Automatic Transfer Switches

OSS-PCN
2000A ~ 6300A

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 devided 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℃ ~ +60℃

b) Altitude ;
Below 2,000m

c) Environmental conditions ;
Relative humidity shall be less than 85% at max. temp. +40℃, less than 90% at 20℃. It shall not be allowed to use or store within the area of petrochemicals, ammonia or corrosive gas. (H2S $\leq$ 0.01ppm, SO2 $\leq$ 0.01ppm, NH3 $\leq$ a few ppm)

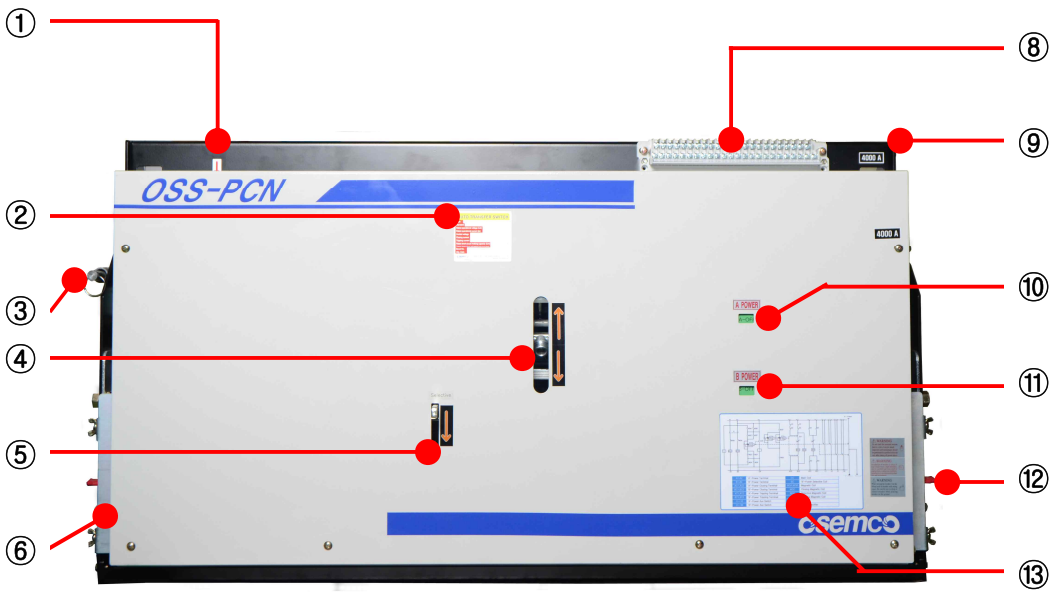
d) Storage temperature ;
-20℃ ~ +60℃

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 Draw in & out indicator	⑧ Connector terminal block
② Name Plate	⑨ Cradle
③ Manual Lever	⑩ “A” Power Transfer Indicator
④ Manual Lever Inlet	⑪ “B” Power Transfer Indicator
⑤ Selective Button for “B” Power-Closing	⑫ Draw in & out trigger
⑥ Draw in & our trigger cover	⑬ Circuit Diagram
⑦ Draw in & out handle	

4. Rated Specification

TYPE			620-PCN	625-PCN	632-PCN
Rated Operational Voltage (VAC) Ue			600		
Rated insulation Voltage (VAC) Ui			800		
Rated impulse withstand Voltage (VAC) Uimp			8000		
Rated Current Ie			2000A	2500A	3200A
Neutral Phase Current			2000A	2500A	3200A
Kind of Throw			Double Throw		
Connection			Back		
Number of poles			3 Poles , 4 Poles		
Weight (kg) 3P / 4P	Fixed		105 / 125	105 / 125	110 / 130
	Drawout		165 / 195	165 / 195	180 / 210
Rated Short-time Withstand Current (1sec) Icw			40 kA	50 kA	50 kA
Rated Short-circuit Making Capacity (peak) Icm			84 kA	105 kA	105 kA
Switching Capacity			AC-33B(10 Ie making/10 Ie breaking cos∅=0.35)		
Switching Frequency			10Time/Hour		
Operating Current peak Closing / Tripping	DC 110~125 V		65A / 15A		
	AC 100~110 V		65A / 15A		
	AC 200~240 V		50A / 15A		
Operating Time	"A" Power	Making	≤ 150ms		
		Breaking	≤ 90ms		
	"B" Power	Making	≤ 200ms		
		Breaking	≤ 90ms		
Number of Operating Cycles	Without Current		5,000		
	With Current		3,000		
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.				

TYPE			640-PCN	650-PCN	663-PCN
Rated Operational Voltage (VAC) Ue			600		
Rated insulation Voltage (VAC) Ui			800		
Rated impulse withstand Voltage (VAC) Uimp			8000		
Rated Current Ie			4000A	5000A	6300A
Neutral Phase Current			4000A	5000A	6300A
Kind of Throw			Double Throw		
Connection			Back		
Number of poles			3 Poles , 4 Poles		
Weight (kg) 3P / 4P	Fixed		180 / 220	200 / 250	200 / 250
	Drawout		220 / 275	245 / 400	300 / 400
Rated Short-time Withstand Current (1sec) Icw			65 kA	65 kA	65 kA
Rated Short-circuit Making Capacity (peak) Icm			143 kA	143 kA	143 kA
Switching Capacity			AC-33B(10 Ie making/10 Ie breaking cos∅=0.35)		
Switching Frequency			10Time/Hour		
Operating Current peak Closing / Tripping	DC 110~125 V		80A / 15A		
	AC 100~110 V		80A / 15A		
	AC 200~240 V		65A / 15A		
Operating Time	"A" Power	Making	≤ 150ms		
		Breaking	≤ 90ms		
	"B" Power	Making	≤ 200ms		
		Breaking	≤ 90ms		
Number of Operating Cycles	Without Current		3,000		
	With Current		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.				

5. Operation Method

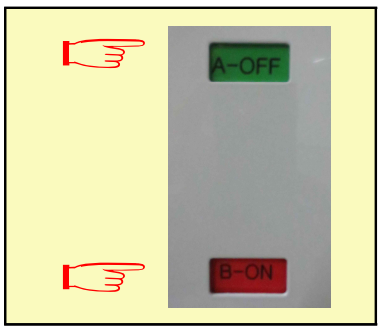
This procedure is for the maintenance or emergency operating of ATS.

Note 1) Change ATS panel to manual mode.

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

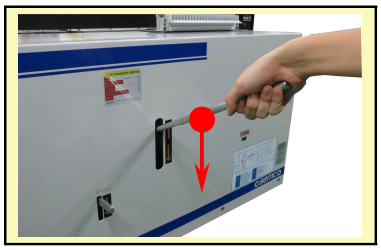
5.1 Manual Transfer

5.1.1 Transfer to “A” Power



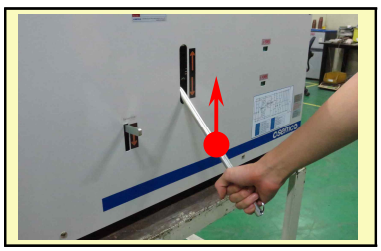
① Check indicator is A-OFF.

Make trip if indicator is shown B-ON.



② Insert manual lever into the lever hole, and push lever down to the full.

Check indicator is B-OFF.

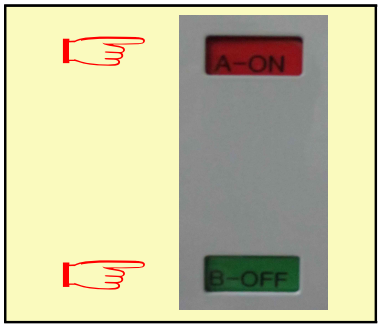


③ Insert manual lever into the lever hole, and pull lever up to the full. Then shall be switched to A power.

④ Check indicator is A-ON.

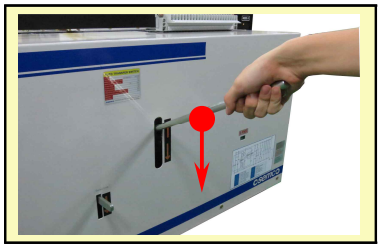
If fail to indicate A-ON, please re-do above mentioned step ③.

5.1.2 Transfer to “B” Power



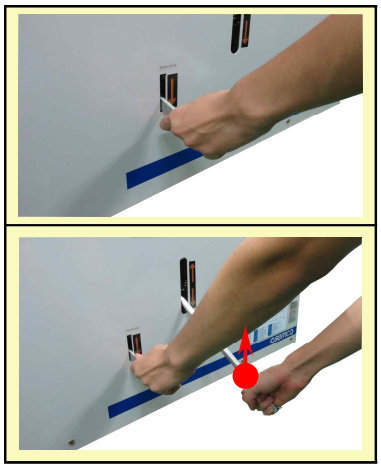
① Check indicator is B-OFF.

Make trip if indicator is shown A-ON.

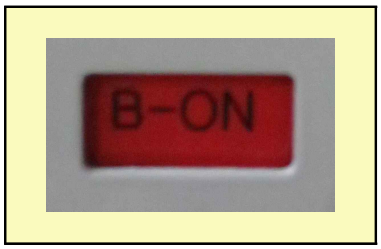


② Insert manual lever into the lever hole, and push lever down to the full.

Check indicator is A-OFF.



③ Press B power selection lever, and insert manual lever into the hole, then pull lever up to the full. Then shall be switched 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.

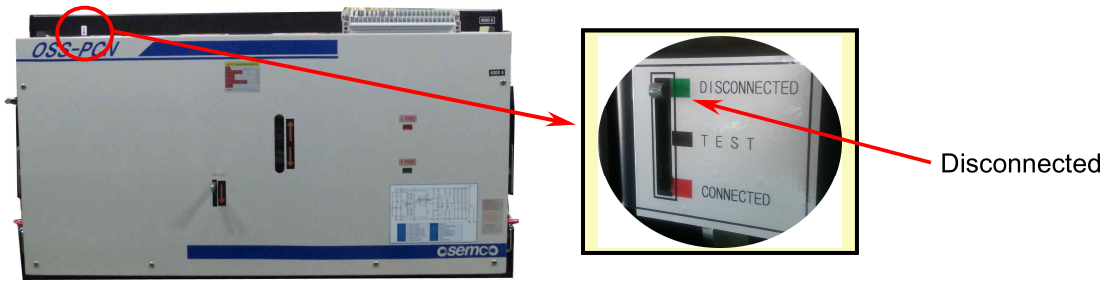
Note) It may cause damage of PCN, if lever were not push up.

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-our lever downed back.

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



2) TEST position

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

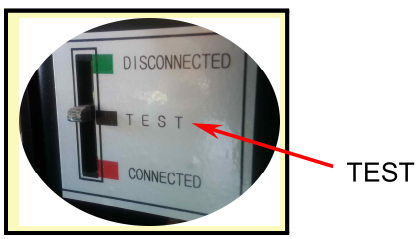
- At disconnected position, push up draw in-out lever located in both side of cradle.

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

- Push PCN into inside of panel until draw in-our lever downed back.

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

Caution) Please check if draw in-out lever downed. (If not downed, incorrective operation may happen during test.)



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

3) Connected position

Normal operation position while PCN and main circuit connected.

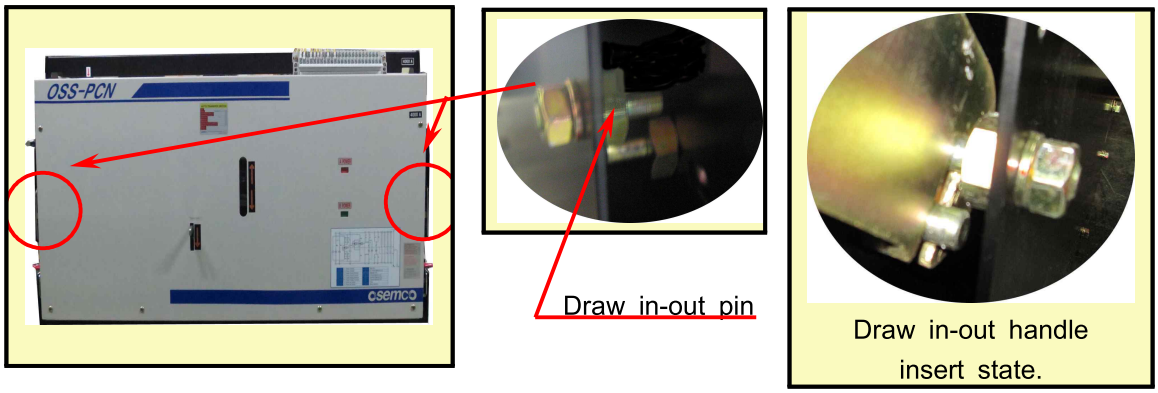
- Push up draw in-out lever at TEST position.

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

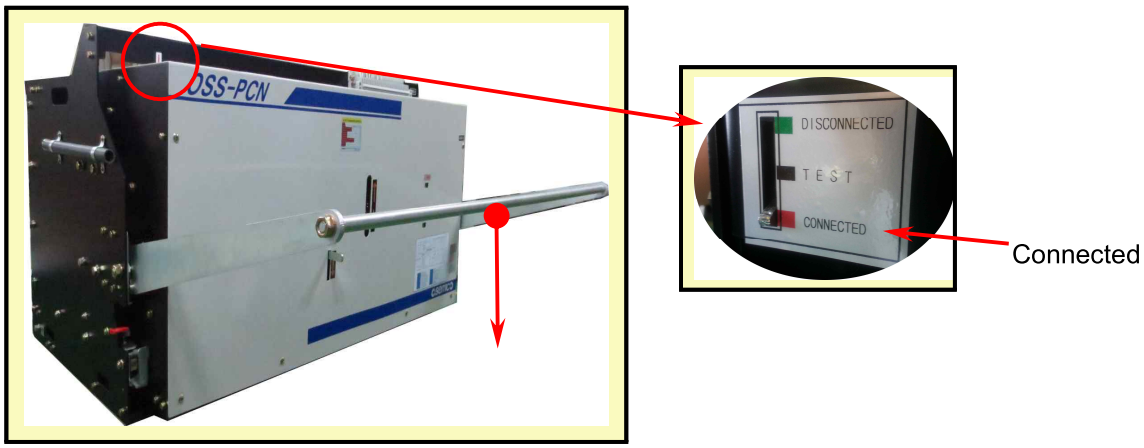
- push PCN into inside of panel until draw in-our lever downed back.

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

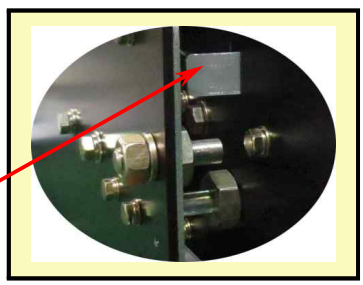
- Push PCN back surely as draw in-out handle reached in locking pin.



- 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.

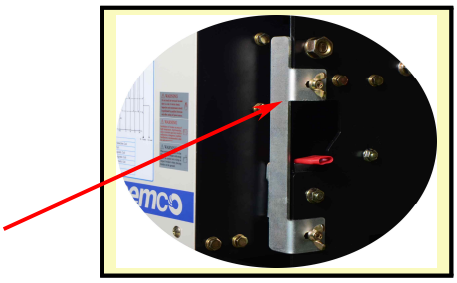


Caution) Make PCN "OFF" if draw in-out handle is not inserted while PCN "ON" status



- 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-ot hadle inserted and push up.

In this time draw in-out lever may downed.

- At "TEST" postion, push draw in-out lever up, and pull PCN out until "Disconnected" position.

Caution) PCN may fall down if PCN over the disconencted 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	• 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	• 5㏁ over • 20㏁ 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