Automatic Transfer Switches

T3 , TB3 - Type

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.

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)

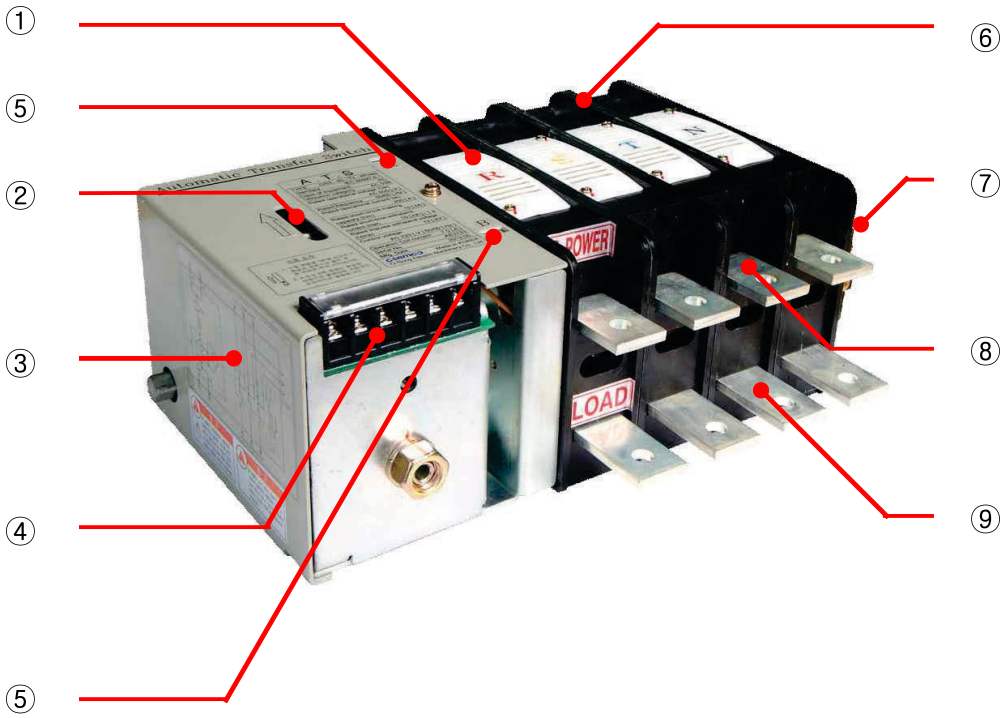
d) Storage temperature ;
-20℃ ~ +60℃

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



No	Designations	No	Designations
①	Arc-extinguishing Chamber	⑥	Main Circuit Terminal for "A' Power
②	Manual Lever Inlet	⑦	Aux Switch
③	Circuit Diagram	⑧	Main Circuit Terminal for "B' Power
④	Control Circuit Terminal Block	⑨	Main Circuit Terminal for Load
⑤	On/Off Indicator		

4. Rated Specification

TYPE		61-T3, TB3			62-T3, TB3			64-T3, TB3			66-T3, TB3		
Rated Operational Voltage (VAC) Ue		600											
Rated insulation Voltage (VAC) Ui		600											
Rated impulse withstand Voltage (VAC) Uimp		12,000											
Rated Current Ie		100A			200A			400A			600A		
Neutral Phase Current		100A			200A			400A			600A		
Kind of Throw		Double Throw 쌍 투											
Connection		Front 표 면 (T3) , Back 배 면 (TB3)											
Number of poles		2P	3P	4P	2P	3P	4P	2P	3P	4P	2P	3P	4P
Weight (kg)		7	8	9	9	10	12	16	19	22	16	19	22
Rated Short-time Withstand Current (1sec) Icw		5 kA			10 kA			12 kA			12 kA		
Rated Short-circuit Making Capacity (peak) Icm		7.5 kA			17 kA			24 kA			24 kA		
Switching Capacity		AC-33B (10 Ie making/10 Ie breaking) (Ie≤100A cos∅=0.35 , Ie>100A cos∅=0.45)											
Switching Frequency		60Time / Hour											
Operating Current peak	DC 110~125 V	18 A						25 A					
	AC 100~110 V	18 A						25 A					
	AC 200~240 V	8 A						8 A					
Operating Time	Change-over Time	≤ 130ms						≤ 160ms					
	Opening Time	≤ 50ms						≤ 60ms					
	Contact Transfer Time	≤ 80ms						≤ 120ms					
Number of Operating Cycles	Without Current	250,000											
	With Current	50,000											
Cautions	1. For complete operation, Be sure to provide control source for more than 0.5sec												

5. Precautions

5.1 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.

5.2 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 so that ATS can be stored in good condition.

1) Please avoid any place of high temperature and high humidity.
2) Please avoid any place of noxious gases and dust. Particularly, Please avoid mixiture 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.

5.3 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.

6. Installation & Connection

6.1 Method

1) Please place ATS so that name plate can be clearly read from the front.
2) Please install ATS horizontally on vertical plane in accordance with below FIg 1.
3) When fitting connectors, Please do not over-fix so that connectors of main circuit should be kept horizontally.

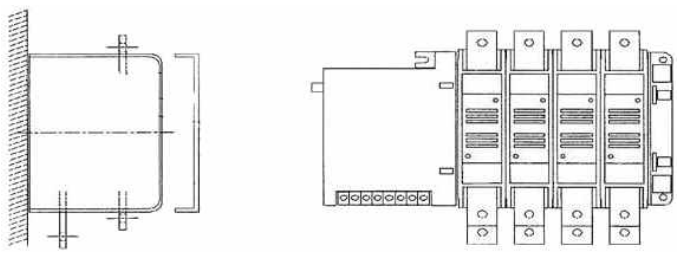


Fig 1

6.2 Caution

The construction and characteristics of ATS is designed according to constant mounting direction. If mounting direction is changed, Characteristic might be changed and following malfunction might be occurred.

1) When switching, Operating current can be increased because mechanical Characteristic is not corresponding to design criteria.
2) Switching time and switching capacity can be changed.
3) In worst case, Switching can not be made and "Again" might be indicated.

7. Operation Method

7.1 Manual Mode

Danger

This device shall be operated under no-load condition at manual operation mode because switching power and speed is different between operators.

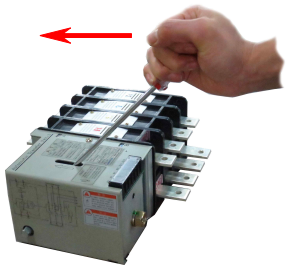
Caution

In case of manual operation, please make switch "OFF" or change to manual mode from auto mode.
Electrical operation and trouble would be happen.

1) Once manual closing operation, please insert a screw driver (+ 6mm) into a manual operation hole, and push lever up until end stop, and return lever down to original position.

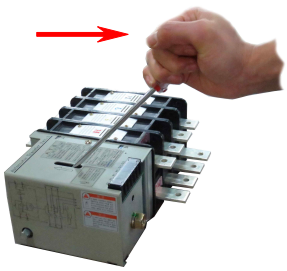
2) Please check indicator is On or Off.

3) A power and B power switching operation will be done in same way, and A and B power changed in turn.



① Insert + 6mm screw driver into the hole, and push up to arrow direction.

② Push screw driver up until end stop.



③ Return screw driver to the original position.

Caution

Remove screw driver from the hole after manual operation.
Accident would be happen when auto operation is doing.

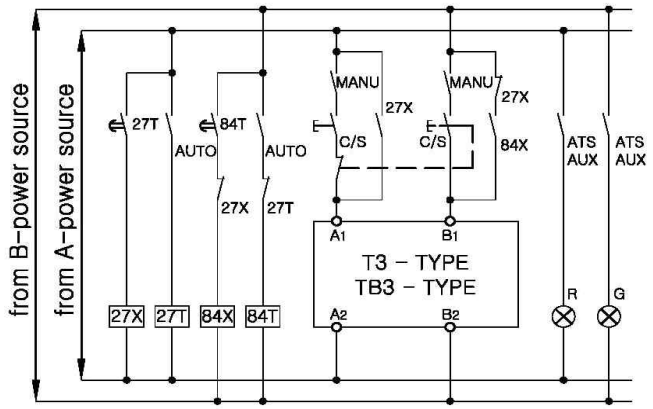
7.2 Auto Mode

For Auto operation, please use ATS controller or build control circuit.

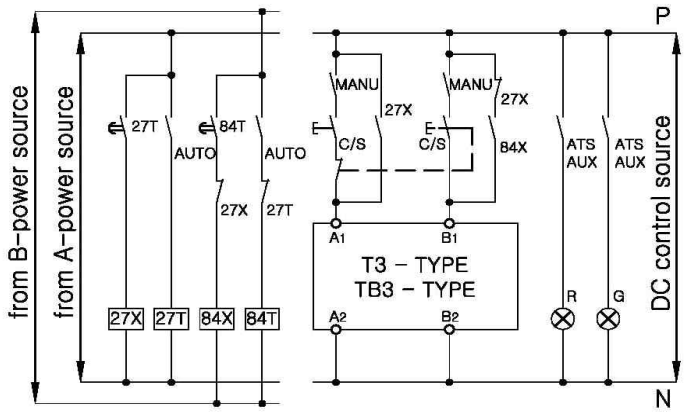
Please see wiring drawing for control circuit.

Wiring Diagram

1. AC Operating and Control



2. DC Operating and Control



27X	Source-A Operating Relay	84X	Source-B Operating Relay
27T	27X Operating Delay Relay	84T	84X Operating Delay Relay
AUTO,MANU	Automatic , Manual	C/S	Control Switch

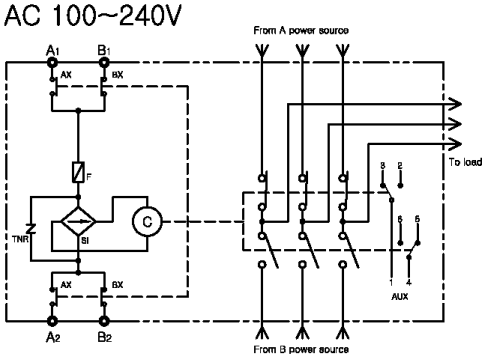
8. Drawings

8.1 Circuit Diagram

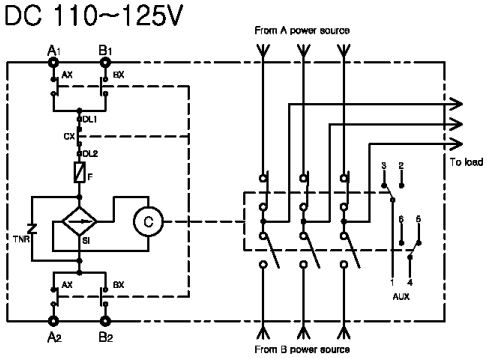
T3, TB3-Type

Circuit Diagram (회로도)

AC 100~240V



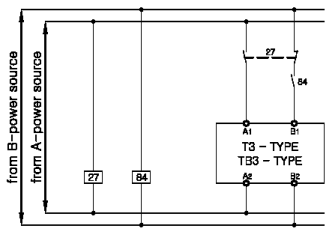
DC 110~125V



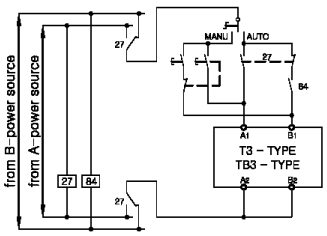
A1 , A2	A-Power Closing Terminal	AX , BX , CX	Control Switch	SI	Silicon Rectifier
B1 , B2	B-Power Closing Terminal	AUX	Aux Switch	D	Diode
C	Closing coil	TNR	Varistor for Surge suppression	F	Fuse

Typical Operating Circuit (대표적 조작회로 예)

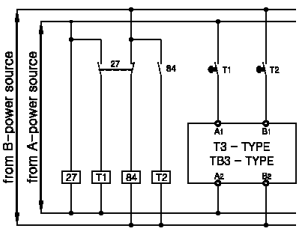
Standard
(일반적인 절체)



In case of using
a changeover switch
(수동-자동 절체)

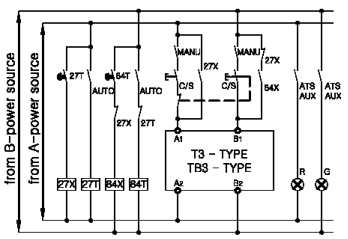


In case of using a timer
(타이머를 이용한 절체)

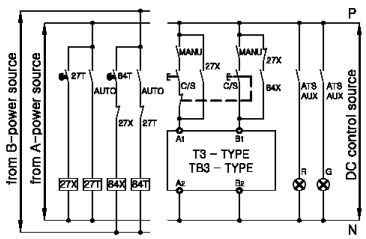


Wiring Diagram (결선도)

AC Operating and Control



DC Operating and Control



27X	Source-A Operating Relay	84X	Source-B Operating Relay
27T	27X Operating Delay Relay	84T	84X Operating Delay Relay
AUTO,MANU	Automatic , Manual	C/S	Control Switch

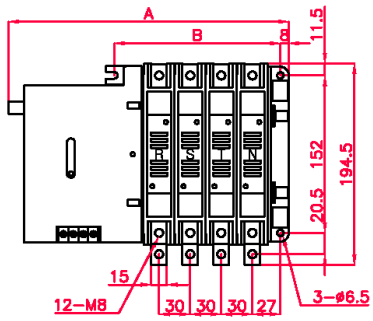
8.2 Outline Dimension

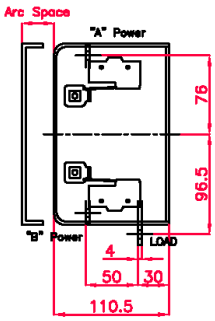
T3–Type 100A~600A

unit : mm

OSS–61–T3

100A

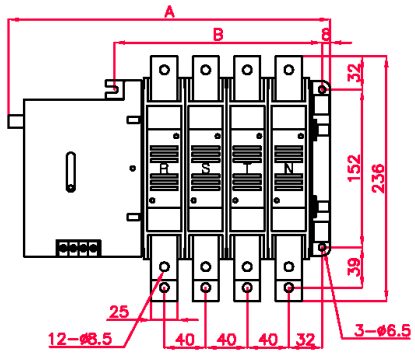


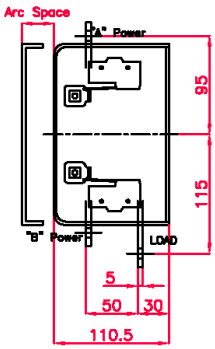


	Dimension	
Pole	A	B
2 P	204	100
3 P	234	130
4 P	264	160

OSS–62–T3

200A

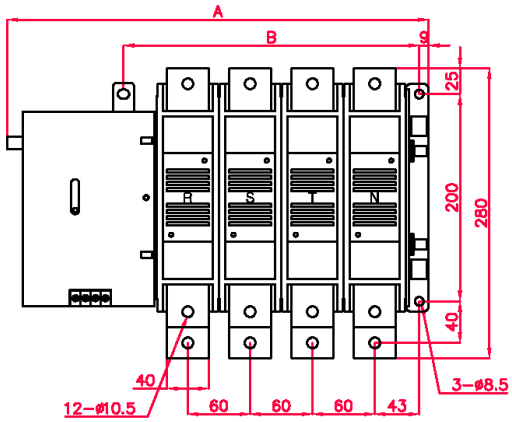


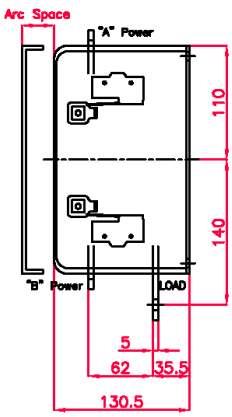


	Dimension	
Pole	A	B
2 P	224	120
3 P	264	160
4 P	304	200

OSS–64–T3
OSS–66–T3

400A, 600A



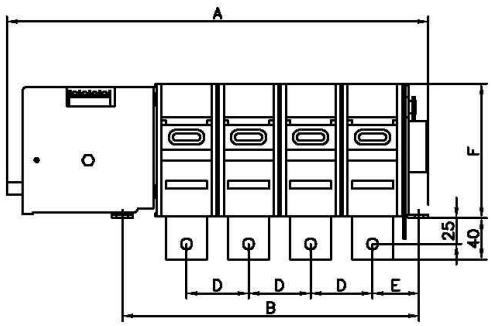


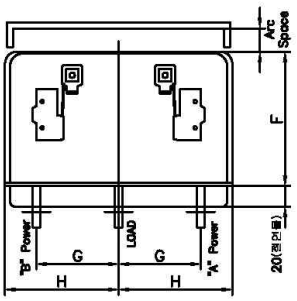
* Arc space for main circuit
- 30mm for AC 220V
- 60mm for AC 660V

	Dimension	
Pole	A	B
2 P	283	165
3 P	343	225
4 P	403	285

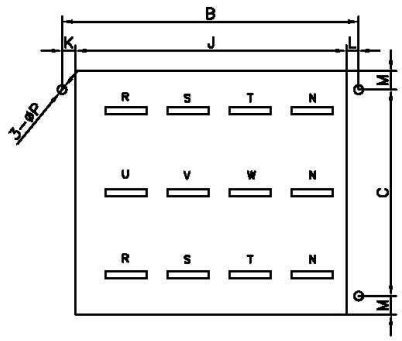
TB3-Type 100A~600A

unit : mm

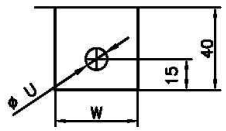




* Arc space for main circuit
- 30mm for AC 220V
- 60mm for AC 600V



PANEL CUTTING



		61-TB3	62-TB3	64-TB3	66-TB3
W		15	25	40	
U		ø8.5		ø10.5	
T	LINE	4	5	5	
	LOAD	4	5	7	

TERMINAL THICKNESS

all dimensions are in mm. (본 카다록의 치수는 mm임)

		A	B	C	D	E	F	G	H	J	K	L	M	P
61-TB3	2 P	206	102	152	30	29	110.5	62.5	87.5	82	9	11	19	ø6.5
	3 P	236	132							112				
	4 P	266	162							142				
62-TB3	2 P	226	122	152	40	34	110.5	63	87.5	102	9	11	19	ø6.5
	3 P	266	162							142				
	4 P	306	202							182				
64-TB3 66-TB3	2 P	285	167	200	60	45	130.5	80.5	110	142	13	12	18	ø8.5
	3 P	345	227							202				
	4 P	405	287							262				

9. 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.

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

9.2 Visual inspection for distortion or discolour of contacts area.

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

9.4 Check loose of bolts and nuts.

9.5 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	

9.6 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.

10. 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