

2011.05

# AUTOMATIC TRANSFER SWITCHES



MCCB Type



## A. Automatic Transfer Switches

### 1. Functions and features:

- a. Main function: When the normal power supply is abnormal, the load will switch to emergency power (generators). While the normal power return, the load will back to normal power supply.
- b. Mechanical Interlock: To make sure two breakers in ATS could not be switch "ON" in the same time.
- c. Transmission gear switch structure:When switching, it will switch two breakers off,then put one breaker on. The design could avoid the breakers put on in the same time.
- d. Following IEC 60947-6 standard

### 2. Basic equipment:

- a. ATS with two Shihlin' MCCB which is qualified in electrical and mechanical performance and quality(with overload and short-circuit protection).
- b. Basic transfer switches(BTS)
- c. Electrical and mechanical Interlock
- d. Simple operating handle.
- e. Control Panel-Electronic(including three adjustable delay timers,and one fixed delay timer)
- f. Self-test: normal power failure simulation test.



( For voltage:220V/380V )

### 3. Options:

- a. Over and under voltage protection
- b. Manual handle with lock
- c. Input phase fault detector
- d. 440V above power transformer for control panel
- e. Outside the box

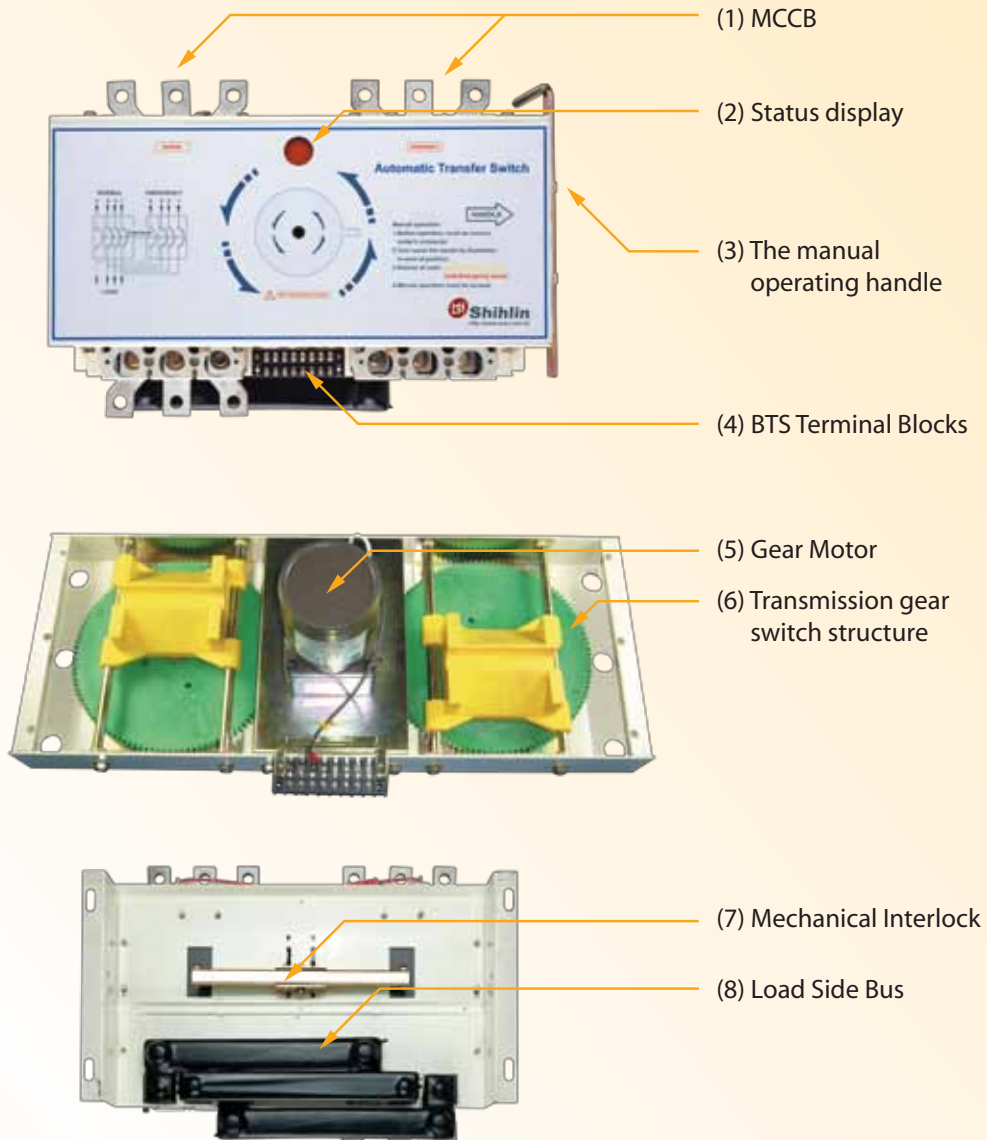
## B. MCCB TYPE Specification

Type	Pole	Rated current In (A)	AC Rated Breaking Capacity Sym r.m.s(kA) IEC 60947-2 Icu	
			220V	380V
BS100CN	2P, 3P, 4P	10, 15, 20, 30, 40, 50, 60, 75, 100.	10	7.5
BS100SN	2P, 3P, 4P		25	15
BS100HN	2P, 3P, 4P		50	30
BS225CN	2P, 3P, 4P	125, 150, 175, 200, 225.	30	22
BS225SN	2P, 3P, 4P		50	30
BS400CN	2P, 3P, 4P		35	25
BS400SN	2P, 3P, 4P	250, 300, 350, 400.	50	35
BS400HN	2P, 3P, 4P		85	50
BS600CN	3P, 4P		35	25
BS600SN	3P, 4P	500, 600.	50	25
BS600HN	3P, 4P		85	43
BS800CN	3P, 4P		50	25
BS800SN	3P, 4P	700, 800.	85	50
BS800HN	3P, 4P		100	70
BS1000HS	3P		1000.	130
BS1200HS	3P	1200.	130	100
BS1600HS	3P	1400, 1600.	130	100

Note 1: Rated Breaking Capacity (kA) IEC 60947-2

Note 2: Special breaking capacity please contact sales representative.

### C. The main structure analysis diagram



### D. The main structure description

- (1). Shihlin Brand Molded Case Circuit Breaker (Shihlin Electric circuit breakers quality guaranteed).
- (2). The Input Display: Display change the red ON / Green OFF conditions, when ATS switch escape from the status quo.
- (3). Manual operating handle:
  - a. Mode of operation, depending on the direction of rotation against the clock to make switch to change the ON and OFF.
  - b. Optional handles with locks, to prevent equipment by non-management staff of arbitrary action, while the damage.
- (4). BTS Terminal Blocks
- (5). Gear Motor: The composition of induction motor and reduction gear, according to torque required switch configuration.
- (6). Transmission gear switch structure.
- (7). Mechanical Interlock devices:
 

The use of seesaw principle of chain device, in any side of the MCCB inputs on the other side of the bakelite MCCB will bulge to withstand the primary contact, to avoid both sides of the Switch inputs at the same time.
- (8). Load-side bus (400A and above):
 

Copper forging, jumper two of the secondary side switches, copper-handling devices on the base below the copper connections with copper pillars connected with each other, after locking, and to Silver welding, strengthening the conductive area, resin covered conductive adhesive as a whole at any thickness up to 1.5mm, insulation withstand voltage of over 1000V or more.

## E. Control Panel-Electronic

### 1. Features

- a. Following EMC standard (IEC 60947-6), with anti-surge and anti-noise capability.
- b. Reading Status Easily: LED lights show status of power supply and load.
- c. Self-testing function:
  - (1).Generator testing switch(AUTO-ON-OFF)
  - (2).Normal power failure simulation test(TEST-AUTO)
- d. Flexibility: Option function for "Over and under voltage protector" and "Input phase fault detector"

### 2. Delay timer instructions

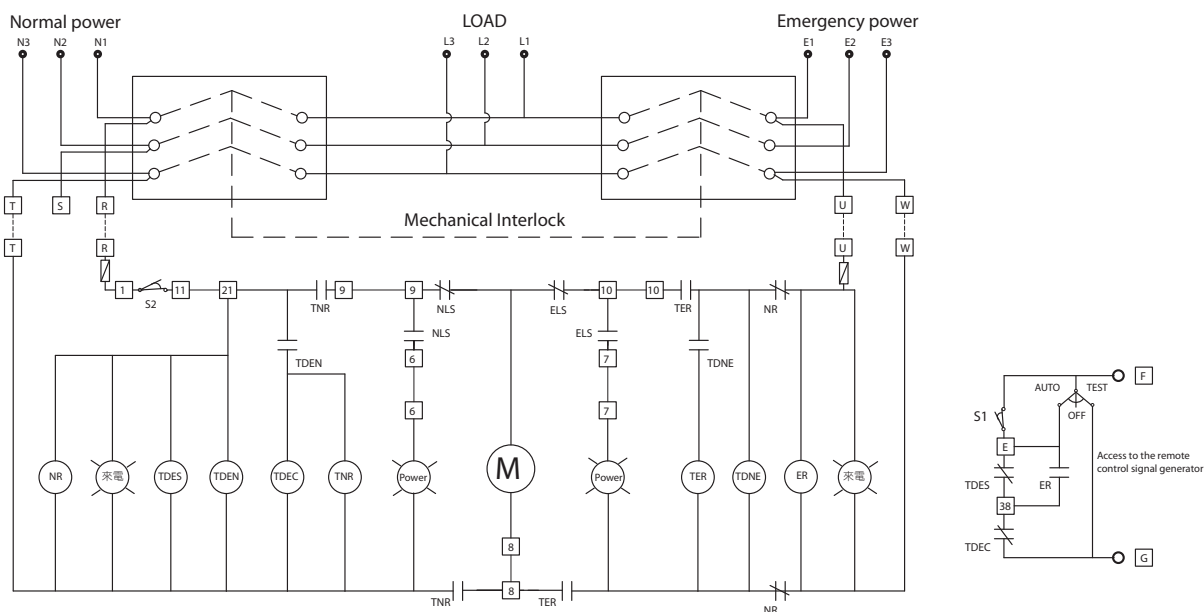
- a. TDEN:Time delay of transfer from Emergency to Normal when the normal power returned to normal.
- b. TDNE:Time delay of transfer from Normal to Emergency when the normal power supply is abnormal.
- c. TDES:Time delay on engine starting when the normal power supply is abnormal.(Fixed 4 seconds).
- d. TDEC:Time delay for engine cool-off after the power supply from the emergency power to the normal power.



Control panel: 220V(standard)

Disk hole size: 194.5mm Width (W) x 164mm high (H)

## F. Control circuit diagram



#### Notes:

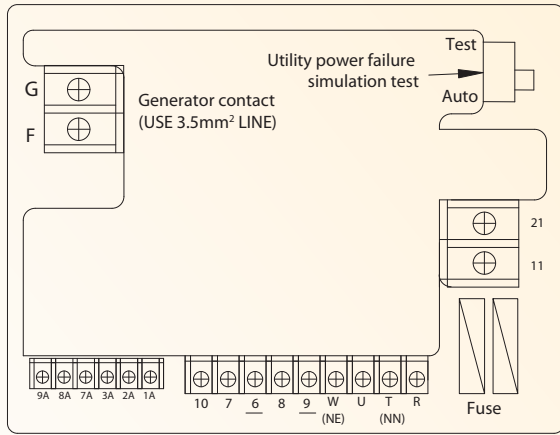
- 1.S1 Generator Remote Control Auto / Test function
- 2.S2 common side power simulation test
3. Dashed line for the additional equipment
4. Controlling voltage is 220V, if no please install the transformer voltage

#### Code Description:

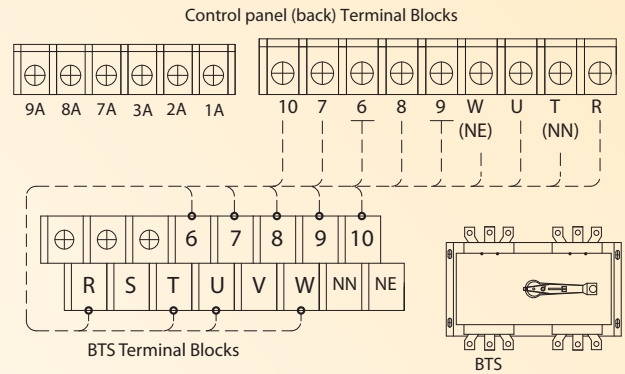
- TNR, TER, ER: Power Relay  
 M: motor  
 TDEN: from emergency to normal power supply switching time required  
 TDNE: from normal to emergency power supply switching time required  
 TDES: generator start time delay  
 TDEC: generator shutdown delay time

## G. Control panel configuration diagram

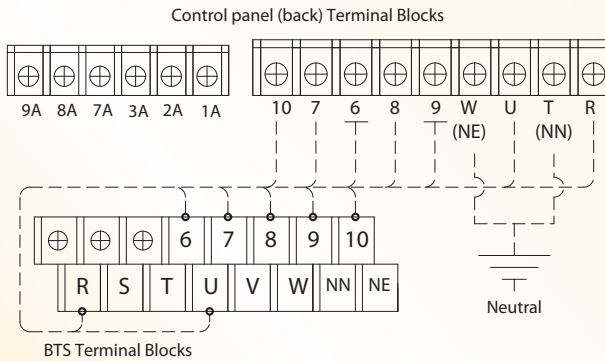
### Control panel (back) Description



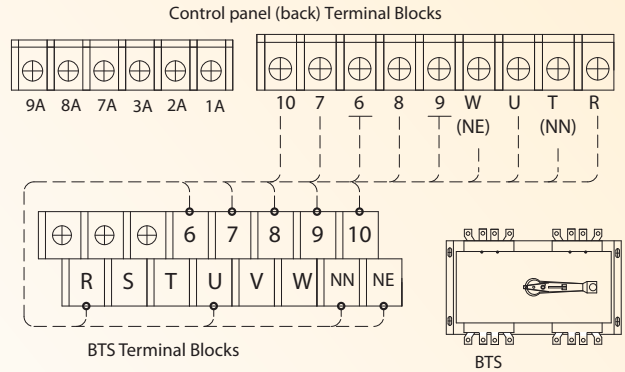
### 3P-ATS access line 3Ø3W 220V



### 3P-ATS access line 3Ø4W 220V/380V



### 4P-ATS access line 3Ø4W 220V/380V



#### ATS for the 3P Connection :

System voltage : 3Ø3W 220V : Normal power connect to R, T. Emergency power connect to U, W.

3Ø4W 220V/380V : Normal power connect to R. Emergency power connect to U. Neutral (N) connect to T, W.

3Ø3W 380V/480V above: Normal power through the transformer into 220V and connect to R, T. Emergency power go through the transformer to 220V and connect to U, W.

#### ATS for the 4P connection :

System voltage : 3Ø4W 220V/380V : Normal power connect to R, NN. Emergency power connect to U, NE.

3Ø4W 120V/208V : Normal power connect to R, T. Emergency power connect to U, W.

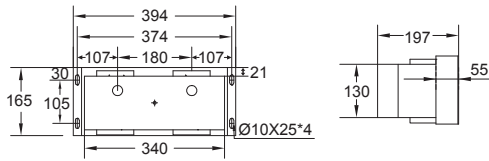
**Notes:** The standard control panel is required 220V input. If required for 380/440V input, please refer the transformer specification as below.

Transformer (PT) selected :

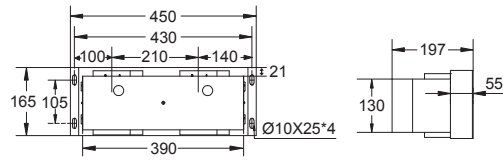
- a. 225AT below ATS use 100VA.
- b. 250 ~ 400AT of ATS use 150VA.
- c. 500AT above ATS use 300VA.

H. Overall dimensions (mm)

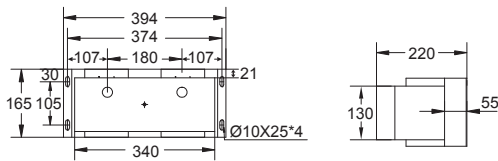
3P BS100 & BS225 type



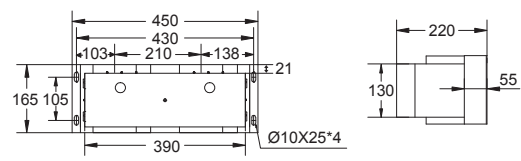
4P BS100 & BS225 type



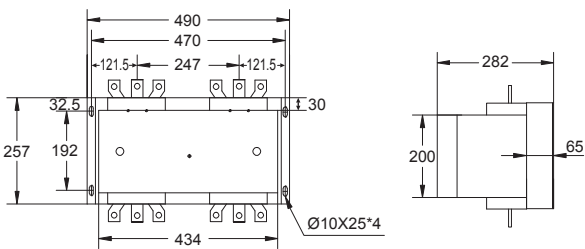
3P BS100 & BS225 high capacity(kA) type



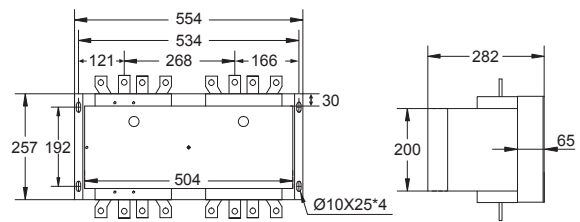
4P BS100 & BS225 high capacity(kA) type



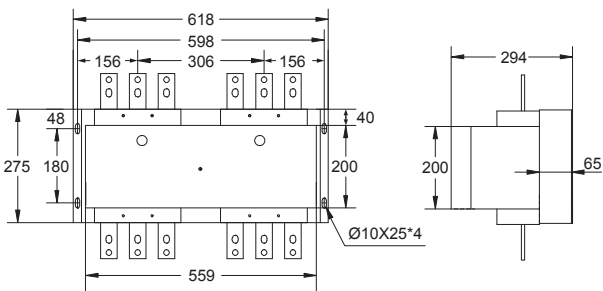
3P BS400 type(including high capacity(kA))



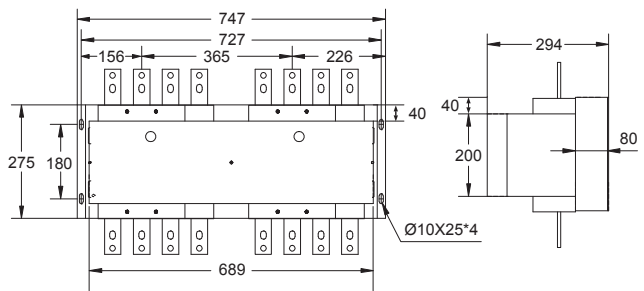
4P BS400 type(including high capacity(kA))



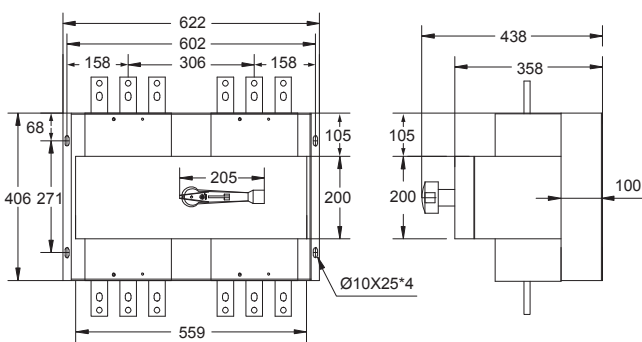
3P BS600 & BS800 type



4P BS600 & BS800 type



3P BS1000 above high capacity(kA) type



Description:

1. This table using the units of millimeters (mm) mark.
2. This form is only marked (for industrial use - Standard type) size.
3. This table is for standard specification, if require the special specification, please contact representative.



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