

INSTRUCTIONS OF OPERATION AND MAINTENANCE FOR

TFW SERIES

**SMALL SIZE THREE-PHASE SYNCHRONOUS BRUSHLESS
GENERATOR**

III. CONNECTION DIAGRAM (FIG.1)

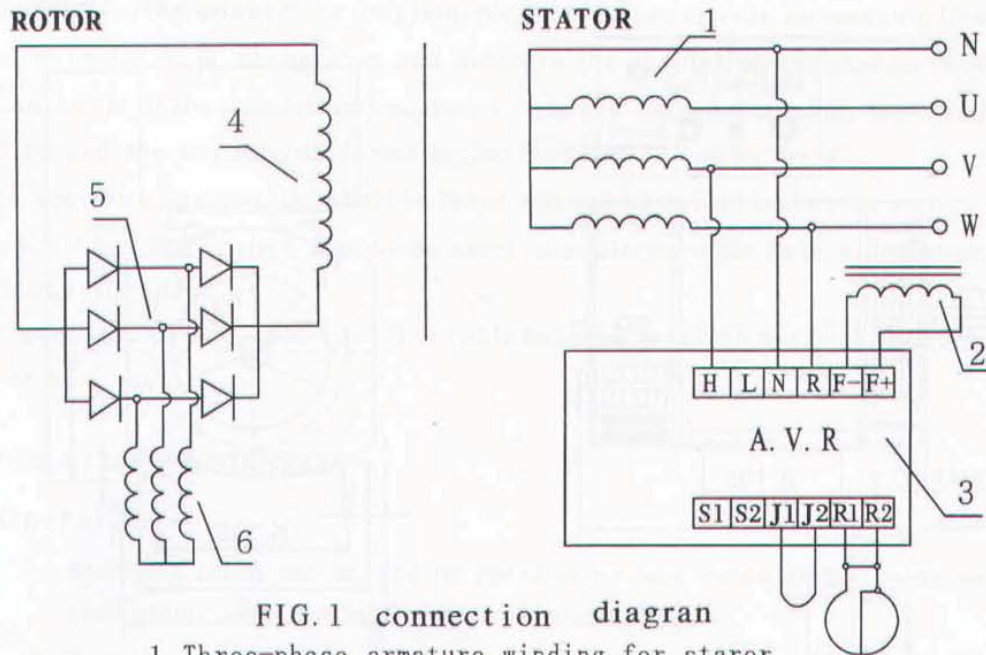


FIG.1 connection diagram

1. Three-phase armature winding for staror
2. Excitation winding
3. Automatic voltage regulation
4. The winding for magnetic field of rotor
5. Revolving rectifier
6. Excitation magnetic armature winding

IV. SPECIFICATION FOR MAIN MODELS(FIG. 1)

FIG.1

Model	Output		Voltage (V)	Currert (A)	Power Factor (Cos ϕ)	Pole Number	Speed (r.p.m)	Constand Voltage Adjusting Rate
	(KVA)	(KW)						
TFW-8	10	8	400/230	14.4	0.8	4	1500	$\pm 2.5\%$
TFW-10	12.5	10	400/230	18.1	0.8	4	1500	$\pm 2.5\%$
TFW-12	15	12	400/230	21.7	0.8	4	1500	$\pm 2.5\%$
TFW-15	18.75	15	400/230	27.1	0.8	4	1500	$\pm 2.5\%$
TFW-20	25	20	400/230	36.1	0.8	4	1500	$\pm 2.5\%$
TFW-24	30	24	400/230	43.3	0.8	4	1500	$\pm 2.5\%$
TFW-30	37.5	30	400/230	54.1	0.8	4	1500	$\pm 2.5\%$
TFW-40	50	40	400/230	72.2	0.8	4	1500	$\pm 2.5\%$
TFW-50	62.5	50	400/230	90.2	0.8	4	1500	$\pm 2.5\%$
TFW-64	80	64	400/230	115.6	0.8	4	1500	$\pm 2.5\%$
TFW-75	93.7	75	400/230	135.5	0.8	4	1500	$\pm 2.5\%$
TFW-90	112.5	90	400/230	162.6	0.8	4	1500	$\pm 2.5\%$
TFW-120	150	120	400/230	216.8	0.8	4	1500	$\pm 2.5\%$

V. EXTERNAL DIMENSIONS AND INSTALLING DIMENSION(FIG.2)

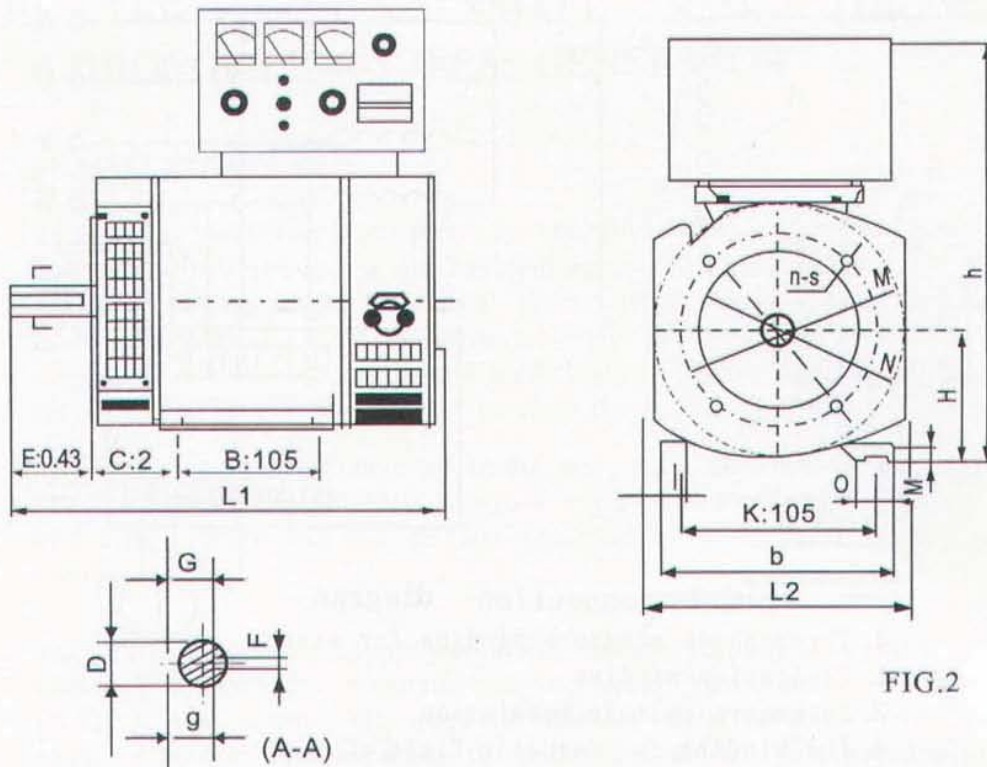


FIG.2

TYPE	Output		INSTALLING DIMENSIONS (mm)													EXTERNAL DIMENSIONS (mm)						Weight (kg)
	S	P	A	B	C	D	E	F	G	H	K	n-s	M	N	a	b	h1	h	L1	L2	g	
TFW-8	10	8	279	203	121	φ 42	110	12	37	180	15	4M12	φ 215	φ 180	55	334	25	511	640	365	41.8	138
TFW-10	12.5	10	279	203	121	φ 42	110	12	37	180	15	4M12	φ 265	φ 230	55	334	25	511	640	365	41.8	143
TFW-12	15	12	279	203	121	φ 42	110	12	37	180	15	4M12	φ 265	φ 230	55	334	25	511	640	365	41.8	165
TFW-15	18.75	1.5	318	228	133	φ 48	110	14	42.5	200	19	4M12	φ 265	φ 230	60	378	30	548	680	400	51.2	210
TFW-20	25	20	318	228	133	φ 48	110	14	42.5	200	19	4M16	φ 300	φ 250	60	378	30	548	680	400	51.2	219
TFW-24	30	24	318	267	133	φ 48	110	14	42.5	200	19	4M16	φ 300	φ 250	60	378	30	605	718	400	51.2	254
TFW-30	37.5	30	356	286	149	φ 60	140	18	53	225	19	4M16	φ 350	φ 300	65	421	32	605	840	452	64	323
TFW-40	50	40	356	311	149	φ 60	140	18	53	225	19	4M16	φ 350	φ 300	65	421	32	605	863	452	64	358
TFW-50	62.5	50	356	356	149	φ 60	140	18	53	225	19	4M16	φ 350	φ 300	65	421	32	605	910	452	64	398
TFW-64	80	64	406	349	168	φ 70	140	20	62.5	250	24	8M16	φ 400	φ 350	84	490	33	662	994	490		
TFW-75	93.7	75	406	406	168	φ 70	140	20	62.5	250	24	8M16	φ 400	φ 350	84	490	33	662	1039	490		
TFW-90	112.5	90	457	368	190	φ 80	170	22	71	280	24	8M16	400	350	120	580	30	720	1090	580		
TFW-120	150	120	457	457	190	φ 80	170	22	71	280	24	8M16	400	350	120	580	30	720	1180	580		
TFW-150	187.5	150	457	457	190	φ 80	170	22	71	280	24	8M16	400	350	120	580	30	720	1180	580		

VI. PREPARE WORK BEFORE OPERATION

1. according to the connection diagram, please measure circuit connection line U, V, W and N or U, V, W connection and measure the insulation resistance between winding and earth. If the insulation resistance is lower than 0.5 mohm, the winding shall be dried and the temperature is not higher than 120°C when dried.

2. The section of output line shall be large enough and shall be put the switch and use for each line. The switch should be short the circuit state before operation to guarantee the safe use.

3. To rotate the rotor by hand or other tools before operation to check the rotating smoothly or not.

VII. OPERATION AND STOP

1. Operation

- I. Start the prime mover, add its speed to no-load speed of the prime mover and volume of voltage meter is near to rated voltage.
- II. Turn the switch on and can supply the power

2. Stop

- I. Turn the switch off and short the circuit.
- II. Reduce the speed of prime mover till to stop the prime mover.

VIII. THE COMMON FAULTS AND TREATMENT

- A. Can not generate with no-load, the reason and method to be treated are as follows:
 1. May be caused by no residual magnetism or the residual magnetic is reversal in direction to the magnetic field of the rectified current. Charge it with 6V D.C. "+" connect F1 and "-" connects F2 or charge the magnetic field again till the spark appear.
 2. The speed is lower than the value of excitation, measure the speed and raise the speed.
 3. The static or revolving rectifier elements are broken, short circuit or break, please measure it with multimeter and replace the static or revolving rectifier elements and check it according the connection diagram.
 4. The armature winding taps, reactor, bridge rectifier or excitation winding are short circuit or loosed. Connect them again or solder or tight loosed connections well

B. Under voltage when no-load working

1. The speed of prime mover is low and speed up the about rated value.
2. Turn the A.V.R. to big volume direction.

C. Over voltage when full-load working

1. Speed of prime mover is too high. Please lower the speed of prime mover (the frequency of rated load is 50HZ)
2. Turn the A.V.R. to small volume direction.

D. High temperature or part high temperature.

1. Overload of the generator. Please monitor instruments and keep full load current and voltage not exceeding rated value.
2. The condition of ventilation is not good or surrounding temperature is too high. Please check the surrounding temperature and improve the condition of ventilation.
3. The high temperature may be caused by the friction with stator and rotor. Please open the generator and pull out the rotor and check it and cover may be loose and bearing may be wear and tear:

E. Considerable vibration

1. It is not good to connect with the prime mover. Please check it and realign with prime mover
2. It is not good to install or not balance of base plate. Please check the base plate keep it strong and make it balance.

F. The bearing is over heat

1. Bad quality of grease or use mixed grease or excessive filling. Please clean the bearing and renew grease.
2. In case of belt drive, belt tension force is too large, please adjust the tension force properly.

IX. MAINTENANCE AND REPAIR

1. Maintenance

- A. The generator should be stored in a dry place. If put on the surface of earth or cement ground, it should be raised using insulators and cover with oilcloth to protect the damp.
- B. To prevent from entering of moisture like rust, water drop and metal chips.
- C. Cannot be covered with any other coverage to order have good

ventilation.

- D. Can not over-load.
- E. Can not used in place of too much of steamer, rust and flammability gases.
- F. The bearing grease shall be renewed at intervals of about 1500 operating hours, clean the used grease from the bearing out, wash the chamber using kerosene and fill with new grease every year. The bearing chamber shall be filled up to 1/2 volume. Grease mixed with different grade shall not be used. #ZL-3 lithium grease shall be used. The temperature of bearing can not be exceed 95°C

2. Repair

The generator should be examined every half year.

- A. Open the cover and switch box. If find any rust inside of generator, please clean it with dry compressed air. The pressure can not exceed 0.4Mpa.
- B. Check fire grease clean or not. If find it becomes discolored, it shall be renewed.

3. Caution for checking

- A. The removed parts should be keeping and should not be lost.
- B. If take apart of the line, should remark it and reconnect it according to the remarks
- C. When remove the cover, please cover with clean paper to avoid entering the rust.
- D. After installing the generator, please rotate rotor by hand and check it smoothly or not.

X. GUARANTEE

On condition that the generator is properly stored and used according to this operation and Maintenance Instructions, the Manufacturer guarantees that the generator will operate properly within one year from the date when it is put into service or within two years from the date when it is dispatched from the manufacturer whichever is first. In the above period, if the generator is damaged or cannot be operated properly due to imperfect manufacturing the manufacturer will take the responsibility to make good or replace the defective parts or the generator at no cost to the customer.