

A6 Automatic Transfer Switches

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Automatic Transfer Switches

100~200A

It is a product that passed a KERI Type Test for the first time in the country.

It provides a stable power and a user-centered safety as well as the reliability and safety based on the quality and intensive technology that are recognized even by UL.

VITZROTECH Auto Transfer Switch is designed and produced by applying a new IT technology and it provides an optimal solution that is suitable in any customer's environment. It is a premium product equipped with a user-friendly protection function in order to satisfy diverse needs of customers and to ensure the safety.

Utility

Its performance was recognized through technology integration and international standard certifications.

- It is a product applied with the accumulated switch design and application technologies, operating machine design technology and insulation design technology.
- It is a product with the largest short circuit capacity internationally and domestically, applied with the international standards IEC60947-3 (Switches) and IEC60947-6 (Transfer Switching Equipment).
- It is an automatic transfer switch equipped with the breaking capacity and its reliability has improved (Obtained a short circuit certificate through KERI Type Test).
- It provides the reliability and safety of the electric equipment based on the stable quality and intensive technology via UL1008 certification.
- It is a unique product equipped with both-way breaking capacity considering the distributed power.

Compact

It is possible to install a 600 mm LV panel board for all types through an optimal reduction of exterior structure

- Standard Type : Reduction of max. 73% /
Economic Type : Reduction of max. 48%
- It can be built inside the movable generator or UPS since it is in a miniature structure.
- It is possible to supply a stable power by composing a separate system.
- All types can be installed horizontally and vertically.



Convenient

It is easy to carry out maintenance and designed in a safe structure.

- It is easy to attach/detach the insulation cover of the front part so that it is easy to identify the structural health of the breaking part and connecting terminal part.
- It is easy to check the switching performance and main contact state through a simple, removable Arc Shute structure.
- The operational part is protected by a steel cover and the structural health of solenoid can be checked by a simple removable.

Internal Accessories

Automatic Transfer Switches 100~3000A

VITZROTECH Auto Transfer Switch provides an optimal solution based on the various operational environments. Based on the experiences of switch field accumulated for a long period of time, it provides a user-centered safety and quality and intensive technology recognized at UL. VITZROTECH ATS is designed and produced by applying IT technology which enables it to provide the optimal solution that is appropriate at any customer's environment.

In addition, we have products that are equipped with various specifications to be applied to various operational environments such as a miniature, enclosed type transfer switch and an uninterruptible transfer switch, ranging from low voltage to medium voltage vacuum transfer switches. We export the products to Americas, Europe and Middle East and their technology and quality were recognized. It is a premium product fully equipped with the user-centered protection function to ensure the best safety ever.





Safety

Each phase is enclosed separately to improve the breaking capacity and safety.

- Each phase is molded and enclosed individually to improve the breaking capacity and to increase the operational cycle of the product.
- The operational cycle is semi-permanent since the arc time generated during the switching is short and contact consumption is small.
- It ensures a steady and stable breaking capacity regardless of the operating voltage through an open operation using a separate breaking spring.

The safety of users has improved.

- It strengthened the main contact protection and breaking capacity using a 4-pole pre-closing and post-breaking structural design.
- The operational cycle of the product is long since it generates little arc due to a superior switching function.

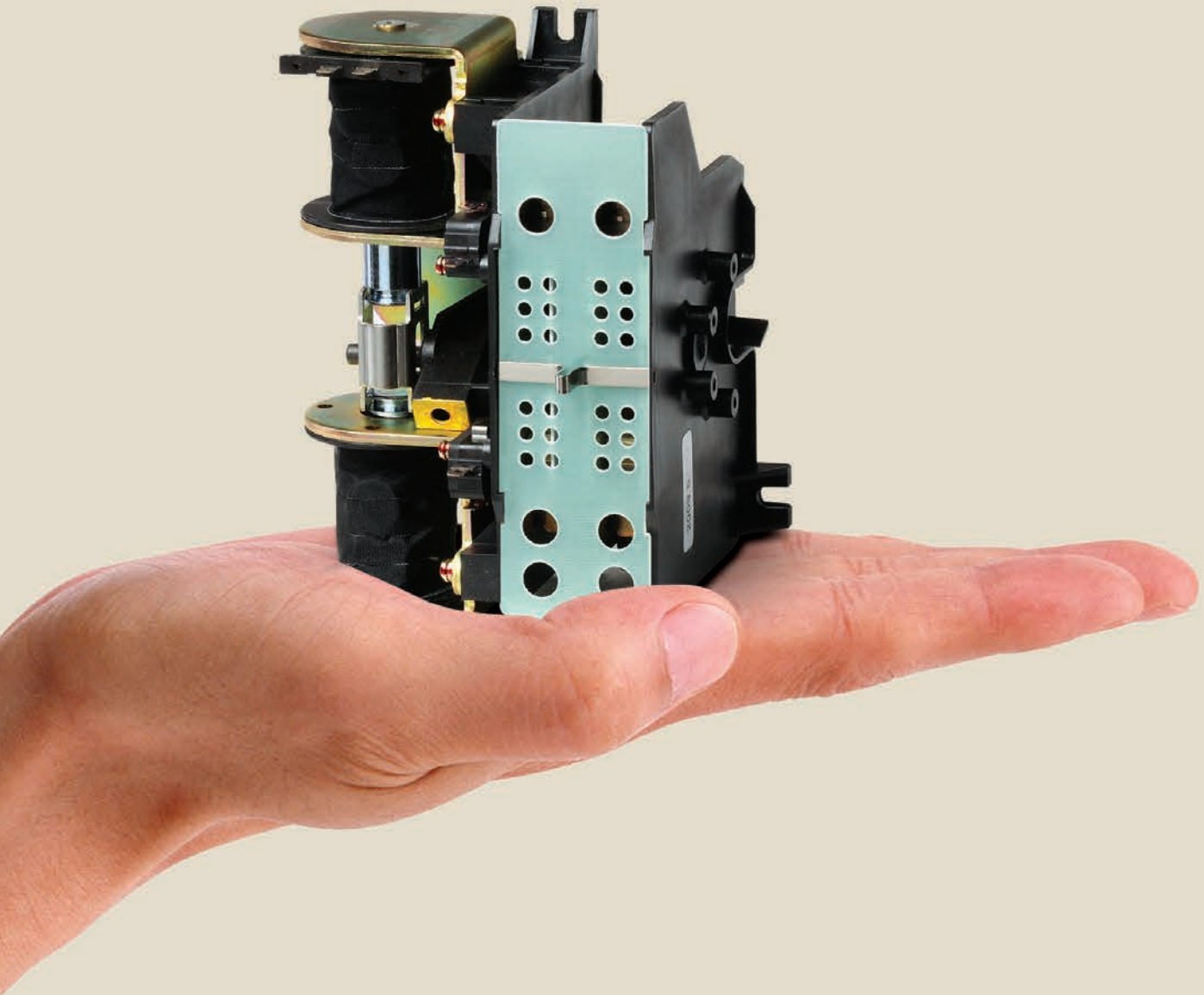
Compact

It seems comfortable due to a compact design for the customers.

- It enhance the user-friendly image by adopting a volumized shape and creates the innovativeness by applying a simple, elegant and advanced product image.
- It stresses the reliability by adopting a streamlined form which is a simple and clean shape.
- The products inside the panel board are arranged neatly by applying a clear color.

Ratings

World-Best ATS Technology achieved by constant researches and continuous technology development – We invite you to the world of premium electric equipment ever, the finest products in the world.



Miniature ATS HS Types

2P 100A 200A



Features

Saving power

It is in an instantaneous excitation mode with little operating current (1.6A in case of AC 220V operation)

Safe Design

The breaking part is molded for a dust-proof so the operational cycle of the contact part is semi-permanent.

2-Coil Mode

It adopted a simple operation mode using 2 coils

Miniature

It can be built inside the portable generator or UPS

Low Cost

It is a miniature type and it is optimal for a single phase with less than 200A (non-inductive)

Applied Standard

IEC 60947-6-1 / UL1008

Type		21HS	22HS	
Rated Current(In)	A	100	200	
Rated Voltage(Ue)	V	AC220	AC220	
Rated Insulation Voltage(Ui)	V	AC300	AC300	
Rated Impulse Voltage(Uimp)	kV	4	4	
Poles	P	2	2	
Throw	T	One Throw	One Throw	
Connection Type	Front	●	●	
	Back	—	—	
Performance				
Short Time Current(1s) I _{cw}	kA	5	10	
Short Circuit Peak Current I _{cm}	kA	5	10	
With Specific Circuit Breaker	kA	14	25	
Fuse Mounting	kA	200	200	
Switch Capacity ^{Note1)}	Class	AC-33B	AC-33B	
Endurance	Electrical	Cycles	5,000	
	Mechanical	Cycles	10,000	
Transfer Sequence		A ↔ B	A ↔ B	
Operation Time	Opening	msec	≤30	
	Switching	msec	≤60	
Conditions of Uninterruptible Transfer				
Switching	AC/DC 110V	A	—	
	AC 220V	A	1,6	
Dimensions & Weights				
	H		165	176
	W		127	151
	D		100	121
Weight	kg		1,1	2,2
Precautions		1) Transfer time is operated at 0,3 sec or less. Make sure a full operation is possible with an operation command of 0,5 sec or more. 2) When A-side and B-side operation command is done simultaneously, it may lead to coil burning. 3) In case of an operation relay, select a sufficient contact capacity that exceeds the operating current.		

* **Note1)** Switching Capacity : AC-33B :
 Overcurrent Switching Performance (Closing 10×I_e, Breaking 10×I_e, Cos∅ = 0.35),
 Rated Load Switching Performance (Closing 1×I_e, Breaking 1×I_e, Cos∅ = 0.8)

Ratings

Standard ATS WN Types

100A ~ 3000A



New model with improved insulated feature and safety

Neutral Point Mode added

A ↔ Neutral(off) ↔ B

Features

Full insulated feature

The breaking part is fully enclosed in a mold structure to completely prevent electrical accidents due to the insulation degradation resulting from an electric shock due to a physical contact or attachment of dust or foreign substances when used for a long time.

Safe Conduction

All phases are designed to have a certain contact pressure which allows them to maintain a safe conducting performance. It is protected by Latch device so the intensity of the over-current is high in case of a short circuit.

Sophisticated Design

Each phase is fully insulated and is in an independent 1-phase structure. According to the convenience of users, the conduction parts of 3-phase and 4-phase can be combined depending on the capacity and the number of phases.

One-coil Mode

It is a Compact Type where closing of commercial power and reserved power is possible with 1 closing coil.

Safe Open Feature

By adopting a unique-structured arc shute, the operational cycle is semi-permanent because the arc breaking time is short and the contact consumption is little. A stable breaking can always be implemented regardless of the operating voltage by applying a trip operation that uses a breaking spring.

Neutral Point Mode

After checking the stability and safety of the circuit, Neutral Point ("OFF" state) is possible due to the trip structure for the transfer mode.

That is, operation by A → off → B, B → off → A as well as A → off → A, B → off → B and instantaneous transfer are possible.

Saving Power

It is in an instantaneous excitation mode with very little power consumption. The contact pressure is protected by Latch device so the intensity of the over-current is high in case of a short circuit. By adopting a unique-structured arc shute, the operational cycle is semi-permanent because the arc breaking time is short and the contact consumption is little

Various Products

There are various products with the rated voltage and current up to 600V, 100-3000A and they are molded in a dust-proof structure. DC load switch is also possible.

Breaking Feature

A stable breaking can always be implemented regardless of the operating voltage by applying a trip operation that uses a breaking spring.

Type		61WN	62WN	64WN							
Rated Current(In)	A	100	200	400							
Rated Voltage(Ue)	V	AC600	AC600	AC600							
Rated Insulation Voltage(Ui)	V	AC800	AC800	AC800							
Rated Impulse Voltage(Uimp)	kV	8	8	8							
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 Current(1s) I _{cw}	kA	5	10	12							
Short Circuit Peak Current I _{cm}	kA	5	10	12							
With Specific Circuit Breaker	kA	14	25	35							
Fuse Mounting	kA	200	200	200							
Switch Capacity ^{Note1)}	Class	AC-33B	AC-33B	AC-33B							
Endurance	Electrical	Cycles	5,000	5,000	5,000						
	Mechanical	Cycles	10,000	10,000	10,000						
Transfer Sequence		A ↔ B, A ↔ Neutral(off) ↔ B									
Operation Time	Closing	msec	≤55	≤55	≤55						
	Trip	msec	≤20	≤20	≤20						
Conditions of Uninterruptible Transfer		2P	3P	4P	2P	3P	4P	2P	3P	4P	
Closing	AC/DC 110V	A	4	4	5	4	4	5	5	5	7,2
	AC 220V	A	2	2	2,5	2	2	2,5	2,5	2,5	3,6
Trip ^{Note2)}	AC/DC 110V	A	1,4			1,4			1,4		
	AC 220V	A	0,7			0,7			0,7		
Dimensions & Weights											
Front Size (mm)		H	192	192	192	192	192	254	254	254	
		W	218	254	290	218	254	290	248	299	350
		D	118	118	118	118	118	118	119	119	119
Back Size (mm)		H	174	174	174	174	174	208	208	208	
		W	218	254	290	218	254	290	248	299	350
		D	144	144	144	144	144	144	164	164	164
Weight	Front	kg	4,5	6	8	4,5	6	8	7,5	9	10,5
	Back	kg	4,5	6	8	4,5	6	8	6	8	10
Additional Product Information											
Circuit diagram			A6-19	A6-19	A6-19						
Time chart			A6-18	A6-18	A6-18						
Drawing			A6-24	A6-24	A6-25						
Precautions			A6-14	A6-14	A6-14						

* Note1) Switching Capacity : AC-33B :

Overcurrent Switching Performance (Closing 10×I_e, Breaking 10×I_e, Cosφ = 0.35),

Rated Load Switching Performance (Closing 1×I_e, Breaking 1×I_e, Cosφ = 0.8

* Note2) Trip : The switch in the circuit is opened to the neutral position (OFF) at Power A or B.

	66WN		68WN		610WN		612WN		616WN		620WN		625WN		630WN	
	600		800		1000		1200		1600		2000		2500		3000	
	AC600		AC600		AC600		AC600		AC600		AC600		AC600		AC600	
	AC800		AC800		AC800		AC800		AC800		AC800		AC800		AC800	
	8		8		8		8		8		8		8		8	
	3, 4		3, 4		3, 4		3, 4		3, 4		3, 4		3, 4		3, 4	
	Double Throw		Double Throw		Double Throw		Double Throw		Double Throw		Double Throw		Double Throw		Double Throw	
	●		●		●		●		●		-		-		-	
	●		●		●		●		●		●		●		●	
	15		22		22		25		32		40		50		50	
	15		22		22		25		32		40		50		50	
	50		50		50		65		65		85		85		85	
	200		200		200		200		200		200		200		200	
	AC-33B		AC-33B		AC-33B		AC-33B		AC-33B		AC-33B		AC-33B		AC-33B	
	5,000		5,000		5,000		5,000		5,000		3,000		3,000		3,000	
	10,000		10,000		10,000		10,000		10,000		5,000		5,000		5,000	
	A ↔ B, A ↔ Neutral(off) ↔ B															
	≤60		≤100		≤100		≤115		≤115		≤140		≤180		≤180	
	≤20		≤30		≤30		≤30		≤30		≤35		≤35		≤35	
	3P	4P	3P	4P	3P	4P	3P	4P	3P	4P	3P	4P	3P	4P	3P	4P
	6,4	9	8	10	8	10	8	10	13	16	13	16	-	-	-	-
	3,2	4,5	4	5	4	5	4	5	4	5	6,5	8	8	9	8	9
	3		3		3		4		4		4		-		-	
	1,5		1,5		1,5		2		2		2		2		2	
	278	278	298	298	298	298	535	535	535	535	-	-	-	-	-	-
	340	400	400	480	400	480	453	536	453	536	-	-	-	-	-	-
	143	143	143	143	143	143	228	228	228	228	-	-	-	-	-	-
	248	248	267	267	267	267	380	380	380	380	380	380	380	380	380	380
	340	400	400	480	400	480	453	536	153	536	528	636	603	736	603	736
	176	176	178	178	178	178	261	261	261	261	261	261	326	326	326	326
	15	18	20	24	21	25	52,5	63,5	58	69	-	-	-	-	-	-
	14	17	19	23	20	24	50	60	55	65	65	85	92,5	119	92,5	119
	A6-19		A6-19		A6-19		A6-19		A6-19		A6-19		A6-19		A6-19	
	A6-18		A6-18		A6-18		A6-18		A6-18		A6-18		A6-18		A6-18	
	A6-26		A6-26		A6-26		A6-27		A6-27		A6-27		A6-28		A6-28	
	A6-14		A6-14		A6-14		A6-14		A6-14		A6-14		A6-14		A6-14	

Ratings

Economic Type ATS W, WP Types

100A ~ 400A



W type Standard Type A ↔ B



WP type Pause Function
Additional Type A ↔ Pause ↔ B

Features

Safe Design

It provides a safe operation by adopting a dust-proof mold structure at the breaking part.

For both AC/DC

The operating circuit can use both AC/DC.

One Coil Instantaneous Excitation Mode

- It is a power saving structure with an instantaneous excitation mode in one coil.
- The voltage of operating coil is both AC110/220V (※ Refer to the instruction).

It is an instantaneous operation type where the operation time cannot be adjusted. But, in case of WP type, a Neutral position is added between A-power source and B-power source which enables it to provide a temporary pause function (pause in OFF state) within 30 seconds that is not connected to both A and B power sources in case of transfer operation.

[Ex] When transferring from A-power to B-power

- ① A Opening →
- ② Pause for 3-30 seconds →
- ③ B Closing

This function is to prevent a short-circuit of load part and power source part by transferring to the other power after a residual voltage is extinct if the existing load is the same as the motor load that generates much residual voltage.

If a pause of more than 30 seconds or OFF status should be maintained, use a standard WN type.

Type		61W	62W		
Rated Current(In)	A	100	200		
Rated Voltage(Ue)	V	AC600	AC600		
Rated Insulation Voltage(Ui)	V	AC800	AC800		
Rated Impulse Voltage(Uimp)	kV	8	8		
Pole	P	3, 4	3, 4		
Throw	T	One Throw	One Throw		
Connection Type	Front	●	●		
	Back	—	—		
Performance					
Short Time Current(1s) I _{cw}	kA	5	10		
Short Circuit Peak Current I _{cm}	kA	5	10		
With Specific Circuit Breaker	kA	14	25		
Fuse Mounting	kA	200	200		
Switch Capacity ^{Note1)}	Class	AC-33B	AC-33B		
Endurance	Electrical	Cycles	5,000	5,000	
	Mechanical	Cycles	10,000	10,000	
Transfer Sequence			A ↔ B	A ↔ B	
Operation Time	Opening	msec	≤30	≤30	
	Switching	msec	≤60	≤60	
	Off	sec	—	—	
Conditions of Uninterruptible Transfer			3P	4P	3P
Switching	AC/DC 110V	A	—	—	—
	AC 220V	A	10	10	10
Dimensions & Weights					
Front Size (mm)		H	171	171	171
		W	219	219	219
		D	110	110	110
Back Size (mm)		H	—	—	—
		W	—	—	—
		D	—	—	—
Weight	Front	kg	2,5	3	3,5
	Back	kg	—	—	—
Additional Product Information					
Circuit diagram			A6-21	A6-21	
Time chart			A6-18	A6-18	
Drawing			A6-31	A6-31	
Precautions			A6-16	A6-16	

* Note1) Switching Capacity : AC-33B :

Overcurrent Switching Performance (Closing 10×I_e, Breaking 10×I_e, Cosθ = 0.35),
Rated Load Switching Performance (Closing 1×I_e, Breaking 1×I_e, Cosθ = 0.8)

	64W			61WP			62WP			64WP		
	400			100			200			400		
	AC600			AC600			AC600			AC600		
	AC800			AC800			AC800			AC800		
	8			8			8			8		
	2, 3, 4			2, 3, 4			2, 3, 4			2, 3, 4		
	Double Throw			Double Throw			Double Throw			Double Throw		
	●			●			●			●		
	●			-			-			-		
	12			5			10			12		
	12			5			10			12		
	35			14			25			35		
	200			200			200			200		
	AC-33B			AC-33B			AC-33B			AC-33B		
	5,000			50,000			5,000			5,000		
	10,000			10,000			10,000			10,000		
	A ↔ B			A ↔ Pause ↔ B			A ↔ Pause ↔ B			A ↔ Pause ↔ B		
	≤60			≤30			≤30			≤60		
	≤200			≤200			≤200			≤200		
	-			3~30			3~30			3~30		
	2P	3P	4P	2P	3P	4P	2P	3P	4P	2P	3P	4P
	7.5	7.5	11	5.4	5.4	7.5	7.5	7.5	11	11	11	12.8
	3.8	3.8	5.5	2.7	2.7	3.8	3.8	3.8	5.5	5.5	5.5	6.4
	254	254	254	191	191	191	252	252	252	254	254	254
	248	299	350	214	244	274	244	289	334	246	287	348
	119	119	119	112	112	112	112	112	112	119	119	119
	208	208	208	-	-	-	-	-	-	-	-	-
	236	287	338	-	-	-	-	-	-	-	-	-
	164	164	164	-	-	-	-	-	-	-	-	-
	7.5	9	10.5	4.5	6	8	6	8	10	11	14	18
	6	8	10	-	-	-	-	-	-	-	-	-
	A6-21			A6-20								
	A6-18			A6-18								
	A6-31			A6-33								
	A6-16			A6-16								

Ratings

Uninterruptible Transfer Types ATS CTTS

100A ~ 3000A

It is a Closed Transition Transfer Switch that automatically transfers without interruption to the control direction within 0.1 second (100ms) by detecting the voltage difference between both powers and frequency difference and checking the synchronizing condition after a simultaneous closing of commercial (A) power and emergency (B) power.



WP type Pause Function
A ↔ Synchronizing ↔ B

Features

Main Plant

Lightning may generate voltage drop for the commercial power or power failure and for the load that requires a long-time recovery, it can be transferred to the emergency power in advance without interruption and back to the commercial power without interruption.

*In case of an uninterruptible transfer,

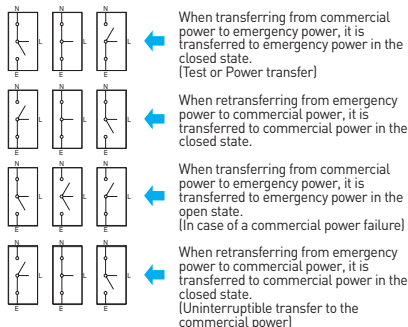
- ① Power failure notified by KEPCO
- ② When the power is recovered and transferred to power plant
- ③ When an instantaneous power failure is expected due to the weather
- ④ When testing a generator or equipment

Uninterruptible transfer is possible when performing the planned maintenance or repairing such as the regular inspection of electrical equipment installed at banks and stations.

UPS Power Transfer Equipment

By examining the phase of both UPS powers, if they are within the standard value, an uninterruptible transfer is possible.

Explanation on Transfer Operation



Type		61CT	62CT					
Rated Current(In)	A	100	200					
Rated Voltage(Ue)	V	AC600	AC600					
Rated Insulation Voltage(Ui)	V	AC800	AC800					
Rated Impulse Voltage(Uimp)	kV	8	8					
Pole	P	2, 3, 4	2, 3, 4					
Throw	T	Double Throw	Double Throw					
Connection Type	Front	●	●					
	Back	—	—					
Performance								
Short Time Current(1s) I _{cw}	kA	5	10					
Short Circuit Peak Current I _{cm}	kA	5	10					
With Specific Circuit Breaker	kA	14	25					
Fuse Mounting	kA	200	200					
Switch Capacity ^{Note1)}	Class	AC-33B	AC-33B					
Endurance	Electrical	Cycles	5,000	5,000				
	Mechanical	Cycles	10,000	10,000				
Transfer Sequence	A ↔ Overlapping (overlapping) ↔ B, A ↔ B, A ↔ Neutral(off) ↔ B							
Conditions for Uninterrupted Switchover	Phase difference : Within electrical angle 10°, Frequency difference : Within 0.2Hz, Voltage : Voltage difference with the commercial one is within 5%, Instantaneous Interconnection Time : Within 0.05 second							
Operation Time	Closing	msec	≤55	≤55				
	Trip	msec	≤20	≤20				
Conditions of Uninterruptible Transfer		2P	3P	4P	2P	3P	4P	
Closing	AC/DC 110V	A	4	4	5	5	7	
	AC 220V	A	2	2	2.5	2.5	3.6	
Trip ^{Note2)}	AC/DC 110V	A	1.4			1.4		
	AC 220V	A	0.7			0.7		
Dimensions & Weights								
Front Size (mm)		H	268	268	268	283	283	283
		W	211	241	271	241	286	331
		D	112	112	112	112	112	132
Back Size (mm)		H	—	—	—	—	—	—
		W	—	—	—	—	—	—
		D	—	—	—	—	—	—
Weight	Front	kg	6,5	8	10	8	10	12
	Back	kg	—	—	—	—	—	—
Additional Product Information								
Circuit Diagram	A6-24			A6-24				
Drawing	A6-40~42			A6-40~42				
Precautions	A6-18			A6-18				

* Note1) Switching Capacity : AC-33B :
Overcurrent Switching Performance (Closing 10×I_e, Breaking 10×I_e, Cosθ = 0.35),
Rated Load Switching Performance (Closing 1×I_e, Breaking 1×I_e, Cosθ = 0.8)

* Note2) Trip : The switch in the circuit is opened to the neutral position (OFF) at Power A or B.

* Note3) 416CT/425CT Test Report held

	64CT			66CT		610CT		616CT 416CT ^{Note3)}		620CT		425CT ^{Note3)}		630CT	
	400			600		800, 1000		1200, 1600		2000		2500		2500, 3000	
	AC600			AC600		AC600		AC600 AC415V		AC600		AC415		AC600	
	AC800			AC800		AC800		AC800 AC600V		AC800		AC600		AC800	
	8			8		8		8 6		8		6		8	
	2, 3, 4			3, 4		3, 4		3, 4		3, 4		3, 4		3, 4	
	Double Throw			Double Throw		Double Throw		Double Throw		Double Throw		Double Throw		Double Throw	
	●			●		●		●		-		-		-	
	-			-		-		●		●		●		●	
	12			15		25		32		40		50		50	
	12			15		25		32		40		50		50	
	35			50		50		65		85		85		85	
	200			200		200		200		200		200		200	
	AC-33B			AC-33B		AC-33B		AC-33B		AC-33B		AC-33B		AC-33B	
	5,000			5,000		5,000		5,000		3,000		3,000		3,000	
	10,000			10,000		10,000		10,000		5,000		5,000			
	A ↔ Overlapping(overlapping) ↔ B , A ↔ B, A ↔ Neutral(off) ↔ B														
	Phase difference : Within electrical angle 10°, Frequency difference : Within 0.2Hz, Voltage : Voltage difference with the commercial one is within 5%, Instantaneous Interconnection Time : Within 0,05 second														
	≤60			≤100		≤115		≤150		≤250		≤250		≤250	
	≤25			≤30		≤30		≤60		≤80		≤80		≤80	
	2P	3P	4P	3P	4P	3P	4P	3P	4P	3P	4P	3P	4P	3P	4P
	6,4	6,4	9	7	8	8	10	10	13	-	-	-	-	-	-
	3,2	3,2	4,5	3,5	4	4	5	5	6,5	6,5	8	8	9	8	9
	2			2		2		2		-		-		-	
	1			1		1		1		2		2		2	
	307	307	307	545	545	609	609	645	645	-	-	-	-	-	-
	293	353	413	465	530	510	590	570	670	-	-	-	-	-	-
	132	132	220	220	220	220		220	220	-	-	-	-	-	-
	-	-	-	-	-	-	-	478	478	580	580	580	580	580	580
	-	-	-	-	-	-	-	570	670	683	818	833	1018	833	1018
	-	-	-	-	-	-	-	300	300	329	329	364	364	364	364
	14	17	21	53	61	66	76	72	84	-	-	-	-	-	-
	-	-	-	-	-	-	-	72	84	130	150	165	205	165	205
	A6-24			A6-24						A6-24					
	A6-40~42			A6-40~42						A6-40~42					
	A6-18			A6-18						A6-18					

Applied Standards

Low Voltage Auto Transfer Switch ... ATS, CTTS

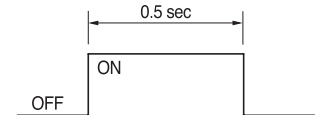
Consideration points when applying and selecting

Relevant Standards

- UL 1008
- IEC 60947-6-1

Control Command

Closing and trip transfer operation is completed within 0.3 second but set Sequence so that it can be operated with a control command of 0.5sec or more.



Interlock

Install an interlock (electrical) so that A power source and B power source are not commanded simultaneously at the operating circuit.

In case of WN Type, set a Sequence so that closing command and trip command are not in the same direction.

TR Capacity for Operating Circuit

The TR capacity of operating circuit should be calculated as shown below and use the capacity that exceeds the calculated value.

Operating Voltage \times Operating Current \times 0.5 = (JVA

- ex) Operating Voltage AC220V Operating Current 4A
 $220 \times 4 \times 0.5 = 440\text{VA}$
 Use TR with 440VA or above.

Control Circuit

ATS is designed to turn OFF the operating current using an internal SW after the operation is completed. When the operating current is turned OFF by an auxiliary SW of body, it may lead to malfunctioning.

Selection of Control Relay

Use the selected voltage Relay 27, 84 and Timer with contact conducting current that exceeds the ATS operating current.

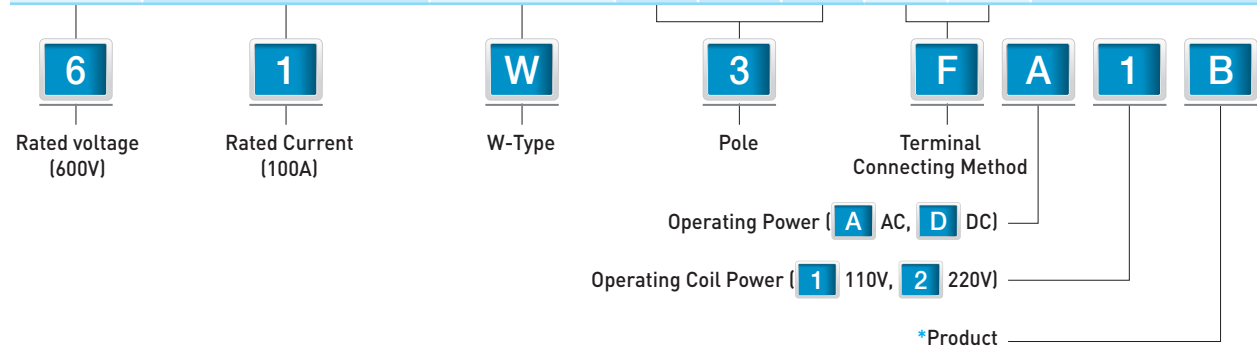
Considering the chattering of control relay, select a relay that can interrupt the operating current which is safer.

* When the operating power is unstable, use a voltage fixed relay.



Type & Marking Method

Type			Poles			Connection Method		Overview
Voltage	Current	Type	2	3	4	Front	Back	
			F	B				
2 AC250V	1 100A	HS	○	-	-	○	-	Miniature Type
	2 200A							
6 AC600V	1 100A	W	○	○	○	○	-	Economic Type
	2 200A		○	○	○	○	-	
	4 400A		○	○	○	○	○	
6 AC600V	1 100A	WP	○	○	○	○	-	
	2 200A		○	○	○	○	-	
	4 400A		○	○	○	○	-	
6 AC600V	1 100A	WN	○	○	○	○	○	Standard Type
	2 200A		○	○	○	○	○	
	4 400A		○	○	○	○	○	
	6 600A		-	○	○	○	○	
	10 800/1000A		-	○	○	○	○	
	16 1200/1600A		-	○	○	○	○	
	20 2000A		-	○	○	○	-	
30 3000A	-	○	○	○	-	○		
6 AC600V	1 100A	CT	○	○	○	○	-	CTTS
	2 200A		○	○	○	○	-	
	4 400A		○	○	○	○	-	
	6 600A		-	○	○	○	-	
	10 800/1000A		-	○	○	○	-	
	16 1200/1600A		-	○	○	○	○	
	20 2000A		-	○	○	○	-	
30 3000A	-	○	○	○	-	○		



*The product classification marking can be modified without prior notice while improving the specifications.

Applied Standards

Low Voltage Auto Transfer Switch ATS, CTTS

Installation Location

Avoid high-temperature and highly humid places and places with poisonous gas.

Installation Direction

ATS is designed to use it by installing it in a certain direction. When the installation direction is changed, the feature will be changed. So, install it accurately.

ATS should be installed so that the body rating plate can be read properly when facing the front and it should be installed without any twist, vertical to the panel.

* If a normal installation is not possible due to problems on wiring or equipment arrangement, consult with our company.

Operating Power

In case of DC operation and if a dropper circuit is included in the operating power, the operating power of ATS must be connected to the input part of dropper circuit.

Control Circuit Connection

Use a control power and control line with extra length.

In case of DC operation, be cautious of battery shortage and charging shortage.

Main Circuit Connection

Firmly connect it by selecting wire size and solderless terminal that meets the current capacity.

Be careful not to add an excessive stress to the main circuit terminal.

Especially, when connecting using a Busbar, be careful not to add an excessive stress to the main circuit terminal.

Precautions when Operating Handle

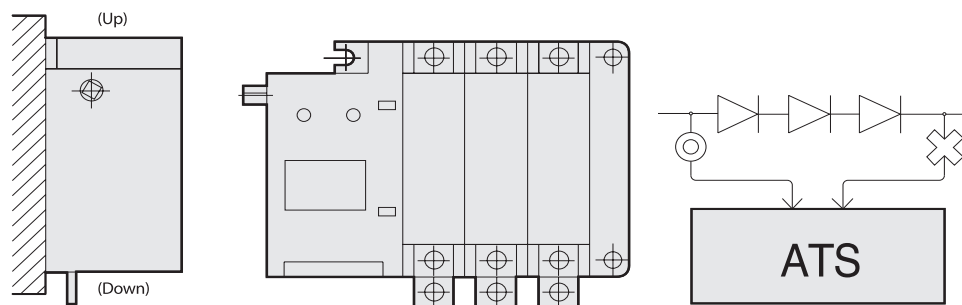
Manual operation of ATS should be carried out only when a detailed inspection of operating part and charging part is performed at no-load status.

There may be some differences in switch force, switch speed and so on based on the manual operation of the operator, so ATS features cannot be guaranteed.

Maintenance & Inspection

Conduct maintenance and inspection at regular cycle in order to maintain the performance of ATS steadily and well.

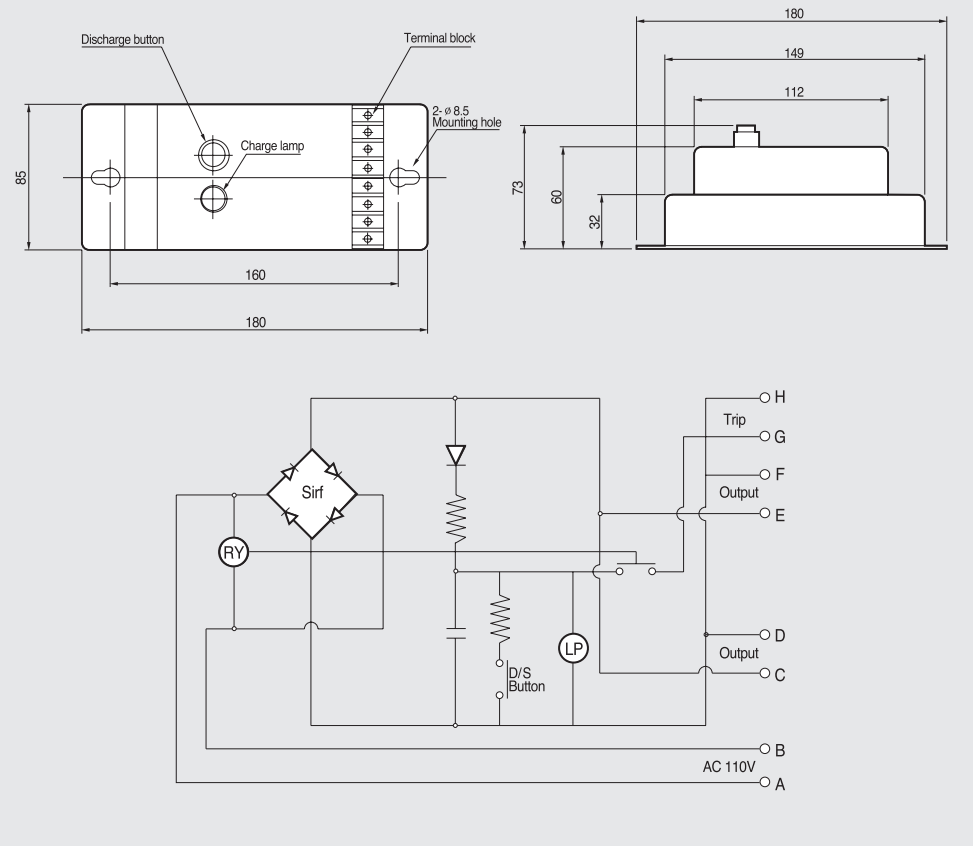
* Refer to the maintenance and inspection items presented in the instruction manual for the detailed information.



**Low Voltage Auto Transfer Switch
ATS, CTTS**

Option

Capacitor Trip Device



When using as CTD

When G, H terminals are connected to Trip Circuit during a power failure, it immediately trips. If tripping is required at an optional time, it can be used by adding S/W. (Normal operation is possible within 30 seconds)

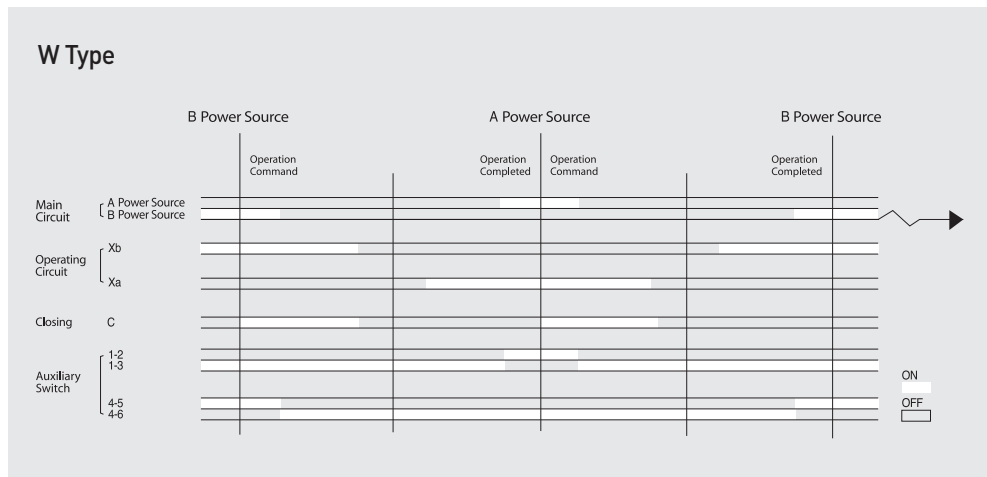
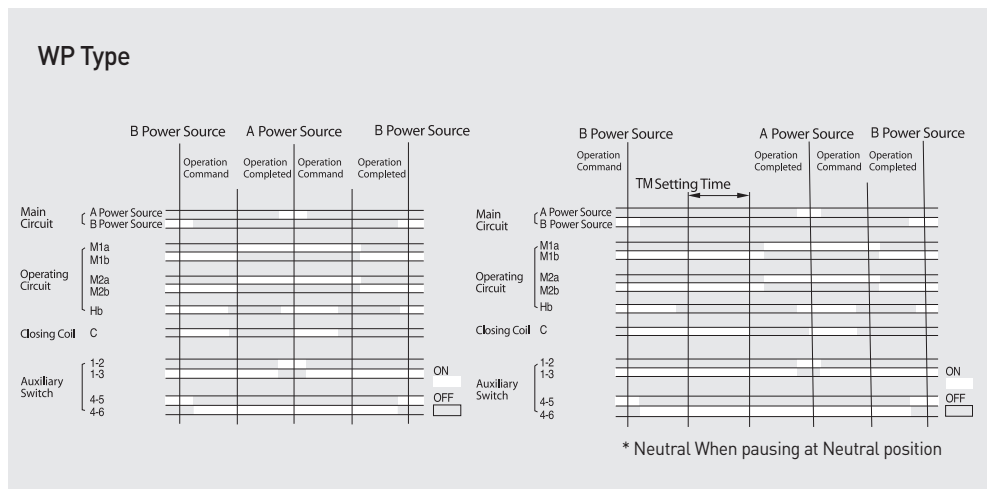
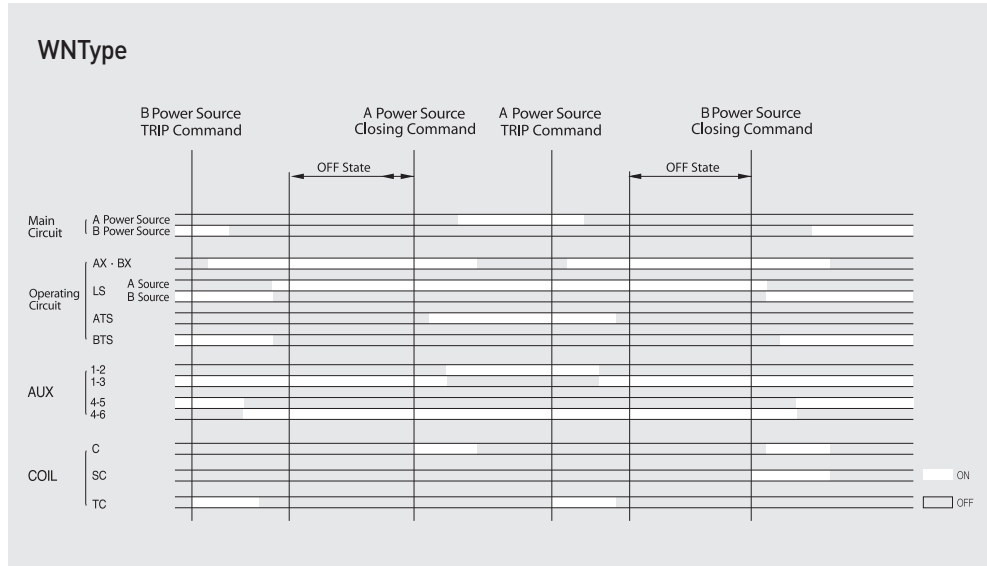
When using as Rectifier

C, D and E, F output terminals can be used as DC power. (Close, Open, Motor OCR Power and etc)

Contact Time Charts & Circuit Diagrams

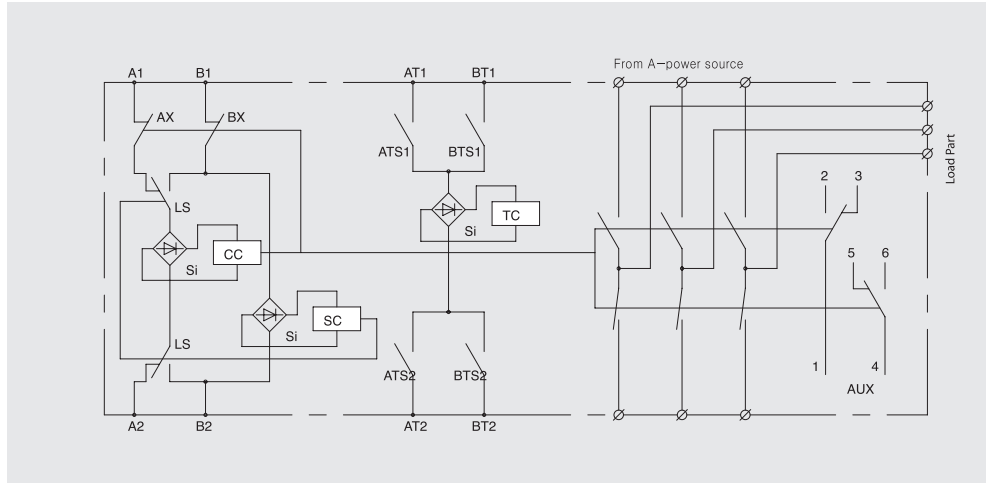
Low Voltage Auto Transfer Switch ATS, CTTS

Contact Time Charts

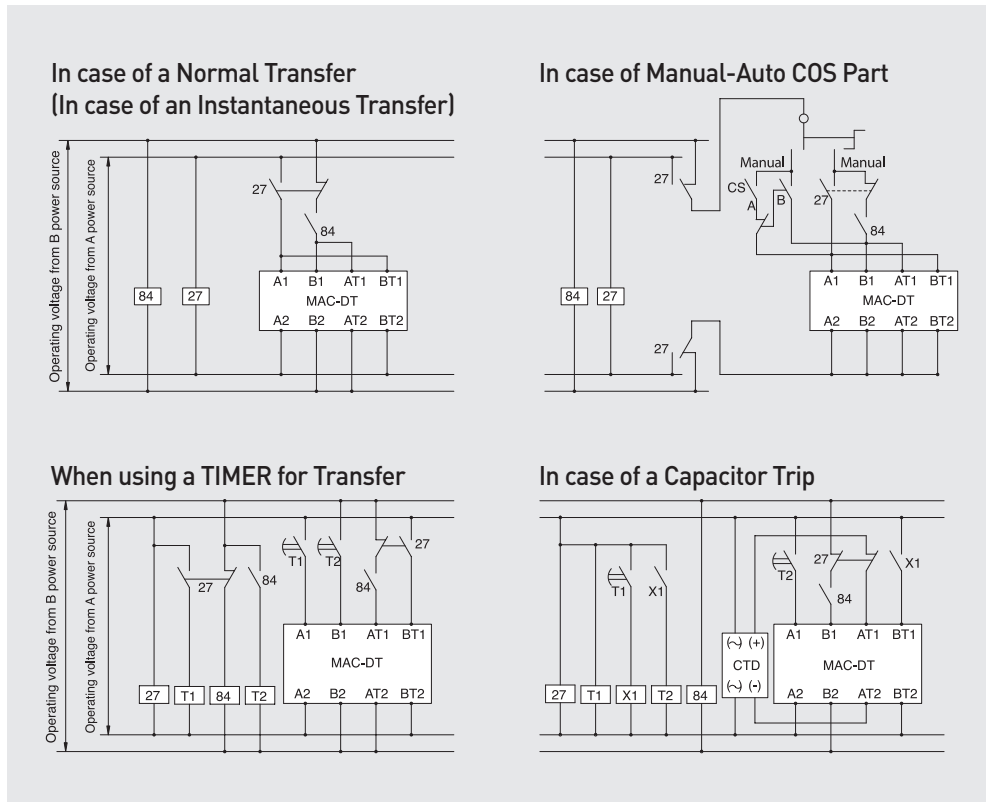


Low Voltage Auto Transfer Switch
ATS, CTTS

WN Type Internal Circuit



WN Type Operating Circuits



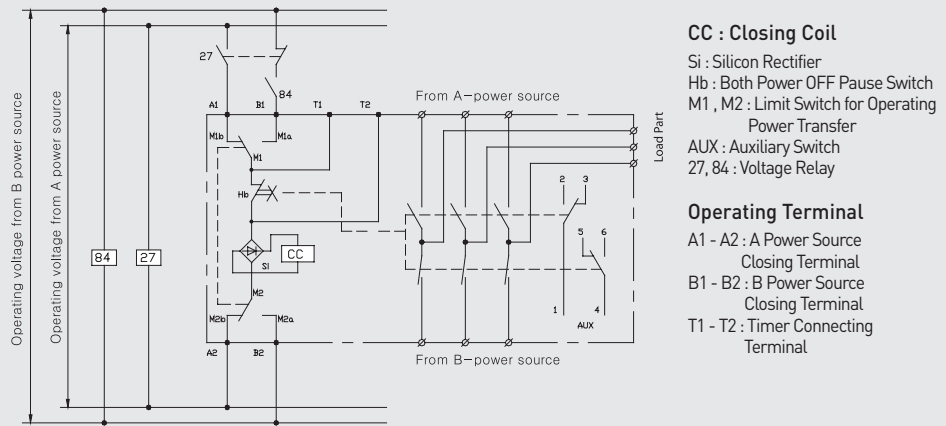
Circuit Diagrams

Low Voltage Automatic Transfer Switch ATS, CTTS

WP Type

Internal Circuit

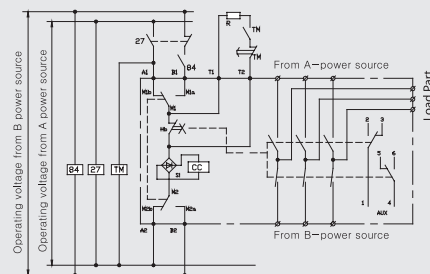
Control Circuit in case of a pause at neutral point



Operating Circuit 1

Pausing at Neutral Point when transferring B → A

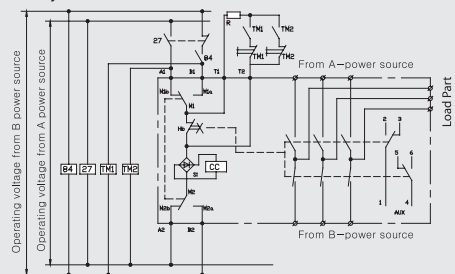
TM : Timer
 R : Limited Resistance
 27, 84 : Voltage Relay



Operating Circuit 2

Pausing at Neutral Point when transferring from both ways, A → B, B → A

TM1, TM2 : Timer
 R : Limited Resistance
 27, 84 : Voltage Relay



Precautions

- To pause at a neutral position, connect a Timer and limited resistance to T1, T2 terminals.
 * Prepare a separate Timer and limited resistance.
- If the pause time is less than 3 seconds at the neutral position, the limited resistance should not be installed.
- The operating voltage to use when pausing at the neutral position should be AC 110, AC 220V.

Limited Resistance

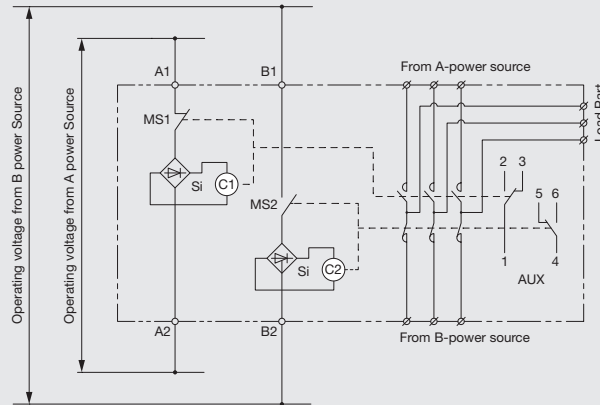
Type	61WP ~ 62WP		64WP	
Operating Voltage	AC110V	AC110V	AC110V	AC220V
Timer Used	Select a Timer that can interrupt the operating current.			
Timer Adjusting Time	3sec ~ 30sec			
Limited Resistance	Rated Power	200W	200W	200W
	Resistance	50Ω	50Ω	50Ω

- When operating continuously, it should be within 5 times. When operating continuously for more than 5 times, it may malfunction due to overheating of coil or coil may be burned. Be cautious.
- When it is required to pause for more than 30 seconds (Both power OFF), use WN-Type of our company.

W Types

100~200A

Control Circuit Diagram

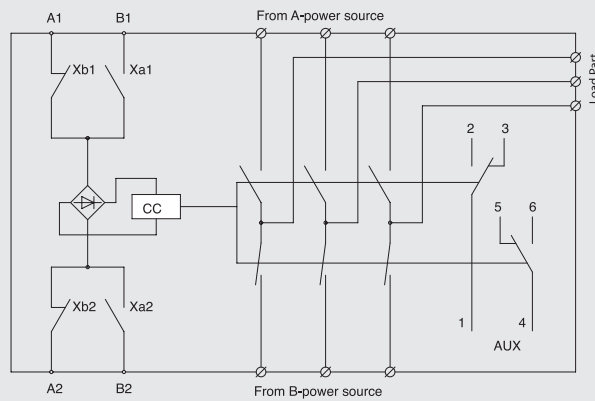


C1, C2 : Closing Coil
 Si : Silicon Rectifier
 MS1, MS2 : Manipulation for Power Source Limit Switch
 AUX : Auxiliary Switch

Operating Terminal
 A1 - A2 : A-Power Source Closing Terminal
 B1 - B2 : B-Power Source Closing Terminal

400A

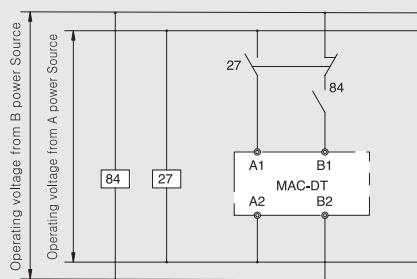
Internal Circuit



Xa1 - Xa2, Xb1 - Xb2 : Control Switch
 CC : Closing Coil
 Si : Silicon Rectifier

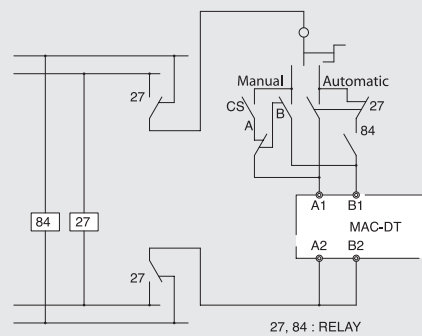
Operating Terminal
 A1 - A2 : A-Power Source Closing Terminal
 B1 - B2 : B-Power Source Closing Terminal

Operating Circuit 1



In case of a Normal Transfer
 (In case of an Instantaneous Transfer)
 * 27, 84 : Voltage Relay

Operating Circuit 2



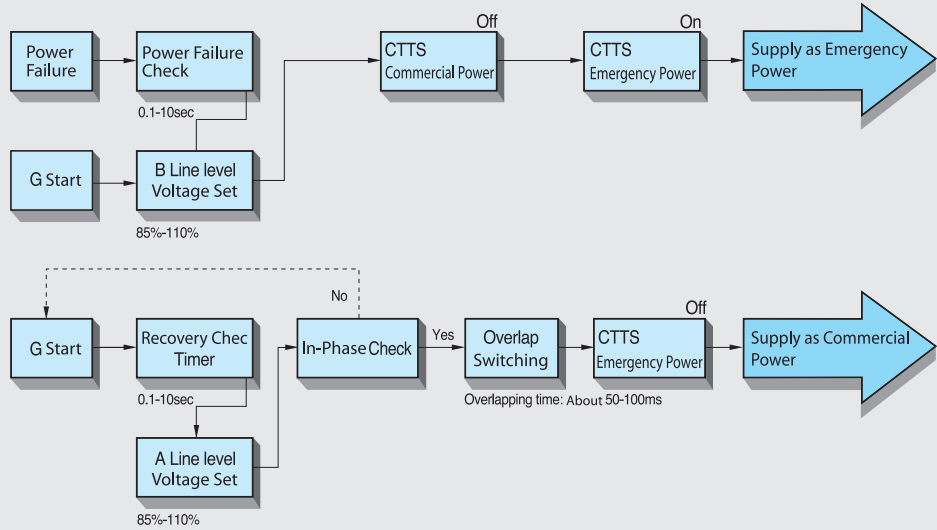
In case of Manual-Auto COS Part
 * 27, 84 : Voltage Relay

Circuit Diagrams

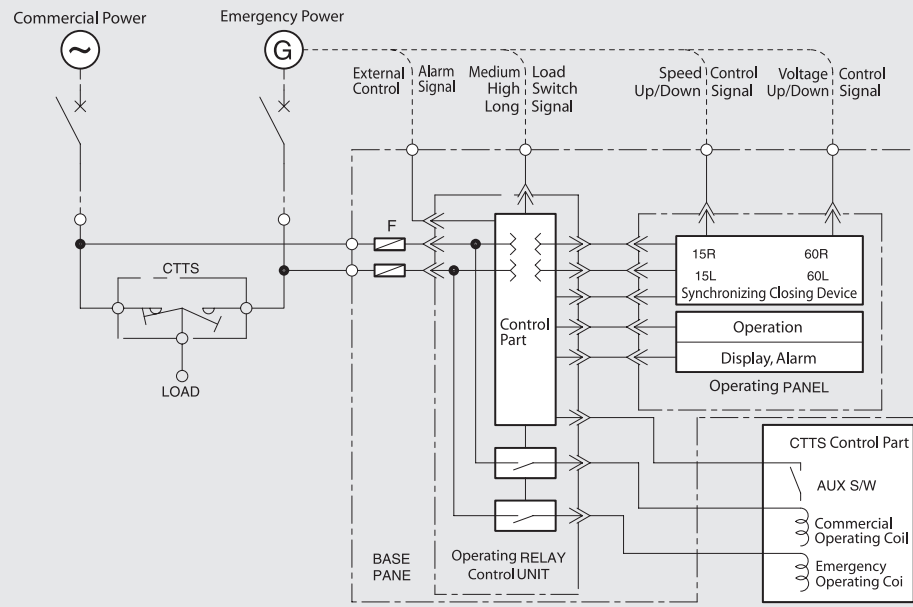
Low Voltage Automatic Transfer Switch ATS, CTTS

CTTS

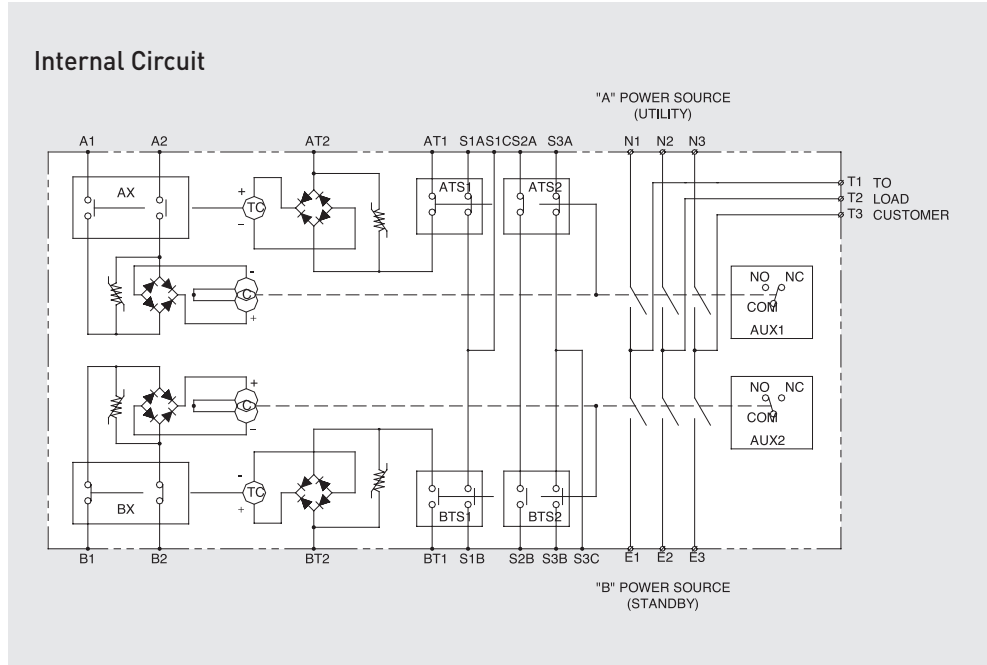
Operational Flow Chart



Operating Circuit



Low Voltage Automatic Transfer Switch ATs, CTTS



A1, A2	"A" Power source side(On)
AT1, AT2	"A" Power source side(Trip)
ATS1, ATS2	Switch, Position contacts
BTS1, BTS2	Switch, Position contacts
AUX1, 2	Switch, Auxiliary
AX, BX	Switch, Control
B1, B2	"B" Power source side(On)
BT1, BT2	"B" Power source side(Trip)
C	Coil, Closing
COM	Common
CTTS	Closed transition transfer switch
E1, E2, E3	Standby power source conn.
NO	Normally open
NC	Normally closed
N1, N2, N3	Utility power source
S1A, S1B, S1C	Switch, Position sensing
S2A, S2B	
S3A, S3B, S3C	
TC	Coil, Trip
T1, T2, T3	Customer load conn.

All contacts of switch shown in
Utility : Closed
Standby : Open

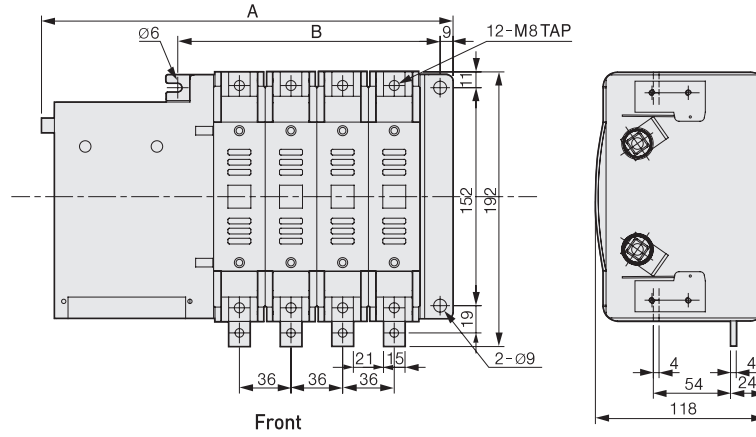
× : Closed ○ : Open

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	×	×	○

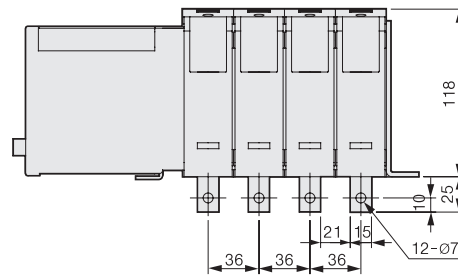
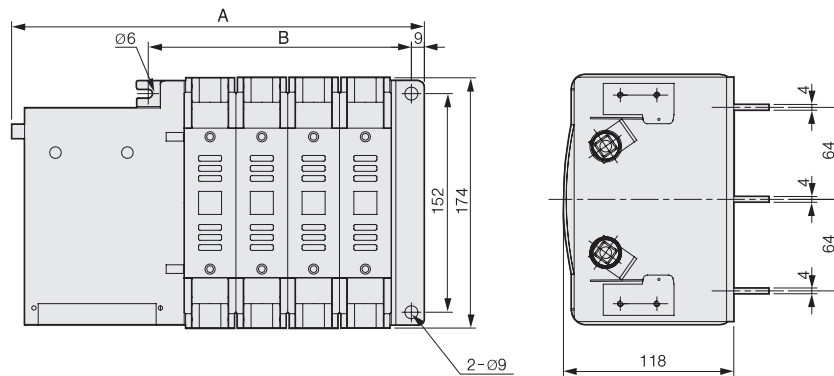
External Sizes

Low Voltage
Automatic
Transfer Switch
ATS, CTTS

WN Types 61WN~62WN



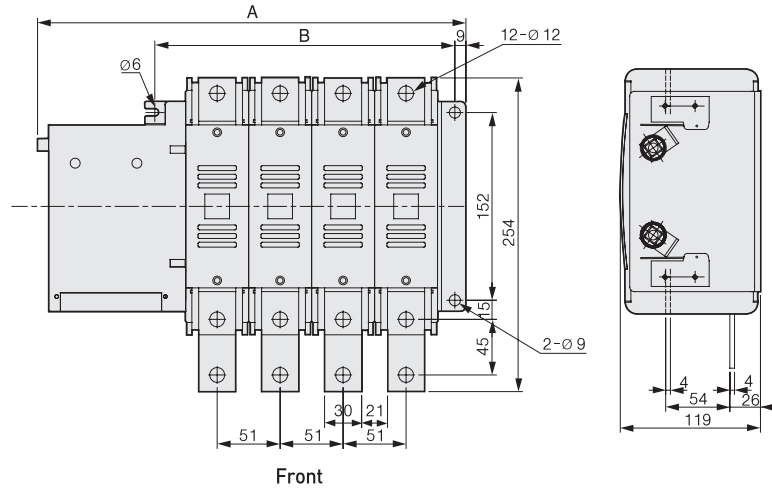
Type	A	B
2P	215	111
3P	251	147
4P	287	183



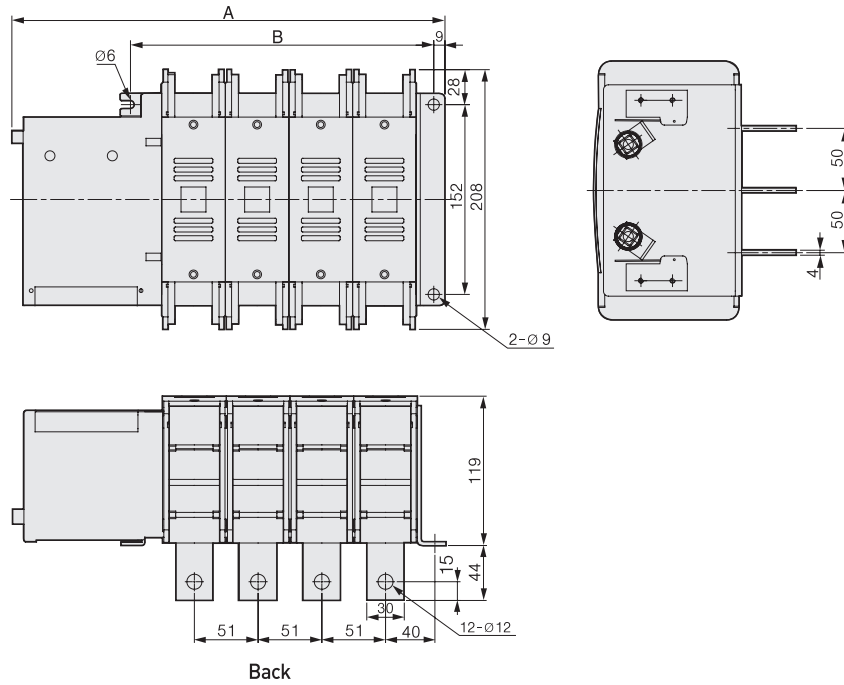
Type	A	B
2P	215	111
3P	251	147
4P	287	183

Low Voltage
Automatic
Transfer Switch
ATS, CTTS

WN Type 64WN



Type	A	B
2P	245	141
3P	296	192
4P	347	243

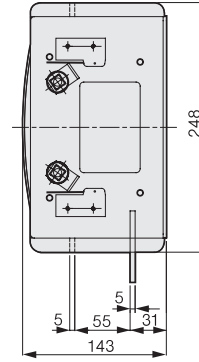
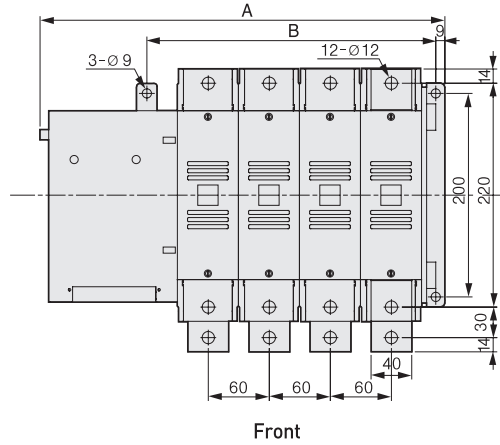


Type	A	B
2P	245	141
3P	296	192
4P	347	243

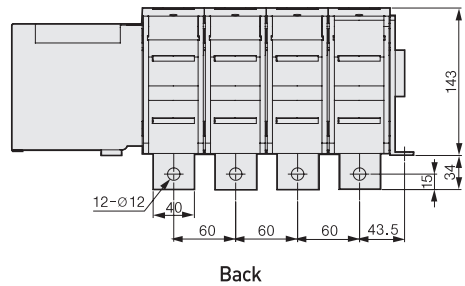
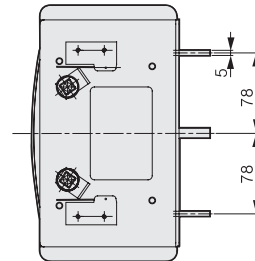
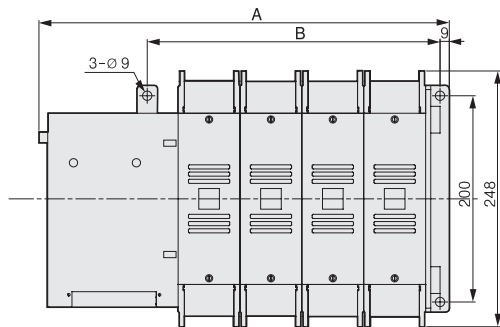
External Sizes

Low Voltage
Automatic
Transfer Switch
ATS, CTTS

WN Type 66WN



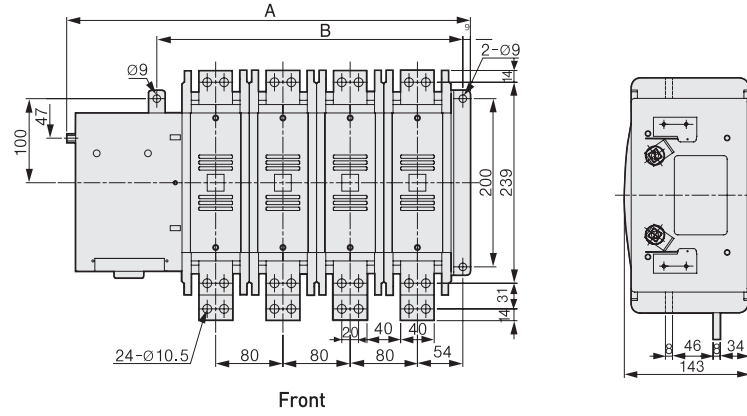
Type	A	B
3P	340	224
4P	400	284



Type	A	B
3P	340	224
4P	400	284

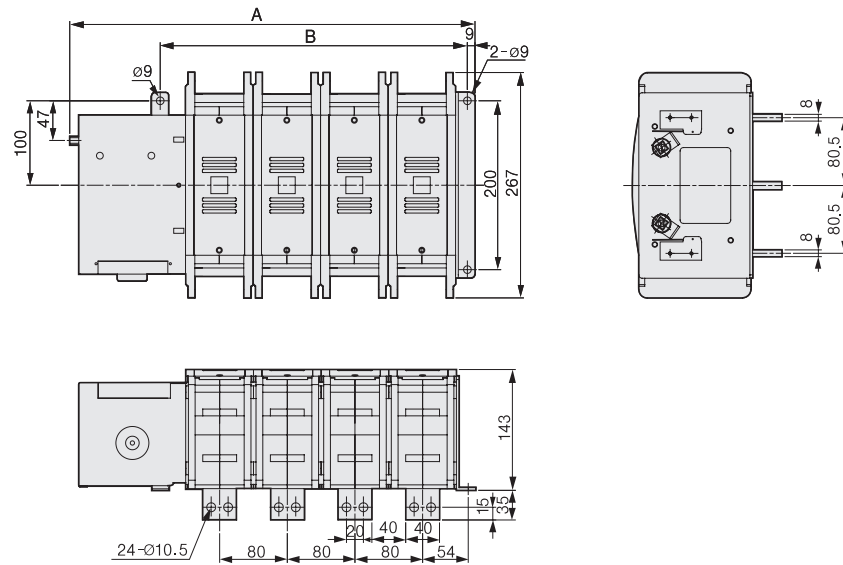
Low Voltage Automatic Transfer Switch ATS, CTTS

WN Type 68WN



Front

Type	A	B
3P	400	284
4P	480	364



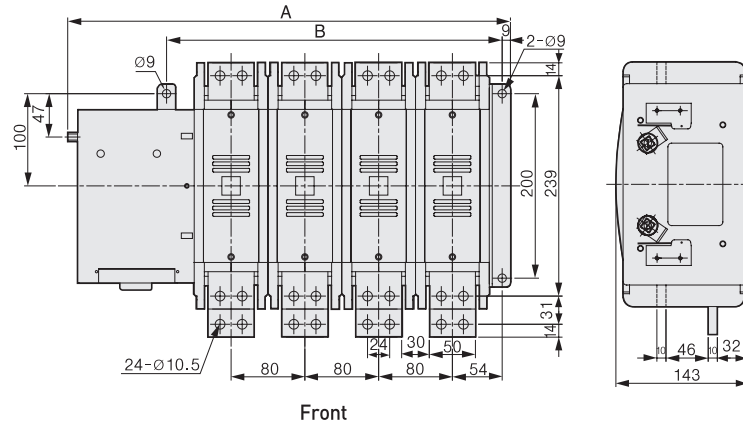
Back

Type	A	B
3P	400	284
4P	480	364

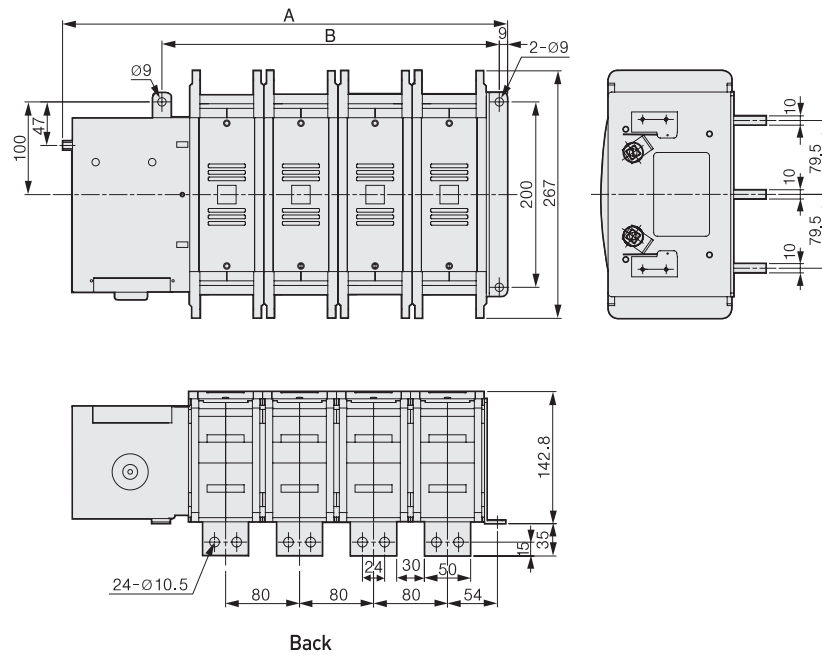
External Sizes

Low Voltage
Automatic
Transfer Switch
ATS, CTTS

WN Type 610WN



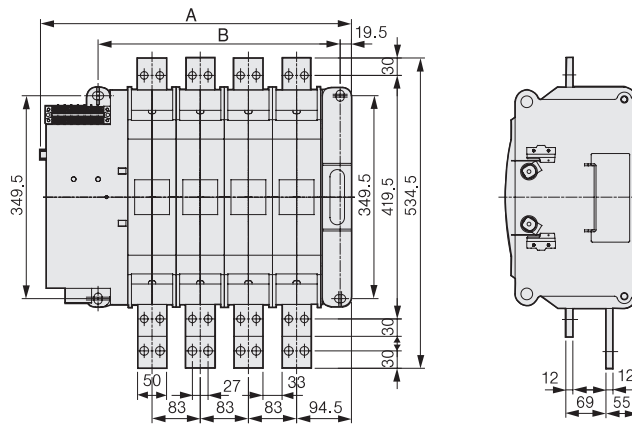
Type	A	B
3P	400	284
4P	480	364



Type	A	B
3P	400	284
4P	480	364

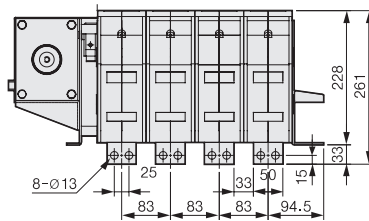
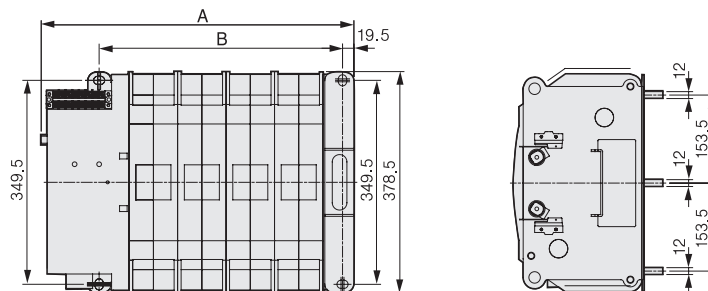
Low Voltage
Automatic
Transfer Switch
ATS, CTTS

WN Type 612WN



Front

Type	A	B
3P	452,5	334
4P	535,5	417



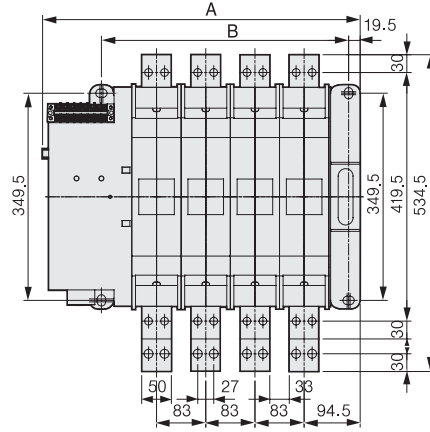
Back

Type	A	B
3P	452,5	334
4P	535,5	417

External Sizes

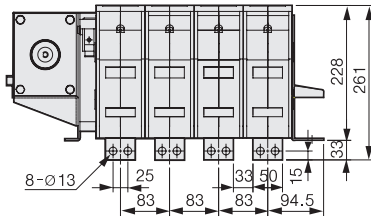
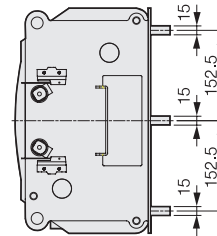
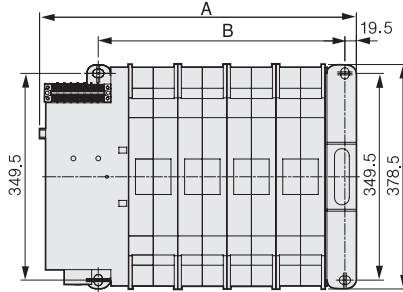
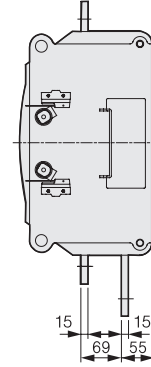
Low Voltage
Automatic
Transfer Switch
ATS, CTTS

WN Type 616WN



Front

Type	A	B
3P	452,5	334
4P	535,5	417

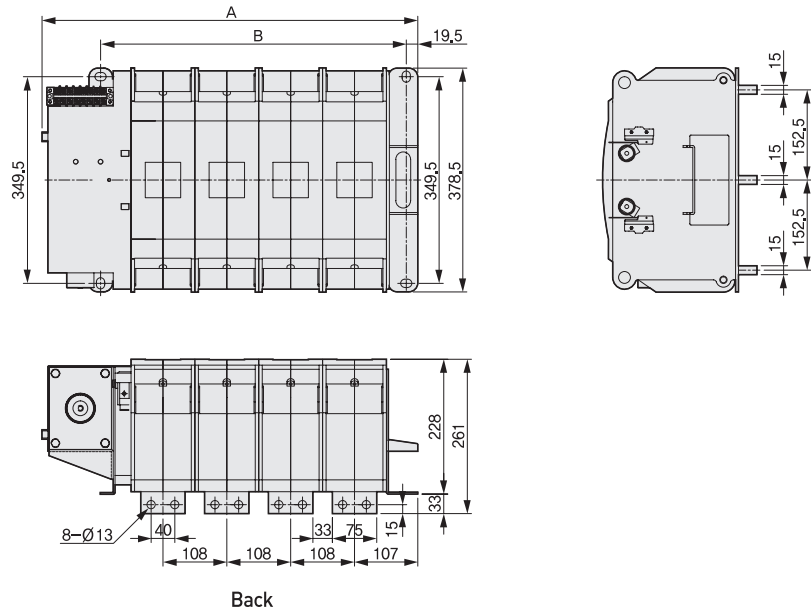


Back

Type	A	B
3P	452,5	334
4P	535,5	417

Low Voltage
Automatic Transfer
Switch ATS, CTTS

WN Type 620WN

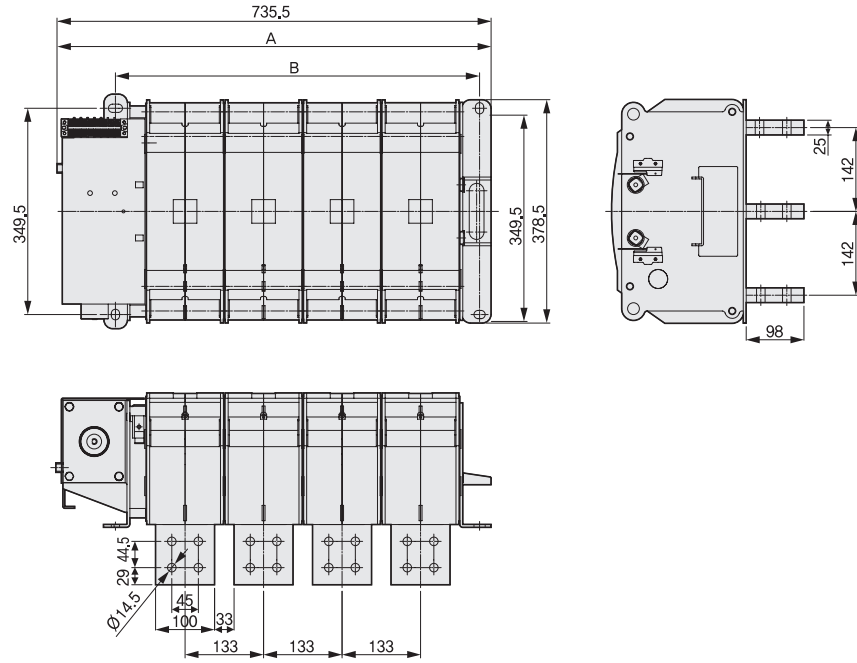


Type	A	B
3P	527,5	409
4P	635,5	517

External Sizes

Low Voltage
Automatic
Transfer Switch
ATS, CTTS

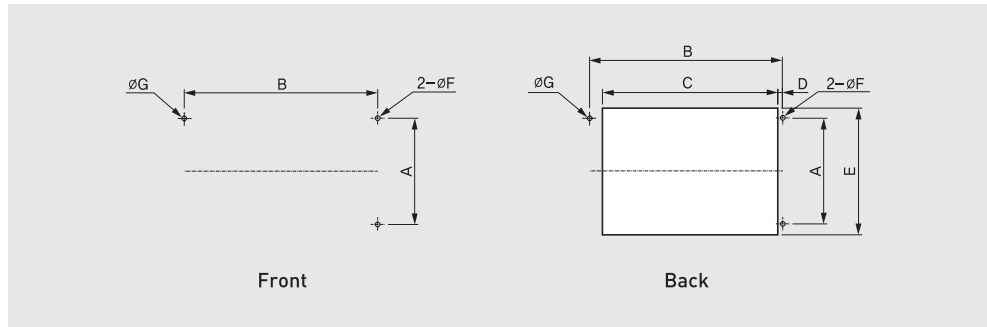
WN Types 625~630WN



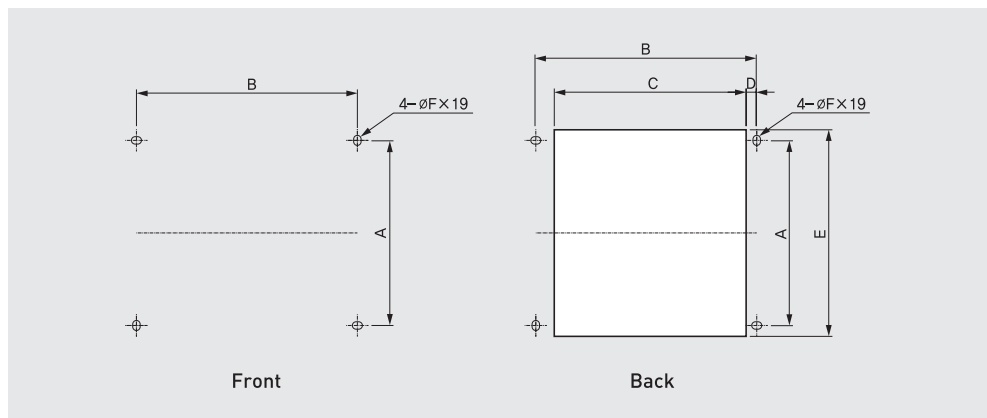
Type	A	B
3P	602,5	484
4P	735,5	617

Panel Processing Dimension

WN Types 100A~1000A



WN Types 1200A~3000A



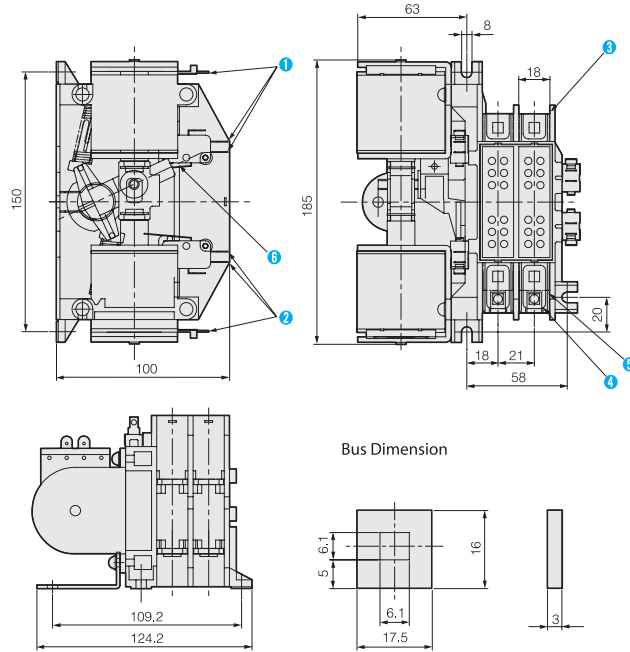
Type	100~200A		400A		600A		800A	
	Front	Back	Front	Back	Front	Back	Front	Back
A	152	152	152	152	200	200	200	200
B	2P	111	111	141	141	-	-	-
	3P	147	147	192	192	224	224	284
	4P	183	183	243	243	284	284	364
C	2P	-	88	-	118	-	-	-
	3P	-	124	-	169	-	200	-
	4P	-	160	-	220	-	260	-
D	-	9.5	-	9.5	-	9	-	9
E	-	172	-	155	-	215	-	240
F	10	10	10	10	10	10	10	10
G	7	7	7	7	10	10	10	10

Type	1000A		1200A		1600A		2000A	3000A
	Front	Back	Front	Back	Front	Back	Back	Back
A	200	200	349.5	349.5	349.5	349.5	349.5	349.5
B	2P	-	-	-	-	-	-	-
	3P	284	284	334	334	334	334	409
	4P	364	364	417	417	417	417	517
C	2P	-	-	-	-	-	-	-
	3P	-	250	-	279	-	279	354
	4P	-	330	-	362	-	362	462
D	-	9	-	18.5	-	18.5	18.5	18.5
E	-	240	-	390	-	390	390	390
F	10	10	14	14	14	14	14	14
G	10	10	-	-	-	-	-	-

External Sizes

Low Voltage
Automatic
Transfer Switch
ATS, CTTS

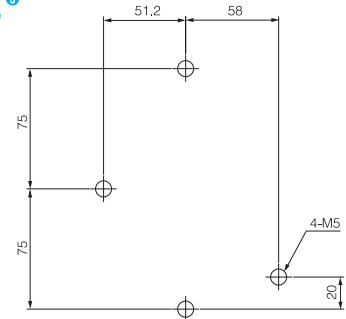
HS Type 21HS



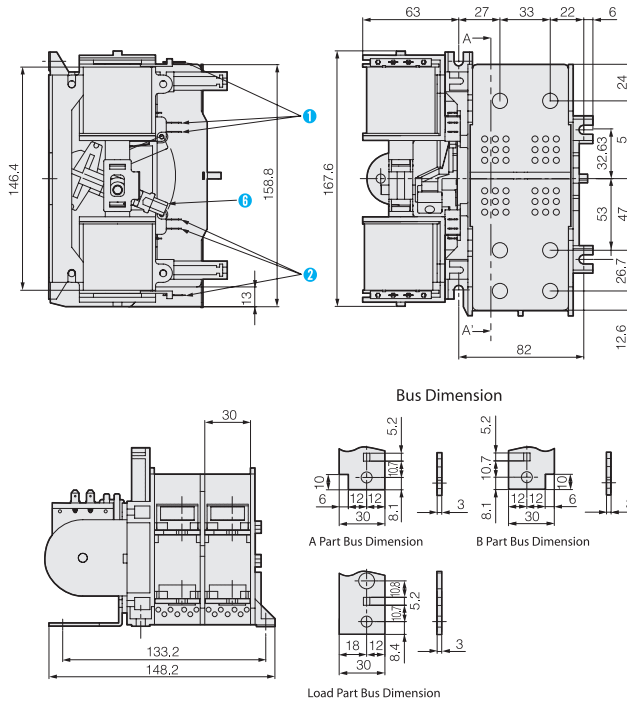
Part Names

- 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

Panel Processing Dimension (Front)/100A 2P

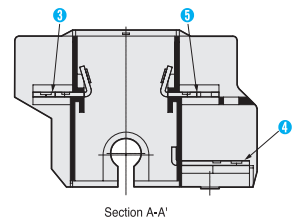


HS Type 22HS

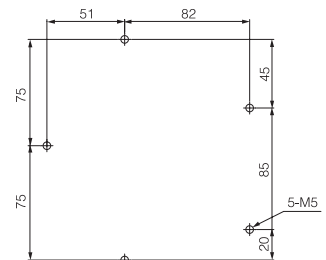


Part Names

- 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

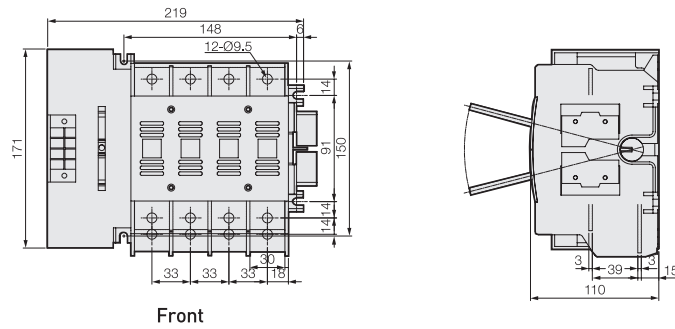


Panel Processing Dimension (Front)/200A 2P



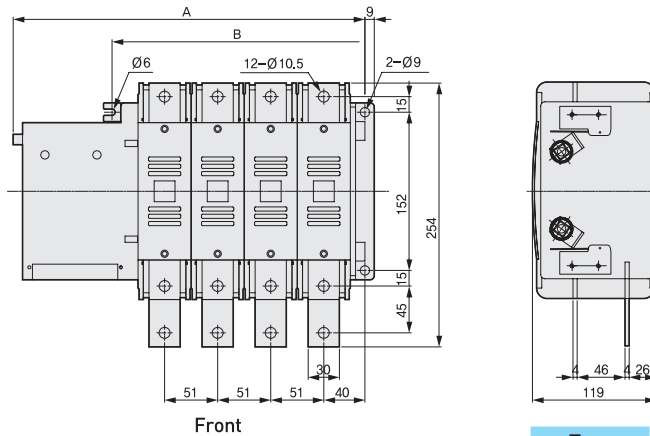
Low Voltage
Automatic
Transfer Switch
ATS, CTTS

W Types 61W~62W



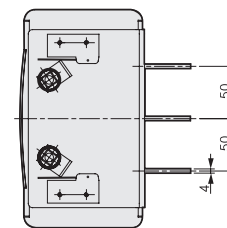
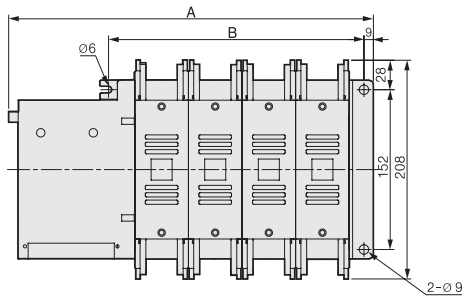
Front

W Type 64W

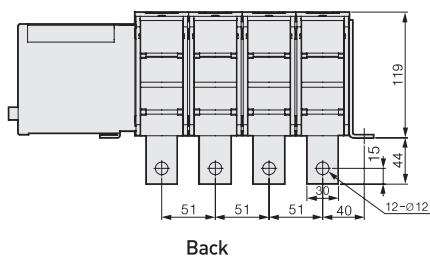


Front

Type	A	B
2P	245	141
3P	296	192
4P	347	243



Type	A	B
2P	245	141
3P	294	192
4P	347	243

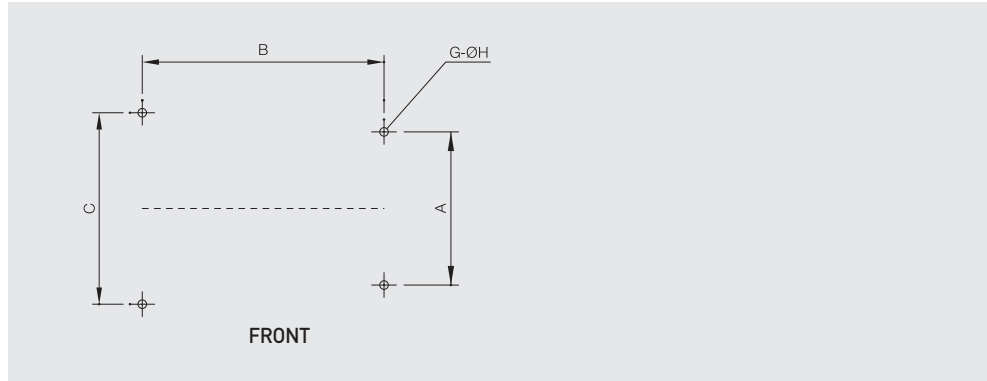


Back

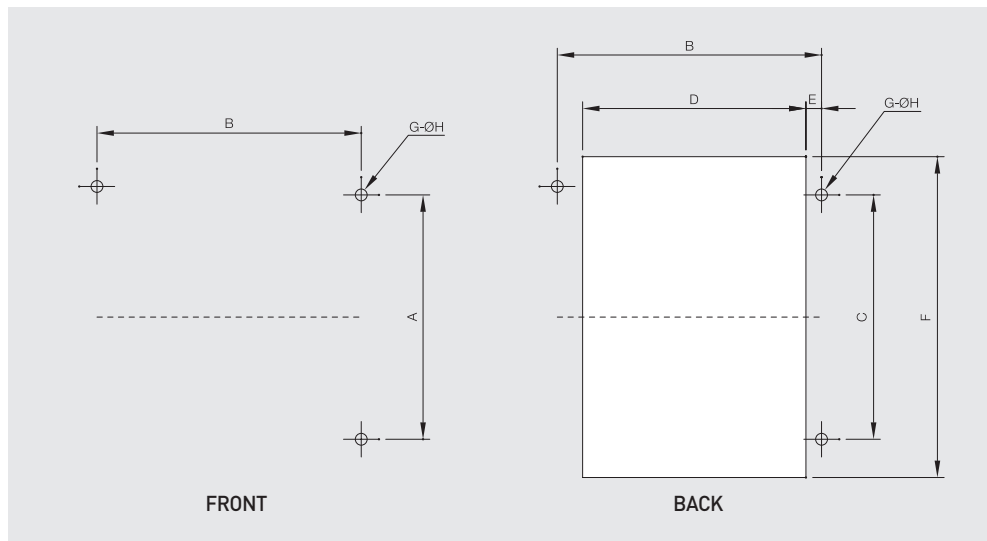
External Sizes

Panel Processing Dimensions

W Types 100A~200A



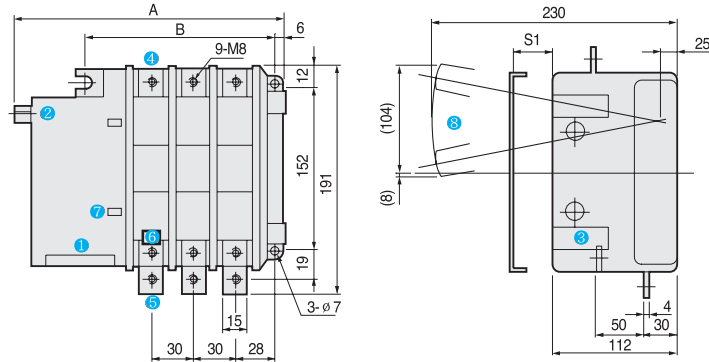
W Type 400A



Type	100~200A		400A	
	Front		Front	Back
A	91		152	-
B	2P	-	141	141
	3P	148	192	192
	4P	148	243	243
C	150		152	152
D	2P	-	-	120
	3P	-	-	170
	4P	-	-	220
E	-		-	9,5
F	-		-	155
G	4		3	3
H	9		9	9

Low Voltage Automatic Transfer Switch ATS, CTTS

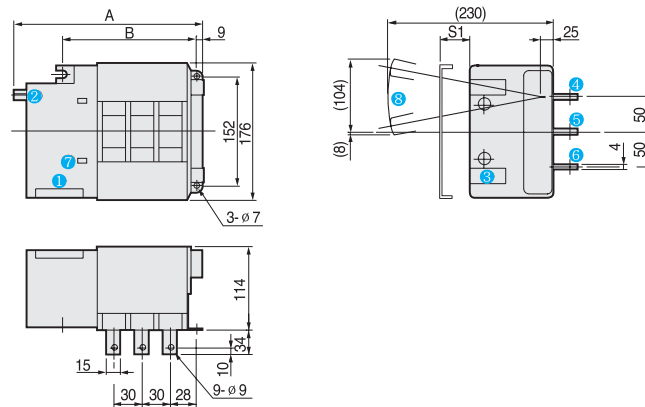
WP Type 61WP Front connection



Arc space size (S1) is 30 mm when the main circuit voltage is 220V and 60 mm when it is 600V.

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

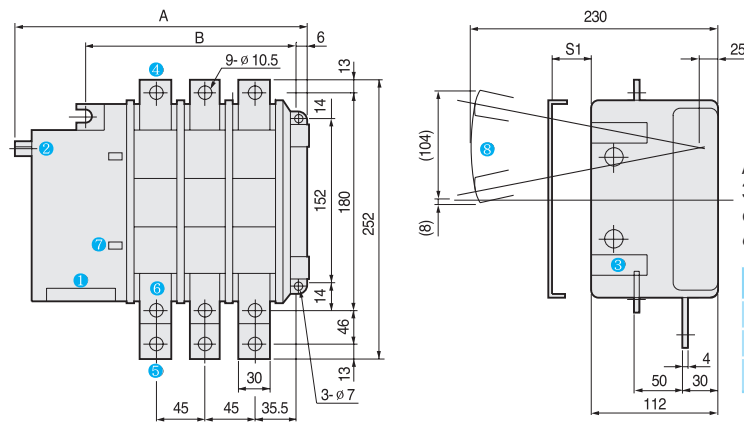
WP Type 61WP Back connection



Arc space size (S1) is 30 mm when the main circuit voltage is 220V and 60 mm when it is 600V.

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

WP Type 62WP Back connection



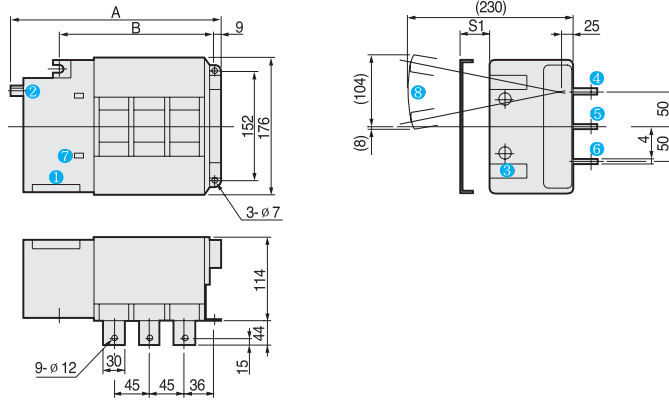
Arc space size (S1) is 30 mm when the main circuit voltage is 220V and 60 mm when it is 600V.

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

External Sizes

Low Voltage Automatic Transfer Switch ATS, CTTS

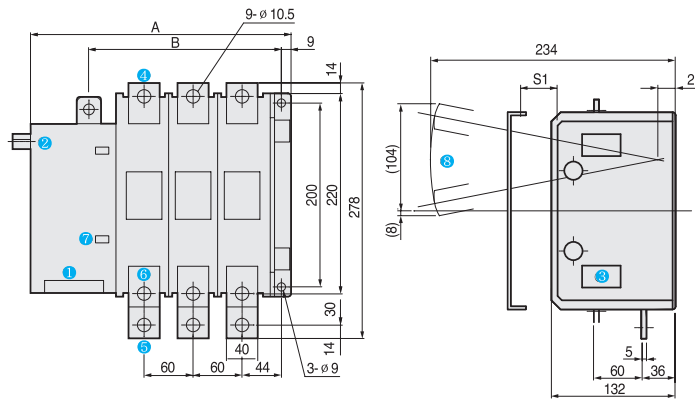
WP Type 62WP Back connection



Arc space size (S1) is 30 mm when the main circuit voltage is 220V and 60 mm when it is 600V.

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

WP Type 64WP Front connection

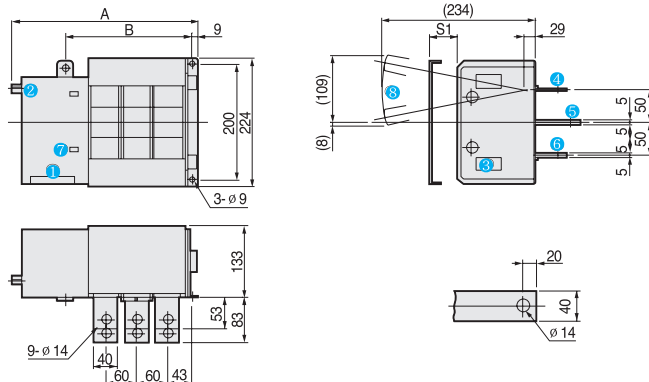


Arc space size (S1) is 30 mm when the main circuit voltage is 220V and 60 mm when it is 600V.

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

- 1 Operation Main Circuit Terminal
- 2 Manual Operating Shaft
- 3 Auxiliary Switch
- 4 A-Power Source Main Circuit Terminal
- 5 Load Part Main Circuit Terminal
- 6 B-Power Source Main Circuit Terminal
- 7 Switch Display
- 8 Manual Handle

WP Type 64WP Back connection



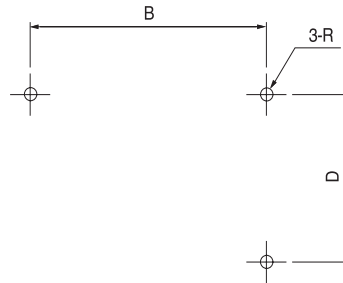
Arc space size (S1) is 30 mm when the main circuit voltage is 220V and 60 mm when it is 600V.

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

- 1 Operation Main Circuit Terminal
- 2 Manual Operating Shaft
- 3 Auxiliary Switch
- 4 A-Power Source Main Circuit Terminal
- 5 Load Part Main Circuit Terminal
- 6 B-Power Source Main Circuit Terminal
- 7 Switch Display
- 8 Manual Handle

Panel Processing Dimensions

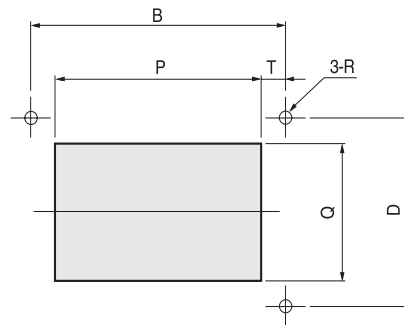
WP Types 61-64WP Front connection



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	

WP Types 61-64WP Back connection



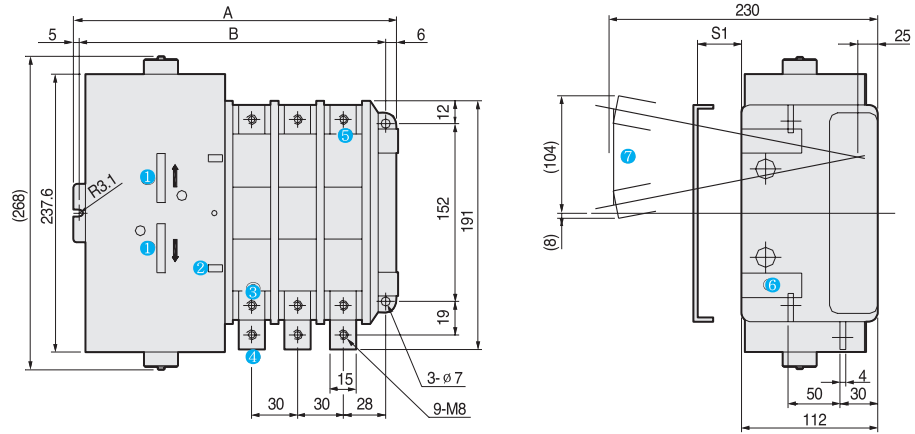
WP-Type

Type	606-61WP	62WP	64WP	
B	2P	113	143	174
	3P	143	188	234
	4P	173	233	294
D	152	152	200	
R	2P	85	110	135
	3P	115	155	195
	4P	145	200	255
Q	140		180	
T	7,5		9	
R	M5		M8	

External Sizes

Low Voltage
Automatic
Transfer Switch
ATS, CTTS

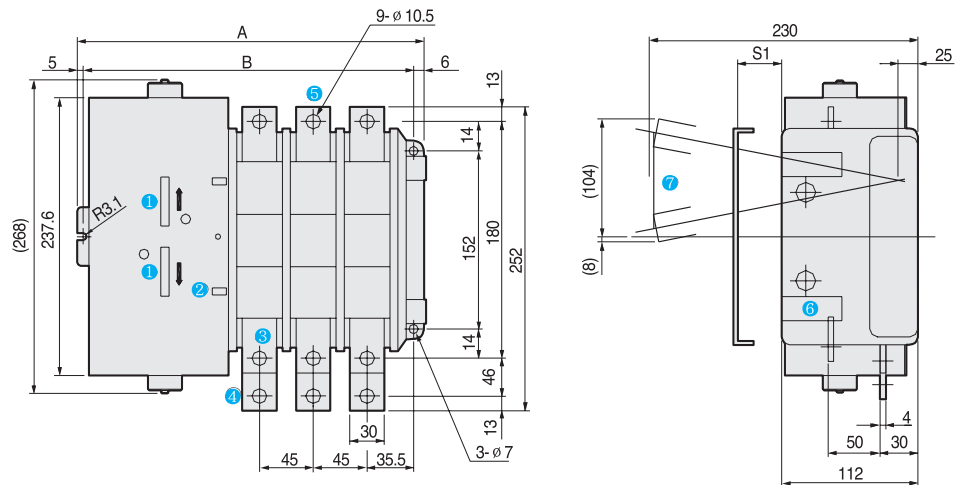
CTTS Type 61CT Front connection



Arc space size (S1) is 30 mm when the main circuit voltage is 220V and 60 mm when it is 600V.

Type	A	B
2P	210,8	199,8
3P	240,8	229,8
4P	270,8	259,8

CTTS Type 62CT Front connection



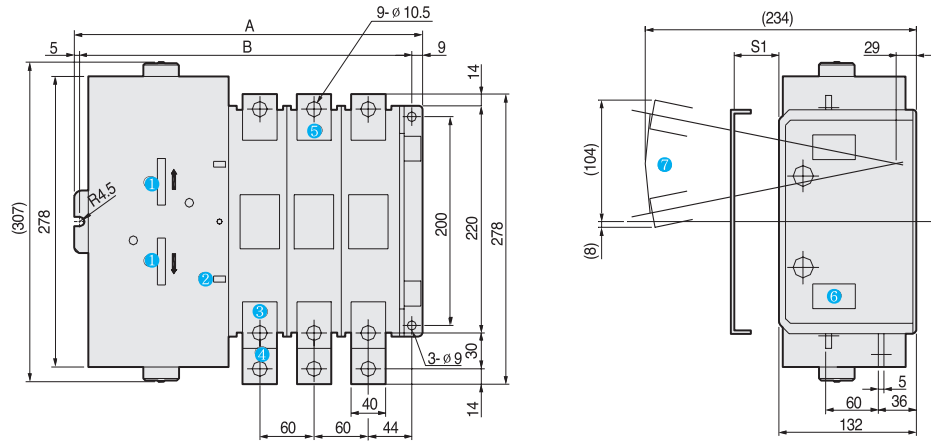
- 1 Manual Operation Hole
- 2 Switch Display
- 3 B-Power Source Main Circuit Terminal
- 4 Load Part Main Circuit Terminal
- 5 A-Power Source Main Circuit Terminal
- 6 Auxiliary Switch
- 7 Manual Handle

Arc space size (S1) is 30 mm when the main circuit voltage is 220V and 60 mm when it is 600V.

Type	A	B
2P	240,8	229,8
3P	285,8	274,8
4P	330,8	319,8

Low Voltage Automatic Transfer Switch ATS, CTTS

CTTS Type 64CT Front connection

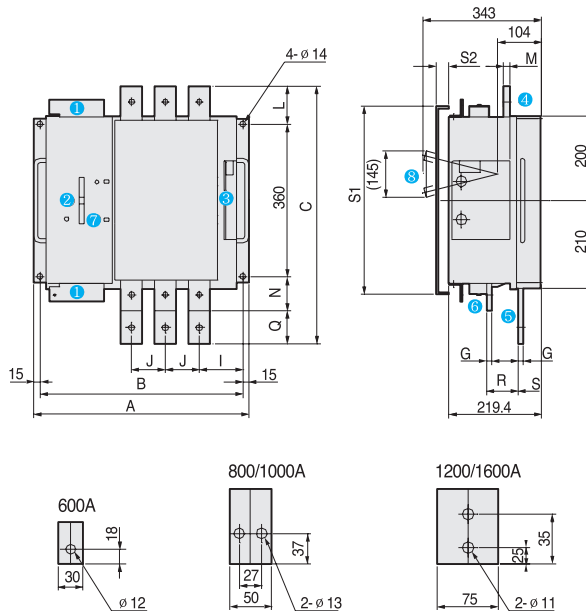


- 1 Manual Operation Hole
- 2 Switch Display
- 3 B-Power Source Main Circuit Terminal
- 4 Load Part Main Circuit Terminal
- 5 A-Power Source Main Circuit Terminal
- 6 Auxiliary Switch
- 7 Manual Handle

Arc space size (S1) is 30 mm when the main circuit voltage is 220V and 60 mm when it is 600V.

Type	A	B
2P	292,5	278,5
3P	352,5	338,5
4P	412,5	398,5

CTTS Type 66-616CT Front connection



- 1 Operating Circuit Terminal
- 2 Manual Operation Hole
- 3 Auxiliary Switch
- 4 A-Power Source Main Circuit Terminal
- 5 Load Part Main Circuit Terminal
- 6 B-Power Source Main Circuit Terminal
- 7 Switch Display
- 8 Manual Handle

Arc space Size

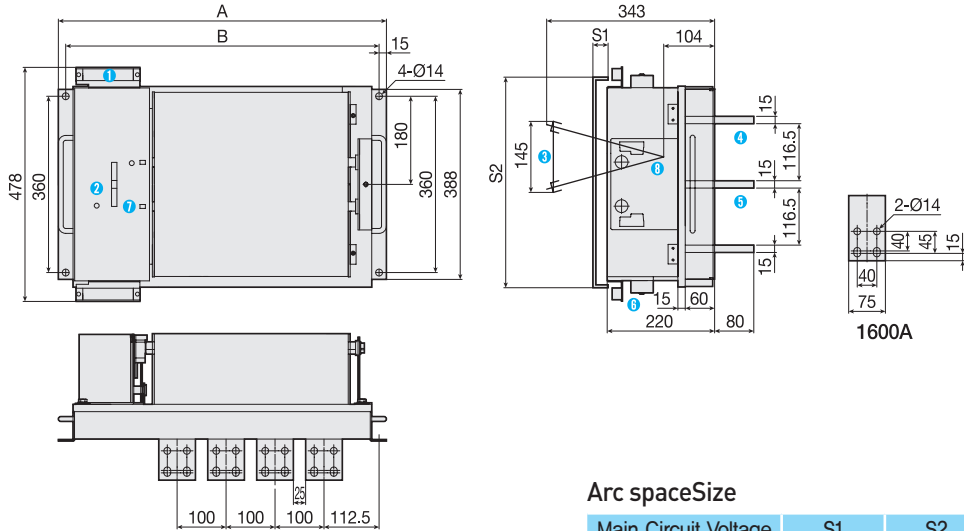
Main Circuit Voltage	S1	S2
200V	430mm	25mm
600V	450mm	90mm

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		

External Sizes

Low Voltage
Automatic
Transfer Switch
ATS, CTTS

CTTS Types 616CT/416CT Back connection



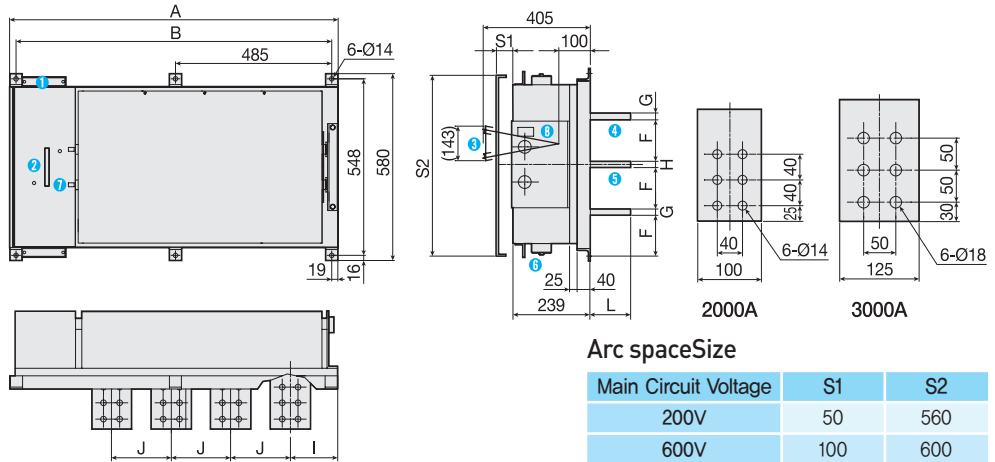
- ① Operating Circuit Terminal
- ② Manual Operation Hole
- ③ Auxiliary Switch
- ④ A-Power Source Main Circuit Terminal
- ⑤ Load Part Main Circuit Terminal
- ⑥ B-Power Source Main Circuit Terminal
- ⑦ Switch Display
- ⑧ Manual Handle

Arc spaceSize

Main Circuit Voltage	S1	S2
200V	26	430
600V	90	450

Type	A	B
3P	570	540
4P	670	640

CTTS Types 620-630CT Back connection



- ① Operating Circuit Terminal
- ② Manual Operation Hole
- ③ Auxiliary Switch
- ④ A-Power Source Main Circuit Terminal
- ⑤ Load Part Main Circuit Terminal
- ⑥ B-Power Source Main Circuit Terminal
- ⑦ Switch Display
- ⑧ Manual Handle

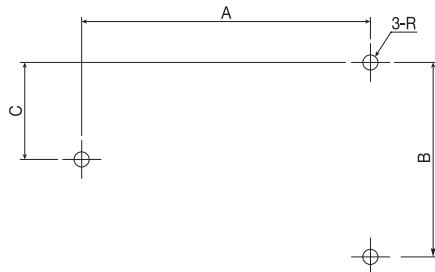
Arc spaceSize

Main Circuit Voltage	S1	S2
200V	50	560
600V	100	600

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

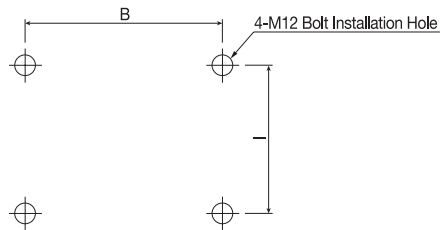
Panel Processing Dimensions

61-64CT Front connection



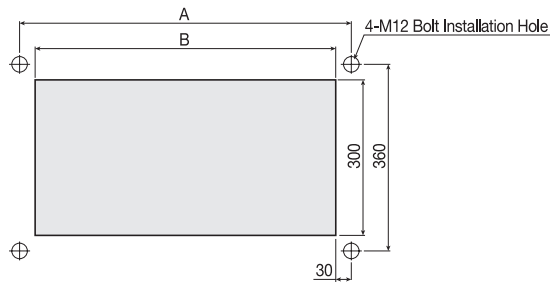
Type	100A	200A	300A	
A	2P	199,8	229,5	278,5
	3P	229,8	274,8	338,5
	4P	259,8	319,8	398,5
B		152	200	
C		76	100	
R		M5	M8	

66-616CT Front connection



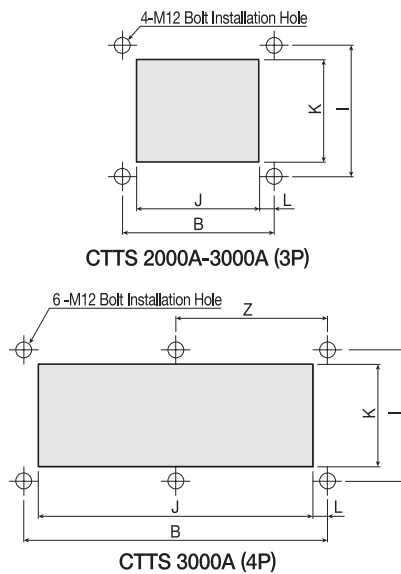
Type	600A	800A	1000A	1200A	1600A
B	2P	435	480	540	
	3P	500	560	640	
I	360	360	360		

616CT/416CT Back connection



Type	A	B
3P	540	480
4P	640	580

620-630CT Back connection



CTTS 2000A-3000A (3P)

CTTS 3000A (4P)

Type	200A	300A	
B	2P	645	795
	3P	780	980
I	568	568	
J	3P	420	545
	4P	555	730
K	460	460	
L	28	40	
Z	-	485	

Certifications

BUREAU VERITAS
Certification



Certification

Awarded to

VITZROTECH Co., Ltd.

Head office : #233-3, 1-Dong, Sungsu-2Ga, Sungdong-Gu, Seoul, KOREA
Factory : 605-2, Sunggok-Dong, Danwon-Gu, Ansan-City, Kyunggi-Do, KOREA

Bureau Veritas Certification certify that the Management System of the above organization has been audited and found to be in accordance with the requirements of the management system standards detailed below

Standards

ISO 9001:2000 / KS A 9001:2001

Scope of supply

DESIGN/DEVELOPMENT, PRODUCTION, SALES AND SERVICING OF VACUUM CIRCUIT BREAKER, VACUUM CONTACTOR, VACUUM INTERRUPTER, AIR CIRCUIT BREAKER, LOAD BREAK SWITCH, AUTOMATIC TRANSFER SWITCH, MAIN CIRCUIT BREAKER FOR ELECTRIC RAILWAY, SURGE PROTECTION EQUIPMENT, OUTDOOR VACUUM SWITCH, DISCONNECTING SWITCH, POLYMER LIGHTNING ARRESTER, CABLE TERMINATION KIT, CABLE SPLICE KIT, INSTRUMENT AND CONTROL SYSTEM, SUPERVISOR AND MAINTENANCE CONTROL SYSTEM FOR SUBSTATION FACILITIES, MOTOR CONTROL CENTER AND SEWITCHGEAR

Original Approval Date: **01 August 1998**

Subject to the continued satisfactory operation of the organization's Management System, this certificate is valid until: **22 June 2007**

To check this certificate validity please call (+662 670 4800)

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organization

Date: **14 February 2007**

Certificate Number: **158328**



Bureau Veritas Certification
Using the accreditation
certificate number 008

008

ISSUING OFFICE: Bureau Veritas Certification (UK) Ltd.
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London SE1 2TX
MANAGING OFFICE: Bureau Veritas Certification Korea Ltd.
Rm 1102, Namsil Tower, 677-325, Yeoksam-Dong, Gangnam-Gu,
Seoul, Korea





Certification

Awarded to

VITZROTECH Co., Ltd.

605-2, Sunggok-Dong, Danwon-Gu, Ansan-City, Kyunggi-Do, KOREA

Bureau Veritas Certification certify that the Management System of the above organization has been audited and found to be in accordance with the requirements of the management system standards detailed below

Standards

ISO 14001:2004 / KS A 14001:2004

Scope of supply

DESIGN/DEVELOPMENT, PRODUCTION, SALES AND SERVICING OF VACUUM CIRCUIT BREAKER, VACUUM CONTACTOR, VACUUM INTERRUPTER, AIR CIRCUIT BREAKER, LOAD BREAK SWITCH, AUTOMATIC TRANSFER SWITCH, MAIN CIRCUIT BREAKER FOR ELECTRIC RAILWAY, SURGE PROTECTION EQUIPMENT, OUTDOOR VACUUM SWITCH, DISCONNECTING SWITCH, POLYMER LIGHTNING ARRESTER, CABLE TERMINATION KIT, CABLE SPLICE KIT, INSTRUMENT AND CONTROL SYSTEM, SUPERVISOR AND MAINTENANCE CONTROL SYSTEM FOR SUBSTATION FACILITIES, MOTOR CONTROL CENTER AND SEWITCHGEAR

Original Approval Date: **29 December 2003**

Subject to the continued satisfactory operation of the organization's Management System, this certificate is valid until: **28 November 2009**

To check this certificate validity please call (+662 670 4800)

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organization

Date: **11 April 2007**

Certificate Number: **271402**



Bureau Veritas Certification Using the accreditation certificate number 008

008



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201, H103, Kyeongil Tower, 677-23, Yeoksam-Dong, Gangnam-Gu,
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