AUTOMATIC TRANSFER SWITCHES

http://www.osemco.com

INSTURCTION AND MAINTENANCE MANUAL

OSS-PC, PSO

osemco

O-Sung Electric Machinery CO.,LTD.

111-3 Yeoungtae-Ri, Wollong-Myeon, Paju-City, Kyungki-Do, Korea

Tel : (82-31)944-3521/3 Fax : (82-31)944-3525

TABLE OF CONTENTS

1. External View

① Arc quenching chamber	② Apeature for Manual Handle
③ Manual Handle	④ Name Plate
⑤ Lifting Hook	⑥ Circuit Diagram
⑦ On-Off Indicator	⑧ Terminal Block

2. Precautions

2.1 Points to check after receiving

1) Please check the ratings of rated current and control voltage, etc specified in name plate whether ATS is delivered in accordance with ordered specification.
2) Please check whether there is no any damage during the transportation.

2.2 Storage

ATS is recommended to install and use as soon as possible after receiving. If not in immediate use, Please pay attention on following points.

1) Please avoid any place of high temperature and high humidity.
2) Please avoid any place of noxious gases and dust. Particularly, Please avoid the mixture of cement with moisture because these causes corrosion on various parts.
3) Please put ATS on horizontal plane.
4) Please do not put ATS on the ground.

2.3 Caution during moving

When moving ATS, Please pay attention on following points.

1) Please choose horizontal plane where ATS will be placed.
2) Please avoid any impact during moving.

3. Installation & Connection

1) Please place ATS so that name place can be clearly read from the front.
2) When fitting connectors, Please do not over-fix so that connectors of main circuit should be kept horizontally.

4. Rated Specification (400A ~ 1600A)

Type		604-PSO	606-PSO	608-PC 608-PSO		610-PC 610-PSO		612-PC 612-PSO		616-PC 616-PSO	
Rated Voltage		AC 600V									
Rated Current		400A	630A	800A		1000A		1250A		1600A	
Neutral Phase Current		400A	630A	800A		1000A		1250A		1600A	
Kind of Throw		Double Throw									
Connection		Back									
Number of Poles		4P	4P	3P	4P	3P	4P	3P	4P	3P	4P
Weight (kg) ( ) : PSO	Fixed	70	70	55	60 (75)	55	60 (75)	55	65 (80)	60	70 (85)
	Drawout	100	100	80	95 (105)	80	95 (105)	90	105 (115)	95	110 (120)
Rated short-time withstand current 1sec		25 kA	25 kA	25 kA		25 kA		30 kA		35 kA	
Rated short-circuit making capacity		52.5 kA	52.5 kA	52.5 kA		52.5 kA		63 kA		73.5 kA	
Switching Capacity		AC-33B (10Ie making / 10Ie breaking cos∅=0.35)									
Switching Frequency		60 Time/Hour						20 Time/Hour			
Operating Current peak	DC 110V/125V	45A						50A			
	AC 100V/110V	45A						50A			
	AC 200V/240V	30A						40A			
Operating Time	Charge-over Time	≤ 120 ms / ≤ 150 ms (PC/PSO)									
	Opening Time	≤ 90 ms / ≤ 120 ms (PC/PSO)									
Number of Operating Cycles	Without Current	10,000									
	With Current	5,000									
Cautions	1. For complete operation, Be sure to provide control source for more than 0.5sec. 2. When control source will be provided to A side and B side simultaneously, Coil may be damaged.										

5. Rated Specification (2000A ~ 6300A)

Type		620-PC 620-PSO		625-PC 625-PSO		632-PC 632-PSO		640-PC 640-PSO		650-PC 650-PSO		663-PC 663-PSO	
Rated Voltage		AC 600V											
Rated Current		2000A		2500A		3200A		4000A		5000A		6300A	
Neutral Phase Current		2000A		2500A		3200A		4000A		5000A		6300A	
Kind of Throw		Double Throw											
Connection		Back											
Number of Poles		3P	4P	3P	4P	3P	4P	3P	4P	3P	4P	3P	4P
Weight (kg)	Fixed	90	115	95	125	100	130	180	210	195	230	200	250
	Drawout	110	140	110	140	125	155	220	275	230	285	245	305
Rated short-time withstand current 1sec		40 kA		50 kA		50 kA		65 kA		65 kA		65 kA	
Rated short-circuit making capacity		84 kA		105 kA		105 kA		143 kA		143 kA		143 kA	
Switching Capacity		AC-33B (10Ie making / 10Ie breaking cos∅=0.35)											
Switching Frequency		10 Time / Hour											
Operating Current peak	DC 110V/125V	65A						80A					
	AC 100V/110V	65A						80A					
	AC 200V/240V	50A						65A					
Operating Time	Charge-over Time	≤ 150 ms											
	Opening Time	≤ 120 ms											
Number of Operating Cycles	Without Current	5,000						3,000					
	With Current	3,000						1,500					
Cautions	1. For complete operation, Be sure to provide control source for more than 0.5sec. 2. When control source will be provided to A side and B side simultaneously, Coil may be damaged.												

6. PSO-type ATS

In addition to every function of PC-type ATS, PSO-type ATS has additional function of Overlapping Neutral Contacts.

■ Function of Overlapping Neutral Contacts

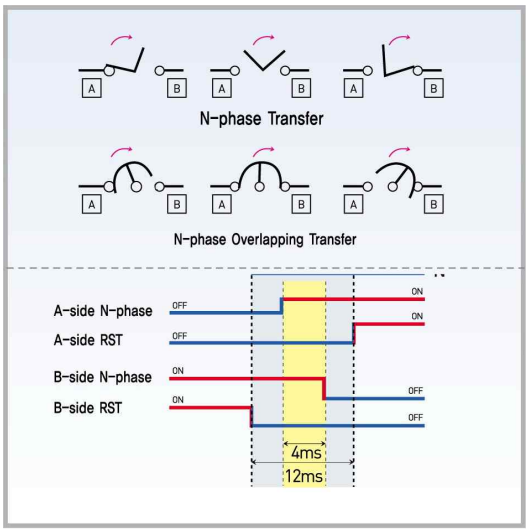
When general ATS will be transferred, Arc will be generated between fixed contacts and moving contacts. Thus, current flows between contacts and arc will be eliminated when current will be at zero level. Eliminating time of arc is 10～12 msec. Therefore, various device of load side can be protected when neutral contacts should be opened 10～12 msec later than other 3-phases contacts. Load side devices of general ATS cannot be sufficiently protected because opening time gap between neutral contacts and other 3-phase contacts is less than 10 msec. In order to solve this problem, Overlapping between neutral contacts of A-power (Normal) and B-power (Emergency) during transfer of switch functions to protect various devices of load side more safely.

In addition, Non-linear load increases the earth potential and potential difference is occurred between earth and neutral line. When general ATS will be transferred, Neutral line is separated from load and reference potential difference cannot be established. Thus, Floating is occurred and electronic devices can be malfunctioned. When ATS with overlapping neutral contact will be applied, Floating can be protected.

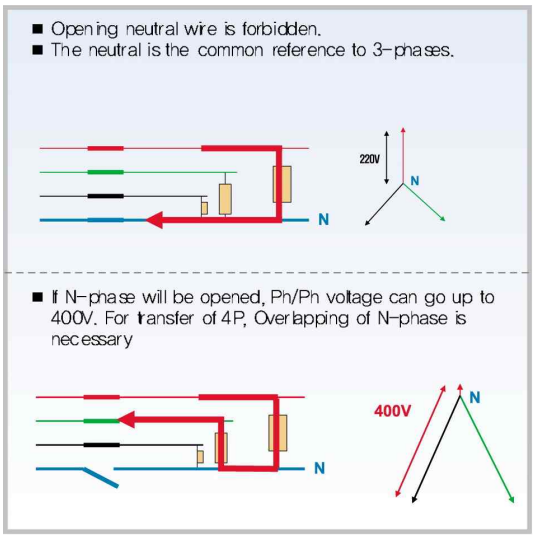
■ Location needed for overlapping neutral contact

- Broadcasting system and telecommunication system
- Petrochemical plant
- Arc furnace
- Large harmonic load (Elevator & Escalator, etc.)
- Military communication system and radar facilities
- Bank and computer center

■ N-phase Transfer



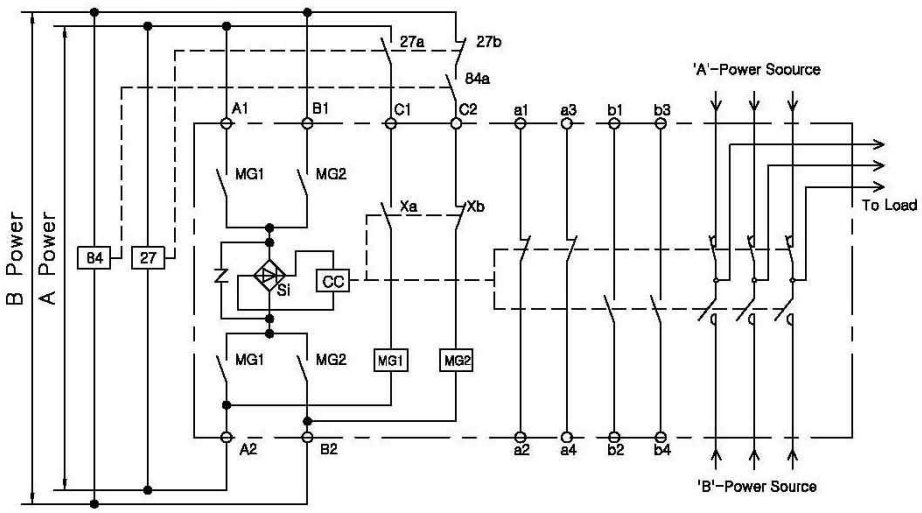
■ Limits of 4P Transfer



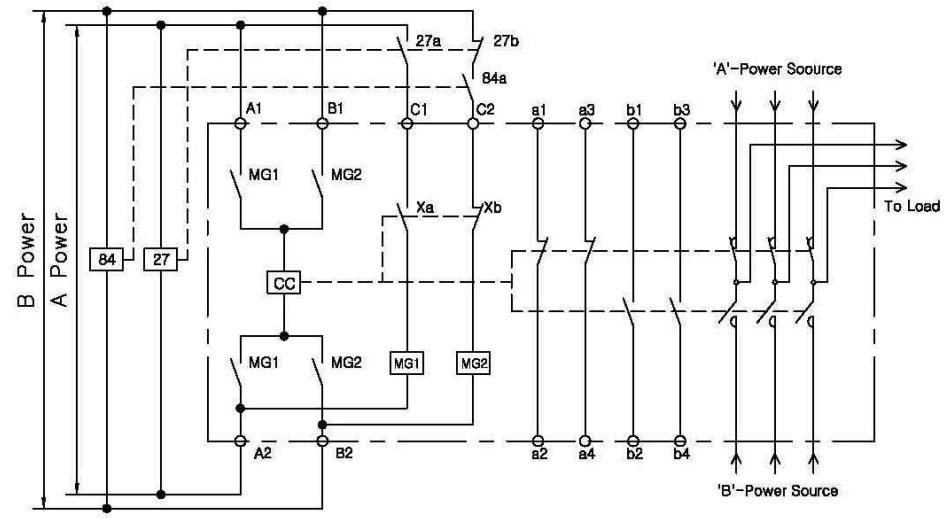
7. Operation Method

7.1 Sequence Diagram for PC-type and PSO-type ATS

AC 110V / 220V



DC 110V / 125V



A1 , A2	"A" POWER	Xa , Xb	Control Switch	a1 ~ a4 b1 ~ b4	Aux Switch
B1 , B2	"B" POWER	CC	Closing Coil	MG1 , MG2	Magnetic Coil

Note : If A-Power Source (Normal) and B-Power Source (Emergency) will be interchanged as per customer's preference, Be sure to exchange the control source also.

7.2 Manual Operation Method

a) Transfer to Normal Power Source :
Put the Manual Handle into the Apeature for Handle and raise upward. Then, Switch is transferred to Normal Power Source and On-Off Indicator shows red-coloured A-ON.

b) Transfer to Emergency Power Source :
Put the Manual Handle into the Apeature for Handle and lower downward. Then, Switch is transferred to Emergency Power Source and On-Off Indicator shows green-coloured B-ON.

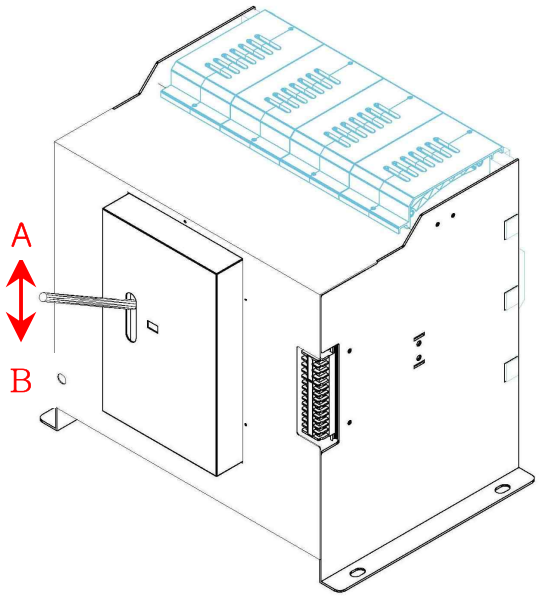
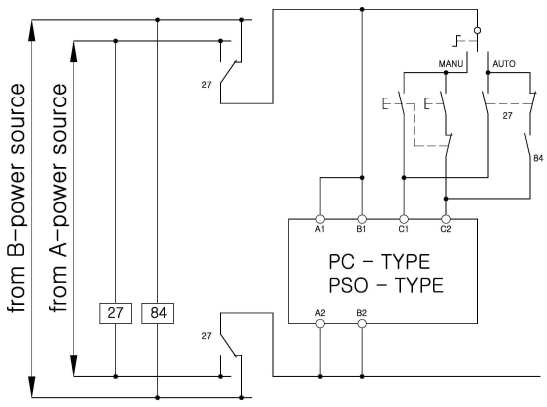


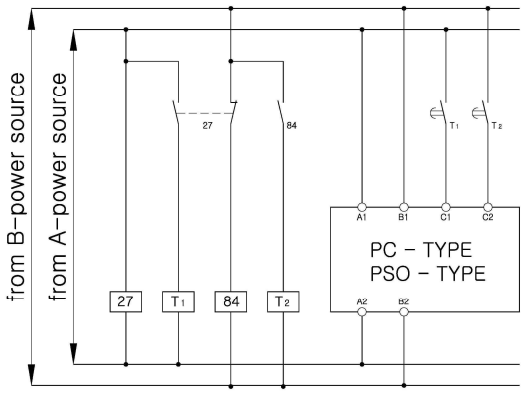
Figure. Manual operating

7.3 Typical Operating Circuit

■ Manual-Auto Transfer

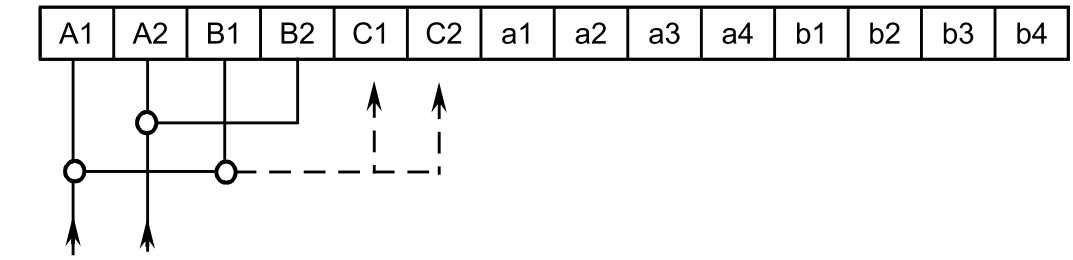


■ Using Timer



Caution : • More than 2.5mm^2 wire should be used for below 1600A rating.
• More than 4.0mm^2 wire should be used for above 2000A rating.

8. ATS Self-testing Method



operating power

After power on of A-Power (Normal) and B-Power (Emergency), Connect A1 and C1. Then, check whether switch is transferred to Normal side. Connect B1 and C2. Then, check whether switch is transferred to Emergency side. If switch is transferred properly, the switch is in normal condition.
If switch is not transferred according to the above testing method, Please refer to clause 9 checkpoint for trouble in this manual.

9. Checkpoint for Trouble

9.1 When switching to A-Power side and B-Power side are not electrically made :

1) Check whether control voltage are supplied to A1,A2 or B1,B2.
2) When control voltage are supplied as per above checking, Remove the cover and check whether MG1 & MG2 are operating.
3) When MG1 & MG2 are not properly operating, Check the operating status of Control Switch(Xa, Xb).
4) When MG1 & MG2 are properly operating, Check the voltage of Control Coil (CC) is DC 110V or DC 220V regardless of control voltage.
5) If DC voltage is not measured, Bridge Diode or Contacts of MG1, MG2 is malfunctioned. Please ask for the after service. If DC voltage is measured, Please check whether Closing Coil is burnt.

9.2 Phase-failure is occurred :

1) Check whether voltage between A-Power side, B-Power side and Main Circuit Terminal is normally supplied.
2) When voltage is normally supplied, Check whether voltage to Load side Main Terminal is normally supplied.
3) If voltage of Main Circuit Terminal is not supplied, Dismantle Arc-quenching Chamber and check the connection condition of Main Contacts.
   (In order to prevent any electric-shock, This should be done after power-off).
4) When checking the connection condition of Main Contacts, Check the foreign material or damage.

9.3 Others :

1) Check whether control voltage is under voltage or voltage dropped.
2) Check whether frequency and voltage of generator is normal.
3) Check whether capacity of Transformer is sufficient.
4) When battery is used for power source, Check whether connecting cable size is sufficient enough considering the connecting distance.