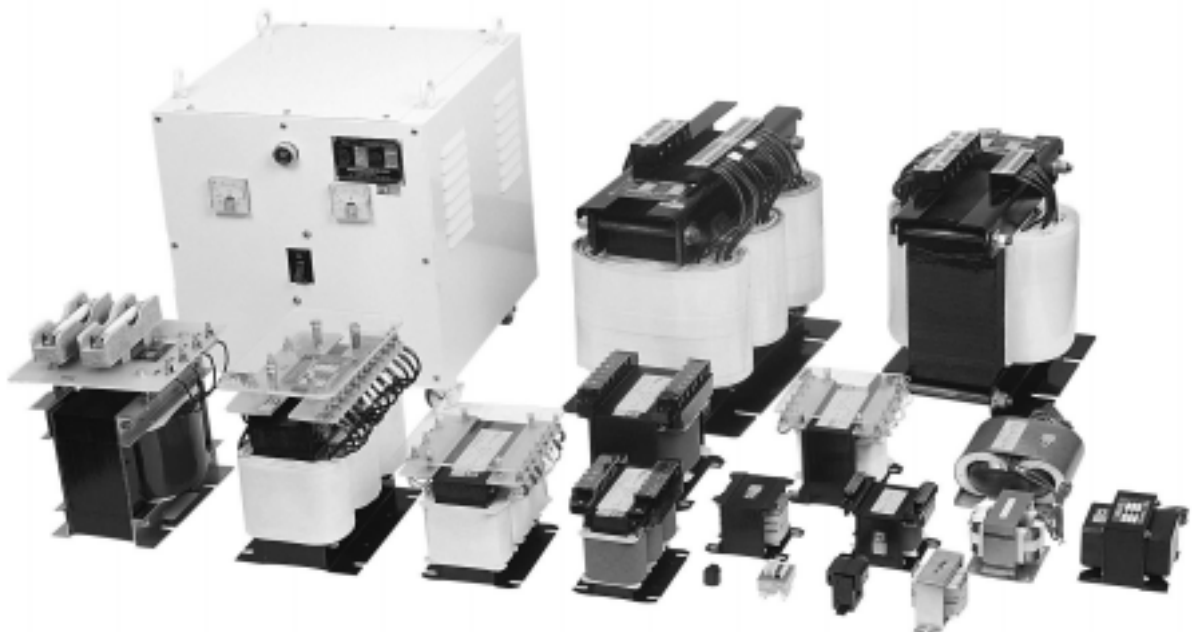


TRANSFORMER

■ TRANSFORMER EXPLANATION1-2

■ TRANSFORMER SPECIFICATION.....1-9



TRANSFORMER

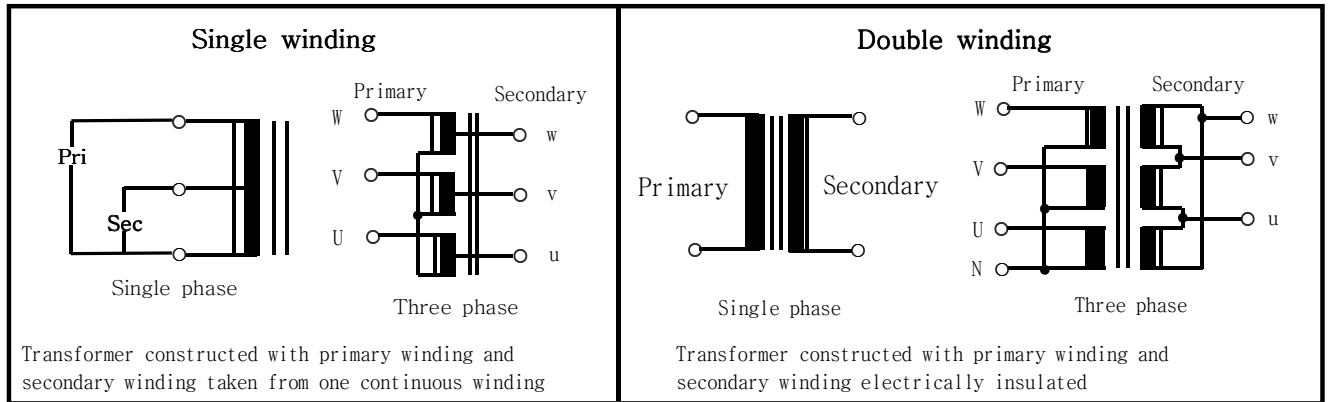
EXPLANATION

ORDER

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1. Single transformer and double transformer Specification

Single winding transformer and double winding transformer circuit



Calculation of capacity

$$1\phi \quad W(\text{VA}) = E(\text{V}) \times I(\text{A})$$

$$3\phi \quad W(\text{VA}) = E(\text{V}) \times I(\text{A}) \times \sqrt{3}$$

W=Capacity	UNIT:VA
E=Secondary voltage	UNIT:V
I=Secondary current	UNIT:A

Transformer protector circuit

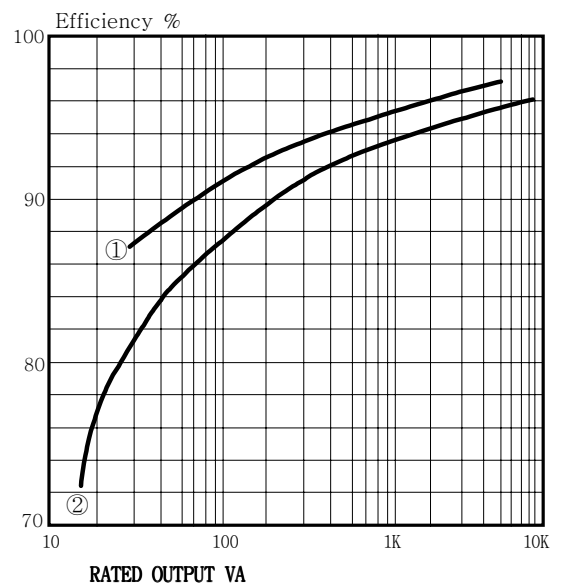
Reasons of accident at transformer are error of transformer itself, error of load at the wiring linkage, error of electric power and increase of temperature etc. in my opinion.

Error of transformer is directly related with fire and electric shock and proper and adequate measure therefore is required in order to use transformer easily. Particularly, electric current fuse, circuit-protector and protector electric circuit etc. are used. When electric current fuse, circuit-protector are selected, two cases should considered. One is when circuit protector does not operate for input current which is more than ten times of temporary normal current in case of thrust of electric current and the other is when circuit is completely intercepted in case of error. Please select circuit-protector which meet two factors mentioned above at the same time. They are electric current fuse, time-lock fuse and transformer protector with initial feature in terms of circuit-protector.

When normal type and high speed type are used, precautions must be made if it operates in abnormal situation or occurs insufficiently. Method to calculate rated figure of fuse or protector are as below.

Rated figure of fuse = the first normal electric current of transformer / 0.7-0.8
The first normal electric current of transformer = rated capacity / (efficiency x input voltage) - refer to the table on the right hand side in terms of efficiency.

Rated output-efficiency curve



- ① Single phase single-winding
- ② Single phase double-winding

- When WY21-1KVA (single phase 1KVA) is used as rated capacity at input voltage 220V.
The first rated electric current = 1000W / (0.93 x 220V) = 4.89
- With regard to rated value of fuse to be designed = 4.89A / 0.7-0.8 = 7-6A

2. TYPE OF PICTURE

<p>1.WT TYPE</p> 	<p>2.WE TYPE</p> 	<p>3.WO TYPE</p> 
<p>4.WB TYPE</p> 	<p>5.WP TYPE</p> 	<p>6.WBB TYPE</p> 
<p>7.WPT TYPE</p> 	<p>8.WPB TYPE</p> 	<p>9.WPO TYPE</p> 
<p>10.WHT TYPE</p> 	<p>11.WYC TYPE</p> 	<p>12.CT TYPE</p> 
<p>13.PULSE TYPE</p> 	<p>14.WDC TYPE</p> 	

3. Terminal block dimension & specification

■ Terminal block standard

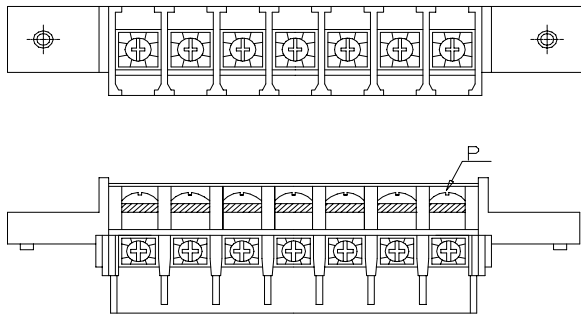
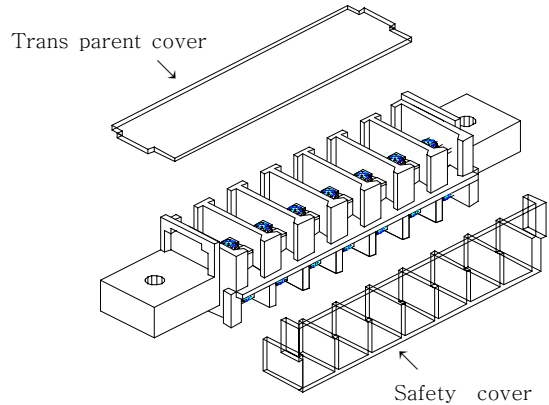


FIG 1



■ Backlite & nickel bolt standard

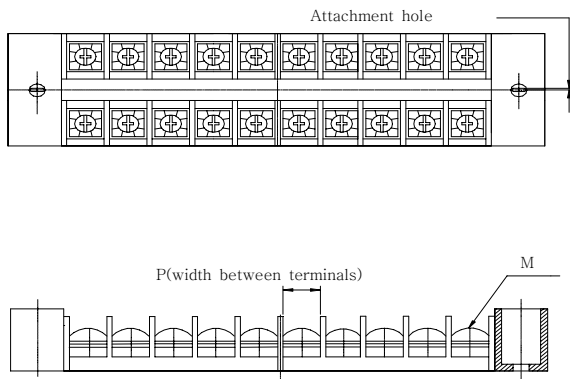


FIG 2

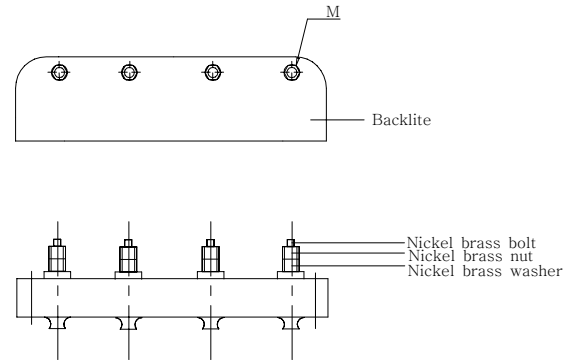


FIG 3

■ Voltage, Current, capacity terminal and bolt type compare chart.

(A)	TYPE		FIG	VOLTAGE		P	M	TERMINAL DESIGNATION	SUITABLE WIRE	RING TERMINAL STANDARD	CAPACITY STANDARD
	(TERMINAL)	(BOLT)		PRI. (V)	SEC. (V)						
0.5	○		1	220 UP 460 DOWN	110 UP 220 DOWN	6.5	3.5	3.5× 7	0.75 mm ²	1.25-3.8φ	50VA UP 2KVA DOWN
1.0	○		1			8.5	4.0	4.0× 8.5	0.75 mm ²	1.25-4.3φ	
2.0	○		1			9.0	4.0	4.0× 8.5	1.25 mm ²	1.25-4.3φ	
3.0	○		1			9.0	4.0	4.0× 8.5	1.25 mm ²	1.25-4.3φ	
5.0	○		1			12.0	4.0	4.0× 10	1.25 mm ²	1.25-4.3φ	
7.5	○		1			12.0	4.0	4.0× 10	2.0 mm ²	2.0-4.3φ	
10	○	○	1.2			12.0	4.0	4.0× 10	2.0 mm ²	2.0-4.3φ	2KVA UP
25	○	○	1.2			10.3	4.5	4.5× 10	3.5 mm ²	3.5-5.4φ	7.5KVA DOWN
50		○	3				8		14 mm ²	14-8.4φ	7.5KVA UP 50KVA DOWN
75		○	3				10		22 mm ²	22-10.5φ	
100		○	3		12		38 mm ²	38-13φ			
150		○	3		14		60 mm ²	60-15φ			
200		○	3		16		100 mm ²	100-17φ			

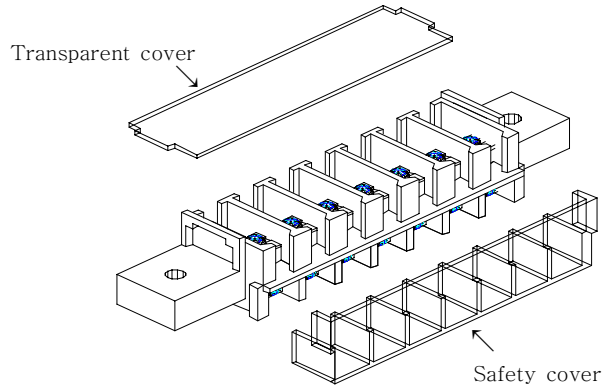
4. NEW Terminal block specification

■ Terminal base shape

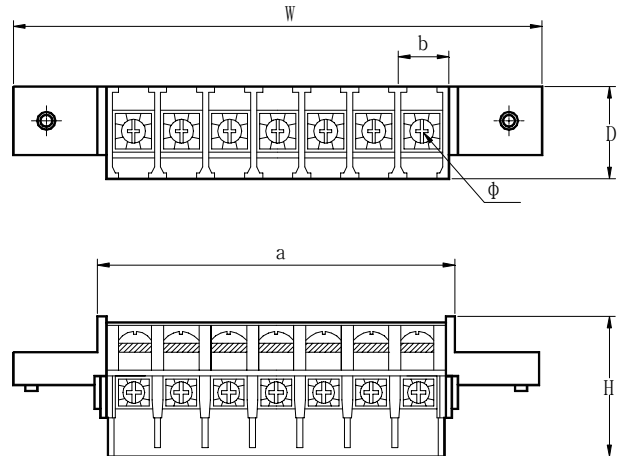
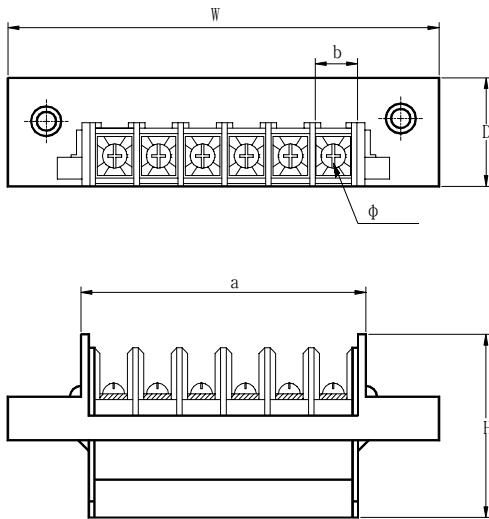
● WT TYPE



Drawing showing cover removed



■ Size of wt terminal class



■ Terminal specifications

RATING CURRENT	600V 10A Min/50A Max
INSULATION RESISTANCE	MORE THEN 100 MΩ DC 500V
WITHSTAND VOLTAGE	AC 2000V / MINIUTE
WIRE BANDING SCREW	M3.5× 8 / M4× 10 BANDING SCREW
MAXIMUM ACCEPTABLE TEMPERATURE	-40℃ ~+ 85℃

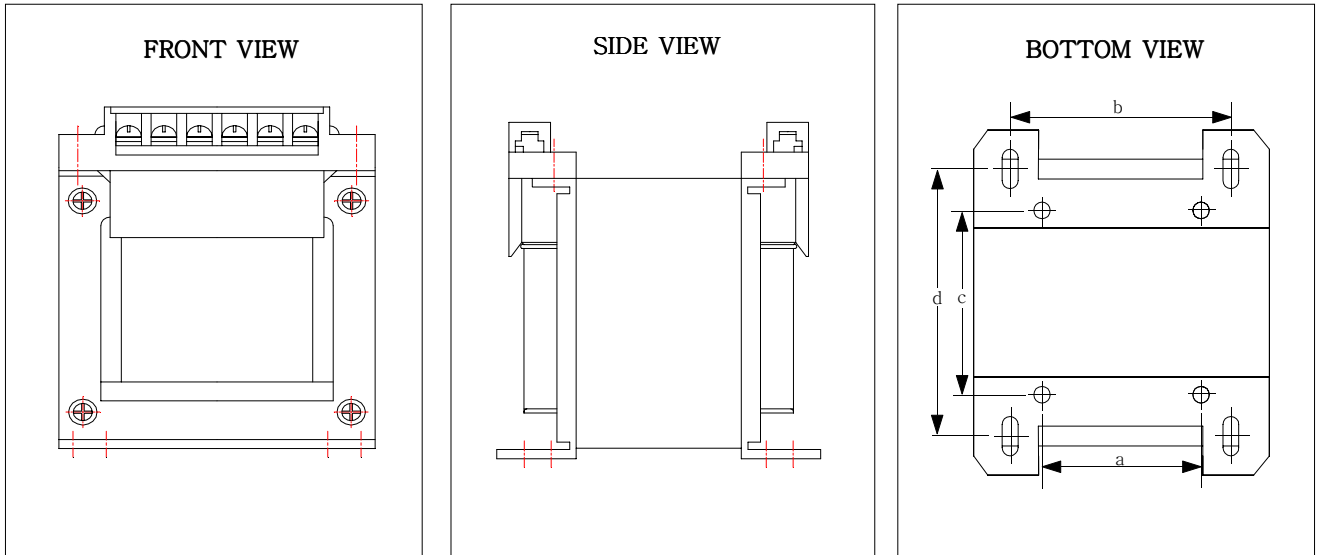
■ Dimension

TYPE	W	H	D	a	b	ϕ	Ring Terminal		VA	
							ϕ	ϕ	DOUBLE	SINGLE
3.5 m/m	79	65	22	51	7	3.5	3.6	6	30-150	75-300
4 m/m	112	90	28	70	8	4.0	4.3	7	200-250	350-400
4 m/m	112	90	28	70	8	4.0	4.3	7	300-450	450-500
4 m/m	140	120	30	91	8	4.0	4.3	7	500-700	750-1.5K
4 m/m	160	140	32	117	12	4.0	4.3	9.5	750-5K	2K-10K

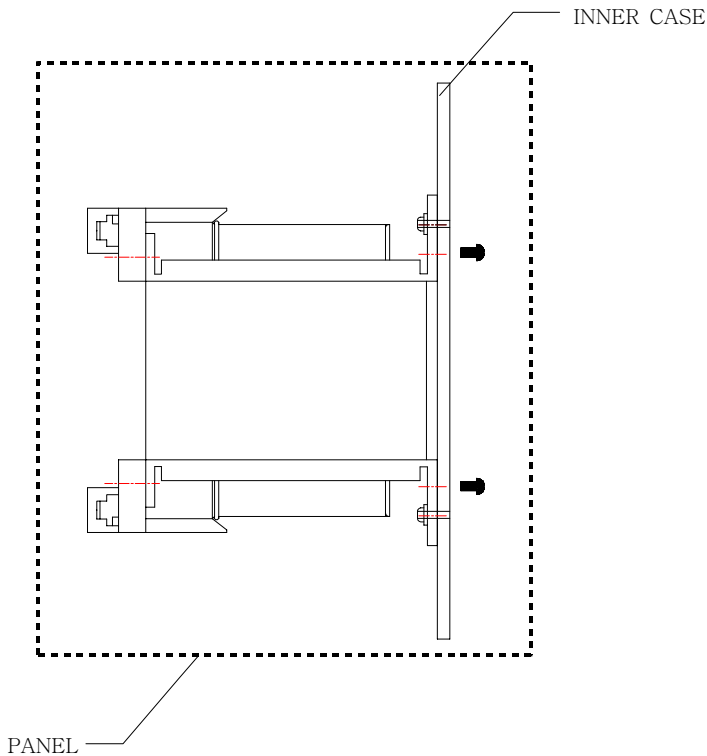
5. Method to bracket of electric power transformer and bracket distance by capacity.

Conventionally, bolt and nut are used for bracket in terms of WT, WO product. But for this product, m/m tap is added to the cover of the product in order to bracket bolt/nut but also from the back as indicated in the picture

■ WT TYPE INSTANT OF BRACKET



■ CAPACITY OF MOUNTING HOLE



SINGLE (VA)	DOUBLE (VA)	MOUNTING HOLE			
		FRONT		BACK	
		b	d	a	c
40	75	57	63	42	48.5
60	100	57	73	42	58.5
80	150	64	80	46	58
100	200	72	84	54	60
150	300	72	94	54	70
200		76	88	66	71
300	500	84	93	82	78
500	1K	98	104.5	96	100.5
750	1.5K	114	123	110	95
1K	2K	114	133		
2K		134	142		

6. Specification of electric source

■ Capacity of transformer of electric source

Concerning capacity of transformer of electric source, total of the voltage of the second coil and electric current must be calculated. In case of regular load, it must be converted to alternating and table for conversion must be referred.

	$E_{ac} \cong E_{dc} \times 1.0$ $I_{ac} \cong I_{dc} \times 2.2$
	$E_{ac} \cong E_{dc} \times 1.6$ $I_{ac} \cong I_{dc} \times 1.0$
	$E_{ac} \cong E_{dc} \times 0.8$ $I_{ac} \cong I_{dc} \times 1.6$

■ Size of transformer of electric source

It has been known that size of transformer is decided by voltage and electric current of the second circuit. In case of identical output capacity, it will be described with relevant example how capacity of transformer varies as a regular circuit.

	$VA \cong 24V \times 2.2A \cong 52.8VA$
	$VA \cong 38.4V \times 1A \cong 38.4VA$
	$VA \cong 19.2V \times 1.6A \cong 30.7VA$

Precautions must be made in selecting specification since size of transformer of electric power varies dramatically according to the circuit and transformer becomes small-sized according to the method to use circuit.