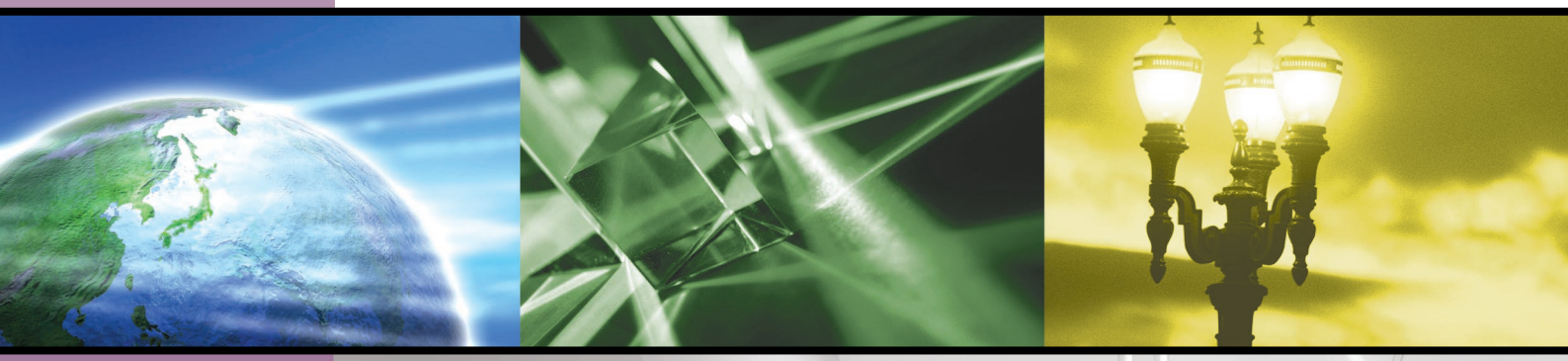
Electric Equipment General Catalog



Automatic Transfer Switch (ATS)

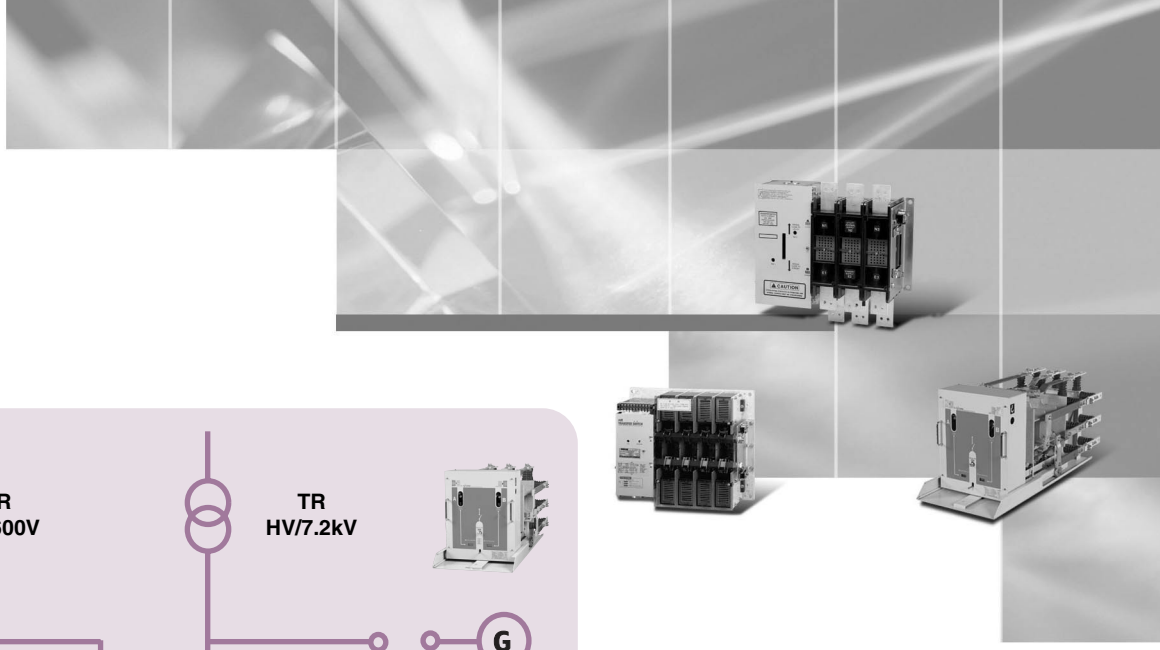
Contents

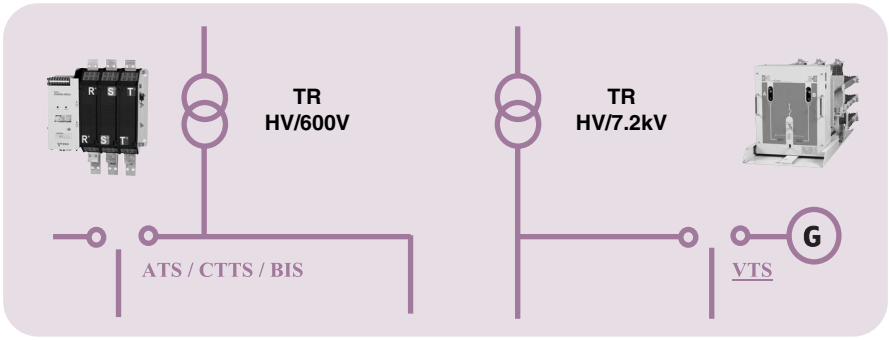
VITZRO Automatic Transfer Switches

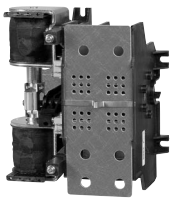
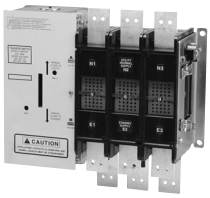
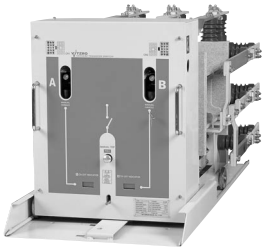
As a leader of ATS industry in the country, VITZROTECH provides diversified types and high quality products.

- **Largest series in the country** : A full series is provided from ultra-small type to high quality devices and high voltage vacuum transfer switch.
- **High quality** : Our products are produced under ISO9000 certification, complying with UL, and exported to U.S.A.

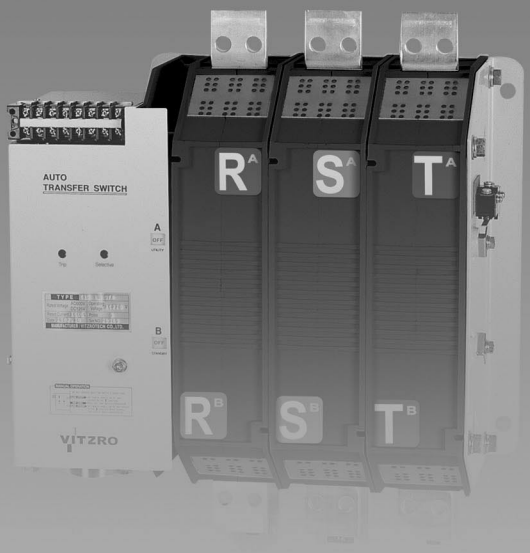
General ATS				
		 Breaking section is sealed and insulated with mold to improve safety and reliability		
Type	Standard		Economy	
Model	WN	WS (New model)	WP	W
Rated voltage	AC600V	AC600V	AC600V	AC600V
Rated current	6300 ~ 3200A	600 ~ 3200A	63~400A	63~400A
Pole	2,3,4	2,3,4	2,3,4	2,3,4
Connection type	Front / Back type	Front / Back type	Front / Back type	Front / Back type
Transfer sequence	A ↔ B A ↔ Neutral(off) ↔ B	A ↔ B A ↔ Neutral(off) ↔ B	A ↔ B A → Off(pause) → B A ← Off(pause) ← B (Pause : 3~30s)	A ↔ B
Features and application	• Stable current-carrying performance via latch structure • Stable opening via breaking spring • Both power sources can be switched off via trip structure. • In transferring the motor load with high residual voltage and generating characteristic, checking the stability and safety of circuit before transfer is available. • Electric line where the load power source must be completely switched off • Hospital, broadcasting station, firefighting equipment,industrial plant, etc.		• Both power sources can be switched off temporarily via limit resistor and timer • In transferring the motor load with high residual voltage and generating characteristic (machines with fly wheel, mercury lamp, etc.), both power sources can be switched off until the extinction of residual voltage (Max. 30s) • Hospital, broadcasting station, life-rearing facilities, bank, hotel, industrial plant, etc., which requires stable power supply	• Load transfer accompanied by low residual voltage • Stable power supply through quick power transfer • Hospital, broadcasting station, firefighting equipment, etc.
Details	F-8	F-6	F-11	F-10

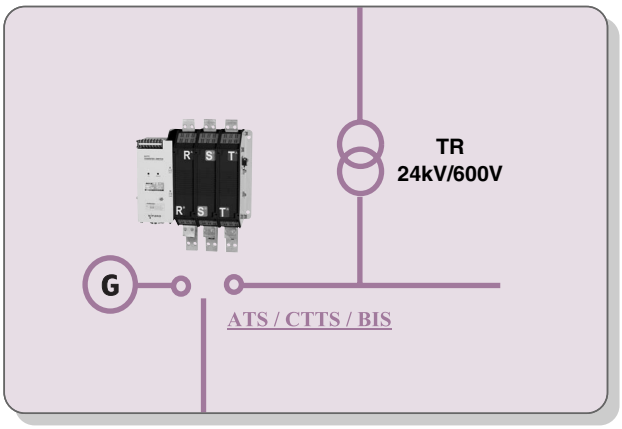




High class ATS (CTTS, BIS)		High voltage ATS (VTS)
		
Ultra-small	Uninterruptible overlapping transfer switch	High voltage vacuum transfer switch
HS	CTTS	VTS
AC250V	AC600V	7.2kV
100/200A	63 ~ 3200A	400, 600A
2-poles exclusive	2,3,4	3
Front typ	Front / Back type	Fixed / Draw-out type
A ↔ B	A ↔ B A ↔ Neutral(off) ↔ B A ↔ overlapping ↔ B (Synchronizing)	A ↔ B
• Single phase load transfer under 15kW • Ultra-small type and built-in UPS available • Built-in portable generator available • Hospital, broadcasting station, traffic signal controller, etc.	• Uninterruptible transfer available ① In a scheduled outage by Power company ② Generator→Power company transfer when Power company power supply is restored ③ When there is no failure at Power company side, but temporary failure is expected due to weather conditions, etc. ④ When there is no failure at Power company side, but generators or equipment are to be tested.	Vacuum interrupter and BMC barrier ensure insulation performance. Built-in electrical/mechanical interlock and overcurrent locking device prevent accidents arising from current breaking failure due to short circuit and overcurrent.
F-5	F-12	F-42

Low voltage Automatic Transfer Switch



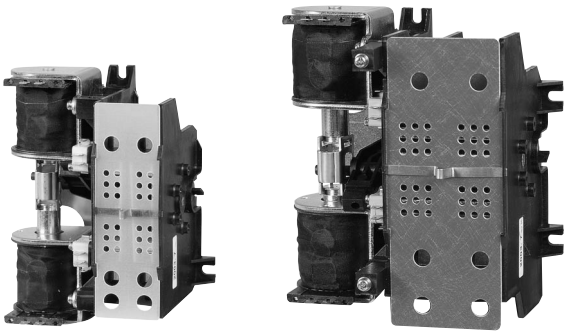


Contents

Ultra-Small ATS

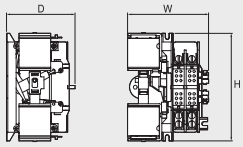
Ultra-Small ATS

HS type ... 2P , 100A , 200A



Features

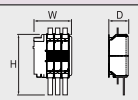
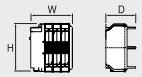
- **Power saving type**
  Instantaneous excitation with small operation current (1.6A for AC 220V operation)
- **Safe design**
  Dust-free structure by mold structure applied to breaking section ensures semi-permanent contact part.
- **Two-coil type**
  Two-coil type simple operation
- **Ultra-small size**
  Ultra-small size, which can be built in the portable generator or UPS.
- **Low cost**
  Optimal for single phase load (non-inductive) under 200A.
- **Applied standard**
  JEM1465 / UL1008

Type			21HS	22HS
Rated current		A	100	200
Rated voltage		V	AC240	
Pole		P	2	
Connection type			Front	
Performance				
Short-time withstand current (1s)kA			10	
Short circuit peak current		kA	25	
Switching capacity			Closing 10 × Ie, breaking 8 × Ie, Cos ø =0.35	
Endurance	Electrical	Times	50, 000	
	Mechanical	Times	250, 000	
Switching frequency		Times/hr	150(No. 4)	
Transfer sequence			A ↔ B	
Operating time	Opening	ms	≤ 30	
	Closing	ms	≤ 60	
Operating voltage and current			AC220V, 1.6A	AC220V, 4.85A
External dimension and weight				
		H	165	176
		W	127	151
		D	100	121
Weight		kg	1.1	2.2
Caution			1) Transfer time is 0.3s or less, but operating instruction of 0.5s or more can ensure stable operation. 2) Simultaneous operating instruction for both A side and B side can lead to coil burnout. 3) Provide sufficient contact capacity well over operating current for the operation relay	
Circuit diagram			See F-21	
Drawing			See F-35	

Standard ATS

WS Type... 600A ~ 3000A

New model with improved insulation and safety Neutral point added
A ↔ Neutral(off) ↔ B

Type				66WS		610WS		616WS	
Rated current			A	600/630		800/1000		1250/1600	
Rated voltage			V	AC 600		AC 600		AC 600	
Pole			P	3, 4		3, 4		3, 4	
Throw			T	Double Throw		Double Throw		Double Throw	
Connection type	Front			●		●		●	
	Back			●		●		●	
Performance									
Short-time withstand current (1s)kA			15	22		25		35	
Short circuit peak current			kA	37.5		50		55	
Switching capacity			Class	AC3		AC3		AC3	
Endurance	Electrical		Times	10, 000		10, 000		10, 000	
	Mechanical		Times	50, 000		50, 000		50, 000	
Switching frequency			Time/h	150(No. 4)		150(No. 4)		150(No. 4)	
Transfer sequence				A ↔ B, A ↔ Neutral(off) ↔ B					
Operating time	Power A	closing	ms	≤ 100		≤ 115		≤ 115	
		trip	ms	≤ 30		≤ 30		≤ 30	
	Power B	closing	ms	≤ 135		≤ 145		≤ 150	
		trip	ms	≤ 30		≤ 30		≤ 30	
Operating voltage and current				3P	4P	3P	4P	3P	4P
Closing	DC110V - 125V		A	7	8	8	10	10	13
	AC100 - 120V		A	7	8	8	10	10	13
	AC200 - 240V		A	3.5	4	4	5	5	6.5
Trip	AC200 - 240V		A	2		2		2	
	DC220V - 125V		A	1		1		1	
External dimension and weight									
Front type dimension (mm)		H		311	311	575	575	615	615
		W		372	442	453	536	528	636
		D		131	131	218	218	218	218
Back type dimension (mm)		H		220	220	380	380	380	380
		W		372	442	453	536	528	636
		D		194	194	304	304	304	304
Weight	Front type		kg	43	51	56	66	62	74
	Back type		kg	33	42	40	51	47	59
Other details									
Circuit diagram				See F-19		See F-19		See F-19	
Time chart				See F-18		See F-18		See F-18	
Drawing				See F-30, 34		See F-31, 34		See F-32, 34	
Caution				See F-16		See F-16		See F -16	

(1) Switching capacity : AC3 class : Closing 10 × Ie, breaking 8 × Ie, Cos ø =0.35
DC1 class : Closing 1.1 × Ie, breaking 1.1 × Ie, L/R=1ms
AC2 class : Closing 4 × Ie, breaking 4 × Ie, Cos ø =0.65
(2) Trip : Opening of a circuit to a neutral position off from power A or power B.

Standard ATS

620WS		630WS	
2000		2500/3200	
AC 600		AC 600	
3, 4		3, 4	
Double Throw		Double Throw	
●		-	
●		●	
50			
60		80	
AC3		AC3	
5, 000		5, 000	
10, 000		10, 000	
30(No. 5)		30(No. 5)	
≤ 180		≤ 140	
≤ 30		≤ 35	
≤ 220		≤ 190	
≤ 30		≤ 35	
3P	4P	3P	4P
13	16	16	18
13	16	16	18
6.5	13	8	9
4		4	
2		2	
218			
380	380	580	580
603	736	823	1010
316	316	388	388
115	135	150	190
See F-19		See F-19	
See F-18		See F-18	
See F-32, 34		See F-33, 34	
See F-16		See F-16	

Features

- **Reliable insulation**
  The current breaking part is completely sealed in a mold structure to exclude the risk of electric shock by human body contact, or electric faults due to accumulated dusts or foreign matters on conducting parts during long-term use.

- **Safe conducting performance**
  Safe conducting performance is maintained by constant contact pressure for each phase. Short-circuit overcurrent strength is high because it is protected by latch mechanism.

- **High class design**
  This product has a one-phase structure insulated and separated by phase, so that three- or four-phase conducting parts can be assembled conforming to the capacity and number of phases according to the user's convenience.

- **One-coil type**
  This is a compact type in which both normal side and standby side can be closed.

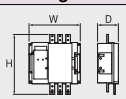
- **Safe opening characteristic**
  Semi-permanent lifetime is ensured by employing a unique structure arc chute, with short arc breaking time and low wear of contact. The trip operation by breaking spring always realizes stable breaking characteristic, regardless of operating voltage.

- **Neutral point type**
  Power source is transferred after the stability and safety of circuit are checked, and the neutral position ("off" status) is available via the trip structure.
  That is, A→off → A / B → off → B as well as A → off → B / B → off → A, and instantaneous transfer are all available.

Standard ATS

WN Type... 100A ~ 3000A

Neutral point added
A ↔ Neutral(off) ↔ B

Type				61WN			62WN			64WN			66WN		610WN	
Rated current			A	63/100			125/160/200			250/400			600/630		800, 1000	
Rated voltage			V	AC 600			AC 600			AC 600			AC 600		AC 600	
Pole			P	2, 3, 4			2, 3, 4			2, 3, 4			3, 4		3, 4	
Throw			T	Double Throw			Double Throw			Double Throw			Double Throw		Double Throw	
Connection type	Front			●			●			●			●		●	
	Back			●			●			●			●		●	
Performance																
Short-time withstand current (1s)kA			5	10			12			15			22		25	
Short circuit peak current			kA	12.5			25			30			37.5		50	
Switching capacity			Class	AC3			AC3			AC3			AC3		AC3	
Endurance	Electrical		Times	50, 000			50, 000			50, 000			10, 000		10, 000	
	Mechanical		Times	250, 000			250, 000			250, 000			50, 000		50, 000	
Switching frequency			Time/h	150 (No. 4)			150 (No. 4)			150 (No. 4)			150 (No. 4)		150 (No. 4)	
Transfer sequence				A ↔ B, A ↔ Neutral(off) ↔ B												
Operating time	Power A	closing	ms	≤ 55			≤ 55			≤ 60			≤ 100		≤ 115	
		trip	ms	≤ 20			≤ 20			≤ 25			≤ 30		≤ 30	
	Power B	closing	ms	≤ 80			≤ 80			≤ 90			≤ 135		≤ 145	
		trip	ms	≤ 20			≤ 20			≤ 25			≤ 30		≤ 30	
Operating voltage and curren				2P	3P	4P	2P	3P	4P	2P	3P	4P	3P	4P	3P	4P
Closing	DC110V - 125V		A	4	4	5	5	5	7.2	6.4	6.4	9	7	8	8	10
	AC110V - 120V		A	4	4	5	5	5	7.2	6.4	6.4	9	7	8	8	10
	AC220/240V		A	2	2	2.5	2.5	2.5	3.6	3.2	3.2	4.5	3.5	4	4	5
Trip	AC220 - 240V		A	1.4			1.4			2			2		2	
	DC110 - 125V		A	0.7			0.7			1			1		1	
External dimension and weight																
Front type dimension (mm)		H		191	191	191	252	252	252	278	278	278	545	545	609	609
		W		204	234	264	234	279	324	280	340	400	465	530	510	590
		D		112	112	112	112	112	112	132	132	132	220	220	220	220
Back type dimension (mm)		H		176	176	176	176	176	176	224	224	224	410	390	410	390
		W		204	234	264	234	279	324	280	340	400	405	470	450	530
		D		148	148	148	158	158	158	216	216	216	210	210	250	250
Weight	Front type		kg	4.5	6	8	6	8	10	11	14	18	43	51	56	66
	Back type		kg	4.5	6	8	6	8	10	11	14	18	33	42	40	51
Other details																
Circuit diagram				See F-19									See F-19			
Time chart				See F-18									See F-18			
Drawing				See F-26, 27, 29									See F-28, 29			
Caution				See F-16									See F-16			

(1) Switching capacity : AC3 class : Closing 10 × Ie, breaking 8 × Ie, Cos ø =0.35
DC1 class : Closing 1.1 × Ie, breaking 1.1 × Ie, L/R=1ms
AC2 class : Closing 4 × Ie, breaking 4 × Ie, Cos ø =0.65
(2) Trip : Opening of a circuit to a neutral position off from power A or power B.

Standard ATS

616WN		620WN		630WN	
1250/1600		2000		2500/3200	
AC 600		AC 600		AC 600	
3, 4		3, 4		3, 4	
Double Throw		Double Throw		Double Throw	
●		-		-	
●		●		●	
35		50			
55		60		80	
AC3		AC3		AC3	
10, 000		5, 000		5, 000	
50, 000		10, 000		10, 000	
150 (No. 4)		30(No. 5)		30(No. 5)	
A ↔ B, A ↔ Neutral(off) ↔ B					
≤ 115		≤ 180		≤ 140	
≤ 30		≤ 30		≤ 35	
≤ 150		≤ 220		≤ 190	
≤ 30		≤ 30		≤ 35	
3P	4P	3P	4P	3P	4P
10	13	13	16	16	18
10	13	13	16	16	18
5	6.5	6.5	8	8	9
2		4		4	
1		2		2	
645	645				
570	670				
220	220				
410	390	580	580	580	580
510	610	675	810	825	1000
250	250	335	335	370	370
62	74				
47	59	115	135	150	190
See F-19		See F-19		See F-19	
See F-18		See F-18		See F-18	
See F-28, 29		See F-28, 29		See F-28, 29	
See F-16		See F-16		See F-16	

Features

- **One-coil type**
  This is a compact type in which both normal side and standby side can be closed (Model utility registration No. 34781).

- **Neutral point type**
  When there is an UPS, power source is transferred after the stability and safety of circuit are checked in case of power failure or power restoration, instead of emergency transfer, and the neutral position (off status) is available via the trip structure.
  That is, A→off→A / B→off→B as well as A→off→B / B→off→A is available. As in the existing products, instantaneous transfer is also available according to operating instruction.
  Transfer time can be arbitrarily specified via external sequence in the WN type with neutral (Off) position to definitely prevent the contact between the power source and residual voltage at the load side.

- **Power-saving type**
  Power consumption is very low due to instantaneous excitation, short-circuit current strength is high due to the protection of contact pressure by latch mechanism, and a unique structure arc chute facilitates short arc breaking time and low contact wear, realizing semi-permanent lifetime.

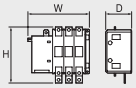
- **Diversified products**
  Diversified products including 600V and 63-3200A products in series with dust-proof structure by mold are provided. DC load switching is also available.

- **Breaking characteristic**
  Trip operation by breaking spring always realizes stable breaking characteristic regardless of operation voltage.

Economy Type ATS

W, WP type ... 100A ~ 400A

W type
General type
A ↔ B

Type			61W			62W			64W		
Rated current		A	63/100			125/160/200			250/400		
Rated voltage		V	AC 600			AC 600			AC 600		
Pole		P	2, 3, 4			2, 3, 4			2, 3, 4		
Throw		T	Double Throw			Double Throw			Double Throw		
Connection type	Front		●			●			●		
	Back		●			●			●		
Performance											
Short-time withstand current (1s)kA		5	10			12			5		
Short circuit peak current		kA	12.5			25			30		
Switching capacity		Class	AC3			AC3			AC3		
Endurance	Electrical	Times	50, 000			50, 000			50, 000		
	Mechanica	Times	250, 000			250, 000			250, 000		
Switching frequency		Time/h	150 (No. 4)			150 (No. 4)			150 (No. 4)		
Transfer sequence			A ↔ B								
Operating time	opening	ms	≤ 60			≤ 60			≤ 60		
	closing	ms	≤ 200			≤ 200			≤ 250		
	Closing delay (off)	sec	-			-			-		
Operating voltage and current			2P	3P	4P	2P	3P	4P	2P	3P	4P
	DC110V - 125V	A	5.4	5.4	7.5	7.5	7.5	11	10	10	12.8
	AC100 - 120V	A	5.4	5.4	7.5	7.5	7.5	11	10	10	12.8
	AC220 - 240V	A	2.7	2.7	3.8	3.8	3.8	5.5	5	5	6.4
External dimension and weight											
Front type dimension (mm)		H	191	191	191	252	252	252	278	278	278
		W	204	234	264	234	279	324	280	340	400
		D	112	112	112	112	112	112	132	132	132
Back type dimension (mm)		H	176	176	176	176	176	176	224	224	224
		W	204	234	264	234	279	324	280	340	400
		D	148	148	148	158	158	158	216	216	216
Weight		kg	4.5	6	8	6	8	10	11	14	18
Other details											
Circuit diagram			See F-21								
Time chart			See F-18								
Drawing			See F-26, 27, 29								
Caution			See F-16								

(1) Switching capacity : AC3 class : Closing 10 × Ie, breaking 8 × Ie, Cos ø =0.35
DC1 class : Closing 1.1 × Ie, breaking 1.1 × Ie, L/R=1ms

Economy Type ATS

WP type
Pause function added
A ↔Pause↔B

61WP			62WP			64WP		
63/100			125/160/200			250/400		
AC 600			AC 600			AC 600		
2, 3, 4			2, 3, 4			2, 3, 4		
Double Throw			Double Throw			Double Throw		
●			●			●		
●			●			●		
10			12					
12.5			25			30		
AC3			AC3			AC3		
50, 000			50, 000			50, 000		
250, 000			250, 000			250, 000		
150 (No. 4)			150 (No. 4)			150((No. 4)		
A ↔ B, A → Off(pause) → B, A ← Off(pause) ← B								
≤ 60			≤ 60			≤ 60		
≤ 200			≤ 200			≤ 200		
0, 3~30(timer)			0, 3~30(timer)			0, 3~30(timer)		
2P	3P	4P	2P	3P	4P	2P	3P	4P
5.4	5.4	7.5	7.5	7.5	11	10	10	12.8
5.4	5.4	7.5	7.5	7.5	11	10	10	12.8
2.7	2.7	3.8	3.8	3.8	5.5	5	5	6.4
191	191	191	252	252	252	278	278	278
214	244	274	244	289	334	290	350	410
112	112	112	112	112	112	132	132	132
176	176	176	176	176	176	224	224	224
214	244	274	244	289	334	290	350	410
148	148	148	158	158	158	216	216	216
4.5	6	8	6	8	10	11	14	18
See F-20								
See F-18								
See F-24, 25, 29								
See F-16								

Features

- **Safe design**
  Dust-proof structure at the current breaking part provides safe operation.

- **For both AC/DC**
  Control circuit can use both AC and DC power sources.

- **Single coil instantaneous excitation type**
  - One coil, instantaneous excitation type that saves power consumption.
  - AC 110V/240V can be available for the operating coil.
    (※Refer to the manual)

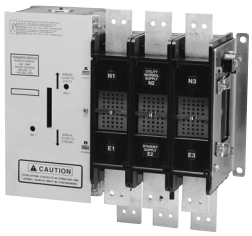
* Pause function of WP type
W type consists of two-position switch at the power sources A and B, and is an instantaneous operation type in which transfer operating time cannot be adjusted. WP type is equipped with a neutral position between power sources A and B, and provides temporary pause off from A and B within 30 seconds (controlled with timer).
[Ex] Transfer from A to B
① A side opening → ② Pause for 3~30 seconds → ③ B side closing

This function is introduced to prevent the short circuit between load side and power source side by transferring to other power source after the extinction of residual voltage when the current load is a motor load with high residual voltage.

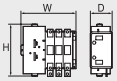
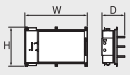
If 30 seconds or more of pause or “Off” condition is required, use the standard WN type.
This function can also be disabled.
* For details, see F -18.

Uninterruptible Transfer Type CTTS

CTTS... 100A ~ 3000A



Uninterruptible transfer type added
A ↔ Synchronizing ↔ B

Type				61CT			62CT			64CT			66CT		610CT	
Rated current			A	63/100			125/160/200			250/400			600/630		800, 1000	
Rated voltage			V	AC 600			AC 600			AC 600			AC 600		AC 600	
Pole			P	2, 3, 4			2, 3, 4			2, 3, 4			2, 3, 4		2, 3, 4	
Throw			T	Double Throw			Double Throw			Double Throw			Double Throw		Double Throw	
Connection type	Front			●			●			●			●		●	
	Back			●			●			●			●		●	
Performance																
Short-time withstand current (1s)kA			5	10			12			15			22		25	
Short circuit peak current			kA	12.5			25			30			37.5		50	
Switching capacity			Class	AC3			AC3			AC3			AC3		AC3	
Endurance	Electrical		Times	50, 000			50, 000			50, 000			10, 000		10, 000	
	Mechanical		Times	250, 000			250, 000			250, 000			50, 000		50, 000	
Switching frequency			Time/h	150 (No. 4)			150 (No. 4)			150 (No. 4)			150((No. 4)		150((No. 4)	
Transfer sequence				A ↔ B, A ↔ Neutral(off) ↔ B, A ↔ (overlapping) ↔ B												
Condition for uninterruptible transfer				Phase difference: Electric angle ≤10°, Frequency difference: ≤0.2Hz, Voltage: Difference from common voltage ≤5%, Instantaneous linking time: ≤0.05s												
Operating time	Power A	closing	ms	≤ 55			≤ 55			≤ 60			≤ 100		≤ 115	
		trip	ms	≤ 20			≤ 20			≤ 25			≤ 30		≤ 30	
	Power B	closing	ms	≤ 80			≤ 80			≤ 90			≤ 135		≤ 145	
		trip	ms	≤ 20			≤ 20			≤ 25			≤ 30		≤ 30	
Operating voltage and current				2P	3P	4P	2P	3P	4P	2P	3P	4P	3P	4P	3P	4P
Closing	DC110V - 125V		A	4	4	5	5	5	7	6.4	6.4	9	7	8	8	10
	AC110V - 120V		A	4	4	5	5	5	7	6.4	6.4	9	7	8	8	10
	AC220 - 240V		A	2	2	2.5	2.5	2.5	3.6	3.2	3.2	4.5	3.5	4	4	5
Trip	AC220 - 240V		A	1.4			1.4			2			2		2	
	DC110V - 125V		A	0.7			0.7			1			1		1	
External dimension and weight																
Front type dimension (mm)		H		268	268	268	283	283	283	307	307	307	545	545	609	609
		W		211	241	271	241	286	331	293	353	413	465	530	510	590
	D	112		112	112	112	112	112	132	132	132	220	220	220	220	
Back type dimension (mm)		H														
		W														
	D															
Weight	Front type		kg	6.5	8	10	8	10	12	14	17	21	53	61	66	76
	Back type		kg	6.5	8	10	8	10	12	14	17	21	43	52	50	61
Other details																
Circuit diagram				See F-22									See F-22			
Drawing				See F-36~38									See F-37, 39			
Caution				See F-16									See F-16			

(1) Switching capacity : AC3 class: Closing 10 × Ie, breaking 8 × Ie, Cos ø =0.35
DC1 class: Closing 1.1 × Ie, breaking 1.1 × Ie, L/R=1ms
AC2 class: Closing 4 × Ie, breaking 4 × Ie, Cos ø =0.65
(2) Trip : Opening of a circuit to a neutral position off from power A or power B.

Uninterruptible Transfer Type CTTS

After simultaneous supply of normal power (A) and emergency generation power (B), this closed transition transfer switch (CTTS) detects the differences for voltage and frequency, verifies the synchronizing condition, and performs uninterruptible transfer automatically within 0.1s (100ms) in the direction of control.

616CT		620CT		630CT	
1250/1600		2000		2500/3200	
AC 600, DC125		AC 600, DC125		AC 600, DC125	
2, 3, 4		2, 3, 4		2, 3, 4	
Double Throw		Double Throw		Double Throw	
●		-		-	
●		●		●	
35		50			
55		60		80	
AC3		AC3		AC3	
10, 000		5, 000		5, 000	
50, 000		10, 000		10, 000	
150 (No. 4)		30(No. 5)		30(No. 5)	
A ↔ B, A ↔ Neutral(off) ↔ B, A ↔ (overlapping) ↔ B					
Phase difference: Electric angle ≤10°, Frequency difference: ≤0.2Hz, Voltage: Difference with common voltage ≤5%, Instantaneous linking time: ≤0.05s, Voltage: Difference from common voltage ≤5%, Instantaneous linking time: ≤0.05s					
≤ 115		≤ 180		≤ 140	
≤ 30		≤ 30		≤ 35	
≤ 150		≤ 220		≤ 190	
≤ 30		≤ 30		≤ 35	
3P	4P	3P	4P	3P	4 p
10	13	13	16	16	18
10	13	13	16	16	18
5	6.5	6.5	8	8	9
2		4		4	
1		2		2	
645	645				
570	670				
220	220				
		600	600	600	600
		683	818	833	1018
		329	329	364	364
72	84				
57	69	130	150	165	205
		See F-22			
		See F-38, 39			
		See F-16			

Major Uses

• Major plants

Uninterruptible transfer to emergency generator power is available in case of a voltage drop or power failure of normal power source, for example by lightning, or a long-term power failure. Transfer to normal power source is also available in an uninterruptible way.

* **Uninterruptible transfers**

① Scheduled outage from Power company side

②Generator→Power company transfer when Power company power supply is restored

③When temporary failure is expected due to weather conditions, etc.

④ When generators or equipment are to be tested.

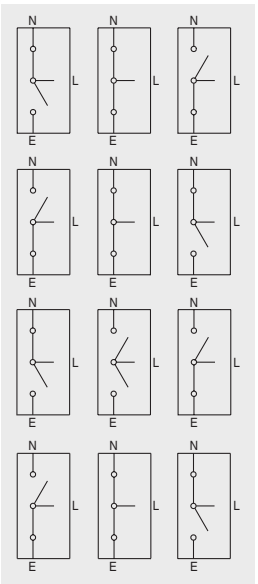
• Electric facilities in banks and stations

Uninterruptible transfer is available in case of scheduled maintenance such as regular inspection.

• Transfer facility for UPS power sources

Uninterruptible transfer is available if the phase difference between both power sources is within the regulated value.

Transfer operations



In the transfer from normal power to generator power: Transfer from closed state to generator power (For test or power source transfer)

Retransfer from generator power to normal power: Transfer from closed state to normal power

Transfer from normal power to generator power: Transfer from opened state to generator power (In case of normal power outage)

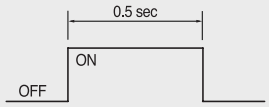
Retransfer from generator power to normal power: Transfer from closed state to normal power (Uninterruptible transfer to normal power)

... ATS, CTTS (Automatic Transfer Switches)

Considerations for Application and Selection

- **Applied standard**
  - · JEM 1038 · UL 1008
  - · KSC 4504 · KSC 0703

- **Control instruction**
  Closing and trip transfer operation is completed in 0.3s, but operating instruction of 0.5s or more can ensure stable operation.



- **Interlock**
  Install the interlock (electrical) at the operation circuit so that there can be no simultaneous instruction for power A and power B. For WN type, set the sequence so that there can be no closing and trip instructions in the same direction.

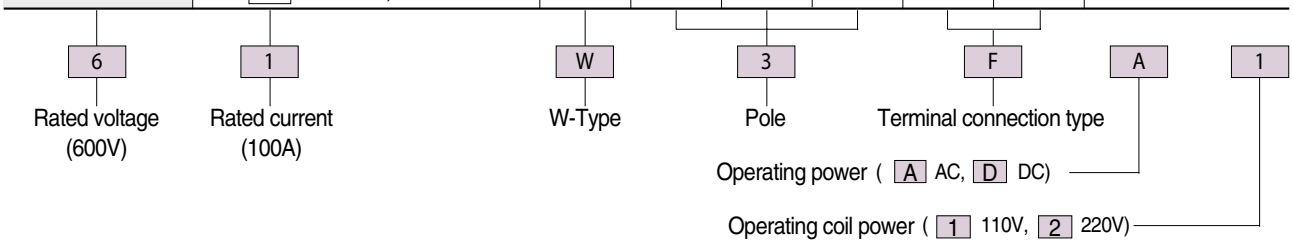
- **Operational transformer capacity**
  Use the capacity greater than the value calculated with the following equation for the transformer capacity for operation circuit.
  Operating voltage x Operating current x 0.5 = ( )VA
  Ex) Operating voltage : AC 220V, operating current : 4A
  $220 \times 4 \times 0.5 = 440VA$
  Use the transformer of 440VA or higher.

- **Control circuit**
  ATS is designed to switch off the operating current using the internal switch after operation. Switching off the operating current using the auxiliary switch in the main body leads to erroneous operation.

- **Selection of control relay**
  Use the voltage relay 27 and 84 and timer with a conducting current at the contact higher than the operating current of ATS. It is safe to select a relay that can break the operating current, considering chattering, etc. of control relay.
  * When the operating power is unstable, please use the voltage buildup relay.

Type Indication and Order Codes

Classification				Pole			Connection type		Description
Voltage	Current		Type	2	3	4	Front	Back	
							F	B	
2 AC250V	1	100A	HS	○			○		Ultra-small
	2	200A							
6 AC600V DC125V	1	63, 100A	W	○	○	○	○	○	Economy
	2	125, 160, 200A		○	○	○	○	○	
	4	250, 400A		○	○	○	○	○	
6 AC600V DC125V	1	63, 100A	WP	○	○	○	○	○	
	2	125, 160, 200A		○	○	○	○	○	
	4	250, 400A		○	○	○	○	○	
6 AC600V DC125V	1	63, 100A	WN	○	○	○	○	○	Standard
	2	125, 160, 200A		○	○	○	○	○	
	4	250, 400A		○	○	○	○	○	
	6	600, 630A			○	○	○	○	
	10	800, 1000A			○	○	○	○	
	16	1250, 1600A			○	○	○	○	
6 AC600V	20	2000A			○	○		○	
	30	2500, 3200A			○	○		○	
6 AC600V DC125V	6	600, 630A	WS	○	○	○	○	○	Standard
	10	800, 1000A		○	○	○	○	○	
	16	1250, 1600A		○	○	○	○	○	
	20	2000A		○	○	○	○	○	
	30	2500, 3200A			○	○		○	
6 AC600V DC125V	1	63, 100A	CT	○	○	○	○	○	CTTS
	2	125, 160, 200A		○	○	○	○	○	
	4	250, 400A		○	○	○	○	○	
	6	600, 630A			○	○	○	○	
	10	800, 1000A			○	○	○	○	
	16	1250, 1600A			○	○	○	○	
6 AC600V	20	2000A			○	○		○	
	30	2500, 3200A			○	○		○	

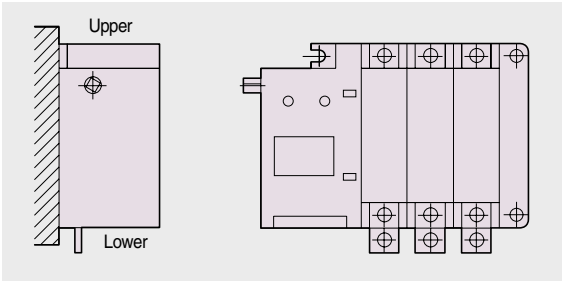


... ATS, CTTS (Automatic Transfer Switches)

Caution

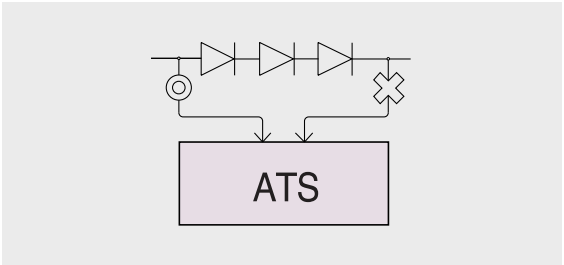
- **Place for installation**
  Avoid high temperature, high humidity and hazardous gas.

- **Installating direction**
  ATS is designed to be installed in a specified direction. Conform to the direction because the change of installing direction may change the operating characteristics.
  Install the ATS so that the name plate on the main body can be read in front, vertically to the panel surface without distortion.



* When the normal installation is impossible due to wiring or device arrangement, please consult us.

- **Operating power**
  When there is a dropper circuit for the DC operating power, be sure to connect the operating power of ATS to the input of the dropper circuit.



- **Control circuit wiring**
  Be sure to use sufficient control power and control cord. Be especially careful about the lack of battery capacity or charging in case of DC operation.

- **Main circuit connection**
  For connection, select the wires and terminals conforming to the current capacity and connect them firmly. Do not allow excessive stress on the main circuit terminals.
  Be sure not to allow excessive stress on the main circuit terminal in the connection by bus bar.

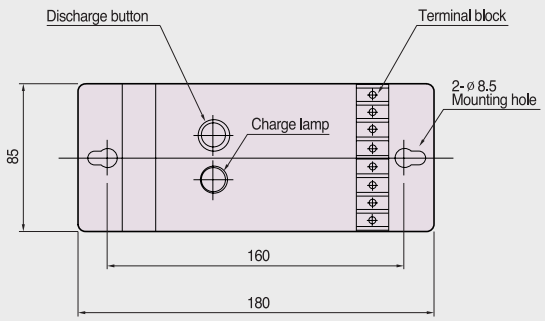
- **Caution in operating the manual handle**
  Operate ATS manually only for the purpose of detailed inspection on operating mechanism and conducting part under no-load.
  Power and switching speed of manual operation differs by operator, so that it cannot ensure the switching characteristics of ATS.

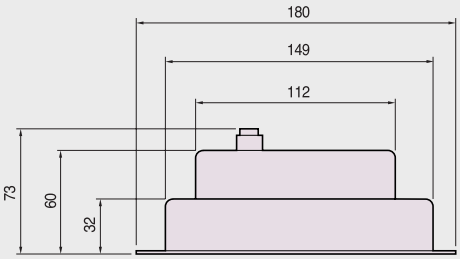
- Maintenance
  Conduct regular maintenance to keep the performance of ATS.

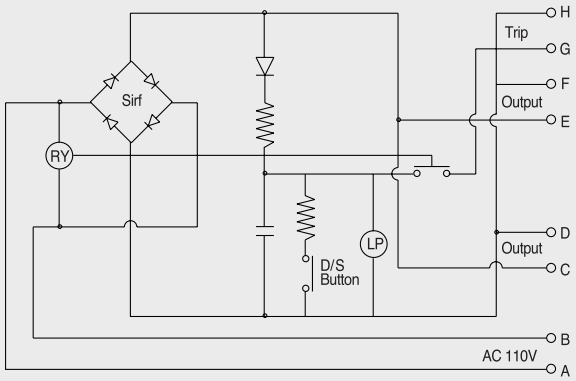
* For further details of maintenance, please refer to the maintenance section of the instruction manual.

Options

Condenser Trip Device







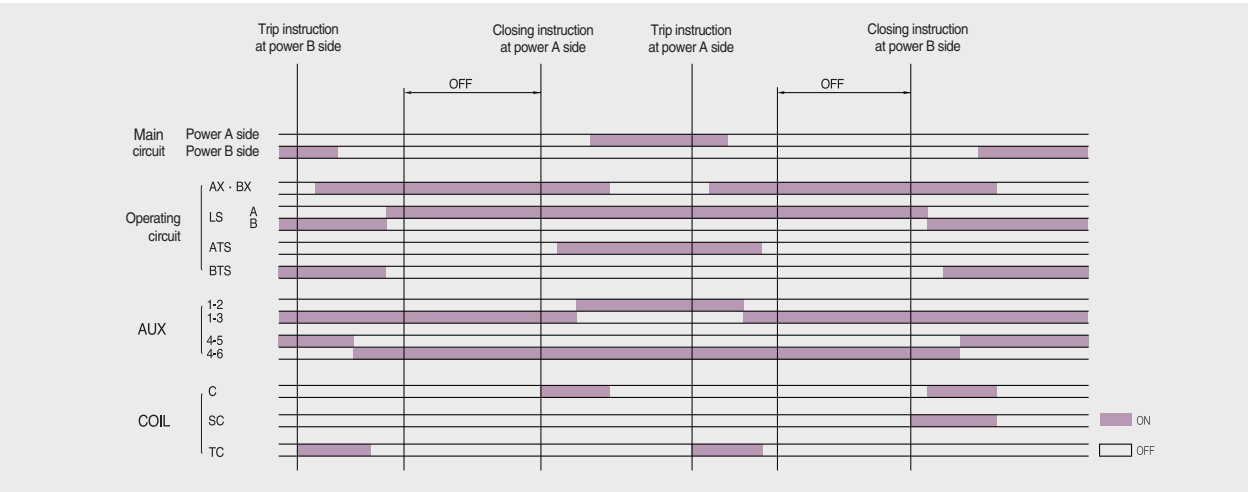
1) When used as a CTD
For immediate trip in case of power failure, connect G and H terminals to the trip circuit. An additional switch can trip the circuit at a specific time.
(Normal operation range: within 30s)

2) When used as a rectifier
C-D and E-F terminals can be used for the DC power.
(Close, open, power of motor OCR, etc.)

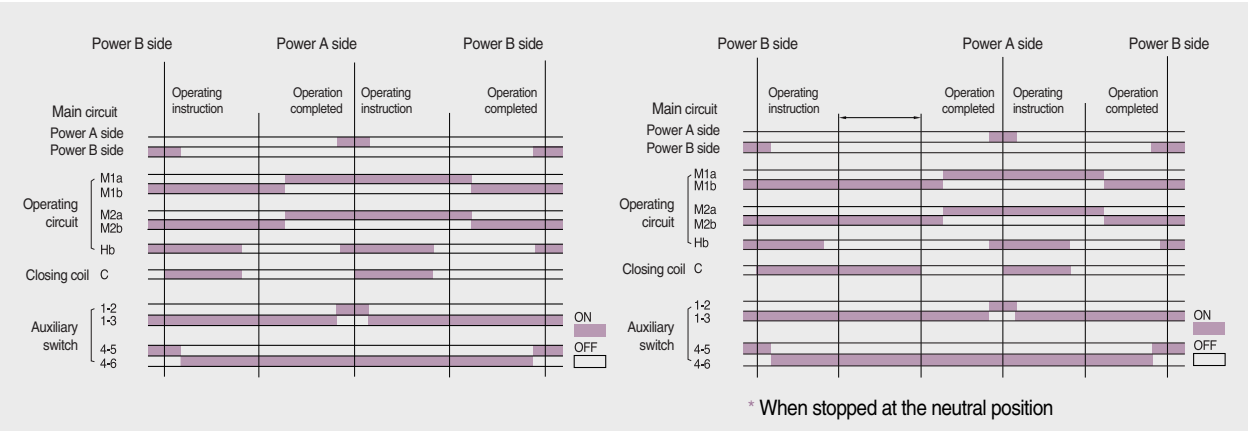
... ATS, CTTS (Automatic Transfer Switches)

Contact Time Chart

WN, WS Type

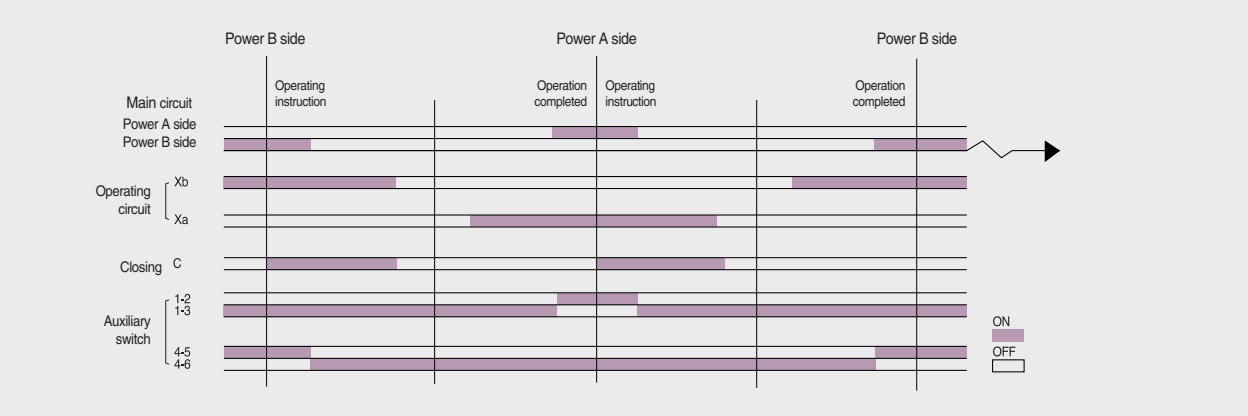


WP Type



* When stopped at the neutral position

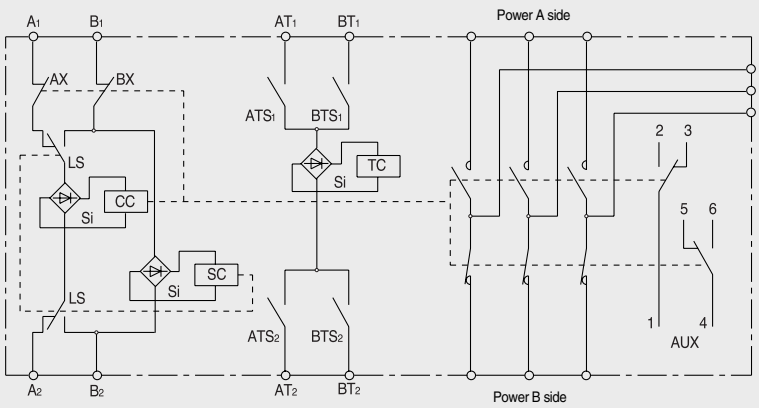
W type



Circuit Diagram

WN, WS Type

Internal Circuit

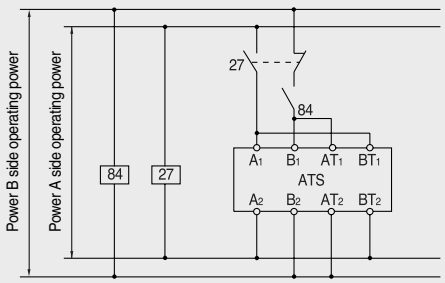


CC: Closing coil
Si: Silicon rectifier
LS: Select switch
ATS_1, ATS_2
BTS_1, BTS_2 : Trip control switch
AX, BX: Control switch
SC: Selection coil
TC: Trip Coil
AUX: Auxiliary switch

Operation terminal
A_1 - A_2: Power A side closing terminal
B_1 - B_2: Power B side closing terminal
AT_1 - AT_2: Power A side trip terminal
BT_1 - BT_2: Power B side trip terminal

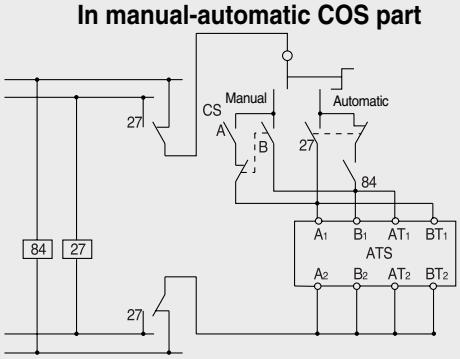
Operating Circuit

In normal transfer (instantaneous transfer)

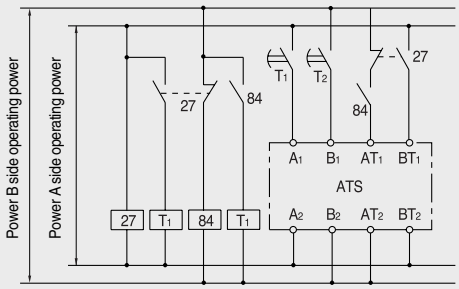


* Note) Operating in the same way as in W type

In manual-automatic COS part

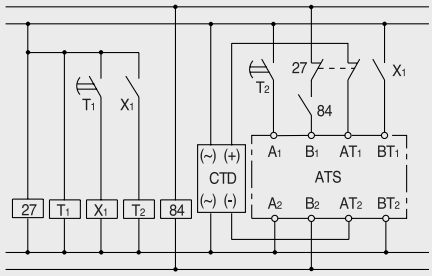


In using timer for transfer



* 27, 84: Voltage relay T1, T2: Timer

In condenser trip



* X1: Control relay, CTD: Condenser trip device
Set the time for the timer, considering the charging time of condenser

* Note) Above circuit example is shown with the power A priority.

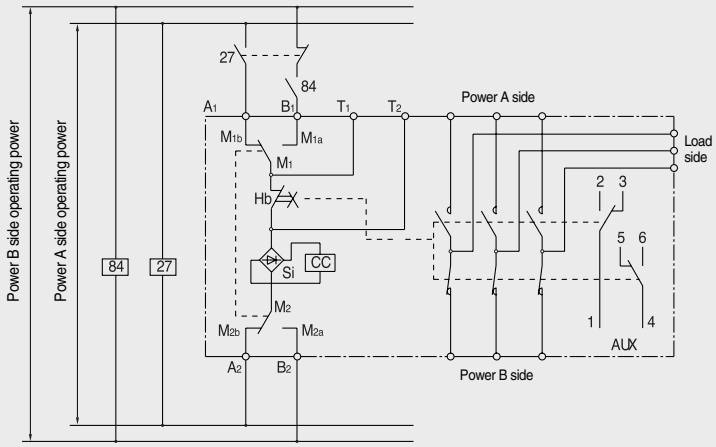
... ATS, CTTS (Automatic Transfer Switches)

Circuit Diagram

WP Type

Internal Circuit

Control circuit diagram in case of pause at the neutral position

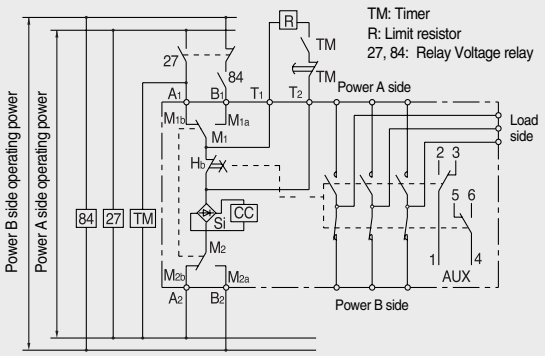


CC: Closing coil
Si: Silicon rectifier
Hb: Switch Both power sources Off/ temporary stop switch
M_1, M_2: Limit switch Limit switch for operating power transfer
AUX: Auxiliary switch
27, 84: RelayVoltage relay

Operation terminal
A_1 - A_2: Power A side closing terminal
B_1 - B_2: Power B side closing terminal
T_1 - T_2: Timer connection terminal

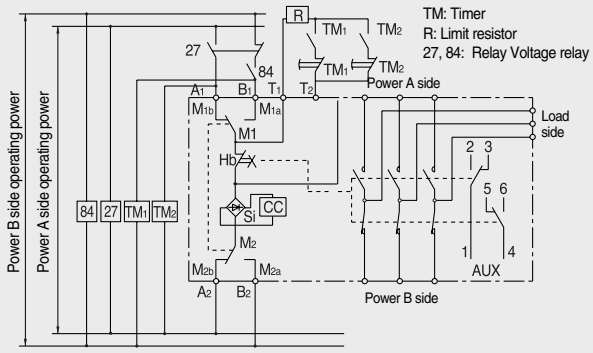
Operating Circuit 1

B→Aransfer/Pause at the neutral position



Operating Circuit 2

A→B, B→A two-way transfer/ Pause at the neutral position



Caution

- For temporary pause at the neutral position, connect the timer and limit resistor to terminals T1 and T2.

* Timer and limit resistor have to be prepared individually.

- Limit resistor

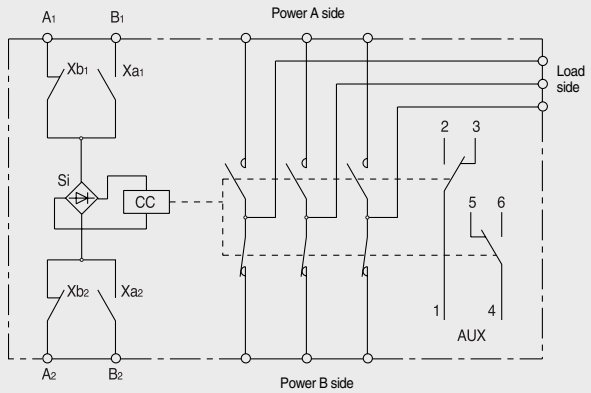
Type		61WP~62WP		64WP	
Operating voltage		AC110-120V	AC220-240V	AC110-120V	AC220-240V
Timer		Select a timer that can break the operating current. Adjusted time of timer			
Adjusted time of timer		3sec ~ 30sec			
Limit resistor	Rated power	200W	200W	200W	200W
	Resistance	50 Ω	200 Ω	50 Ω	200 Ω

- The limit resistor is not required for 3 seconds or less pause at the neutral position.
- Use AC 110-120V or AC 220-240V for the operating voltage in case of the pause at the neutral position.
- For continuous operation, limit the operating times to 5 or less. Be careful because 5 or more continuous operations may cause coil overheating or coil burnout.
- For a pause of 30 seconds or more (both powers off), use our WN- type products.

Circuit diagram

W type

Internal Circuit



Xa_1-Xa_2 : Control switch
Xb_1-Xb_2

CC: Closing coil

Si: Silicon rectifier

Operation terminal

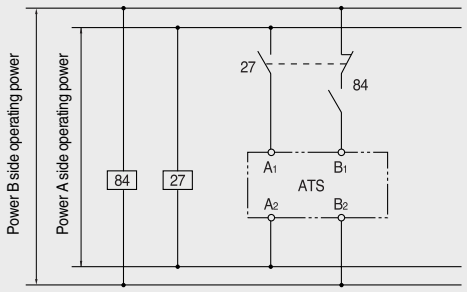
A_1 - A_2: Power A side closing terminal

B_1 - B_2: Power B side closing terminal

AUX: Auxiliary switch

Operating Circuit 1

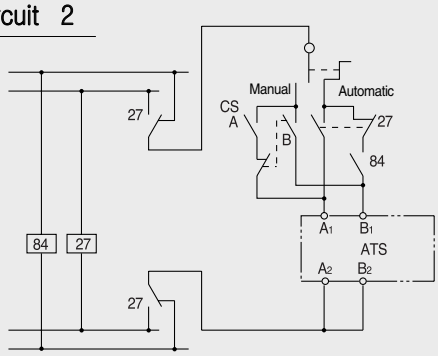
In normal transfer (instantaneous transfer)



*27, 84: Voltage Relay

Operating Circuit 2

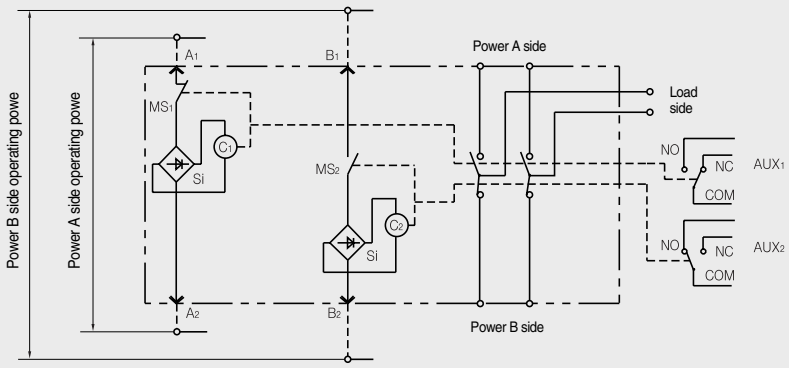
In manual-automatic transfer COS part



*27, 84: Voltage Relay

HS type

Control Circuit diagram

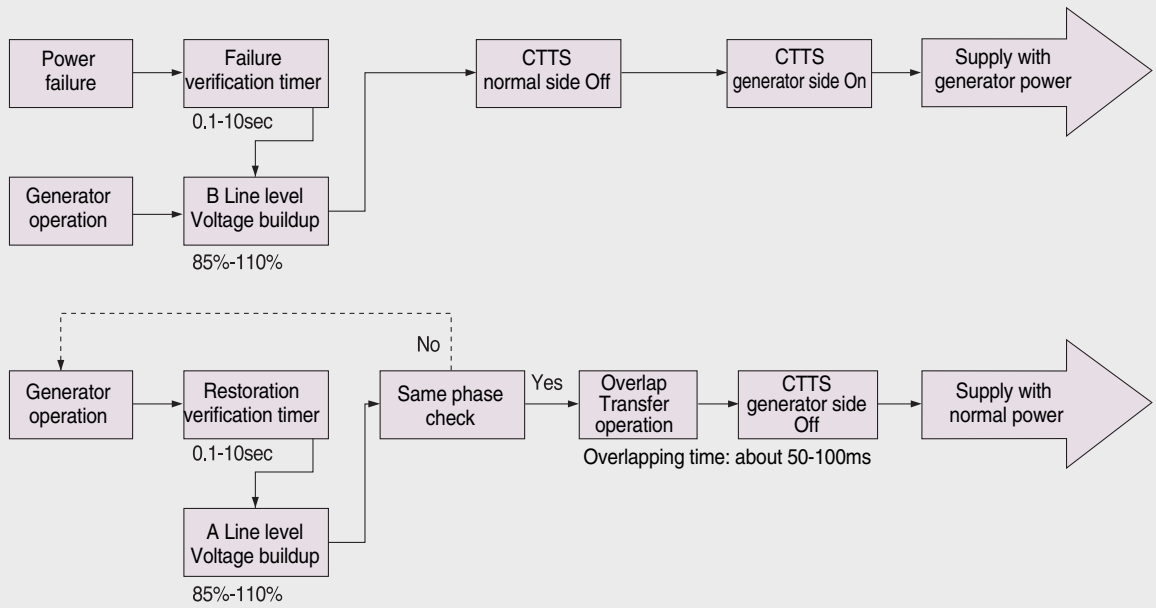


... ATS, CTTS (Automatic Transfer Switches)

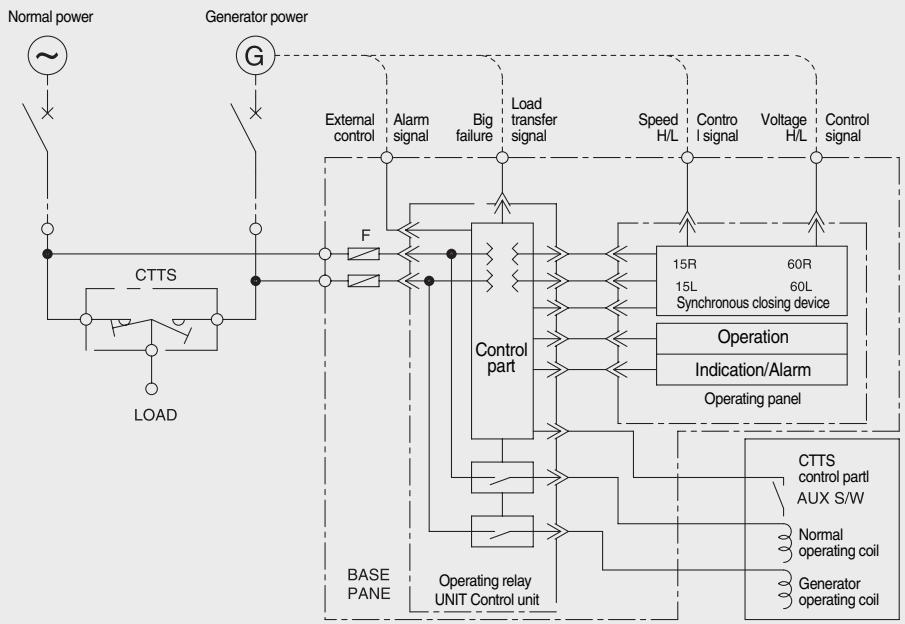
Circuit Diagram

CTTS

Operation Flow Chart

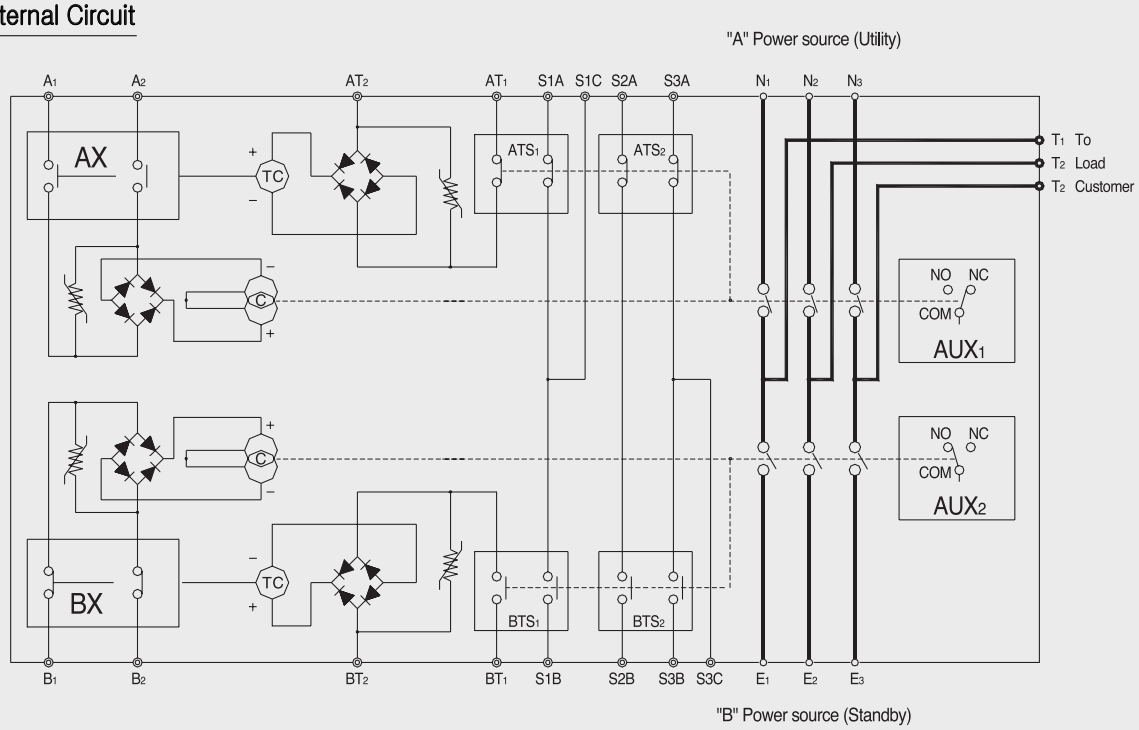


Operating Circuit



Low Voltage Automatic Transfer Switch

Internal Circuit



A_1, A_2	"A" Power source side(On)
AT_1, AT_2	"A" Power source side(Trip)
ATS_1, ATS_2	Switch, Position contacts
BTS_1, BTS_2	
$AUX_{1,2}$	Switch, Auxiliary
AX, BX	Switch, Control
B_1, B_2	"B" Power source side(On)
BT_1, BT_2	"B" Power source side(Trip)
C	Coil, Closing
COM	Common
CTTS	Closed transition transfer swiitch
E_1, E_2, E_3	Standby power source conn.
NO	Normally open
NC	Normally closed
N_1, N_2, N_3	Utility power source
S1A, S1B, S1C	Switch, Position sensing
S2A, S2B	
S3A, S3B, S3C	
TC	Coli, Trip
T_1, T_2, T_3	Costomer load conn.

All contacts of switch shown in:

Utility: Closed

Standby: Open

×: Closed ○: Open

Utility side	Switch position	Utility closed	Neutral	Utility open
Aux. 1	COM - NC	×	○	○
	COM - NO	○	×	×

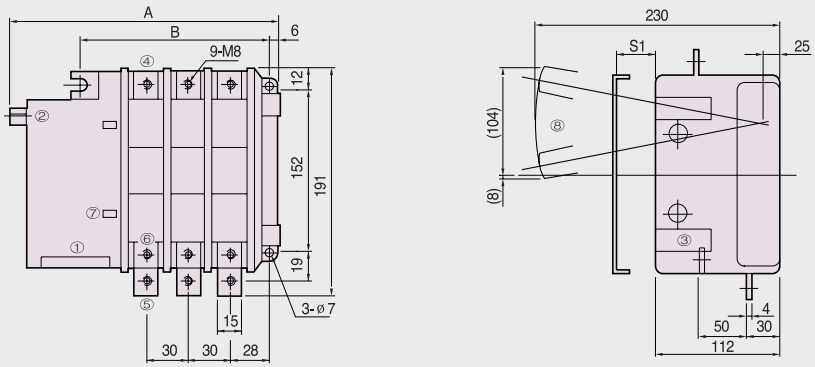
Standby side	Switch position	Standby Open	Neutral	Standby closed
Aux. 2	COM - NC	○	○	×
	COM - NO	×	×	○

... ATS, CTTS (Automatic Transfer Switches)

Outside Drawing

WP Type

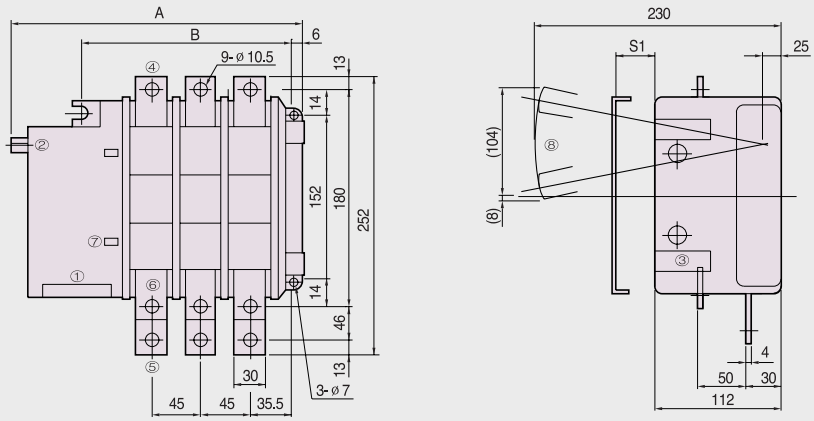
61WP
Front Connection



The arc space dimension (S1) is 30mm for a main circuit voltage of 220V, and 60mm for 600V.

	A	B
2P	214	113
3P	244	143
4P	274	173

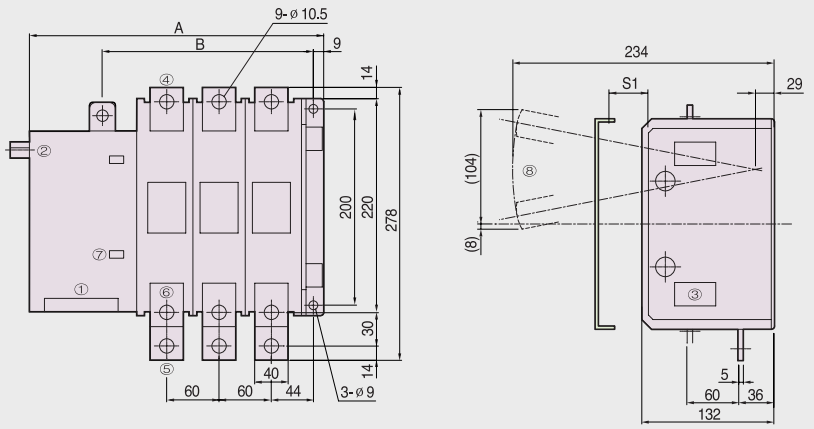
62WP
Front Connection



The arc space dimension (S1) is 30mm for a main circuit voltage of 220V, and 60mm for 600V.

	A	B
2P	244	143
3P	289	188
4P	334	233

64WP
Front Connection



The arc space dimension (S1) is 30mm for a main circuit voltage of 220V, and 60mm for 600V.

	A	B
2P	290	174
3P	350	234
4P	410	294

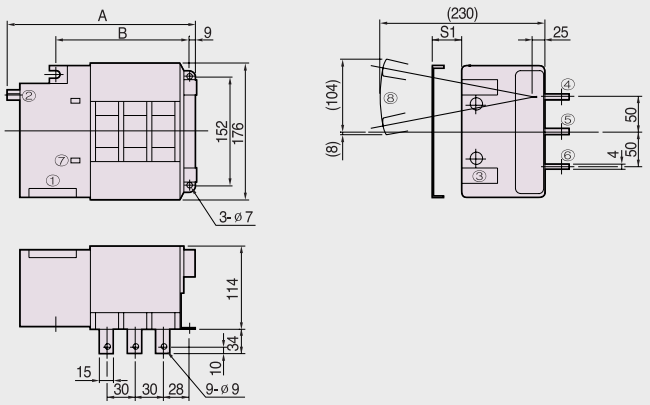
① Operating circuit terminal
② Manual operation shaft
③ Auxiliary switch
④ Power A side main circuit terminal
⑤ Load side main circuit terminal
⑥ Power B side main circuit terminal
⑦ Transfer indicator
⑧ Manual handle

Low Voltage Automatic Transfer Switch

Outside Drawing

WP Type

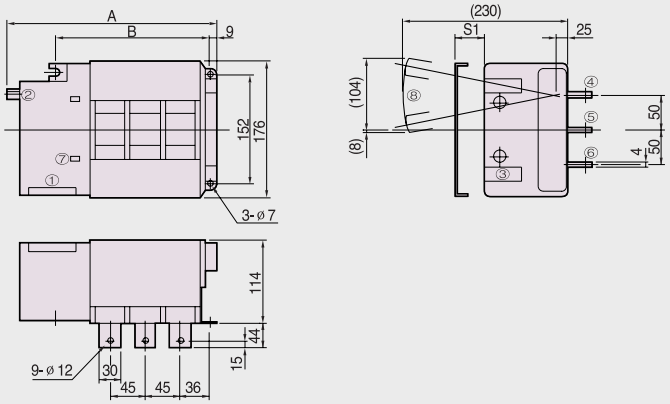
61WP
Back connection



The arc space dimension (S1) is 30mm for a main circuit voltage of 220V, and 60mm for 600V.

	A	B
2P	214	113
3P	244	143
4P	274	173

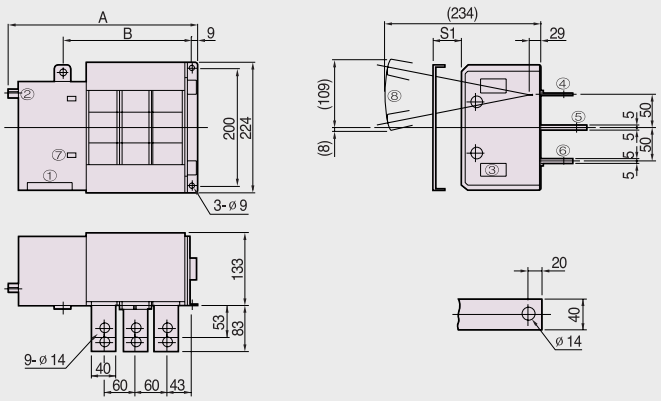
62WP
Back Connection



The arc space dimension (S1) is 30mm for a main circuit voltage of 220V, and 60mm for 600V.

	A	B
2P	244	143
3P	289	188
4P	334	233

64WP
Back Connection



The arc space dimension (S1) is 30mm for a main circuit voltage of 220V, and 60mm for 600V.

	A	B
2P	290	174
3P	350	234
4P	410	294

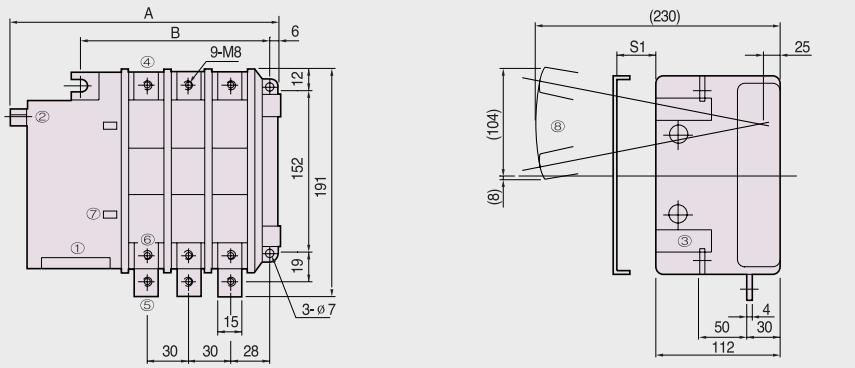
① Operating circuit terminal
② Manual operation shaft
③ Auxiliary switch
④ Power A side main circuit terminal
⑤ Load side main circuit terminal
⑥ Power B side main circuit terminal
⑦ Transfer indicator
⑧ Manual handle

... ATS, CTTS (Automatic Transfer Switches)

Outside Drawing

WN, W Type

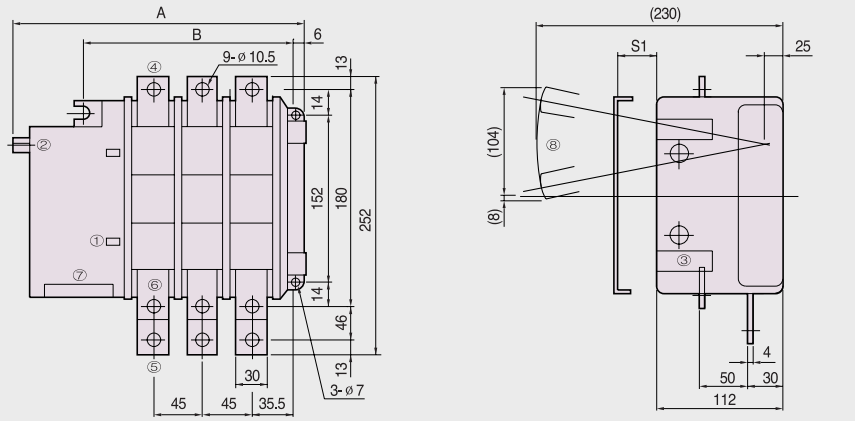
61WN, 61W
Front Connection



The arc space dimension (S1) is 30mm for a main circuit voltage of 220V, and 60mm for 600V.

	A	B
2P	204	103
3P	234	133
4P	264	163

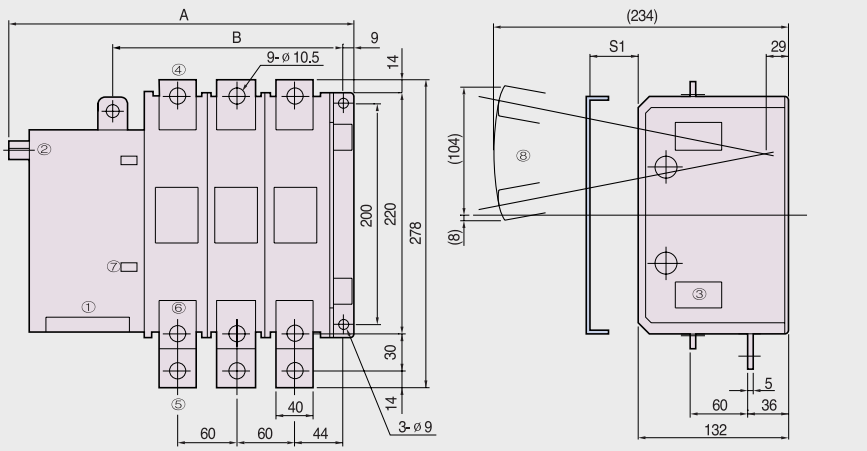
62WN, 62W
Front Connection



The arc space dimension (S1) is 30mm for a main circuit voltage of 220V, and 60mm for 600V.

	A	B
2P	234	133
3P	279	178
4P	324	223

64WN, 64W
Front Connection



The arc space dimension (S1) is 30mm for a main circuit voltage of 220V, and 60mm for 600V.

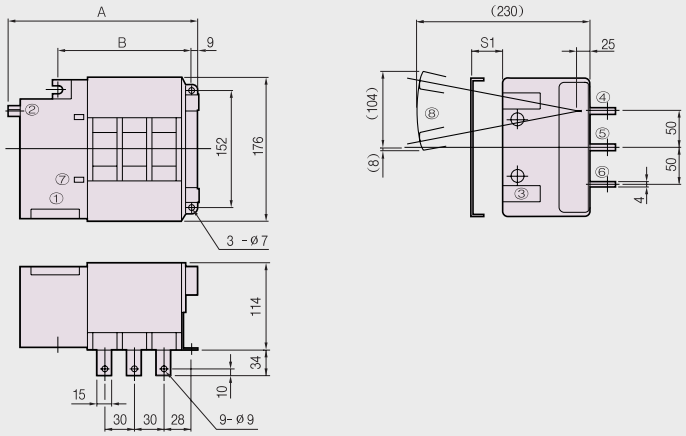
	A	B
2P	280	164
3P	340	224
4P	400	284

① Operating circuit terminal ② Manual operation shaft ③ Auxiliary switch ④ Power A side main circuit terminal
⑤ Load side main circuit terminal ⑥ Power B side main circuit terminal ⑦ Transfer indicator ⑧ Manual handle

Outside Drawing

WN, W Type

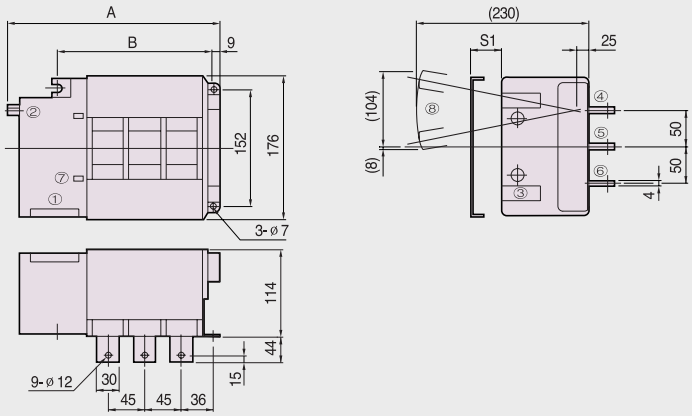
61WN, 61W
Back Connection



The arc space dimension (S1) is 30mm for a main circuit voltage of 220V, and 60mm for 600V.

	A	B
2P	204	103
3P	234	133
4P	264	163

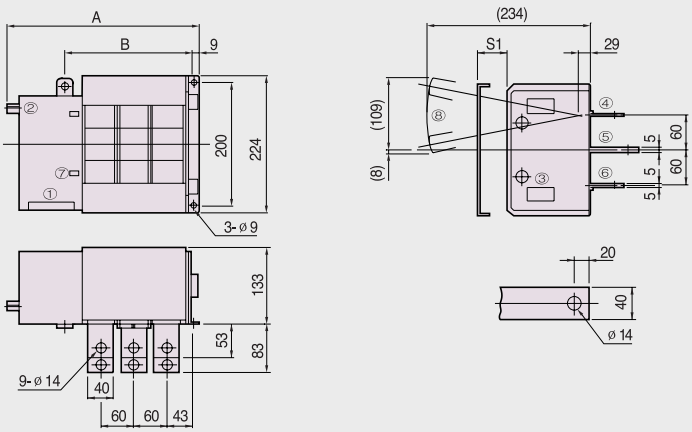
62WN, 62W
Back Connection



The arc space dimension (S1) is 30mm for a main circuit voltage of 220V, and 60mm for 600V.

	A	B
2P	234	133
3P	279	178
4P	324	223

64WN, 64W
Back Connection



The arc space dimension (S1) is 30mm for a main circuit voltage of 220V, and 60mm for 600V.

	A	B
2P	280	164
3P	340	224
4P	400	284

① Operating circuit terminal
② Manual operation shaft
③ Auxiliary switch
④ Power A side main circuit terminal
⑤ Load side main circuit terminal
⑥ Power B side main circuit terminal
⑦ Transfer indicator
⑧ Manual handle

... ATS, CTTS (Automatic Transfer Switches)

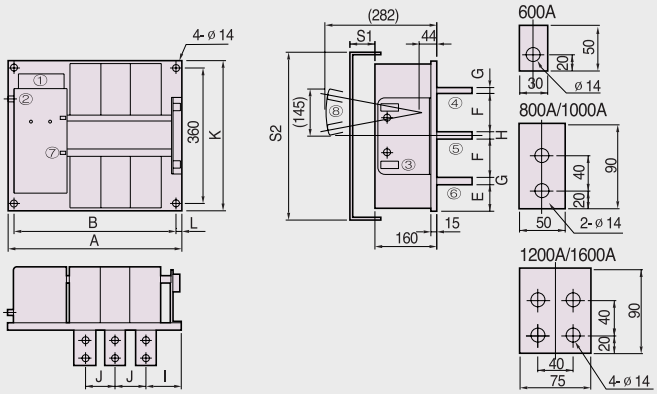
Outside Drawing

66WN – 616WN
Back Connection

Type		66WN	68WN	610WN	612WN	616WN
A	3P	405	450		510	
	4P	470	530		610	
B	3P	365	410		480	
	4P	440	500		580	
E		75	74		71	
F		117.5	116.5			
G		10	12		15	
H		15				
I		80	88		97.5	
J		65	80		100	
K	3P	410	410		410	
	4P	410	410		410	
L	3P	20	20		15	
	4P	15	15		15	

Arc space dimension

Main circuit voltage	S1	S2
200V	45mm	430mm
600V	90mm	450mm

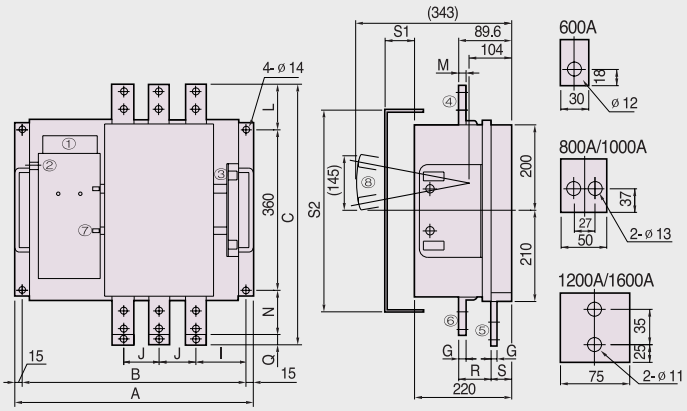


66WN – 616WN
Front Connection

Type		66WN	68WN	610WN	612WN	616WN
A	3P	465	510		570	
	4P	530	590		670	
B	3P	435	480		540	
	4P	500	560		640	
C		545	608.5		645	
G		10	12		15	
I		95.7	101.6		112.4	
J		65	80		100	
L		73	91		111	
M		15	15		15	
N		68	79.5		109	
Q		44	78		65	
R		65	74		76	
S		55	55		57	

Arc space dimension

Main circuit voltage	S1	S2
200V	45mm	430mm
600V	90mm	450mm

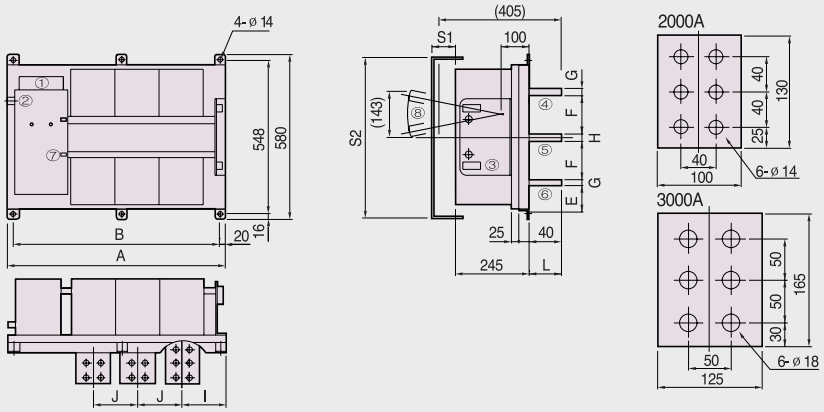


620/630WN
Back Connection

Type		620WN	630WN
A	3P	675	825
	4P	810	1000
B	3P	635	785
	4P	770	970
E		119	114
F		132.5	130
G		15	20
H		15	20
I		121	146
J		135	185
L		90	125

Arc space dimension

Main circuit voltage	S1	S2
200V	50mm	560mm
600V	100mm	600mm



① Operating circuit terminal ② Manual operation shaft ③ Auxiliary switch ④ Power A side main circuit terminal
⑤ Load side main circuit terminal ⑥ Power B side main circuit terminal ⑦ Transfer indicator ⑧ Manual handle

* Earth terminal is mounted at the right side of operating circuit terminal support.

Low Voltage Automatic Transfer Switch

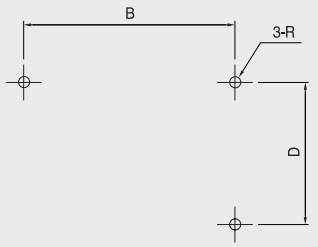
... ATS, CTTS (Automatic Transfer Switches)

Panel Processing Dimensions

WN, W, WP Type

61-64WN, 61-64W, 61-64WP

Front Connection



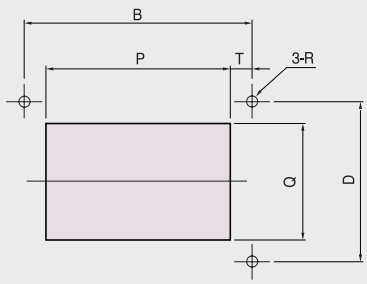
W, WN-Type

Type		606-61W, WN	62W, WN	64W, WN
B	2P	103	133	164
	3P	133	178	224
	4P	163	223	284
D		152	152	200
R		M5		M8

WP-Type

Type		606-61WP	62WP	64WP
B	2P	113	143	174
	3P	143	188	234
	4P	173	233	294
D		152	152	200
R		M5		M8

Back Connection



W, WN-Type

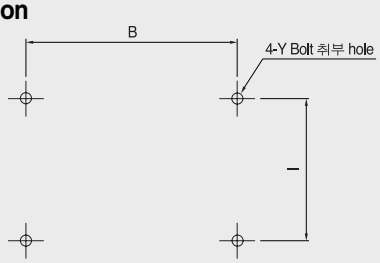
Type		606-61W,WN	62W, WN	64W, WN
B	2P	103	133	164
	3P	133	178	224
	4P	163	223	284
D		152	152	200
P	2P	85	110	135
	3P	115	155	195
	4P	145	200	255
Q		140		180
T		7.5		9
R		M5		M8

WP-Type

Type		606-61WP	62WP	64WP
B	2P	113	143	174
	3P	143	188	234
	4P	173	233	294
D		152	152	200
P	2P	85	110	135
	3P	115	155	195
	4P	145	200	255
Q		140		180
T		7.5		9
R		M5		M8

66-616WN

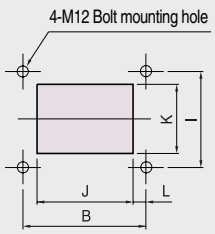
Front Connection



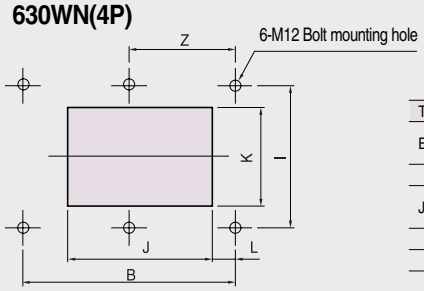
Type		66WN	68WN 610WN	612WN 616WN
B	3P	435	480	540
	4P	500	560	640
I		360	360	360
Y		M12	M12	M12

66-620WN
630WN(3P)

Back Connection



630WN(4P)



Type		66WN	68WN/610WN	612WN/616WN	620WN	630WN
B	3P	365	410	480	635	785
	4P	440	500	580	770	970
I		360	360	360	548	548
J	3P	335	380	440	420	545
	4P	400	460	540	555	730
K		330	330	330	460	460
L		20	20	20	28	40
Z		-	-	-	-	485

... ATS, CTTS (AutomaticTtransfer Switches)

Outside Drawing

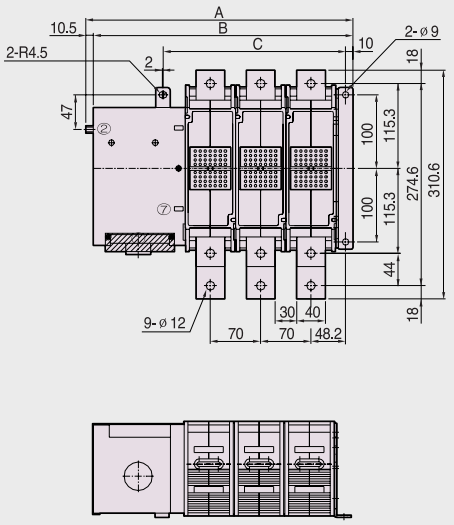
S Type

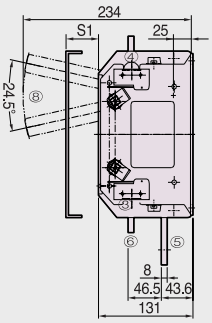
66S
Front Connection

	3P	4P
A	371.2	441.2
B	360.7	430.7
C	254	324

Arc space dimension

Main circuit voltage	S1	S2
200V	45mm	226mm
600V	90mm	226mm



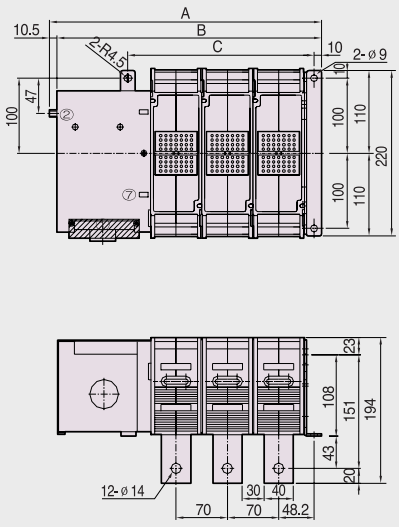


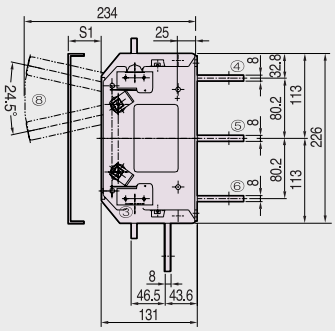
66S
Back Connection

	3P	4P
A	371.2	441.2
B	360.7	430.7
C	254	324

Arc space dimension

Main circuit voltage	S1	S2
200V	45mm	226mm
600V	90mm	226mm





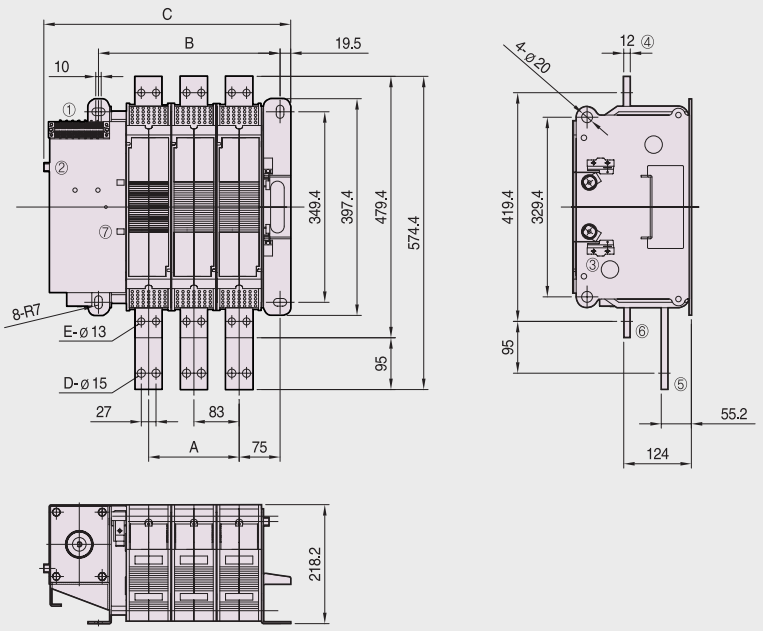
① Operating circuit terminal ② Manual operation shaft ③ Auxiliary switch ④ Power A side main circuit terminal
⑤ Load side main circuit terminal ⑥ Power B side main circuit terminal ⑦ Transfer indicator ⑧ Manual handle

Outside Drawing

S Type

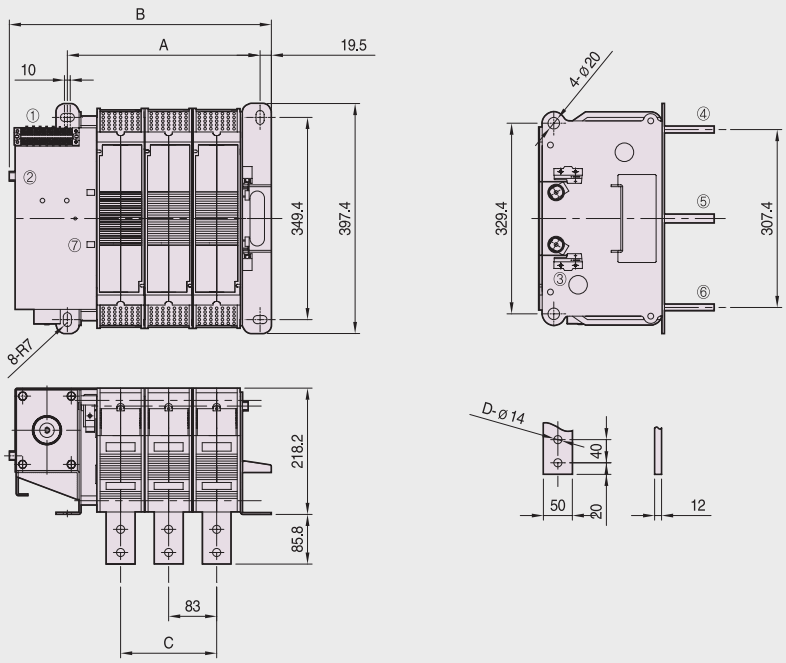
610W
Front Connection

	3P	4P
A	166	249
B	333	416
C	452.7	535.7
D	6	8
E	12	16



610S
Back Connection

	3P	4P
A	333	416
B	452.7	535.7
C	166	243
D	18	24



① Operating circuit terminal ② Manual operation shaft ③ Auxiliary switch ④ Power A side main circuit terminal
⑤ Load side main circuit terminal ⑥ Power B side main circuit terminal ⑦ Transfer indicator ⑧ Manual handle

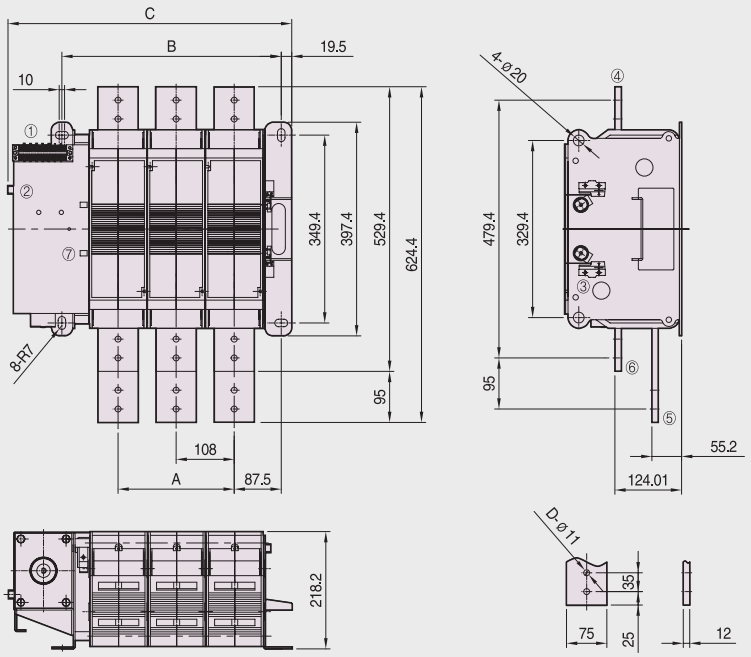
... ATS, CTTS (Automatic Transfer Switches)

Outside Drawing

S Type

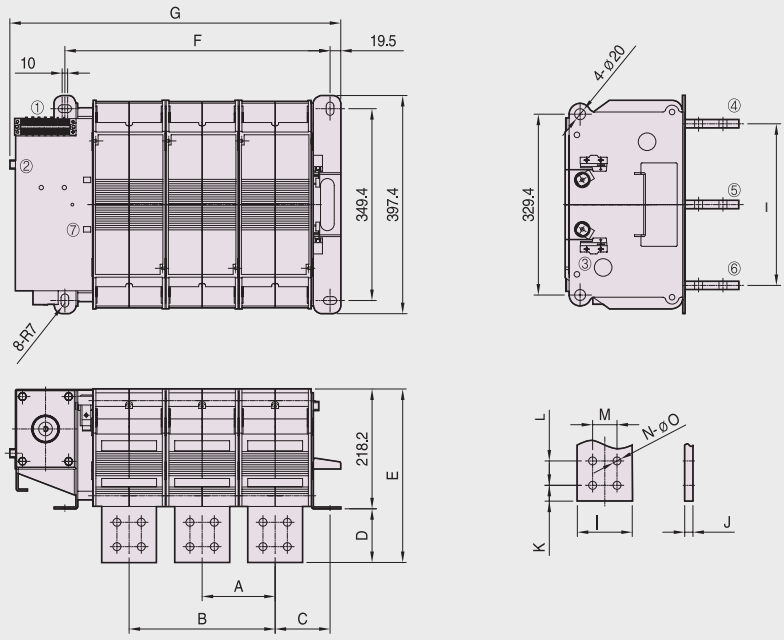
616WS
Front connection

	3P	4P
A	216	324
B	408	516
C	527.7	635.7
D	18	24



616/620WS
Back Connection

Classification	616WS		620WS	
	3P	4P	3P	4P
A	108	108	133	133
B	216	324	266	399
C	88.5	88.5	100	100
D	85.8	85.8	97.8	97.8
E	304	304	316	316
F	408	516	483	616
G	527.7	635.7	602.7	735.7
H	307.4	307.4	294.4	294.4
I	75	75	100	100
J	12	12	15	15
K	20	20	28.8	28.8
L	40	40	44.4	44.4
M	40	40	44.4	44.4
N	36	48	36	48
O	14	14	14.5	14.5



① Operating circuit terminal ② Manual operation shaft ③ Auxiliary switch ④ Power A side main circuit terminal
⑤ Load side main circuit terminal ⑥ Power B side main circuit terminal ⑦ Transfer indicator ⑧ Manual handle

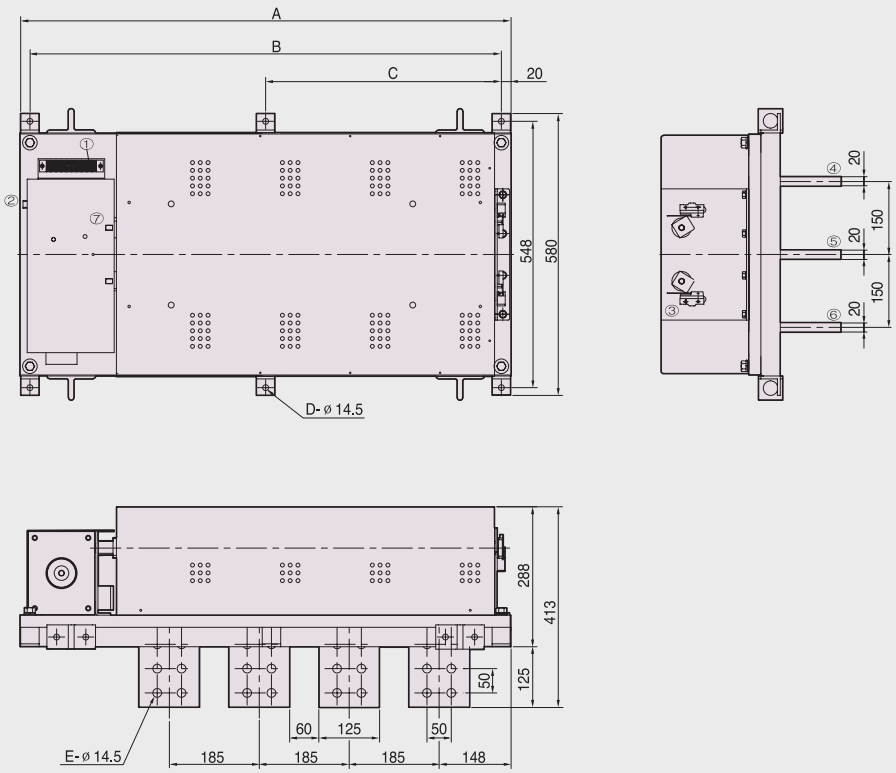
... ATS, CTTS (Automatic Transfer Switches)

Outside Drawing

WS Type

630WS
Back Connection

	3P	4P
A	825	1010
B	785	970
C	-	485
D	4	6
E	54	72



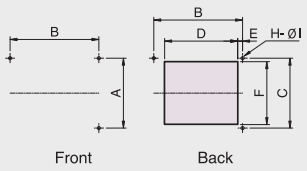
① Operating circuit terminal ② Manual operation shaft ③ Auxiliary switch ④ Power A side main circuit terminal
⑤ Load side main circuit terminal ⑥ Power B side main circuit terminal ⑦ Transfer indicator ⑧ Manual handle

... ATS, CTTS (Automatic Transfer Switches)

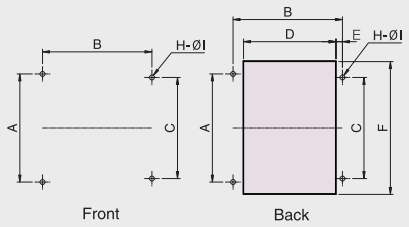
Outside Drawing

WS Type

<600A>



<1000A~2000A>



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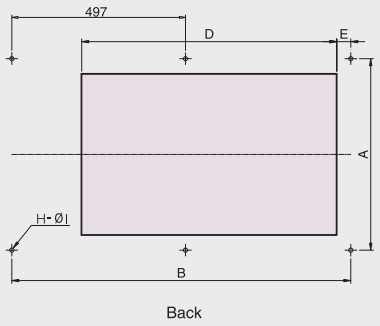


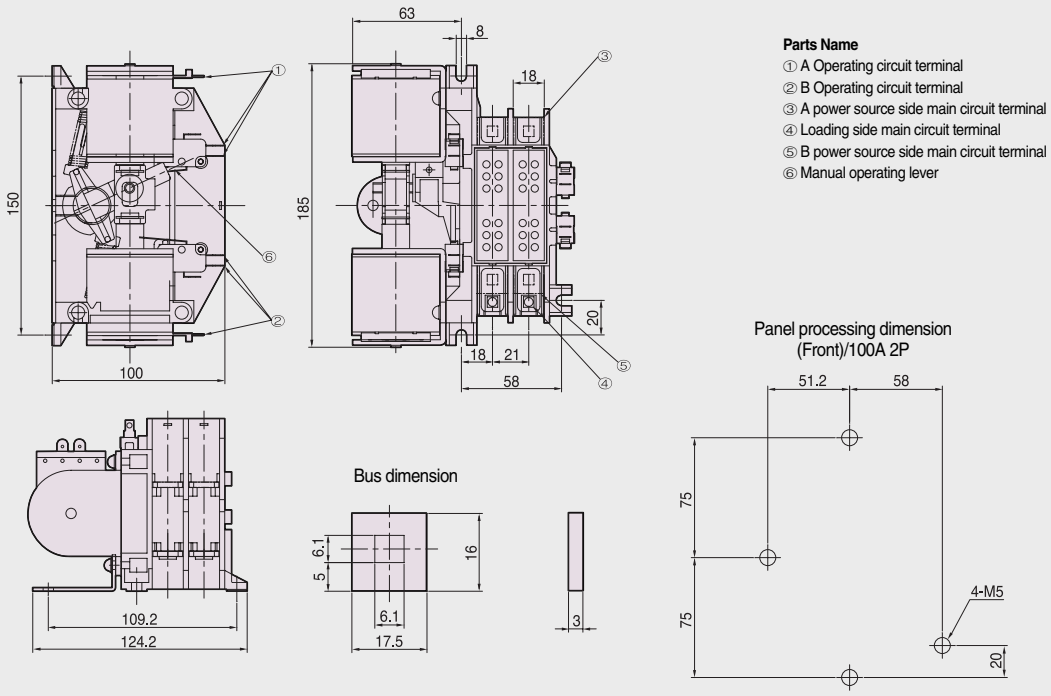
Classification		600A		1000A		600A		2000A		3000A
		Front	Back	Front	Back	Front	Back	Front	Back	Back
A	3P	200	200	349.4	349.4	349.4	349.4	-	349.4	548
	4P	200	200	349.4	349.4	349.4	349.4	-	349.4	548
B	3P	254	254	333	333	408	408	-	483	785
	4P	324	324	416	416	516	516	-	616	970
C	-	200	200	349.4	349.4	349.4	349.4	-	349.4	-
D	3P	-	209	-	264.5	-	339.5	-	414.5	545.2
	4P	-	279	-	347.5	-	447.5	-	547.5	730
E	-	-	14	-	28.5	-	28.5	-	28.5	40
F	-	-	180	-	380	-	390	-	390	-
G	-	-	-	-	-	-	-	-	-	-
H	-	3	3	4	4	4	4	-	4	6
I	-	9	9	14	14	14	14	-	14	14

... ATS, CTTS (Automatic Transfer Switches)

Outside Drawing

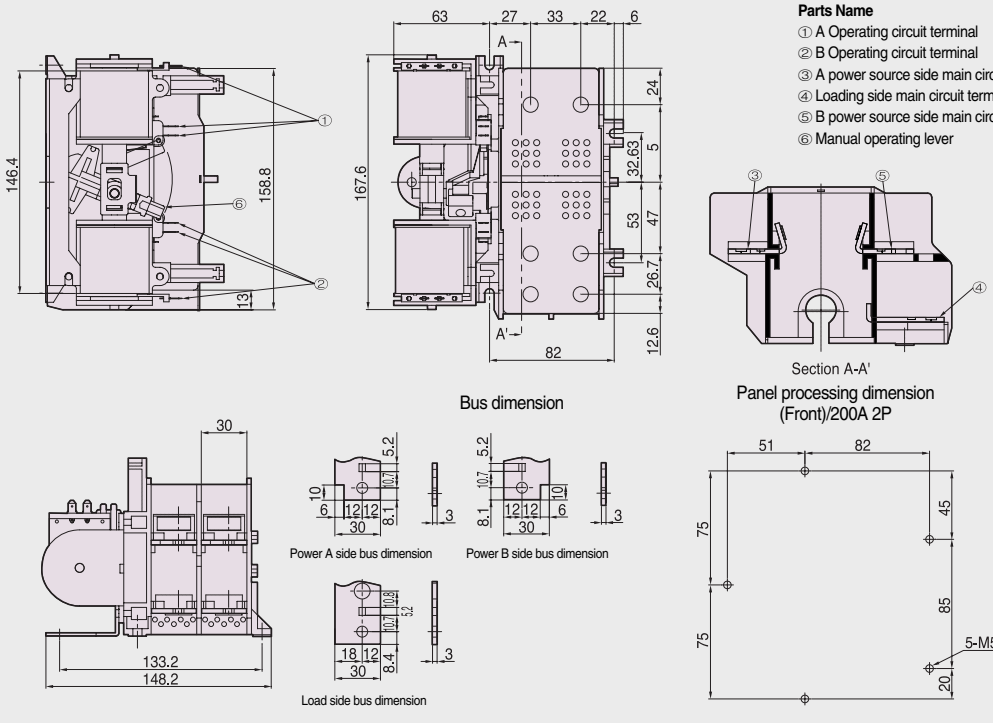
HS Type

21HS



Parts Name
① A Operating circuit terminal
② B Operating circuit terminal
③ A power source side main circuit terminal
④ Loading side main circuit terminal
⑤ B power source side main circuit terminal
⑥ Manual operating lever

22HS



Parts Name
① A Operating circuit terminal
② B Operating circuit terminal
③ A power source side main circuit terminal
④ Loading side main circuit terminal
⑤ B power source side main circuit terminal
⑥ Manual operating lever

... ATS, CTTS (Automatic Transfer Switches)

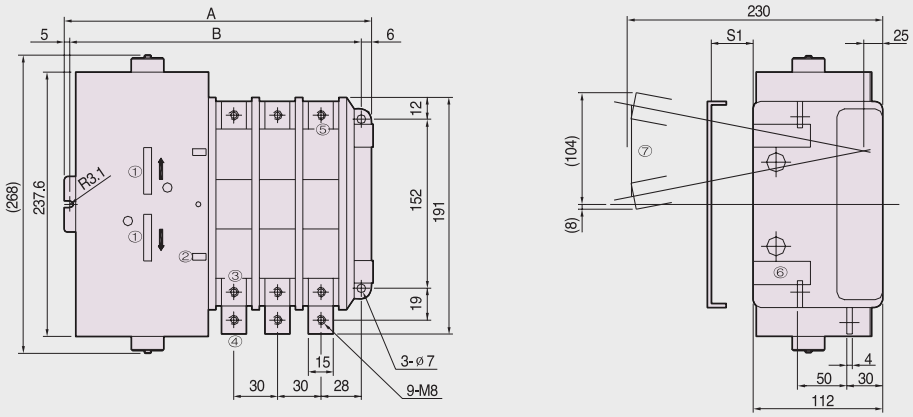
Outside Drawing

CTTS Type

61CT
Front Connection

The arc space dimension (S1) is 30mm for a main circuit voltage of 220V, and 60mm for 600V.

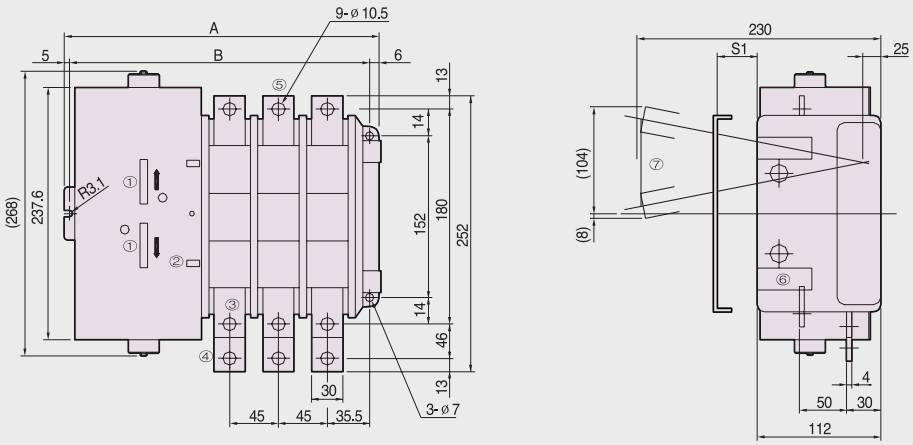
	A	B
2P	210.8	199.8
3P	240.8	229.8
4P	270.8	259.8



62CT
Front Connection

The arc space dimension (S1) is 30mm for a main circuit voltage of 220V, and 60mm for 600V.

	A	B
2P	240.8	229.8
3P	285.8	274.8
4P	330.8	319.8



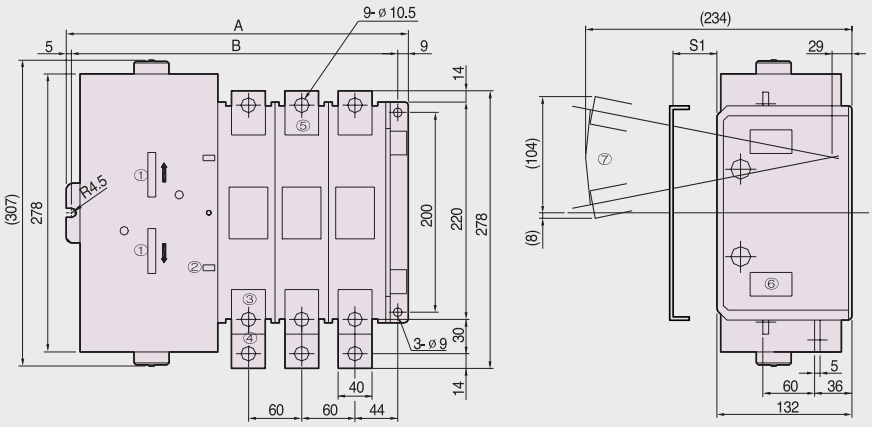
① Manual operation hole ② Transfer indicator ③ Power B side main circuit terminal ④ Load side main circuit terminal
⑤ Power A side main circuit terminal ⑥ Auxiliary switch ⑦ Manual handle

Low Voltage Automatic Transfer Switch

64CT
Front Connection

The arc space dimension (S1) is 30mm for a main circuit voltage of 220V, and 60mm for 600V.

	A	B
2P	292.5	278.5
3P	352.5	338.5
4P	412.5	398.5



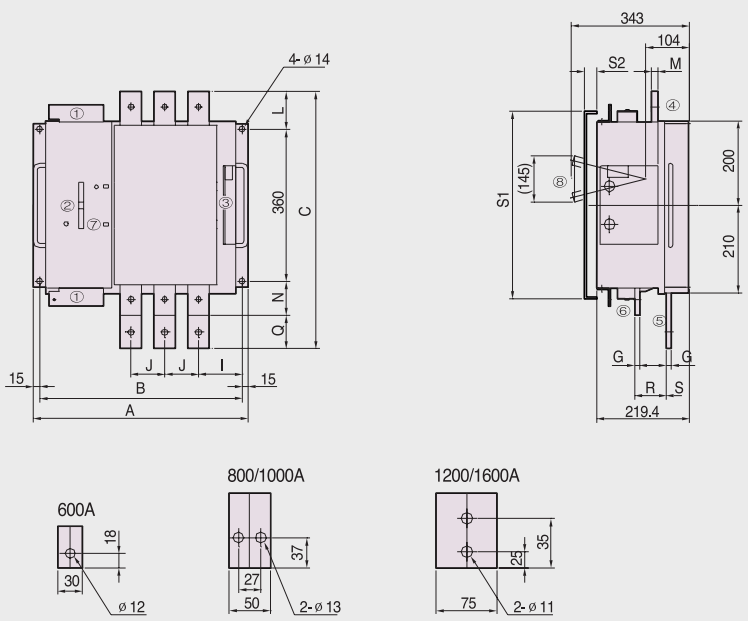
① Manual operation hole ② Transfer indicator ③ Power B side main circuit terminal ④ Load side main circuit terminal
⑤ Power A side main circuit terminal ⑥ Auxiliary switch ⑦ Manual handle

66–616CT
Front Connection

Arc space dimension

dimensions	A	B
200V	25mm	430mm
600V	90mm	450mm

Type		600A	800A	1000A	1200A	1600A
A	3P	465	510		570	
	4P	530	590		670	
B	3P	435	480		540	
	4P	500	560		640	
C		545	608.5		645	
G		10	12		15	
I		95.7	101.6		112.4	
J		65	80		100	
L		73	91		111	
M		15	15		15	
N		15	79.5		109	
Q		44	78		65	
R		65	74		76	
S		55	55		57	



① Operating circuit terminal ② Manual operation hole ③ Auxiliary switch ④ Power A side main circuit terminal
⑤ Load side main circuit terminal ⑥ Power B side main circuit terminal ⑦ Transfer indicator ⑧ Manual handle

... ATS, CTTS (Automatic Transfer Switches)

Outside Drawing

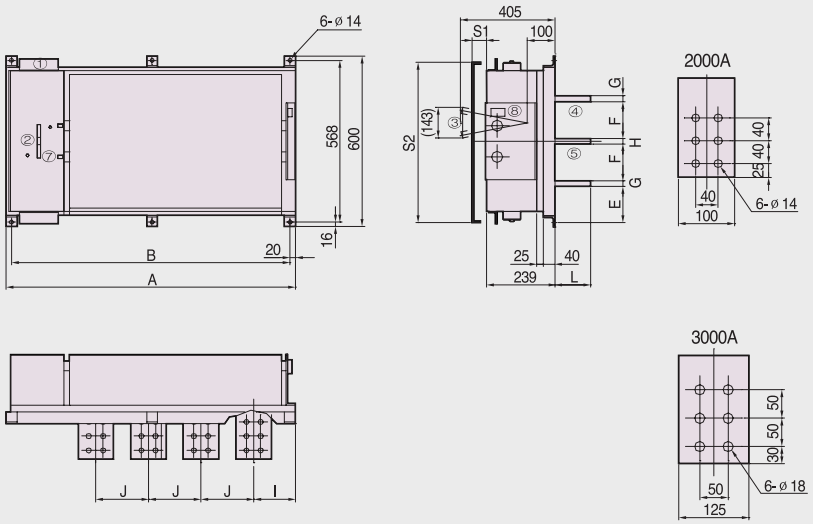
CTTS Type

620~630CT
Back Connection

Arc space dimension

Main circuit voltage	S1	S2
200V	50	560
600V	100	600

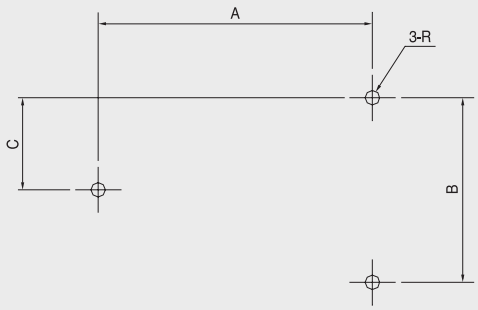
Type		2000A	3000A
A	3P	683	833
	4P	818	1018
B	3P	645	795
	4P	780	980
E		128.5	126
F		132.5	130
G		15	20
H		15	20
I		123	148
J		135	185
L		90	125



① Operating circuit terminal ② Manual operation hole ③ Auxiliary switch ④ Power A side main circuit terminal
⑤ Load side main circuit terminal ⑥ Power B side main circuit terminal ⑦ Transfer indicator ⑧ Manual handle

Panel Processing Dimensions

61~64CT
Front Connection

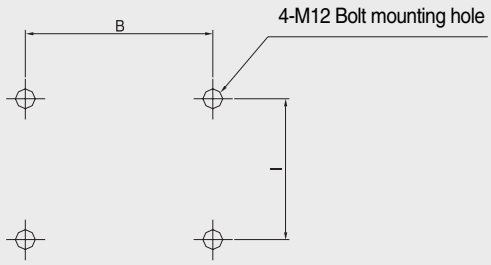


Type		100A	200A	400A
A	2P	199.8	229.5	278.5
	3P	229.8	274.8	338.5
	4P	259.8	319.8	398.5
B		152		200
C		76		100
R		M5		M8

Dimension for Panel

CTTS

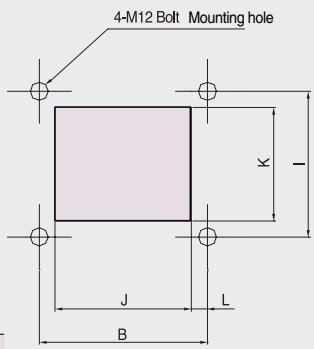
66–616CT
Front Connection



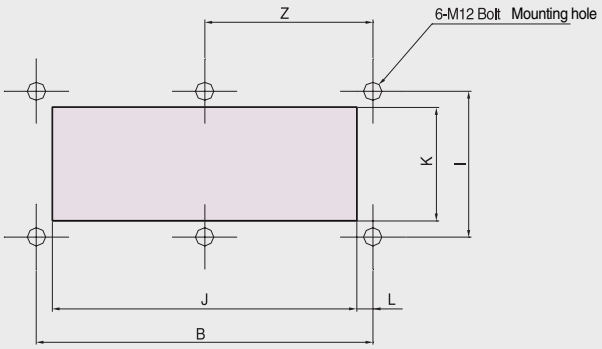
Type		600A	800A	1000A	1200A	1600A
B	2P	435	480		540	
	3P	500	560		640	
I		360	360		360	

620–630CT
Back Connection

CTTS 2000A-3000A (3P)

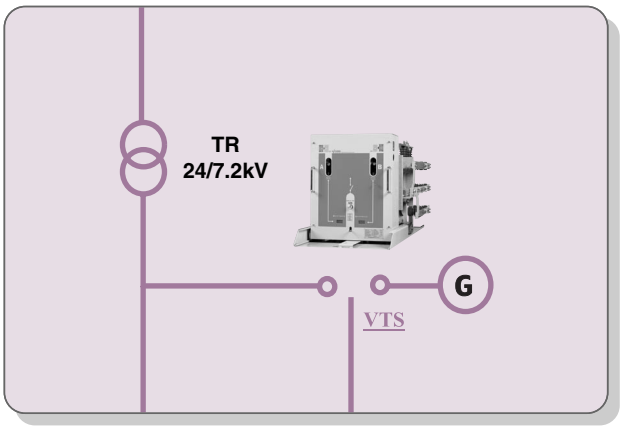


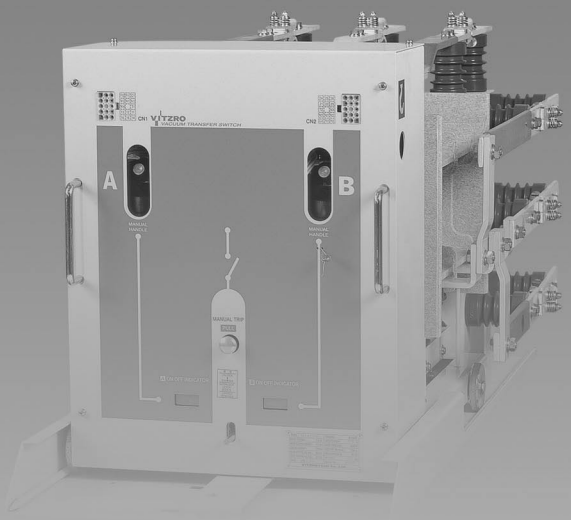
CTTS 3000A (4P)



Type		2000A	3000A
B	2P	645	795
	3P	780	980
I		568	568
J	3P	420	545
	4P	555	730
K		460	460
L		28	40
Z		-	490

High-Voltage Vacuum Transfer Switch(VTS)

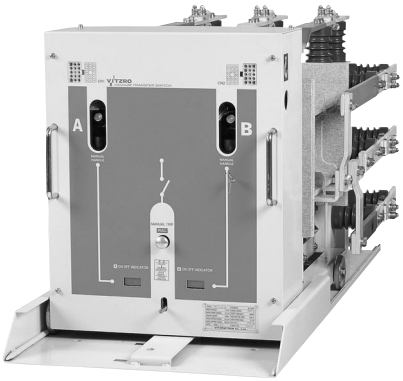


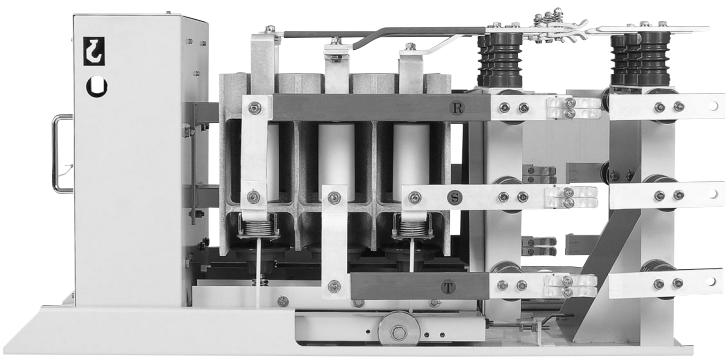


Contents

High-Voltage Vacuum Transfer Switch (VTS)

Vacuum Transfer Switch, VTS ... 7.2kV , 400/600A





Features

- **Built-in electrical/mechanical interlock.**
  Interlock at the transfer part prevents erroneous operation. Design is easy without having to consider external electrical/mechanical interlock.

- **Long lifetime**
  The vacuum interrupter employed at the switching part has 20 years or more vacuum lifetime, with very little contact wear.

- **Easy maintenance**
  This VTS is draw-out type for which maintenance is easy, and has open type mold insulation barrier for easy cleaning. Transfer operation is instantaneous excitation type, and electric power is consumed only at the transfer operation.

- **Multiple stage installation available**
  Panel width can be reduced in comparison to fixed type products. This product also allows other multiple-stage high voltage devices to be installed. It is light-weight for easy handling.

Economical Characteristic Comparison

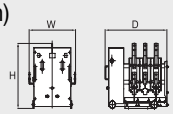
Classification	VTS	Fixed switch transfer	2 breakers
Product price	Built-in electrical/mechanical interlock. Instantaneous excitation	Built-in electrical/mechanical interlock. Instantaneous excitation	Mechanical interlock is required to secure safety
	Medium pric	Low price	High price
Installation price	VTS+3 VCBs are installed on one cubicle plane. Minimum space.	Fixed type+3 VCBs are installed requiring at least two cubicle planes.	Five breakers in total are installed requiring at least two cubicle planes.
	Low price	High price	High price
Maintenance cost	Draw-out type, easy to be drawn out and maintained in a short time	Fixed type, difficult to be drawn out and maintained in a long time	Operation at the mechanical interlock must be checked after maintenance
	Low price	High price	Medium pric
Total	Low price	Medium pric	High price

High-Voltage Vacuum Transfer Switch (VTS)

VITZROTECH vacuum transfer switch provides excellent insulating performance by using vacuum interrupter and BMC barrier, and is equipped with electrical and mechanical interlock and overcurrent lock to prevent accidents by breaking failure in case of short circuit and overcurrent conduction.

Applied Facilities

- Industrial plants under the risk of great damage by power failure
- Limited space including basement machine room
- Hospitals, broadcasting companies, airports and banks that does not allow electric outage.
- Department stores, movie theaters, hotels, etc. that are designated as special fire protection facilities according to the Fire Regulation.

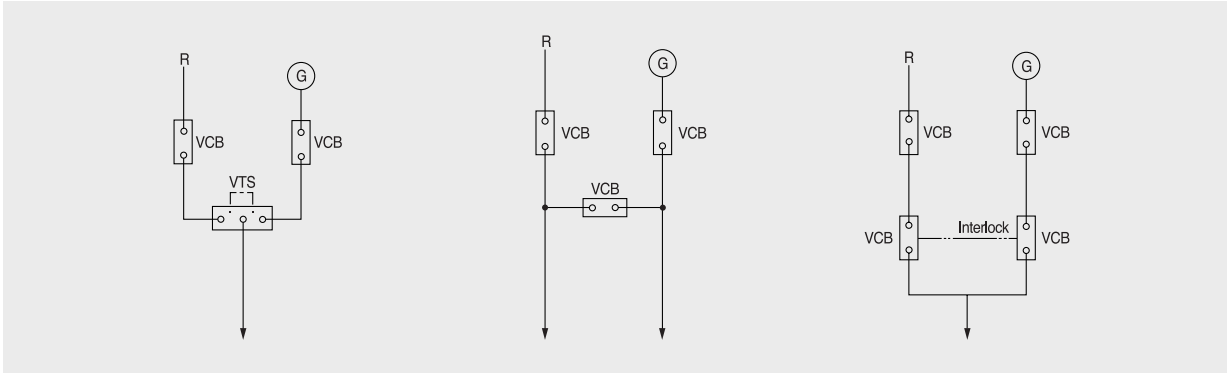
Type		Fixed	VTS-6N4		VTS-6N6	
		Draw-out	VTS-6N4E		VTS-6N6E	
Rated current		A	400		600	
Rated voltage		kV	7.2			
Pole		P	3			
Performance						
Short-time withstand current (1s)kA		12.5				
Rated making current		kA	31.5			
Lock current		A	2500			
Endurance	Rated current switching	Times	10, 000			
	No-load switching	Times	10, 000			
Transfer sequence			A ↔ off(trip)↔ B			
Power frequency withstand voltage	Main circuit-earth	kV	22			
	Between main circuits (two-phase)	kV	22			
	etween main circuits (one-phase)	kV	35			
	Control circuit-earth	kV	2			
Impulse withstand voltage	Main circuit-earth	kV	60			
	Between main circuits (two-phase)	kV	60			
	Between main circuits (one-phase)	kV	70			
Operation type			Magnetic operation (Instantaneous energized type)			
Operating power	Closing		DC 100/110V, 30A or less			
	Trip)		DC 100/110V, 5A or less			
	Control		DC 100/110V, 0.3A or less			
External dimension and weight						
Weight	Fixed	kg	120		130	
	Draw-out	kg	140		150	
Dimension(mm) 			Fixed	Draw-out	Fixed	Draw-out
		H	585	545	585	545
		W	530	592	530	592
		D	700	870	700	870
Reference standard			JIS C4605			

... VTS (Vacuum Transfer Switches)

About High-Voltage Power Transfer

- **Example of Power Transfer Circuit**

For high-voltage power transfer (two-line supply, normal-standby/normal-generator), the designer is highly responsible for selecting methods and devices because there is no unified regulation on the circuit and devices.
An example of power transfer circuit is as follows.



- **Purpose of Using a Switch in Power Transfer**

'High-voltage receiving facility' states that "A section switch shall be installed at the supply point in terms of security". The section switch refers to a switch that sectionalizes the power line, and increases the withstand voltage between terminals of single-phase main circuits above surroundings (e.g. main circuit-earth) and prevents the entrance of abnormal voltage from inside and outside by grounding it.

Performance of Major High-Voltage Devices

(In case of 8kA or 12.5kA for receiving point short circuit current, and 7.2kV receiving end)

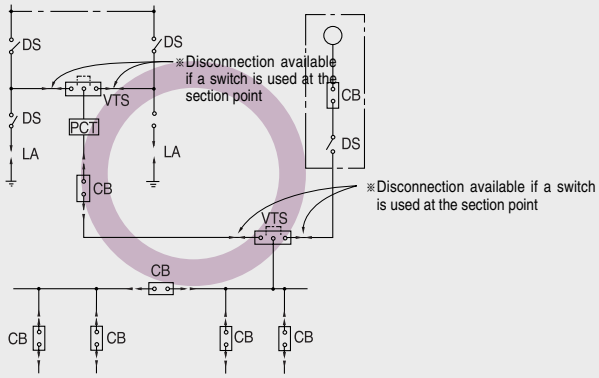
			Disconnecting switch	Switch	Breaker	Contactor Switch
Section (Disconnection) performance			○	○	×	×
Withstand voltage performance	Power frequency	Main circuit-earth	35kV	35kV	22kV	16kV
		Between main circuits (two-phase)	22kV	22kV	22kV	16kV
		Between main circuits (one-phase)	22kV	22kV	22kV	16kV
	Impulse	Main circuit-earth	70kV	70kV	60kV	N/A
		Between main circuits (two-phase)	60kV	60kV	60kV	45kV
		Between main circuits (one-phase)	60kV	60kV	60kV	45k
Load current switching performance			×	○	○	○
Short-circuit current breaking performance			×	× (Lock in case of exceeding the breaking current of switch)	○	× (Max. 4.4A)
Short-circuit withstand current performance			○	○	○	× (Max. 4.4A)
Making current performance			×	○	○	×

High-Voltage Vacuum Transfer Switch (VTS)

For high-voltage power transfer (two-line supply, normal-standby/normal-generator), the designer is highly responsible for selecting methods and devices because there is no unified regulation on the circuit and devices.
Fig. 1 is a representative power transfer single line diagram. By examining this circuit considering the 'High-voltage receiving facility guide' , a risk can be recognized if a switch equipped with disconnecting capacity is not applied to normal (A)↔ normal (B) transfer or normal ↔ generator transfer.

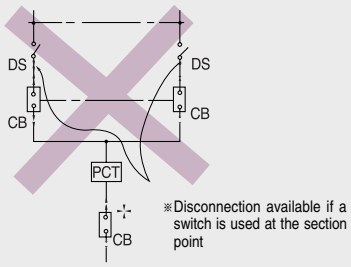
Fig. 1. One Line Diagram

(1) When using VTS



* Section point needs sectionalizing (disconnecting) function, theoretically.

(2) When using two breakers



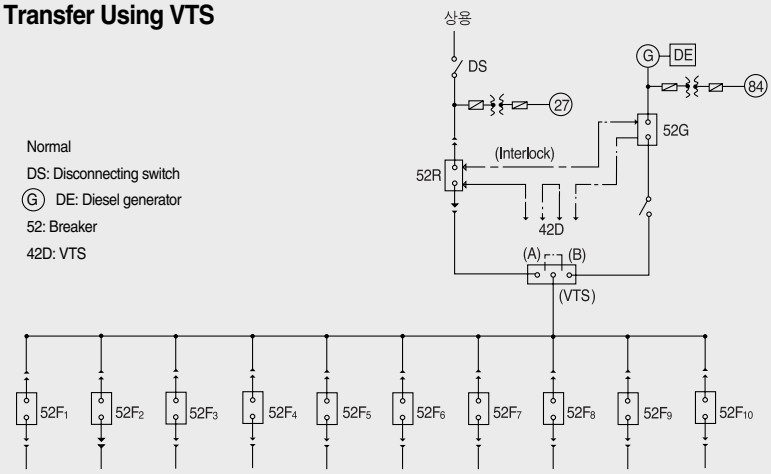
* Interlock by two CBs generally has only electrical interlock, without mechanical interlock, leading to risks.

- **Example of VTS Application**

(1) Normal-generator

Pause before the restoration of normal power is based on the 'Generation facilities installation guide', and there is no limit for normal → generator transfer time in case of normal power outage.

Fig 2. Example of Transfer Using VTS



... VTS (Vacuum Transfer Switches)

Fig. 3 Transfer Operation in Case of Failure at the Normal Power Side

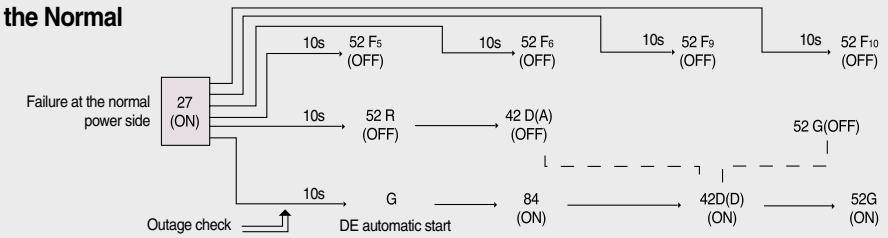
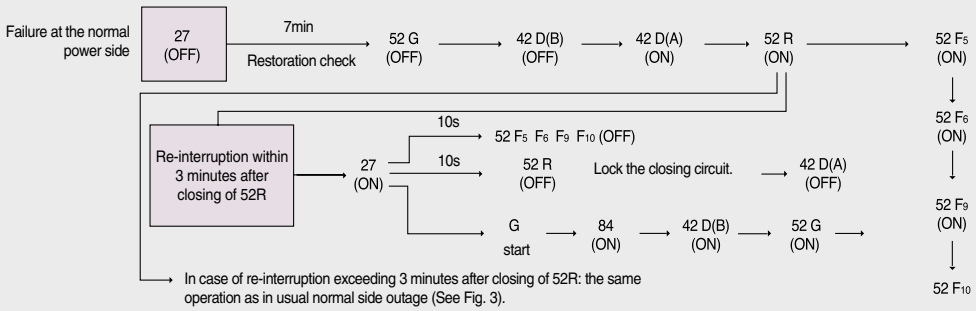


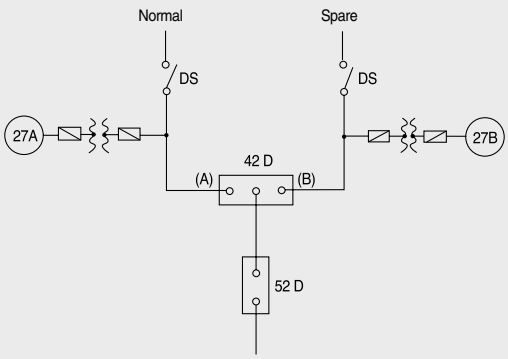
Fig. 4 Transfer Operation in Case of Restoration at the Normal Power Side



(2) Example of normal-standby transfer (receiving two lines)

Fig. 5 shows normal-standby transfer circuit and operation, which is rarely used in new facilities but usually used to modify existing facilities. In this case, there is no limit in the transfer time, but time is set according to the number of relays and section switches in the distribution system to prevent the reclosing of faulty line.

Fig. 5 Normal-Standby Transfer Circuit and Operation Diagram



[Condition]
- With normal power-priority circuit
- Only after 3 or more minutes' feeding from standby line can the normal power be restored. The same condition is applied to the transfer to standby line.

Normal power outage

27A	→	(52R)	→	42D(B)	→	42D(A)	→	(52R)
(ON)		(OFF)		(OFF)		(ON)		(ON)

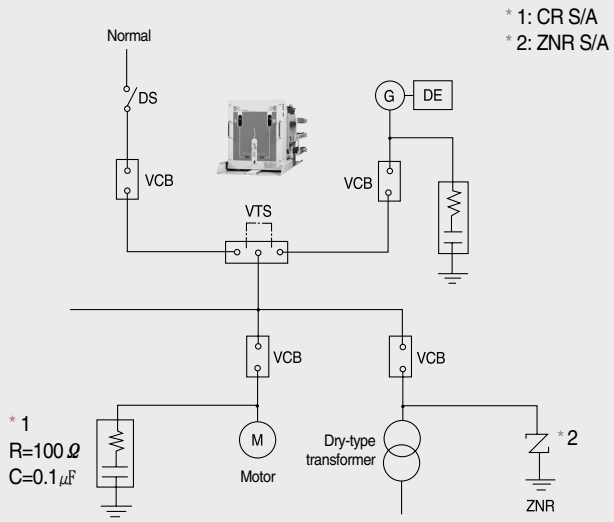
Normal power restoration

27A	→	(52R)	→	42D(B)	→	42D(A)	→	(52R)
(ON)		(OFF)		(OFF)		(ON)		(ON)

High-Voltage Vacuum Transfer Switch (VTS)

- **Surge protection when using VTS**

Fig. 6 Transfer Operation in Case of Failure at the Normal Power Side



Vacuum device cuts off the arc in high vacuum, so that the breaking capacity is excellent due to rapid diffusion of arc and high insulation strength in vacuum state. Meanwhile, in switching transformers or rotary devices including no-load motor and generator, breaking of current before approaching zero point may cause overvoltage by current chopping, therefore leading to insulating breakdown of motors, etc. That' s why surge protection is required.

VTS requires no surge protection because the transfer is conducted at no voltage. (Surge protection is required, however, when VCB is used as a breaker.)

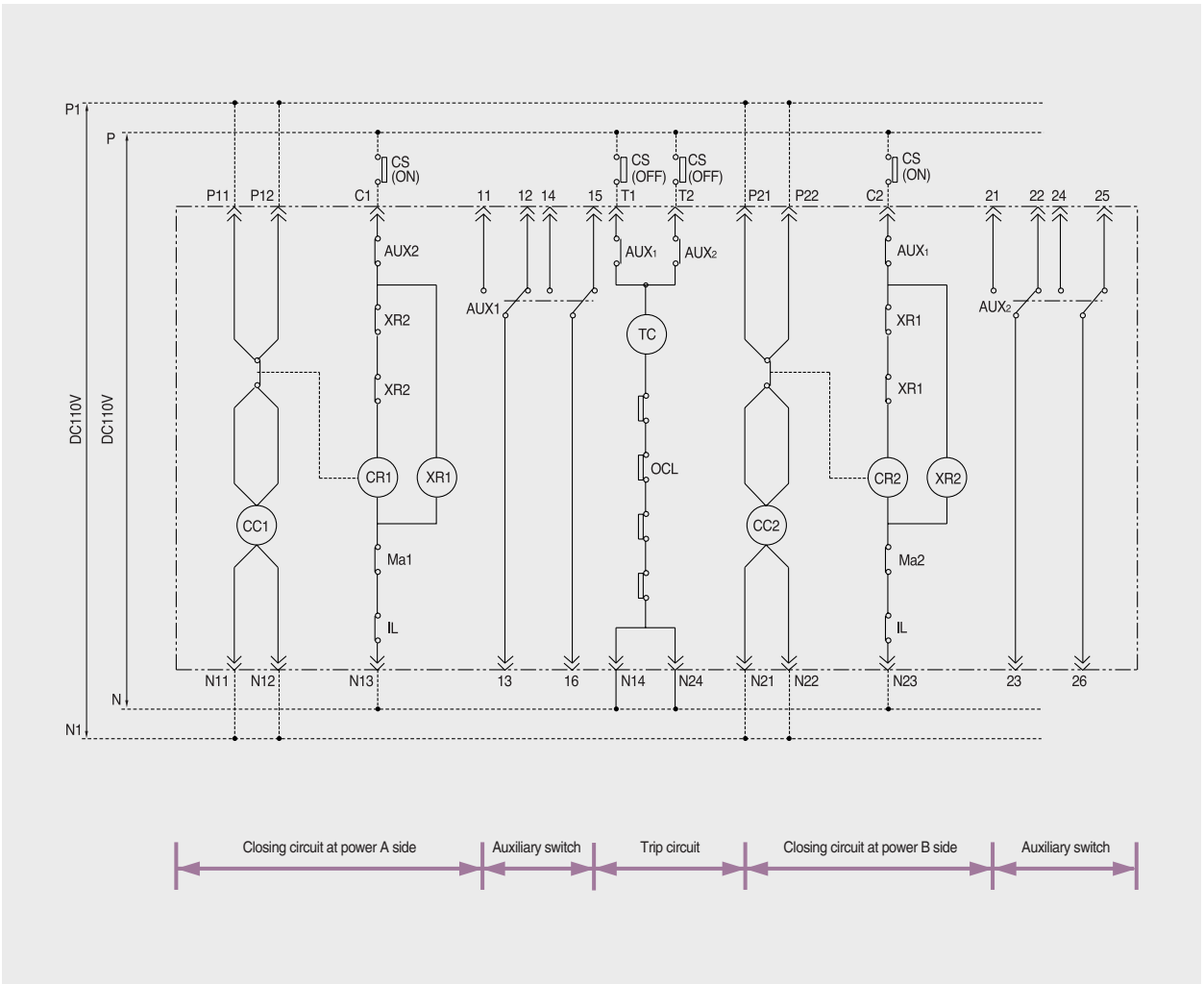
- For the selection of surge absorber (S/A), see our S/A catalog.

Ratings of surge absorber

Type		KMSA-3.6	KMSA-7.2
Rated voltage	kV	3.3	6.6
Applied circuit voltage	kV	3.6	7.2
Operation starting voltage	kV	9~10	18~20
Discharge voltage	kV	≤13	≤26
Nominal discharge current	kA	5	5
Discharge withstand current rating (4×10μs)kA		40	40
Rated frequency	Hz	60	60
Weight	kg	0.41	0.6

... VTS (Vacuum Transfer Switches)

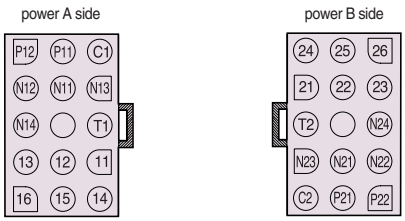
Circuit Diagram



Name.

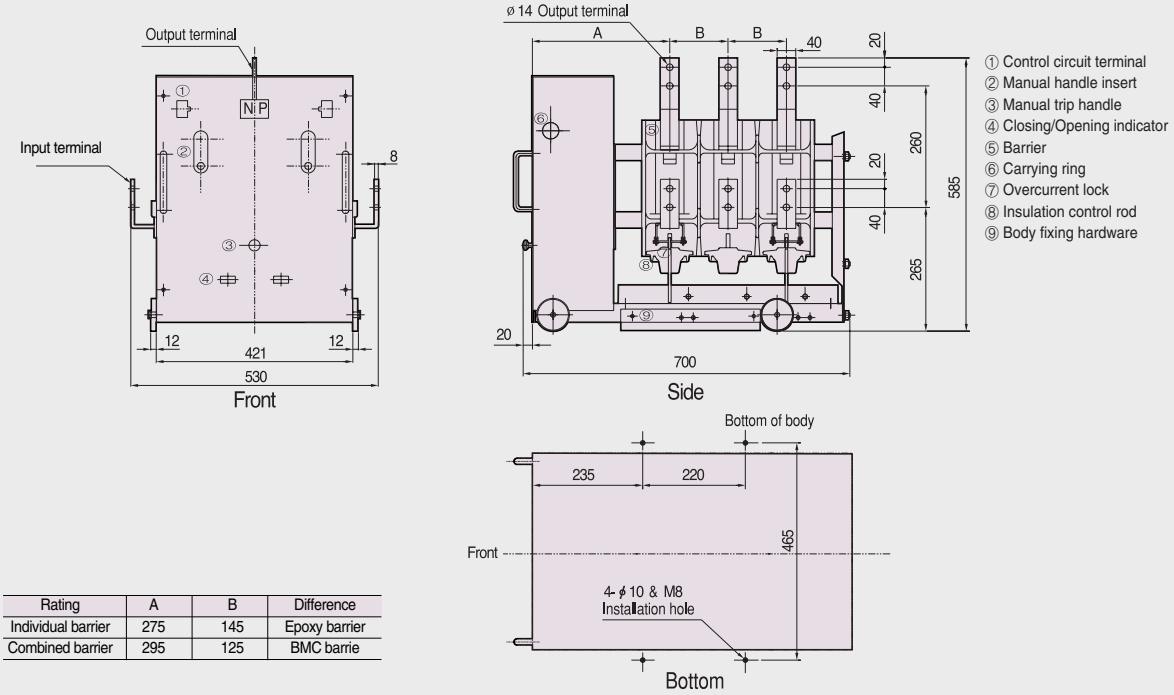
CC: Closing Coil
TC: Trip Coil
AUX: Auxiliary switch
CR: Closing control Relay
XR: Interlock Relay
Ma: Check Switch
IL: Interlock contact (Draw-out type)
OCL: Overcurrent lock contact

* When a transformer for operation is used at the operating power, connect the indicator lamp at AC side.



Outside Drawing

Fixed Type (N)



Rating	A	B	Difference
Individual barrier	275	145	Epoxy barrier
Combined barrier	295	125	BMC barrie

Draw-Out Type (E)