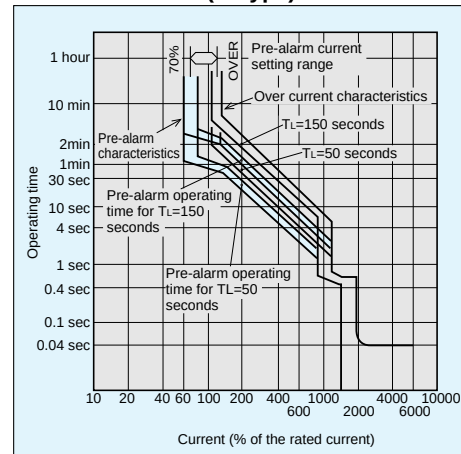


Option

Pre-alarm (PAL)

If the load current of the breaker exceeds the set value, A "PAL" LED lights and a relay output is energized. This is useful in securing a continuous power supply to a important circuit. The operating characteristic shown on the curve is proportional to half of the Long-time-delay tripping characteristic. It is designed to prevent unnecessary alarms from the inrush currents to the load. Moreover, the relay output is of a self-hold type for the general use relay and an auto reset type for the generator protection use relay. (The control supply and reset button are used in common with the trip indicator.)

● Characteristics (S Type)



Note: "TL" represents the Long-time-delay time

Option

OCR alarm (AL)

The OCR alarm (AL) is a short-time operating switch (1a) for the electrical indication of when the breaker trips due to overcurrent. The AL is an integral part of the electronic trip relay. Though it operates when the breaker trips due to the Long-time-delay, Short-time-delay, Instantaneous/MCR, Ground fault protection (GFR), It does not operate when the breaker trips due to the Earth leakage protection (ER).

Note: Though a control supply is not required for the operation of the OCR alarm (AL), a self-hold circuit is required since the relay output only operates for 0.03 seconds.

Note: When a continuous output signal from the OCR alarm (AL) is required please use the output signal from the trip indicator (TI) which is operated by the same causes as the OCR alarm (AL).

Option

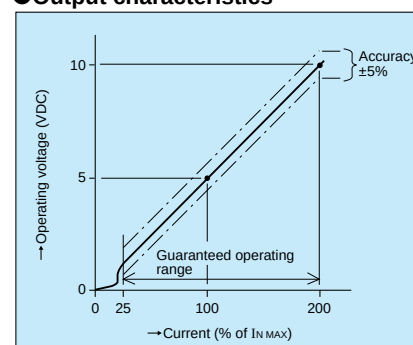
Load current measurement (LM)

A direct current voltage, converted from the effective value current in the overcurrent tripping device, is taken out by using an insulation amplifier. Use the receiving indicator that can be operated by an input of 0-10 V DC since the voltage signal proportional to the largest phase current is transmitted. Moreover, the maximum current flowing phase is displayed on the front of the relay as the subordinate option, the "largest phase" indicating LED, is lighting.

Note 1: See to it that the wiring is within 3 m of the breaker control circuit terminal by using the twist pair wire (over 40 turns/m).

Note 2: The required control power supply is common to the trip indicator.

● Output characteristics



Option

Temperature alarm (TAL)

If the temperature of the main contact rises above a pre-determined level, a LED will light and a relay contact (1a) will energize. This will prevent trouble and increase contact life, a useful preventive maintenance feature. (The control supply and the reset button are used in common with the trip indicator.)

Accessories (External accessories 1/2)

Option

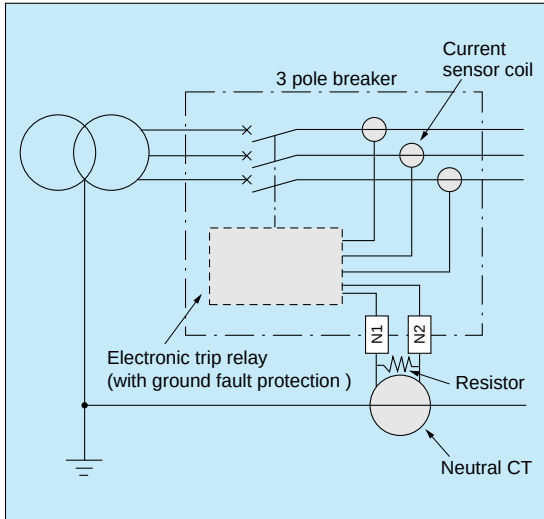
Neutral CT (NCT)

The neutral CT is used for ground fault protection when a 3 pole breaker is used on a 3 phase 4 wires system. It should be used together with the electronic trip relay that has the ground fault protection (G) option.

Type	Applicable CT type
AE 630-SS/SH	CW-40LM 630A
AE 1000-SS/SH	CW-40LM 1000A
AE 1250-SS/SH	CW-40LM 1250A
AE 1600-SS/SH	CW-40LM 1600A
AE 2000-SS/SH	CW-40LM 2000A
AE 2500-SS/SH	CW-40LM 2500A
AE 3200-SS/SH	CW-40LM 3200A
AE 4000-SS, SSC	CW-40LM 4000A
AE 5000-SS	CW-40LM 5000A
AE 6300-SS	CW-40LM 6300A CW-40LM 6000A (JIS)

Note: A suitable resistor (0.1Ω 10W) and screened wire (2m) is attached on the product.

● Wiring diagram



Option

External ZCT

This option is used to detect several amperes of earth leakage when use in combination with a electronic trip relay that has the earth leakage tripping (ER) option.

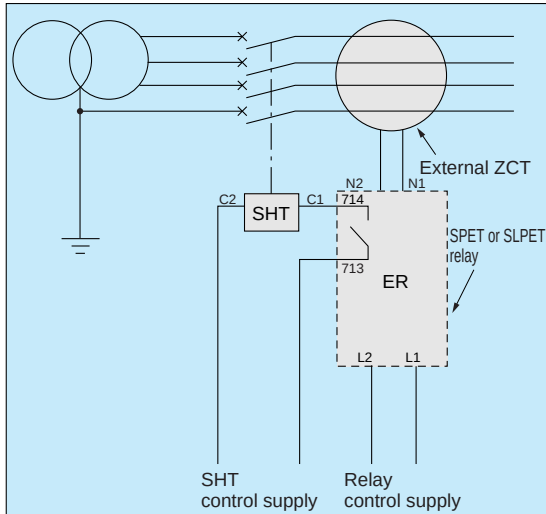
Two methods are available: The first is where the three load conductors (and neutral in 4 wires system) pass through the ZCT. The other method uses a smaller ZCT through which the supply transformer's ground wire passes through to earth.

● Type

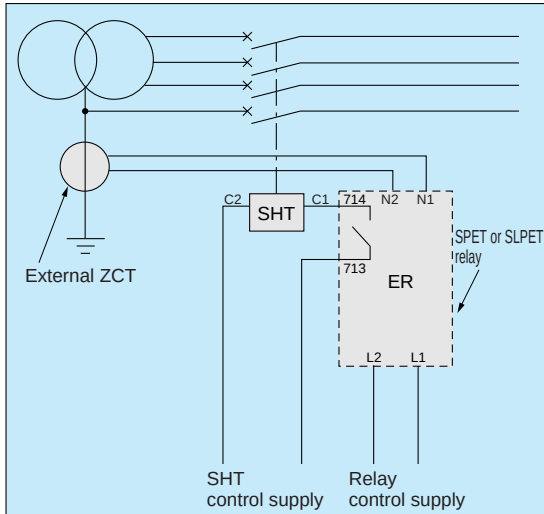
Application	External ZCT for load circuits			External ZCT for transformer ground wire					
Type	ZCT163	ZCT323	ZCT324	ZT15A	ZT30A	ZT40A	ZT60A	ZT80A	ZT100A

Note: A screened wire (2m) is attached on the product.

1. Wiring diagram (load circuit method)



2. Wiring diagram (transformer ground wire method)

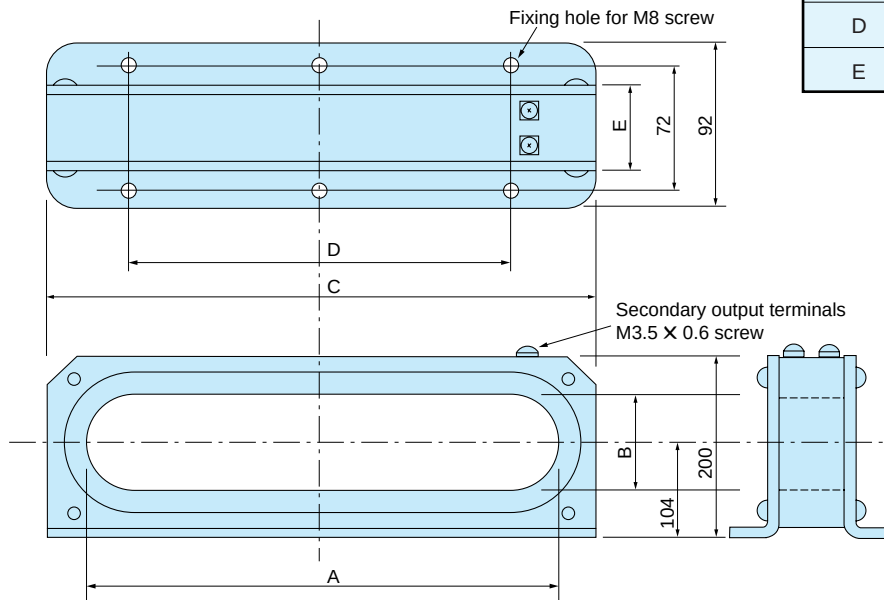


1. External ZCT for load circuits

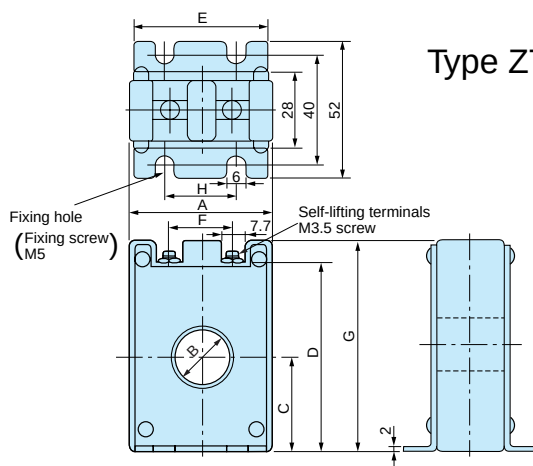
● Dimension table

(mm)

Type	ZCT163	ZCT323	ZCT324
Dimension			
A	230	370	500
B	60	108	108
C	323	460	600
D	250	400	550
E	47	47	48

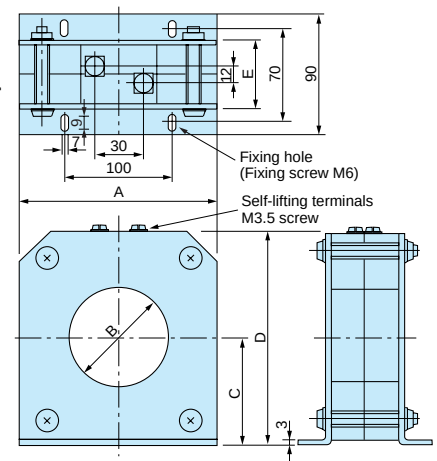


2. External ZCT for transformer ground wire



Type ZT $\bigcirc$ $\bigcirc$ A

Hole diameter



(1) Dimension table of ZT15A, 30A, 40A

Type	ZT15A	ZT30A	ZT40A
Dimension			
A	48	68	85
B	15	30	40
C	29	37	43
D	62	82	92
E	46	66	81
F	15	30	40
G	70	90	100
H	25	50	50

(mm)

(2) Dimension table of ZT60A, 80A, 100A

Type	ZT60A	ZT80A	ZT100A
Dimension			
A	140	160	185
B	60	80	100
C	73	82	93
D	150	169	190
E	46	48	50

(mm)

Accessories (External accessories 2/2)

Option

Field test device

The electronic trip relay can be checked without the breaker being connected to the main supply. The breaker will trip when tested.

Y-160 test device is not available for M type relay.

Type	Y-2000	Y-160
Test function	LTD, STD, INST, GFR Pre-alarm	LTD, STD, INST, GFR
Power supply	AC100-240V 50-60Hz	Battery use
		•AC100-120V •AC200-240V
Test current signal setting	10%~2000% (continuously variable)	6-point setting possible (20%, 50%, 125%, 200%, 500%, 2000%)
Ammeter	Yes	—
Time counter	Yes	Yes

Option

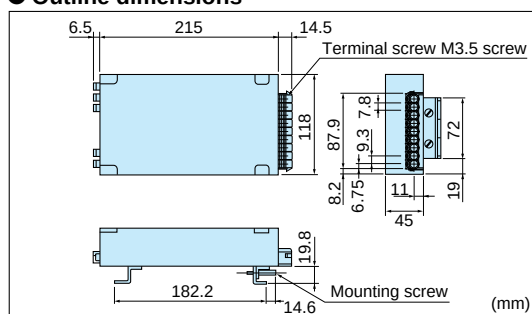
External power supply unit (PS)

This unit is used when a 24 VDC control supply is needed for the trip indicator on the electronic trip relay.

The unit can be installed from the front to the left side of the breaker.

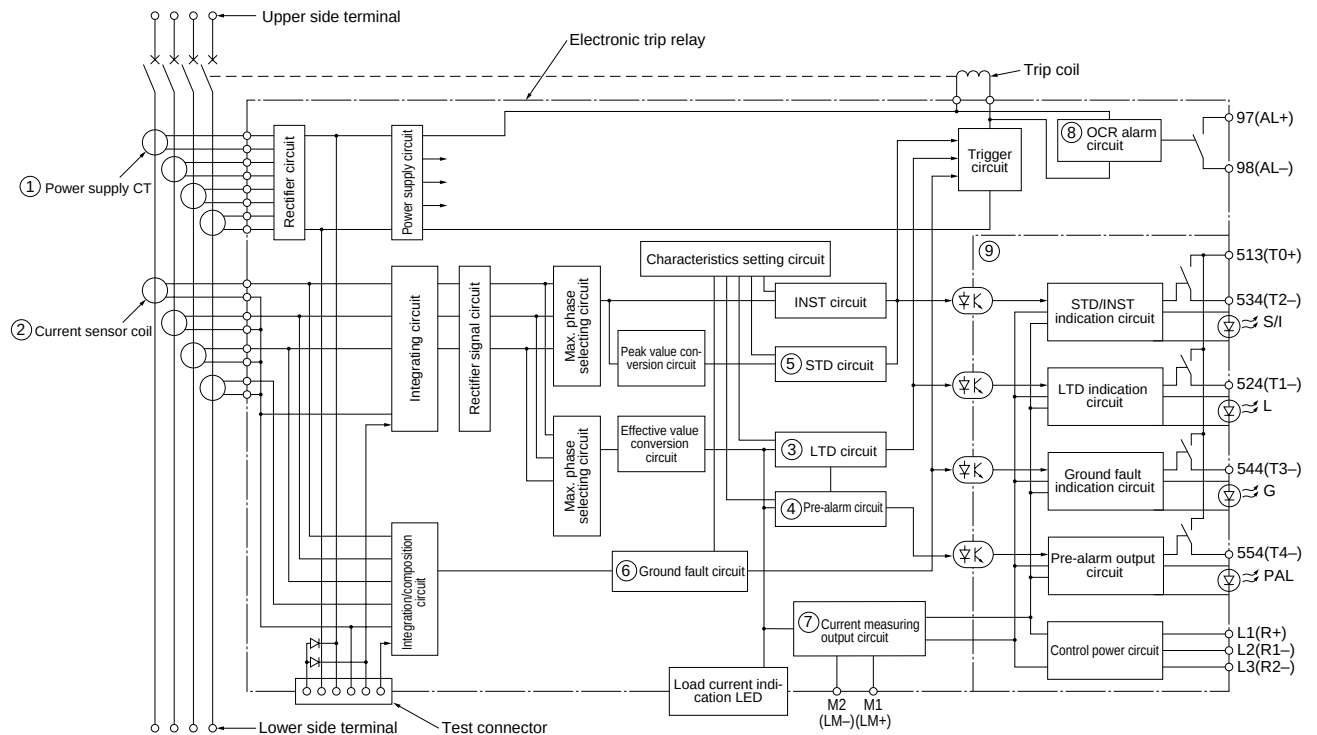
Item	Type	PS-A200	PS-D200	PS-A400
Input voltage		100-110/ 200-24VAC (50-60HZ)	200VDC	380-415VAC (50-60HZ)
Input voltage range		+10 -15 %	+10 -15 %	+10 -15 %
Input VA		30 VA MAX.	30 W MAX.	30 VA MAX.
Output voltage		24VDC±10% 0.42A MAX		24VDC±10% 0.3A MAX

● Outline dimensions



Circuit diagram of the electronic trip relay Super AE

Circuit diagram of the electronic trip relay (SPGT)

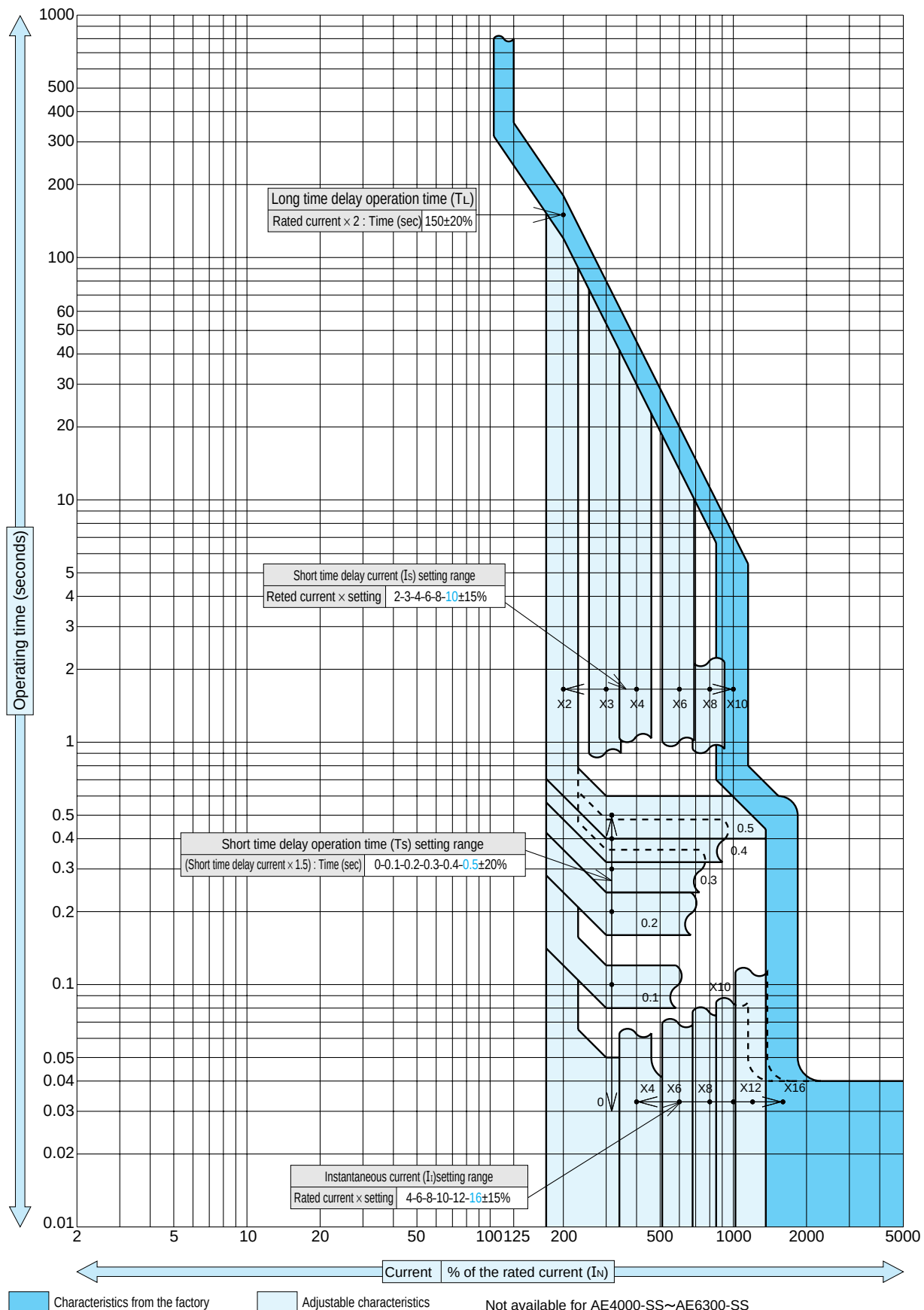


Operating function of each device

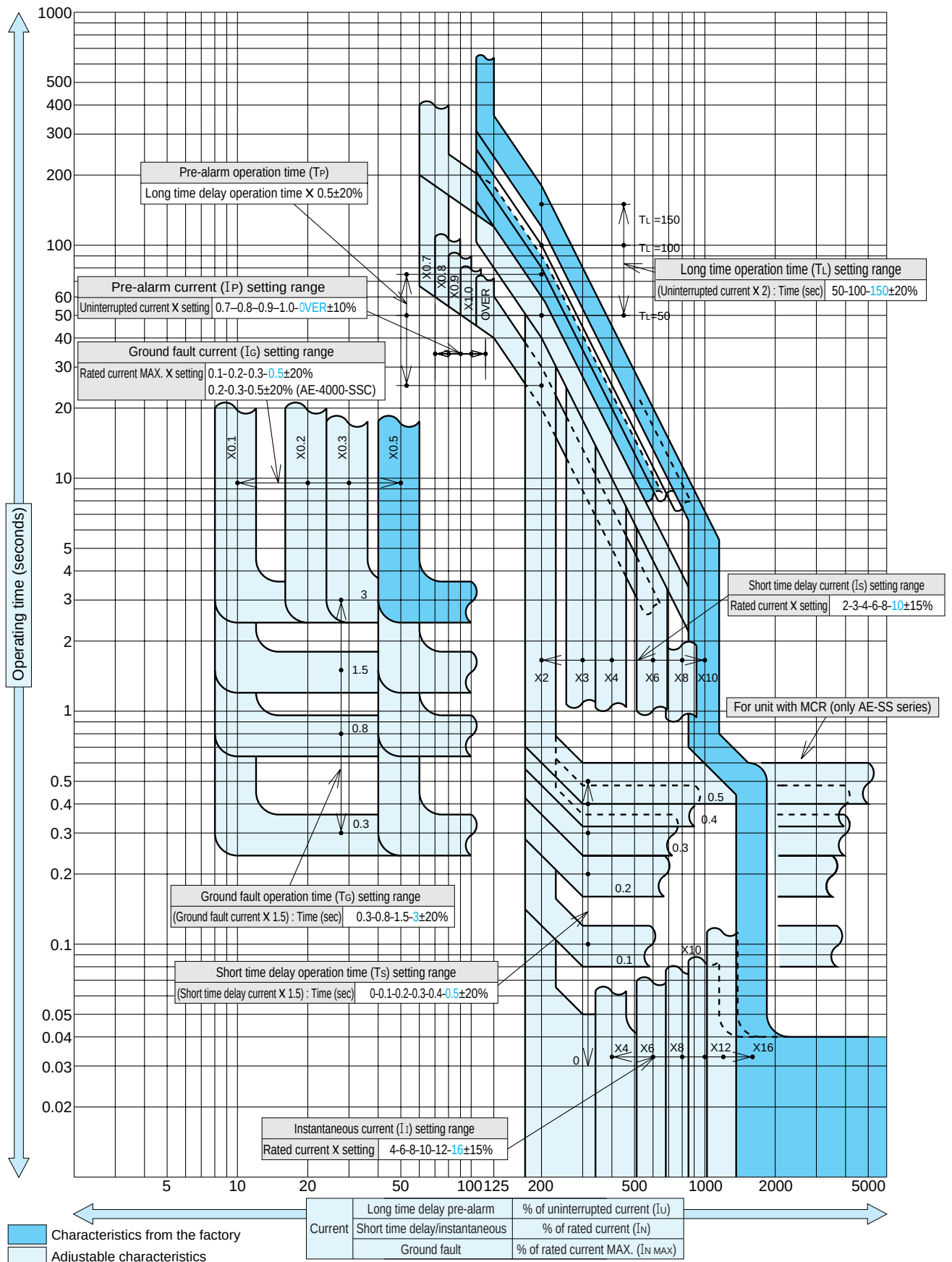
- ① Power supply CT
Energy is supplied for the operation of the overcurrent tripping and ground fault tripping (GFR) function of the electronic trip relay.
- ② Current sensor coil
The current in each phase flowing through in the breaker is detected. A coreless coil which has good linearity is employed. The integrating circuit integrates the output voltage and provides a signal voltage waveform which is in proportion with the load current.
- ③ LTD circuit
This is an effective value detection type which is strong against the distorted wave. It has a memory effect for the overcurrent state. If the electronic trip relay is tripped, the overcurrent memory is reset.
- ④ Pre-alarm circuit
This is an effective value detection system. As it does not have a memory effect for the overcurrent state, once the load current becomes less than the value of the pre-alarm setting current, it is reset.
- ⑤ STD/INST circuit
This is a peak value detection system, and is influenced by the distortion of the waveform.
- ⑥ Ground fault circuit
The signals in each phase are summed in the vector mode in order to gain the ground fault value.
- ⑦ Current measuring output circuit
This is an effective value detection system, since insulation amplifiers are used, it is insulated between the input and output.
- ⑧ OCR alarm circuit
An alarm signal is output to the contact when the breaker is tripped. Signal pulse has a duration of only 0.03 seconds.
- ⑨ Trip indication circuit
The trip indicator is operated simultaneously with the OCR alarm, when the breaker tripped because of Long time delay, short time delay/instantaneous and Ground fault or Earth leakage.
A control power supply is required.

■ Operating characteristics (General use)

C type: AE630-SS/SH ~ AE3200-SS/SH

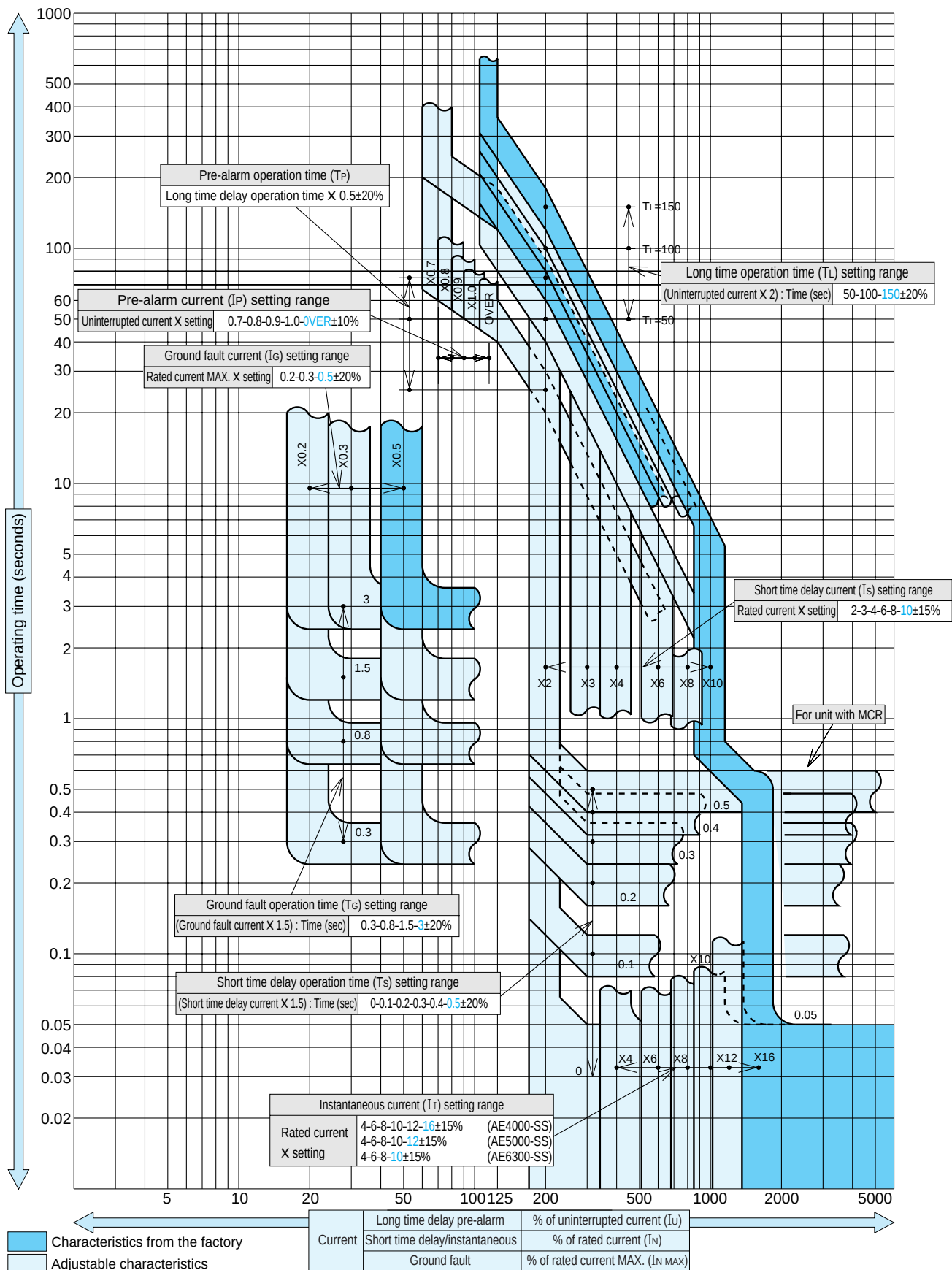


S type : AE630-SS/SH~AE3200-SS/SH, AE4000-SSC

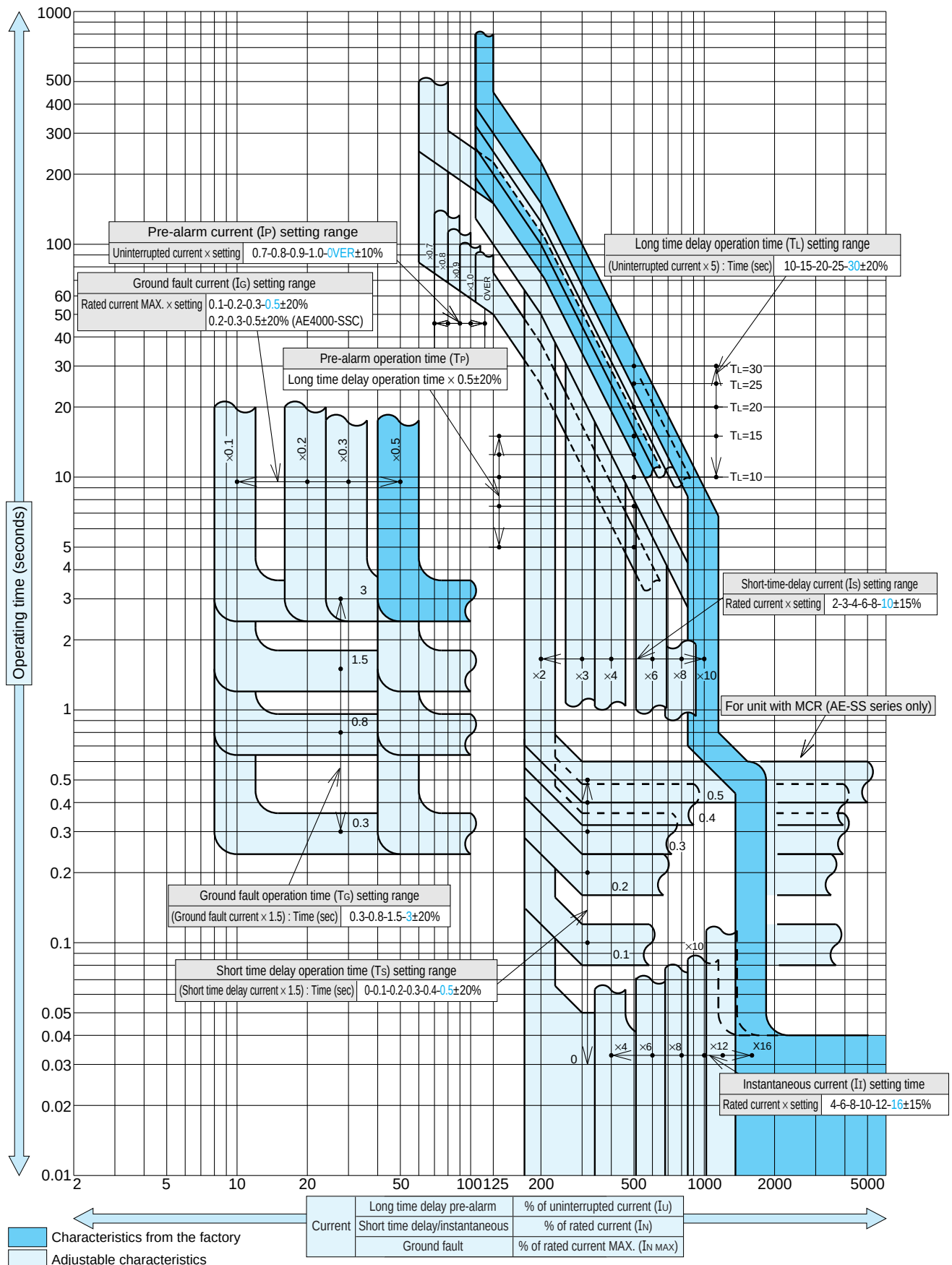


Operating characteristics (General use)

S type : AE4000-SS~AE6300-SS

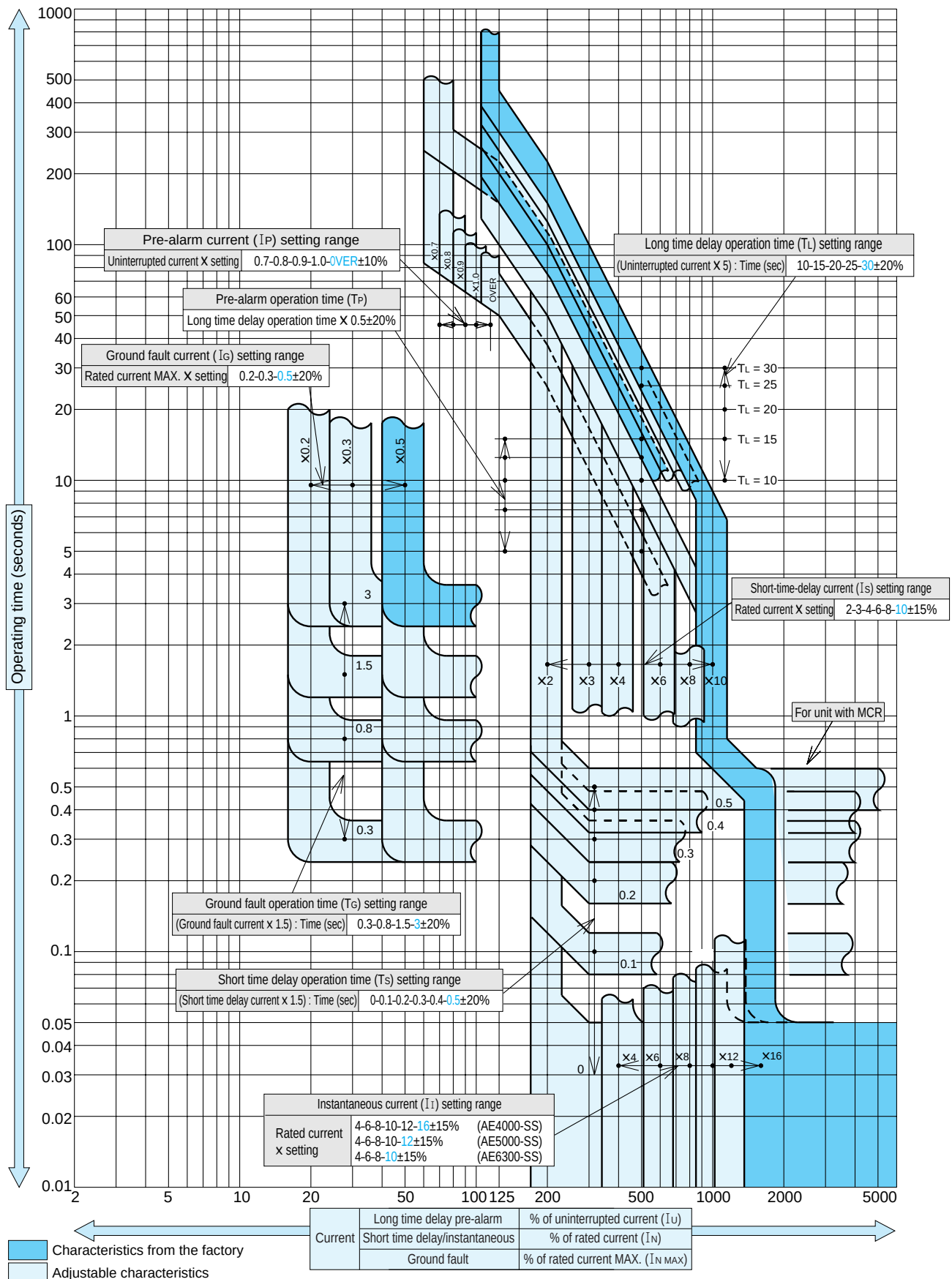


SL type : AE630-SS/SH~AE3200-SS/SH, AE4000-SSC



■ Operating characteristics (General use)

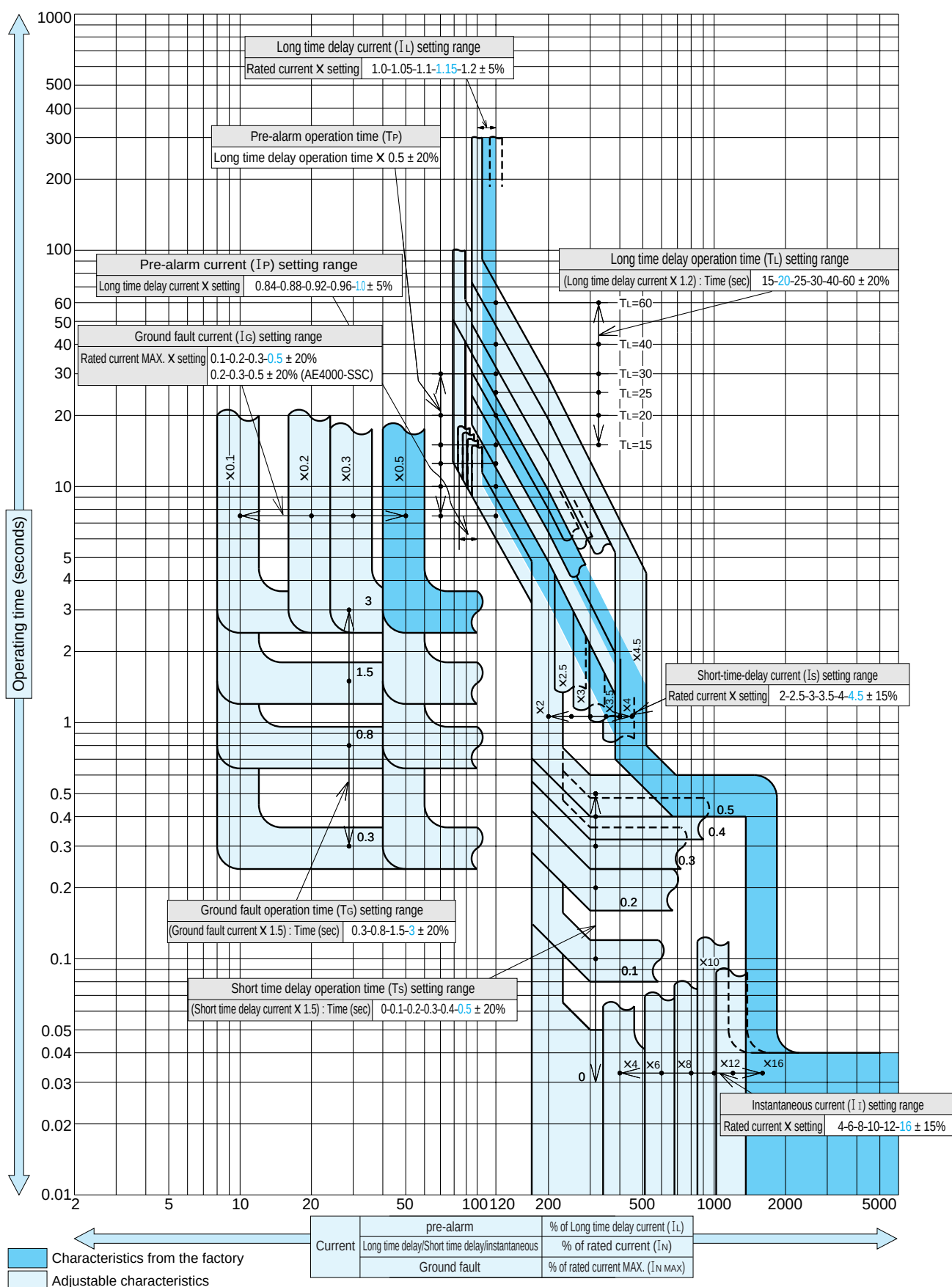
SL type : AE4000-SS~AE6300-SS



Operating characteristics (Generator protection use)

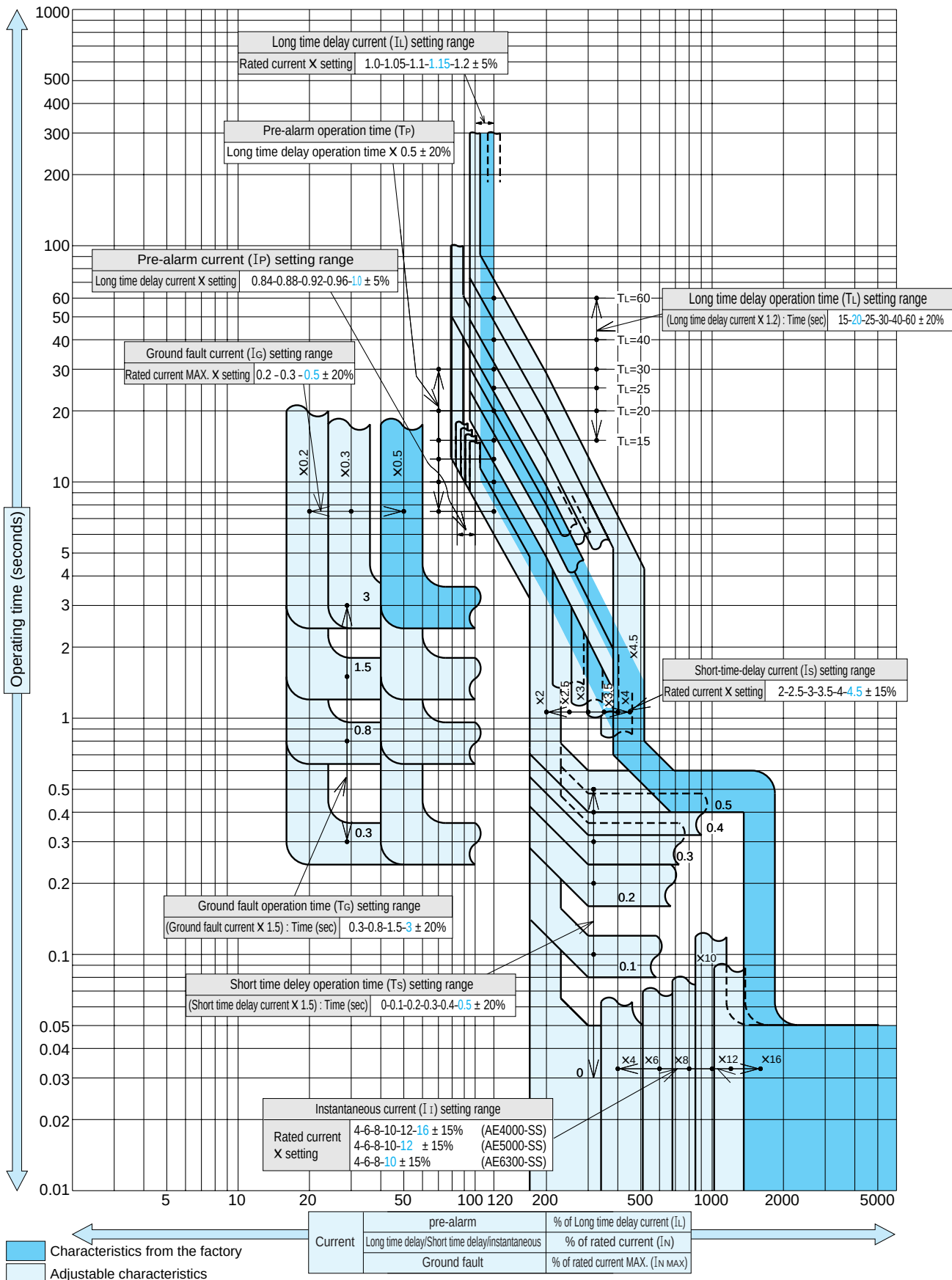
*Super***AE**

M type : AE630-SS/SH~AE3200-SS/SH, AE4000-SSC



Operating characteristics (Generator protection use)

M type : AE4000-SS~AE6300-SS

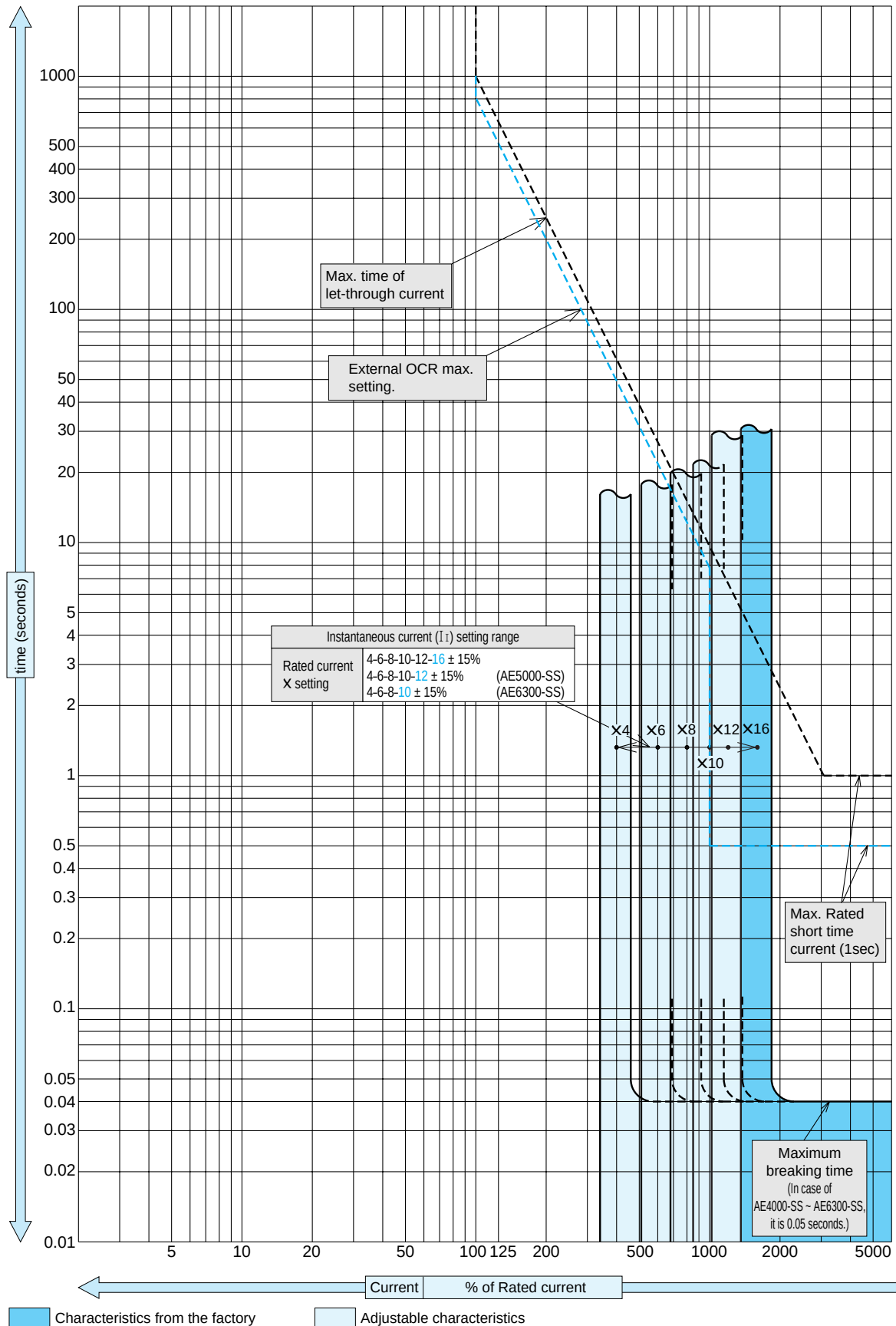


■ MAX. time of let-through current and B type relay characteristics

*Super***AE**

B-COA

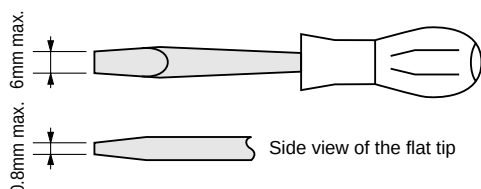
(Not available for AE-SH)



■ Tripping characteristics setting

Setting procedure

1. A small flat-tipped screwdriver is prepared.



2. Insert the flat-tipped screwdriver into the opening of the electronic trip relay cover. Then, lightly press the screwdriver leftward, and the cover will open.

3. There are 4 types of switches for setting up the required tripping characteristics and they should be used as follows:-

① Step adjustable type

A rotary switch is used. Do not stop the switch between steps as it would be the same setting value as that associated with the nearest step line. (Operate the switch with a torque of 0.1N•m or less.)

② Continuously adjustable type

Since a variable resistor is used, it is adjustable to any desired position on the scale. (Operate the switch with a torque of 0.1N•m or less.)

③ Slide switch type

Slide the switch to the left or right. (operate the switch with a force of 1kg or less.)

④ Pushbutton type

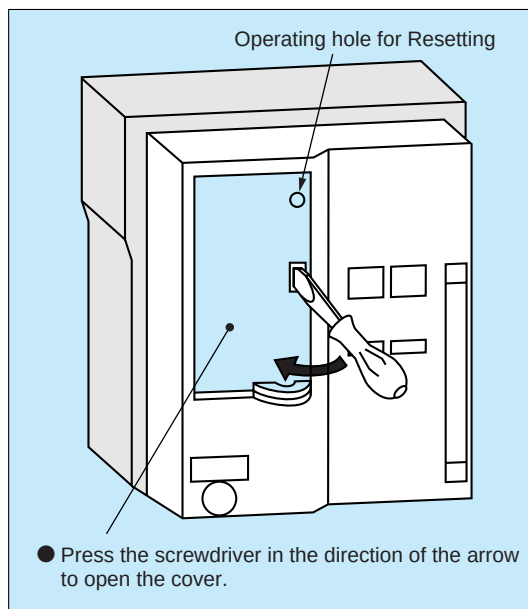
A pushbutton is provided for temporary operation. Press it with a force of 1kg or less. Before operating make sure that the push-button is in its initial state.

4. When the characteristics have been set, they should be checked using a field tester etc.

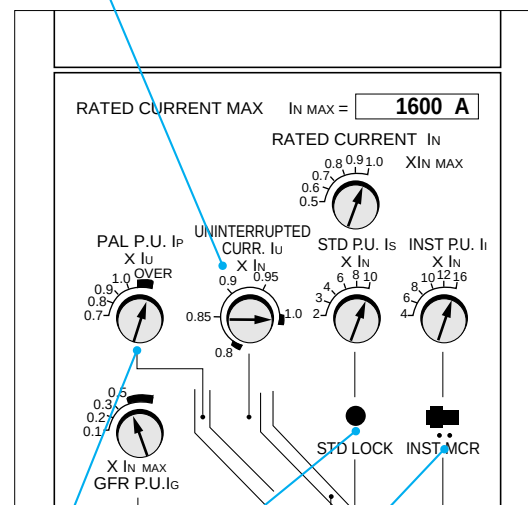
5. Two methods for sealing the cover are provided, select either from the following:-

- ① Stick the sealing label on the opening of the electronic trip relay cover, and close the cover. The cover can not be opened unless the sealing label is removed.
Note: The sealing label is supplied with the relay.

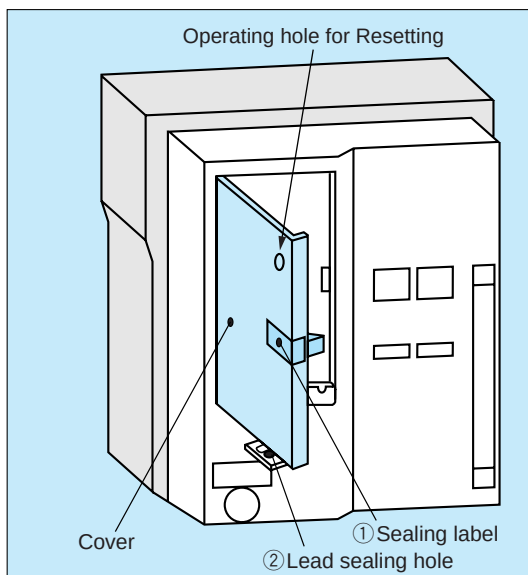
- ② Seal the electronic trip relay cover by using the lead sealing hole at the bottom of the cover.



② Continuously adjustable type



- ① Step type
- ④ Push-button type
- ③ Slide switch type

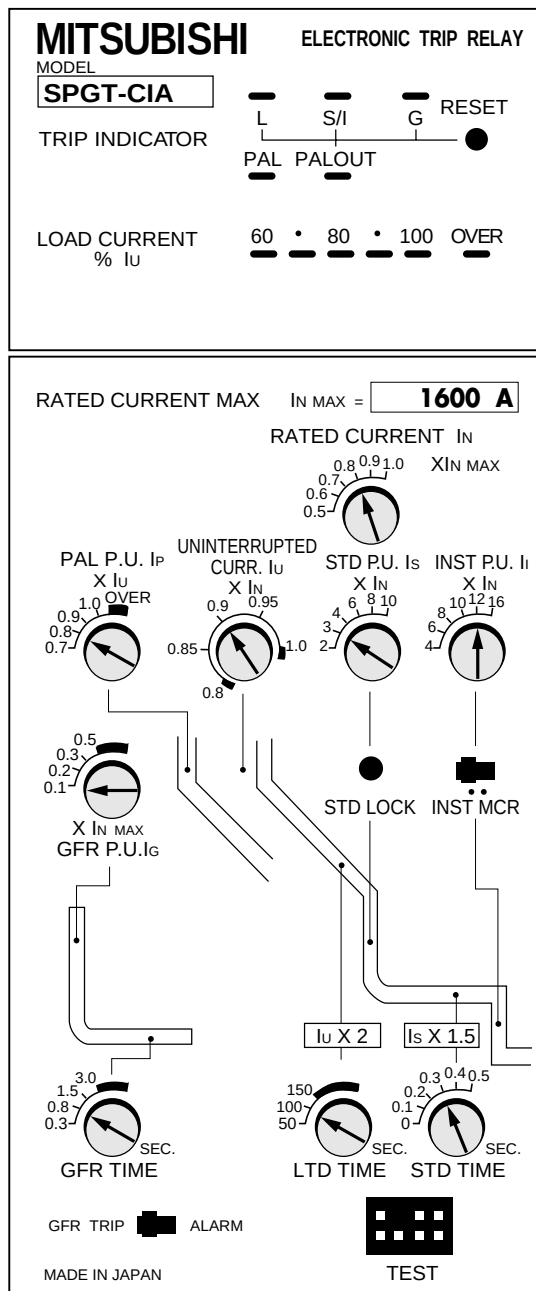


How to adjust the trip relay of AE-SS

AE-SS has very intelligent relay with multi functions.
But sometime, it seemed to be difficult to adjust it.
This report can help you to solve such questions.

<Front view of the relay>

The relay is set as follows.



Here

$I_{N\ MAX}$ = Maximum rated current

I_N = Rated current

I_U = Uninterrupted current

LTD TIME = Long time delay tripping time

I_S = Short time delay pick-up current

STD TIME = Short time delay tripping time

I_I = Instantaneous pick-up current

I_P = Pre-alarm (PAL) operating current

I_G = Ground fault pick-up current

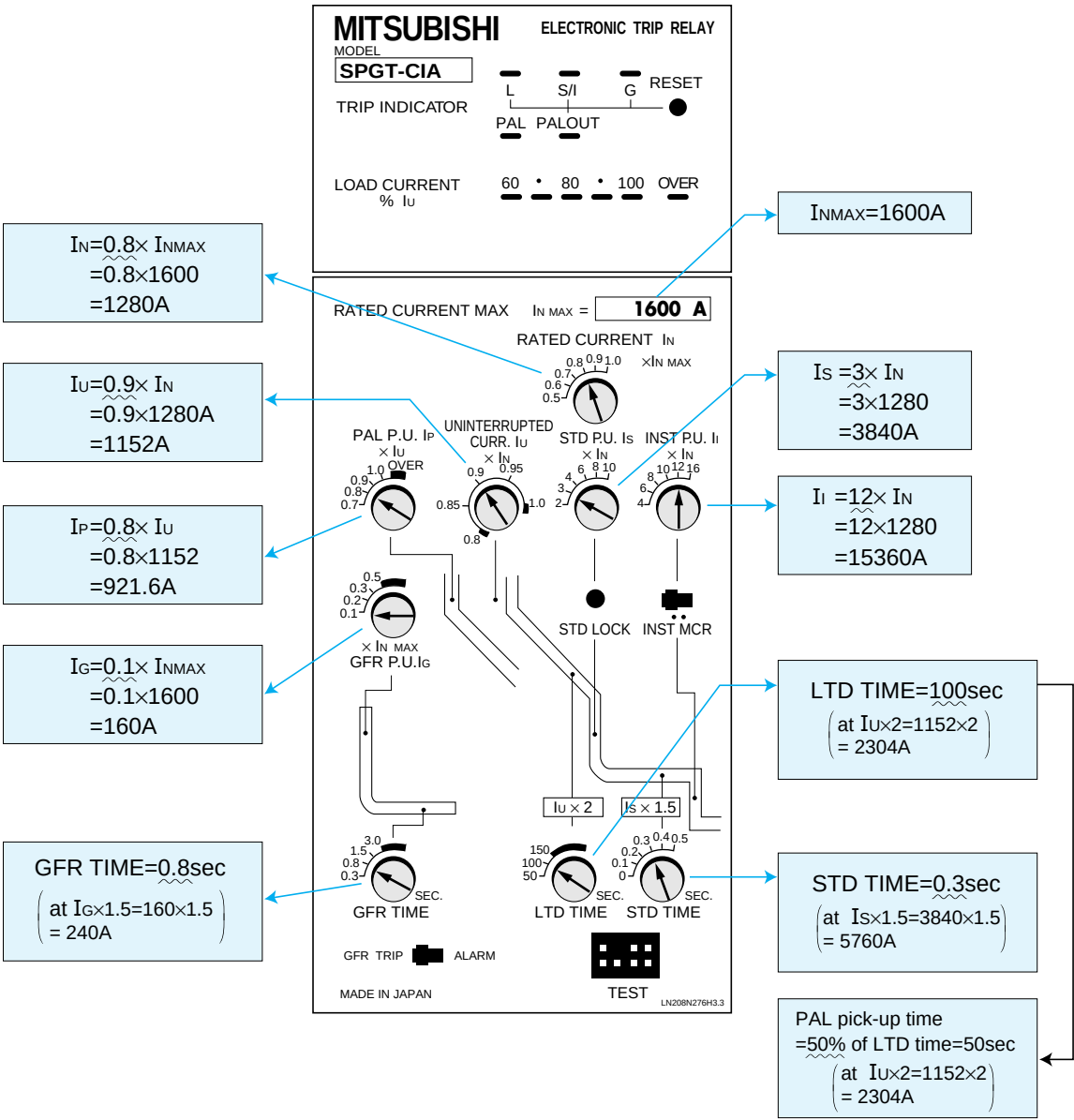
GFR TIME = Ground fault operating time

■ Tripping characteristics setting (2/3)

How to get the current settings and operating times

<Actual setting>

Current settings and operating times are calculated.



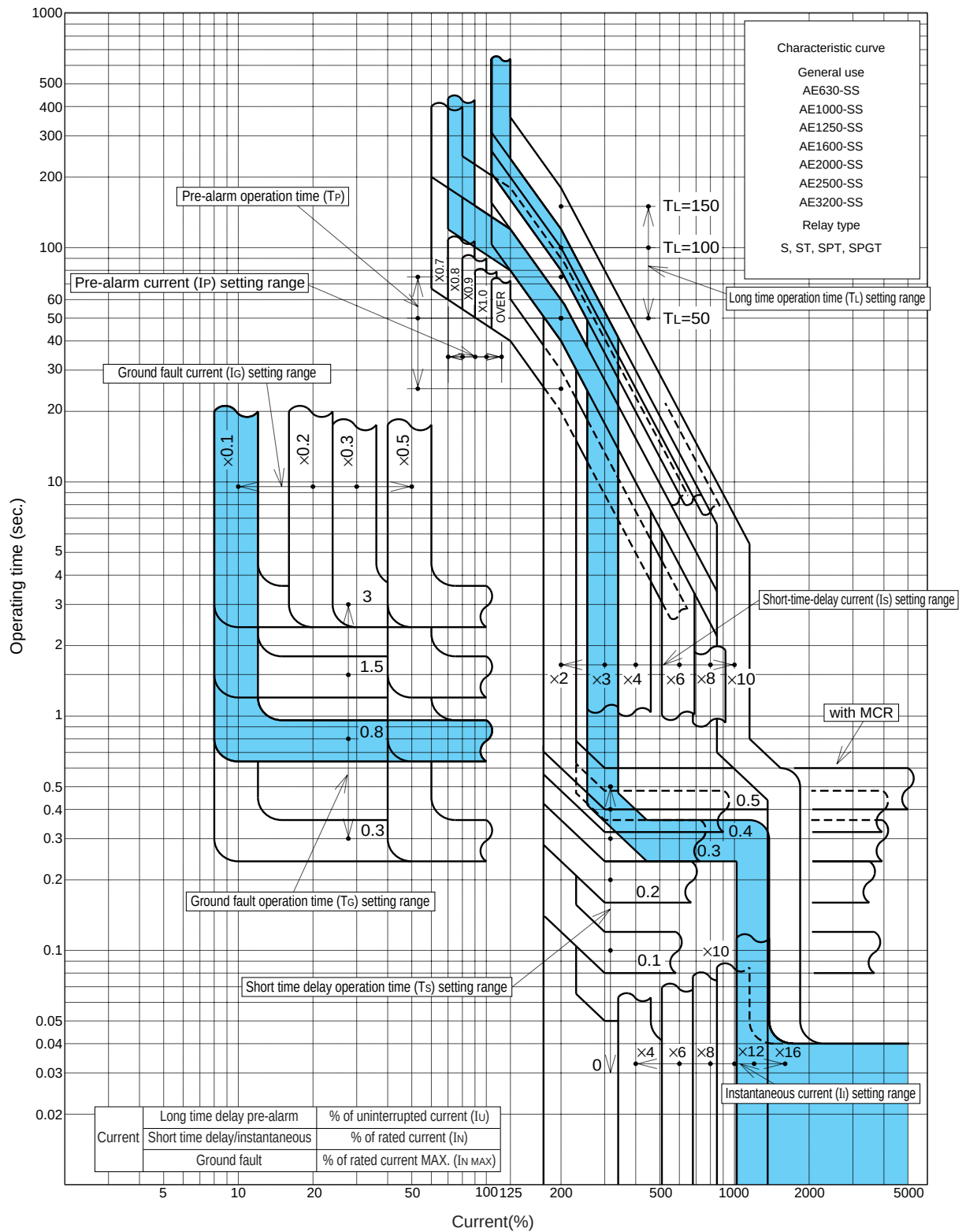
Actual settings are as following table.

I _N MAX	=1600A	I _i	=15360A±15%
I _N	=1280A	I _P	=921.6A±10%
I _u	=1152A	PAL pick-up time =50sec±20% (at 2304A)	
LTD TIME	=100sec±20% (at 2304A)	I _G	=160A±20%
I _s	=3840A±15%	GFR TIME	=0.8sec±20% (at 240A)
STD TIME	=0.3sec±20% (at 5760A)		—

<Characteristic curve> (1)

In above settings, operating characteristics are set as follows.

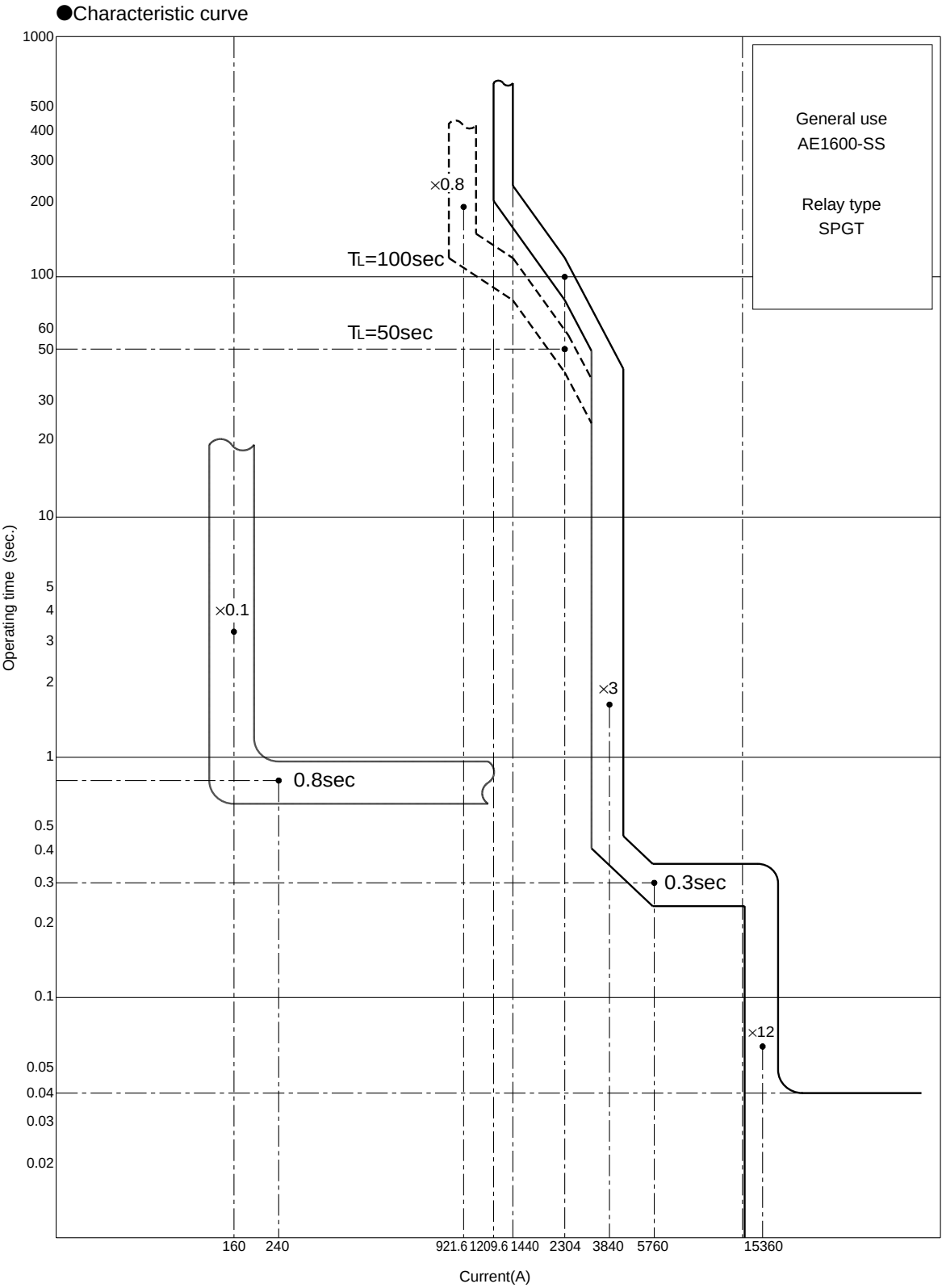
●Characteristic curve



■ Tripping characteristics setting (3/3)

<Characteristic curve> (2)

Actual operating characteristics are shown is following curve by %-A figure.



■ Tripping characteristics check *Super AE*

Test terminals are provided at the right hand lower area on the front panel of super AE Series electronic trip relay. These terminals are for checking the tripping characteristics. by using a special field tester or by using a DC power supply.

Functions of the test terminals

1. Trip check (TC) terminal

The breaker will trip when a power supply of 30VDC±10% is applied across terminals (TC) and (VT-) shown in the figure on the right.

2. Test power supply terminals ((VT+) and (VT-))

The power supply input terminals are used to test the tripping characteristics of the Long-time-delay. Short-time-delay and Instantaneous tripping. A power supply capacity of 5W at 30VDC±10% is required.

3. Overcurrent signal (OS) terminal

When measuring the overcurrent tripping characteristics, input the AC voltage signal between terminals (OS) and (GG). The standard signal sizes are as follows.

Note: In case of M relay R, S, T can be independently checked. Please apply for further details.

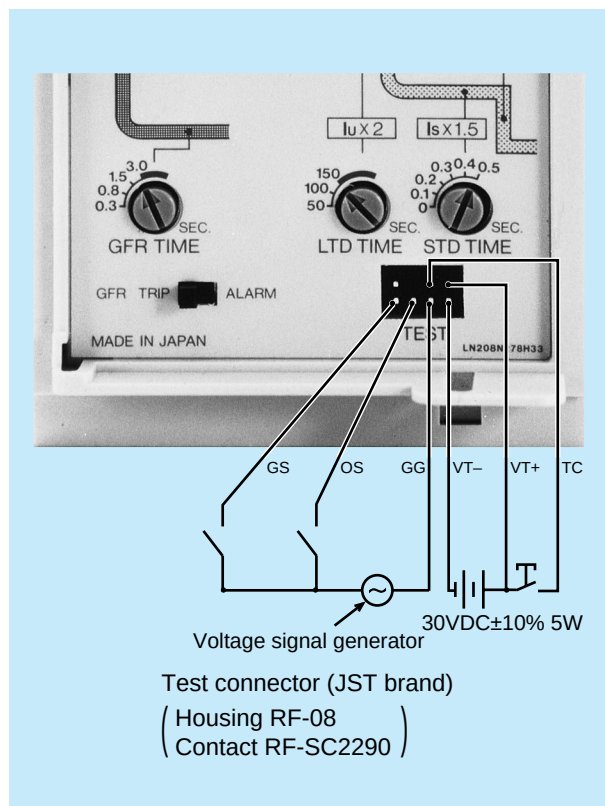
AC voltage signal

Frequency	Signal level	Test voltage
50Hz	141mV AC	$141\text{mV} \times \frac{\text{Test current}}{I_{N \text{ MAX}}}$
60Hz	170mV AC	$170\text{mV} \times \frac{\text{Test current}}{I_{N \text{ MAX}}}$

● The signal is equivalent to the Rated current MAX. ($I_{N \text{ MAX}}$).

4. Ground fault signal terminal (GS)

When measuring the ground fault tripping characteristics (G characteristics), input the AC voltage signal between terminals (GS) and (GG). The standard signal levels are the same as for the overcurrent signal (OS).



Checking procedure using a field tester (Y-160 and Y-2000)

If the test power supply or a similar signal is applied to the test terminals of the electronic trip relay, the overcurrent tripping characteristics or ground fault tripping characteristics can easily be measured. Two models are available: Model Y-160 a small battery type and Model Y-2000 which can measure all the characteristics.

(Refer to page 39)

● Points to remember during testing

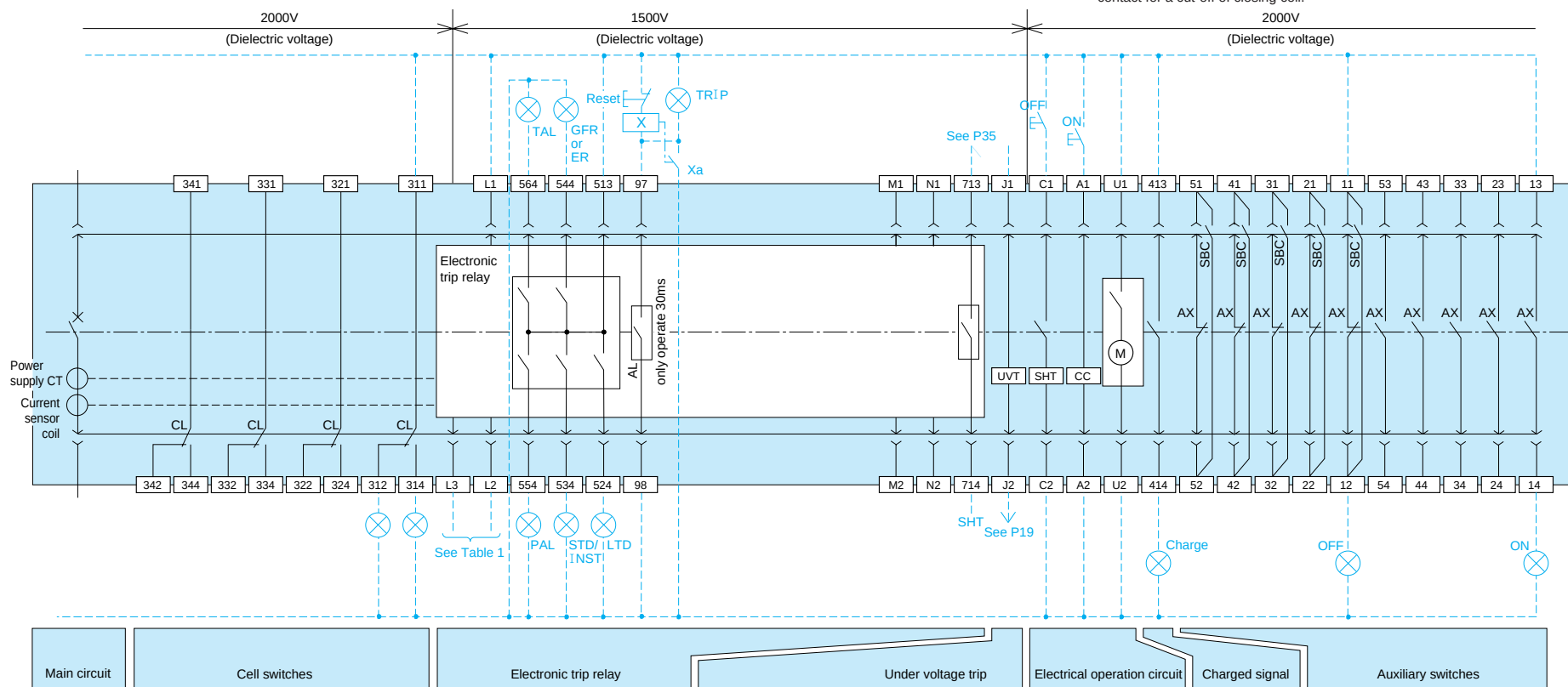
- ① If any current flows in the main circuit of the breaker, the correct characteristics will not be measured since the current will distort the test signal. Therefore, ensure that the test is conducted when the load current does not exist in the main circuit.
- ② Before measuring the Long-time-delay time, remove any influence which may result from energization, before the test, by tripping the breaker once with the trip check.
- ③ The Instantaneous tripping current is the value measured when the breaker is gradually tripped, by increasing the overcurrent signal (OS) and continuously pressing the "STD LOCK" button (When using the Model Y-2000)

Wiring diagram (According to EN50005)

Internal wiring diagram

● The following wiring diagram shown accessories fully equipped.

- The Fig. below is the wiring diagram at fully equipped state.
- CL and SBC are accessories for draw-out type.
- On the draw-out type, the control circuit terminal block should be moved to the left or right by 5mm, after cables connecting.
- When using coil loads such as DC magnetic switch, etc. as operating voltage in the peripheral circuits, install diodes, surge absorbers, etc. as a countermeasure against the surge (counter electromotive force) at the time of switching.
- Because of pumping prevention is not performed, do not use AXb contact for a cut-off of closing coil.



Terminal Symbols

[13] ~ [54]	Auxiliary switch contact a	[N1] [N2]	For N-pole CT or external ZCT connection
[11] ~ [52]	Auxiliary switch contact b	[M1] [M2]	Load ammeter
[413] [414]	Charged signal a	[97] [98]	OCR alarm contact
[U1] [U2]	Motor charging	[524] ~ [544]	Trip indication contact
[A1] [A2]	Closing coil	[554]	Pre-alarm indication contact
[C1] [C2]	Shunt trip	[564]	Temperature alarm contact
[31] [32]	Under voltage trip	[L1] [L2] [L3]	Electronic relay unit control power supply
[713] [714]	Earth leakage trip output (for SHT trip)	[311] ~ [344]	Cell switch

(Table-1)

Applicable power supply	
Voltage(V)	Input terminal
AC	100-120 [L1] [L2]
	200-240 [L1] [L3]
	Common
DC	100-110 [L1] [L2]
	125
	24
	48

Accessory Symbols

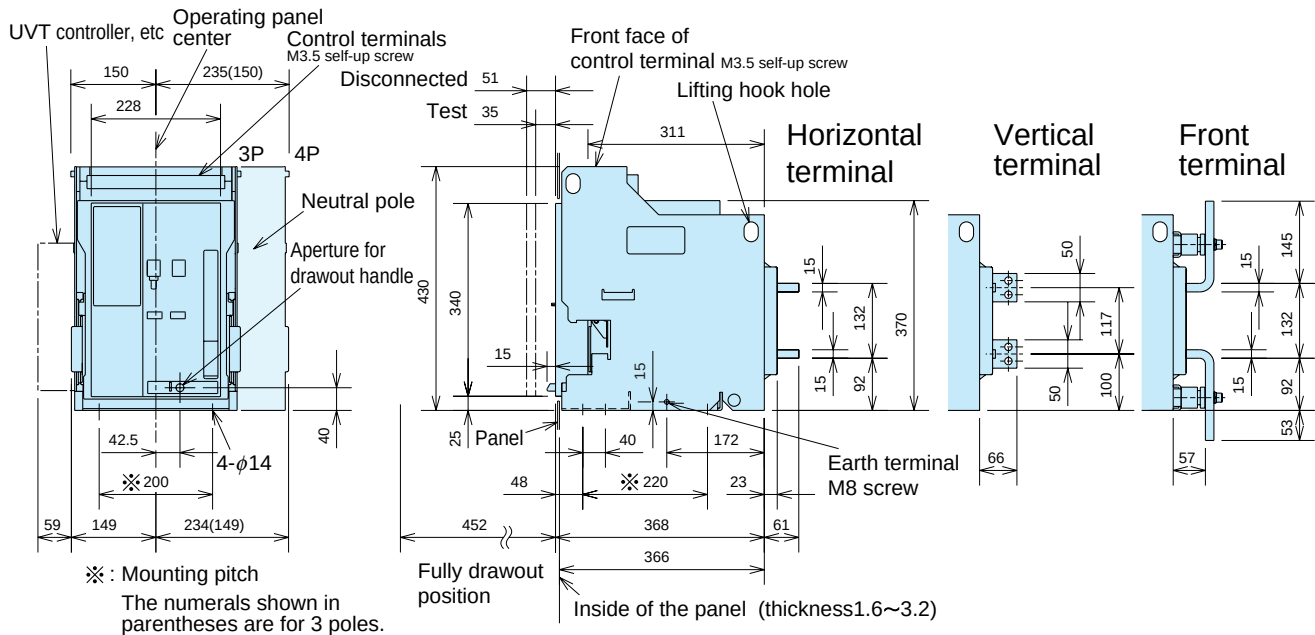
[M]	Motor	[GFR or ER]	Ground fault trip or earth leakage indication LAMP
[CC]	Closing coil	[PAL]	Pre-alarm indication LAMP
[SHT]	Shunt trip device	[TAL]	Temperature alarm indication LAMP
[UVT]	Under voltage trip coil	[X]	Self-hold relay
[AL]	OCR alarm (30ms)	---	Wiring completed by the factory
[LTD]	Long-time-delay trip indication LAMP	---	Wiring by the user
[STDINST]	Short-time-delay or instantaneous trip indication LAMP		

Outline dimensions (1/4)

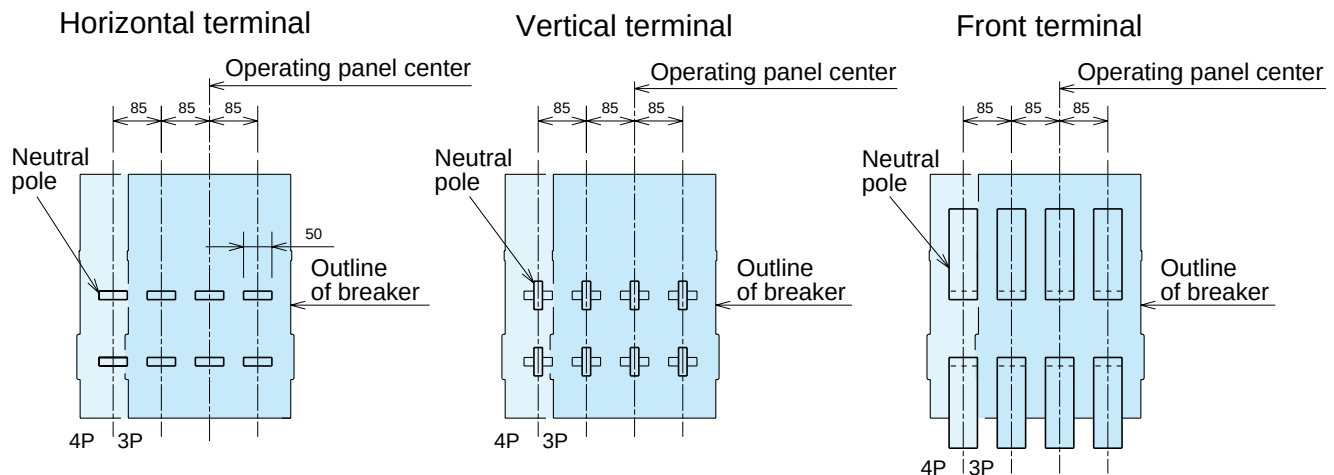
Drawout type AE630-SS~AE1600-SS

Front view

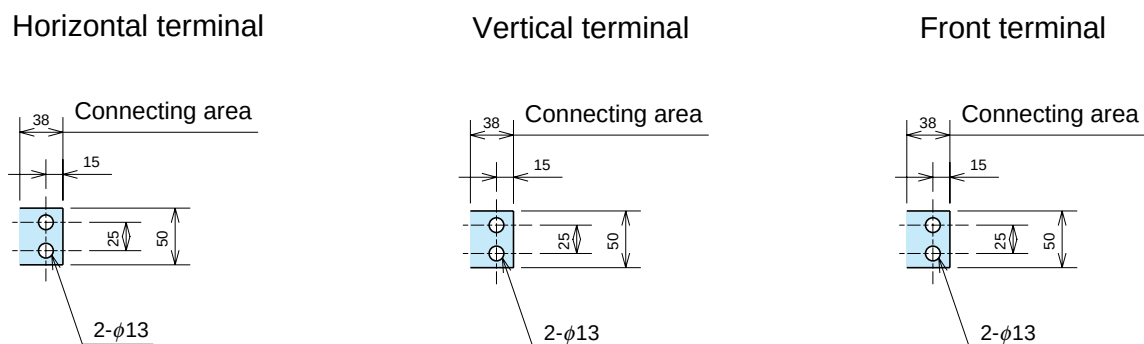
Side view



Rear view

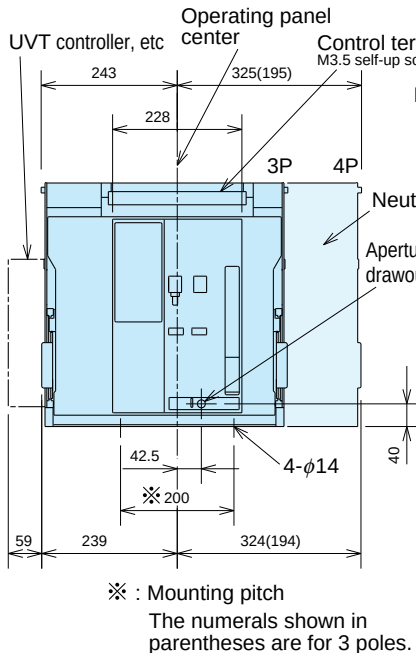


Main circuit terminal dimensions

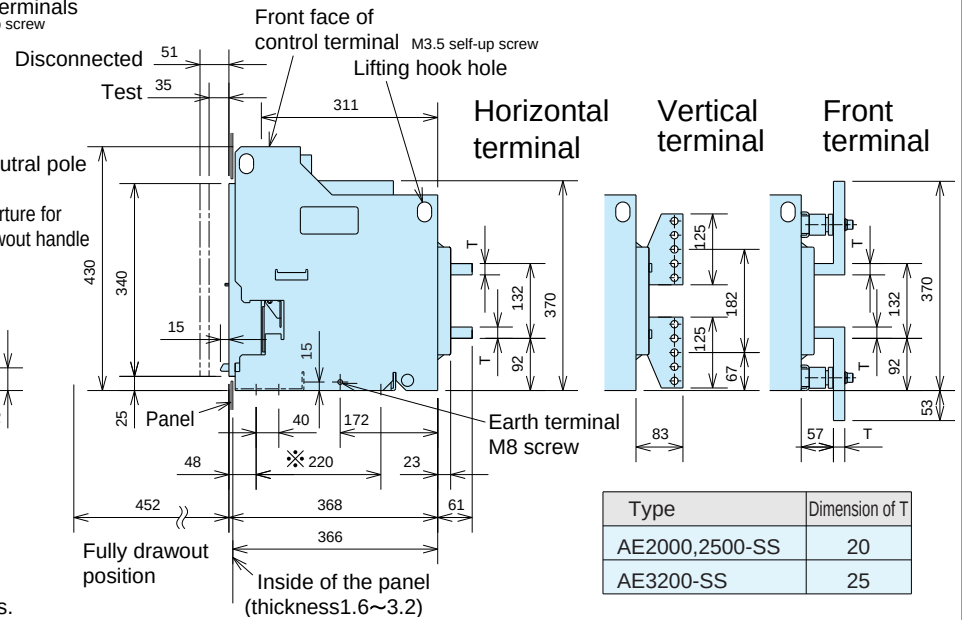


Drawout type AE2000-SS~AE3200-SS

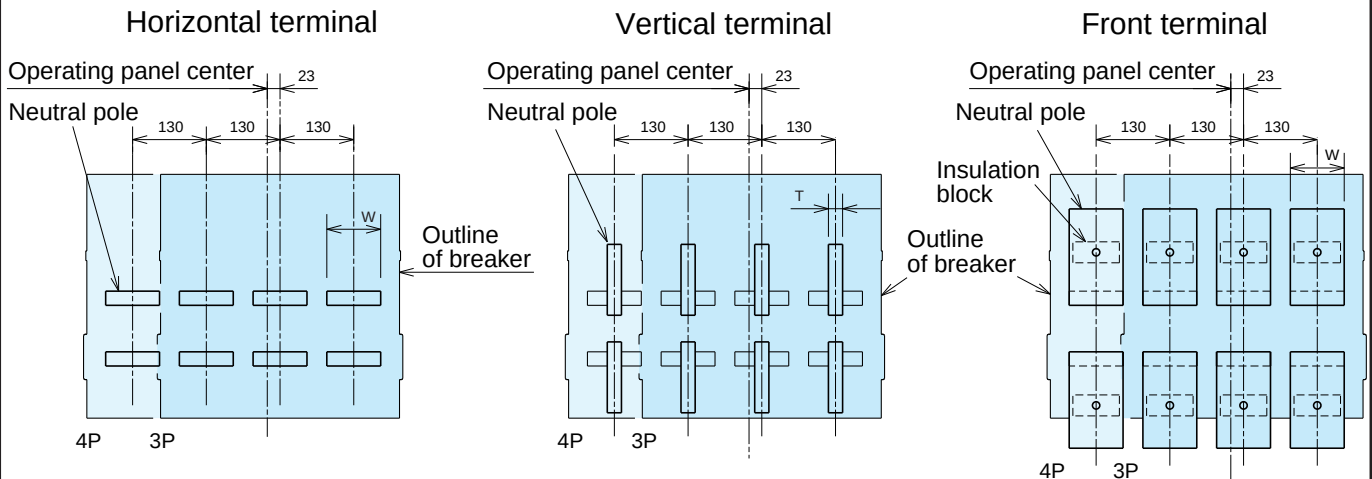
Front view



Side view

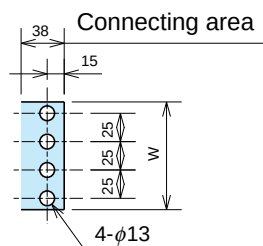


Rear view

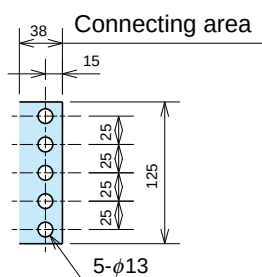


Main circuit terminal dimensions

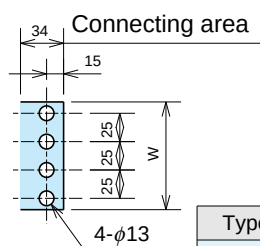
Horizontal terminal



Vertical terminal



Front terminal

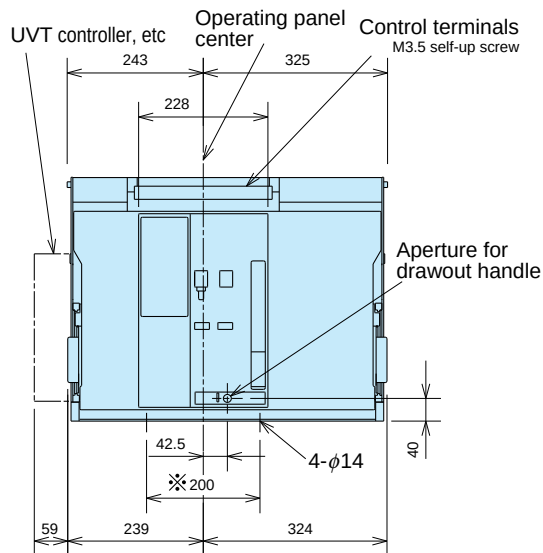


Type	Dimension of W
AE2000,2500-SS	95
AE3200-SS	103

Outline dimensions (2/4)

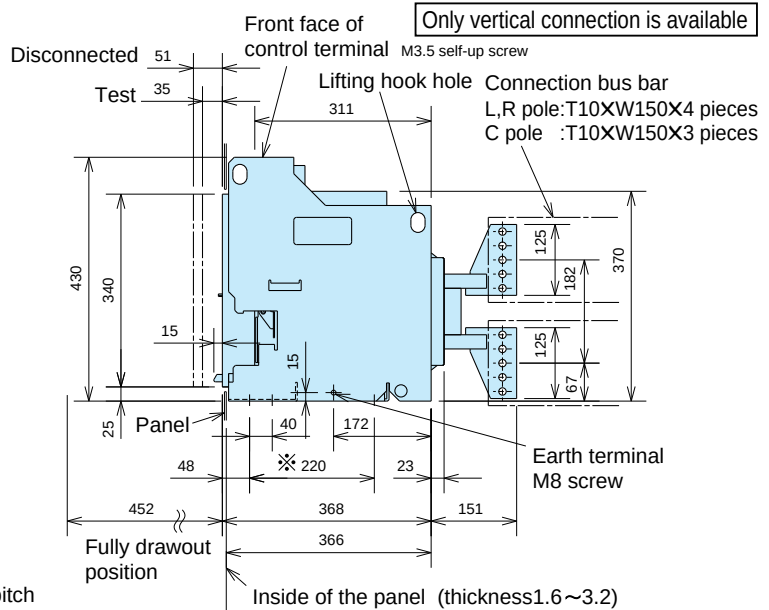
Drawout type AE4000-SSC (3P)

Front view

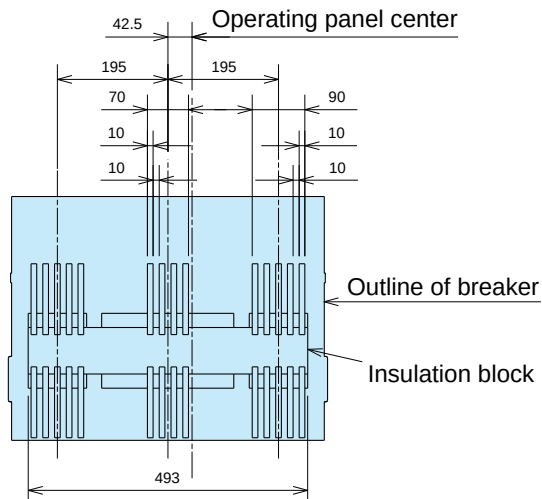


※ : Mounting pitch

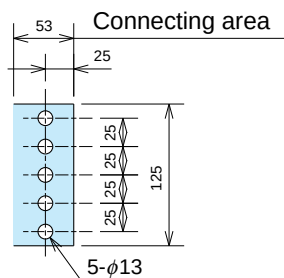
Side view



Rear view

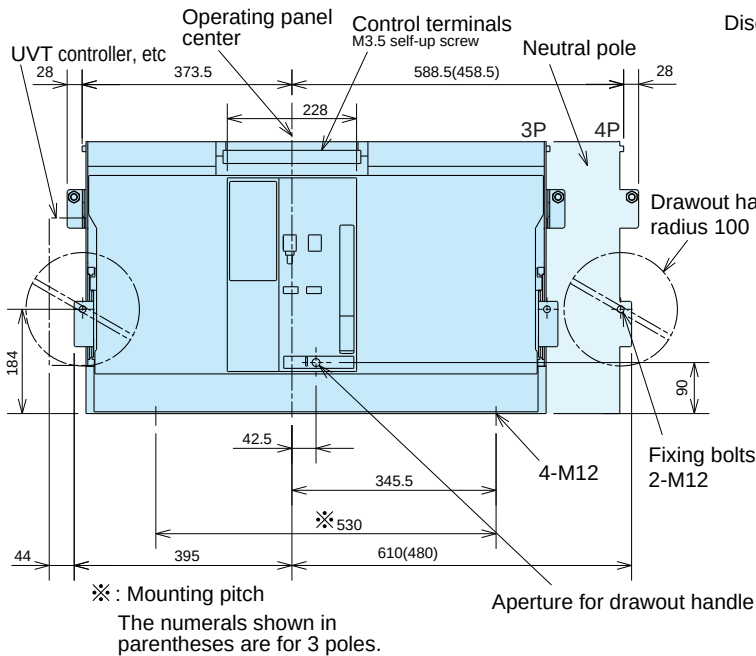


Main circuit terminal dimensions

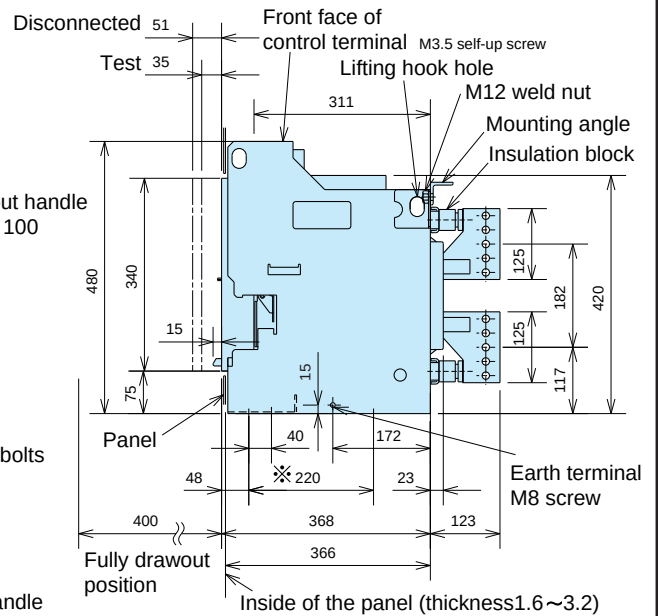


Drawout type AE4000-SS~AE6300-SS

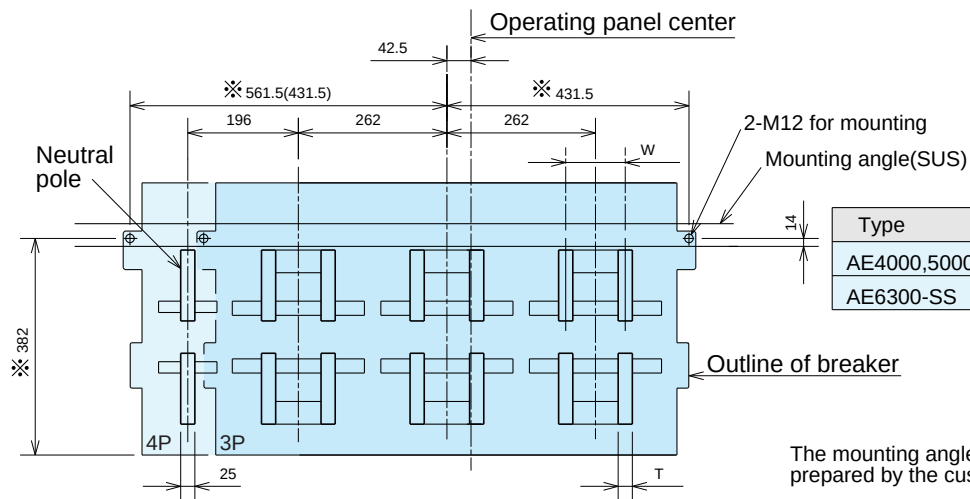
Front view



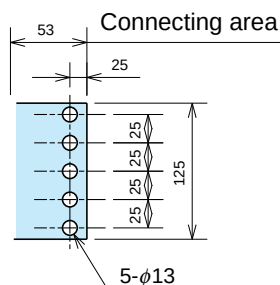
Side view



Rear view



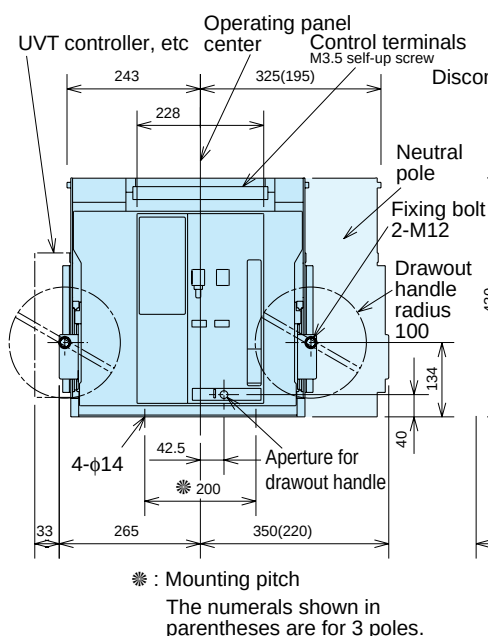
Main circuit terminal dimensions



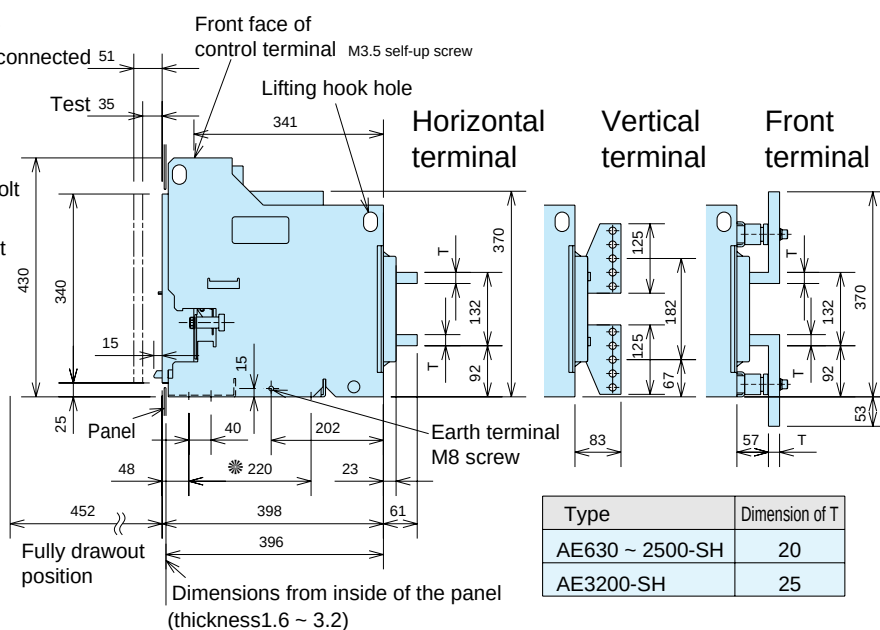
■ Outline dimensions (3/4)

Drawout type AE630-SH~AE3200-SH

Front view

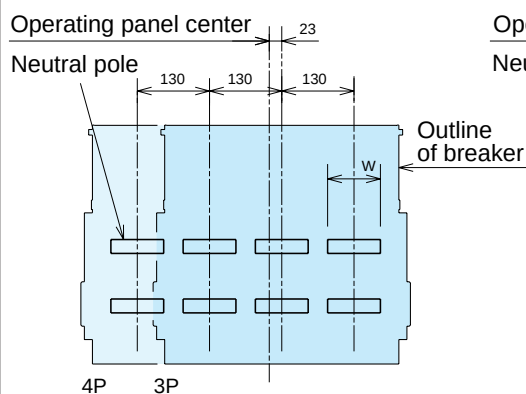


Side view

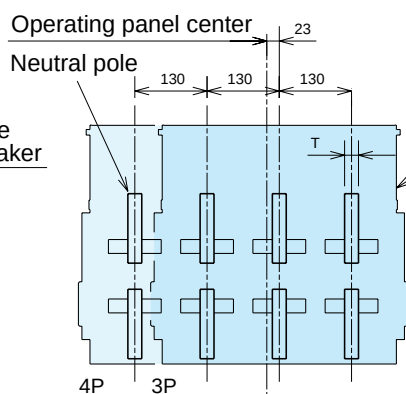


Rear view

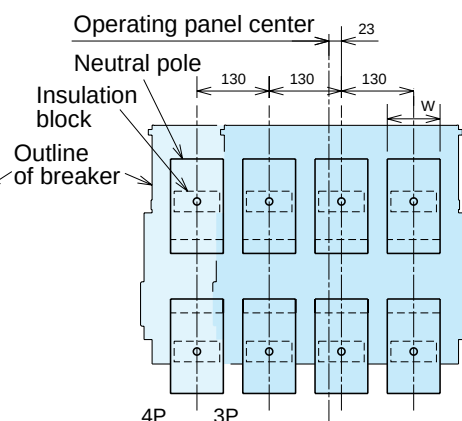
Horizontal terminal



Vertical terminal

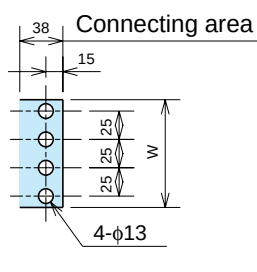


Front terminal

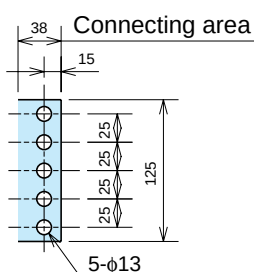


Main circuit terminal dimensions

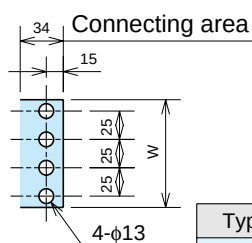
Horizontal terminal



Vertical terminal



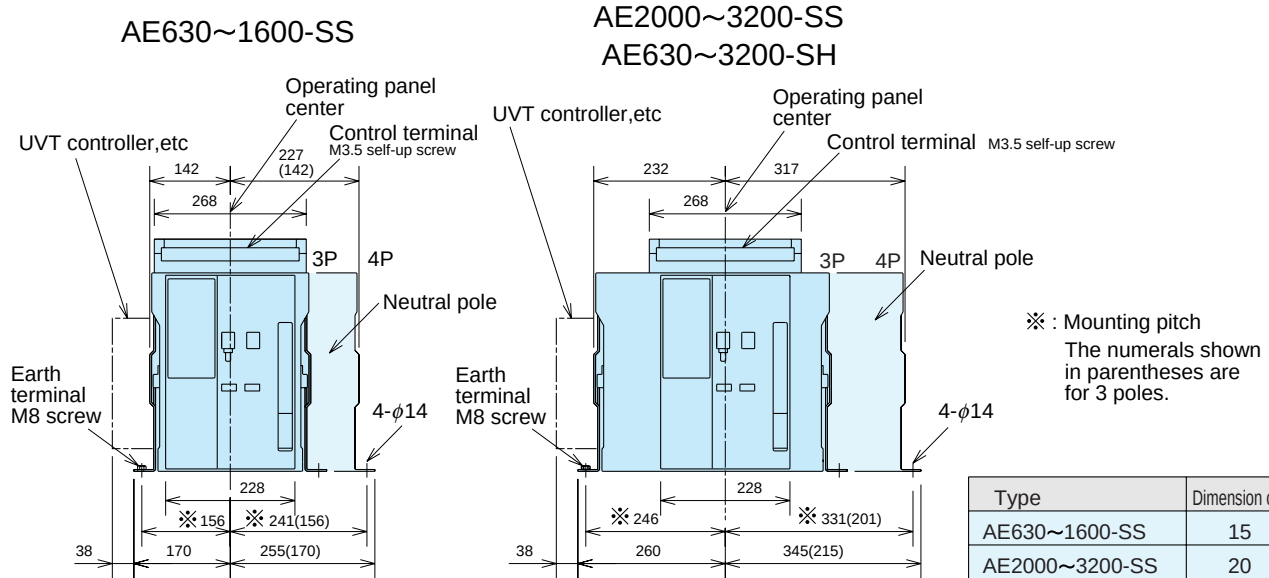
Front terminal



Type	Dimension of W
AE630 ~ 2500-SH	95
AE3200-SH	103

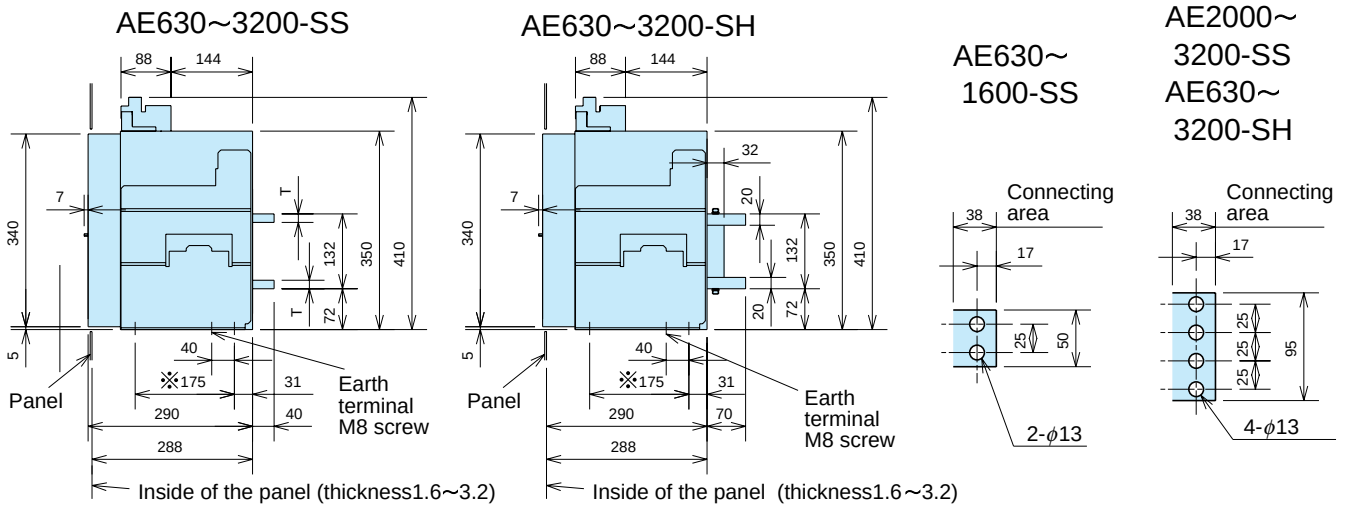
Fixed type AE630-SS/SH~AE3200-SS/SH

Front view

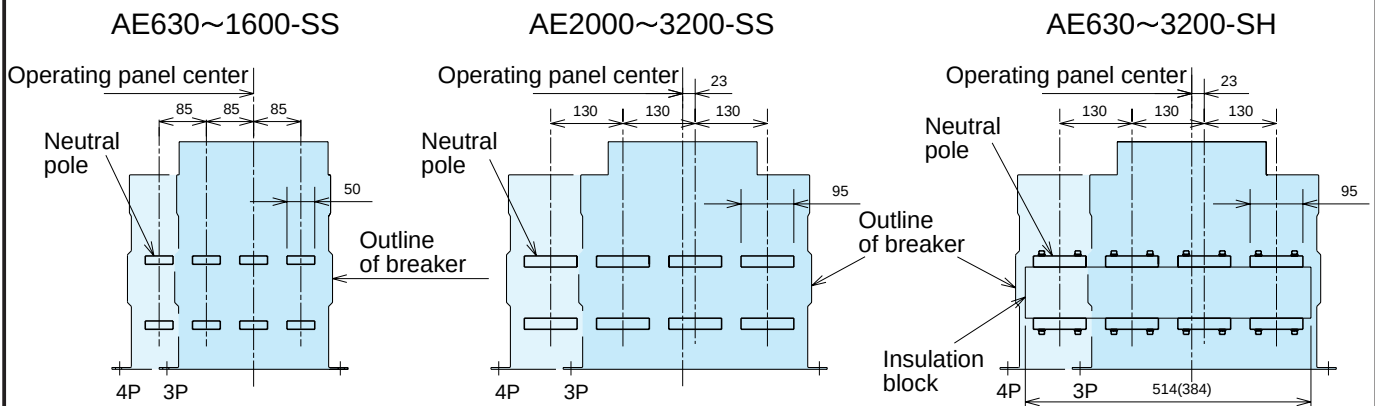


Side view

Main circuit terminal dimensions



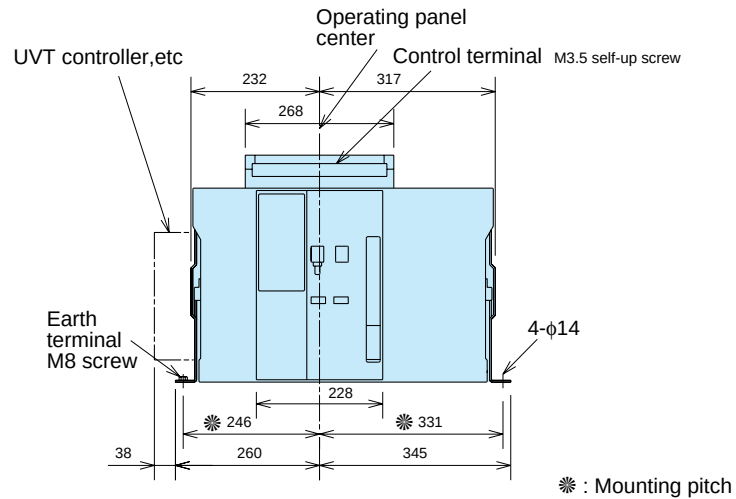
Rear view



■ Outline dimensions (4/4)

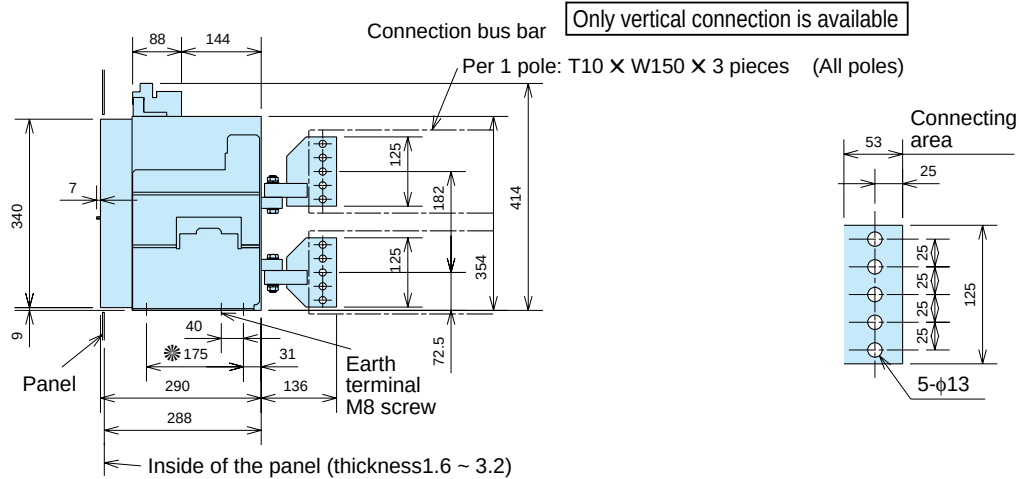
Fixed type AE4000-SSC (3P)

Front view

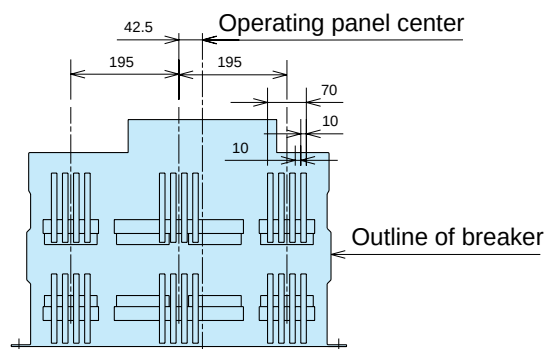


Side view

Main circuit terminal dimensions



Rear view



■ Technical information (1/3)

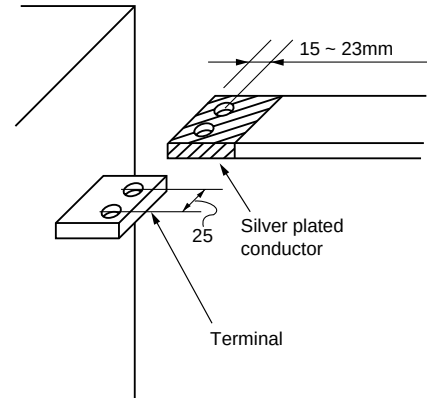
Pre-cautions when making connections

For the terminal connections, use M12 bolts, washers and spring washers.

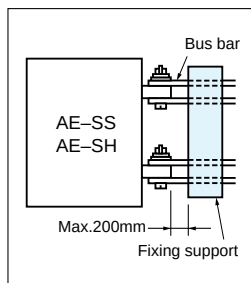
In order to prevent increased contact resistance due to humidity, silver plating of the contact surface of the conductor which is connected to the terminal of the breaker, is recommended. Also clean the contact surface, and securely connect them at a suitable torque.

Standard Tightening Torque

Screw size	Tightening torque (N • m)
M12	40 ~ 50



Since fault current flowing through the conductors cause large electromagnetic forces, the conductors should be secured firmly, using the values in Table on the right as a reference. Max busbar supporting distance nearest to ACB is less than 200mm.



Electromagnetic force in kg-f per 1m conductor (in the case of three phase short circuit)

kg-f

Type (A)	AE630-SS ~ AE1600-SS	AE2000-SS ~ AE3200-SS AE - SH	AE4000-SSC	AE4000-SS ~ AE6300-SS
Conductor distance (mm)	85	130	195	262
Prospective fault current kA (pf)				
30 (0.2)	750	450	340	230
42 (0.2)	1460	890	670	450
50 (0.2)	2080	1250	940	630
65 (0.2)	3510	2120	1590	1060
85 (0.2)	6020	3620	2720	1810
100 (0.2)	—	5010	—	2510
130 (0.2)	—	8470	—	4240

When selecting conductors for connection to a Series AE breaker, ensure that they have a sufficient current capacity, refer to Table on the right.

Conductor Size (IEC-60947-1 ; 40°C Ambient Temp., Open air)

Rated current Max. (A)	Connecting conductors (copper bus bar)		
	Arrangement	Quantity	Conductor size (mm)
630	With long surface vertical	2	40X5
1000	With long surface vertical	2	60X5
1250	With long surface vertical	2	80X5
1600	With long surface vertical	2	100X5
2000	With long surface vertical	3	100X5
2500	With long surface vertical	4	100X5
3150(3200)*1	With long surface vertical	3	100X10
4000*2	With long surface vertical	4	100X10
5000	With long surface vertical	4	150X10
6300	With long surface vertical	4	200X10

*1.The temperature rise of rated current 3200A conforms to the requirement of IEC 60947-1 for the connecting conductor size of a rated current of 3150A.

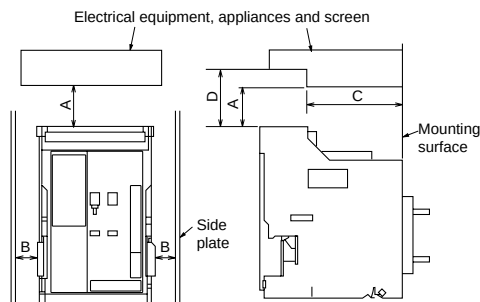
In case of more than 3200A, conductor sizes are not given in IEC 60947-1.

*2.In case of AE-4000-SSC, refer to P59, 63.

Line side insulation clearance

When a short-circuit current is interrupted, hot gas blows out discharged from the exhaust port of the arc extinguishing chamber, so provide a clearance as shown in the following table.

- On the fixed type, maintenance is possible with following clearance.



● Dimensions

(mm)

Type	AE630-SS ? AE3200-SS AE4000-SSC		AE4000-SS ? AE6300-SS AE-SH
	Applicable voltage		
	AC600V or less	AC660V, 690V	AC690V or less
Fix type	A (Note 1)	0	(Note 1) 200
	B (Note 3)	50	(Note 3) 50
	C	162	—
	D (Note 2)	50	200
Drowout type	A	0	(Note 1) 200
	B (Note 3)	50	(Note 3) 50
	C	240	—
	D (Note 2)	50	200

Note 1 : 300mm or more clearance is necessary to inspect the arc-extinguishing chamber and contacts.

Note 2 : The wiring space required for the control terminal block.

Note 3 : In case dimension B becomes larger when the UVT controller, the mechanical interlock, door interlock, etc. are installed.

Service conditions

1 Normal service condition

If under ordinary conditions the following normal working conditions are all satisfied, the AE Series air circuit breaker may be used unless otherwise specified.

1. Ambient air temperature
A range of max. +40°C to min. -5°C is recommended. However, the average over 24 hours must not exceed +35°C.
2. Altitude
2,000m (6,600 feet) or less
3. Environmental conditions
The air must be clean, and the relative humidity 85% or less at a max. of +40°C. Do not use and store in atmospheres with sulfide gas, ammonia gas etc. ($H_2S \leq 0.01ppm$ $SO_2 \leq 0.1ppm$ $NH_3 \leq$ a few ppm.)
4. Installation conditions
When installing the AE Series air circuit breaker, refer to the installation instructions in the catalogue and instruction manual.
5. Storage temperature
A range of max. +60°C to min. -20°C is recommended to store. However, the average over 24 hours must not exceed +35°C.
6. Replacement
Approx. 15 years.
Please refer to the instruction manual.

2 Special service conditions

In the case of special service condition, modified air circuit breakers are available. Please specify when ordering. Service life may be shorter depend on service conditions.

1. Special environmental conditions
If it is used at high temperature and/or high humidity, the insulation durability and other electrical/mechanical features may deteriorate. Therefore, the breaker should be specially treated. Moisture fungus treatment with increased corrosion-resistance is recommended. Since some parts may pose problems due to corrosion in the environments where corrosive gas results from the corrosion, the increased Extra-corrosion proof specifications is recommended.
2. Special ambient temperature
If the ambient temperature exceeds +40°C, the uninterrupted current rating will be reduced. Since the reduction value is different depending on the applicable standard, refer to P68.
3. Special altitude
If it is used at the 2,000m or higher the heat radiation rate is reduced decreasing the operating voltage rating, continuous current capacity and breaking capacity. Moreover the durability of the insulation is also decreased owing to the atmospheric pressure. Apply for further detail.

■ Technical information (2/3)

Internal resistance, reactance and power consumption (per pole)

Type	Connection	Internal resistance (mΩ)	Reactance (mΩ)	Power consumption (W)
AE630-SS	Fixed type	0.028	0.059	11
	Drawout type	0.042	0.089	17
AE630-SH	Fixed type	0.020	0.047	8
	Drawout type	0.030	0.071	12
AE1000-SS	Fixed type	0.026	0.060	26
	Drawout type	0.040	0.091	40
AE1000-SH	Fixed type	0.018	0.047	18
	Drawout type	0.028	0.071	28
AE1250-SS	Fixed type	0.024	0.060	38
	Drawout type	0.038	0.091	60
AE1250-SH	Fixed type	0.016	0.047	25
	Drawout type	0.026	0.071	41
AE1600-SS	Fixed type	0.016	0.063	41
	Drawout type	0.030	0.095	77
AE1600-SH	Fixed type	0.014	0.047	36
	Drawout type	0.024	0.071	61
AE2000-SS	Fixed type	0.010	0.047	40
	Drawout type	0.020	0.071	80
AE2000-SH	Fixed type	0.012	0.047	48
	Drawout type	0.022	0.071	88
AE2500-SS	Fixed type	0.008	0.047	50
	Drawout type	0.018	0.071	113
AE2500-SH	Fixed type	0.010	0.047	63
	Drawout type	0.020	0.071	125
AE3200-SS	Fixed type	0.008	0.048	72
	Drawout type	0.014	0.072	143
AE3200-SH	Fixed type	0.009	0.048	92
	Drawout type	0.016	0.072	164
AE4000-SSC	Fixed type	0.008	0.048	128
	Drawout type	0.014	0.072	224
AE4000-SS	Drawout type	0.013	0.062	210
AE5000-SS	Drawout type	0.011	0.062	275
AE6300-SS	Drawout type	0.0085	0.062	340

● The above values are applicable for one pole.

Deratings by ambient temperature

(A)

Standard	Ambient temperature	AE630-SS AE630-SH	AE1000-SS AE1000-SH	AE1250-SS AE1250-SH	AE1600-SS AE1600-SH	AE2000-SS AE2000-SH	AE2500-SS AE2500-SH	AE3200-SS AE3200-SH	AE4000-SSC	AE4000-SS	AE5000-SS	AE6300-SS
IEC60947-2 BS (Standard : 40°C)	40°C	630	1000	1250	1600	2000	2500	3200	4000	4000	5000	6300
	45°C	630	1000	1250	1600	2000	2500	3200	3800	4000	5000	6000
	50°C	630	1000	1250	1600	2000	2500	3200	3650	4000	5000	5750
	55°C	630	1000	1250	1550 (1600)	2000	2450	3000	3500	3900	5000	5500
	60°C	630	1000	1200 (1250)	1500 (1600)	2000	2350	2900	3300	3750	4750	5200
JISC8372 JISC8370 (Standard : 40°C)	40°C	630	1000	1250	1600	2000	2500	3200	3600	4000	5000	6000
	45°C	630	1000	1250	1600	2000	2500	3200	3500	4000	5000	5800
	50°C	630	1000	1250	1500 (1600)	2000	2500	3000	3350	4000	5000	5600
	55°C	630	1000	1200 (1250)	1450 (1600)	2000	2350	2900	3200	4000	4900	5450
	60°C	630	1000	1150 (1250)	1400 (1600)	2000	2250	2800	3050	4000	4700	5250
LR,AB,GL DNV,BV (Standard : 45°C)	45°C	630	1000	1250	1600	2000	2500	3200	—	4000	5000	6000
	50°C	630	1000	1250	1600	2000	2500	3200	—	4000	5000	5750
	55°C	630	1000	1250	1550 (1600)	2000	2450	3050	—	3900	5000	5500
	60°C	630	1000	1200	1500 (1600)	2000	2350	2900	—	3750	4750	5200
NK (Standard : 45°C)	45°C	630	1000	1250	1600	2000	2500	3200	3500	4000	5000	5700
	50°C	630	1000	1250	1500 (1600)	2000	2500	3000	3350	4000	5000	5500
	55°C	630	1000	1200 (1250)	1450 (1600)	2000	2350	2900	3200	4000	4800	5300
	60°C	630	1000	1150 (1250)	1400 (1600)	2000	2250	2800	3050	4000	4600	5100

Note : The figures in () in the above Table indicate reduced current values exclusive to AE-SH series.

Technical information (3/3)

Selective interrupting combinations table

AE-SS Series air circuit breakers provide easy selective co-ordination with branch circuit breakers.
For selective co-ordinations, refer to the following table.

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Main circuit breaker Branch circuit breaker		Unit breaking capacity	AE-SS									
			AE630-SS	AE1000-SS	AE1250-SS	AE1600-SS	AE2000-SS	AE2500-SS	AE3200-SS	AE4000-SS	AE5000-SS	AE6300-SS
			65	65	65	65	85	85	85	85	130	130
N-F-S • MB	NF30-SP	5	5	5	5	5	5	5	5	5	5	5
	MB30-SP											
	MB50-CP											
	NF50-SP	10	9(10)	10	10	10	10	10	10	10	10	10
	NF60-SP											
	MB50-SP											
	NF50-HP	25	9(25)	25	25	25	25	25	25	25	25	25
	NF60-HP											
	NF50-HRP	85	9(65)	50(65)	65	65	85	85	85	85	85	85
	NF100-SP											
	NF100-SEP	50	9(50)	45(50)	50	50	50	50	50	50	50	50
	MB100-SP											
	NF100-HP	100	9(65)	50(65)	65	65	85	85	85	100	100	100
	NF250-SP											
	NF250-SEP	50	9(50)	20(50)	22(50)	42(50)	50	50	50	50	50	50
	MB250-SP											
	NF250-HP	100	9(65)	25(65)	40(65)	65	85	85	85	85	100	100
	NF400-SP	85	–	–	20(65)	27(65)	42(65)	70	85	85	85	85
	NF400-SEP	85	9(65)	15(65)	20(65)	27(65)	42(65)	70	85	85	100	100
	NF400-HEP	100	9(65)	15(65)	20(65)	27(65)	42(65)	70	85	85	100	100
	NF400-REP	125	9(65)	15(65)	20(65)	27(65)	42(65)	70	85	85	125	125
N-F-C	NF630-SP	85	–	–	–	24(65)	30(65)	40(65)	60(65)	85	85	85
	NF630-SEP	85	–	15(65)	18(65)	24(65)	30(65)	40(65)	60(65)	85	85	85
	NF630-HEP	100	–	15(65)	18(65)	24(65)	30(65)	40(65)	60(65)	85	85	85
	NF630-REP	125	–	15(65)	18(65)	24(65)	30(65)	40(65)	60(65)	85	85	85
	NF800-SEP	85	–	–	18(65)	24(65)	30(65)	40(65)	60(65)	85	85	85
	NF800-HEP	100	–	–	18(65)	24(65)	30(65)	40(65)	60(65)	85	85	85
	NF800-REP	125	–	–	18(65)	24(65)	30(65)	40(65)	60(65)	85	85	85
	NF50-CP	5	5	5	5	5	5	5	5	5	5	5
	NF60-CP											
	NF100-CP	25	9(25)	15(25)	18(25)	24(25)	25	25	25	25	25	25
N-F-U	NF250-CP	30	9(30)	15(30)	18(30)	24(30)	30	30	30	30	30	30
	NF400-CP	50	–	15(50)	20(50)	27(50)	42(50)	50	50	50	50	50
	NF630-CP	50	–	–	–	24(50)	30(50)	40(50)	50	50	50	50
	NF800-CEP	50	–	–	18(50)	24(50)	30(50)	40(50)	50	50	50	50
	NF100-RP	125	65	65	65	65	85	85	85	85	125	125
	NF100-UP	200	65	65	65	65	85	85	85	85	130	130
	NF250-RP	125	9(65)	65	65	65	85	85	85	85	125	125
	NF250-UP	200	9(65)	65	65	65	85	85	85	85	130	130
	NF400-UEP	200	9(65)	15(65)	18(65)	29(65)	48(65)	85	85	85	130	130
	NF630-UEP	200	–	15(65)	18(65)	24(65)	30(65)	37(65)	68	85	120	120
	NF800-UEP	200	–	–	18(65)	24(65)	30(65)	37(65)	68	85	120	120

- The values in the table represent the max. rated current for both Series AE-SS air circuit breakers and branch breakers, and the selective co-ordination applies when the AE-SS series air circuit breakers instantaneous pick up is set to maximum.
- The numerals shown in parentheses are for AE-SS with MCR. (When set MCR).
- Please apply in case of AE-SH.

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Main circuit breaker Unit breaking capacity			AE-SS											
			AE630-SS 65	AE1000-SS 65	AE1250-SS 65	AE1600-SS 65	AE2000-SS 85	AE2500-SS 85	AE3200-SS 85	AE4000-SSC 85	AE4000-SS 130	AE5000-SS 130	AE6300-SS 130	
NF-S • MB	NF30-SP	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
	MB30-SP													
	MB50-CP													
	NF50-SP	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5		
	NF60-SP													
	MB50-SP													
	NF50-HP	10	9(10)	10	10	10	10	10	10	10	10	10	10	
	NF60-HP													
	NF50-HRP	30	9(30)	30	30	30	30	30	30	30	30	30	30	30
	NF100-SP	25	7(25)	20(25)	25	25	25	25	25	25	25	25	25	25
	NF100-SEP													
	MB100-SP													
	NF100-HP	50	9(50)	30(50)	50	50	50	50	50	50	50	50	50	50
	NF250-SP	25	7(25)	14(25)	19(25)	25	25	25	25	25	25	25	25	25
	NF250-SEP													
	MB250-SP													
	NF250-HP	50	7(50)	15(50)	25(50)	42(50)	50	50	50	50	50	50	50	50
	NF400-SP	50	—	—	18(50)	24(50)	33(50)	45(50)	50	50	50	50	50	50
	NF400-SEP	50	9(50)	15(50)	18(50)	24(50)	33(50)	45(50)	50	50	50	50	50	50
	NF400-HEP	65	9(65)	15(65)	18(65)	24(65)	33(65)	45(65)	65	65	65	65	65	65
NF400-REP	125	9(65)	15(65)	18(65)	24(65)	33(65)	45(65)	80	85	110	110	110	110	
NF630-SP	50	—	—	—	24(50)	33(50)	45(50)	50	50	50	50	50	50	
NF630-SEP	50	—	15(50)	18(50)	24(50)	30(50)	40(50)	50	50	50	50	50	50	
NF630-HEP	65	—	15(65)	18(65)	24(65)	30(65)	40(65)	60(65)	65	65	65	65	65	
NF630-REP	125	—	15(65)	18(65)	24(65)	30(65)	40(65)	60(65)	85	85	85	85	85	
NF800-SEP	50	—	—	18(50)	24(50)	30(50)	40(50)	60(50)	50	50	50	50	50	
NF800-HEP	65	—	—	18(65)	24(65)	30(65)	40(65)	60(65)	65	65	65	65	65	
NF800-REP	125	—	—	18(65)	24(65)	30(65)	40(65)	60(65)	85	85	85	85	85	
NF-C	NF50-CP	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
	NF60-CP													
	NF100-CP	10	9(10)	10	10	10	10	10	10	10	10	10	10	
	NF250-CP	15	9(15)	15	15	15	15	15	15	15	15	15	15	
	NF400-CP	25	—	15(25)	18(25)	24(25)	25	25	25	25	25	25	25	
	NF630-CP	35	—	—	—	24(35)	30(35)	35	35	35	35	35	35	
	NF800-CEP	35	—	—	18(35)	24(35)	30(35)	35	35	35	35	35	35	
NF-U	NF100-RP	125	35(65)	65	65	65	85	85	85	85	125	125	125	
	NF100-UP	200	50(65)	65	65	65	85	85	85	85	130	130	130	
	NF250-RP	125	9(65)	50(65)	65	65	85	85	85	85	125	125	125	
	NF250-UP	200	9(65)	65	65	65	85	85	85	85	130	130	130	
	NF400-UEP	200	9(65)	15(65)	18(65)	29(65)	48(65)	85	85	85	130	130	130	
	NF630-UEP	200	—	15(65)	18(65)	24(65)	30(65)	37(65)	68	85	120	120	120	
	NF800-UEP	200	—	—	18(65)	24(65)	30(65)	37(65)	68	85	120	120	120	
	NF630-UEP	200	—	—	18(65)	24(65)	30(65)	37(65)	68	85	120	120	120	

- The values in the table represent the max. rated current for both Series AE-SS air circuit breakers and branch breakers, and the selective co-ordination applies when the AE-SS series air circuit breakers instantaneous pick up is set to maximum.
- The numerals shown in parentheses are for AE-SS with MCR. (When set MCR).

- Please apply in case of AE-SH.

Ordering information for Mitsubishi AE-SS series air circuit breaker (General useS.SL Types)

Customer(name)

Order No.

Number of units2 units

TypeP13~16AE1600-SSAE-SH

Number of poles☒3P☐4PNote1

Rated current1600A

Applicable standard☒IEC 60947-2☐JIS C8372
☐Others

Ambient temperature☒40°C☐Others°CNote2

ConnectionP17☐Fixed type(FIX)Note3☒Drawout type(DR)Note4

Main circuit terminal

Only for Horizontal terminals

☒Horizontal terminals(standard)
☐Vertical terminals(DR-VT)
☐Front terminals(DR-FT)

Electronic trip relayP25~40

SPGT

2

A

T

Electronic trip relay type

S	SL	S...Standard	SL... Longtime delay
ST	SLT	T...Trip indication	special
SPT	SLPT	P...Pre-alarm	
SPGT	SLPGT	G...Ground fault protection	Note5
SPET	SLPET	E...Earth leakage protection	Note6

BARE

Relay not requireNote7

Tripping characteristicsNote5

Blank	LTD+STD+INST
CNote7	LTD+STD+INST/MCR
NNote3,8	Neutral pole protection ☐ 50% ☐ 100%

Electronic trip relay accessoriesP23~24

☒Cell switchCL-2C/T/D(Maximum: 4 pcs.)
☐Shorting-B contact(SBC)
☐Lifting hooks(HP)
☒Safety shutter(SST)
☒Shutter lock(SST-LOCK)
☐Mis-insertion preventer(MIP)Note3
☐Test jumper(TJ)units

Drawout type accessoriesP23~24

☐Vertical terminal adapter(VTA)
☐Front terminal adapter(FTA)
Can be connected to the Horizontal terminals

ElectricalP18~20

Accessories

☒Auxiliary switch

5A5BMax.5A5B

☒Standard(AX)
☐High capacity(HAX)"A"and"B"should be same.

☒Motor charging(MD)

Note:When specifying MD, be sure to order the closing coil(CC)and shunt trip device(SHT)for remote operation.

☒AC・DC100-125V
☐AC・DC200-250V
☐DC24V
☐DC48V

☒Closing coil(CC)

☒AC・DC100-250V
☐DC24-48V

☒Shunt trip device(SHT)

☒AC・DC100-250V
☐AC380-500V
☐DC24-48V

☐Under voltage trip device

☐Instantaneous(UVT-SSB)AC100-120/200-240
☐0.5sec Time-delay type(UVT-05SSB)/380-460V
☐3sec Time-delay type(UVT-30SSB)DC24V
DC48V
DC100-110V
DC120-125V

MachineP21~22

Accessories

☒Push button cover(BC-L)
☒Counter(CNT)
☐Cylinder lock(CYL)
☐Door interlock(DI)Note9
☐Terminal cover(TTC)
☐Door frame(DF)
☐Dust cover(DUC)
☒Interphase barrier(BA)Note1,3for 2units
☐Mechanical interlock(MI)for 3units

Special environmentsP66

☐Moisture-fungus treatment
☐Extra-corrosion proof specification

Data

☒Specifications
☒Test report

Electronic trip relay accessories

Blank	Not required
A	OCR alarm(30msec.1 pulse)
C	Load current measurement(voltage output)
T	Temperature alarm(LED&1a contact)

Control supply

0	Not required(Only for S,SL type)
1	AC100-120/200-240V
2	DC100-110V
3	DC125V
4	DC24V
5	DC48V

Neutral CT(NCT)
External ZCT(ZCT)TypeRefer P37

☒Y-2000 field test deviceAC100-240V
☐Y-160 field test deviceAC100-120V
AC200-240V

Condenser trip device(COT)P22

☒AC100-110V
☐AC200-220V

Remark

Production date

Example

Note1. Not available for AE4000-SSC.
Note2. There is case to derate by ambient temperature.
Note3. Not available for AE4000-6300-SS.
Note4. The terminal for AE4000-SSC, AE4000-6300-SS shall be vertical terminal.
Note5. Not available for AE-SS series with maximum rated current (IN Max) coming to 315A or 500A, nor AE630-SH. Neutral CT is needed for Ground fault protection when a 3 pole breaker is used on a 3 phase 4 wires system.
Note6. In case of Earth leakage alarm, It need external ZCT. In case of Earth leakage tripping, It also need SHT.
Note7. Not available for AE-SH.
Note8. Available for ST type relay.
Note9. If install together with MI, Please ask us.

Ordering information for Mitsubishi AE-SS series air circuit breaker (General useS.SL Types)

Customer(name) _____		Order No. _____		Number of units _____ units	
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Type P13~16 AE _____ -SS _____ AE _____ -SH _____	
Number of poles ☐ 3P ☐ 4P Note1	
Rated current _____ A	
Applicable standard ☐ IEC 60947-2 ☐ JIS C8372 ☐ Others _____	
Ambient temperature ☐ 40°C ☐ Others _____ °C Note2	
Connection P17 ☐ Fixed type(FIX) Note3 ☐ Drawout type(DR) Note4	
Main circuit terminal Only for Horizontal terminals ☐ Horizontal terminals(standard) ☐ Vertical terminals(DR-VT) ☐ Front terminals(DR-FT)	

Electronic trip relay type	
S	SL
ST	SLT
SPT	SLPT
SPGT	SLPGT
SPET	SLPET

S... Standard SL... Longtime delay
T... Trip indication special
P... Pre-alarm
G... Ground fault protection Note5
E... Earth leakage protection Note6

☐ BARE ☐ Relay not require Note7

Tripping characteristics Note5	
Blank	LTD+STD+INST
C Note7	LTD+STD+INST/MCR
N Note3,8	Neutral pole protection ☐ 50% ☐ 100%

Electrical P18~20 accessories	
☐ Auxiliary switch	☐ Standard (AX) ☐ High capacity (HAX)
☐ Motor charging (MD)	☐ AC • DC100~125V ☐ AC • DC200~250V ☐ DC24V ☐ DC48V
☐ Closing coil (CC)	☐ AC • DC100~250V ☐ DC24~48V
☐ Shunt trip device (SHT)	☐ AC • DC100~250V ☐ AC380~500V ☐ DC24~48V
☐ Under voltage trip device	☐ AC100~120 /200~240 /380~460V ☐ DC24V ☐ DC48V ☐ DC100~110V ☐ DC120~125V

Electronic trip relay accessories	
Blank	Not required
A	OCR alarm(30msec.1 pulse)
C	Load current measurement(voltage output)
T	Temperature alarm(LED&1a contact)

Control supply	
0	Not required(Only for S,SL type)
1	AC100~120/200~240V
2	DC100~110V
3	DC125V
4	DC24V
5	DC48V

Machine P21~22 accessories	
☐ Push button cover(BC-L)	
☐ Counter(CNT)	
☐ Cylinder lock(CYL)	
☐ Door interlock(DI) Note9	
☐ Terminal cover(TTC)	
☐ Door frame(DF)	
☐ Dust cover(DUC)	
☐ Interphase barrier(BA) Note1,3	
☐ Mechanical interlock(MI) ☐ for 2units ☐ for 3units	

Drawout type accessories P23~24	
☐ Cell switch CL- ☐ C ☐ T ☐ D (Maximum: 4 pcs.)	
☐ Shorting-B contact(SBC)	
☐ Lifting hooks(HP)	
☐ Safety shutter(SST)	
☐ Shutter lock(SST-LOCK)	
☐ Mis-insertion preventer(MIP) Note3	
☐ Test jumper(TJ) _____ units	

☐ Vertical terminal adapter(VTA)	Can be connected to the Horizontal terminals
☐ Front terminal adapter(FTA)	

Electrical P18~20 accessories	
☐ Auxiliary switch	☐ Standard (AX) ☐ High capacity (HAX)
☐ Motor charging (MD)	☐ AC • DC100~125V ☐ AC • DC200~250V ☐ DC24V ☐ DC48V
☐ Closing coil (CC)	☐ AC • DC100~250V ☐ DC24~48V
☐ Shunt trip device (SHT)	☐ AC • DC100~250V ☐ AC380~500V ☐ DC24~48V
☐ Under voltage trip device	☐ AC100~120 /200~240 /380~460V ☐ DC24V ☐ DC48V ☐ DC100~110V ☐ DC120~125V

Electronic trip relay accessories	
Blank	Not required
A	OCR alarm(30msec.1 pulse)
C	Load current measurement(voltage output)
T	Temperature alarm(LED&1a contact)

Control supply	
0	Not required(Only for S,SL type)
1	AC100~120/200~240V
2	DC100~110V
3	DC125V
4	DC24V
5	DC48V

Machine P21~22 accessories	
☐ Push button cover(BC-L)	
☐ Counter(CNT)	
☐ Cylinder lock(CYL)	
☐ Door interlock(DI) Note9	
☐ Terminal cover(TTC)	
☐ Door frame(DF)	
☐ Dust cover(DUC)	
☐ Interphase barrier(BA) Note1,3	
☐ Mechanical interlock(MI) ☐ for 2units ☐ for 3units	

Drawout type accessories P23~24	
☐ Cell switch CL- ☐ C ☐ T ☐ D (Maximum: 4 pcs.)	
☐ Shorting-B contact(SBC)	
☐ Lifting hooks(HP)	
☐ Safety shutter(SST)	
☐ Shutter lock(SST-LOCK)	
☐ Mis-insertion preventer(MIP) Note3	
☐ Test jumper(TJ) _____ units	

☐ Vertical terminal adapter(VTA)	Can be connected to the Horizontal terminals
☐ Front terminal adapter(FTA)	

Electrical P18~20 accessories	
☐ Auxiliary switch	☐ Standard (AX) ☐ High capacity (HAX)
☐ Motor charging (MD)	☐ AC • DC100~125V ☐ AC • DC200~250V ☐ DC24V ☐ DC48V
☐ Closing coil (CC)	☐ AC • DC100~250V ☐ DC24~48V
☐ Shunt trip device (SHT)	☐ AC • DC100~250V ☐ AC380~500V ☐ DC24~48V
☐ Under voltage trip device	☐ AC100~120 /200~240 /380~460V ☐ DC24V ☐ DC48V ☐ DC100~110V ☐ DC120~125V

Electronic trip relay accessories	
Blank	Not required
A	OCR alarm(30msec.1 pulse)
C	Load current measurement(voltage output)
T	Temperature alarm(LED&1a contact)

Control supply	
0	Not required(Only for S,SL type)
1	AC100~120/200~240V
2	DC100~110V
3	DC125V
4	DC24V
5	DC48V

Machine P21~22 accessories	
☐ Push button cover(BC-L)	
☐ Counter(CNT)	
☐ Cylinder lock(CYL)	
☐ Door interlock(DI) Note9	
☐ Terminal cover(TTC)	
☐ Door frame(DF)	
☐ Dust cover(DUC)	
☐ Interphase barrier(BA) Note1,3	
☐ Mechanical interlock(MI) ☐ for 2units ☐ for 3units	

Drawout type accessories P23~24	
☐ Cell switch CL- ☐ C ☐ T ☐ D (Maximum: 4 pcs.)	
☐ Shorting-B contact(SBC)	
☐ Lifting hooks(HP)	
☐ Safety shutter(SST)	
☐ Shutter lock(SST-LOCK)	
☐ Mis-insertion preventer(MIP) Note3	
☐ Test jumper(TJ) _____ units	

☐ Vertical terminal adapter(VTA)	Can be connected to the Horizontal terminals
☐ Front terminal adapter(FTA)	

Electrical P18~20 accessories	
☐ Auxiliary switch	☐ Standard (AX) ☐ High capacity (HAX)
☐ Motor charging (MD)	☐ AC • DC100~125V ☐ AC • DC200~250V ☐ DC24V ☐ DC48V
☐ Closing coil (CC)	☐ AC • DC100~250V ☐ DC24~48V
☐ Shunt trip device (SHT)	☐ AC • DC100~250V ☐ AC380~500V ☐ DC24~48V
☐ Under voltage trip device	☐ AC100~120 /200~240 /380~460V ☐ DC24V ☐ DC48V ☐ DC100~110V ☐ DC120~125V

Electronic trip relay accessories	
Blank	Not required
A	OCR alarm(30msec.1 pulse)
C	Load current measurement(voltage output)
T	Temperature alarm(LED&1a contact)

Control supply	
0	Not required(Only for S,SL type)
1	AC100~120/200~240V
2	DC100~110V
3	DC125V
4	DC24V
5	DC48V

Machine P21~22 accessories	
☐ Push button cover(BC-L)	
☐ Counter(CNT)	
☐ Cylinder lock(CYL)	
☐ Door interlock(DI) Note9	
☐ Terminal cover(TTC)	
☐ Door frame(DF)	
☐ Dust cover(DUC)	
☐ Interphase barrier(BA) Note1,3	
☐ Mechanical interlock(MI) ☐ for 2units ☐ for 3units	

Drawout type accessories P23~24	
☐ Cell switch CL- ☐ C ☐ T ☐ D (Maximum: 4 pcs.)	
☐ Shorting-B contact(SBC)	
☐ Lifting hooks(HP)	
☐ Safety shutter(SST)	
☐ Shutter lock(SST-LOCK)	
☐ Mis-insertion preventer(MIP) Note3	
☐ Test jumper(TJ) _____ units	

☐ Vertical terminal adapter(VTA)	Can be connected to the Horizontal terminals
☐ Front terminal adapter(FTA)	

Electrical P18~20 accessories	
☐ Auxiliary switch	☐ Standard (AX) ☐ High capacity (HAX)
☐ Motor charging (MD)	☐ AC • DC100~125V ☐ AC • DC200~250V ☐ DC24V ☐ DC48V
☐ Closing coil (CC)	☐ AC • DC100~250V ☐ DC24~48V
☐ Shunt trip device (SHT)	☐ AC • DC100~250V ☐ AC380~500V ☐ DC24~48V
☐ Under voltage trip device	☐ AC100~120 /200~240 /380~460V ☐ DC24V ☐ DC48V ☐ DC100~110V ☐ DC120~125V

Electronic trip relay accessories	
Blank	Not required
A	OCR alarm(30msec.1 pulse)
C	Load current measurement(voltage output)
T	Temperature alarm(LED&1a contact)

Control supply	
0	Not required(Only for S,SL type)
1	AC100~120/200~240V
2	DC100~110V
3	DC125V
4	DC24V
5	DC48V

Machine P21~22 accessories	
☐ Push button cover(BC-L)	
☐ Counter(CNT)	
☐ Cylinder lock(CYL)	
☐ Door interlock(DI) Note9	
☐ Terminal cover(TTC)	
☐ Door frame(DF)	
☐ Dust cover(DUC)	
☐ Interphase barrier(BA) Note1,3	
☐ Mechanical interlock(MI) ☐ for 2units ☐ for 3units	

Drawout type accessories P23~24	
☐ Cell switch CL- ☐ C ☐ T ☐ D (Maximum: 4 pcs.)	
☐ Shorting-B contact(SBC)	
☐ Lifting hooks(HP)	
☐ Safety shutter(SST)	
☐ Shutter lock(SST-LOCK)	
☐ Mis-insertion preventer(MIP) Note3	
☐ Test jumper(TJ) _____ units	

☐ Vertical terminal adapter(VTA)	Can be connected to the Horizontal terminals
☐ Front terminal adapter(FTA)	

Electrical P18~20 accessories	
☐ Auxiliary switch	☐ Standard (AX) ☐ High capacity (HAX)
☐ Motor charging (MD)	☐ AC • DC100~125V ☐ AC • DC200~250V ☐ DC24V ☐ DC48V
☐ Closing coil (CC)	☐ AC • DC100~250V ☐ DC24~48V
☐ Shunt trip device (SHT)	☐ AC • DC100~250V ☐ AC380~500V ☐ DC24~48V
☐ Under voltage trip device	☐ AC100~120 /200~240 /380~460V ☐ DC24V ☐ DC48V ☐ DC100~110V ☐ DC120~125V

Electronic trip relay accessories	
Blank	Not required
A	OCR alarm(30msec.1 pulse)
C	Load current measurement(voltage output)
T	Temperature alarm(LED&1a contact)

Control supply	
0	Not required(Only for S,SL type)
1	AC100~120/200~240V
2	DC100~110V
3	DC125V
4	DC24V
5	DC48V

Machine P21~22 accessories	
☐ Push button cover(BC-L)	
☐ Counter(CNT)	
☐ Cylinder lock(CYL)	
☐ Door interlock(DI) Note9	
☐ Terminal cover(TTC)	
☐ Door frame(DF)	
☐ Dust cover(DUC)	
☐ Interphase barrier(BA) Note1,3	
☐ Mechanical interlock(MI) ☐ for 2units ☐ for 3units	

Drawout type accessories P23~24	
☐ Cell switch CL- ☐ C ☐ T ☐ D (Maximum: 4 pcs.)	
☐ Shorting-B contact(SBC)	
☐ Lifting hooks(HP)	
☐ Safety shutter(SST)	
☐ Shutter lock(SST-LOCK)	
☐ Mis-insertion preventer(MIP) Note3	
☐ Test jumper(TJ) _____ units	

☐ Vertical terminal adapter(VTA)	Can be connected to the Horizontal terminals
☐ Front terminal adapter(FTA)	

Electrical P18~20 accessories	
☐ Auxiliary switch	☐ Standard (AX) ☐ High capacity (HAX)
☐ Motor charging (MD)	☐ AC • DC100~125V ☐ AC • DC200~250V ☐ DC24V ☐ DC48V
☐ Closing coil (CC)	☐ AC • DC100~250V ☐ DC24~48V
☐ Shunt trip device (SHT)	☐ AC • DC100~250V ☐ AC380~500V ☐ DC24~48V
☐ Under voltage trip device	☐ AC100~120 /200~240 /380~460V ☐ DC24V ☐ DC48V ☐ DC100~110V ☐ DC120~125V

Electronic trip relay accessories	
Blank	Not required
A	OCR alarm(30msec.1 pulse)
C	Load current measurement(voltage output)
T	Temperature alarm(LED&1a contact)

Control supply	
0	Not required(Only for S,SL type)
1	AC100~120/200~240V
2	DC100~110V
3	DC125V
4	DC24V
5	DC48V

Machine P21~22 accessories	
☐ Push button cover(BC-L)	
☐ Counter(CNT)	
☐ Cylinder lock(CYL)	
☐ Door interlock(DI) Note9	
☐ Terminal cover(TTC)	
☐ Door frame(DF)	
☐ Dust cover(DUC)	
☐ Interphase barrier(BA) Note1,3	
☐ Mechanical interlock(MI) ☐ for 2units ☐ for 3units	

Drawout type accessories P23~24	
☐ Cell switch CL- ☐ C ☐ T ☐ D (Maximum: 4 pcs.)	
☐ Shorting-B contact(SBC)	
☐ Lifting hooks(HP)	
☐ Safety shutter(SST)	
☐ Shutter lock(SST-LOCK)	
☐ Mis-insertion preventer(MIP) Note3	
☐ Test jumper(TJ) _____ units	

☐ Vertical terminal adapter(VTA)	Can be connected to the Horizontal terminals
☐ Front terminal adapter(FTA)	

Electrical P18~20 accessories	
☐ Auxiliary switch	☐ Standard (AX) ☐ High capacity (HAX)
☐ Motor charging (MD)	☐ AC • DC100~125V ☐ AC • DC200~250V ☐ DC24V ☐ DC48V
☐ Closing coil (CC)	☐ AC • DC100~250V ☐ DC24~48V
☐ Shunt trip device (SHT)	☐ AC • DC100~250V ☐ AC380~500V ☐ DC24~48V
☐ Under voltage trip device	☐ AC100~120 /200~240 /380~460V ☐ DC24V ☐ DC48V ☐ DC100~110V ☐ DC120~125V

Electronic trip relay accessories	
Blank	Not required
A	OCR alarm(30msec.1 pulse)
C	Load current measurement(voltage output)
T	Temperature alarm(LED&1a contact)

Control supply	
0	Not required(Only for S,SL type)
1	AC100~120/200~240V
2	DC100~110V
3	DC125V
4	DC24V
5	DC48V

Machine P21~22 accessories	
☐ Push button cover(BC-L)	
☐ Counter(CNT)	
☐ Cylinder lock(CYL)	
☐ Door interlock(DI) Note9	
☐ Terminal cover(TTC)	
☐ Door frame(DF)	
☐ Dust cover(DUC)	
☐ Interphase barrier(BA) Note1,3	
☐ Mechanical interlock(MI	

Ordering information for Mitsubishi AE-SS series air circuit breaker (General use ...C Type, Special use ...B-COA)

Customer(name) _____		Order No. _____		Number of units _____ units	
Type P13~16 AE _____ -SS _____ AE _____ -SH _____					
Number of poles ☐ 3P ☐ 4P Note1					
Rated current _____ A					
Applicable standard ☐ IEC 60947-2 ☐ JIS C8372 ☐ Others _____					
Ambient temperature ☐ 40°C ☐ Others _____ °C Note2					
Connection P17 ☐ Fixed type(FIX) Note3 ☐ Drawout type(DR) Note4					
Main circuit terminal Only for Horizontal terminals ☐ Horizontal terminals(standard) ☐ Vertical terminals(DR-VT) ☐ Front terminals(DR-FT)					
Drawout type accessories P23~24 ☐ Cell switch CL- ☐ C ☐ T ☐ D (Maximum: 4 pcs.) ☐ Shorting-B contact(SBC) ☐ Lifting hooks(HP) ☐ Safety shutter(SST) ☐ Shutter lock(SST-LOCK) ☐ Mis-insertion preventer(MIP) Note3 ☐ Test jumper(TJ) _____ units ☐ Vertical terminal adapter(VTA) Can be connected to the Horizontal terminals ☐ Front terminal adapter(FTA)					
Electronic trip relay P25~40 Electronic trip relay type C-0 C type Note1, Note3 BARE Relay not require Note5 If the special use relay (B-COA) is required, enter [B] - [C0]; [A] in the column. Note5 ☐ Y-2000 field test device _____ AC100~240V ☐ Y-160 field test device _____ ☐ AC100~120V ☐ AC200~240V					
Electrical accessories P18~20 ☐ Auxiliary switch ☐ Standard(AX) ☐ High capacity(HAX) ☐ Motor charging(MD) ☐ Closing coil(CC) ☐ Shunt trip device (SHT) ☐ Under voltage trip device ☐ Instantaneous(UVT-SSB) ☐ 0.5sec Time-delay type (UVT-05SSB) ☐ 3sec Time-delay type (UVT-30SSB) ☐ AC • DC100~125V ☐ AC • DC200~250V ☐ DC24V ☐ DC48V ☐ AC • DC100~250V ☐ DC24~48V ☐ AC • DC100~250V ☐ AC380~500V ☐ DC24~48V ☐ AC100~120 /200~240 ☐ /380~460V ☐ DC24V ☐ DC48V ☐ DC100~110V ☐ DC120~125V ☐ A ☐ B Max.5A5B *A"and"B"should be same. ☐ Condenser trip device (COT) ☐ AC100~110V ☐ AC200~220V					
Machine accessories P21~22 ☐ Push button cover(BC-L) ☐ Counter(CNT) ☐ Cylinder lock(CYL) ☐ Door interlock(DI) Note6 ☐ Terminal cover(TTC) ☐ Door frame(DF) ☐ Dust cover(DUC) ☐ Interphase barrier(BA) ☐ Mechanical interlock(MI) ☐ for 2units ☐ for 3units Special environments P66 ☐ Moisture-fungus treatment ☐ Extra-corrosion proof specification Data ☐ Specifications ☐ Test report					
Remark Production date					

Ordering information for Mitsubishi AE-SS series air circuit breaker (Generator protection useM Types)

Customer(name) _____		Order No. _____		Number of units _____		units _____																											
Type P13~16 AE _____ -SS _____ AE _____ -SH _____																																	
Number of poles ☐ 3P ☐ 4P Note1, Note2																																	
Rated current _____ A																																	
Applicable standard ☐ LR ☐ AB ☐ GL ☐ DNV ☐ BV ☐ NK ☐ IEC 60947-2 ☐ Others _____																																	
Ambient temperature ☐ 45°C ☐ Others _____ °C Note3																																	
Connection P17 ☐ Fixed type(FIX) Note4 ☐ Drawout type(DR) Note5																																	
Main circuit terminal ☐ Only for Horizontal terminals ☐ Horizontal terminals(standard) ☐ Vertical terminals(DR-VT) ☐ Front terminals(DR-FT)																																	
Drawout type accessories P23~24 ☐ Cell switch CL- ☐ C ☐ T ☐ D (Maximum: 4 pcs.) ☐ Shorting-B contact(SBC) ☐ Lifting hooks(HP) ☐ Safety shutter(SST) ☐ Shutter lock(SST-LOCK) ☐ Mis-insertion preventer(MIP) Note4 ☐ Test jumper(TJ) _____ units ☐ Vertical terminal adapter(VTA) Can be connected to the Horizontal terminals ☐ Front terminal adapter(FTA)																																	
Electronic trip relay P25~40 <table border="1" style="margin-right: 10px;"> <caption>Electronic trip relay type</caption> <tr><td>M</td><td>M...Standard</td></tr> <tr><td>MT</td><td>T...Trip indication</td></tr> <tr><td>MPT</td><td>P...Pre-alarm</td></tr> <tr><td>MPGT</td><td>G...Ground fault protection Note6</td></tr> </table> <table border="1"> <caption>Control supply</caption> <tr><td>0</td><td>Not required(Only for M type)</td></tr> <tr><td>1</td><td>AC100 - 120/200 - 240V</td></tr> <tr><td>2</td><td>DC100 - 110V</td></tr> <tr><td>3</td><td>DC125V</td></tr> <tr><td>4</td><td>DC24V</td></tr> <tr><td>5</td><td>DC48V</td></tr> </table> <table border="1"> <caption>Electronic trip relay accessories</caption> <tr><td>Blank</td><td>Not required</td></tr> <tr><td>A</td><td>OCR alarm(30msec.1 pulse)</td></tr> <tr><td>T</td><td>Temperature alarm(LED & 1a contact)</td></tr> </table>								M	M...Standard	MT	T...Trip indication	MPT	P...Pre-alarm	MPGT	G...Ground fault protection Note6	0	Not required(Only for M type)	1	AC100 - 120/200 - 240V	2	DC100 - 110V	3	DC125V	4	DC24V	5	DC48V	Blank	Not required	A	OCR alarm(30msec.1 pulse)	T	Temperature alarm(LED & 1a contact)
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Electrical accessories P18~20 ☐ Auxiliary switch ☐ Standard(AX) ☐ A ☐ B Max.5A5B *"A"and"B"should be same. ☐ High capacity(HAX) ☐ Motor charging(MD) Note:When specifying MD, be sure to order the closing coil (CC) and shunt trip device(SHT)for remote operation. ☐ AC • DC100 - 125V ☐ AC • DC200 - 250V ☐ DC24V ☐ DC48V ☐ Closing coil(CC) ☐ AC • DC100 - 250V ☐ DC24 /48V ☐ Shunt trip device (SHT) ☐ AC • DC100 - 250V ☐ AC380 - 500V ☐ DC24 - 48V ☐ Under voltage trip device ☐ AC100 - 120 /200 - 240 ☐ 0.5sec Time-delay type (UVT-05SSB) ☐ 380 - 460V ☐ 3sec Time-delay type (UVT-30SSB) ☐ DC24V ☐ DC48V ☐ DC100 - 110V ☐ DC120 - 125V Specify the tripping characteristics Refer to P28, 46, 47. LTD Current % of Rated Current LTD Time sec. at 120% of LTD Current STD Current % of Rated Current STD Time sec. at 150% of STD Current INST Current % of Rated Current PAL Current % of LTD Current PAL Time 50 % of LTD Time GFR Current % of Rated Current MAX. GFR Time sec. at 150% of GFR Current ☐ Neutral CT(NCT) ☐ Y-2000 field test device _____ AC100 - 240V																																	
Machine accessories P21~22 ☐ Push button cover(BC-L) ☐ Counter(CNT) ☐ Cylinder lock(CYL) ☐ Door interlock(DI) Note7 ☐ Terminal cover(TTC) ☐ Door frame(DF) ☐ Dust cover(DUC) ☐ Interphase barrier(BA) ☐ for 2units ☐ Mechanical interlock(MI) ☐ for 3units ☐ Condenser trip device (COT) ☐ AC100 - 110V ☐ AC200 - 220V																																	
Special environments P66 ☐ Moisture-fungus treatment ☐ Extra-corrosion proof specification Remark 																																	
Data ☐ Specifications ☐ Test report Production date <table border="1" style="width:100%; height: 40px;"> <tr> <td style="width: 25%;"></td> <td style="width: 25%;"></td> <td style="width: 25%;"></td> <td style="width: 25%;"></td> </tr> </table>																																	

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Service network

Country/Region	Company	Address	Telephone
U.K.	Mitsubishi Electric Europe B.V. UK-Branch.	Travellers Lane, Hatfield, Herts, AL10 8 XB, England, U.K.	44-1707,276,100
Ireland	Irish Branch.	Westage Business Park, Ballymount, Dublin 22, Ireland.	353-1-4505007
Germany	German Branch.	Gother Strasse 8, 40880 Ratingen, Germany.	49-2102-4860
Italy	Carpaneto 10090 CASCINE VICA-RIVOLI (TO)	Via Ferrero, 10-Ang. Pavia 6 Italy.	39-11-9590111
Spain	Spanish Branch (Barcelona).	Polingono Industrial "Can Magi", Calle Joan Buscallà 2-4, Apartado de Correos 420,08190 Sant Cugat del Valles, Barcelona, Spain.	34-93-565-3131
Sweden	Euro Energy Components AB	Box 10161 S-43422 Kungsbacka	(0300)51800
Norway	SCANELEC	5074 Godvik Leirvikasen 43B. Norway.	47-55-506000
Denmark	ELPEFA A/S	Geminivej 32, DK-2670 Greve, Denmark.	45-43-694369
Greece	Antonios Drepanias.S.A.	ANTONIOS DREPANIAS 52, ARKADIAS STR.GR 121 32,PERISTERI ATHENS GREECE	30(1)5781599, 30(1)5781699
The Netherlands	R+H Technology BV.	3361 HJ Sliedrecht Industrieweg 30. Netherlands.	31-104871521
Switzerland	Trielec A G	8201 Schaffhausen Mühlerentalstrasse 136. Switzerland	41-52-6258425
Belgium	Emac S.A.	1702 Groot-Bijgaarden Industrialaan 1, Belgium.	32-2-4810211
Poland	MPL Technology Sp zo.o.	30011 Krakow Ul. Wroclawska 53 Poland.	48-12-322885
Israel	Gino Industries LTD.	3, Ophir St. 32235 Haifa Israel.	972-4-8670656
Turkey	HEDEF	Balmumcu-Istanbul Barboros Bulv. iba Blokleri Gazi Umur P. So Turkey.	90-212-2754876
Slovenia	INEA	61230 Domzale Ljubljanska 80 Slovenia.	386-61-718000
South Africa	M.S.A.MANUFACTURING(PTY)LTD.	BRAMLEY 2018 JOHANNESBURG SOUTH AFRICA.	27-011-444-8080
Lebanon	COMPTOIR D'ELECTRICITE GENERALE-LIBAN	CEBACO CENTER-BLOCK A AUTOSTRADE DORA P.O. BOX: 90-1314, BEIRUT-LEBANON.	961-1-240430
Saudi Arabia	CENTER OF ELECTRICAL GOODS	AL-NABHANIYA STREET-4Th CROSSING AL-HASSA ROAD P.O. BOX: 15955 RIYADH 11454, SAUDI ARABIA.	966-1-4770149
Egypt	CAIRO ELECTRICAL GROUP	9 ROSTOUM STREET GARDEN CITY, P.O. BOX: 165-11516, CAIRO EGYPT.	202-356-1337
Kuwait	SALEM M AL-NISF ELECTRICAL CO.W.L.L.	P.O. Box 4784. Safat.13048.Kuwait.	965-484-5660
China	SETSUYO AUSCHINA ELECTRIC CO. LTD.	Building of Innovation Center, Room No. 406A, Guiping Road Shanghai China	021-6485-6611
	RYODEN INTERNATIONAL LTD.	3F Block 5 Building, Automation Instrumentation Plaza, 103 Cao Bao Road, Shanghai 200233, China	86-21-6475-3228
Hong Kong	Ryoden international Ltd.	10/F Manulife Tower 169 Electric Road North Point. Hong Kong.	28878870
Taiwan	Setsuyo Enterprise Co., Ltd.	8th Fl. NO.88 SEC. 6, Chung-Shan N Rd. Taipei, Taiwan	02-2381-3015
Korea	STC Techno Seoul Co., Ltd.(Setsuyo)	2 Fl. Dong Seo Game Channel Bldg ., 660-11 Deungchon-Dong, Kangseo-Ku, Seoul, Korea	02-3664-8333
Singapore	MITSUBISHI ELECTRIC ASIA PTE LTD	307 ALEXANDRA ROAD #05-01/02 MITSUBISHI ELECTRIC BUILDING SINGAPORE 159943	65-473-2308
Indonesia	P.T.SAHABAT INDONESIA.	Jl. Muara Karang Selatan Blok A/Utara No.1 kav.11 NO.1 P.O. Box 5045/Jakarta/11050. Jakarta Indonesia.	021-6621780
Philippines	EDISON ELECTRIC INTEGRATED INC.	24th Fl. Galleria Corporate Center Edsa Cr, Ortigas Ave. Quezon City, Metro Manila. Philippines.	02-643-8691
Thailand	UNITED TRADING & IMPORT CO. LTD.	77/12 BAMRUNG MUANG ROAD, KLONG MAHANAK, POMPRAB, BANGKOK 10100. Thailand.	02-223-4200-3
Pakistan	Prince Electric Co.	16 Brandreth Road Lahore 54000. Pakistan.	042-7654342
Vietnam	Sa Giang Techno co., Ltd.(Setsuyo)	207/4 NGUYEN VAN THU ST., DA KAO WARD, DIST 1 HCMC, VIETNAM	848-821-5450
Lao PDR	SOCIETE LAO IMPORT-EXPORT	43-47 LANE XANG ROAD P.O. BOX 2789 VT VIENTIANE LAO PDR.	21-215043, 21-215110
Myanmar	PEACE MYANMAR ELECTRIC CO., LTD.	NO. 216, BO AUNG GYAW STREET, BOTATAUNG 11161, YANGON, MYANMAR.	951-295426
Nepal	Watt & Volt House Co., Ltd.	KHA 2-65, Volt House Dilli Bazar Post Box: 2108, kathmandu, Nepal	977-1-411330
Australia	348 VICTORIA ROAD.	P.O. BOX: 11, RYDALMERE NSW 2166.	612-9684, 7245
New Zealand	Melco Sales (N.Z.) Ltd.	1 Parliament Street Lower Hutt. New Zealand.	644-569-7350
Colombia	Proelectrico LTDA.	Carrera 43G No. 27-12 P.O. Box 4346 Medellin. COLOMBIA.	(4) 2623038
Chile	RHONA S.A.	Vte. Agua Santa 4211 Casilla (P.O. Box) 30-D Viña Del Mar. Chile	(32)-611294
Uruguay	Fierro Vignoli S.A.	Avda. 1274 Montevideo. Uruguay.	(2) 921230
Peru	I.T.E.	Ingenieros s.a. Paseo de la Republica 3573 Lima 27. Peru.	(1) 221-2710
Venezuela	ADESCO C.A.	Calle 7,EDF.LOS ROBLES,LOCALES CYD URBANIZACION LA URBINA -EDO,MIRANDA P.O. BOX 78034 CARACAS 1074A	(2) 241-7634

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 **mitsubishi electric corporation**
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