OPERATING INSTRUCTIONS

for the AQUALOAD Model X-100 Load Bank

1.0 General

Please become familiar with the entire instruction sheet, before applying power to the load bank.

1.1 Electrical Specifications

Maximum Load:	150 KW
Input Connection:	3 phase, 3 or 4 wire (A neutral cable is not required. Phase rotation is not important) For DC or single phase applications, the three resistor elements can be connected in series or parallel.

1.2 Cooling requirements

Water flow rate:	refer to Table 1
Inlet water temperature:	15°C (59°F) maximum
Outlet water temperature:	90°C (194°F) maximum

1.3 Protection

In case a severe overload is applied, the resistor elements will open and act as fuses. There will be no damage to the load bank or to the load.

2.0 Resistor Installation (Replacement)

Remove the top cover after opening four latches.

The resistor elements are attached to a red insulator plate. Lift the resistor assembly out of the tank by pulling up on the bus bar.

Detach three corrosion shields after removing six nylon nuts.

Detach the resistor elements after removing four nuts from each.

To install resistor elements, reverse the above procedure.

Precautions: Use only the stainless steel and nylon nuts provided by the factory.

Before installing the resistor elements, make sure that the busbar is clean. There must be good contact between the bus bar and the resistors. Install the long bolts at the top, and the short bolts at the bottom of the resistor. Tighten the steel nuts to at least 10 ft-lbs. The nylon nuts must be finger tight.

3.0 Water Cooling

CAUTION: Do not apply electrical power until the load bank is filled with water, and adequate water flow has been established. The correct cooling water flow is very important. Too little flow will make the water boil, and the resistor elements will burn out.

The tank is not designed to be pressurized. Too much water pressure will cause the tank to overflow, and water may be forced into the terminal area above the red insulating plate. This will cause an electrical short circuit, and severe damage to the load bank will result. It is very important that the instructions below are followed carefully.

3.1 Hose Connections

Connect a 5/8 inch garden hose to load bank water inlet. Connect the output hose, supplied with the unit, to the load bank outlet. The outlet hose must not be longer than 32 inches, otherwise excessive back pressure develops, preventing adequate cooling.

3.2 Determine the Maximum Water Flow

The following procedure is used to establish that the inlet water pressure is not excessive:

Connect the input and output hoses. Open the load bank lid. Lift up on the resistor assembly, so that the inside of the water tank can be observed. Open the water supply valve completely. The water must not flow over the rim of the tank. Adjust the water supply valve until the overflow has stopped. The valve must never be opened beyond this point.

3.3 Determine the Maximum Allowable Load.

The maximum electrical load, which may be connected to the AquaLoad bank, is limited by the available water flow rate. The available water flow, and the maximum allowable load, can be established simply by using the method below:

Drain the load bank tank completely. Open the inlet water valve. Measure the elapsed time from opening the inlet valve until water flows from the tank outlet. Read the water flow rate and the maximum allowable load from table 1.

Table 1. MAXIMUM ALLOWABLE LOAD

Maximum Load in KW	Water Flow in GPM	Fill Time in Seconds
150	7.5	40
140	7.0	42
130	6.5	46
120	6.0	50
110	5.5	54
100	5.0	60
90	4.5	66
80	4.0	75
70	3.5	86
60	3.0	100
50	2.5	120
40	2.0	150
30	1.5	200
20	1.0	300
10	0.5	600

4.0 Operation:

Do not apply electrical power until the load bank is filled with water.

Be sure that the correct resistor elements are installed. Check the number marked on the resistor elements and refer to table 2.

With the cover removed, connect the electrical cables to the bus bars. Size cables in accordance with the National Electric Code. Use wire rated for 90°C (194°F) or higher. Fine strand flexible cables are preferable. The use of too heavy inflexible cables may damage the load bank.

Any number of load banks may be connected in parallel.

A neutral cable is not required. **For safety, the load bank ground terminal must be connected to the building ground.**

Install the load bank cover. Turn on the cooling water as described in section 3.0.

Switch the electrical power on. The outlet cooling water temperature should not exceed 90 degrees C. If the water in the tank starts to boil, the water flow must be increased or the load must be reduced immediately. Otherwise the resistor element will open and act as a fuse.

Table 2 STANDARD RESISTOR ELEMENTS

P/N	Ohm	208/ 120 V	480/ 277 V	380/ 220 V	415/ 240 V	600/ 346 V
208045	0.96	45 KW, 125 A	---	---	---	---
208065	0.67	65 KW, 181 A	---	---	---	---
208090	0.48	90 KW, 250 A	---	---	---	---
208115	0.38	115 KW,320 A	---	---	---	---
208125	0.35	125 KW, 346 A	---	---	---	---
208150	0.29	150 KW, 417 A	---	---	---	---
380150	0.97	45 KW, 124 A	---	150 KW, 227 A	---	---
415150	1.15	38 KW, 104 A	---	126 KW, 191 A	150 KW, 208 A	---
480065	3.54	12 KW, 33 A	65 KW, 78 A	41 KW, 62 A	49 KW, 68 A	---
480115	2.00	22 KW, 60 A	115 KW, 138A	73 KW, 110 A	86 KW, 120 A	---
480150	1.54	28 KW, 78 A	150 KW, 181A	94 KW, 143 A	115 KW, 159 A	---
600078	4.60	9 KW, 26 A	50 KW, 60 A	32 KW, 48 A	38 KW, 52 A	78 KW, 75 A
600124	2.90	15 KW, 41 A	79 KW, 96 A	50 KW, 76 A	60 KW, 83 A	124 KW, 119A
600150	2.40	18 KW, 50 A	~~18~~ KW, ~~50~~ 96 A	61 KW, 92 A	72 KW, 100 A	150 KW, 145A
XXX—	Voltage, three-phase, line to line					
—XXX	KW, total of three resistive elements					

Table 3 REPLACEMENT PARTS

Ref #	Description	P/N	Qty
1	Identification Label	100108	1
2	Handle Strap	100105	1
3	Handle Mounting Bracket	100106	2
4	Warning Label	100110	2
5	Top Cover	100101	1
6	Latch Keeper	100102	4
7	Screws, 8-32 * 7/16, S.S.	100103	8
8	Screws, 10 * 1-1/4, S.S.	100204	4
9	Base Plate, Center	100202	1
10	Gasket, Rubber	100103	1
11	Base Pate, Top and Bottom	100201	2
12	Mounting Bar	100205	1
13	Busbar, Phase	100206	3
14	Screws, 10 * 1, S.S.	100208	7
15	Bolt, 5/16-18 *1-1/4, S.S.	100209	6
16	Sleeving, Phase	100207	3
17	Sleeving, Neutral	100216	1
18	Spacer, Long	100213	2
19	Corrosion Shield	100211	3
20	Resistor Element	specify	3
21	Spacer, Short	100214	2
22	Busbar, Neutral	100215	1
23	Retaining Nut	100305	1
24	Water Outlet	100305	1
25	Draw Latch	100302	4
26	Screws, 8-32 * 1/2, S.S.	100303	8
27	Tank, Model X-100	100301	1
28	Lock Nut, Brass	100306	1
29	Water Inlet	100307	1