

Automatic Transfer Switches

OSS-PCN
800A ~ 1600A

INSTRUCTION AND MAINTENANCE MANUAL



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1. Safety Notice

These Safety Notice describes the important information for safety. Before commencing installation or operation of this equipment, Please read all notices very carefully and note the details.

These safety notices are divided as “Danger” and “Caution” according to the hazard level.



Danger

Emergency situation, which may cause death or serious disaster if there is mistake.



Caution

A potentially problematic situation, which may cause slight personal injury and/or damage.

1.1 Transportation Precaution



Danger

- Do not enter the area under the ATS when it is lifted or suspended using a lifter or chain block. The ATS may suddenly drop.
The ATS is heavy. Entering such an area may cause serious injury.

1.2 Installation Precaution



Caution

- Installation should be performed by qualified persons.
- Prior to commencing any installation, open the upstream circuit breaker to isolate all power/voltage sources.
Otherwise, electric shock may occur.
- Tighten terminal screws securely according to the specified torque.
Otherwise, a fire may occur.
- Fix the ATS firmly on a flat level using mounting screws.
- Do not place the SMART-N Controller in such area of high temperature, high humidity, dusty air, corrosive gas, strong vibration and shock or other unusual condition.
Otherwise, a fire or malfunction may occur.
- Be careful to prevent foreign material of debris, concrete powder, iron powder, etc and rainwater from entering into the SMART-A Controller.
Otherwise, a fire or malfunction may occur.

1.3 Operation Precaution



Danger

- Do not touch the live terminal parts.
Otherwise, electric shock may occur.
- Do not leave the ATS in the drawout position.
The ATS is heavy. Dropping the ATS could cause serious injury.



Caution

- When ATS will be drawn-in or drawn-out, Draw-in or draw-out after confirming Open status.
Otherwise, This may cause the damage or fire.

1.4 Maintenance and Inspection Precaution



Caution

- Maintenance, inspection or components replacement should be performed by qualified persons.
- Prior to commencing any work, open the upstream circuit breaker to isolate all power/voltage sources.
Otherwise, electric shock may occur.
- Retighten the terminals of main circuit with standard torque periodically.
Loosening may cause a fire.
- Retighten the terminals of control circuit periodically.
Loosening may cause malfunction.
- Be sure to reinstall the arc chute if removed.
Failure to do so or incorrect installation may result in a fire or cause of burns.

2. Normal/Special Service Condition

2.1 Normal Service Condition

ATS should be used under following normal condition unless otherwise specified.

a) Ambient temperature ;

-10°C ~ +60°C

b) Altitude ;

Below 2,000m

c) Environmental conditions ;

Relative humidity shall be less than 85% at max. temp. +40°C, less than 90% at 20°C. It shall not be allowed to use or store within the area of petrochemicals, ammonia or corrosive gas. (H₂S ≤ 0.01ppm, SO₂ ≤ 0.01ppm, NH₃ ≤ a few ppm)

d) Storage temperature ;

-20°C ~ +60°C

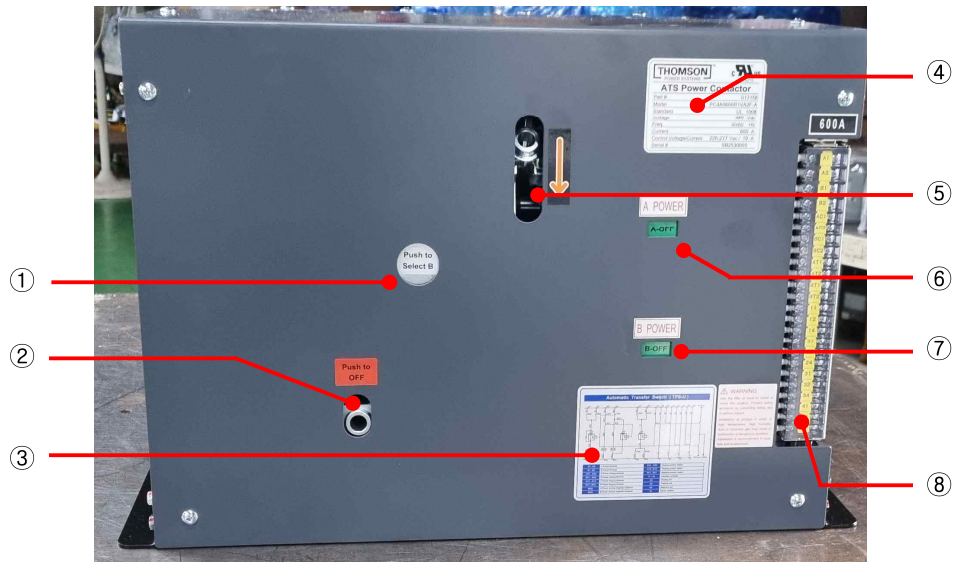
2.2 Special Service Condition

In the case of special service condition, Modified ATS are available.

Please specify when ordering. Service life may be reduced depending on the service condition.

- Where ambient temperature or altitude is severe than conditions in above 2.1.
- Where heavy offshore wind blows.
- Where always high humid.
- Where are excessive water vapor or oil vapor.
- Where are explosive, flammable or noxious gas.
- Where are heavily dusty.
- Except above condition, Where are abnormal or strange condition.

3. External View



①	Selective Button for “B” Power-Closing	⑤	Manual Lever Inlet
②	Trip Button	⑥	“A” Power Transfer Indicator
③	Circuit Diagram	⑦	“B” Power Transfer Indicator
④	Name Plate	⑧	Control Circuit Terminal Block

4. Rated Specification

TYPE		608-PCN	610-PCN	612-PCN	616-PCN
Rated Operational Voltage (VAC)	Ue	600			
Rated insulation Voltage (VAC)	Ui	800			
Rated impulse withstand Voltage (VAC)	Uimp	8000			
Rated Current	le	800A	1000A	1250A	1600A
Neutral Phase Current		800A	1000A	1250A	1600A
Kind of Throw		Double Throw			
Connection		Back			
Number of poles		3 Poles , 4 Poles			
Weight (kg)	Fixed	60 / 70	60 / 70	65 / 75	75 / 85
	3P / 4P Drawout	130 / 145	130 / 145	140 / 155	150 / 165
Rated Short-time Withstand Current (1sec)	lcw	25 kA	25 kA	30 kA	35 kA
Rated Short-circuit Making Capacity (peak)	lcm	52.5 kA	52.5 kA	63 kA	73.5 kA
Switching Capacity		AC-33B(10 le making/10 le breaking cos ϕ =0.35)			
Switching Frequency		60Time / Hour		20Time/Hour	
Operating Current peak Closing / Tripping	DC 110~125 V	25A / 15A		40A / 15A	
	AC 100~110 V	25A / 15A		40A / 15A	
	AC 200~240 V	15A / 15A		30A / 15A	
Operating Time	"A" Power	Making	$\leq 150\text{ms}$		
		Breaking	$\leq 40\text{ms}$		
	"B" Power	Making	$\leq 150\text{ms}$		
		Breaking	$\leq 40\text{ms}$		
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. Operation Method

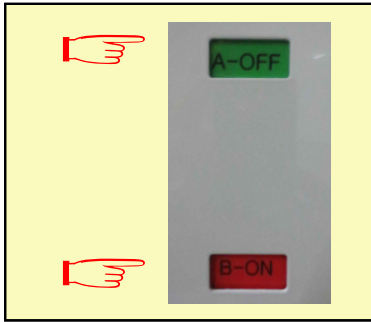
This procedure is for the maintenance or emergency operating of ATS.

Note 1) Change ATS panel to manual mode.

Note 2) Manual operation shall be done under no load condition.

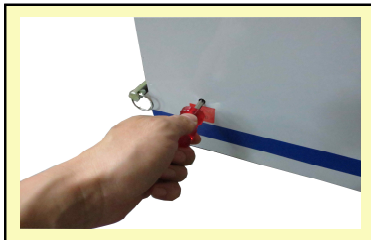
5.1 Manual Transfer

5.1.1 Transfer to "A" Power



① Check indicator is A-OFF.

If indicator B-ON, press Trip button, and check indicator B-OFF.

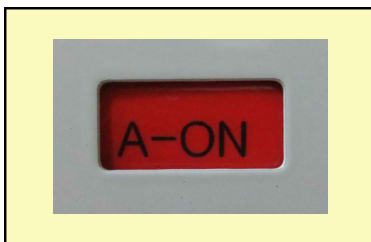


② Press Trip button using by screw driver.

Check indicator is B-OFF.



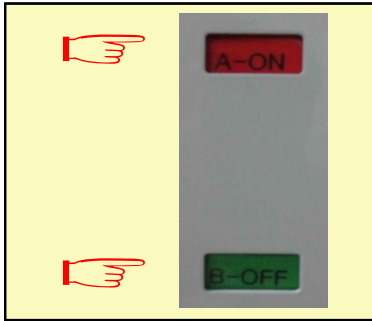
③ Insert lever into a hole, and push down the lever, and check indicator is A-ON.



④ Check indicator is A-ON.

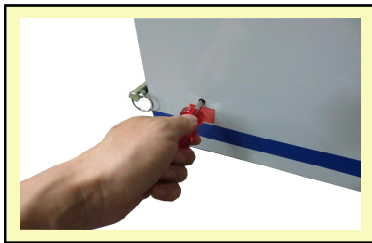
If fail to indicate A-ON, please re-do above mentioned step ③.

5.1.2 Transfer to "B" Power



① Check indicator is B-OFF.

If indicator A-ON, press Trip button, and check indicator A-OFF.

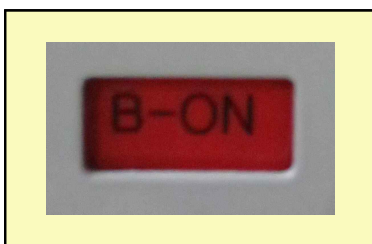


② Press Trip button using by screw driver.

Check indicator is A-OFF.



③ Insert manual operation lever into a hoe, and push down lever while B-Power close button using by screw driver. And transfer to B-Power



④ Check indicator is B-ON.

If fail to indicate B-ON, please re-do above mentioned step ③.

5.2 Draw In and Out method (In case of Draw type)

5.2.1 Draw In

- Make both power OFF using by PCN manual lever.
(article 5.1)
- Push up draw in & out lever which located at left and right side of cradle. (2 left and right)
Be refer lever's location mentioned on external view.



Note) It may cause damage of PCN, if lever were not push up.

1) Disconnected position

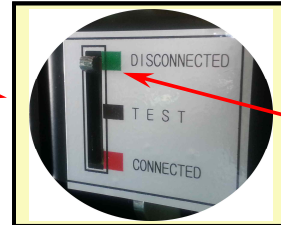
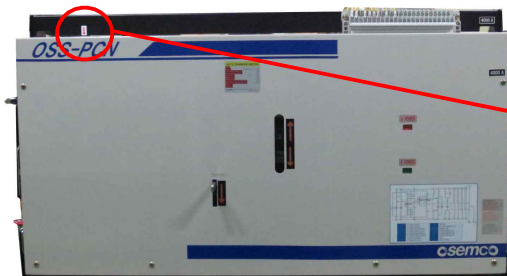
Status of main circuit terminal and operation circuit terminal is disconnected.

- Place PCN on the rail of cradle where located on left and right side, and then push PCN into inside of panel until draw in-out lever downed back.

Draw in-out rail



"Disconnected" will shows in Draw in-out indicator.



Disconnected

2) TEST position

Test and checking is available while main circuits terminal is disconnected, but operation circuit is connected.

- At disconnected position, push up draw in-out lever located in both side of cradle.

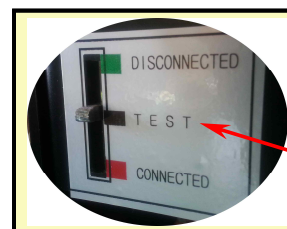
Caution) It may cause damage if draw in-out lever were not push up.

- Push PCN into inside of panel until draw in-out lever downed back.
"Test" will shows in Draw in-out indicator.

Caution) Please check if draw in-out lever downed.

(If not downed, incorrect operation may happen during test.)

- Make off of both power sources for draw in operation.(refer article 5.1)



TEST

3) Connected position

Normal operation position while PCN and main circuit connected.

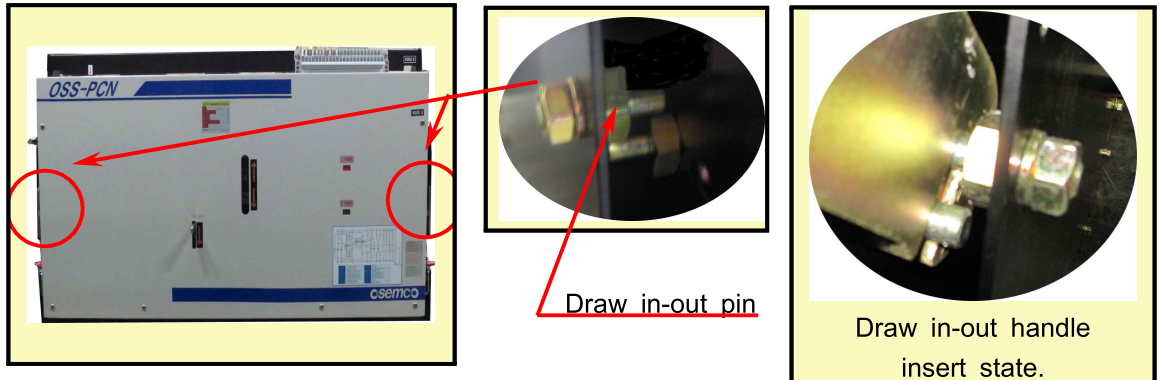
- Push up draw in-out lever at TEST position.

Caution) It may cause damage if draw in-out lever were not push up.

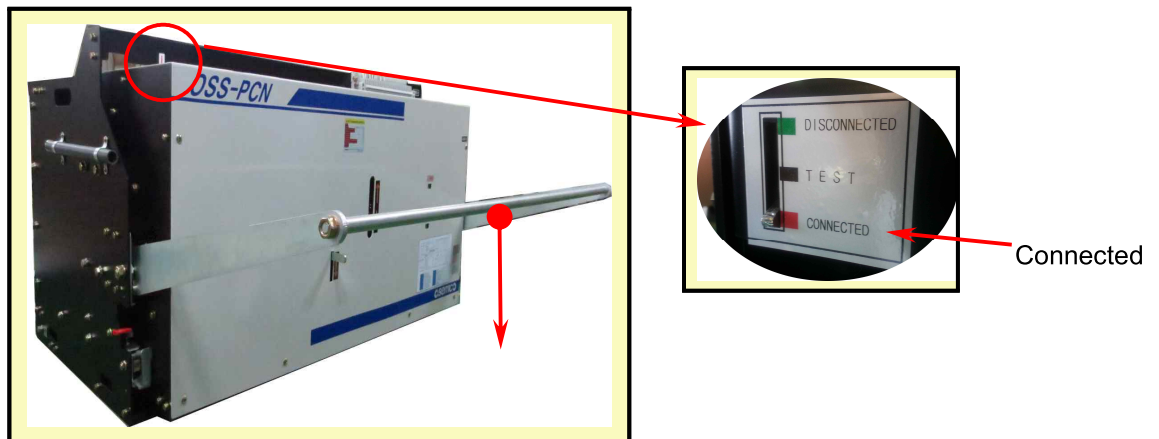
- push PCN into inside of panel until draw in-out lever downed back.

Caution) Switch will not be draw-in compartments if PCN is ON.

- Push PCN back surely as draw in-out handle reached in locking pin.

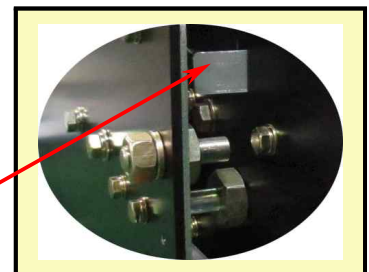


- After push PCN back, please push down draw in-out handle, and check if draw in-out indicator is "Connected" position. Draw in-out lever may be downed back.



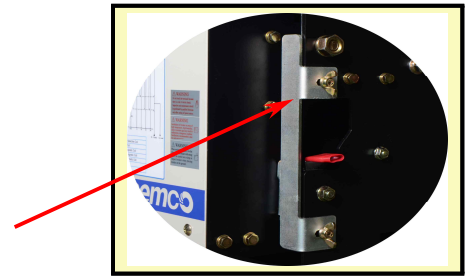
Caution) Make PCN "OFF" if draw in-out handle is not inserted while PCN "ON" status

Safety bar for Draw in-out



- After draw in complete, place cover of draw in-out and fix butterfly bolts. (2 bolts)

Caution) PCN may draw out if cover is not fixed due to vibration.



Cover for draw in-out lever

5.2.2 Draw out [refer article 5.2.1 3)]

- Make PCN both power OFF. (refer article 5.1)
- Remove cover for lever by unfix butterfly bolts.
- Insert draw in-out handle while draw in-out lever push up.
 - Caution) Safety bar will not allow draw in-out handle inserting under PCN "ON" status.
- PCN may draw out into "TEST" position while draw in-out handle inserted and push up.
 - In this time draw in-out lever may downed.
- At "TEST" position, push draw in-out lever up, and pull PCN out until "Disconnected" position.
 - Caution) PCN may fall down if PCN over the disconnected position or faster draw out forced.
- Remove PCN from cradle while draw in-out lever push up at "Disconnected" position.

6. Maintenance

Reasonable care in preventive maintenance will ensure high reliability and long life of ATS. Please note this article in details and do maintenance according to following instruction. Safety caution is required during maintenance.

6.1 Every 6 month, clean the dust and oil which residue on the ATS.

6.2 Visual inspection for distortion or discolour of contacts area.

6.3 Do ON-OFF operation of ATS one(1) time for a year to check rust, oxidation or dust placed.

6.4 Check loose of bolts and nuts.

6.5 Checking requirement

Checking Class	Checking Interval	
	General Environmental	Severe Environmental
Instantaneous	1 time 6 month	1 time 1 month
Periodic	1 time 1 year	1 time 6 month
Temporary	If necessary	

6.6 Instantaneous checking.

Checking Class	Check Point
Visual Checking	<ul style="list-style-type: none"> • Over heat and discolour of terminal • Rusts • Dusts • Abnormal smell • Damage, breakage, distortion and discolour of insulation materials.

7. Periodic Checking

Checking item		Checking requirement	Solution and trouble shooting
Insulation Materials	Contacts enclosure & Insulation Frame.	• No damage or crack on Insulation materials ?	• Stop operation and consider to replace parts.
		• No humidity and dust is found on surface ?	• If serious humidity and dust, stop operation and clean it up.
		• Any loosen of bolts ?	• Retighten bolts as specified torque. Bolts fixing should be balanced.
		• Nor arcing scratch on insulation barrier ?	• If serious, assume damage of contacts and arching chamber. Then consider to replace those parts.
	Arching Chamber	• Serious damage on arching chamber ?	• Considered normal condition if discolour of arching chamber inside. but if insulation barrier is broken, must consider to replace those parts.
		• Serious damage of arching barrier ?	• Consider to replace those parts.
Insulation Resistance	• Between phase and Ground • Insulation resistance of operation circuit	• 5M Ω over • 20M Ω over	
Conductive Parts	Contacts	• Any damage of auxiliary contacts ?	• Light discolour, clean up busing by sand paper or file in high density. If serious, replace those parts.
		• Keep good contacts ?	• Bad contacts may cause over heating.
		• Any wrinkles or scratch on contacts ?	• As a result of over heating, discolour, flashing and smelling founded.
		• Discolouring due to over heating on contacts ?	• If serious, deep discolour and distortion occurred.
		• Any loosen bolts on contacts ?	• Loosen bolt may cause over heating, re-fixing as much as specified torque.
Driving and operation	Mechanical Drive	• Rotating and lubricant device is keeping smooth?	• Do lubricant
		• No damage or rust on rotating and lubricant device ?	• Cause incorrective operation
		• No rust and damage on springs ?	• Replace damaged parts
		• No loosen on bolts and nuts ?	• Retighten again as specified torque
		• No loosen and damage on E-ring and stopper pins ?	• Replace or fix it on right position