

GENERAL

Load Technology -

Date: 04/30/10

Model: OSL4v-0750.1-480V33-0600-10

Rating: 750 KW Voltage: 480V, 3ø, 3W, 60Hz. Power Factor: 1.0



TECHNICAL DESCRIPTION STATIONARY RESISTIVE TYPE LOAD BANK

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4/26/10 Pg. 1 of 2

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BASIC UNIT			
MODEL:	OSL4v-0750.1-480V33-0600-10		
RATING:	750 KW @ 480 V, 3Ø, 3W, 60 Hz, 1.0 P.F.		
RESOLUTION:	10 KW nominal load step adjustment from 0-100% of unit rating.		
TOLERANCE:	0 -+5% overall tolerance, +/- 2% phase-to-phase balance		
APPLICATION:	The unit has the capability of loading power sources of varying power and voltage ratings.		
CONFIGURATION:	The Load Bank consists of two (2) separate items: 1) An outdoor weatherproof load enclosure		
	containing the load resistors, power control devices, and cooling fan. 2) A Wall mounted		
	Operator Interface Panel		
ENCLOSURE:	Load: Outdoor Weatherproof Vertical Exhaust, Nema 3R, with bolt down provisions for permanent mounting; captive fork lifting provisions and lifting eyes for handling during installation. The enclosure is fabricated of galvanized steel that is primed and painted as described below. The top exhaust is protect with articulated cover doors automatically operated by a linear actuator controlled and power from the Digital Controller. Control: (1)Nema 12 Wall Mounted Enclosure		
PHYSICAL:	Load Enclosure: 96"H x 48.5"W x 66"D, 1800 LBS		
	Control Enclosure: 14"H x 12"W x 8"D, 30 LBS		
PAINT:	Preparation: SSPC Surface Preparation Standards # SP1		
	Primer: Polyvinyl-butyl resin based etching type		
	Finish: Catalyzed type polyurethane enamel		
AMBIENT: Temperature.: -20 F./-30 C. to +120 F./+50 C.			
	Humidity: up to 100 %		
	Altitude: 4000 Ft / 1200 M		
LOAD RESISTOR:	The Loadtec RESISTAR is designed specifically for high density applications. The resistor is		
	continuously supported to eliminate possible shorting contact with surrounding resistors. Load		
	resistors are mounted in trays that are independently mounted so each is removable without		
COOLING:	affecting any other tray. The RESISTAR has an industry exclusive 3 year limited warranty. Forced air cooled by a TEFC motor with a direct drive airfoil propeller.		
CONTROL POWER:			
Cooling Motor:			
	24 VAC, $1\emptyset$, 60 Hz., derived from the fan power $3\emptyset$ source via a control power transformer.		
CONTROL POWER:			
	24 VDC from engine starting battery.		
CONTROL:	Processor Control / Metering System		
Features:			
	 Serial interface to Control Panel(s) using conventional Category 5 data cable connection. Up to (4)Control Panels can be connected on a single unit with a simple "daisy chain" wiring. Remote Control Panel(s) install with up to 1,000ft of control cabling without external control power required for the control panel. Control Module installed in the load enclosure and the OIP installed in the control panel are both upgradeable with firmware flash capability. 		
	* Additional serial RS232, RS422 and RS485 ports are available for optional Modbus and		
	optional Windows DLL external control interfaces. * Ethernet port for optional TCP/IP interface functions.		
Operation:	 The control system is accessed at the Operator Interface Panel (OIP) installed in the Control 		
operation.	Panel		
	* The control system provides the following programmable functions:		
	 Manual Load Step Control 		
	 Automatic Loading Operation 		
	 Regenerative Absorption Operation 		
	 Base Load Control for enhanced transfer and block load response. 		
	 Automatic Exercise Operation (Internal Clock) 		
	 Exercise Monitoring and Alarm Circuitry 		
	 Automatic Load Sequencing (External Exercise Clock) 		
	 Transfer Switch position monitoring for operational logic coordination 		
Metering:	* The control system provides metering values on the Operator Interface Panel.		
	* All values are true RMS		



TECHNICAL DESCRIPTION STATIONARY RESISTIVE TYPE LOAD BANK

4/26/10 Pg. 2 of 2

- ♦ Voltage each Ø-Ø, +/-1.0%
- Voltage Average, +/-1.0%
- Current each Ø, +/-1.0%
- Current Average +/-1.0%
- Frequency: 45-65 Hz, +/-0.2%
- Kilowatts Average, +/-1.0%
- Aux. Contacts: * (4) Addressable "C" Form Auxiliary contact signals are provided. Standard Signals:.
 - * Generator Start for Automatic Exercise Operation
 - * Exercise Failure for Automatic Exercise Operation
 - * Normal Operation
 - * Common Failure

Operator Interface: * Wall mounted Panel.

- * The features of the system is accessed by the Operator Interface Panel.
- * Serial interface to Control Panel(s) using conventional Category 5 data cable connection.
- * Up to (4)Control Panels can be connected on a single unit with a simple "daisy chain" wiring.
- * The panel consists of the following components:
 - LCD Graphics Display Screen
 - Control Keypad
 - Audible Input Signal
 - LED General Operational Indicators
 - Lamp & Graphical Display Test
- * The LCD Display provides:
 - Soft Key Legend
 - Metering display
 - Operational Mode
 - Operational status and alarm condition details

PROTECTIVE SYSTEM

- Cooling: A temperature & air flow sensors monitors cooling and disconnects the unit on failure.
- Voltage: Voltage monitoring circuits monitor for connected sources and alarms and disconnects on faults.
- **Cooling Motors:** Thermal overload relays with thermal magnetic circuit breaker for protection and disconnect. **FUSES:** Fuse protection is provided for each individual load section and control circuit.
- POWER CONTROL: The load is controlled by contactors that are applied for continuous and cycling operation.
- MANUALS: (2) As built drawing manuals are provided at time of shipment.

OPTION #1: Modbus Interface

INTERFACE: Provides external control of Load Bank via serial RS 485 Modbus RTU interface Note: This does not included programming or setup of master Modbus control device that communicates with the Load Bank.

NOTE #1: The load bank circuit breaker is not included in this proposal. The load bank circuit breaker must be installed at the generator switchgear or generator junction box to protect both the load bank and cabling. A circuit breaker in the load bank will not meet code requirements for connection cable protection.







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PROGRAMMABLE	FROLLER	LAWP DISPLAY TEST F1 F2 F3
DIGITAL CONTROL PROGRAMMABLE FOR SITE REQUIREMENTS AUTOMATIC EXERCISE OPERATION: Real time AUTOMATIC LOADING OPERATION: Real time BASE LOADING OPERATION: Maintain BASE LOADING OPERATION: Ioad the general REGENERATIVE ABSORPTION OPERATION: a MANUAL LOADING OPERATION: Operator co METERING: Monitor the electrical values and to DIGITAL COMMUNICATION INTERFACES INTERCONNECTIONS: Simple CAT5 cable inter MULTIPLE CONTROL PANELST: up to (4) par EXTERNAL CONTROLT: Mod-Bus® & other co TCP/IP INTERFACET: Connect to a LAN or W	A control protocol communications a	available
 AUTOMATIC EXERCISE OPERATION: THE AUTOMATIC EXERCISE FUNCTIONS PROVIDES CAPABILITY TO SCHEDULE AN UNATTENDED EXERCISE LOADING OF THE SOURCE. THE FOLLOW PARAMETERS ARE PROGRAMMABLE: ENABLE / DISABLE TIME OF DAY DAY INTERVAL/DAY OF WEEK TEST SEQUENCE: (8) stage FAILURE TO COMPLETE EXERCISE ALARM Under/Over Volt & FREQ. LEVELS TO ALARM Under/Over Volt & FREQ. LEVELS TO ALARM BASE LOADING OPERATION: THE BASE LOADING FUNCTION PROVIDES THE CAPAB TO PROGRAM THE LOADING OF THE GENRATOR AT STAR AND BEFORE THE CONNECTION TO THE FACILITY LO THIS PROVIDES ENGINE TURBO BOOST & ALTERNATOR F BOOST TO IMPROVE GENERATOR CONNECTION STABILIT MOTOR LOAD AND NON-LINEAR LOADS. THE FOLLOW PARAMETERS ARE PROGRAMMABLE: ENABLE / DISABLE VOLTAGE PERCENTAGE INITIATION AMOUNT OF LOAD TIME LOAD IS APPLIED IN SECONDS 	SE & CAPABILITY TO PROGR SOURCE. THIS REDUC OPERATION OF THE PARAMETERS ARE PROD ENABLE / DISABLE SOURCE RATING PERCENTAGE OF LO CURRENT TRANSFO DELAY PROFILES: IN LOADING RESOLUTION REGENERATIVE ABSO ADS. CAPABILITY TO ABSORD LIST FIELD SUCH AS ELEVATORS TO THE FOLLOWING PARAMET WING ENABLE / DISABLE PERCENTAGE OF RE METERING IS PROVIDED AND SOURCE ELECTRIC	DING FUNCTION PROVIDES THE AM A MINIMUM LOADING OF THE CES INEFFICIENT OR UNSTABLE SOURCE. THE FOLLOWING GRAMMABLE: DAD TO MAINTAIN RMER SIZE NITIAL, LOAD, UNLOAD DN DRPTION OPERATION: SORPTION FUNCTION PROVIDES THE OAD REGENERATION FROM SOURCES PREVENT GENERATOR OVERSPEED. TERS ARE PROGRAMMABLE: GENERATION TO MONITOR THE LOAD BANK CAL VALUES.
 MANUAL LOADING OPERATION THE MANUAL OPERATION ALLOWS THE OPERATOR DIRECTLY APPLY DESIRED LOAD TO THE SOURCE. SELECT LOAD VALUE LOAD ON/OFF † Designates Optional Equipment or Feature 	 General: VM,AM,F Load Bank: KW Source: KW GENERAL: LCD GRAPHIC OPER LED'S FOR BASIC SY REAL TIME CLOCK NON-VOLATILE MEMORY 	ATOR DISPLAY STEM STATUS
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SITE

• The Load Bank is designed for outdoor or indoor installation on a suitable concrete pad or supporting structure.

Outdoor

- This is the preferred method of installation.
- Air exhaust is hot and serious considerations must be given to surrounding equipment and conditions. The Load Bank exhaust should be a minimum of twenty (20) feet from any object. The exhaust should not be directed to any other equipment's air intakes such as air conditioners or ventilating equipment; never be directed to flammable surfaces or areas with flammable storage; or areas that are routinely occupied or used as walkways.
- When installing on roofs, consideration must be given for shielding of the roof surface. A modified louver assembly can be supplied for this type of application to direct the exhaust flow upwards.
- Air intake(s) should be a minimum distance of six (6) feet from any walls , barriers, or restricting objects.
- Consideration must be given to other heat rejecting equipment being directed at the intake or site area that would exceed the ambient limits.
- The air exhaust should not be directed toward prevailing winds. The Load Bank should be positioned so the prevailing winds are directed to the air intake or sides of the unit.

Indoor

- Air exhaust is hot and serious considerations must be given to indoor installation.
- Indoor installation requires special considerations to provide adequate cooling air and a means to duct or dissipate the heat rejected by the Load Bank.
- Specific calculations for the Load Bank's heat rejection affect on the room's ambient must be made to assure the rooms ventilating system can maintain the Load Bank's makeup air within ambient limits.
- The cooling system of the Load Bank has a limited ability to overcome static pressure restrictions placed on it by intake and exhaust ductwork. Ductwork should be designed to the least amount of total static pressure and must not exceed of the maximum allowed for the specific unit being installed.
- When intake ductwork is not used, static pressure concerns still exist. When the Load Bank's makeup air is derived directly from the room, the room may have a negative static pressure that is created by other air moving equipment such as engine cooling fans and room ventilating systems. These other systems may create a condition of negative static pressure that the Load Bank cooling fan may not be able to overcome thus causing cooling problems.
- Install the Load Bank on the prepared structure or pad in accordance with previously outlined criterion.

CONNECTION

- The Load Bank electrical connection requirements are detailed by the drawing manual provided.
- The Load Bank will require two (2) basic connections: Power and Control
- Connect the required power conductors from the power source(s) to the Load Bank Main Bus connection points as detailed by the supplied drawings for the specific unit. All connections must take in consideration National Electrical Code and any local code requirements concerning, but not limited to, cable sizing, wiring methods, and over current protection.
- Particular attention must be made in properly grounding the Load Bank per National Electrical Code and any local codes.

WARNING

FOR OPERATOR SAFETY

The Load Bank MUST BE ELECTRICALLY GROUNDED in accordance with the National Electrical Code & any local codes.

- Connect the required pilot conductors from the Load Bank to the Control panel connection points as detailed by the supplied drawings for the specific unit. All connections must be made in accordance with the National Electrical Code and any local code requirements concerning, but not limited to, cable sizing, wiring methods, and over correct protection.
- Connect the required pilot conductors from the Control panel connection points to any required external monitoring or control points as detailed by the supplied drawings for the specific unit. All connections must be made in accordance with the National Electrical Code and any local codes.



LIMITED WARRANTY Terms

TIER #1: Standard Limited Warranty

LOADTEC, Load Technology Inc., warrants that its products are free from defects in material and/or workmanship under normal use and service. Its liability under this Warranty Tier shall be limited to twelve (12) months from date of shipment for products and/or components except as noted:

(3)Year Term Items (included in Standard level)

- The "RESISTAR" Load Resistor assemblies as manufactured by Loadtec. These assemblies have the Warranty term extended to a total of thirty-six (36) months from the date of shipment. The "RESISTAR" Load Resistor assemblies warranty is limited to the failure of the alloy wire, its termination, and workmanship of the assembly. Physical damage or breakage is not covered. All other terms of the Tier #1 Warranty apply.
- The digital electronic control assemblies that are manufactured by Loadtec. These components and assemblies have the Warranty term extended to total of thirty-six (36) months from the date of shipment. All other terms of the Standard Warranty apply.

The warranty liability is limited to repair, refurbishing, or replacement; at LOADTEC's sole discretion, at the factory or authorized service station. The products and/or components shall be returned with transportation costs **prepaid**. Returned products and/or components that are determined defective and within the warranty period will be repaired or replaced, and returned F.O.B. factory or repair station, freight charges collect. Authorization to return must be obtained prior to receipt at the factory by contacting Loadtec Service Department. The delivery of any unauthorized returned Products shall be refused.

This warranty does not cover incidental and consequential damages, nor does this warranty cover defects caused by abuse, improper use, improper installation, improper connection, lack of reasonable maintenance, modifications, shipping damage, or accident. This Standard Warranty Tier does not included any labor charges, service charges, or any liability except repair or replacement of the products and/or components as previously described and governed by the General Conditions section.

TIER #1a: 2 Years without Labor Limited Warranty

LOADTEC, Load Technology Inc., offers this Tier #1a Warranty as an option to the Tier #1, Standard Warranty as previously described. The terms of the Tier #1 Standard apply plus the addition of one 12 months to the basic 12 month term for a total of (24) months from date of shipment. This Tier 1a Limited Warranty does not included any labor charges, service charges, or any liability except repair or replacement of the products and/or components as previously described and governed by the General Conditions section.

TIER #1b: 1Years with Labor Limited Warranty

LOADTEC, Load Technology Inc., offers this Tier #1b Warranty as an option to the Tier #1, Standard Warranty as previously described. The terms of the Tier #1 Standard apply plus the addition of labor costs to accomplish repair. The labor cost may be provided in the form of a technician dispatched from the factory or a locally dispatched independent service company's personnel. If the damage is deemed not repairable on the site, the Warranty will cover removal and transportation cost to the factory and return to the site. The remedy shall be the sole discretion of Loadtec. The entity making the Warranty claim shall make available to the Service Department of Load Technology, the person at the site who has working knowledge of the equipment and has reported the claim. This person will be required to provide details of the claim with preliminary data and readings to evaluate the validity of the claim. If it is found later that the supplied data is not accurate, and the claim is not covered by this Warranty, the entity making the claim will be charged and held responsible for costs incurred that will include, but not limited to: labor, transportation, lodging, and material costs. This Warranty option is governed by the General Condition section of this document.

TIER #2: 2 Years with Labor Limited Warranty

LOADTEC, Load Technology Inc., offers this Tier #2 Warranty as an option to the Tier #1, Standard Warranty as previously described. The terms of the Tier #1 Standard apply plus the addition of labor costs to accomplish repair. The term of the Tier #2 warranty is two (2) years from the date of shipment from the factory. The labor cost may be provided in the form of a technician dispatched from the factory or a locally dispatched independent service company's personnel. If the damage is deemed not repairable on the site, the Warranty will cover removal and transportation cost to the factory and return to the site. The remedy shall be the sole discretion of Loadtec. The entity making the Warranty claim shall make available to the Service Department of Load Technology, the person at the site who has working knowledge of the equipment and has reported the claim. This person will be required to provide details of the claim with preliminary data and readings to evaluate the validity of the claim. If it is found later that the supplied data is not accurate, and the claim is not covered by this Warranty, the entity making the claim will be charged and held responsible for costs incurred that will include, but not limited to: labor, transportation, lodging, and material costs. This Warranty option is governed by the General Condition section of this document.

TIER #3: 3 Years with Labor Limited Warranty

LOADTEC, Load Technology Inc., offers this Tier #3 Limited Warranty as an option to the Tier #1, Standard Limited Warranty as previously described. The terms of the Tier #1 Standard Limited Warranty apply plus the addition of labor costs. The terms of the Tier #3 Limited Warranty are the same as the Tier #2 Limited Warranty with the only exception being the term being three (3) years from the date of shipment from the factory.

TIER #4: 4 Years with Labor Limited Warranty

LOADTEC, Load Technology Inc., offers this Tier #4 Limited Warranty as an option to the Tier #1, Standard Limited Warranty as previously described. The terms of the Tier #1 Standard Limited Warranty apply plus the addition of labor costs. The terms of the Tier #3 Limited Warranty are the same as the Tier #2 Limited Warranty with the only exception being the term being four (4) years from the date of shipment from the factory.

TIER #5: 5 Years with Labor Limited Warranty

LOADTEC, Load Technology Inc., offers this Tier #5 Limited Warranty as an option to the Tier #1, Standard Limited Warranty as previously described. The terms of the Tier #1 Standard Limited Warranty apply plus the addition of labor costs. The terms of the Tier #5 Limited Warranty are the same as the Tier #2 Limited Warranty with the only exception being the term being five (5) years from the date of shipment from the factory.

GENERAL CONDITIONS:

- No Warranty Tier covers incidental and/or consequential damages, nor does it cover failures caused by abuse, improper use, improper installation, improper connection, lack of reasonable maintenance, unauthorized modifications or repairs, shipping damage, or accident.
- Products that are resold after original installation or commissioning and ownership is transferred are not covered under this Warranty.
- Consumable components of the products are not included in this Warranty. Consumable items include fuses, light bulbs and other components that have a
 wear life such as brakes and tires on trailer products and are not covered.
- Tier 1 Warranty apply to all products of Load Technology except where a written notice is signed by the Purchaser.
- Tier 2, 3, 4, 5 Warranties are not available for all products provided by Load Technology, Inc. Certain products may have certain components, structures or assemblies specifically excluded due to the lack of available extended support by their manufacturer or supplier. Any such limitations will be indicated on the specific product's purchase documents.
- Tier 2, 3, 4, 5 Warranties are offered on an optional basis and are at an additional cost and are not included in base equipment offering unless specifically listed in writing in the purchase documents.
- Tier 2, 3, 4, 5 Warranties are only available for products installed and/or used in the continental United States. This condition is not waived if quoted or sold and the unit is installed/or used outside the continental United States. The remedy for such an occurrence is the refunding of the Warranty purchase price to the Purchaser.
- Tier 2, 3, 4, 5 Warranty must be purchased within 90 days of the product shipping from the Factory. The Tier 2,3,4,5 Warranties are invalid if purchased after a warrantable occurrence but within the 90 day shipping period. The remedy for such occurrence is the refunding of the Warranty purchase price to the Purchaser.
- Tier 1,2, 3, 4, 5 All claims must be presented to Load Technology in a timely manner. A reasonable amount of time must be allowed to remedy any claims. All claims must be presented to Load Technology for evaluation before any repairs are initiated. Any repairs undertaken without authorization are not covered under this Warranty and any claim for payment will be rejected.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations may not apply to you. Purchaser / owner agrees to make no claims against Load Technology, Inc. based on negligence.

This Warranty is in lieu of any other Warranties, expressed or implied.