

MICRO-HYDRO GENERATOR

HV4000 - 4KW

240/440VAC - 12/24/48VDC

HIGH VOLTAGE

HYDRO INDUCTION POWER
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WIRING INSTRUCTIONS FOR HIGH VOLTAGE UNIT

1. Transformer Rectifier (TR) Box:
 - a. Mount TR box near batteries.
 - b. Connect 3 AC wires from Hydro to "AC-in block" in TR Box.
 - c. Connect DC block to DC breakers, fuse, or battery.
 - d. Remove fan fuse until unit is running and stable.
 - e. Connect shunt regulator to DC block.

2. Hydro Generator:
 - a. Connect the 3 wires from TR Box to generator.
 - b. Connect and clamp flexible pipe to nozzles.
 - c. Open one valve **very slowly** until the field ignites (hydro will slow to +/- 70Hz). Open remaining jets to match available flow.
 - d. Check output at TR Box - do not exceed rated Watts.
 - e. Replace fan fuse after checking regulator, etc.
 - f. Check motor after a few hours for excessive heat or noise.
 - g. Check hydro monthly for excessive heat, noise, or vibration.
 - h. Change bearings every 3-6 years, depending on use.
 - i. Inspect runner for excessive wear (bad intake).

3. Specifications for 1200W:

AC output: 240/440V	25/12Amp	Fuses: 3 x 15/8Amp
DC output: 12/24/48V	320/160/80Amp	Fuses: 3 x 120/60/30Amp

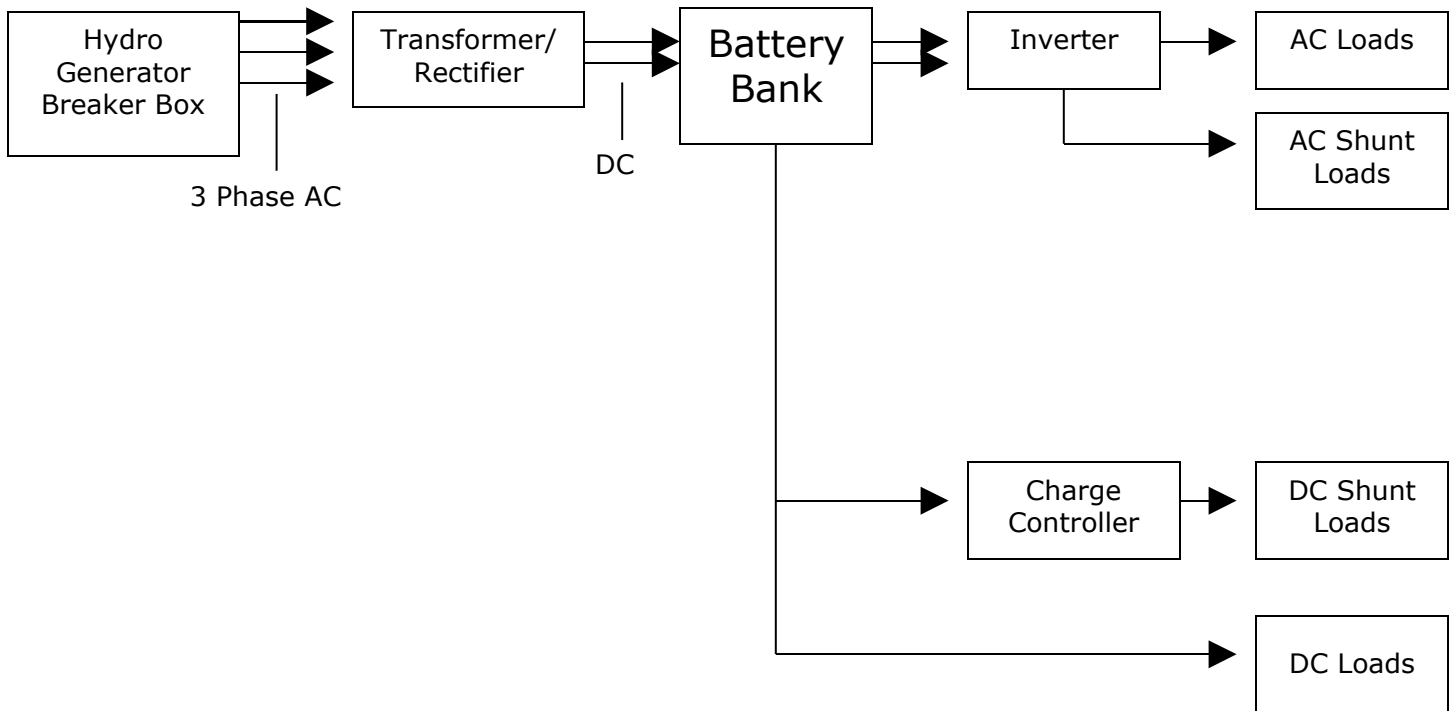
4. Trouble Shooting:

Low or no output:	Low pressure, check intake; Blocked or partially blocked nozzle; Check AC + DC fuses in TR Box;
Motor spins fast:	Blown fuses or Open Line; Shorted line (above 80Hz); Shorted diode (after lightning); Motor will not 'excite' (Output 0.5 - 5VAC) (remove load to excite. After prolonged short, remove AC input (small wires) from any two transformers.)
Motor sounds loud:	Bad bearings; or One bad AC fuse;

DANGER:

**Motor will keep spinning after water has been turned off.
Wait one minute before trying to check or change nozzles.
If motor does not spin freely after hydro has been turned off, bearings need to be replaced.**

WIRING DIAGRAM



FLOW THROUGH NOZZLES IN GPM AT VARIOUS HEADS

Feet	Psi	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	7/8"	1.0"	RPM for	
													4" Turbine	
5	2.2	-	-	-	-	6.18	8.4	11	17.1	24.7	33.6	43.9	460	
10	4.3	-	-	3.88	6.05	8.75	11.6	15.6	24.2	35	47.6	62.1	650	
15	6.5	-	2.68	4.76	7.4	10.7	14.6	19	29.7	42.8	58.2	76	800	
20	8.7	1.37	3.09	5.49	8.56	12.4	16.8	22	34.3	49.4	67.3	87.8	925	
30	13	1.68	3.78	6.72	10.5	15.1	20.6	26.9	42	60.5	82.4	107	1140	
40	17	1.94	4.37	7.76	12.1	17.5	23.8	31.1	48.5	69.9	95.1	124	1310	
50	22	2.17	4.88	8.86	13.6	19.5	26.6	34.7	54.3	78.1	106	139	1470	
60	26	2.38	5.35	9.51	14.8	21.4	29.1	38	59.4	85.6	117	152	1600	
80	35	2.75	6.18	11	17.1	24.7	33.6	43.9	68.6	98.8	135	176	1850	
100	43	3.07	6.91	12.3	19.2	27.6	36.6	49.1	76.7	111	150	196	2070	
120	52	3.36	7.56	13.4	21	30.3	41.2	53.8	84.1	121	165	215	2270	
150	65	3.76	8.95	15	23.5	33.8	46	60.1	93.9	135	184	241	2540	
200	87	4.34	9.77	17.4	27.1	39.1	53.2	69.4	109	156	213	278	2930	
250	108	4.86	10.9	19.9	30.3	43.6	59.4	77.6	121	175	238	311	3270	
300	130	5.32	12	21.3	33.2	47.8	65.1	85.1	133	191	261	340	3590	
400	173	6.14	13.8	24.5	38.3	55.2	75.2	98.2	154	221	301	393	4140	
		HARRIS OR TURGO								TURGO ONLY				

ROUGH OUTPUT IN WATTS PER NOZZLE							
Pressure:		Nozzle Size:					
feet	Psi	3/16	1/4	5/16	3/8	7/16	1/2
100	43	16/7	63/12	156/19	225/28	337/37	412/49
120	52	38/8	100/13	222/21	311/30	446/41	553/54
150	65	71/9	155/15	310/24	442/34	611/46	958/60
200	87	122/10	274/17	515/27	592/39	Watt Hrs/Gpm	

CUTTING THE PLASTIC TURGO NOZZLE TO OPTIMAL SIZE:

(Not available on all units!)

Cutting the nozzle can be done with a hack saw and finished with sand paper on a flat surface.

Nozzles are marked in millimeters.

mm	3	4.5	6	8	10	13	16	19	22	25
inches	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	7/8	1

HIGH – LOW POWER SWITCH

(Not available on all units!)

At low flow or low power, the turbine is more efficient operating at a lower voltage (80-120V).

During periods of prolonged low flow, putting the switch in the LOW position (down) can increase output 30-50%.

Leaving the switch in low in periods of high power (10Amps@24V) may cause overspinning and a collapse of the field. Leaving the switch in this position for long periods can result in overheating of transformers.

Turning switch to HIGH position (up) and turning the flow off for a minute, before slowly opening it again, should cause the field to ignite and the motor to slow down. Do not flip switch up and down when output is greater than 300Watts.

Always start with the switch in the UP position.

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Suggested Hookup

