

AUTOMATIC TRANSFER SWITCHES

SSK SERIES

E TYPE (Opened Transition)

Instantaneous Excitation & Mechanical Holding Type

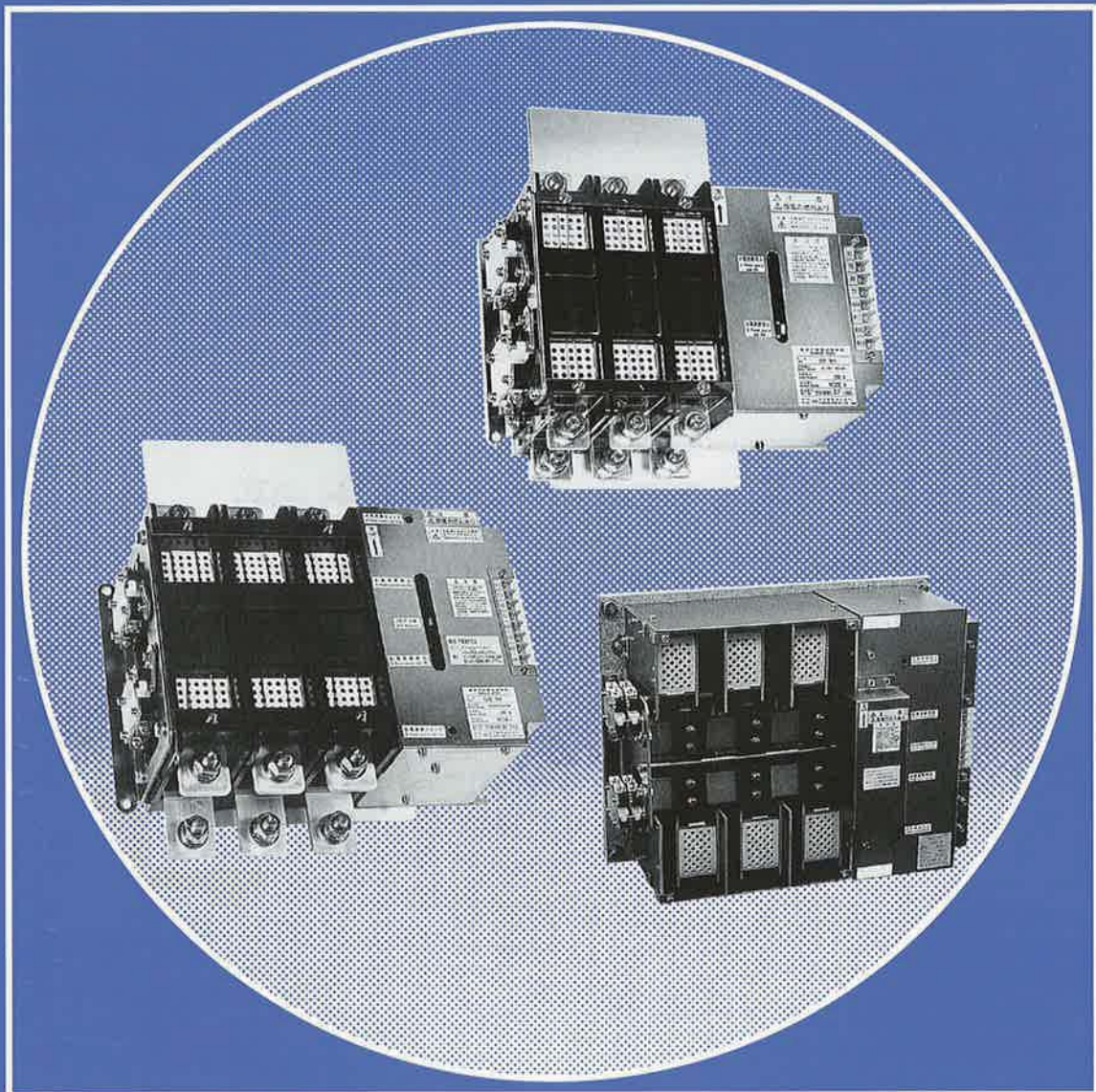
NE TYPE (Delayd Transition)

Instantaneous Excitation & Mechanical Holding Type with OFF Position

LE TYPE (Closed Transition)

OVERLAP TRANSFER SWITCH

Instantaneous Excitation & Mechanical Holding Type

**WashiON**共立継器株式会社
KYORITSU KEIKI CO.,LTD.

Safety Instructions



For proper and safe operation, be sure to carefully read the Instruction Manual, "Safety Instructions" and "Operating Instructions" before starting to use the Transfer Switch.

- Install the transfer switch in the vertical position as indicated by the UP marking. Failure to install in the correct orientation may lead to malfunction.
- Provide the arcing space specified in the catalog around the transfer switch. Arc coming into contact with a metallic object at shutdown can cause accidents.
- Do not allow a voltage drop of more than 4 percent for the control circuit, including the control wiring and contacts of control contactors. Large voltage drop can cause malfunction or abnormal heating.
- Design the circuit in such a way that no simultaneous excitation command or continuous alternate excitation command is given to the control coils. Incorrect circuit design can cause malfunction or abnormal heating.
- Be sure to install a fuse for protecting the control circuit. The fuse capacity should be 40 to 50 percent of the rated coil current.
- When the transfer switch is to be used with an induction motor, provide a circuit to protect the switch from abnormal inrush current caused at switching. Also the switch to be used must have a sufficient capacity.
- When used with a transformer, capacitor or incandescent lamp, select the transfer switch that has a capacity large enough to withstand expected transient inrush current.

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TRANSFER SWITCHES

Instantaneous Excitation & Mechanical Holding Type

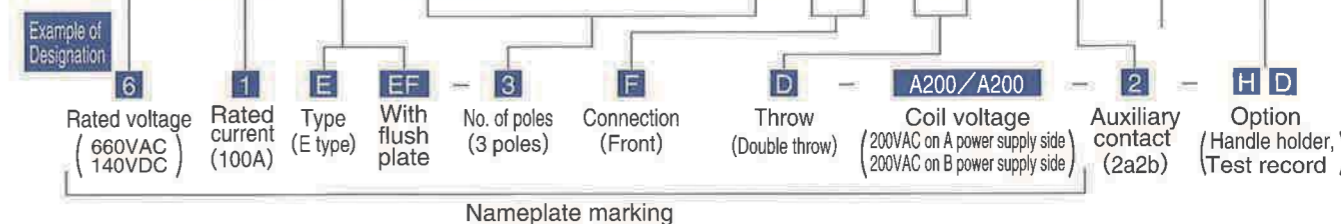
■ Features

- Small size and light weight
- Control circuit and main circuit housed in a casing
- Dedicated auxiliary contact built in for instantaneously cutting off control auxiliary relay
- Terminal covers provided for control circuit and main circuit (Terminal cover for main circuit: Front type only)
- Environment friendly contacts free of cadmium
- A wide range of models to select from for your applications
- The main contacts of each phase (contacts of A power supply and B power supply) have each arcing space.

■ Model Designation and Selection

- Standard model (Models immediately available to order)
- Semi-standard model (Models produced on standard lines and so available in short lead time)
- Non-standard model (Models produced to individual orders)

Rated voltage	Rated current	Type	No. of poles (Neutral pole of N3, N4 : earlier make and later break)					Connection		Throw		Auxiliary circuit (auxiliary contact)	Option		
			1 P	2 P	3 P	3 P (single phase, 3 wire)	4 P	4 P (3 phase, 4 wire)	Front	Back	Double throw			Single throw	
			1	2	3	N3	4	N4	F	B	D	S			
250VAC 140VDC	03 30A	E												2a2b standard (1a1b on each power supply side)	H Handle holder
	06 60A														
	1 100A														
	1.5 150A														
	2 200A														
	3 300A														
660VAC 140VDC	4 400A	EF											4a4b max. (2a2b on each power supply side)	R Auxiliary relay panel	
	6 600A														
	8 800A														
	10 1000A														
	12 1200A														
	16 1600A														
660VAC	20 2000A												(4a4b : optional)	D Test record	
	30 3000A														
	40 4000A														
	50 5000A														



● Standard accessories

- Operation handle
- Control circuit terminal cover
- Main circuit terminal cover (Front only)
- Main circuit terminal bolt (400A or below)

- NOTES
1. Standard control coil voltages are 100/110VDC, 100/110VAC and 200/220VAC. Other voltages are available to individual orders.
 2. Even with the back connection type, front wiring is used for the control circuit and auxiliary circuit.
 3. The electrical and mechanical interlocks assure error-free operation both in auto and manual mode.

standard : JEM1038 · JEM1465 · IEC60947-6-1 · JIS C-8325 · UL1008 · CCC (NE TYPE)

1 Installation

1-1 Environment of installation

- Do not install the transfer switch in an environment of high temperature or high humidity or in an atmosphere containing dust or harmful gases.
- The environmental requirements are in compliance with JEM 1038 (1990) as follows:
 - Altitude : 2000m or below
 - Ambient temperature : -5°C~40°C (average temperature of a day : 35°C or below)
 - Relative humidity : 45% ~ 85%RH
 - No abnormal vibration or shocks
 - Atmosphere free from excessive water vapor, oil vapor, smoke, dust, salt, corrosive material, etc.
- About use under conditions other than specified, contact Kyoritsu Keiki for advice.
- The approximate reduction rate of the rated operating current for use at high temperatures above 40°C is as follows:

50°C ... 90%	60°C ... 80%
--------------	--------------

1-2 Positioning

- Install the transfer switch according to the UP marking.
For installation in orientation other than specified, consult Kyoritsu Keiki.
- Attach the mounting base on a vertical surface, and install the transfer switch with the control circuit, main circuit and auxiliary circuit in this order from right to left.

2 Control Circuit

2-1 Pickup voltage

- The control coils of the transfer switch are an instantaneous excitation type and of short time rating. The pickup voltage range is as follows:

AC control	80 to 120% of rated voltage
DC control	80 to 130% of rated voltage
- Make sure that the control voltage does not drop below 80 percent of the rated voltage at the control terminals of the transfer switch.
- In order to prevent action failure, make certain that the voltage drop is less than 4 percent in the wiring from power supply to the terminals of the control circuit, including the contacts of the excitation contactor.

2-2 Control circuit

- Be sure to fit a fuse for coil protection in the control circuit.
- Although the switching operation is completed within 0.3 seconds, give a signal of 0.5 seconds or longer so as to ensure reliable operation.
- Be sure to provide an interlock circuit so as to make sure that no simultaneous excitation commands, continuous alternate excitation commands or simultaneous excitation commands for the same direction work on the control coils.
- The transfer switch is of such design that on completion of operation the control current is turned off by the internal contact. Use of any external auxiliary contact can cause failure of the operation.
- Where there is a dropper circuit provided for control power supply (DC), connect the control power supply to the input side of the dropper circuit. (Never connect it to the output side.)
- For sequence and control, select proper contactors and sensors with full understanding of their performance.
- The exciting coils have a built-in thermal protector as a protection against continuous energization. (For AC operation)
- The reset time when the thermal protector has operated is 15 to 60 minutes. Before being reset, the transfer switch will not work even when a switching signal is given.

2-3 Coil protection fuse

- When introducing fuse for coil protection, select a fuse whose capacity is 40 to 50% of the rated coil current and use it solely for the transfer switch (excl. control contactor, etc.). Too large fuse capacity will not serve the purpose of coil protection.
- Kyoritsu is positive of the absolute safety of the operation of SSK Series. Even if any improper control circuit or parts are used, the control coil of SSK Series, which is of short-time rating, contains a thermal protector within to prevent the burnout or melting of the coil thus assuring absolute safety.

2-4 Control contactor

- The control contactor must be highly reliable to always ensure normal operation of the transfer switch. That is, the contactor to be used must have a switching capacity large enough to withstand the induction load of the control coil.
- For direct control with the contacts of undervoltage relay (27), built-up voltage relay (84) and timer (T), use a relay whose contact capacity is larger than the control current of the transfer switch. And use a built-up voltage relay (84) whose pickup voltage is 80% or above. (Use of a general-purpose relay, whose pickup voltage is below 80%, can cause operation failure or other trouble.)
- The power relay and built-up voltage relay, when used, will cause repetition of switching if their operation and reset timings are set extremely short. Therefore set proper operation and reset timings upon confirming the load and power supply conditions.
- Do not use ordinary miniature relays or the like as a making auxiliary relay. If they are used, operation failure may result from the bouncing or voltage drop at the contacts. Therefore select an auxiliary relay with sufficient capacity. You are advised to use an auxiliary relay of the contactor type.

2-5 Capacity of control transformer

- The capacity of the control transformer must be equal to or larger than the value calculated by the following equation:

$$\square \text{ VA} = \text{Control voltage} \times \text{Control current} \times 0.6$$

3 Main Circuit

3-1 Main circuit connection

- Select wires to be connected which have proper current capacity.
- When tightening, take care not to apply excessive stress to the terminals.

3-2 Arcing space

- When installing the transfer switch, be sure to provide arcing space as indicated in "Overall Dimensions". Arc at the time of breaking, when it comes in contact with any other device or metal body, can lead to some accident.

3-3 Use with induction motor

- An induction motor, when used with the transfer switch, turns into a generator at the moment of switching when the input becomes zero, thus generating a voltage. If another voltage 180 degrees out of phase with the generated voltage should be inputted, an abnormally large current will flow and cause a fused contact of the switch. To prevent such an accident, provide an appropriate circuit and select an appropriate transfer switch of sufficient capacity.

3-4 Use with transformer

- A transient inrush current is generated at the turning-on of power to a transformer. The current can be about 20 times as large as the normal current. Therefore, select a transfer switch of a capacity large enough to withstand such a current.

3-5 Use with capacitor

- An inrush current may occur when the transfer switch is used with a capacitor as the load. When two or more capacitors connected in parallel are switched on in sequence, a voltage equalization current between the capacitors is added to the inrush current from the power supply. Select a transfer switch of appropriate capacity in consideration of such currents.
- A capacitor circuit, generally speaking, should be provided with a series reactor (6% of the capacitor reactance).

3-6 Use with electric lamp

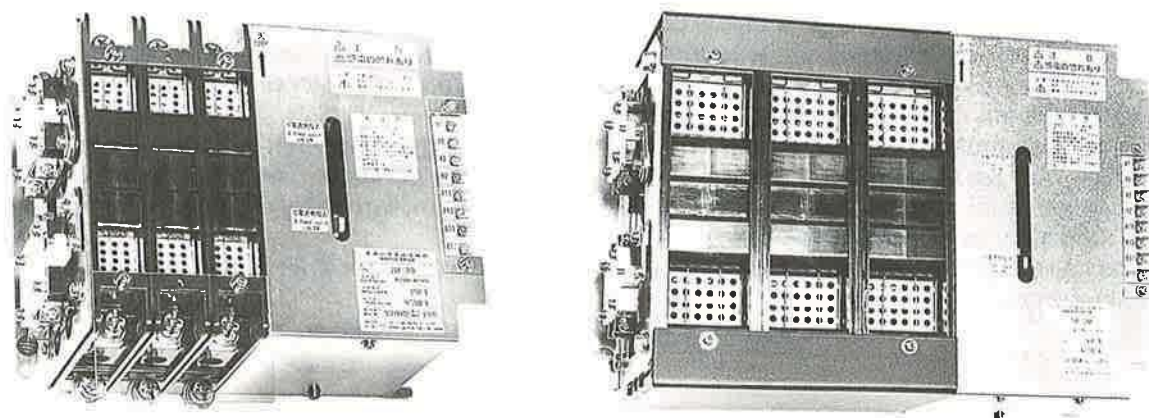
- When an electric lamp is the load, prepare for inrush currents by selecting a transfer switch of appropriate capacity.
The transient inrush current of an incandescent electric lamp is about 10 times as large as the rated current and it becomes a steady current within about 0.1 second.
- With a fluorescent lamp, the starting current, about 10 times the rated lamp current, flows for about 2 seconds, although that varies with the presence or absence of a stabilizer circuit or power-factor regulating capacitor.
- A mercury lamp is provided with a stabilizer of general type, low starting current type or constant power type. With the general type or the low starting current type, the starting current of about 1.8 times the steady current flows for about 5 minutes.

4 Manual Operation

- Manual operation of the transfer switch is to be performed for checks. Never conduct this checking while power is being supplied.
- Be sure to turn off the main circuit and control circuit before manual operation.

1 Features

- 250VAC rating
- Small-size and lightweight
- A broad variety of models



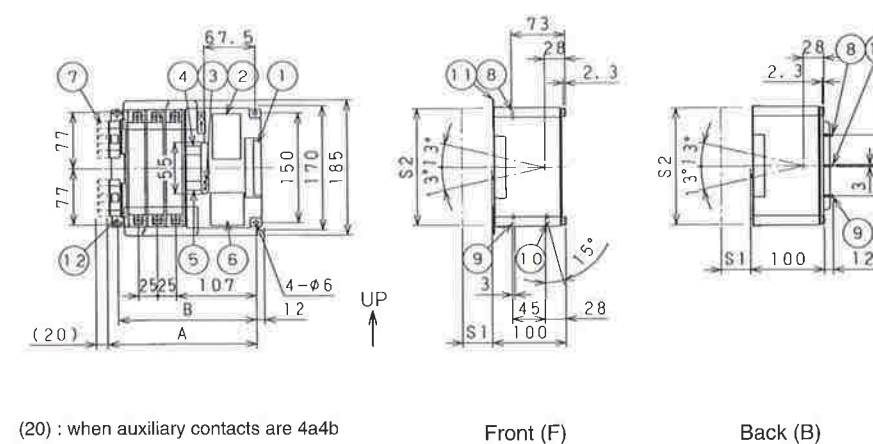
2 Specifications

Type	203 E	206 E	21 E	21.5 E	22 E	23 E	24 E
Rated voltage	250VAC/140VDC						
Rated current	30A	60A	100A	150A	200A	300A	400A
Throw	Double throw (D), Single throw (S)						
Connection	Front (F), Back (B)						
Weight Front (Back)	2 P	4.8 Kg (4.6 Kg)	6.9 Kg (6.7 Kg)	8.4 Kg (8.0 Kg)	15.2 Kg(14.6Kg)		
	3 P	5.3 Kg (5.1 Kg)	7.8 Kg (7.6 Kg)	10.1 Kg (9.7 Kg)	18.4 Kg(17.8Kg)		
	4 P	5.8 Kg (5.6 Kg)	8.7 Kg (8.5 Kg)	11.8 Kg (11.4 Kg)	21.6Kg(21.0Kg)		
Control current	2 P	100VDC	2.5 A	3.5 A	6.0 A	8.3 A	
		100VAC	2.9 A	3.9 A	6.4 A	9.8 A	
	3 P	200VAC	1.5 A	2.0 A	3.3 A	5.4 A	
		100VDC	3.2 A	6.0 A	8.6 A	12.1 A	
	4 P	100VAC	3.5 A	6.4 A	10.2 A	14.1 A	
		200VAC	1.7 A	3.3 A	5.1 A	6.8 A	
Coil insulation class	A class (short time rating)						
Withstand voltage	Main circuit	2500V AC, one minute (50/60 Hz)					
	Control circuit	2000V AC, one minute (50/60 Hz)					
Short time current capacity (1sec during conduction)	2 kA	5 kA	10 kA	12 kA			
Short peak current	5 kA	12 kA	25 kA	30 kA			
Make and break capacity	AC 3 class (10Ie make, 8Ie break Cos φ=0.35) DC 1 class (1.1Ie make, 1.1Ie break L/R=1ms)						
Life	Class 4 (mechanical life: 250,000 times, electrical life: 50,000 times)						
Switching frequency	No. 4 (150 times / hr)						
Switching characteristics (at rated voltage)	Opening time	0.02 sec	0.022 sec	0.025 sec	0.03 sec		
	Switching time	0.05 sec	0.06 sec	0.07 sec	0.09 sec		
Auxiliary contact make & break capacity	Max. 250VAC 15A, 110VDC 5A, Min. 24VDC 0.1A						
Notes	1	Weight represents that of Double throw (D) ,Front (F) and Back (B) type.					
	2	Even with the back (B) connection type, front wiring is to be performed for the control circuit and auxiliary circuit.					
	3	Opening time is the time when the contact is not in either make or break position. Switching time is the time from control signal ON to contact making.					

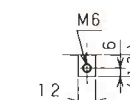
3 Overall Dimensions (Drawings represent 3P)

- Control circuit terminal block (M3.5)
- Safety label
- Manual closing handle inlet
- A power supply closing marking
- B power supply closing marking
- Model nameplate
- Auxiliary circuit terminal (M4)
- A power supply main circuit terminal
- B power supply main circuit terminal
- Load main circuit terminal
- Main circuit terminal cover (Front only)
- Earth terminal (also for mounting use)

203E, 206E

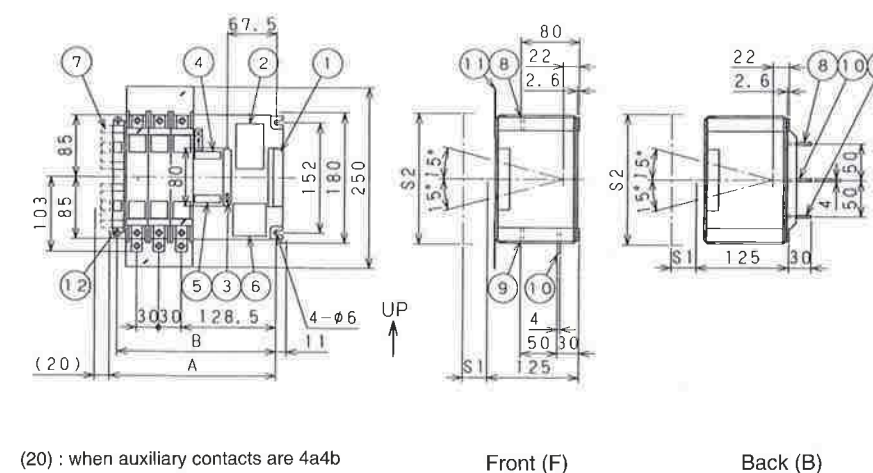


Dimension Poles	A	B	Arc space	
			S 1	S 2
2 P	190	160		
3 P	215	185	20	160
4 P	240	210		

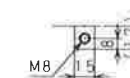


Detail of Terminal
() : Connectable dimension

21E, 21.5E

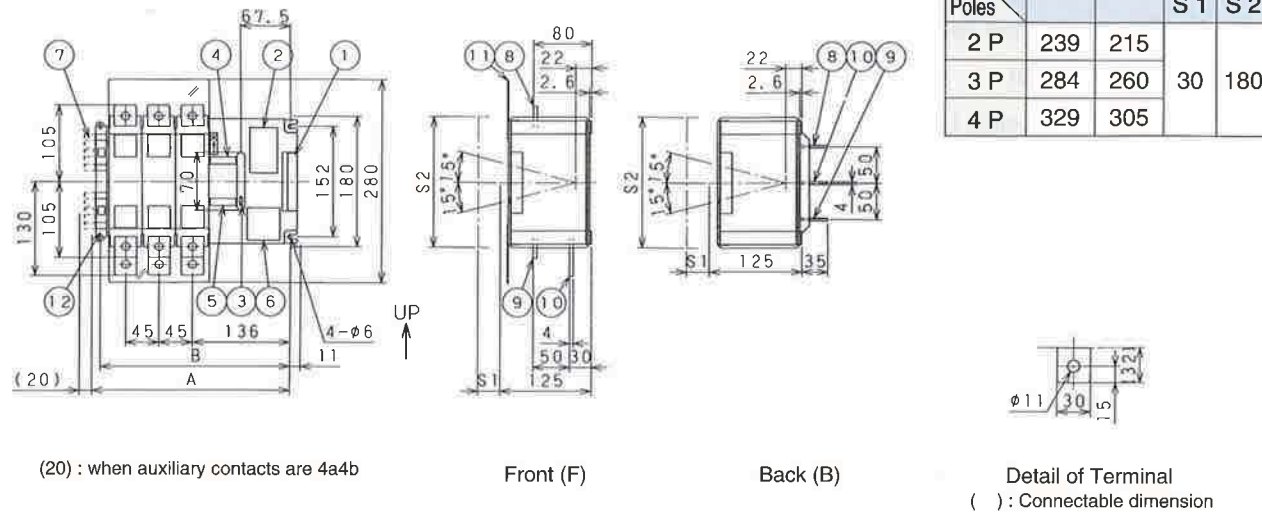


Dimension Poles	A	B	Arc space	
			S 1	S 2
2 P	209	185		
3 P	239	215	30	180
4 P	269	245		

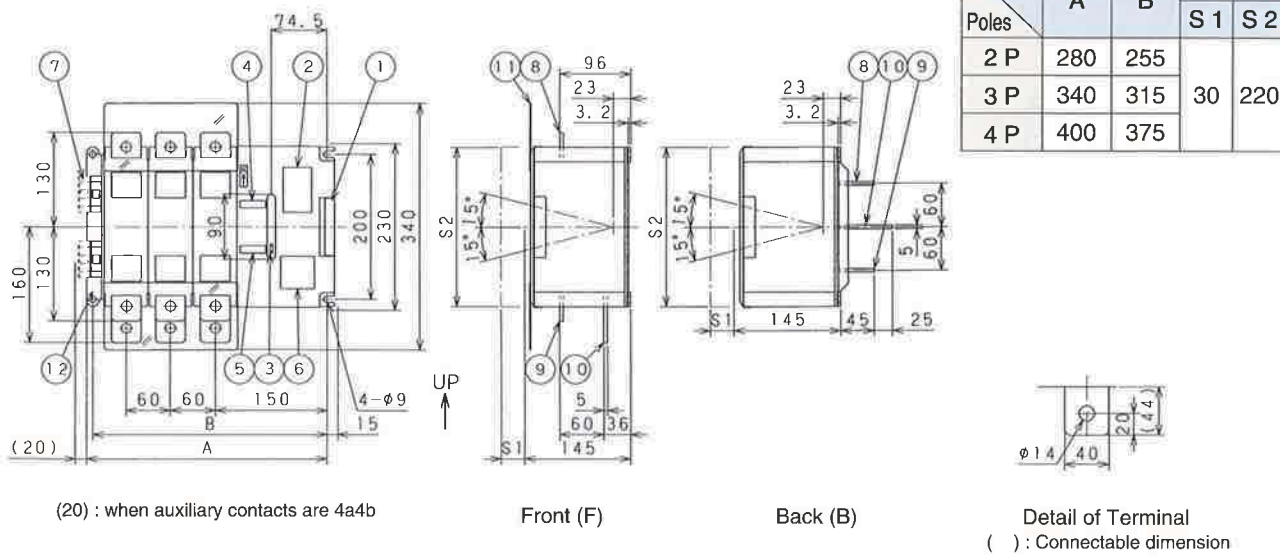


Detail of Terminal
() : Connectable dimension

22E, 23E

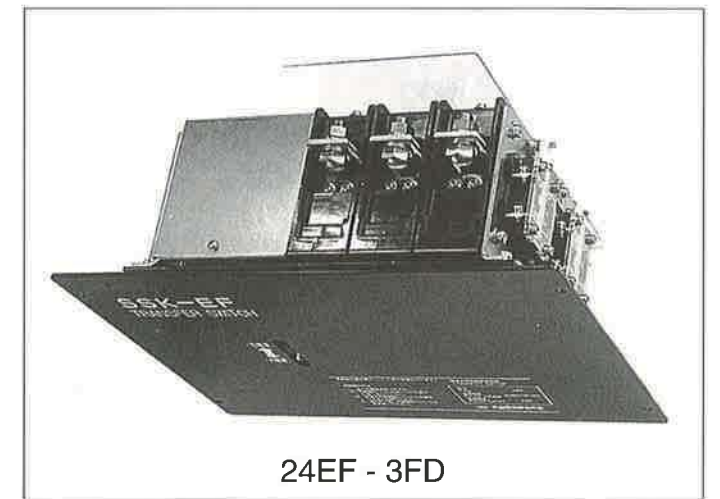


24E



1 Features

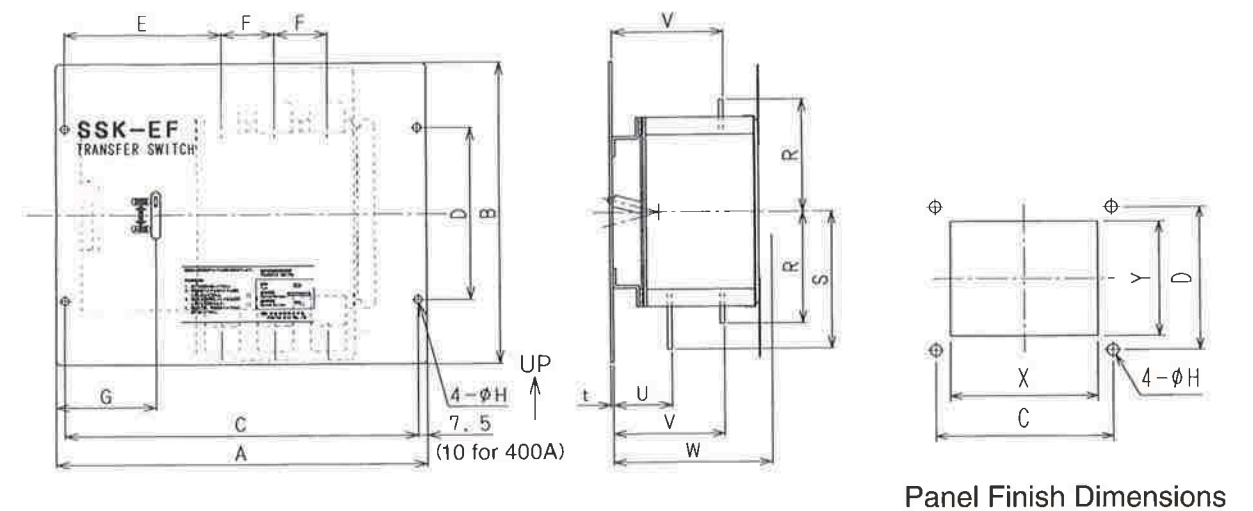
- Flush plate provided
- 250VAC rating
- Mounted on flush plate at delivery
- Manual operation possible for both front and back types



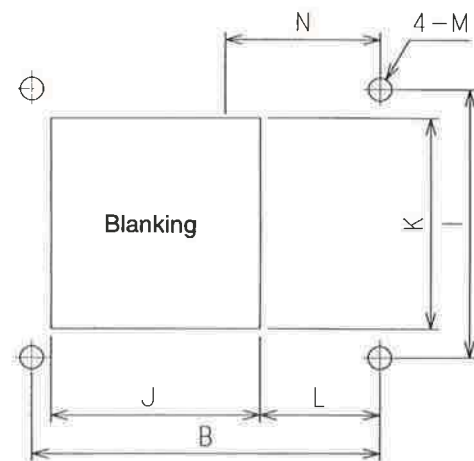
NOTE :
Be sure to specify the EF type when ordering this type of transfer switch.

2 The rated specifications are the same as those for the E type

3 Overall Dimensions



4 Panel Finish Dimensions



Type	203E 206E	21E 21.5E	22E 23E	24E	
B	2 P	160	185	215	255
	3 P	185	215	260	315
	4 P	210	245	305	375
J	2 P	75	75	105	135
	3 P	100	105	150	195
	4 P	125	135	195	255
I	150	152	152	200	
K	140	140	150	180	
L	75	100	100	110	
M	φ6	φ6	φ6	φ9	
N	107	128.5	136	150	

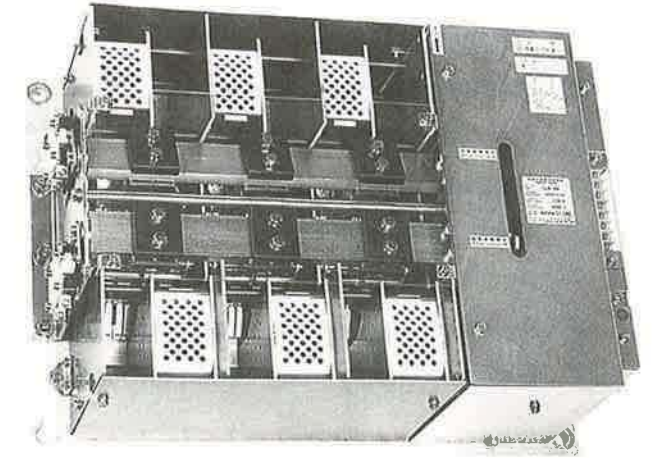
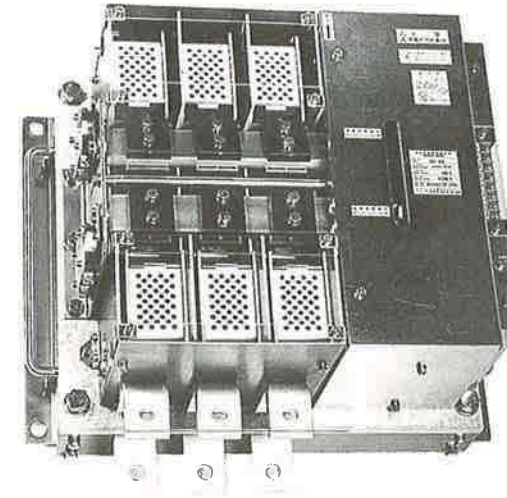
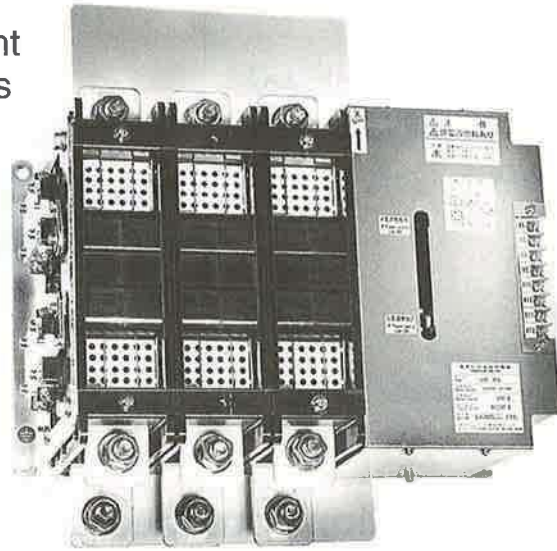
- N: Distance to right-hand terminal
- J, K and L apply to the back type (B).

Capacity (A)	Dimensions				Installation				Other dimensions								Panel cut					
	A		B	t	C			D	H	E	F	G	R	S	U	V	W	X				Y
	2 P	3 P			4 P	2 P	3 P											4 P	2 P	3 P	4 P	
30, 60	255	280	305	190	2.6	240	265	290	160	6	139	25	101	77	77	53	98	125	225	250	275	175
100,150	275	305	335	230	2.6	260	290	320	200	7	155	30	117	85	103	55	105	150	245	275	305	210
200,300	305	350	395	260	3.2	290	335	380	200	7	163	45	117	105	130	55	105	150	275	320	365	240
400	360	420	480	350	3.2	340	400	460	200	9	180	60	126	130	160	66	126	175	320	380	440	320

NOTE 1: For the arc space, refer to the dimensional drawings of the E type.
NOTE 2: Refer to page 19 for the types with flush plate of 600A and above.

1 Features

- 660VAC rating
- Small-size and lightweight
- A broad variety of models



2 Specifications

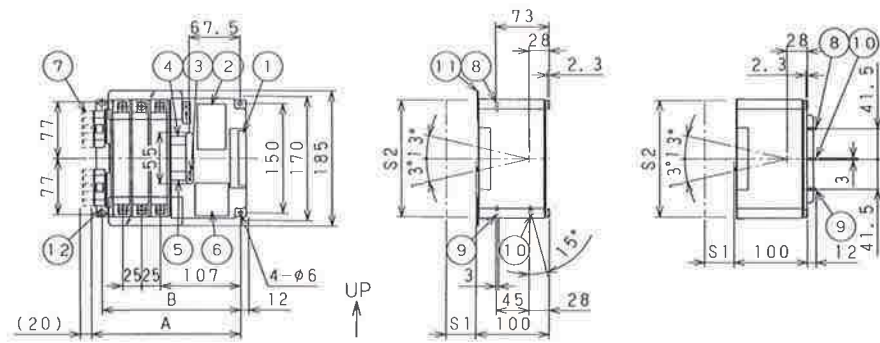
Type		603 E	606 E	61 E	61.5 E	62 E	63 E	64 E	
Rated voltage		660VAC/140VDC							
Rated current		30A	60A	100A	150A	200A	300A	400A	
Throw		Double throw (D), Single throw (S)							
Connection		Front (F), Back (B)							
Weight Front (Back)	2 P	4.8 Kg (4.6 Kg)		6.9 Kg (6.7 Kg)		8.4 Kg (8.0 Kg)		15.2 Kg(14.6 Kg)	
	3 P	5.3 Kg (5.1 Kg)		7.8 Kg (7.6 Kg)		10.1 Kg (9.7 Kg)		18.4 Kg(17.8 Kg)	
	4 P	5.8 Kg (5.6 Kg)		8.7 Kg (8.5 Kg)		11.8 Kg (11.4 Kg)		21.6Kg(21.0 Kg)	
Control current	2 P	100VDC	2.5 A		3.5 A		6.0 A		8.3 A
		100VAC	2.9 A		3.9 A		6.4 A		9.8 A
	3 P	200VAC	1.5 A		2.0 A		3.3 A		5.4 A
		100VDC	3.2 A		6.0 A		8.6 A		12.1 A
	4 P	100VAC	3.5 A		6.4 A		10.2 A		14.1 A
		200VAC	1.7 A		3.3 A		5.1 A		6.8 A
Coil insulation class		A class (short time rating)							
Withstand voltage	Main circuit	2500V AC, one minute (50/60 Hz)							
	Control circuit	2000V AC, one minute (50/60 Hz)							
Short time current capacity (1sec during conduction)		2 kA		5 kA		10 kA		12 kA	
Short peak current		5 kA		12 kA		25 kA		30 kA	
Make and break capacity		AC 3 class (10Ie make, 8Ie break Cos φ=0.35) DC 1 class (1.1Ie make, 1.1Ie break L/R=1ms)							
Life		Class 4 (mechanical life: 250,000 times, electrical life: 50,000 times)							
Switching frequency		No. 4 (150 times / hr)							
Switching characteristics (at rated voltage)	Opening time	0.02 sec		0.022 sec		0.025 sec		0.03 sec	
	Switching time	0.05 sec		0.06 sec		0.07 sec		0.09 sec	
Auxiliary contact make & break capacity		Max. 250VAC 15A, 110VDC 5A, Min. 24VDC 0.1A							
Notes	1	Weight represents that of Double throw (D), Front (F) and Back type.							
	2	Even with the back (B) connection type, front wiring is to be performed for the control circuit and auxiliary circuit.							
	3	Opening time is the time when the contact is not in either make or break position. Switching time is the time from control signal ON to contact making.							

66 E	68 E	610 E	612 E	616 E	620 E	630 E	640 E	650 E
660VAC/140VDC					660VAC			
600A	800A	1000A	1200A	1600A	2000A	3000A	4000A	5000A
Double throw (D), Single throw (S)					Double throw (D)			
Front (F), Back (B)					Back (B)			
45 Kg (35.0 Kg)	48 Kg (38.0 Kg)		68.5 Kg (48.0 Kg)		(100 Kg)	(110 Kg)	(170 Kg)	(190 Kg)
51.5 Kg(41.4 Kg)	57.5 Kg (46.8 Kg)		78.5 Kg (56.5 Kg)		(125 Kg)	(150 Kg)	(210 Kg)	(270 Kg)
61 Kg (51.0 Kg)	68 Kg (58.0 Kg)		88.5 Kg (68.0 Kg)		(150 Kg)	(190 Kg)	(250 Kg)	(350 Kg)
8.7 A	12.0 A		26.3 A		5.2 A	12.2 A	13.1 A	19.0 A
10.2 A	15.5 A		30.3 A		6.4 A	13.9 A	16.1 A	22.3 A
4.9 A	7.4 A		14.2 A		3.4 A	7.1 A	7.7 A	10.9 A
12.0 A	22.2 A		42.3A		12.2 A	20.4 A	24.0 A	31.4 A
15.5 A	23.9 A		50.8 A		13.9 A	25.0 A	28.3 A	36.9 A
7.4 A	13.3 A		19.8 A		7.1 A	12.6 A	14.2 A	18.1 A
A class (short time rating)								
2500V AC, one minute (50/60 Hz)								
2000V AC, one minute (50/60 Hz)								
15 kA		22 kA		25 kA		35 kA	50 kA	50 kA
37 kA		50 kA		55 kA		60 kA	80 kA	100 kA
AC 3 class (10Ie make, 8Ie break Cos φ=0.35) DC 1 class (1.1Ie make, 1.1Ie break L/R=1ms)					AC 2 class (4Ie make, 4Ie break Cos φ=0.65)			
Class 5 (mechanical life: 50,000 times, electrical life: 10,000 times)					(mechanical life: 10,000 times, electrical life: 5,000 times)			
No. 4 (150 times / hr)					No. 5 (30 times / hr)			
0.04 sec	0.045 sec		0.05 sec		0.085 sec	0.09 sec	0.10 sec	0.12 sec
0.1 sec	0.1 sec		0.15 sec		0.15 sec	0.16 sec	0.18 sec	0.21 sec
Max. 250VAC 15A, 110VDC 5A, Min. 24VDC 0.1A								
Weight represents that of Double throw (D), Front (F) and Back (B) type.					Weight represents that of Back (B) type.			
Even with the back (B) connection type, front wiring is to be performed for the control circuit and auxiliary circuit.								
Opening time is the time when the contact is not in either make or break position. Switching time is the time from control signal ON to contact making.								

3 Overall Dimensions (Drawings represent 3P)

- ① Control circuit terminal block (M3.5)
- ② Safety label
- ③ Manual closing handle inlet
- ④ A power supply closing marking
- ⑤ B power supply closing marking
- ⑥ Model nameplate
- ⑦ Auxiliary circuit terminal (M4)
- ⑧ A power supply main circuit terminal
- ⑨ B power supply main circuit terminal
- ⑩ Load main circuit terminal
- ⑪ Main circuit terminal cover (Front only)
- ⑫ Earth terminal (400A and below:also for mounting, 600A and above:M5)

603E, 606E



Dimension	A	B	Arc space	
			S 1	S 2
2 P	190	160		
3 P	215	185	40	160
4 P	240	210		

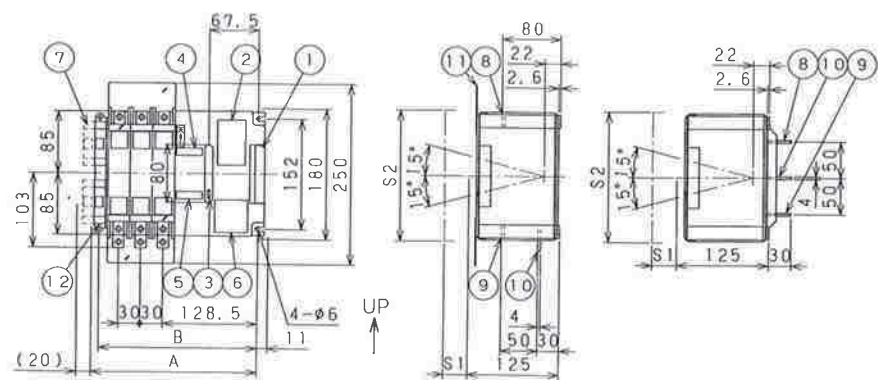
(20) : when auxiliary contacts are 4a4b

Front (F)

Back (B)

Detail of Terminal
() : Connectable dimension

61E, 61.5E



Dimension	A	B	Arc space	
			S 1	S 2
2 P	209	185		
3 P	239	215	60	180
4 P	269	245		

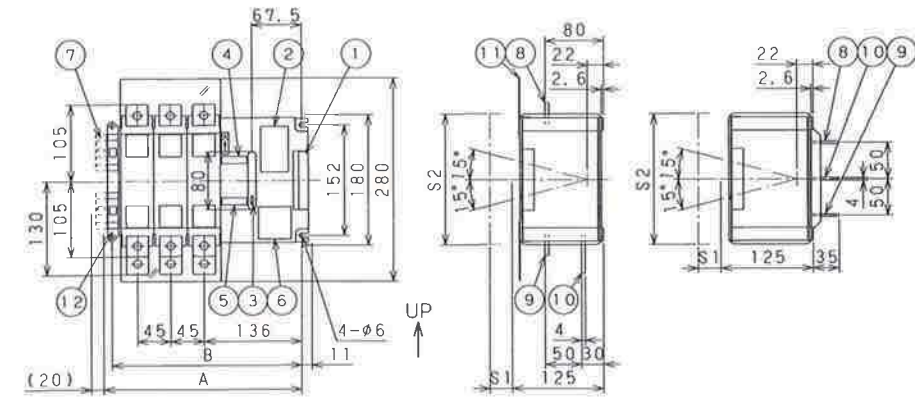
(20) : when auxiliary contacts are 4a4b

Front (F)

Back (B)

Detail of Terminal
() : Connectable dimension

62E, 63E



Dimension	A	B	Arc space	
			S 1	S 2
2 P	239	215		
3 P	284	260	60	180
4 P	329	305		

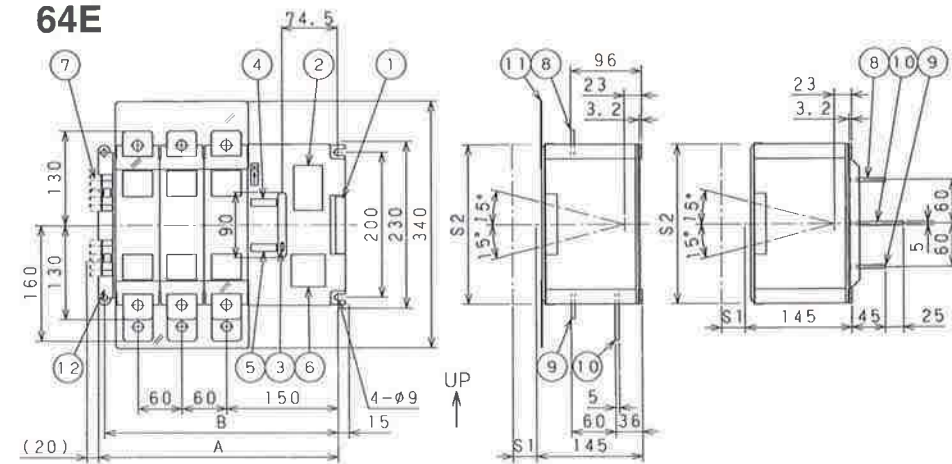
(20) : when auxiliary contacts are 4a4b

Front (F)

Back (B)

Detail of Terminal
() : Connectable dimension

64E



Dimension	A	B	Arc space	
			S 1	S 2
2 P	280	255		
3 P	340	315	60	220
4 P	400	375		

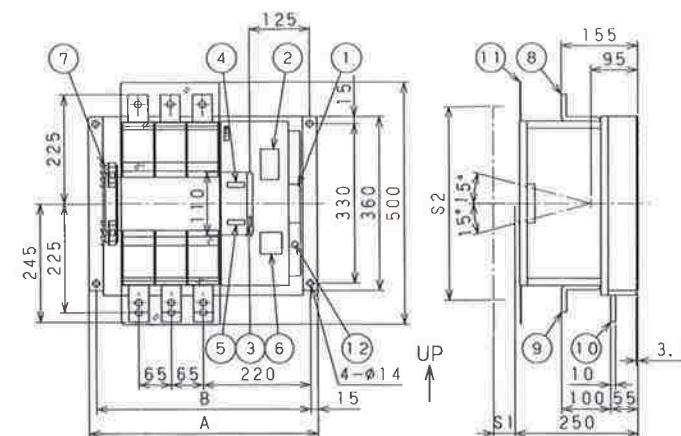
(20) : when auxiliary contacts are 4a4b

Front (F)

Back (B)

Detail of Terminal
() : Connectable dimension

66E Flont (F)



Dimension	A	B	Arc space	
			S 1	S 2
2 P	400	370		
3 P	465	435	45	400
4 P	530	500		

(20) : when auxiliary contacts are 4a4b

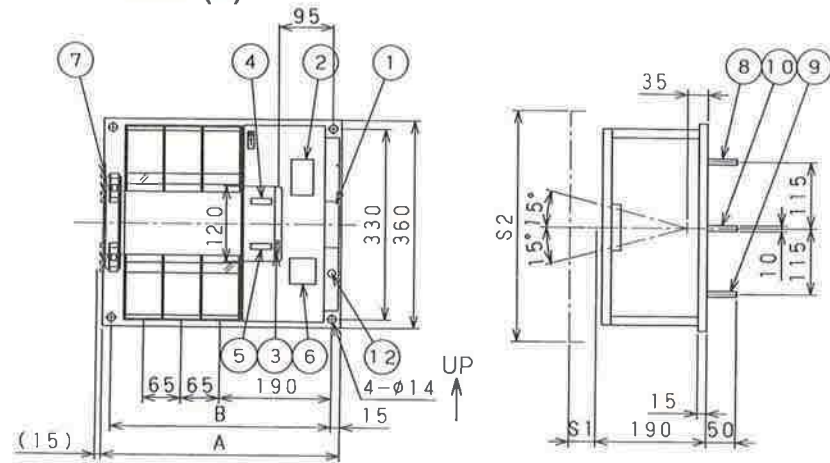
Front (F)

Back (B)

Detail of Terminal
() : Connectable dimension

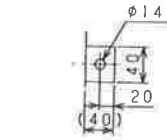
Detail of Terminal
() : Connectable dimension

66E Back (B)



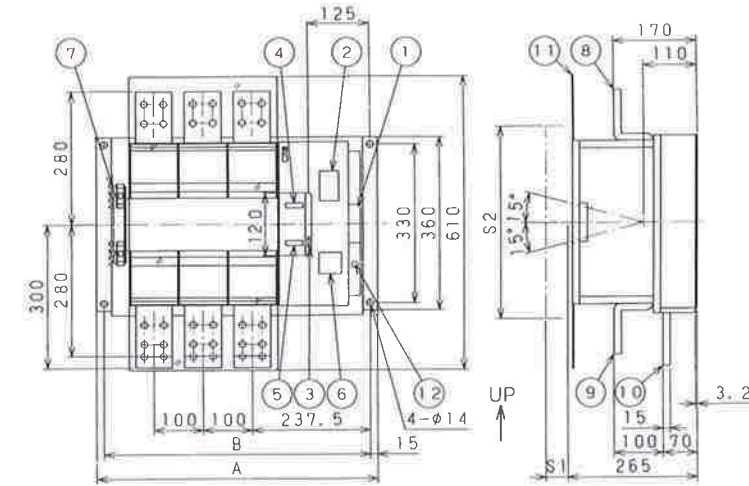
(15) : when auxiliary contacts are 4a4b

Dimension Poles	A	B	Arc space	
			S 1	S 2
2 P	340	310		
3 P	405	375	45	400
4 P	470	440		

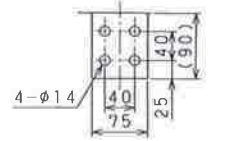


Detail of Terminal
() : Connectable dimension

612E, 616E Flont (F)

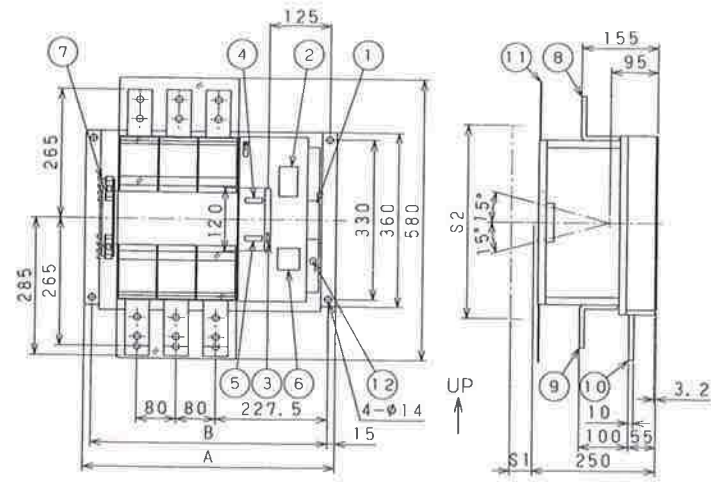


Dimension Poles	A	B	Arc space	
			S 1	S 2
2 P	470	440		
3 P	570	540	45	400
4 P	670	640		

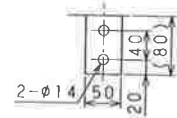


Detail of Terminal
() : Connectable dimension

68E, 610E Flont (F)

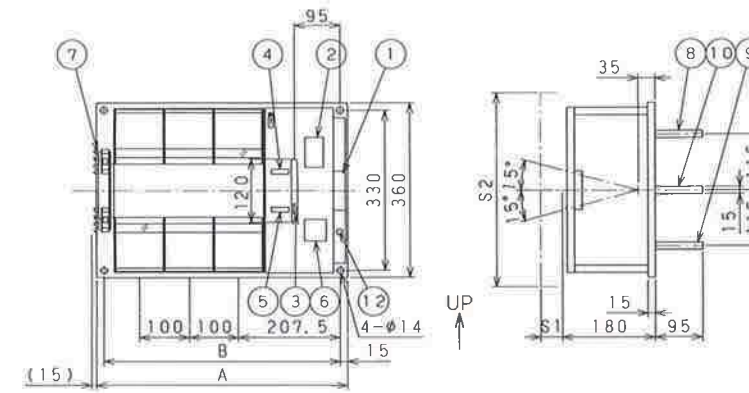


Dimension Poles	A	B	Arc space	
			S 1	S 2
2 P	430	400		
3 P	510	480	45	400
4 P	590	560		



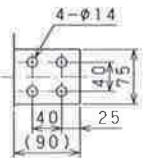
Detail of Terminal
() : Connectable dimension

612E, 616E Back (B)



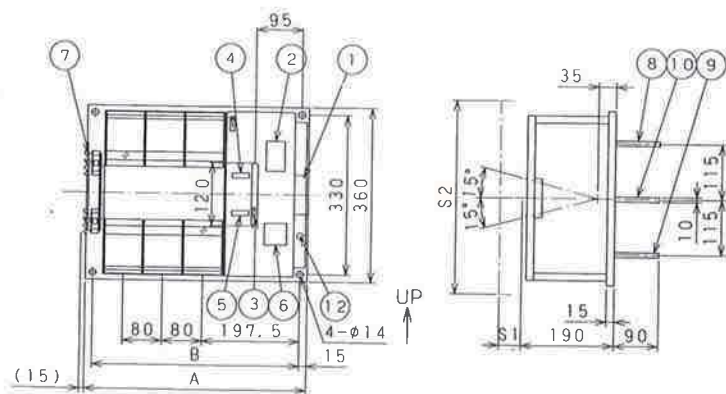
(15) : when auxiliary contacts are 4a4b

Dimension Poles	A	B	Arc space	
			S 1	S 2
2 P	410	380		
3 P	510	480	45	400
4 P	610	580		



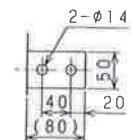
Detail of Terminal
() : Connectable dimension

68E, 610E Back (B)



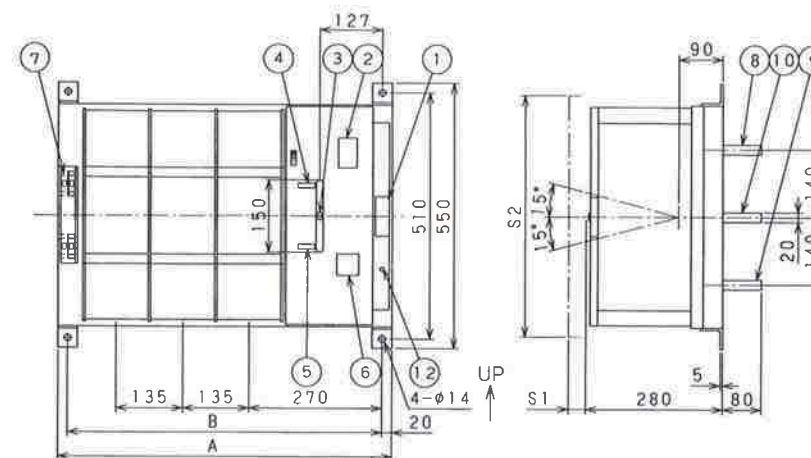
(15) : when auxiliary contacts are 4a4b

Dimension Poles	A	B	Arc space	
			S 1	S 2
2 P	370	340		
3 P	450	420	45	400
4 P	530	500		

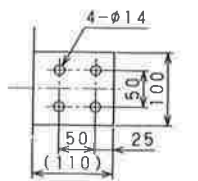


Detail of Terminal
() : Connectable dimension

620E Back (B)

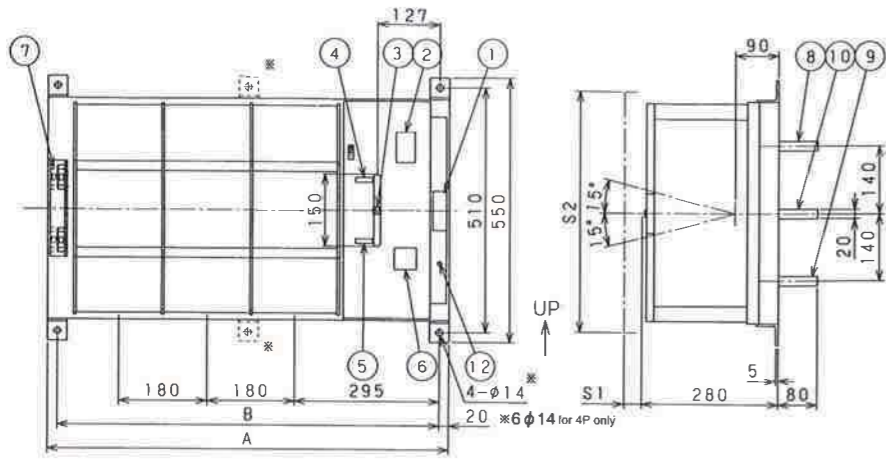


Dimension Poles	A	B	Arc space		
			S 1		S 2
			250V	660V	
2 P	545	505			
3 P	680	640	30	45	500
4 P	815	775			

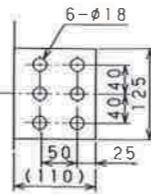


Detail of Terminal
() : Connectable dimension

630E Back (B)

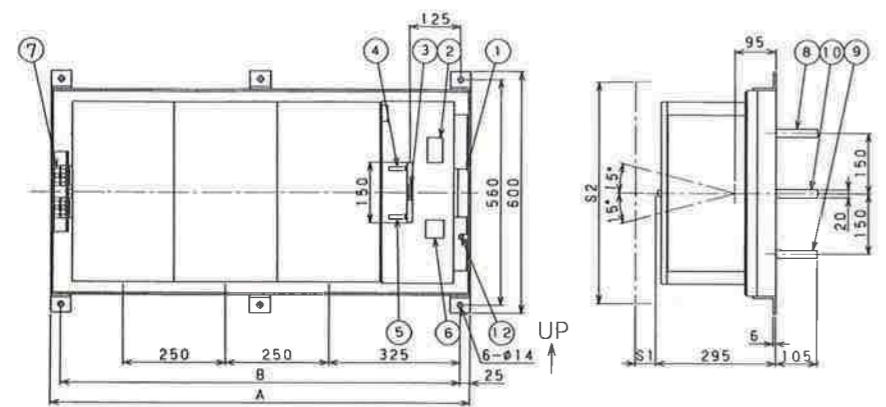


Dimension	A	B	Arc space	
			S 1	S 2
Poles			250V	660V
2 P	640	600		
3 P	820	780	30	45
4 P	1000	960		500

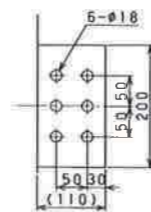


Detail of Terminal
() : Connectable dimension

640E Back (B)

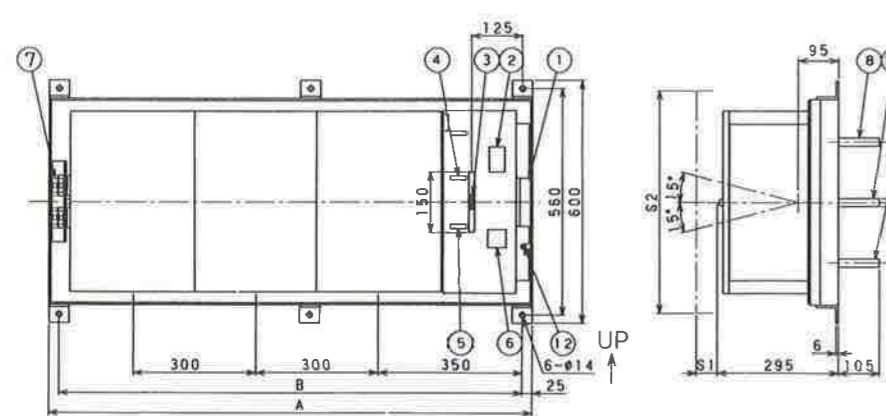


Dimension	A	B	Arc space	
			S 1	S 2
Poles			250V	660V
2 P	780	730		
3 P	1030	980	30	50
4 P	1280	1230		550

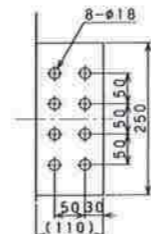


Detail of Terminal
() : Connectable dimension

650E Back (B)

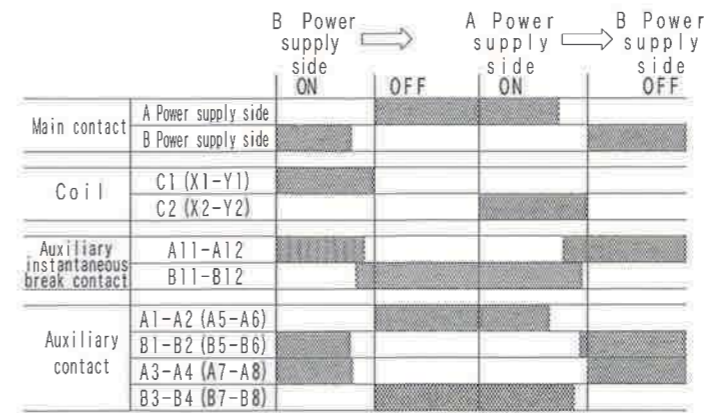


Dimension	A	B	Arc space	
			S 1	S 2
Poles			250V	660V
2 P	880	830		
3 P	1180	1130	35	50
4 P	1480	1430		550



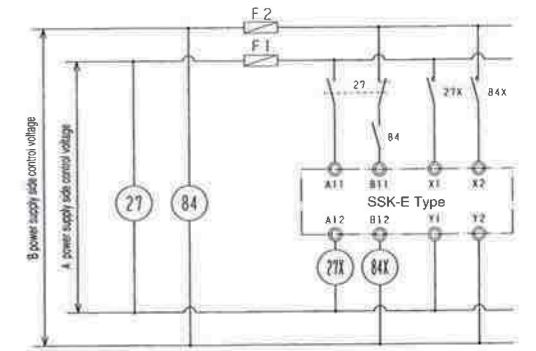
Detail of Terminal
() : Connectable dimension

4 Operation Time Chart (30A~1600A)



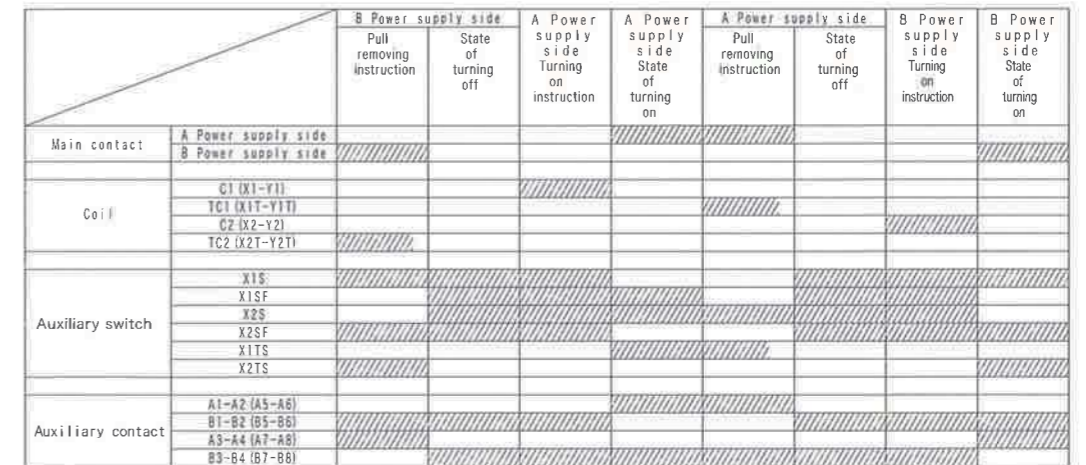
5 Example of Typical Circuit (30A~1600A)

A general case of switching
(Circuit where no excitation is performed after completion of switching 27X and 84X of auxiliary relay)

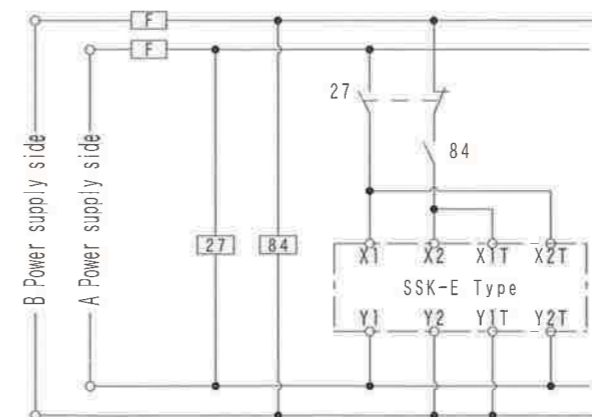


27 Undervoltage relay (27X) 84X Auxiliary relay
84 Built-up voltage relay

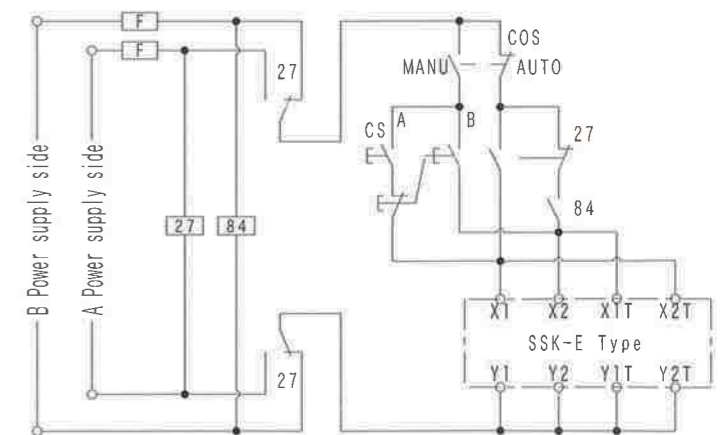
6 Operation Time Chart (2000A~5000A)



7 Example of Typical Circuit (2000A~5000A)



8 AUTO-MANU switch introduced (2000A~5000A)

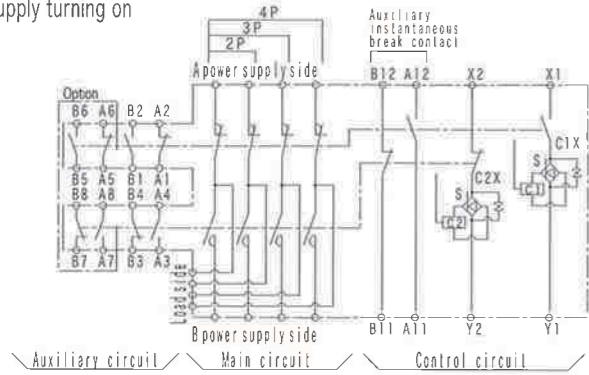


9 Circuit Diagrams (30A~1600A)

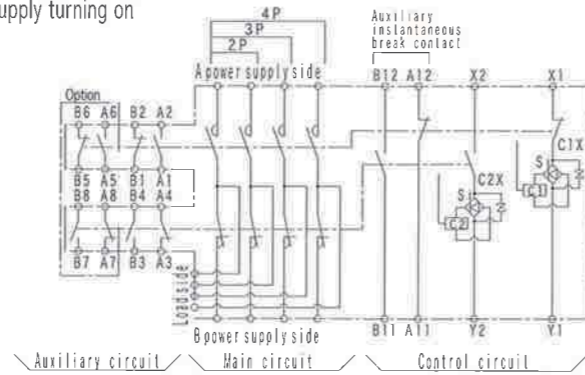
- The diagrams below represent 4P and auxiliary circuit 4a4b.
- For single-phase 3-wire [N3], the neutral pole is in the middle. (N marking on the transfer switch)
- For 3-phase 4-wire [N4], the neutral pole is on the right. (N marking on the transfer switch)

Circuit for AC Control

A s state of power supply turning on



B s state of power supply turning on

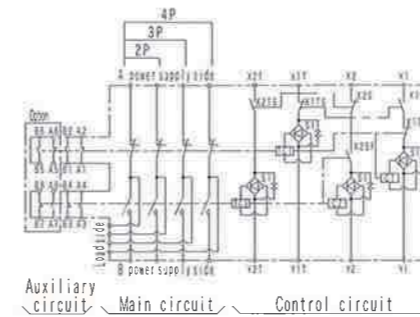


10 Circuit Diagrams (2000A~5000A)

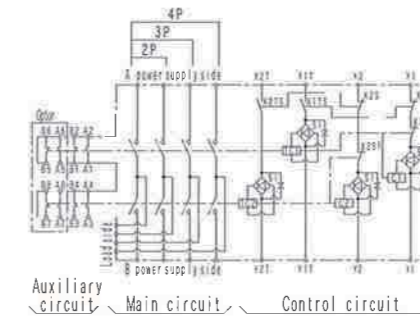
- The diagrams below represent 4P and auxiliary circuit 4a4b.
- For single-phase 3-wire [N3], the neutral pole is in the middle. (N marking on the transfer switch)
- For 3-phase 4-wire [N4], the neutral pole is on the right. (N marking on the transfer switch)

Circuit for AC Control

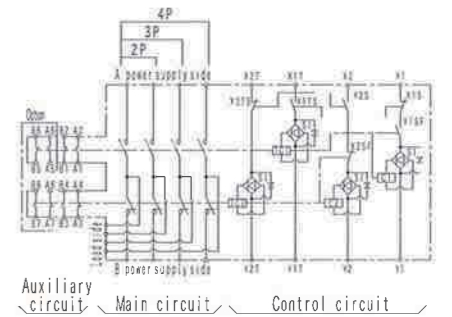
A s state of power supply turning on



Neutral state

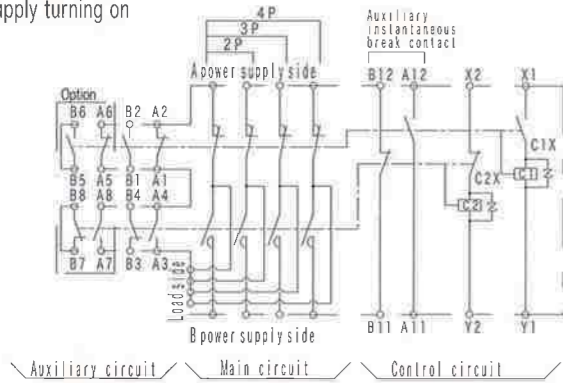


B s state of power supply turning on

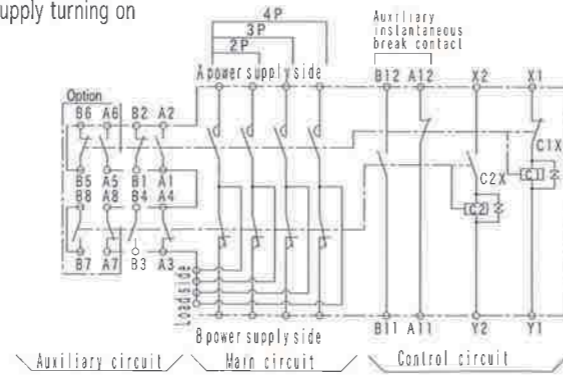


Circuit for DC Control

A s state of power supply turning on

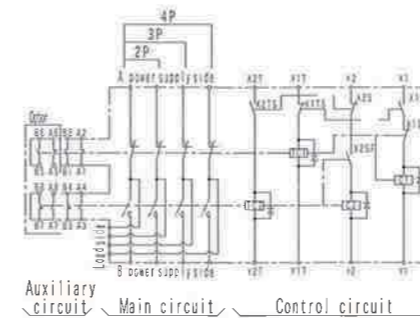


B s state of power supply turning on

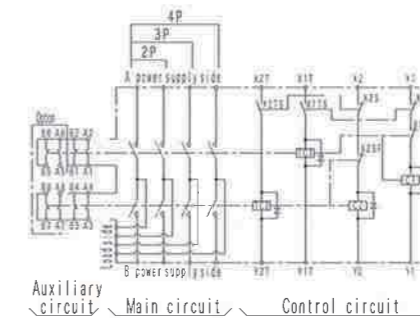


Circuit for DC Control

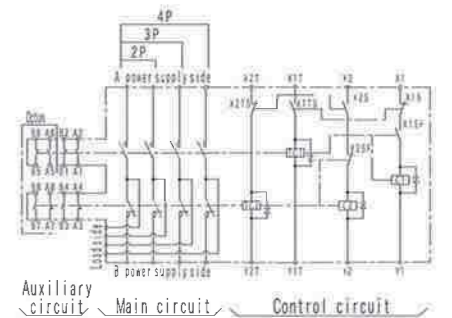
A s state of power supply turning on



Neutral state



B s state of power supply turning on



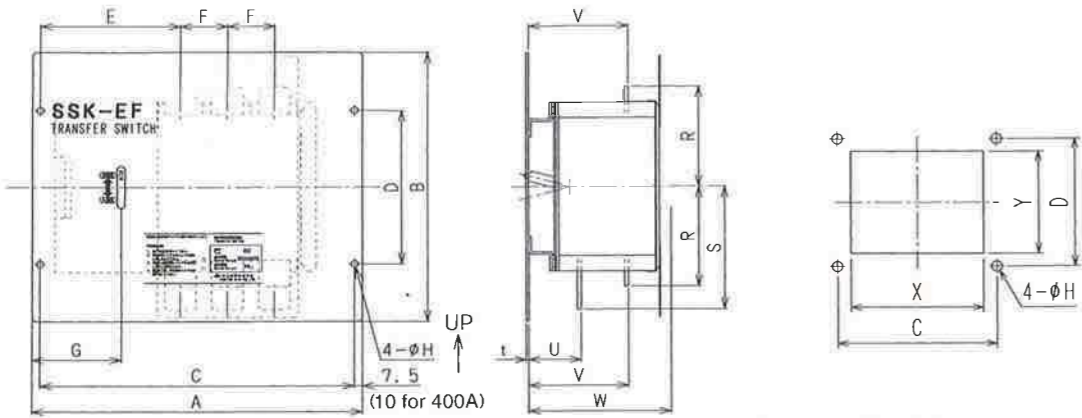
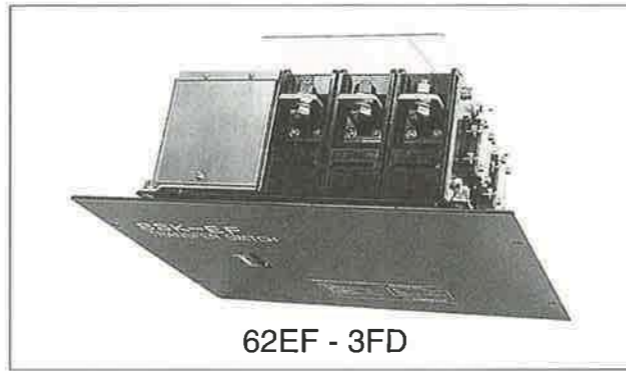
1 Features

- Flush plate provided
- 660VAC rating
- Mounted on flush plate at delivery
- Manual operation possible for both front and back types

2 The rated specifications are the same as those for the E type

3 Overall Dimensions

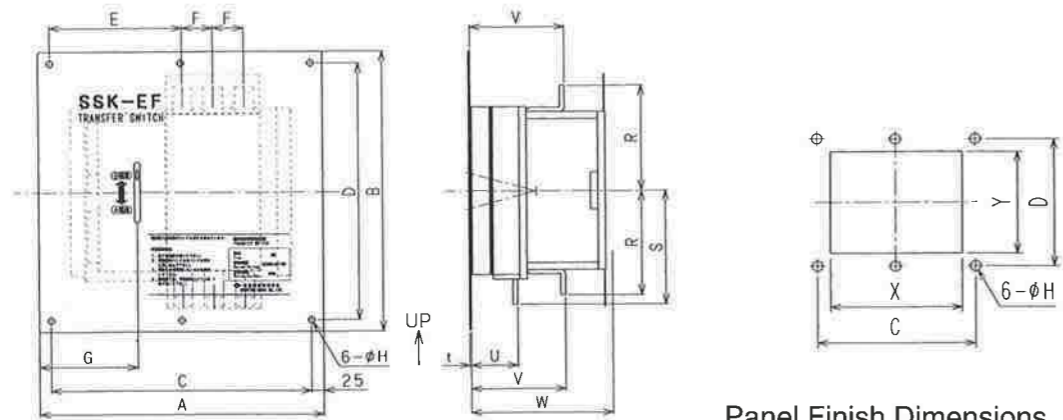
■ 30A~400A



Panel Finish Dimensions (mm)

Capacity (A)	Dimensions				t	Installation				Other dimensions										Panel cut			
	2P	3P	4P	B		2P	3P	4P	D	H	E	F	G	R	S	U	V	W	2P	3P	4P	Y	
30, 60	255	280	305	190	2.6	240	265	290	160	6	139	25	101	77	77	53	98	125	225	250	275	175	
100,150	275	305	335	230	2.6	260	290	320	200	7	155	30	117	85	103	55	105	150	245	275	305	210	
200,300	305	350	395	260	3.2	290	335	380	200	7	163	45	117	105	130	55	105	150	275	320	365	240	
400	360	420	480	350	3.2	340	400	460	200	9	180	60	126	130	160	66	126	175	320	380	440	320	

■ 600A~1600A



Panel Finish Dimensions (mm)

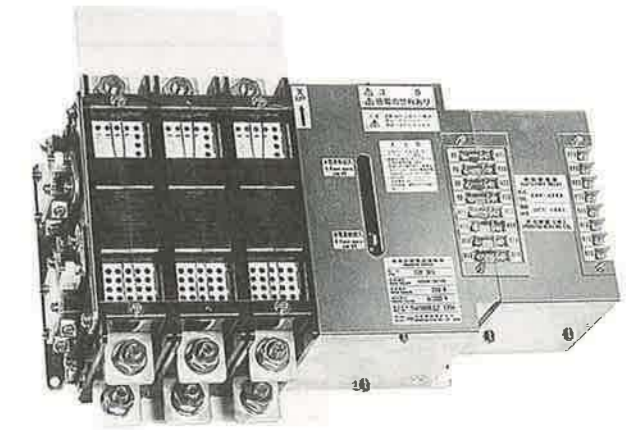
Capacity (A)	Dimensions				t	Installation				Other dimensions										Panel cut			
	2P	3P	4P	B		2P	3P	4P	D	H	E	F	G	R	S	U	V	W	2P	3P	4P	Y	
600	535	600	665	600	3.2	485	550	615	550	14	278	65	173	225	245	100	200	295	435	500	565	510	
800,1000	565	645	725	670	3.2	515	595	675	620	14	285	80	173	265	285	100	200	295	465	545	625	580	
1200,1600	605	705	805	700	3.2	555	655	755	650	14	295	100	173	280	300	115	215	310	505	605	705	610	

1 Features

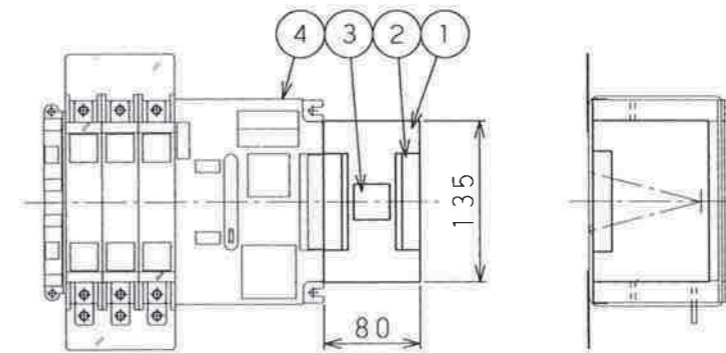
- Auxiliary relay panel for 30A ~ 1600A only
- Mounted on switch body

2 Specifications

Rated voltage	250VAC
Rated current	30A
Control current	100VDC 0.08A
	100VAC 0.1A
	200VAC 0.05A
Coil insulation class	B class (continuous)
Withstand voltage	Main circuit 2500V AC 1 minute (50/60Hz)
	Control circuit 2000V AC 1 minute (50/60Hz)



3 Overall Dimensions

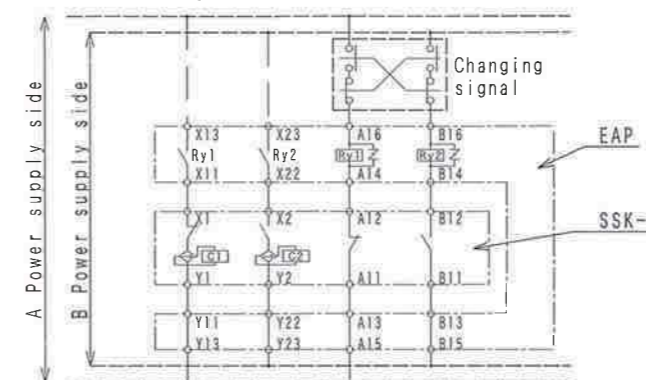


- ① EAP type (Auxiliary relay panel)
- ② Control terminal block (M3.5)
- ③ Model nameplate
- ④ SSK-E type

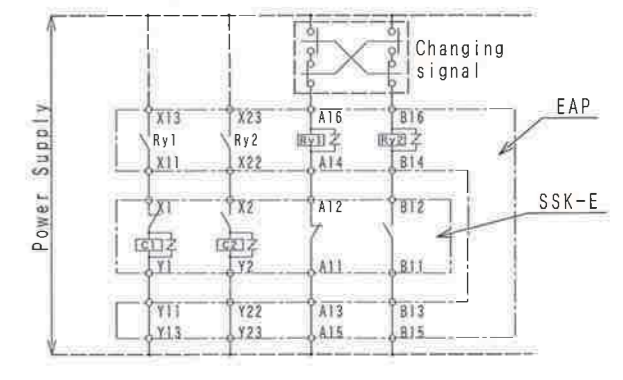
4 Circuit Diagram

※ The dotted line part of this operation connection diagram becomes the wiring with a visitor.

○ AC operation circuit



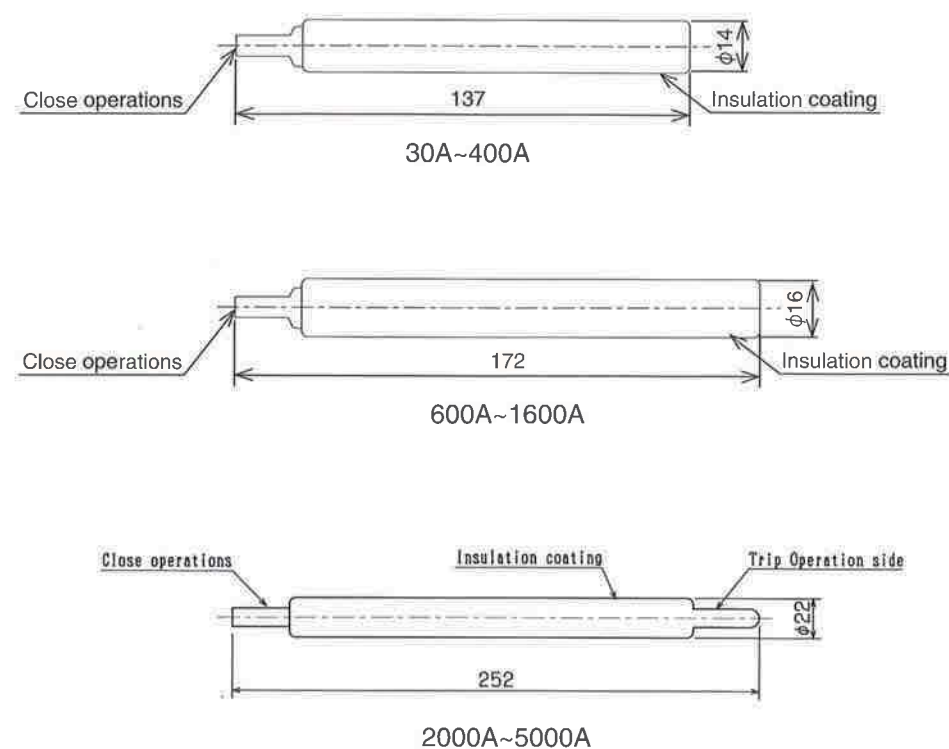
○ DC operation circuit



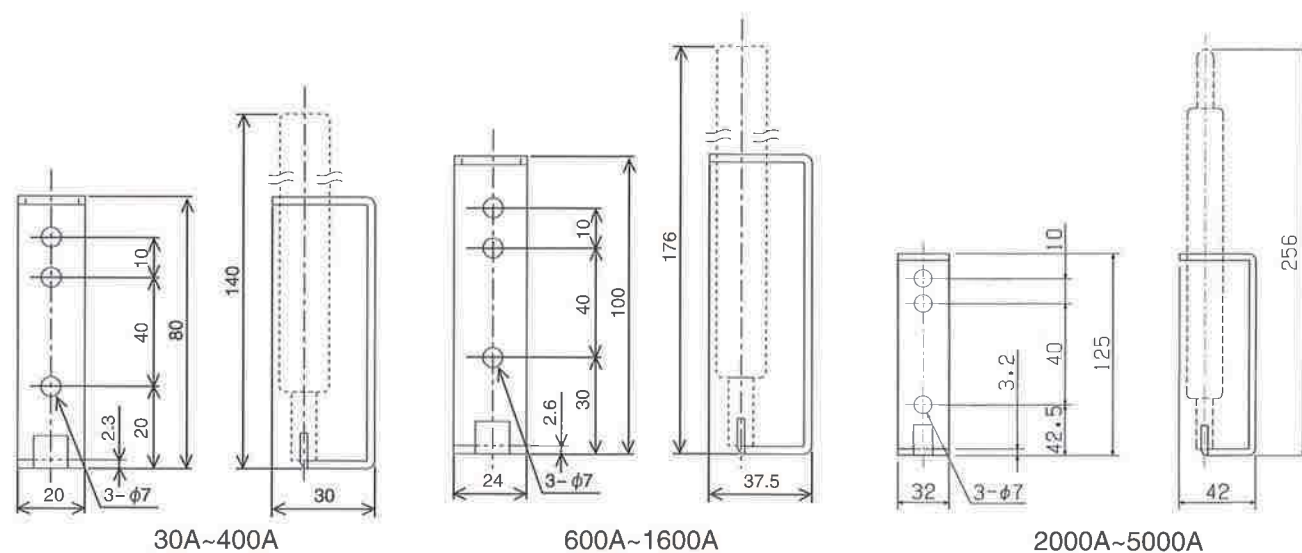
5 Contact Kyoritsu Keiki for information on the capacitor trip panel.

Manual Operation Handle

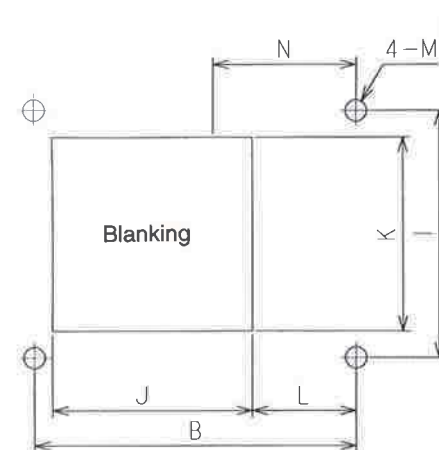
1 Overall Dimensions



2 Handle Holder (Option)



3 Panel Finish Dimensions



形式	603E	61E	62E	64E	66E		68E-610E		612E-616E		620E	630E	640E	650E	
	606E	61.5E	63E		Flont	Back	Flont	Back	Flont	Back					
B	2 P	160	185	215	255	370	310	400	340	440	380	505	600	730	830
	3 P	185	215	260	315	435	375	480	420	540	480	640	780	980	1130
	4 P	210	245	305	375	500	440	560	500	640	580	775	960	1230	1430
J	2 P	75	75	105	135	—	280	—	310	—	350	465	560	680	780
	3 P	100	105	150	195	—	345	—	390	—	450	600	740	930	1080
	4 P	125	135	195	255	—	410	—	470	—	550	735	920	1180	1380
I		150	152	152	200	330		330		330	510	510	560	560	
K		140	140	150	180	—	300	—	300	—	300	420	420	450	450
L		75	100	100	110	—	15	—	15	—	15	20	20	25	25
M		$\phi 6$	$\phi 6$	$\phi 6$	$\phi 9$	$\phi 14$		$\phi 14$		$\phi 14$	$\phi 14$	$\phi 14$	$\phi 14$	$\phi 14$	$\phi 14$
N		107	128.5	136	150	220	190	227.5	197.5	237.5	207.5	270	295	325	350

• N: Distance to right-hand terminal
• J, K, and L apply to the back type (B).

4 Control Circuit Wire Size Table

1. This table shows the wire size when one 2p or 3p model is to be operated.
2. The specified wire length is the total length(line reciprocation).
3. The specified wires are 2mm² or thicker.
4. When two or more models are to be operated, calculate the wire size so that the control wire has a sufficient capacity.

TYPE	Pole number	100VDC												100VAC												200VAC											
		Current (A)		Wire length (m)										Current (A)		Wire length (m)										Current (A)		Wire length (m)									
		10	20	30	40	50	60	10	20	30	40	50	60	10	20	30	40	50	60	10	20	30	40	50	60												
203E, 206E	2-3P	2.5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2											
603E, 606E	4P	3.2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2											
21E, 21.5E	2-3P	3.5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2											
61E, 61.5E	4P	6.0	2	2	2	3.5	3.5	3.5	3.5	6.4	2	2	2	3.5	3.5	3.5	3.3	2	2	2	2	2	2	2	2	2											
22E, 23E	2-3P	6.0	2	2	2	3.5	3.5	3.5	3.5	6.4	2	2	2	3.5	3.5	3.5	3.3	2	2	2	2	2	2	2	2	2											
62E, 63E	4P	8.6	2	2	3.5	3.5	5.5	5.5	10.2	2	2	2	3.5	5.5	5.5	8	5.1	2	2	2	2	2	2	2	2	2											
24E, 64E	2-3P	8.3	2	2	3.5	3.5	5.5	5.5	9.8	2	2	2	3.5	5.5	5.5	8	5.4	2	2	2	2	2	2	2	2	2											
	4P	12.1	2	3.5	3.5	5.5	8	8	14.1	2	3.5	5.5	5.5	8	8	6.8	2	2	2	2	2	2	2	2	2	2											
66E	2-3P	8.7	2	2	3.5	3.5	5.5	5.5	10.2	2	2	3.5	5.5	5.5	8	4.9	2	2	2	2	2	2	2	2	2	2											
	4P	12.0	2	3.5	3.5	5.5	8	8	15.5	2	3.5	5.5	5.5	8	14	7.4	2	2	2	2	2	2	2	2	2	2											
68E, 610E	2-3P	12.0	2	3.5	3.5	5.5	8	8	15.5	2	3.5	5.5	5.5	8	14	7.4	2	2	2	2	2	2	2	2	2	3.5											
	4P	17.5	2	3.5	5.5	8	14	14	20.1	2	5.5	8	8	14	14	10.3	2	2	2	2	2	2	2	3.5	3.5												
612E, 616E	2-3P	26.3	3.5	5.5	8	14	14	22	30.3	3.5	8	14	14	14	22	14.2	2	2	2	2	2	2	2	3.5	3.5	5.5											
	4P	42.3	5.5	8	14	22	22	38	50.8	5.5	14	14	22	38	38	19.8	2	2	2	2	2	2	3.5	5.5	5.5	5.5											
620E	2-3P	5.2	2	2	2	2	3.5	3.5	6.4	2	2	2	3.5	3.5	3.5	3.4	2	2	2	2	2	2	2	2	2	2											
	4P	12.2	2	3.5	3.5	5.5	8	8	13.9	2	3.5	5.5	5.5	8	8	7.1	2	2	2	2	2	2	2	2	2	2											
630E	2-3P	12.2	2	3.5	3.5	5.5	8	8	13.9	2	3.5	5.5	5.5	8	8	7.1	2	2	2	2	2	2	2	2	2	2											
	4P	20.4	2	5.5	8	8	14	14	25.0	3.5	8	14	14	14	12.6	2	2	2	2	2	2	2	3.5	3.5	3.5	3.5											
640E	2-3P	13.1	2	3.5	5.5	5.5	8	8	16.1	2	3.5	5.5	8	8	14	7.7	2	2	2	2	2	2	2	2	2	3.5											
	4P	24.0	3.5	5.5	8	14	14	14	28.3	3.5	8	14	14	22	14.2	2	2	2	2	2	2	2	3.5	3.5	5.5	5.5											
650E	2-3P	19.0	2	3.5	5.5	8	14	14	22.3	3.5	8	14	14	14	10.9	2	2	2	2	2	2	2	3.5	3.5	3.5	3.5											
	4P	31.4	3.5	8	14	14	22	22	36.9	3.5	8	14	14	22	18.1	2	2	2	2	2	2	2	3.5	3.5	5.5	5.5											

Safety Instructions



For proper and safe operation, be sure to carefully read the Instruction Manual, "Safety Instructions" and "Operating Instructions" before starting to use the Transfer Switch.

- Install the transfer switch in the vertical position as indicated by the UP marking. Failure to install in the correct orientation may lead to malfunction.
- Provide the arcing space specified in the catalog around the transfer switch. Arc coming into contact with a metallic object at shutdown can cause accidents.
- Do not allow a voltage drop of more than 4 percent for the control circuit, including the control wiring and contacts of control contactors. Large voltage drop can cause malfunction or abnormal heating.
- Design the circuit in such a way that no simultaneous excitation command, continuous alternate excitation command or simultaneous excitation command in the same direction is given to the control coils. Incorrect circuit design can cause malfunction or abnormal heating.
- Be sure to install a fuse for protecting the control circuit. The fuse capacity should be 40 to 50 percent of the rated coil current.
- When the transfer switch is to be used with an induction motor, provide a circuit to protect the switch from abnormal inrush current caused at switching. Also the switch to be used must have a sufficient capacity.
- When used with a transformer, capacitor or incandescent lamp, select the transfer switch that has a capacity large enough to withstand expected transient inrush current.

TRANSFER SWITCHES

Instantaneous Excitation & Mechanical Holding Type with OFF Position

Features

- Small size and light weight
- Neutral stop possible
- Control circuit and main circuit housed in a casing
- Terminal covers provided for control circuit and main circuit (Terminal cover for main circuit: Front type only)
- Environment friendly contacts free of cadmium
- A wide range of models to select from for your applications
- The main contacts of each phase (contacts of A power supply and B power supply) have each arcing space.

Model Designation and Selection

- **Standard model** (Models immediately available to order)
- **Semi-standard model** (Models produced on standard lines and so available in short lead time)
- **Non-standard model** (Models produced to individual orders)

Rated voltage	Rated current	Type	No. of poles (Neutral pole of [N3], [N4] : earlier make and later break)						Connection		Throw	Auxiliary circuit (auxiliary contact)	Option
			1 P	2 P	3 P	3 P (single-phase, 3-wire)	4 P	4 P (3-phase, 4-wire)	Front	Back			
			[1]	[2]	[3]	[N3]	[4]	[N4]	[F]	[B]	[D]		
660VAC 140VDC	60A	NE										[2] 2a2b standard (1a1b on each power supply side)	[H] Handle holder
	100A												
	200A												
	400A												
	600A												
	800A												
	1000A												
	1200A												
1600A													
660VAC	2000A											[4] 4a4b max. (2a2b on each power supply side)	[D] Test record
	3000A												
	4000A												
	4000A												
	5000A												

Example of Designation: [6] [1] [NE] - [3] [B] [D] - [A200/A200] - [2] - [H] [D]

Nameplate marking: Rated voltage (660VAC / 140VDC), Rated current (100A), Type (NE type), No. of poles (3 poles), Connection (Back), Throw (Double throw), Coil voltage (200VAC on A power supply side / 200VAC on B power supply side), Auxiliary contact (2a2b), Option (Handle holder, Test record)

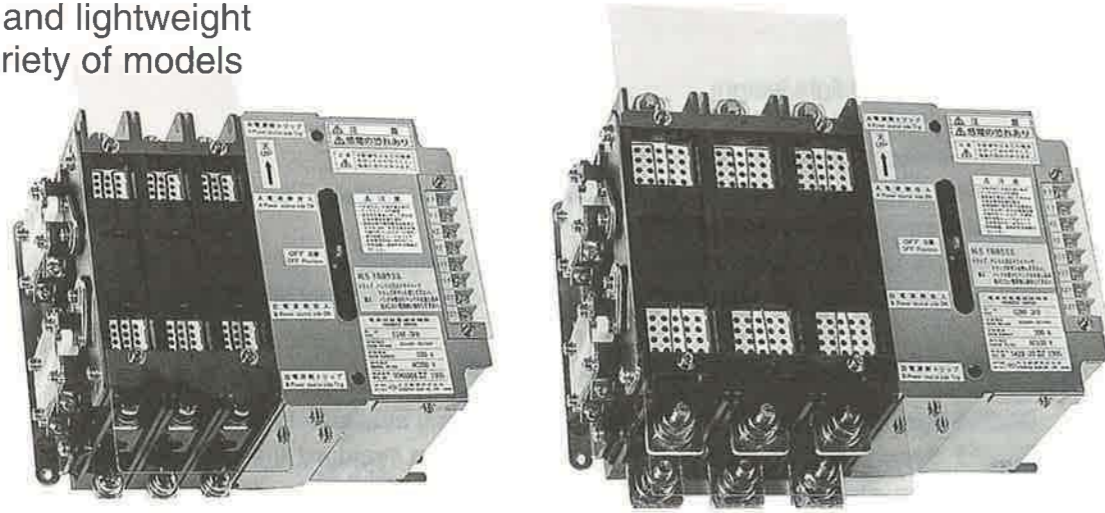
Standard accessories

- Operation handle
- Control circuit terminal cover
- Main circuit terminal cover (Front only)
- Main circuit terminal bolt (400A or below)

- NOTES
1. Standard control coil voltages are 100/110VDC, 100/110VAC and 200/220VAC. Other voltages are available to individual orders.
 2. Even with the back connection type, front wiring is used for the control circuit and auxiliary circuit.
 3. The electrical and mechanical interlocks assure error-free operation both in auto and manual mode.

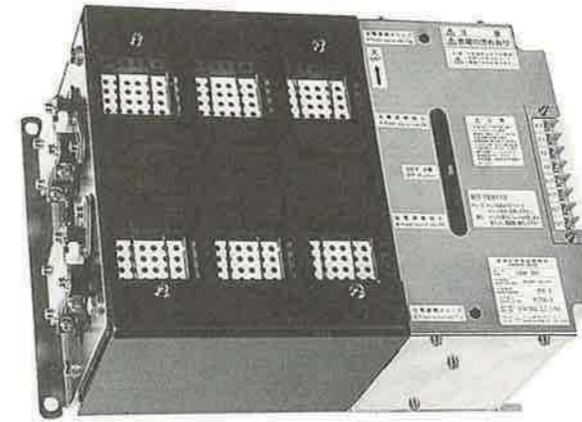
1 Features

- Capable of neutral stop
- Small-size and lightweight
- A broad variety of models

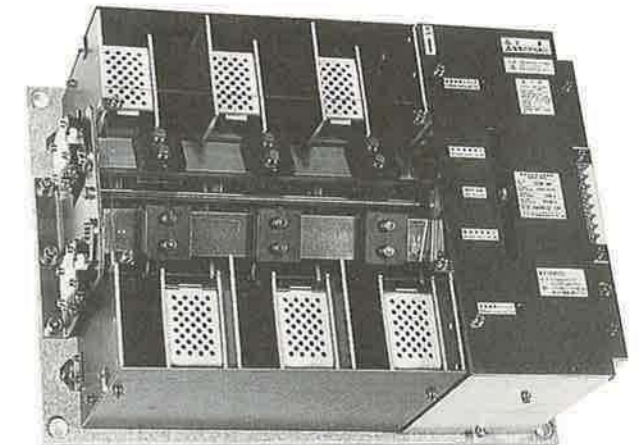


61NE-3FD

62NE-3FD



64NE-3BD



612NE-3BD

2 Specifications

Type		606NE	61NE	62NE	64NE	66NE	68NE	610NE		
Rated voltage		660VAC/140VDC								
Rated current		60A	100A	200A	400A	600A	800A	1000A		
Throw		Double throw (D)								
Connection		Front (F), Back (B)								
Weight Front (Back)	2 P	7.5 kg (6.5 Kg)	9 kg (8.0Kg)	15 kg(13.0Kg)	45 kg(35.0Kg)	50 kg (38.0 Kg)				
	3 P	9 kg (8.0 Kg)	11 kg(10.0Kg)	18 kg(16.0Kg)	53 kg(43.0Kg)	60 kg (48.0 Kg)				
	4 P	10.5 kg (9.5 Kg)	13 kg(12.0Kg)	21 kg(19.0Kg)	61 kg(51.0Kg)	70 kg (58.0 Kg)				
Control current	Make	2 P 100VDC	3.0 A	4.0 A	4.4 A	5.2 A	6.3 A			
		3 P 100VAC	3.2 A	4.4 A	5.2 A	6.2 A	7.2 A			
		200VAC	1.8 A	2.4 A	2.7 A	3.2 A	3.6 A			
		4 P 100VDC	4.0 A	4.3 A	6.0 A	6.3 A	7.1 A			
		100VAC	4.4 A	5.0 A	7.0 A	7.2 A	8.1 A			
		200VAC	2.4 A	2.5 A	3.5 A	3.6 A	4.1 A			
	Trip	2 P 100VDC	0.8 A	1.0 A	1.1 A	1.5 A	2.1 A			
		3 P 100VAC	1.0 A	1.2 A	1.2 A	1.6 A	2.4 A			
		200VAC	0.5 A	0.6 A	0.6 A	0.8 A	1.2 A			
		Coil insulation class A class (short time rating)								
		Withstand voltage	Main circuit	2500VAC, one minute (50/60 Hz)						
			Control circuit	2000VAC, one minute (50/60 Hz)						
Short time current capacity (1sec during conduction)		5KA	10KA	12KA	15KA	22KA				
Short peak current		12KA	25KA	30KA	37KA	50KA				
Make and break capacity		AC 3 class (10le make, 8le break Cos φ=0.35) DC 1 class (1.1le make, 1.1le break L/R=1ms)								
Life		Class 4 (mechanical life: 250,000 times, electrical life: 50,000 times)				Class 5 (mechanical life: 50,000 times, electrical life: 10,000 times)				
Switching frequency		No. 4 (150 times / hr)								
Switching characteristics (at rated voltage)	Make	0.030 sec	0.035 sec	0.045 sec	0.060 sec	0.065 sec				
	Trip	0.028 sec	0.030 sec	0.040 sec	0.050 sec	0.050 sec				
Auxiliary contact make & break		Max. 250VAC 15A, 110VDC 5A, Min. 24VDC 0.1A								
Notes	1	Weight represents that of F types.				Weight represents that of Back (B) type.				
	2	Even with the back (B) connection type, front wiring is to be performed for the control circuit and auxiliary circuit.								
	3	Make time is the time from control signal ON to contact making. Trip time is the time from control signal ON to contact breaking.								

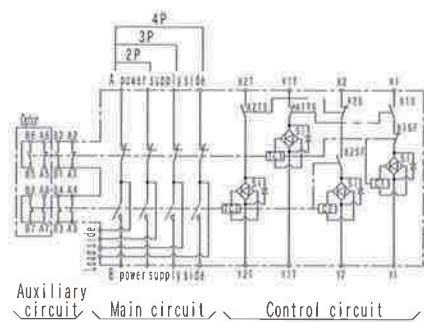
Type		612NE	616NE	620NE	630NE	640NE	650NE		
Rated voltage		660VAC/140VDC							
Rated current		1200A	1600A	2000A	3000A	4000A	5000A		
Throw		Double throw (D)							
Connection		Front (F), Back (B)			Back (B)				
Weight	2 P	71 kg (48.0 Kg)	(100 kg)	(110 kg)	(170 kg)	(190 kg)			
	3 P	80 kg (58.0 Kg)	(125 kg)	(150 kg)	(210 kg)	(270 kg)			
	4 P	98 kg (70.0 Kg)	(150 kg)	(190 kg)	(250 kg)	(350 kg)			
Control current	Make	2 P 100VDC	7.1 A	5.2 A	12.2 A	13.1 A	19.0 A		
		3 P 100VAC	8.1 A	6.4 A	13.9 A	16.1 A	22.3 A		
		200VAC	4.1 A	3.4 A	7.1 A	7.7 A	10.9 A		
		4 P 100VDC	9.7 A	12.2 A	20.4 A	24.0 A	31.4 A		
		100VAC	11.5 A	13.9 A	25.0 A	28.3 A	36.9 A		
		200VAC	5.6 A	7.1 A	12.6 A	14.2 A	18.1 A		
	Trip	2 P 100VDC	2.5 A	4.2 A	5.3 A	8.2 A	12.5 A		
		3 P 100VAC	2.8 A	4.5 A	6.2 A	9.5 A	15.1 A		
		200VAC	1.4 A	2.4 A	3.9 A	5.2 A	7.1 A		
		Coil insulation class A class (short time rating)							
		Withstand voltage	Main circuit	2500VAC, one minute (50/60 Hz)					
			Control circuit	2000VAC, one minute (50/60 Hz)					
Short time current capacity (1sec during conduction)		25KA	35KA	50KA	50KA	50KA			
Short peak current		55KA	60KA	80KA	100KA	120KA			
Make and break capacity		AC 3 class (10le make, 8le break Cos φ=0.35) DC 1 class (1.1le make, 1.1le break L/R=1ms)			AC 2 class (4le make, 4le break Cos φ=0.65)				
Life		Class 5 (mechanical life: 50,000 times, electrical life: 10,000 times)			(mechanical life: 10,000 times, electrical life: 5,000 times)				
Switching frequency		No. 4 (150times / hr)			No. 5 (30 times / hr)				
Switching characteristics (at rated voltage)	Make	0.07 sec	0.085 sec	0.09 sec	0.10 sec	0.12 sec			
	Trip	0.06 sec	0.065 sec	0.07 sec	0.08 sec	0.09 sec			
Auxiliary contact make & break		Max. 250VAC 15A, 110VDC 5A, Min. 24VDC 0.1A							
Notes	1	Weight represents that of Back (B) type.							
	2	Even with the back (B) connection type, front wiring is to be performed for the control circuit and auxiliary circuit.							
	3	Make time is the time from control signal ON to contact making. Trip time is the time from control signal ON to contact breaking.							

3 Circuit Diagrams

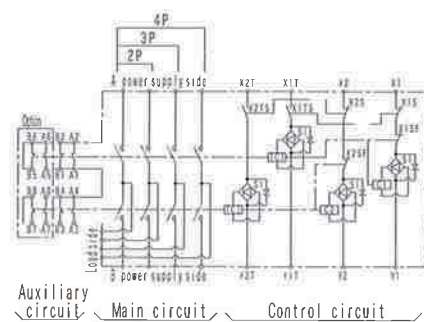
- The diagrams below represent 4P and auxiliary circuit 4a4b.
- For single-phase 3-wire [N3], the neutral pole is in the middle. (N marking on the transfer switch)
- For 3-phase 4-wire [N4], the neutral pole is on the right. (N marking on the transfer switch)

Circuit for AC Control

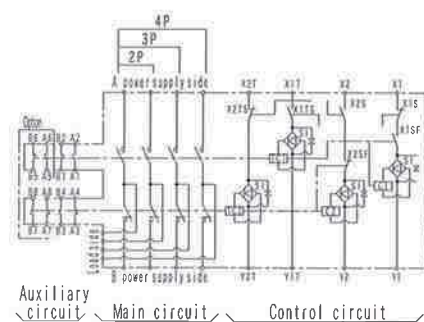
A state of power supply turning on



Neutral state

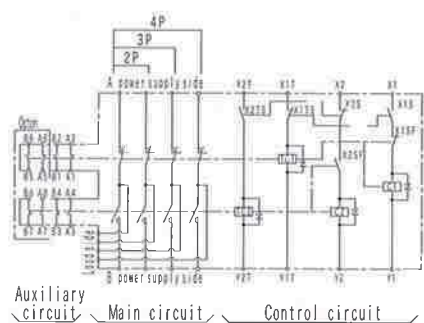


B state of power supply turning on

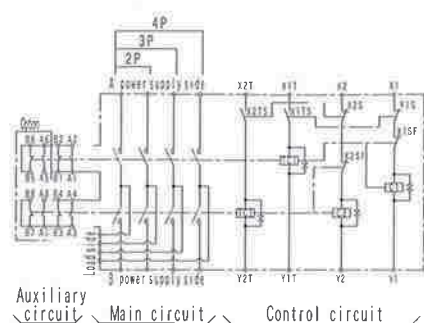


Circuit for DC Control

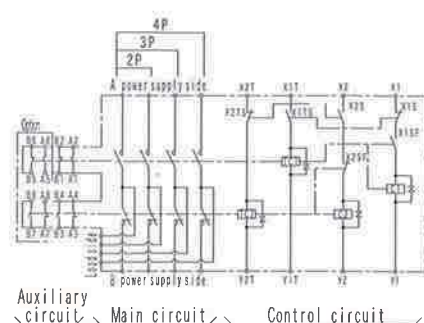
A state of power supply turning on



Neutral state



B state of power supply turning on

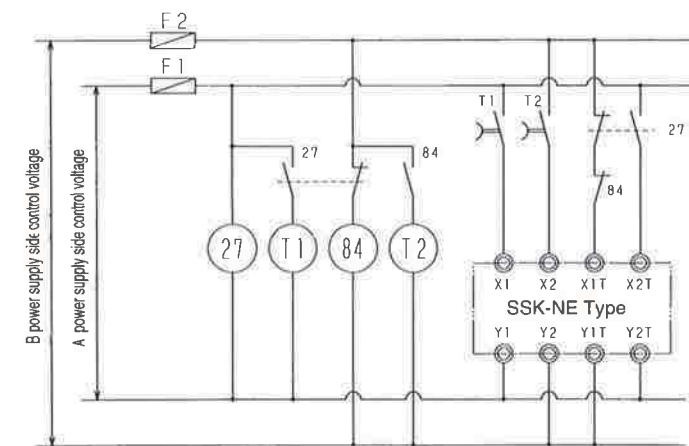


4 Operation Time Chart

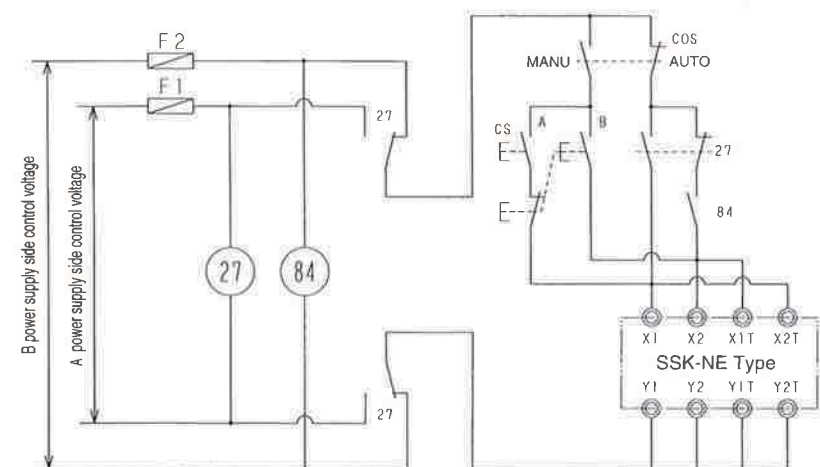
		B power supply side ON		Neutral		A power supply side ON		Neutral		B power supply side ON	
Main circuit	Main circuit	A power supply side									
	B power supply side										
Control circuit	Coil	C1 (X1-Y1)									
		C2 (X2-Y2)									
	Break	TC1 (X1T-Y1T)									
		TC2 (X2T-Y2T)									
Auxiliary circuit	Auxiliary contact	A power supply side									
		B power supply side									
		A1-A2 (A5-A6)									
		B1-B2 (B5-B6)									
		A3-A4 (A7-A8)									
		B3-B4 (B7-B8)									

5 Example of Typical Circuit

OFF position created by use of timer for switching



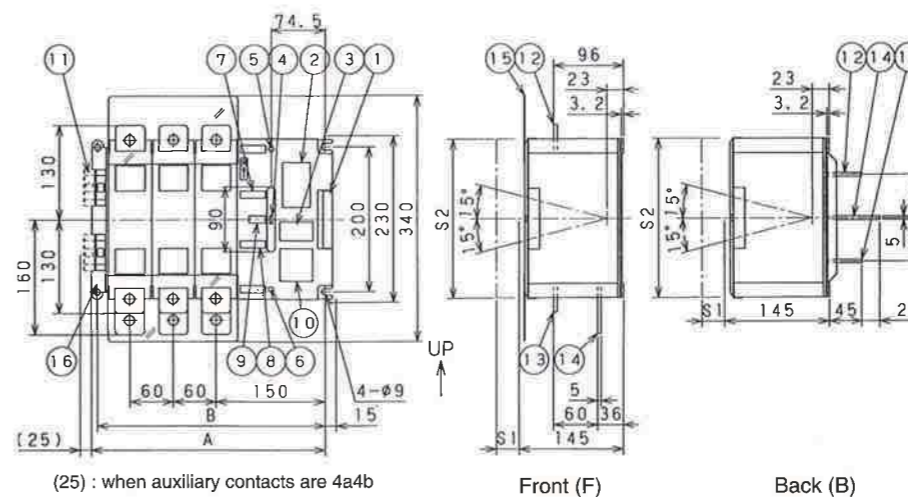
AUTO-MANU switch introduced



6 Overall Dimensions (Drawings represent 3P)

- ① Control circuit terminal block (M3.5)
- ② Safety label
- ③ Manual operation nameplate
- ④ Manual closing handle inlet
- ⑤ A power supply manual tripping pushbar inlet
- ⑥ B power supply manual tripping pushbar inlet
- ⑦ A power supply closing marking
- ⑧ B power supply closing marking
- ⑨ OFF position marking
- ⑩ Model nameplate
- ⑪ Auxiliary circuit terminal (M4)
- ⑫ A power supply main circuit terminal
- ⑬ B power supply main circuit terminal
- ⑭ Load main circuit terminal
- ⑮ Main circuit terminal cover (Front only)
- ⑯ Earth terminal (400A and below; also for mounting use)

64NE



Dimension Poles	A	B	Arc space		
			S 1		S 2
			250V	660V	
2 P	275	255			
3 P	335	315	30	60	220
4 P	395	375			

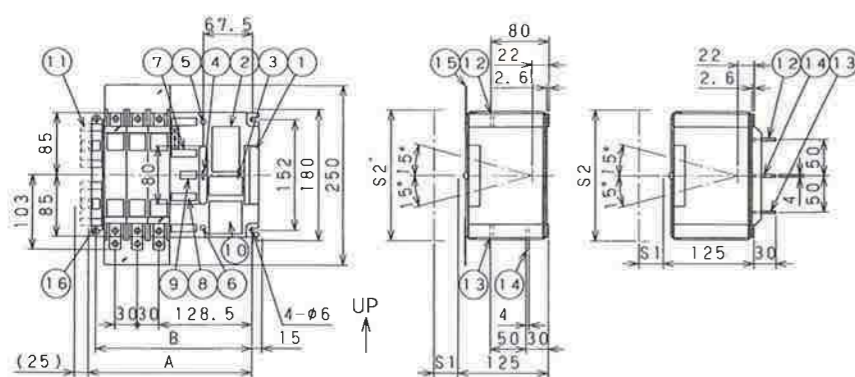
(25) : when auxiliary contacts are 4a4b

Front (F)

Back (B)

Detail of Terminal
() : Connectable dimension

606NE, 61NE



Dimension Poles	A	B	Arc space		
			S 1		S 2
			250V	660V	
2 P	200	185			
3 P	230	215	30	60	180
4 P	260	245			

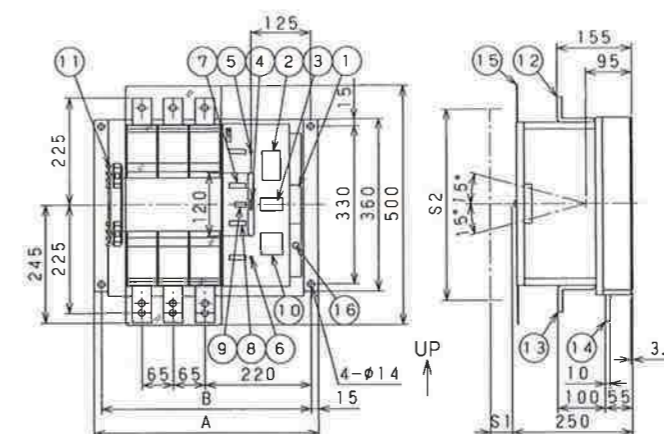
(25) : when auxiliary contacts are 4a4b

Front (F)

Back (B)

Detail of Terminal
() : Connectable dimension

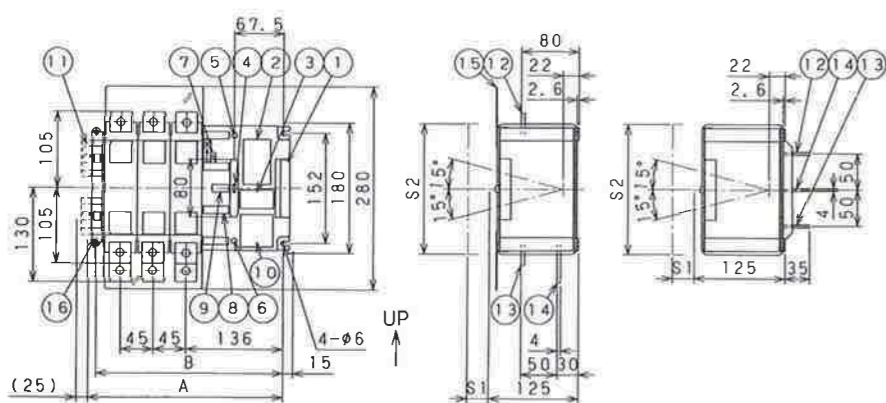
66NE Front (F)



Dimension Poles	A	B	Arc space		
			S 1		S 2
			250V	660V	
2 P	400	370			
3 P	465	435	30	45	400
4 P	530	500			

Detail of Terminal
() : Connectable dimension

62NE



Dimension Poles	A	B	Arc space		
			S 1		S 2
			250V	660V	
2 P	230	215			
3 P	275	260	30	60	180
4 P	320	305			

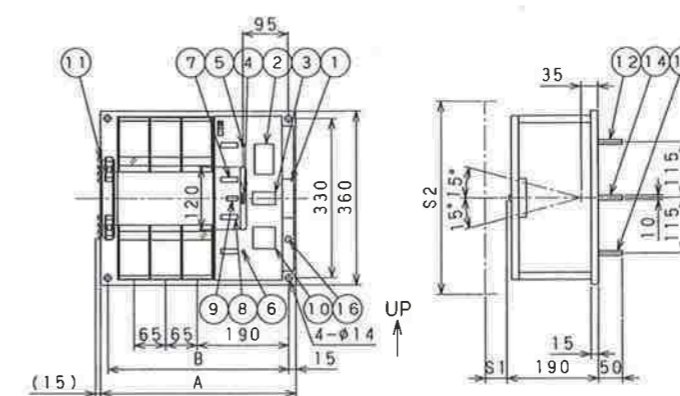
(25) : when auxiliary contacts are 4a4b

Front (F)

Back (B)

Detail of Terminal
() : Connectable dimension

66NE Back (B)

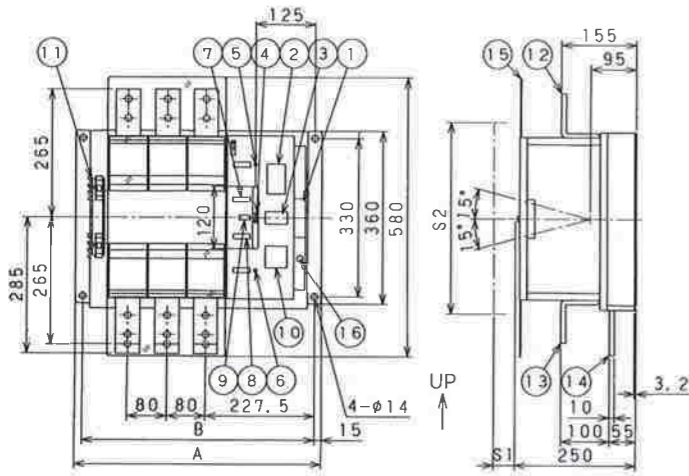


Dimension Poles	A	B	Arc space		
			S 1		S 2
			250V	660V	
2 P	340	310			
3 P	405	375	30	45	400
4 P	470	440			

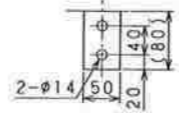
Detail of Terminal
() : Connectable dimension

(15) : when auxiliary contacts are 4a4b

68NE, 610NE Front (F)

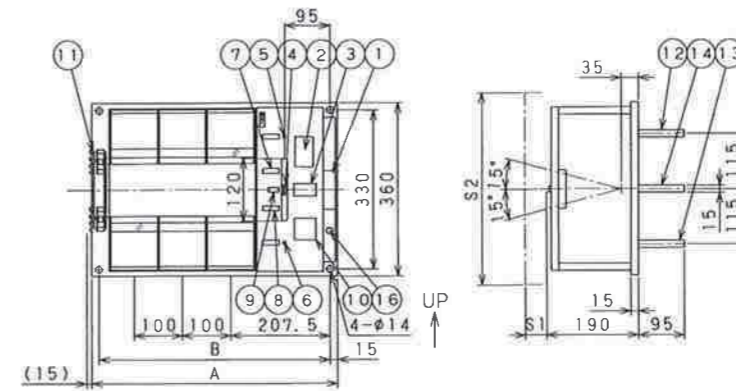


Dimension	Arc space		
	A	B	
	S 1	S 2	
Poles	250V	660V	
2 P	430	400	
3 P	510	480	30 45 400
4 P	590	560	

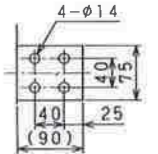


Detail of Terminal
() : Connectable dimension

612NE, 616NE Back (B)

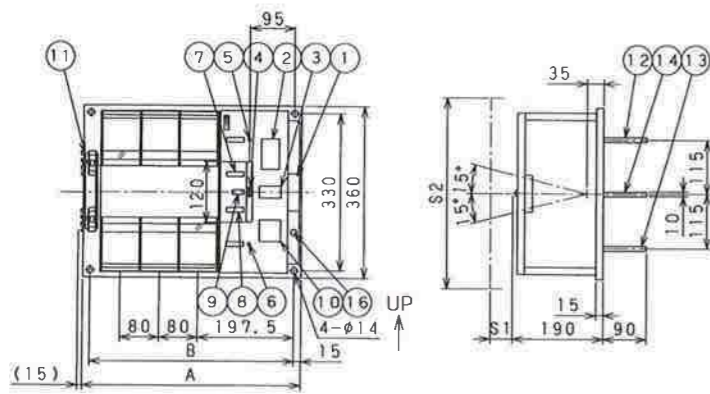


Dimension	Arc space		
	A	B	
	S 1	S 2	
Poles	250V	660V	
2 P	410	380	
3 P	510	480	30 45 400
4 P	610	580	

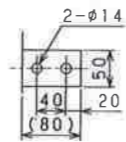


Detail of Terminal
() : Connectable dimension

68NE, 610NE Back (B)

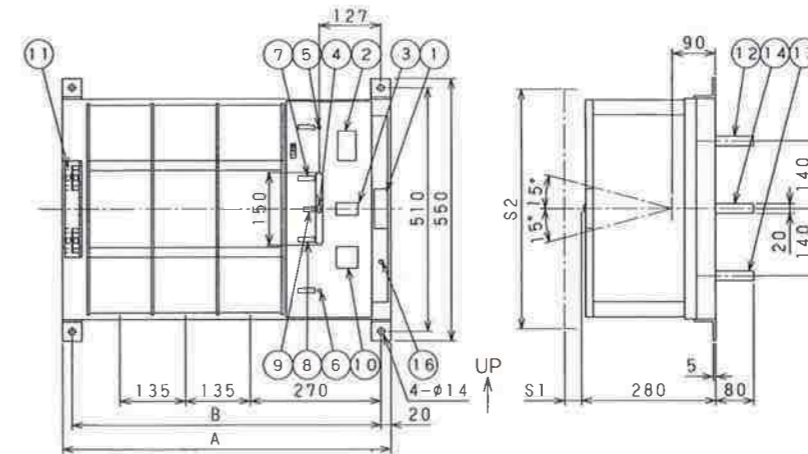


Dimension	Arc space		
	A	B	
	S 1	S 2	
Poles	250V	660V	
2 P	370	340	
3 P	450	420	30 45 400
4 P	530	500	

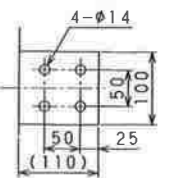


Detail of Terminal
() : Connectable dimension

620NE Back (B)

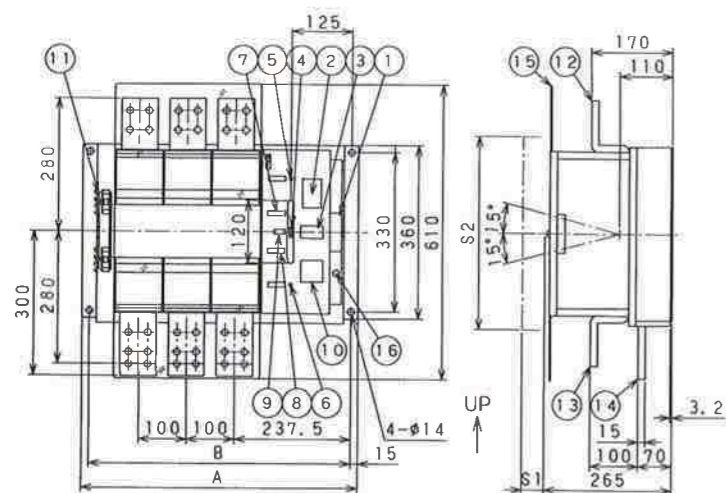


Dimension	Arc space		
	A	B	
	S 1	S 2	
Poles	250V	660V	
2 P	545	505	
3 P	680	640	30 45 500
4 P	815	775	

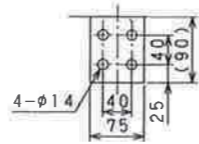


Detail of Terminal
() : Connectable dimension

612NE, 616NE Front (F)

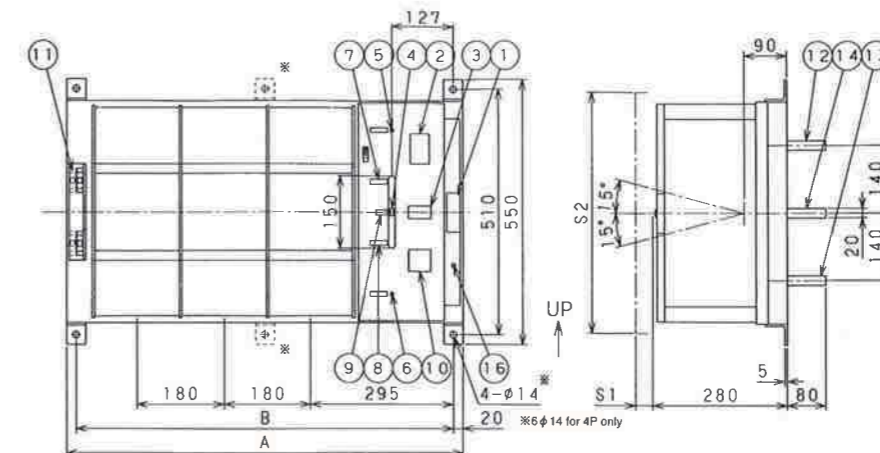


Dimension	Arc space		
	A	B	
	S 1	S 2	
Poles	250V	660V	
2 P	470	440	
3 P	570	540	30 45 400
4 P	670	640	

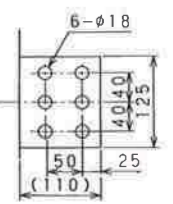


Detail of Terminal
() : Connectable dimension

630NE Back (B)

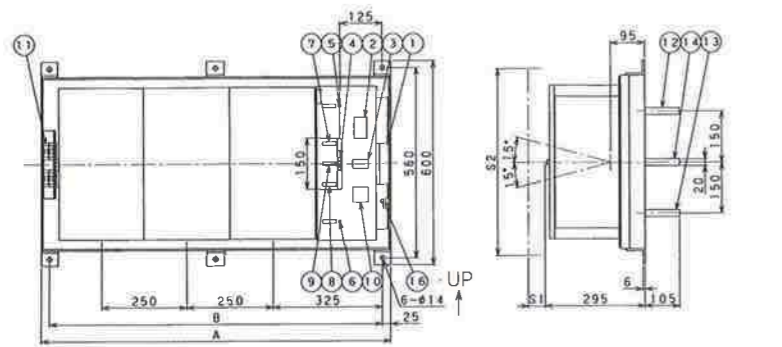


Dimension	Arc space		
	A	B	
	S 1	S 2	
Poles	250V	660V	
2 P	640	600	
3 P	820	780	30 45 500
4 P	1000	960	

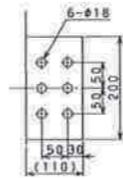


Detail of Terminal
() : Connectable dimension

640NE Back (B)

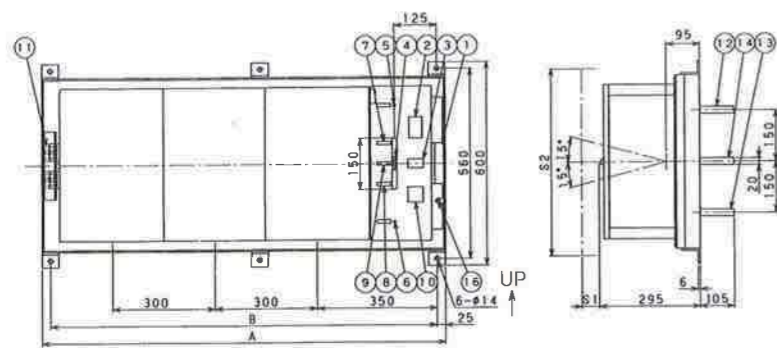


Dimension	Arc space		S 1		S 2
	A	B	250V	660V	
	Poles				
2 P	780	730			
3 P	1030	980	30	50	550
4 P	1280	1230			

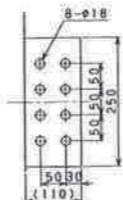


Detail of Terminal
() : Connectable dimension

650NE Back (B)

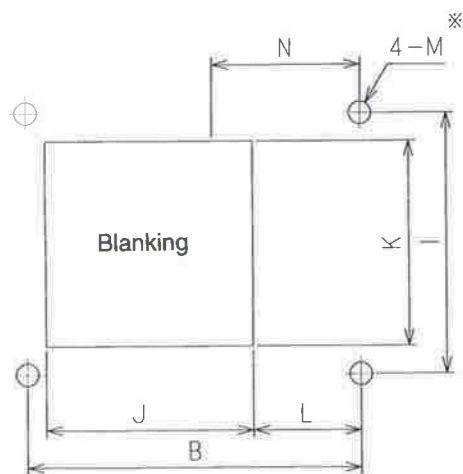


Dimension	Arc space		S 1		S 2
	A	B	250V	660V	
	Poles				
2 P	880	830			
3 P	1180	1130	35	50	550
4 P	1480	1430			



Detail of Terminal
() : Connectable dimension

7 Panel Finish Dimensions



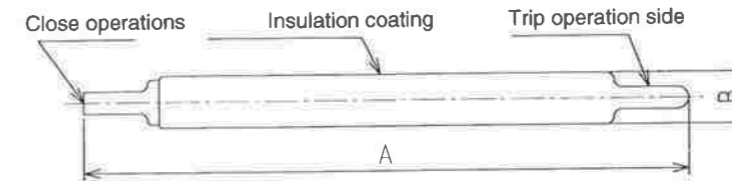
形式	606NE	62NE	64NE	66NE		68NE·610NE		612NE·616NE		620NE	630NE	640NE	650NE	
	61NE			Front	Back	Front	Back	Front	Back					
B	2 P	185	215	255	370	310	400	340	440	380	505	600	730	830
	3 P	215	260	315	435	375	480	420	540	480	640	780	980	1130
	4 P	245	305	375	500	440	560	500	640	580	775	960	1230	1430
J	2 P	75	105	135	—	280	—	310	—	350	465	560	680	780
	3 P	105	150	195	—	345	—	390	—	450	600	740	930	1080
	4 P	135	195	255	—	410	—	470	—	550	735	920	1180	1380
I	152	152	200	330	—	330	—	330	—	510	510	560	560	
K	140	150	180	—	300	—	300	—	300	420	420	450	450	
L	100	100	110	—	15	—	15	—	15	20	20	25	25	
M	φ6	φ6	φ9	φ14	—	φ14	—	φ14	—	φ14	φ14	φ14	φ14	φ14
N	128.5	136	150	220	190	227.5	197.5	237.5	207.5	270	295	325	350	

● N: Distance to right-hand terminal
● J, K, and L apply to the back type (B).
※6-M for 630NE(4P), 640NE and 650NE

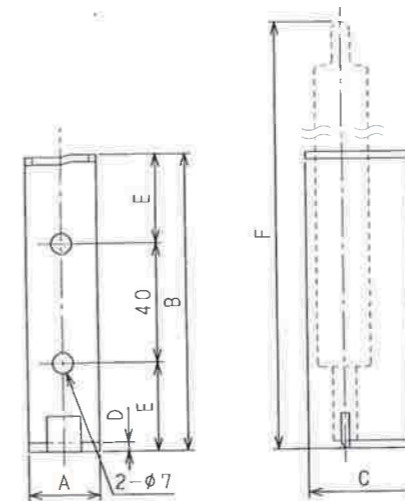
8 Manual Operation Handle

Overall Dimensions

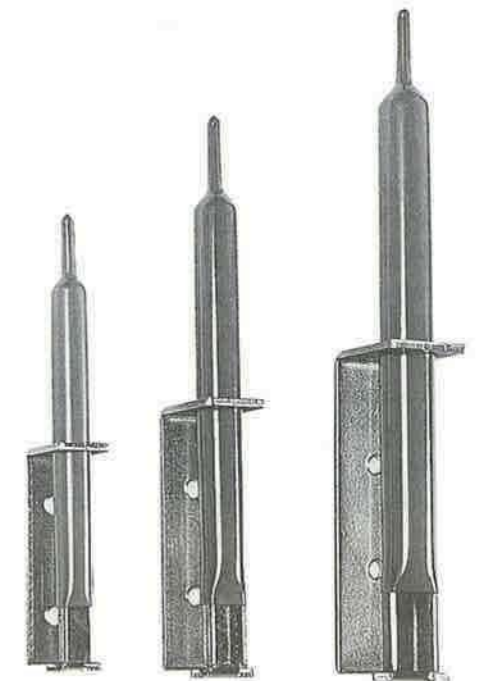
	606NE-64NE	66NE-616NE	620NE-630NE	640NE-650NE
A	162	202	252	502
B	φ14	φ16	φ22	φ22



Handle Holder (Option)



	606NE-64NE	66NE-616NE	620NE-630NE	640NE-650NE
A	20	24	32	32
B	80	100	125	125
C	30	37.5	42	42
D	2.3	2.6	3.2	3.2
E	20	30	42.5	42.5
F	165	206	256	506



Safety Instructions



For proper and safe operation, be sure to carefully read the Instruction Manual, "Safety Instructions" and "Operating Instructions" before starting to use the Transfer Switch.

- Install the transfer switch in the vertical position as indicated by the UP marking. Failure to install in the correct orientation may lead to operation failure.
- Provide arcing space as specified in the catalog around the transfer switch. Arc coming into contact with a metallic object at breaking can cause accidents.
- The exciting coils of this transfer switch is of the short-time rating. Do not allow a voltage drop of more than 4 percent for the exciting circuit, including the wiring and contacts of exciting contactors. Otherwise, "Minimum pickup voltage" (85%) - "Voltage drop" (4%) = 81%. Large voltage drop can cause operation failure and consequently abnormal heating of coils.
- Design the circuit in such a way that no simultaneous excitation command or continuous alternate excitation command is given to the two exciting coils. Incorrect circuit design can cause malfunction, abnormal heating of coils or fusion of main contacts.
- Be sure to install a fuse for protecting the control circuit. The fuse capacity should be 40 to 50 percent of the rated coil current.
- When the transfer switch is used for overlapped switching between two power supplies, be sure to use it with the phase of the two power supplies adjusted.

- Do not use the overlap transfer switch for the switching between stand-by power supply system for emergency use and commercial power supply system. (The Guide Book of Electrical Equipment, 43-2)
- The electrical angle of phase difference at switching must be less than 7 degrees.
- The voltage difference between the two power supply systems at switching must be less than five percent.
- The frequency difference between the two power supply systems at switching must be less than 0.2 Hz.
- Transient current flows according to the phase difference and voltage difference, so that consideration must be given to the resistance of the power supply system to the transient current.

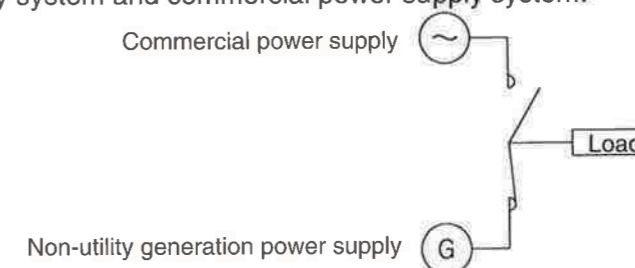
■ Uses

- This transfer switch (contactor) is capable of switching between different types of power supply systems without any instantaneous power break.
- The transfer switch can replace the functions of NFB, ACB, etc.
- The merits the LE type transfer switch provides include:
 - ! More efficient use of space
 - " Easy connection of main circuit
 - # Simplification of control circuit

■ Examples of Usage

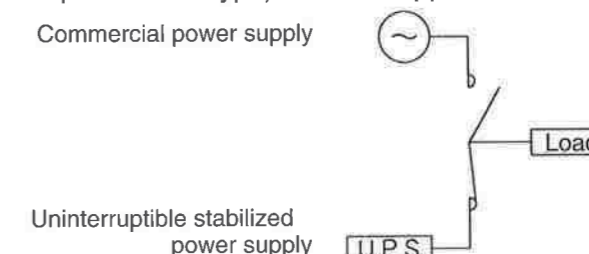
(1) Switching between non-utility generation power supply system and commercial power supply system without any instantaneous power break

You can use the overlap transfer switch for instantaneous switching between non-utility generation power supply system and commercial power supply system.

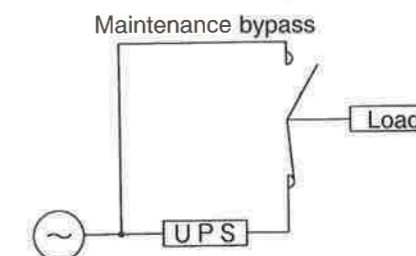


(2) Switching between uninterruptible stabilized power supply system and commercial power supply system without any instantaneous power break

The LEF type (overlap time fixed type) suits this application.

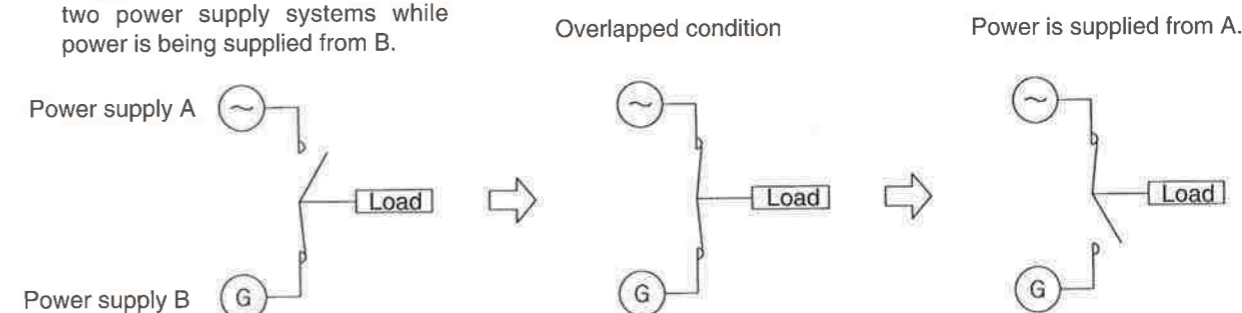


(3) Bypass switching for maintenance of uninterruptible stabilized power supply system



■ Example of Switching Operation

Phases are matched between the two power supply systems while power is being supplied from B.



standard : JEM1038 · JEM1465 · IEC60947-6-1 · JIS C-8325 · UL1008 · CCC (NE TYPE)

1 Installation

1-1 Environment of installation

- Do not install the transfer switch in an environment of high temperature or high humidity or in an atmosphere containing dust or harmful gases.
- The environmental requirements are in compliance with JEM 1038 (1990) as follows:
 - (1) Altitude : 2000m or below
 - (2) Ambient temperature : -5°C ~ 40°C (average temperature of a day : 35°C or below)
 - (3) Relative humidity : 45% ~ 85%RH
 - (4) No abnormal vibration or shocks
 - (5) Atmosphere free from excessive water vapor, oil vapor, smoke, dust, salt, corrosive material, etc.
- About use under conditions other than specified, contact Kyoritsu Keiki for advice.
- The approximate reduction rate of the rated operating current for use at high temperatures above 40°C is as follows:

50°C ... 90%	60°C ... 80%
--------------	--------------

1-2 Positioning

- Install the transfer switch according to the UP marking.
For installation in orientation other than specified, consult Kyoritsu Keiki.
- Attach the mounting base on a vertical surface, and install the transfer switch with the control circuit, main circuit and auxiliary circuit in this order from right to left.

2 Control Circuit (LEF Type)

2-1 Pickup voltage

- The exciting coils of the transfer switch are an instantaneous excitation type and of short time rating. The pickup voltage range is as follows:

AC control	85 to 110% of rated voltage
DC control	85 to 130% of rated voltage
- Make sure that the exciting voltage does not drop below 85 percent of the rated voltage at the terminals of the exciting coils.
- In order to prevent action failure, make certain that the voltage drop is less than 4 percent in the wiring from power supply to the terminals of the control circuit, including the contacts of the excitation contactor.

2-2 Control circuit

- Be sure to provide the exciting circuit with a fuse for coil protection. (40 to 50% of the rated current of the coil)
- Although the switching operation is completed within 0.3 seconds, give a signal of 0.5 seconds or longer so as to ensure reliable operation.
- Form the circuit in such a way that no simultaneous excitation commands or continuous alternate excitation commands work on the exciting coils.
- The exciting coils have a built-in thermal protector as a protection against continuous energization. (For AC operation)
- The reset time when the thermal protector has operated is 15 to 60 minutes. Before being reset, the transfer switch will not work even when a switching signal is given.
The transfer switch is of such design that on completion of operation the control current is turned off by the internal contact.
Use of any external auxiliary contact can cause failure of the operation.
- Where there is a dropper circuit provided for control power supply (DC), connect the control power supply to the input side of the dropper circuit. (Never connect it to the output side.)
- For sequence and control, select proper contactors and sensors with full understanding of their performance.

2-3 Coil protection fuse

- When introducing fuse for coil protection, select a fuse whose capacity is 40 to 50% of the rated coil current and use it solely for the transfer switch. Too large fuse capacity will not serve the purpose of coil protection.

2-4 Control contactor

- The control contactor must be highly reliable to always ensure normal operation of the transfer switch. That is, the contactor to be used must have a switching capacity large enough to withstand the induction load of the exciting coil.
- Do not use an ordinary miniature relay or the like as an auxiliary relay for excitation. If they are used, operation failure may result from the bouncing of the contacts and the subsequent contact fusion or voltage drop. Therefore select an auxiliary relay with sufficient capacity. You are advised to use the contactor to be purchased from Kyoritsu Keiki.

2-5 Capacity of control transformer

- Use an auto-transformer of the rated capacity as the control transformer.

3 Main Circuit

3-1 Main circuit connection

- Select wires to be connected which have proper current capacity.
- Exercise caution so that no stress works on the terminals.

3-2 Arcing space

- When installing the transfer switch, be sure to provide arcing space as indicated in "Overall Dimensions". Arc, when it comes in contact with any other device or metal body at the time of breaking, can cause accidents.

4 Manual Operation of the LEF Type

- Manual operation of the transfer switch is to be performed only for purposes of checks or maintenance. Manual operation can be done when there is no difference in phase, voltage and frequency between the two power supply systems. (Be sure to turn off power to the control circuit, however.)
- Never conduct manual operation the transfer switch is being energized under conditions other than the above.

Features

- Small size and light weight
- Mounting dimensions identical to those of our E or NE type
- Control circuit and main circuit housed in a casing
- Terminal covers provided for control circuit and main circuit (Terminal cover for main circuit: Front type only)
- A wide range of models to select from for your applications

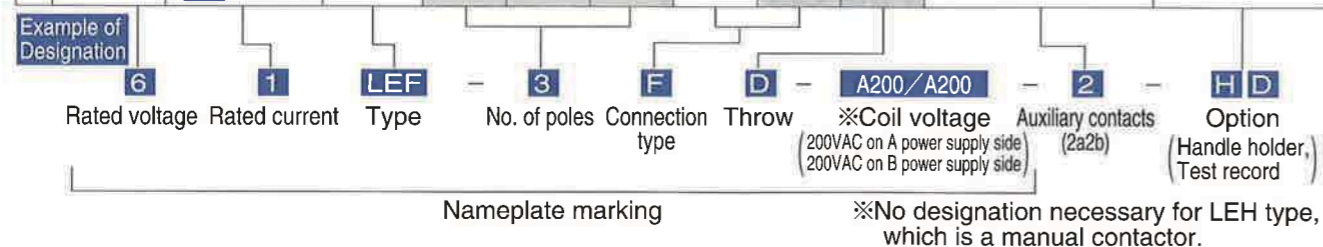
Types

- LEF Type: Overlap transfer switch for time-fixed power supply switching
- LEH Type: Overlap manual contactor for power supply switching

Model Selection & Designation

- Standard model (Models immediately available to order)
- Semi-standard model (Models produced on standard lines and so available in short lead time)

Rated voltage	Rated current	Type	No. of poles			Connection type		Throw	Auxiliary circuit (auxiliary contacts)	Option
			2 P	3 P	4 P	Front	Back	Double throw		
660VAC	100A	LEF LEH	2	3	4	F	B	D	2 2a2b standard (1a1b on each power supply side) 4 4a4b max. (2a2b on each power supply side) (4a4b : optional)	H Handle holder D Test record
	200A									
	400A									
	600A									
	800A									
	1000A									
	1200A									
	1600A									
	2000A									
	3000A									
	4000A									
	5000A									



Standard accessories

- Operation handle
- Control circuit terminal cover
- Hand holder (LEH type only)
- Main circuit terminal cover (Front only)
- Main circuit terminal bolt (400A or below)

- NOTES
- Standard control coil voltages are 100/110VDC, 100/110VAC and 200/220VAC. Other voltages are available to individual orders.
 - Even with the back connection type, front wiring is used for the control circuit and auxiliary circuit.

1 Rated Specifications

Note: The LEH type, which is for manual switching, does not require control power supply.
Weight values in () represent those for the LEH type.

Model		61LEF, 61LEH	62LEF, 62LEH	64LEF, 64LEH	
Rated voltage		660VAC			
Rated current		100 A	200 A	400 A	
Throw		Double throw (D)			
Connection		Front (F), Back (B)			
Weight (Kg)	2 P	8 (6.5)	9.5 (8)	16 (14)	
	3 P	9.5 (8)	11.5 (10)	19 (17)	
	4 P	11 (9.5)	13.5 (12)	22 (20)	
Control current	2 P	100VDC	6.0 A	8.6 A	8.3 A
		100VAC	6.4 A	10.2 A	9.8 A
	3 P	200VAC	3.3 A	5.1 A	5.4 A
		100VDC	6.0 A	7.9 A	12.1 A
	4 P	100VAC	6.4 A	14.1 A	14.1 A
		200VAC	3.3 A	7.8 A	6.8 A
Coil insulation class		A class (short time rating)			
Withstand voltage	Main circuit	2500VAC, one minute (50/60 Hz)			
	Control circuit	2000VAC, one minute (50/60 Hz)			
Short time current capacity (1sec during conduction)		5 kA	10 kA	12 kA	
Make and break capacity		Make and break at rated current			
Life		Mechanical life: 20,000 times			
Switching frequency		No. 4 (150 times / hr)			
Switching characteristics (at rated voltage)	Close time	20~45 msec	20~40 msec	30~50 msec	
	Lap time	10~35 msec	10~40 msec	20~50 msec	
Auxiliary contact make & break capacity		Max. 250VAC 15A, 110VDC 5A, Min. 24VDC 0.1A			
Notes	1	For use in switching between power supplies, the phase difference between them must be adjusted to within an electrical angle of 7 degrees. (LEF type)			
	2	Switching of current below the rated current can be made if it is done without power supply on one side. (20,000 times) (Not possible with the LEH type)			
	3	The overlapping time can be changed with a timer provided externally. (See [2] Circuit Diagram) (LEF type)			

1 Rated Specifications

Note: The LEH type, which is for manual switching, does not require control power supply.

Weight values in () represent those for the LEH type.

Model		66LEF, 66LEH	68LEF, 68LEH	610LEF, 610LEH	612LEF, 612LEH	616LEF, 616LEH
Rated voltage		660VAC				
Rated current		600 A	800 A	1000 A	1200 A	1600 A
Throw		Double throw (D)				
Connection		Front (F), Back (B)				
Weight (Kg)	2 P	42 (38)	47 (43)	58 (51)		
	3 P	49 (45)	55 (51)	65 (58)		
	4 P	56 (52)	63 (59)	73 (66)		
Control current	2 P	100VDC	6.3 A	7.1 A	9.7 A	
		100VAC	7.2 A	8.1 A	11.5 A	
	3 P	200VAC	3.6 A	4.1 A	5.6 A	
		100VDC	8.7 A	9.7 A	12.0 A	
	4 P	100VAC	10.2 A	11.5 A	15.5 A	
		200VAC	4.9 A	5.6 A	7.4 A	
Coil insulation class		A class (short time rating)				
Withstand voltage	Main circuit	2500VAC, one minute (50/60 Hz)				
	Control circuit	2000VAC, one minute (50/60 Hz)				
Short time current capacity (1sec during conduction)		15 kA	22 kA	25 kA		
Make and break capacity		Make and break at rated current				
Life		Mechanical life: 10,000 times				
Switching frequency		No. 5 (30 times / hr)				
Switching characteristics (at rated voltage)	Close time	45~75 msec	50~80 msec	50~80 msec		
	Lap time	55~95 msec	60~80 msec	70~120 msec		
Auxiliary contact make & break capacity		Max. 250VAC 15A, 110VDC 5A, Min. 24VDC 0.1A				
Notes	1	For use in switching between power supplies, the phase difference between them must be adjusted to within an electrical angle of 7 degrees. (LEF type)				
	2	Switching of current below the rated current can be made if it is done without power supply on one side. (20,000 times) (Not possible with the LEH type)				
	3	The overlapping time can be changed with a timer provided externally. (See [2] Circuit Diagram) (LEF type)				

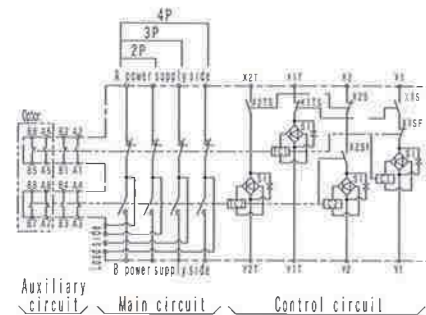
Model		620LEF, 620LEH	630LEF, 630LEH	640LEF, 640LEH	650LEF, 650LEH	
Rated voltage		660VAC				
Rated current		2000 A	3000 A	4000 A	5000 A	
Throw		Double throw (D)				
Connection		Back (B)				
Weight (Kg)	2 P	100 (84)	110 (94)	170 (154)	190 (174)	
	3 P	125 (109)	150 (134)	210 (194)	270 (254)	
	4 P	150 (134)	190 (174)	250 (234)	350 (334)	
Control current	2 P	100VDC	12.2 A	13.1 A	21.0 A	29.0 A
		100VAC	13.9 A	16.1 A	25.5 A	28.5 A
	3 P	200VAC	7.1 A	7.7 A	12.6 A	13.5 A
		100VDC	15.0 A	18.0 A	26.0 A	35.0 A
	4 P	100VAC	16.0 A	19.0 A	30.0 A	40.0 A
		200VAC	8.0 A	9.5 A	15.0 A	20.0 A
Coil insulation class		A class (short time rating)				
Withstand voltage	Main circuit	2500VAC, one minute (50/60 Hz)				
	Control circuit	2000VAC, one minute (50/60 Hz)				
Short time current capacity (1sec during conduction)		35 kA	50 kA	50 kA	50 kA	
Make and break capacity		Make and break at rated current				
Life		Mechanical life: 10,000 times				
Switching frequency		No. 5 (30 times / hr)				
Switching characteristics (at rated voltage)	Close time	50~80 msec	50~80 msec	40~60 msec	40~60 msec	
	Lap time	120~160 msec	120~160 msec	100~140 msec	100~140 msec	
Auxiliary contact make & break capacity		Max. 250VAC 15A, 110VDC 5A, Min. 24VDC 0.1A				
Notes	1	For use in switching between power supplies, the phase difference between them must be adjusted to within an electrical angle of 7 degrees. (LEF type)				
	2	Switching of current below the rated current can be made if it is done without power supply on one side. (20,000 times) (Not possible with the LEH type)				
	3	The overlapping time can be changed with a timer provided externally. (See [2] Circuit Diagram) (LEF type)				

2 Circuit Diagram

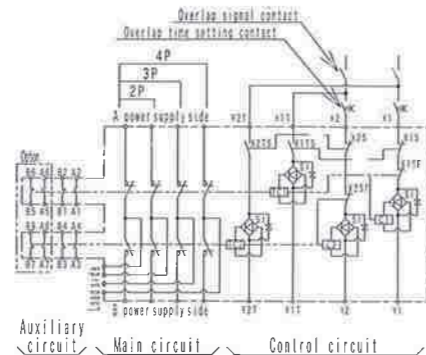
- With the LEF type, the overlapping time can be changed as appropriate with a timer provided externally.
- The LEH type, which is for manual switching, has no electrically-driven control unit.

(1) Circuit for AC Control

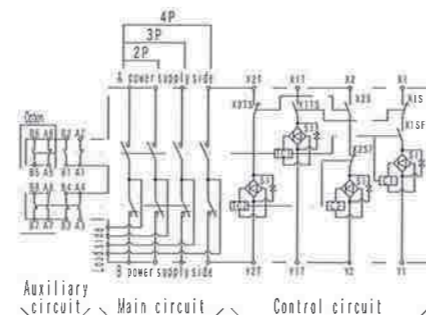
A state of power supply turning on



Overlap of power supply turning on



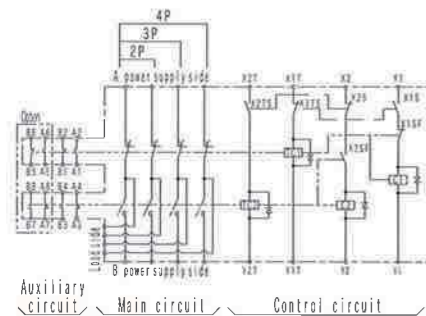
B state of power supply turning on



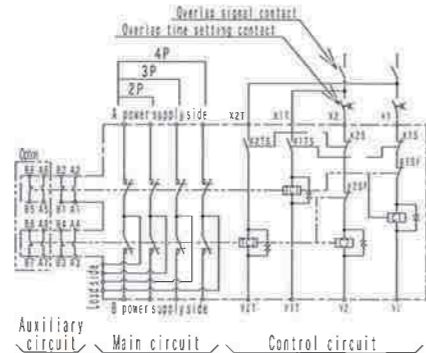
Auxiliary circuit Main circuit Control circuit

(2) Circuit for DC Control

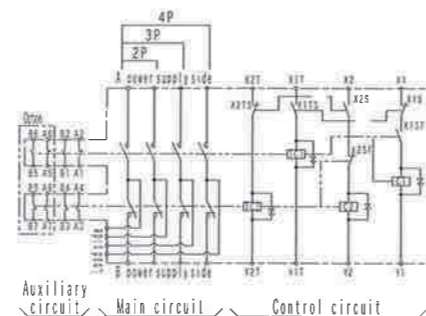
A state of power supply turning on



Overlap of power supply turning on



B state of power supply turning on



Auxiliary circuit Main circuit Control circuit

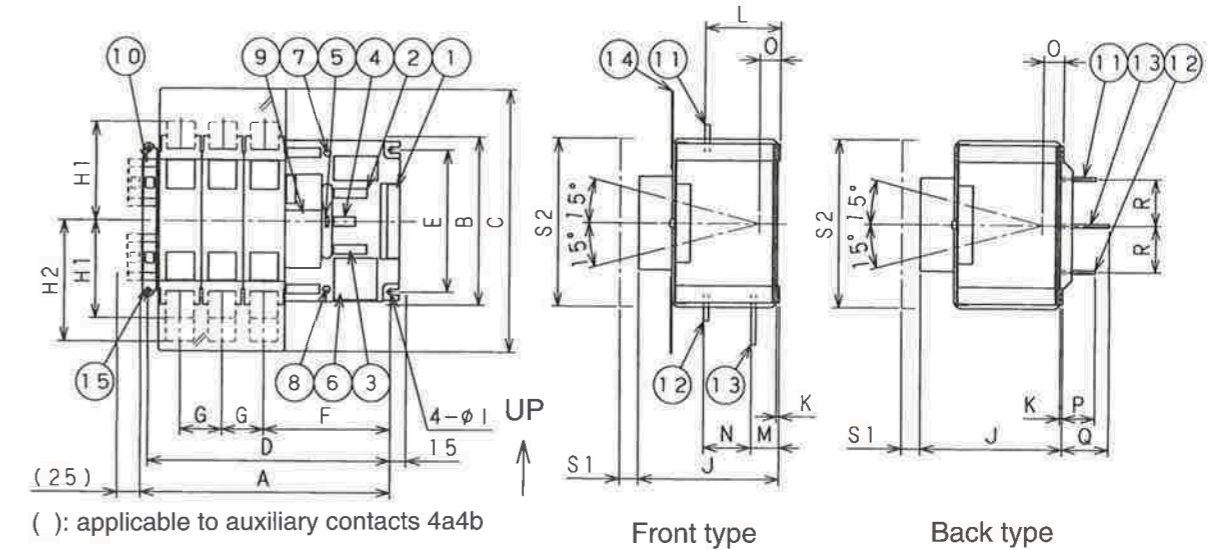
3 Operation Time Chart

Main circuit	Main contact	A power supply side B power supply side	Lap time		Lap time		B power supply side ON
			B power supply side ON	A power supply side ON	A power supply side ON	B power supply side ON	
Control circuit	Coil	C1 (X1-Y1)					
		C2 (X2-Y2)					
		TC1 (X1T-Y1T)					
		TC2 (X2T-Y2T)					
Auxiliary circuit	Auxiliary contact	A1-A2 (A5-A6)					
		B1-B2 (B5-B6)					
		A3-A4 (A7-A8)					
		B3-B4 (B7-B8)					

Note) Use of an external auxiliary circuit for the control circuit can lead to operation failure.

4 Overall Dimensions (Drawings represent 3P.)

(1) 61LEF ~ 64LEF, 61LEH ~ 64LEH



(LEF type 100 to 400A)
(LEH type 100 to 400A)

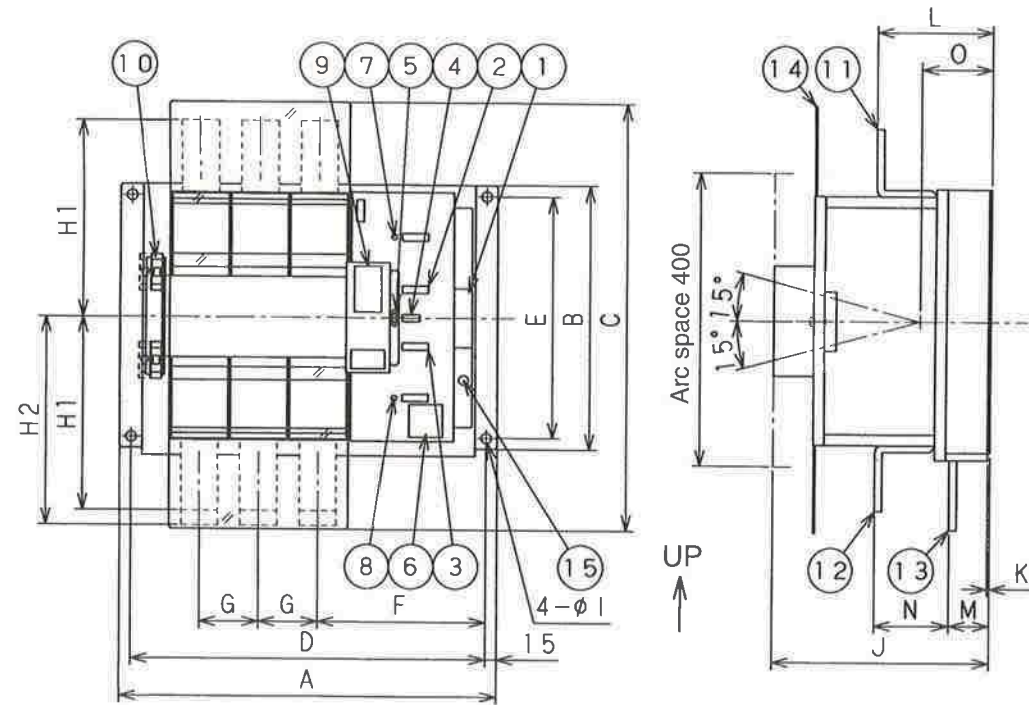
- ① Control circuit terminal block (M3.5)
 - ② A power supply closing marking
 - ③ B power supply closing marking
 - ④ Overlap marking
 - ⑤ Manual closing handle inle
 - ⑥ Model nameplate
 - ⑦ A power supply overlap operation hole
 - ⑧ B power supply overlap operation hole
 - ⑨ Safety label
 - ⑩ Auxiliary circuit terminal (M4)
 - ⑪ A power supply main circuit terminal
 - ⑫ B power supply main circuit terminal
 - ⑬ Load main circuit terminal
 - ⑭ Main circuit terminal cover (Front type only)
 - ⑮ Earth terminal (also for mounting use)
- Note) The LEH type has no control circuit terminal block ①

Model	61LEF · 61LEH	62LEF · 62LEH	64LEF · 64LEH	Back type panel dimensions
Terminal dimensions				
Supplied terminal bolt	M8 × 15	M10 × 25	M12 × 30	

Model	A			B	C	D			E	F	G	Front type		I
	2P	3P	4P			2P	3P	4P				H1	H2	
61LEF · 61LEH	200	230	260	180	250	185	215	245	152	128.5	30	85	103	6
62LEF · 62LEH	230	275	320	180	280	215	260	305	152	136	45	105	130	6
64LEF · 64LEH	275	335	395	230	340	255	315	375	200	150	60	130	160	9

J	K	Front type			O	Back type			S1	S2	T			U	V
		L	M	N		P	Q	R			2P	3P	4P		
150	2.6	80	30	50	22	30	30	50	35	180	75	105	135	140	100
150	2.6	80	30	50	22	35	35	50	35	180	105	150	195	150	100
180	3.2	96	36	60	23	45	70	60	25	220	135	195	255	180	110

(2) 66LEF - 616LEF / 66LEH - 616LEH (Front Type)



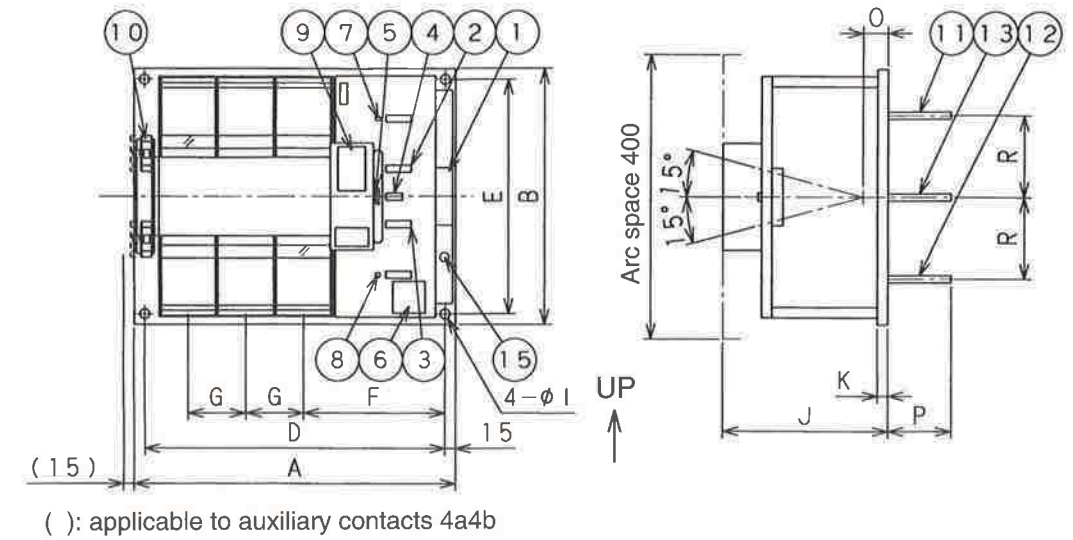
(LEF type 600 to 1600A / Front)
(LEH type 600 to 1600A / Front)

- ① Control circuit terminal block (M3.5)
 - ② A power supply closing marking
 - ③ B power supply closing marking
 - ④ Overlap marking
 - ⑤ Manual closing handle inle
 - ⑥ Model nameplate
 - ⑦ A power supply overlap operation hole
 - ⑧ B power supply overlap operation hole
 - ⑨ Safety label
 - ⑩ Auxiliary circuit terminal (M4)
 - ⑪ A power supply main circuit terminal
 - ⑫ B power supply main circuit terminal
 - ⑬ Load main circuit terminal
 - ⑭ Main circuit terminal cover
 - ⑮ Earth terminal
- Note) The LEH type has no control circuit terminal block ①

Model	66LEF 66LEH	68LEF, 610LEF 68LEH, 610LEH	612LEF, 616LEF 612LEH, 616LEH
Terminal dimensions (mm)			
Note) Terminal bolts are not supplied. Values in () represent connectable dimensions.			

Model	A			B	C	D			E	F	G	H1	H2	I	J	K	L	M	N	O
	2P	3P	4P			2P	3P	4P												
66LEF · 66LEH	400	465	530	360	500	370	435	500	330	220	65	225	245	14	295	3.2	155	55	100	95
68LEF, 610LEF · 68LEH, 610LEH	430	510	590	360	580	400	480	560	330	227.5	80	265	285	14	295	3.2	155	55	100	95
612LEF, 616LEF · 612LEH, 616LEH	470	570	670	360	610	440	540	640	330	237.5	100	280	300	14	310	3.2	170	70	100	110

(3) 66LEF - 616LEF / 66LEH - 616LEH (Back Type)



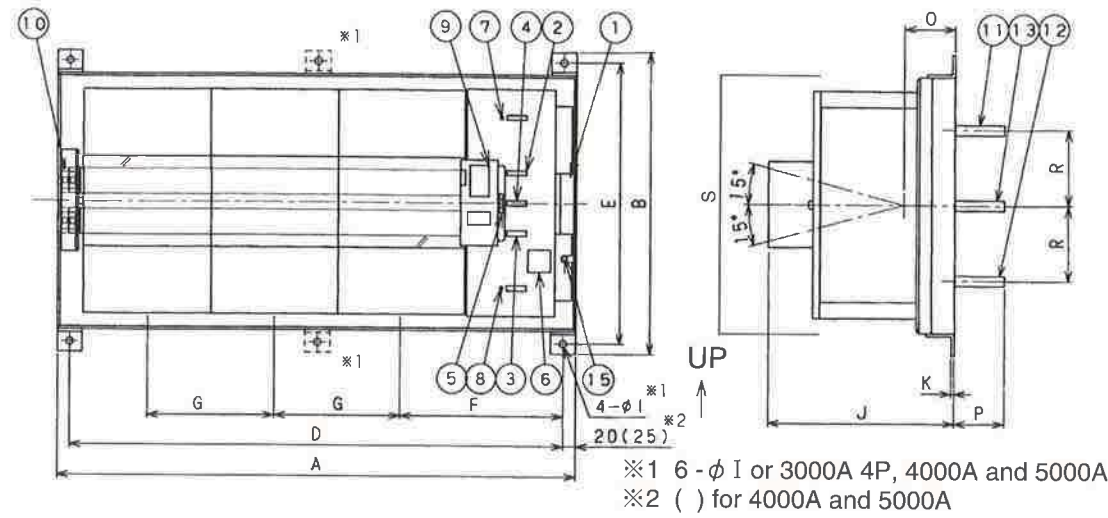
(LEF type 600 to 1600A / Back)
(LEH type 600 to 1600A / Back)

- ① Control circuit terminal block (M3.5)
 - ② A power supply closing marking
 - ③ B power supply closing marking
 - ④ Overlap marking
 - ⑤ Manual closing handle inle
 - ⑥ Model nameplate
 - ⑦ A power supply overlap operation hole
 - ⑧ B power supply overlap operation hole
 - ⑨ Safety label
 - ⑩ Auxiliary circuit terminal (M4)
 - ⑪ A power supply main circuit terminal
 - ⑫ B power supply main circuit terminal
 - ⑬ Load main circuit terminal
 - ⑭ Earth terminal
- Note) The LEH type has no control circuit terminal block ①

Model	66LEF 66LEH	68LEF, 610LEF 68LEH, 610LEH	612LEF, 616LEF 612LEH, 616LEH	Back type panel dimensions
Terminal dimensions (mm)				
Note) Terminal bolts are not supplied. Values in () represent connectable dimensions.				

Model	A			B	D			E	F	G	I	J	K	O	P	R	T			U
	2P	3P	4P		2P	3P	4P										2P	3P	4P	
66LEF · 66LEH	340	405	470	360	310	375	440	330	190	65	14	235	15	35	50	115	280	345	410	300
68LEF, 610LEF · 68LEH, 610LEH	370	450	530	360	340	420	500	330	197.5	80	14	235	15	35	90	115	310	390	470	300
612LEF, 616LEF · 612LEH, 616LEH	410	510	610	360	380	480	580	330	207.5	100	14	250	15	35	95	115	350	450	550	300

(4) 620LEF - 650LEF / 620LEH - 650LEH (Back Type)



(LEF type 2000 to 5000A / Back)
(LEH type 2000 to 5000A / Back)

- ① Control circuit terminal block (M3.5)
- ② A power supply closing marking
- ③ B power supply closing marking
- ④ Overlap marking
- ⑤ Manual closing handle inle
- ⑥ Model nameplate
- ⑦ A power supply overlap operation hole
- ⑧ B power supply overlap operation hole
- ⑨ Safety label
- ⑩ Auxiliary circuit terminal (M4)
- ⑪ A power supply main circuit terminal
- ⑫ B power supply main circuit terminal
- ⑬ Load main circuit terminal
- ⑭ Earth terminal

Note) The LEH type has no control circuit terminal block ①

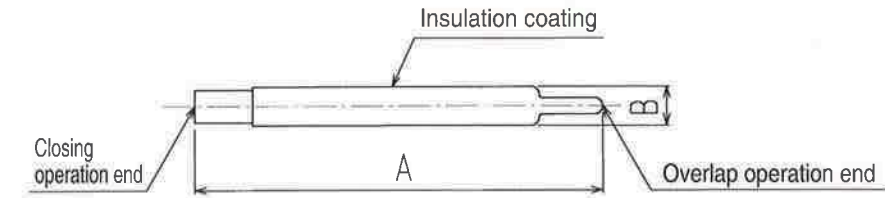
Model	620LEF, 620LEH	630LEF, 630LEH	640LEF, 640LEH	650LEF, 650LEH	Back type panel dimensions
Terminal dimensions (mm)					
Note) Terminal bolts are not supplied. Values in () represent connectable dimensions.					

Model	A			B	D			E	F	G	I	J	K	O	P	R	S	T			U
	2P	3P	4P		2P	3P	4P											2P	3P	4P	
620LEF, 620LEH	545	680	815	550	505	640	775	510	270	135	14	350	5	90	80	140	500	465	600	735	420
630LEF, 630LEH	640	820	1000	550	600	780	960	510	295	180	14	350	5	90	80	140	500	560	740	920	420
640LEF, 640LEH	780	1030	1280	600	730	980	1230	560	325	250	14	365	6	95	105	150	550	680	930	1180	450
650LEF, 650LEH	880	1180	1480	600	830	1130	1430	560	350	300	14	365	6	95	105	150	550	780	1080	1380	450

5 Manual Operation Handle

Overall Dimensions

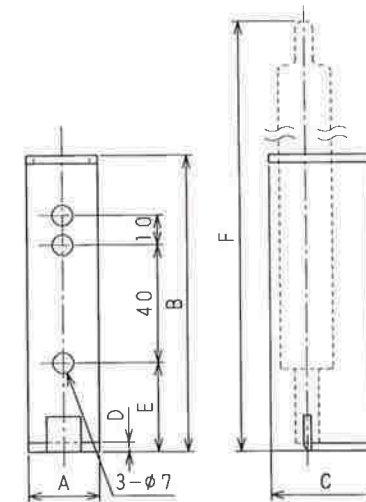
LEF · LEH Type



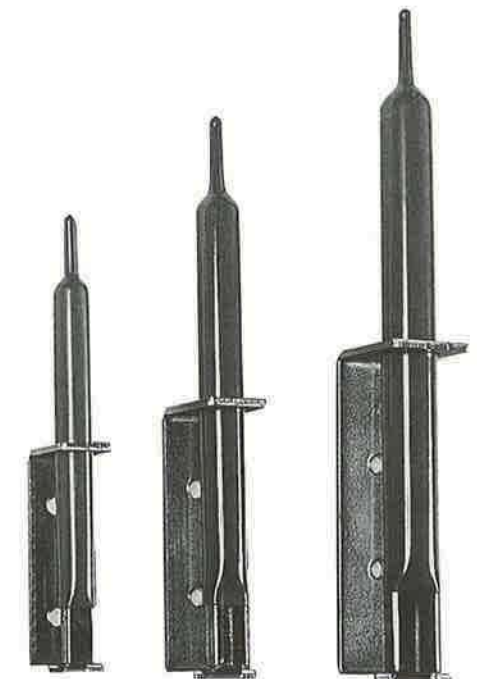
	61LEF~64LEF 61LEH~64LEH	66LEF~616LEF 66LEH~616LEH	620LEF·630LEF 620LEH·630LEH	640LEF·650LEF 640LEH·650LEH
A	162	202	252	502
B	φ 14	φ 16	φ 22	φ 22

Hand Holder (Optional for LEF Type)

Note) Be sure to install in position other than on the transfer switch.



	61LEF~64LEF 61LEH~64LEH	66LEF~616LEF 66LEH~616LEH	620LEF·630LEF 620LEH·630LEH	640LEF·650LEF 640LEH·650LEH
A	20	24	32	32
B	80	100	125	125
C	30	37.5	42	42
D	2.3	2.6	3.2	3.2
E	20	30	42.5	42.5
F	165	206	256	506



Unit : A

Model Type	Condition		Coordination with the Fuse			MCCB Rated Current	Coordination with the MCCB				
	Rated Current	Fuse Rated Current	Circuit Voltage		High quality type MCCB		Normal type MCCB				
			220V/380VAC	480VAC	220V/380VAC		480VAC	220V/380VAC	480VAC		
603E	30A	50A	200,000	200,000	600VAC	50A	22,000	22,000	22,000	10,000	10,000
606E	60A	100A	200,000	200,000	150,000	100A	22,000	22,000	22,000	10,000	10,000
61E	100A	150A	200,000	200,000	150,000	150A	22,000	22,000	22,000	15,000	12,000
61.5E	150A	200A	200,000	200,000	150,000	200A	22,000	22,000	22,000	15,000	12,000
62E	200A	300A	200,000	200,000	150,000	300A	42,000	42,000	42,000	30,000	25,000
63E	300A	400A	200,000	200,000	150,000	400A	42,000	42,000	42,000	30,000	25,000
64E	400A	500A	200,000	200,000	150,000	500A	50,000	50,000	50,000	35,000	30,000
66E	600A	800A	200,000	200,000	150,000	800A	65,000	65,000	65,000	50,000	37,000
68E	800A	1000A	200,000	200,000	150,000	1000A	85,000	85,000	85,000	65,000	50,000
610E	1000A	1250A	200,000	200,000	150,000	1250A	85,000	85,000	85,000	65,000	55,000
612E	1200A	1500A	200,000	200,000	150,000	1500A	85,000	85,000	85,000	65,000	55,000
616E	1600A	2000A	200,000	200,000	150,000	2000A	100,000	100,000	100,000	100,000	85,000
620E	2000A	3000A	200,000	200,000	150,000	3000A	100,000	100,000	100,000	100,000	85,000
630E	3000A	4000A	200,000	200,000	150,000	4000A	100,000	100,000	100,000	100,000	100,000
640E	4000A	5000A	200,000	200,000	150,000	5000A	100,000	100,000	100,000	100,000	100,000
650E	5000A	6000A	200,000	200,000	150,000	6000A	120,000	120,000	120,000	120,000	120,000
606NE	60A	100A	200,000	200,000	150,000	100A	22,000	22,000	22,000	15,000	12,000
61NE	100A	150A	200,000	200,000	150,000	150A	22,000	22,000	22,000	15,000	12,000
62NE	200A	300A	200,000	200,000	150,000	300A	42,000	42,000	42,000	30,000	25,000
64NE	400A	600A	200,000	200,000	150,000	600A	50,000	50,000	50,000	35,000	30,000
66NE	600A	800A	200,000	200,000	150,000	800A	65,000	65,000	65,000	50,000	42,000
68NE	800A	1000A	200,000	200,000	150,000	1000A	85,000	85,000	85,000	65,000	50,000
610NE	1000A	1250A	200,000	200,000	150,000	1250A	85,000	85,000	85,000	65,000	50,000
612NE	1200A	1500A	200,000	200,000	150,000	1500A	85,000	85,000	85,000	65,000	55,000
616NE	1600A	2000A	200,000	200,000	150,000	2000A	100,000	100,000	100,000	100,000	85,000
620NE	2000A	3000A	200,000	200,000	150,000	3000A	100,000	100,000	100,000	100,000	85,000
630NE	3000A	4000A	200,000	200,000	150,000	4000A	100,000	100,000	100,000	100,000	100,000
640NE	4000A	5000A	200,000	200,000	150,000	5000A	100,000	100,000	100,000	100,000	100,000
650NE	5000A	6000A	200,000	200,000	150,000	6000A	120,000	120,000	120,000	120,000	120,000
61LEF	100A	150A	200,000	200,000	150,000	150A	22,000	22,000	22,000	15,000	12,000
62LEF	200A	300A	200,000	200,000	150,000	300A	42,000	42,000	42,000	30,000	25,000
64LEF	400A	600A	200,000	200,000	150,000	600A	50,000	50,000	50,000	35,000	30,000
66LEF	600A	800A	200,000	200,000	150,000	800A	65,000	65,000	65,000	50,000	42,000
68LEF	800A	1000A	200,000	200,000	150,000	1000A	85,000	85,000	85,000	65,000	50,000
610LEF	1000A	1250A	200,000	200,000	150,000	1250A	85,000	85,000	85,000	65,000	55,000
612LEF	1200A	1500A	200,000	200,000	150,000	1500A	85,000	85,000	85,000	65,000	55,000
616LEF	1600A	2000A	200,000	200,000	150,000	2000A	100,000	100,000	100,000	100,000	85,000
620LEF	2000A	3000A	200,000	200,000	150,000	3000A	100,000	100,000	100,000	100,000	85,000
630LEF	3000A	4000A	200,000	200,000	150,000	4000A	100,000	100,000	100,000	100,000	85,000
640LEF	4000A	5000A	200,000	200,000	150,000	5000A	100,000	100,000	100,000	100,000	100,000
650LEF	5000A	6000A	200,000	200,000	150,000	6000A	120,000	120,000	120,000	120,000	120,000

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