



# LOAD BANK MANUAL

**Model: PLB-330S9**

**Serial No S107**

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**For service and information contact:**

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## General Information

- JP Power Technology Inc. load banks are air-cooled, definite purpose contactor controlled systems consisting of fused coiled nichrome 60 wire resistors.
- DC load banks are controlled by solid-state components.
- Load bank enclosures are fabricated out of aluminum for a lightweight, corrosion free product. Painting of aluminum enclosures is optional, and steel enclosures are available if a higher strength product is required. Steel enclosures are powder coated.
- Components have been carefully chosen to provide a reliable and easy to use product.
- Load banks are designed to allow easy servicing should repair be necessary.
- Load banks are cooled by an electric fan, which requires a separate power source. As an option, this power source may be contained within the unit.
- Unit electrical ratings are provided in nameplate specifications or drawings.

## Warnings

- **Load banks emit large quantities of hot air that can reach up to 150°C (300°F). Care must be taken to prevent personal injury or property damage.**
- **Improper operation of load banks while connected to a power source can cause serious damage or personal injury. Follow all applicable rules, laws, and instructions when connecting and operating load banks.**
- **Ensure that all power sources are turned off before connecting load banks.**
- **Non-weatherproof units must be placed in a dry and well-ventilated area.**

## Setup

- Connect the power source to be tested to the appropriate terminals on the load bank. (See attached diagrams).
- The load bank may or may not be phase sensitive. If a three-phase fan motor is supplied, airflow direction must be verified.
- Connect a ground cable to the load bank ground connector. A lug marked “GROUND” is provided on the load bank for one end of the ground cable. The other end should be firmly connected to a suitable ground, such as a plant ground bus, a metal water pipe, or a properly buried rod. The ground cable should be rated for the capacity of the load bank.
- Ensure that cables are placed so that they are safe from being damage and do not present a hazard.
- Prior to operation, check the load bank’s air intake for foreign objects. Blockage can cause the unit to overheat and result in load test interruption.
- If the fan is interrupted (by a blow fuse or other means), the load contactors will open. No damage to the load bank will occur, but the load test will be interrupted until operation of the fan is regained and the “load on” button is depressed.

## Control Circuit

The following control equipment is provided with this load bank:

- a) Selector switch “ON-OFF”
- b) Illuminated pushbutton “Press to start test” indicator light (green)
- c) Illuminated pushbutton “Press to stop test” indicator light (red)
- d) Load increment switches

## Operation

A circuit for sensing voltage is included with multi-voltage load banks and will automatically select the correct configuration of contactors.

- After establishing which load switches will be operated, the equipment can be loaded by following these steps:
  1. Establish output from the equipment being loaded according to the manufacturer's instructions.
  2. Select "On-Off" to on.
  3. Turn off all of the "step switches".
  4. Press "Start Test" (green) button.
  5. Turn on the pre-determined "step switches".
  6. The equipment will now be loaded.
  7. Increase or decrease the load by turning the appropriate load step switches on or off as desired.
  
- The green light indicates that the load is being applied. *Exercise caution around the screen at the air discharge end, as the temperature can become high enough to cause burns.*
- It is also possible to "block load" the equipment by turning on the appropriate number of step switches before the "Load On" button is pressed, however this may cause an overload to some systems.
- *Never leave the system unattended during load bank operation.* Periodic checks should be made of the load bank, the equipment being loaded, as well as all cables and connections.
- After test completion, remove the load by pressing the "Load Off" button. The fan should be left running until the discharge screen and components have cooled.
  
- The following steps should be taken following completion of the test:
  1. Turn off the power source
  2. Disconnect the load and ground cables
  3. Restore equipment to operational condition.
  4. Store the load bank and cables in a dry area.
  
- If a problem occurs during operation (such as overheating or obstruction of airflow), the load will automatically disconnect. The fan will continue to operate. The equipment should be checked for any problems and corrected. If the problem persists, the control circuit will not allow the load to be reapplied. When conditions return to normal, the load bank will resume normal operation.
- The following tables and formulas are provided to assist with calculations:

a) Known

Rated KVA and Power Factor Rating for equipment

$$KW = KVA \times \text{Power factor}$$

b) Known

Rated Voltage, Amps & Power Factor Rating for equipment

3 Phase

$$\underline{KW = 1.732 \times \text{Volts} \times \text{Amps} \times \text{Power Factor}}$$

$$1000$$

Note:

The amperage listed on the equipment nameplate may not relate to unity power factor loads. To use this figure it must be multiplied by the power factor listed on the equipment nameplate.

Example:

Most AC alternators are rated at a power factor of 0.8. If the rated amperage is listed as 100 amps on the alternator nameplate, multiply 100 by 0.8 to get 80 amps. 80 amps should be used when calculating the kilowatts.

**KILOWATTS AT UNITY POWER FACTOR  
(1 PHASE AND DC)**

<i>AMPERE</i>	<i>24VDC</i>	<i>48VDC</i>	<i>120VAC</i>	<i>240VAC</i>	<i>480VAC</i>	<i>600VAC</i>
10	0.24	0.48	1.20	2.40	4.80	6.00
20	0.48	0.96	2.40	4.80	9.60	12.00
30	0.72	1.44	3.60	7.20	14.40	18.00
40	0.96	1.92	4.80	9.60	19.20	24.00
50	1.20	2.40	6.00	12.00	24.00	30.00
60	1.44	2.88	7.20	14.40	28.80	36.00
70	1.68	3.36	8.40	16.80	33.60	42.00
80	1.92	3.84	9.60	19.20	38.40	48.00
90	2.16	4.32	10.80	21.60	43.20	54.00
100	2.40	4.80	12.00	24.00	48.00	60.00
110	2.64	5.28	13.20	26.40	52.80	66.00
120	2.88	5.76	14.40	28.80	57.60	72.00
130	3.12	6.24	15.60	31.20	62.40	78.00
140	3.36	6.72	16.80	33.60	67.20	84.00
150	3.60	7.20	18.00	36.00	72.00	90.00
160	3.84	7.68	19.20	38.40	76.80	96.00
170	4.08	8.16	20.40	40.80	81.60	102.00
180	4.32	8.64	21.60	43.20	86.40	108.00
190	4.56	9.12	22.80	45.60	91.20	114.00
200	4.80	9.60	24.00	48.00	96.00	120.00
210	5.04	10.08	25.20	50.40	100.80	126.00
220	5.28	10.56	26.40	52.80	105.60	132.00
230	5.52	11.04	27.60	55.20	110.40	138.00
240	5.76	11.52	28.80	57.60	115.20	144.00
250	6.00	12.00	30.00	60.00	120.00	150.00
260	6.24	12.48	31.20	62.40	124.80	156.00
270	6.48	12.96	32.40	64.80	129.60	162.00
280	6.72	13.44	33.60	67.20	134.40	168.00
290	6.96	13.92	34.80	69.60	139.20	174.00
300	7.20	14.40	36.00	72.00	144.00	180.00
310	7.44	14.88	37.20	74.40	148.80	186.00
320	7.68	15.36	38.40	76.80	153.60	192.00
330	7.92	15.84	39.60	79.20	158.40	198.00
340	8.16	16.32	40.80	81.60	163.20	204.00
350	8.40	16.80	42.00	84.00	168.00	210.00
360	8.64	17.28	43.20	86.40	172.80	216.00
370	8.88	17.76	44.40	88.80	177.60	222.00
380	9.12	18.24	45.60	91.20	182.40	228.00
390	9.36	18.72	46.80	93.60	187.20	234.00
400	9.60	19.20	48.00	96.00	192.00	240.00
410	9.84	19.68	49.20	98.40	196.80	246.00
420	10.08	20.16	50.40	100.80	201.60	252.00
430	10.32	20.64	51.60	103.20	206.40	258.00
440	10.56	21.12	52.80	105.60	211.20	264.00
450	10.80	21.60	54.00	108.00	216.00	270.00
460	11.04	22.08	55.20	110.40	220.80	276.00
470	11.28	22.56	56.40	112.80	225.60	282.00
480	11.52	23.04	57.60	115.20	230.40	288.00
490	11.76	23.52	58.80	117.60	235.20	294.00
500	12.00	24.00	60.00	120.00	240.00	300.00

**KILOWATTS AT UNITY POWER FACTOR  
(3 PHASE)**

<i>AMPERE</i>	<i>208VAC</i>	<i>240VAC</i>	<i>440VAC</i>	<i>460VAC</i>	<i>480VAC</i>	<i>600VAC</i>
10	3.60	4.16	7.62	7.97	8.31	10.39
20	7.21	8.31	15.24	15.94	16.63	20.79
30	10.81	12.47	22.86	23.90	24.94	31.18
40	14.41	16.63	30.48	31.87	33.26	41.57
50	18.01	20.79	38.11	39.84	41.57	51.96
60	21.62	24.94	45.73	47.81	49.88	62.36
70	25.22	29.10	53.35	55.77	58.20	72.75
80	28.82	33.26	60.97	63.74	66.51	83.14
90	32.42	37.41	68.59	71.71	74.83	93.53
100	36.03	41.57	76.21	79.68	83.14	103.93
110	39.63	45.73	83.83	87.64	91.45	114.32
120	43.23	49.88	91.45	95.61	99.77	124.71
130	46.84	54.04	99.08	103.58	108.08	135.10
140	50.44	58.20	106.70	111.55	116.40	145.50
150	54.04	62.36	114.32	119.51	124.71	155.89
160	57.04	66.51	121.94	127.48	133.03	166.28
170	61.25	70.67	129.56	135.45	141.34	176.67
180	64.85	74.83	137.18	143.42	149.65	187.07
190	68.45	78.98	144.80	151.39	157.97	197.46
200	72.06	83.14	152.42	159.35	166.28	207.85
210	75.66	87.30	160.05	167.32	174.60	218.24
220	79.26	91.45	167.67	175.29	182.91	228.64
230	82.86	95.61	175029	183.26	191.22	239.03
240	86.47	99.77	182.91	191.22	199.54	249.42
250	90.07	103.93	190.53	199.19	207.85	259.82
260	93.67	108.08	198.15	207.16	216.17	270.21
270	97.27	112.24	205.77	215.13	224.48	280.60
280	100.88	116.04	213.39	223.06	232.79	290.99
290	104.48	120.55	221.02	231.06	241.11	301.39
300	108.08	124.71	228.64	239.03	249.42	311.78
310	111.69	128.87	236.26	247.00	257.74	322.17
320	115.29	133.03	243.88	254.00	266.05	332.56
330	118.89	137.18	251.50	262.93	274.36	342.96
340	122.49	141.34	259.12	270.90	282.68	353.35
350	126.10	145.50	266.74	278.87	290.99	363.74
360	129.70	149.65	274.36	286.84	299.31	374.13
370	133.30	153.81	281.99	294.80	307.62	384.53
380	136.91	157.97	289.61	302.77	315.94	394.92
390	140.51	162.12	297.23	310.74	324.25	405.31
400	144.11	166.28	304.85	318.71	332.56	415.70
410	147.71	170.44	312.47	326.67	340.88	426.10
420	151.32	174.60	320.09	334.64	349.19	436.49
430	154.29	178.75	327.71	342.61	357.51	446.88
440	158.52	182.91	335.33	350.58	365.82	457.27
450	162.12	187.07	342.96	358.54	374.13	467.67
460	165.73	191.22	350.58	366.51	382.45	478.06
470	169.33	195.38	358.20	374.48	390.76	488.45
480	172.93	199.54	365.82	382.45	399.08	498.84
490	176.54	203.69	373.44	390.42	407.39	509.24
500	180.14	207.85	381.06	398.38	415.70	219.63