

MICRO-HYDRO GENERATOR

LV1200

12/24/48/120 VOLT

1200 WATT

HYDRO INDUCTION POWER

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WIRING INSTRUCTIONS FOR LOW VOLTAGE UNIT

1. Connect and clamp flexible pipe to nozzle tubes (see diagram).
(warming the pipe with warm water or propane torch makes it easier to work with.)
2. Connect and fuse Hydro to batteries, using appropriate wire and fuse (see chart).
WARNING: Reverse Polarity will destroy the fuse and/or the rectifier. If no meter is available to check and wire is not color coded, use a small fuse (<10A) or a short piece of thin wire (single strand of speaker wire) as a fuse, until you are sure you have it right. Red = Positive. Code requires a fuse at both ends of wire.
3. Slowly open gate valve and check that output does not exceed 1200 Watts (Amps x Volts = Watts). The Amp meter should be at least 2" from motor and other wires when reading. It can be removed and placed on line near residence for convenience.
4. Wait to see if pressure is maintained. If not, use smaller nozzle. Maximum power will be produced if running pressure is 2/3 or more of static pressure.
5. Check housing for adequate drainage - do not allow wheel to be flooded.
6. Check hydro about an hour after installation, and then monthly, for excessive heat, noise, or vibration.
7. Check runner annually: there should be no play or noise from the bearing.
8. Output will increase slightly, when bearings are seated.

FUSES:

Use 20A or less fuses with #12 wire, or 30A if using #10 or larger wire.

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					

WIRE LOSS CHART

This 10%, 12V, Wire Chart represents a normal situation for most hydros.

Hydros can have a much larger voltage drop, as they are not 'voltage limited' like solar panels. In some cases, a 50% or larger voltage drop is acceptable as long as the final power output matches your needs. For example, having a 12V hydro 1000 feet away, will result in about 50% loss at 20A, using #2 wire. Meaning, the hydro will be running at 24V, producing 480W, while the battery is at 12V, receiving 240W.

Most systems are designed with a 10 - 30% loss, which is what you would expect to lose in high voltage transformers, etc. This means, you would go 1-3 times the distance suggested in the chart for 12V and 2-6 times for 24V.

Maximum distance one way in feet of various gauges 2 conductor copper wire from hydro to battery. Using one size larger aluminum wire with correct (non-copper) connectors works very well.

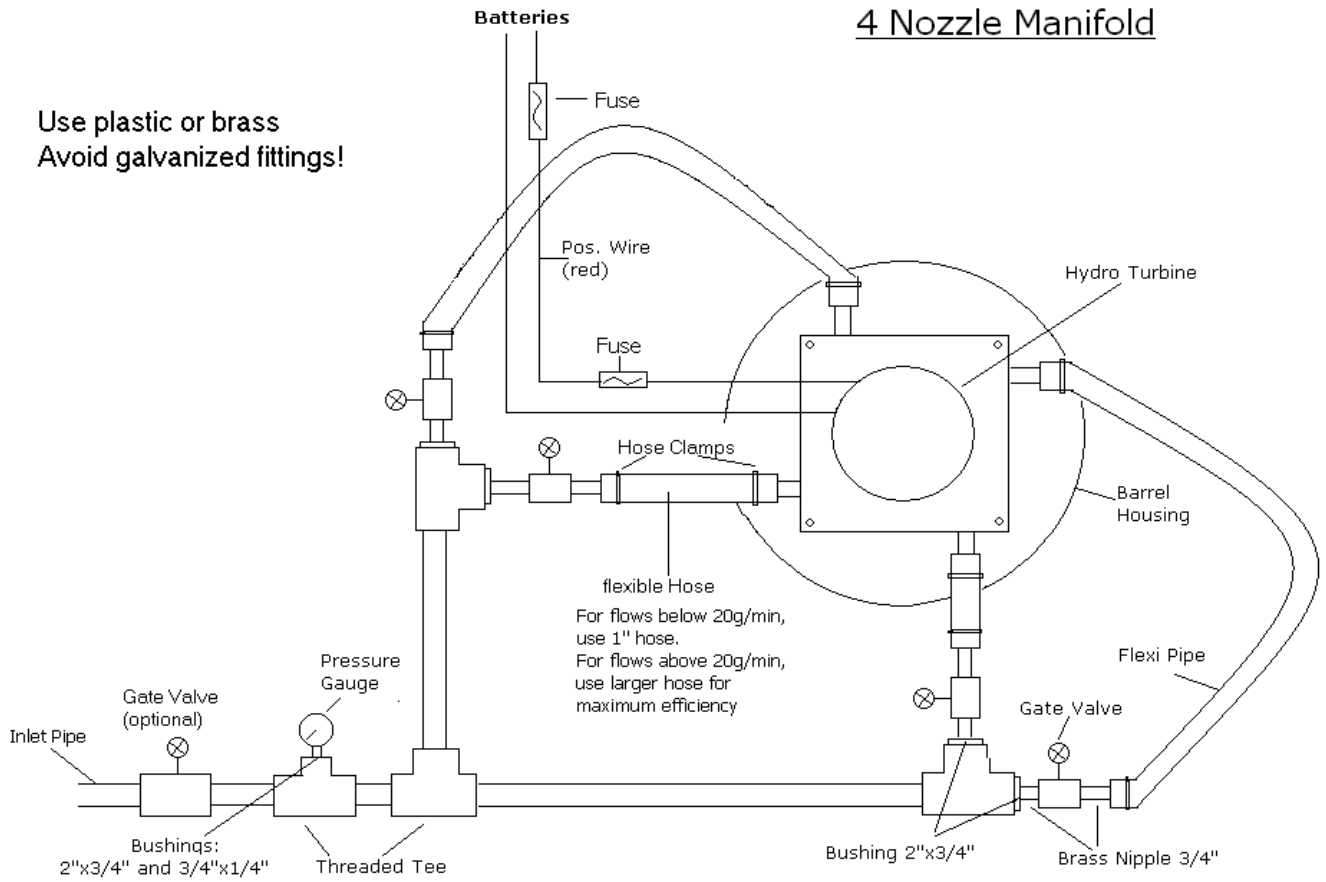
AMPS	#14	#12	#10	#8	#6	#4	#2	1/0	2/0	4/0
1	225	350	575	900	1450	2280	3600			
2	112	175	287	450	725	1140	1800	2900	3600	5300
4	50	87	137	225	362	570	900	1450	1800	2900
6	37	60	87	150	237	375	600	965	1215	1900
8	27	42	75	112	177	285	450	725	900	1450
10	22	35	60	90	142	227	362	575	725	1150
15	15	22	35	60	85	150	240	382	480	750
20		17	27	45	72	112	180	287	362	580
25			22	35	57	90	145	230	290	460
30			17	30	47	75	120	192	242	385

ROUGH OUTPUT IN WATT PER NOZZLE

STANDARD 12/24/48/96V								
Pressure:		Nozzle Size:						
feet	Psi	1/8	3/16	1/4	5/16	3/8	7/16	1/2
46	20					20/ 13-13%	34/ 25-16%	44/ 33-16%
69	30			35/ 9 - 27%	87/ 18 - 44%	132/ 23 - 46%	184/ 32 - 47%	202/ 42 - 40%
100	43		38/ 7 - 31%	104/ 12 - 47%	204/ 19 - 59%	281/ 28 - 57%	377/ 37 - 57%	423/ 49 - 48%
120	52		66/ 8 - 40%	155/ 13 - 54%	289/ 21 - 64%	396/ 30 - 61%	527/ 41 - 59%	580/ 54 - 50%
150	65	18/ 4 - 18%	110/ 9 - 46%	223/ 15 - 55%	421/ 24 - 66%	576/ 34 - 63%	736/ 46 - 59%	847/ 60 - 52%
184	80	26/ 4 - 19%	166/ 9 - 53%	305/ 16 - 55%	600/ 26 - 70%	800/ 37 - 74%	911/ 50 - 62%	1018/ 66-53%
200	87	40/ 4 - 26%	194/ 10 - 55%	345/ 17 - 55%	702/ 27-72%	1042/ 39-74%	Watts per Hr/ Gpm - Efficiency	

Suggested Hookup

Use plastic or brass
Avoid galvanized fittings!



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