




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



MegaBank™ Series
X1000H-1 Load Bank



Operation and
Service Manual

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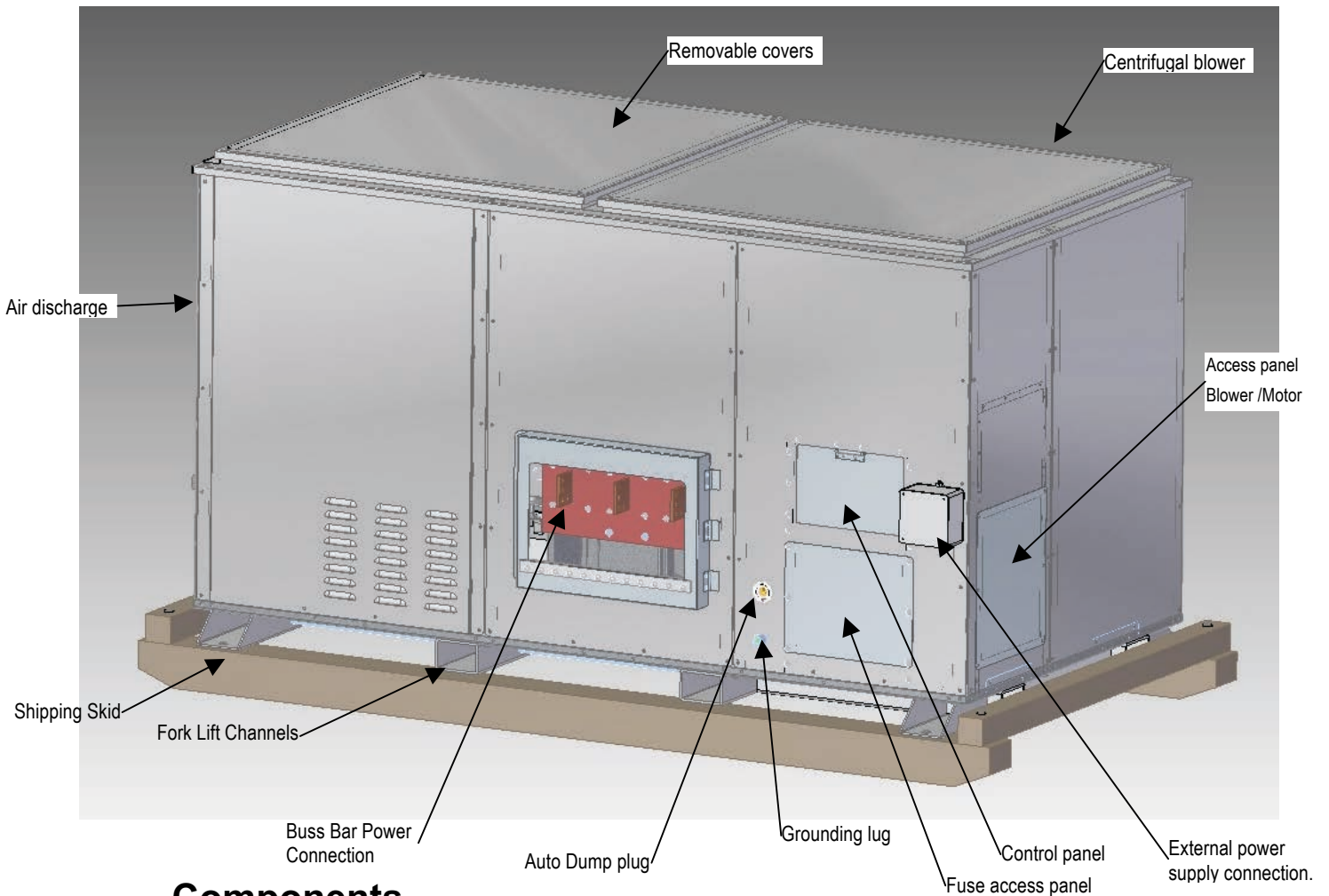
Control drawings, photos, and additional information attached.

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MegaBank™ Load Banks



Components

Enclosure — protects the internal parts and shields the operator.

Electrical power connections — bring the test load into the load bank.

Control and blower connections — provide power for control relaying and cooling. Flange receptacles are standard.

Grounding lug — essential for safety.

Resistor assemblies — Slimline™ and WeldlessWeave™.

Centrifugal blower — prevents overheating.

Indicating lights — show the status of the load bank. See your specific control drawing to determine how these lights function.

Remote Control enclosure — for selecting various test functions from a remote location.

Specifications

Blower	480/240VAC, 3 phase, 60Hz Internally/Externally Powered
Control power	120VAC, 1 phase, 60 Hz Stepped Down from Int. 480/240/208 or Ext. 480/240VAC
Rating	Continuous duty
Power factor	1.0
Load elements	<p>Each resistor is connected in wye. Our WeldlessWeave™ and Slimline™ technologies use a continuous stainless steel ribbon to eliminate all welds. By eliminating welds, hot spots are eliminated. All mica construction.</p> <p>To reduce the operating temperature, no through-bolts are used.</p> <p>Parallel element system reduces the watt density.</p> <p>Our resistors are design to withstand vibration and trailer loading.</p> <p>The kW at each step is subject to a manufacturing tolerance of ±5%.</p>
Enclosure	<p>Light-weight electro-statically painted metal enclosure with lift truck channels for easy maneuvering.</p> <p>Air inlet and outlet are covered by metal screens.</p> <p>Heat is discharged horizontally.</p>

Load steps and load capacity

X1000H-1 1000/625 KW

	kW Steps	kW Steps	kW Steps	kW Steps	Total kW	Amps
480vAC, 3ph.	1 x 50	2 x 100	1 x 250	2 x 250	1000	1200 A
240vAC, 3ph.	1 x 50	2 x 100	1 x 250	2 x 62.5	625	1550 A
208vAC, 3ph.	1 x 37.5	2 x 75	1 x 187.5	2 x 47	468.8	1160 A

Receiving

Your load bank is ready to run when you receive it.

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.

Inspecting

1. Check the exterior of the shipping container or packaging material for obvious damage.
2. Document and report any exterior damage to the carrier immediately.
3. Check that doors open and close properly and that door latches secure the door.
4. Check the control panel for any obvious damage.

Lifting

CAUTION! Use proper lifting devices or methods. Inadequate lifting devices or methods can damage the load bank.

1. Make sure that the fork lift or lift truck type lifting device is rated for the size and weight of the load bank.
2. Before making a move, make sure that lift is balanced and secure.
3. Follow all of the directions provided by the lifting device manufacturer.

Safety

MegaBank™ Load Banks are designed to handle various voltages, currents, and loads, and may have both resistive and reactive elements. 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.

Grounding lug

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

When the load bank is in operation the grounding lug 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.

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.

Exposed metal on electrical connectors may have voltage on them.

Depending on specifications, various types, frequencies, and amplitudes of voltages can be applied to your load bank. All power connections must be guarded or connected. Failure to do so will allow test voltages or in some cases voltages higher than test voltages to be present on exposed metal parts of the connectors. Operators could receive an electrical shock if they come in contact with these exposed conductors. If a loose conductor contacts an exposed metal part of a “hot” conductor, it could lead to grounding-out or shorting-out of the source generator.

Air intakes and exhaust ports

Caution! All air intakes and exhaust ports must be clear and fully open. Each load bank has one or more 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 change 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.

Wind may reduce air flow. Place the load bank so the exhaust ports face away from prevailing winds. Mosebach Manufacturing does not recommend load banks be used in high wind condition.

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 3 minutes after the load is removed or until exhaust air is cool.

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.

Good 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.

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.

Load resistors generate a good deal of heat. Even with sufficient air flow, internal component temperature will exceed 600 degrees F. Exhaust temperatures of 500 degrees F are common. Air and material several feet from the load bank can be heated to temperatures in excess of 150 degrees F. Flammable materials must not be kept around the load bank. Heat from the load bank could ignite this material.

Flammable fumes or material such as paper could be drawn into the load bank, ignited, and expelled from the exhaust port. Operators standing on the exhaust side of the load bank may be exposed to high temperatures or possibly burning materials. Unless proper housekeeping is practiced in the vicinity of the load bank while it is in operation, fire could result.

Connecting and disconnecting

WARNING! BURN HAZARD. Attempting to connect or disconnect leads while load bank is in operation can lead to burns and/or blindness. 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 and heat.

Load banks use high-powered resistor elements that have very small ohmic values. Even at low voltages, large currents may be flowing through connectors. Attempting to couple or uncouple electrical connection under load may lead to arcing. Arcing can cause eye damage or burns.

Operation

Your load bank should operate smoothly and without problems for a very long time.

NOTE: Contact Mosebach Manufacturing if you are planning operations in ambient temperatures above 115 degrees Fahrenheit.

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.

The grounding lug must be connected to earth ground. Operating without a grounding connection could lead to injury or death.

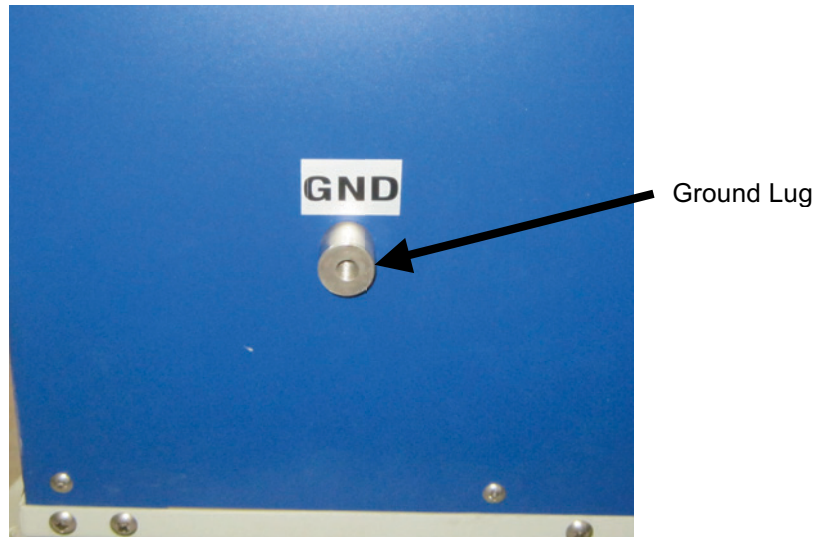
WARNING! FIRE AND BURN HAZARD. Keep flammable material at least 40 feet away from the load bank.

Caution! Unless your load bank has been designed as a weather resistant unit, do not operate in rain or snow.

Caution! Test points (optional) provided on the switch panel are for voltage testing only. Attempting to monitor current will cause fuses to fail.

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 lug to a known earth ground at the testing facility.
Failure to do this may result in a fatal electrical shock.



Connect grounding lug with ½-13 UNC Stainless Steel Bolt

3. Check the control panel and move all switches to the OFF position.

Caution! Select the highest possible expected test voltage during startup. Selecting a lower voltage than the voltage expected during operation may lead to damage to the load bank. **DO NO CHANGE SELECTION WHILE TEST VOLTAGE IS ON** – selecting voltage while test voltage is on will lead to damage

Caution! All air intakes and exhaust ports must be clear and fully open. Reducing or blocking air flow will lead to overheating and load bank failure.

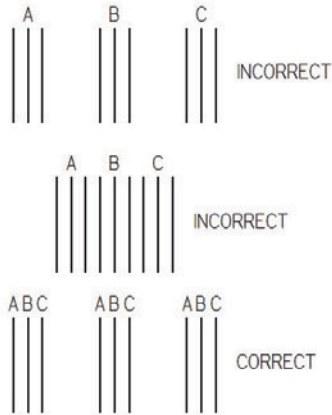
4. Position load bank so that air will flow freely into the intakes and out of the exhaust ports.

Startup

1. Determine source voltages.
2. Connect external 480/240vAC blower power cable if desired.

3. Connect Test Power to bus bars.

Insure cable size is sufficient to carry the expected current. Failure to size conductors properly will lead to conductor over heating, which will damage conductors and may pose a fire hazard. Customer connection from the load bank to the equipment being measured.



It is important to lay out the cables for A, B and C connection as shown in the illustration. Grouping phases together may end up causing an inductance that would imbalance the load in the machine and cause one of the connections to run hotter and give false readings.

4. Turn on unit to be tested.
5. Turn Aux. Power Source switch to the desired method of supplying power to the blower.
6. Activate blower power if from an external source is selected.
7. Turn the MAIN on/off power switch to the ON position.

The red air flow failure light will come on and the small blower will begin to run.

8. Turn Applied Voltage Switch to the correct test source voltage position.

Caution! Mis-matched settings will damage load bank. Failure to properly set load bank to the same as the source voltage will cause damage to internal components rendering load bank inoperable.

9. Turn the blower 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.

10. Check your fans for air flow.

Air should be coming from the exhaust port and the green air flow light should come on. On high powered units you will hear the movement of a lot of air. However, be alert to any unexpected loud mechanical sounds.

11. If air is not flowing out of the exhaust port; move the Blower Switch to the OFF position. Let the blower wheel come to a complet halt. Turn the Blower Reversing Switch to the alternative position. Turn the Blower Switch to the ON position.

12. Check to see that only green lights are lit.

Caution! Make sure voltage is correct. If you apply a voltage that is higher than the voltage selected the load bank will fail.

Testing

1. With the Main Power, Blower and Master Load switches in the ON position
2. Place the desired test step switch in the ON position.
3. Repeat tests as needed.

For Shock load

1. With the Main Power and Blower switches in the ON position and Master Load in the OFF position.
2. Select all step switches that are required.
3. Turn Master Load to the ON position. This will simultaneously engage all selected steps. Be aware that this will place a heavy load on the unit being tested. Insure that the unit being tested can handle the load selected.

Shutdown

1. Place all step switches in the OFF position.
2. Allow fans to operate at least 3 minutes or until exhaust air is cool before shutting them off.
This cooling period will extend the life of your load bank.
3. Turn Blower Selector Switch to the OFF Position.
4. Turn Main Power Switch to the OFF Position.
5. Electrically and mechanically disconnect external control power.
6. Electrically shut down test unit.
7. Uncouple the load bank from the equipment being tested.
8. Move the unit to storage.

Changing voltage on multiple voltage units

Some voltage sag is expected and is normal. The load bank can accommodate normal voltage sag without problems. However, do not attempt to change voltage selected while the load bank is under load.

CAUTION! Never attempt to change test voltage/phase configuration while under load.

Doing so can cause a load imbalance or higher than expected currents and damage the load bank or unit being tested. Severe changes in incoming voltage or

attempting to change voltage/phase combinations under load may cause some contactors to be caught in mid change causing high current conditions. These high current conditions could result in equipment failure.

CAUTION! Make sure all step switches are in the off position when changing test voltage. Failure to do so can cause a load imbalance that could damage the load bank and the test source.

1. Turn all step switches to the OFF position.
2. Turn Master Load to the OFF position.
3. Allow the fan or blower to continue running.
4. Turn Apply Voltage Switch to the OFF position if a voltage is already selected.
5. Turn Apply Voltage Switch to the new desired voltage.
6. The selected voltage must be equal to or greater than the applied test voltage.

Caution! Make sure voltage is correct. If you apply a voltage that is higher than the voltage selected the load bank will fail.

7. Continue with testing.

USB Communication Port for Shark Meter:

Some load banks come equipped with a Shark Meter also have a USB communications post. This port enables the user to connect the meter to a PC and read the test parameters from a remote location. Two CD-ROM disks are provided to the user. The large disk contains communications software and the small disk provides drivers for the USB connection. Both disks must be load on the remote PC in order for the meter to properly communicate with the PC.

The USB cable is not provided. These cables come in various lengths and can be purchased from department stores and electronic specialty stores. You can purchase the length that suits your particular location.

After loading the software, shut the PC off. The PC should always be off prior to making any connections with the load bank. Connect the cable between the PC and the load bank. Turn on the load bank and wait for the meter to go through its startup cycle. Once the meter is on, turn on the PC.

Start the Shark Meter program. Follow the directions in the pop-up menu. The PC will display a representation of the meter and will show what the meter is reading. For more detailed information please read the meter manual which is on the larger disk supplied with the load bank.

Auto Dump Circuit

To protect the stand-by generator from overload during a power grid outage an Auto Dump Circuit may be installed as an option.

Connect the Auto Dump control receptacle to a 110 VAC source. This source must be powered when the power grid is operating normally and must remain in a de-energized state when the

stand by generator is on. As long as there's incoming power applied to the Auto Dump receptacle, contactor CALD will remain energized.

With the SALD (Auto Dump By-Pass) switch is in the normally closed position the CALD contactor is by-passed. So whether power is applied to the Auto Dump control receptacle or not, the load bank will operate normally.

With SALD (Auto Dump By-Pass) switch in the open position, control power will be lost when power to the 110 VAC connected to the Auto Dump control receptacle is lost. Note that if power is restored to the control receptacle when the stand by generator comes on line the load bank will draw a load. To function properly the power supplied to the Auto Dump control receptacle must not be restored when the stand by generator comes on line. The only time that power should be present on the Auto Dump control receptacle is when the power grid is functioning normally.

Meter Configurations

On special orders our load resistors are wire with a "DELTA" configuration. On those load banks the meters are calibrated and wired to correctly read "DELTA" parameters.

On standard load banks the resistors are wired in a "WYE" configuration. Regardless of the generators configuration the meter will display "WYE" parameters.

If your generator is in a "DELTA" configuration do not connect the neutral on the load bank. Do not ground the neutral on the load bank. Ground the load bank through the grounding stud provided.

For additional information you can go to one of the following WEB PAGES listed below:

Shark Meter <http://www.electroind.com/>

Troubleshooting

Load Bank Will Not Turn On	<p>Check that Blower Power is on.</p> <p>Check control power transformer fuses</p> <p>Insure Voltage Selector Switch is not in the OFF position.</p>
Blower will not turn on.	<p>Check external power source.</p> <p>Check for debris preventing fan from turning.</p> <p>Check blower fuses and/or starter.</p>
Airflow light stays red.	<p>Check to see if blower is on.</p> <p>Check blower direction (3-phase units only).</p> <p>Check air path for obstruction that may prevent proper air flow.</p>
Load steps will not turn on.	<p>Check if any red light is on. Eliminate cause of red indicator.</p> <p>Make sure that test source is on.</p> <p>Check control fuses.</p>

Part numbers

Part Number	Description	Part Number	Description
BLWR-0055-0055	Fan, 24" Square	BLWR-0055-0065	Cent. Blower w/115vAC motor
EC-9500-0383	switch, Air pressure	EC-9500-0514	Power Dist. Block, 1 pole, 420A
RA-0055-0106	250kW Resistor	RA-0055-0110	Spacer Grid
RA-0055-0097-4	250kW Resistor	RA-0055-0112	Offset Spacer Grid
RA-0055-0097-5	250kW Resistor	EC-9500-0974	Transformer ,750VA 480/240 - 120
RA-0055-0098-3	100kW Resistor	EC-9500-0869	32/60A IEC Contactor
EC-9500-0870	65/110A IEC Contactor	EC-9500-0953	Overload Relay 32-50A
EC-9500-0981	Overload Relay 57-70A	EC-9500-0248	Toggle Switch
EC-9500-0729	10A Class "T" type Fuse	EC-9500-0961	Fuse Block, 3 pole, 30A max.
EC-9500-0731	15A Class "T" type Fuse	EC-9500-0962	Fuse Block, 3 pole, 60A max.
EC-9500-0736	40A Class "T" type Fuse	EC-9500-0244	10A CC type Fuse
EC-9500-0741	80A Class "T" type Fuse	EC-9500-0245	5A CC type Fuse
EC-9500-0744	150A Class "T" type Fuse	EC-9500-0247	1A CC type Fuse
EC-9500-0916	450A Class "T" type Fuse	HW-9000-0185	Bulkhead Tube to Tube Fitting
EC-9500-0323	Square Base Relay, 14 pin, 4PD	HW-9000-0267	Tubing .188 ID x 5/16" OD"
EC-9500-0324	Relay Socket for EC-9500-0323,	HW-9000-0279	1/2 OD x 1/2"lg. Nylon Standoff"
EC-9500-0363	Fuse-holding Terminal Block	HW-9000-0291	DWYER TUBING CONNECTOR
EC-9500-0365	Banana Jack (black)	HW-9000-0366	8.88 3 groove sheave 2L342"
EC-9500-0881	3 pole 100A Circuit Breaker	HW-9000-0367	Transmission belt 59 G# 6X876
EC-9500-0265	120V receptacle	POWR-022	Single Pole Power Distribution
EC-9500-0582	300A Contactor, Benshaw	POWR-023	3 pole Power Dist. Block
EC-9500-0513	Power Dist. Block, 3 pole, 420A	SWIT-006	Overtemp Switch (210 deg)

Additional information

The attached power and control drawings provide detailed operating conditions and parameters. Please refer to your bid sheet for additional information about your unit.

Operating information about the meters is provided separately from this manual.

For additional assistance please contact our warranty or customer service department.
[412.220.0237]