



PROVIDING RESISTOR AND LOAD BANK TECHNOLOGY... TO THE WORLD



XS400 Load Bank
Operation and
Service Manual

Read all instructions before using the load bank

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- 3) Switch Panel
- 4) Acuvim II Power Meter
- 5) Typical USB A to USB B Male
- 6) Blower and Control Fuses
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IMPORTANT INSTRUCTIONS

1) Components



Total Assembly
XS400

2) Specifications

a. Auxiliary specifications

Blower	480/240VAC, three phase, 60 Hz – externally or internally powered
Control power	120VAC, single phase, 60 Hz – internally powered
Rating	Continuous duty
Power factor	1.0
Load elements	The kW at each step is subject to a manufacturing tolerance of $\pm 5\%$.
Enclosure	Electro-statically powder coat, Blue: PPG PCTZ50108 Touch up paint is Pantone 280-c color. Air inlet and outlet are covered by metal screens. Heat is discharged horizontally.

b. Step power specifications

		Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	Total
208VAC	Power (kW)	3.75	7.5	7.5	18.75	37.5	75	75	75	300
	Current (A)	10.41	20.82	20.82	52.04	104.09	208.18	208.18	208.18	832.72
240VAC	Power (kW)	5	10	10	25	50	100	100	100	400
	Current (A)	12.03	24.06	24.06	60.14	120.28	240.56	240.56	240.56	962.25
480VAC	Power (kW)	5	10	10	25	50	100	100	100	400
	Current (A)	6.01	12.03	12.03	30.07	60.14	120.28	120.28	120.28	481.13

3) Receiving

⚠ WARNING: ELECTRIC SHOCK HAZARD. Electric shock can lead to severe injury or death. If the load bank has been damaged in transit, do not operate until a competent technician inspects the unit and determines that it can be operated safely.

1. Check the equipment for obvious damage.
2. Document and report any exterior damage to the carrier immediately.

4) Safety

This Load Bank is designed for a variety of loads. Because of this, it is possible that voltages higher than those applied can be present inside the load bank and at external connections of the load bank. Work on load bank internal systems should only be attempted by highly trained technicians and only when power has been disconnected and can not be reconnected to the unit.

IMPORTANT INSTRUCTIONS

When using electrical appliances, basic precautions should always be followed to reduce the risk of fire, electrical shock, and injury to persons, including the following:

- 1) Read all instructions before using this load bank.
- 2) This load bank is hot when in use. To avoid burns, do not let bare skin touch hot surfaces. Use handles when moving this load bank. Keep combustible materials, such as furniture, pillows, bedding, papers, clothes, and curtains at least 6 feet (1.8 meters) from the front of the load bank and keep them away from the sides and rear.
- 3) Extreme caution is necessary when any load bank is used by or near children or invalids and whenever the load bank is left operating and unattended.
- 4) Always unplug load bank when not in use.
- 5) Do not operate any load bank with a damaged cord or plug or after the load bank malfunctions or has been dropped or damaged in any manner. Discard load bank or return to authorized service facility for examination and/or repair.
- 6) Use outdoors only if equipped with rain doors.
- 7) Do not use in wet or moist locations if not equipped with rain doors.
- 8) This load bank is not intended for use in wet indoor environments.
- 9) Do not run cord under carpeting. Do not cover cord with throw rugs, runners, or similar coverings. Do not route cord under furniture or appliances. Arrange cord away from traffic areas and where it will not be tripped over.
- 10) To disconnect load bank, turn controls off, then remove plug from outlet.
- 11) Connect to properly grounded outlets only.
- 12) Do not insert or allow foreign objects to enter any ventilation or exhaust opening as this may cause an electric shock or fire, or damage the heater/load bank.
- 13) To prevent a possible fire, do not block air intakes or exhaust in any manner. Do not use on soft surfaces, like a bed, where openings may become blocked.
- 14) A load bank has parts inside. Do not use it in areas where gasoline, paint, or flammable liquids are used or stored.

- 15) Use this load bank only as described in this manual. Any other use not recommended by the manufacturer may cause fire, electric shock, or injury to persons.
- 16) Always plug the control power of the load banks directly into a wall outlet/receptacle. Never use with a re-locatable power tap (outlet/power strip).
- 17) This load bank includes a visual alarm to warn that parts of the load bank are getting excessively hot. If the alarm light goes on, immediately turn the load bank off and inspect for any objects on or adjacent to the load bank that may cause high temperatures. DO NOT OPERATE THE LOADBANK WITH THE ALARM LIGHT ON.
- 18) "SAVE THESE INSTRUCTIONS"

a) Grounding cam

⚠ WARNING: ELECTRIC SHOCK HAZARD. The grounding lug must be connected to earth ground. Operating without a grounding connection could lead to injury or death.

There is one grounding cam located next to the power connections. When the load bank is in operation, the grounding cam must be firmly and electrically connected to earth ground. Failure to do so could allow deadly voltage to be present on the surface of the enclosure. The grounding connection provides a low resistance path to ground. This grounding protects the operator from the possibility of electrical shock.

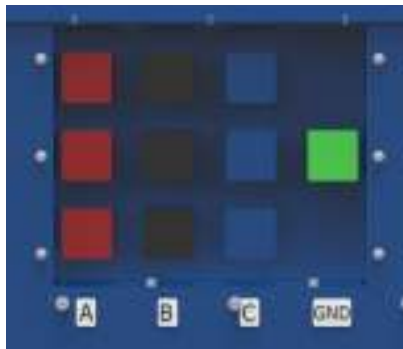


Figure 2. Grounding Cam

b) Power connections

⚠ WARNING: ELECTRIC SHOCK HAZARD. All power connections must be connected or guarded. Failure to do so will expose operators to possible shock and the possibility of grounding-out or shorting-out of the test power source.

c) Air intakes and exhaust ports

⚠ CAUTION: All air intakes and exhaust ports must be clear and fully open. This load bank has two air intakes designed for proper air flow. Reducing or blocking air flow will lead to overheating and load bank failure.

High volumes of cooling air are needed to prevent load elements from overheating. By their very nature, resistors under load convert electrical energy to heat. This heat must be removed from the unit. The blower, intake, and exhaust ports are sized to provide the proper amount of cooling air. Preventing or limiting air flow will allow the load bank to overheat.

Keep intake at least four feet away from walls and obstructions.

To increase the life of the load elements, allow the fans to run at least three minutes after the load is removed or until exhaust air is cool.

No ductwork is permitted on intake or exhaust of this load bank as this will cause a backpressure and decrease the life of the resistors.

⚠ CAUTION: Material can be moved by intake air or exhaust air. Failure to secure material could cause injury to bystanders or damage to the load bank.

Sufficient air flow keeps the load bank cool but can very easily move light debris such as paper, cardboard, and dust with great velocity. Loose materials around the load bank, especially near the intake and exhaust, must be secured to prevent movement. Material on the exhaust side may be blown into and injure a bystander. Material near the intake may be taken into the load bank damaging internal components.

For those units outfitted with covers over the intake and exhaust, the covers must be opened and secured prior to operation of the Load Bank.

d) Exhaust temperature

⚠ WARNING: FIRE AND BURN HAZARD. Keep flammable material at least 40 feet away from the load bank. A great deal of heat is expelled from the load bank. Temperatures inside the load bank are sufficient to ignite flammable fumes or materials. Failure to maintain proper housekeeping and properly securing flammable material could lead to fire, burns, and/or injury.

Even with sufficient air flow, internal component temperature will exceed 400 °C. Exhaust temperatures of 250°C are common. Flammable materials must not be kept around the load bank. Heat from the load bank could ignite this material.

e) Connecting and disconnecting

⚠ WARNING: BURN HAZARD. Attempting to connect or disconnect leads while load bank is in operation can lead to severe injury or death. Connecting or disconnecting plugs and receptacles while current is flowing or voltage is present may cause arcing. Arcing can generate a great deal of light, heat and possibility of electrocution.

5) Operation

NOTICE: Contact Mosebach Manufacturing if you are planning operations in ambient temperatures above 46 °C.

Ambient plus heat generated by the resistor can cause electrical components to possibly malfunction.

a) Pre-startup

1. Check housekeeping in the operational area and correct all unsafe conditions. Failure to do this may result in debris being blown around and may cause a fire hazard.
2. Connect the load bank's grounding cam to a known earth ground.
3. Check the switch panel and move all switches to the OFF position. (see figure 3)
4. Position load bank so that air will flow freely into the intakes and out of the exhaust port.
5. **⚠ CAUTION:** Test points provided on the switch panel are for voltage testing only. Attempting to monitor current will cause fuses and meter to fail.



Figure 3. Switch Panel

b) Startup

1. Connect power cables to the unit via the cam locks provided.

Ensure cable size is sufficient to carry the expected current. Failure to size conductors properly will lead to conductor overheating, which will damage conductors and may pose a fire hazard.

2. If the Load Dump functionality is not desired, turn the Load Dump Bypass switch to the ON position.

⚠ CAUTION: Make sure air is flowing from the exhaust port. Failure to have proper air flow will cause unit to overheat and fail.

c) Applying load

1. Turn the main power switch to the desired voltage.
2. Place the desired test step switches in the ON position.
3. Put the Master Load toggle ON to engage the blower and resistors. (Step switches can be added or removed if desired once Master Switch is on.)
4. Repeat tests as needed.

d) Acuvim II Power Meter

1. Press the “VA” button on the front of the meter to view and cycle through the line voltage and current options.
2. Press the “P” button on the front of the meter to view and cycle through the Power Reading and Power Factor options.

You will find more detailed instructions on the use of your meter on the CD disk that was supplied with your load bank manual or by visiting the “accuenergy.com website.



Figure 4.

e) Shutdown

1. Place all step switches in the OFF position. Put the Master Load in the OFF position.
2. Allow fans to operate at least three minutes or until exhaust air is cool before shutting them off. This cooling period will extend the life of your load bank.
3. Turn Load Dump Bypass switch to the OFF position.
4. Turn main power switch to the OFF position.
5. Turn off source power and customer is to confirm prior to disconnection of power cables.
6. Remove ground connections.
7. Move the unit to storage.

6) USB Communication Port for Acuvim II Power Meter:

This load bank is equipped with a Acuvim II Power Meter that has a USB communications port. This port enables the user to connect the meter to a PC and read the test parameters from a remote location. A CD disk is provided to the user with this manual. The disk contains communications software at the following path:

Utility Software\Acuvim\ Acuvim.zip\NorthAmerica20140613\Acuvim 3.4.2\Acuvim.exe

Run **Acuvim.exe** to load the software on your computer.

After loading the software, connect the cable between the PC and the load bank.

A USB cable is not provided. It should be purchased separately. See Figure 5 for an example.



Figure 5. Typical USB A to USB B Male

Start the Acuvim program and take the following steps:

- Create a connection: Click **Settings > Connection Manager > New**
 Type in a name that you want to use for your connection
 Check **Serial Port**
 Select the Com Port that your computer is set up to use for USB
 Select the Baud Rate – (default for the meter is 19200)
 Set Parity to **None 1**
- Add a device: Click **Operation > Add Device**
 Select **Acuvim II** for the device type
 Select the Com Port name that you configured above
 Select 1 for the **Device Address** (should match meter settings)
 Enter the description that you want to use for this device.
- Connect: Click **Operation > Connect**

You should now be able to view the power meter readings from the load bank.

You will find more detailed instructions on the set-up and use of your software on the CD disk that was supplied with your load bank manual or by visiting the “accuenergy.com” website.

7) Troubleshooting

Meter/load bank will not turn on.	Make sure that the 120VAC plug is connected and powered or the Load Dump Bypass toggle is turned off if the Load Dump functionality is not desired. Make sure the Main Power Switch is turned to the correct position. Check Power Sources. Check Control Fuses. See Figure 8.
Blower will not turn on.	Check for debris preventing fan from turning. Check blower fuse. See Figure 6.
Load steps will not turn on.	Check if overtemp red light is on. Make sure that test source is on. Check control fuses. See Figure 8. Check resistor continuity. See schematic. Check resistor step fuses. See figure 7.
Over temperature light.	This is an indication that the internal cabinet temperature has exceeded 150°F. Make sure the cabinet is ventilated. Check over temperature sensors (OTS). There is an OTS in the main chamber, an OTS in the contactor chamber, and an OTS in the fuse chamber.

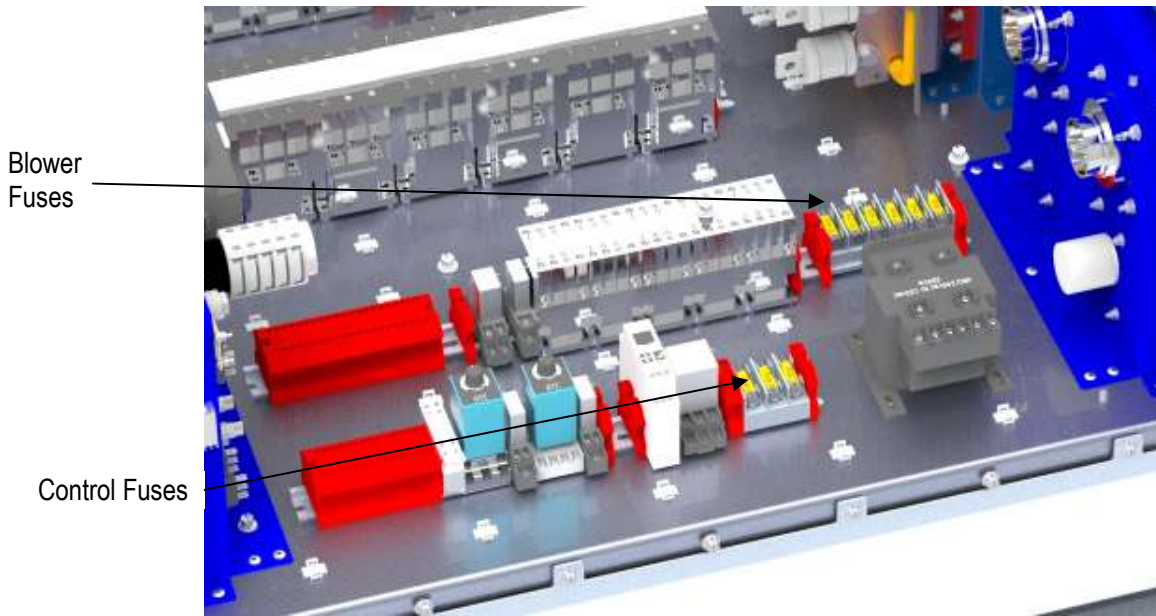


Figure 6. Blower and Control Fuses



Figure 7. Resistor Step Fuses

8) Replacing Fuses

1. Remove ¼-20 hardware from the top panel of the load bank to gain access to fuses.



Figure 8. Load Bank Lid

2. Service on fuses can then be performed.

9) Replacing Resistors

1. Using a 1/4" socket or wrench, remove all bolts from the exhaust panel containing the bad resistor and gently remove the exhaust panel, exposing the resistors. (See Figure 9).

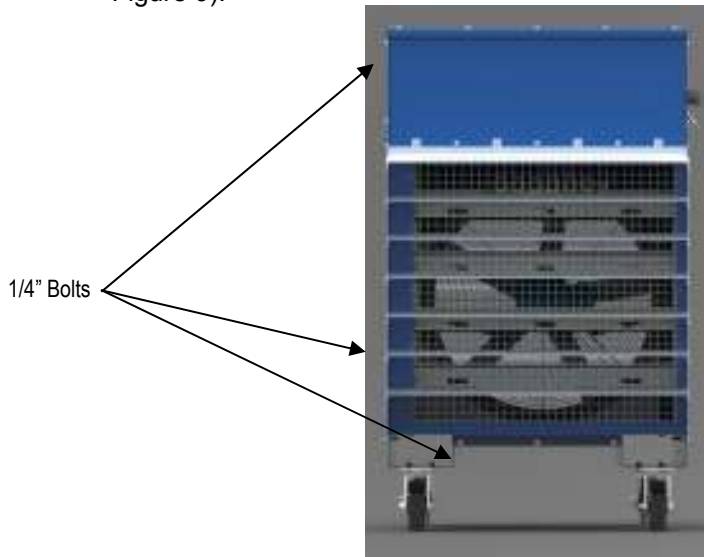


Figure 9a

2. Remove the bad resistor wires from the terminal block connection (see figure 10).

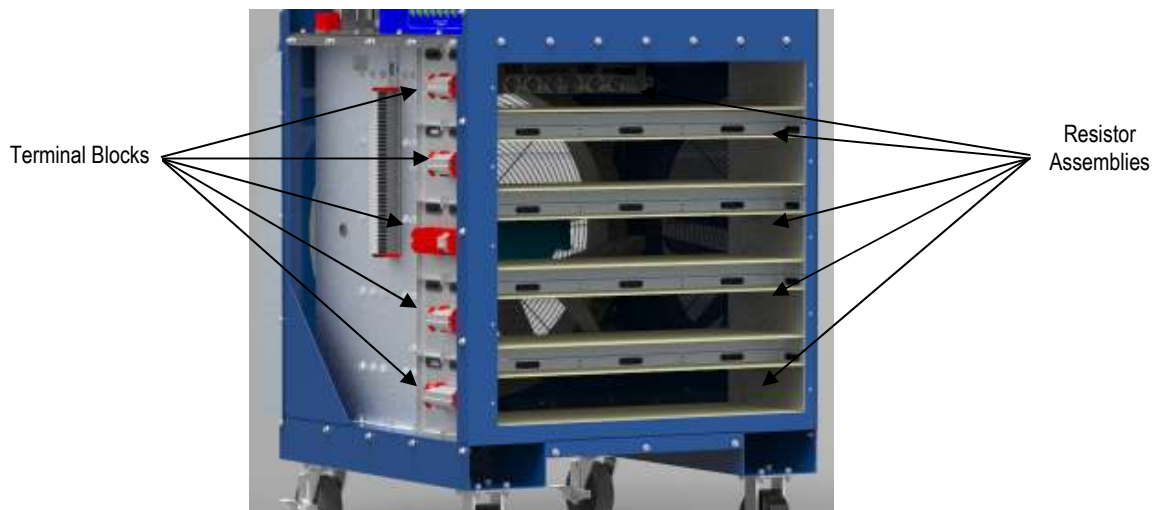


Figure 10

3. Remove the 4 bolts from the top and 4 bolts from the bottom of the bad resistor assembly.
4. Slide the bad resistor out of the load bank and slide the new one in its place.
5. Attach the bolts from step 3 onto the new resistor
6. Attach the new resistor wires into the terminal blocks from step 2.
7. Using a 1/4" socket or wrench, close and fasten the exhaust panel.

10) Preventative Maintenance of the Load Bank

1. Do not use a power washer to clean off the exterior of the unit. It is high-voltage electrical equipment.

Component	Action	Frequency
Entire Unit	Walk around the load bank and inspect for : a) Obvious Damage b) Loose hardware	Check every use
All exterior bolts that hold the sheet metal	Tighten the 1/4"-20 hardware to 5 ft.-lbs.	Check monthly
Resistance readings	Using an ohm meter, check each step for the correct resistance. These values are on sheet 1 of the wiring schematic.	Check yearly
Electrical Components/ Wiring	Check throughout the unit for loose wires, or electrical components that are no longer secure to their mounting plate.	Check every 6 months
Fans	Check the fans for damage that could cause the airflow to change such as damaged or missing bearing, or damaged blades.	Check yearly

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Contactors	Ensure contacts are opening and closing	Check yearly
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11) Service Parts

	Part Number
Fan	BLWR-0055-0100
Resistor Elements	RA-0055-0294 RA-0055-0267
Fuses	1A CC = EC-9500-0247 30A CC = EC-9500-0298 300A = EC-9500-0849
Meter	EC-9500-1584

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