SIMPLEX®

SWIFT-E/SWIFT-E+

Portable Load Bank

This manual was last revised:

June 8, 2021

For up-to-date information on this product or others,
please contact Simplex at 800-637-8603 or
on the web at www.simplexdirect.com.

Table of Contents

I. WARNINGS AND CAUTIONS

I-A. Safety Information Symbols:

This General warning symbol points out important information that, if not followed, could endanger personal safety and/or property.

This Explosion warning symbol points out potential explosion hazards.

This Fire warning symbol points out potential fire hazards.

This Electrical warning symbol points out potential electrical shock hazards.

I-B. Cautions:

This load bank is high-powered, technical, industrial equipment operating at dangerous voltages and temperatures. It is capable of damaging itself, property or personnel if improperly used. It is not a consumer product.

It must be installed, connected and operated by personnel properly trained and experienced in its use. An operator's manual is supplied with each load bank and available online at www.simplexdirect.com. The operator must be familiar with its contents and have access to it during operation.

- **High Voltage:** Turn off and disconnect power source before opening this equipment
- **High Temperature:** Allow hardware to cool before servicing or opening this equipment.
- **Rotating Equipment:** Ensure that the fans have stopped before opening this unit.
- **For Operator Safety:** Make sure this equipment is properly grounded when in use.

All compression-type connections on fuse blocks, load blocks, and contactors should be checked for tightness frequently. This check should be established as part of routine maintenance.

The following cautions should be observed before and during operation:

- Check intake and exhaust screens as well as fan and load elements for foreign objects.
- Position and install the load bank with consideration given to large cubic airflow requirements, exhaust temperature, and velocity. Do not point exhaust at any nearby surface or object that may be adversely affected by high temperature. This includes but is not limited to painted surfaces, tar paper and asphalt roofs, water sprinkler heads, fire alarms, and volatile material.

- Do not use in confined spaces. The load bank may have to compete with cooling air requirements of a nearby running engine generator set where cooling air intake to a confined space may not be adequate for both engine and load bank. Be especially careful not to bounce hot exhaust air off nearby obstructions for re-circulation through the load bank.
- Verify that all control switch positions are set correctly for your intended usage before connecting the load bank to the source to be tested.
- The load cables carry high amperage. Be constantly aware of possibility of inductively heating adjacent ferrous objects to temperatures sufficient to damage cable insulation.
- Always connect the safety ground cable to a proper ground. Do not rely on a possible grounded neutral somewhere else in the system.
- Do not let the load bank run unattended for long periods of time.
- Do not store or operate in rain unless adequate protection is provided.
- Routinely inspect all components and electrical connections for tightness and integrity.
- Repair any damaged or degraded components and wiring without delay.
- If technical assistance, service, or parts are needed, please call 800-837-8603 (24 Hours).

- All hardware covered by this manual have dangerous electrical voltages and can cause fatal electrical shock. Avoid contact with bare wires, terminals, connections, etc. Ensure all appropriate covers, guards, grounds, and barriers are in place before operating the equipment. If work must be done around an operating unit, stand on an insulated dry surface to reduce the risk of electrocution.
- Do not handle any kind of electrical device while standing in water, while barefoot, or while your hands or feet are wet.
- If people must stand on metal or concrete while installing, servicing, adjusting, or repairing this equipment, place insulative mats over a dry wooden platform. Work on the equipment only while standing on such insulative mats.
- The National Electrical Code (NEC), Article 250 requires the frame to be connected to an approved earth ground and/or grounding rods. This grounding will help prevent dangerous electrical shock that might be caused by a ground fault condition or by static electricity. Never disconnect the ground wire while the load bank is in use.
- Wire gauge sizes of electrical wiring, cables, and cord sets must be adequate to handle the maximum electrical current (ampacity) to which they will be subjected.
- Before installing or servicing this (and related) equipment, ensure that all power voltage supplies are completely turned off at their source. Failure to do so can result in hazardous and possibly fatal electrical shock.
- In case of accident caused by electric shock, immediately shut down the source of electrical power. If this is not possible, attempt to free the victim from the live conductor. AVOID DIRECT CONTACT WITH THE VICTIM. Use a nonconducting implement, such as a dry rope or board, to free the victim from the live conductor. If the victim is unconscious, apply first aid and seek immediate medical attention.
- Never wear jewelry when working on this equipment. Jewelry can conduct electricity resulting in electric shock or may get caught in moving components causing injury.

- Keep a fire extinguisher near the hardware at all times. Do NOT use any carbon tetra-chloride type extinguisher. Its fumes are toxic, and the liquid can deteriorate wiring insulation. Keep the extinguisher properly charged and be familiar with its use. If there are any questions pertaining to fire extinguishers, please consult the local fire department.

- The illustrations in this manual are examples only and may differ from your load bank.
- Load Bank warranty is void if incorrectly cooled.

II. DESCRIPTION AND SPECIFICATION

II-A. Features

The Simplex Swift-E Portable Load Bank allows quick and easy testing of small generators. The self-contained, lightweight, and hand-transportable load bank can be used to test and maintain AC generators, AC rectifiers, inverters, power supplies, RV generators, and other AC sources.

The load bank is available as the standard 10KW Swift-E unit and the 15KW Swift-E+ unit. Swift-E load banks contain specially designed power resistors, high-temperature, silicone-insulated power wiring, industrial toggle switches, high-interrupting capacity fuses, and load connection cables. All control and cooling circuits operate from the source under test. Test instrumentation and connection cables are provided.

For a parts legend, please see Table 4 on page 17. Always consult the parts legend drawing when ordering parts.

The Swift-E unit features sealed tubular-type load elements made up of nickel-chromium resistance wire sealed in incoloy sheath (nickel alloy). To reduce the risk of electrical shock and short circuiting of elements, the element has a non-conductive exterior. The element is also rust-proof, vibration-proof, and shock-proof.

Swift-E load banks have panel-mounted toggle switches for each load step, as well as a master load switch. This combination allows for precise load control as well as block loading.

With a connection cable set of 10’ with ring lug terminations, the load bank is encased in an environmental Type 1 enclosure of aluminum construction with exterior powder coating. In addition, the enclosure has protective rubber feet, handles for carrying, and cable wrap for neat storage.

II-B. Safety

To prevent dangerously high temperatures, Swift-E load banks have an over-temperature sensor to de-energize the load and activate the alarm indicator. Should the connection of the load bank be incorrectly installed, an over-voltage sensor will shut down the unit and activate the alarm indicator. For more information, see “Alarms and Warnings” on page 16.

II-C. Specifications

Table 1: Specifications

Model	Weight	Description	Control Power	Max amps at 120V	Max amps at 240V
Swift-E	45lbs.	10KW, 120/240V, Single-Phase, 250W Step Resolution	1.33A	83.3	41.7
Swift-E+	45lbs.	15KW, 120/240V, Single-Phase, 250W Step	1.33A	125	62.5

Table 2: Current Draw at Specified Wattages

Watts	250	500	750	1000	1250	1500
120V	2.1	4.2	6.3	8.3	10.4	12.5
240V	1	2.1	3.1	4.2	5.2	6.3
Watts	1750	2000	2250	2500	2750	3000
120V	14.6	16.7	18.8	20.8	22.9	25
240V	7.3	8.3	9.4	10.4	11.5	12.5
Watts	3250	3500	3750	4000	4250	4500
120V	27.1	29.2	31.3	33.3	35.4	37.5
240V	13.5	14.6	15.6	16.7	17.7	18.8
Watts	4750	5000	5250	5500	5750	6000
120V	39.6	41.7	43.8	45.8	47.9	50
240V	19.8	20.8	21.9	22.9	24	25
Watts	6250	6500	6750	7000	7250	7500
120V	52.1	54.2	56.3	58.3	60.4	62.5
240V	26	27.1	28.1	29.2	30.2	31.3
Watts	7750	8000	8250	8500	8750	9000
120V	64.6	66.7	68.8	70.8	72.9	75
240V	32.3	33.3	34.4	35.4	36.5	37.5
Watts	9250	9500	9750	10000	10250	10500
120V	77.1	79.2	81.3	83.3	85.4	87.5
240V	38.5	39.6	40.6	41.7	42.7	43.8
Watts	10750	11000	11250	11500	11750	12000
120V	89.6	91.7	93.8	95.8	97.9	100
240V	51	52.1	53.1	54.2	55.2	56.3
Watts	13750	14000	14250	14500	14750	15000
120V	114.6	116.7	118.8	120.8	122.9	125A
240V	57.3	58.3	59.4	60.4	61.5	62.5A

III. UNPACKING

III-A. Included Components and Parts

The following items are included with your Swift-E load bank. If any of the following are not included, please contact your Simplex representative at 800-637-8603.

1. Swift-E load bank
2. Manual

III-B. Primary Inspection

Preventative visual inspection of the shipping crate and the load bank is advised. Physical or electrical problems due to handling and vibration may occur. Never apply power to a load bank before performing this procedure. The following five-point inspection is recommended before installation and as part of the 50-hour / 6-month maintenance schedule or as a load bank is relocated:

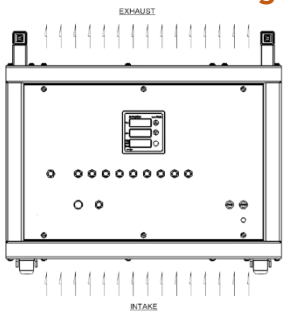
1. If the crate shows any signs of damage, examine the load bank in the corresponding areas for signs of initial problems.
2. Check the entire outside of the cabinet for any visual damage, which could cause internal electrical or mechanical problems due to reduced clearance.
3. Inspect all relays and control modules. Make sure all components are secure in their bases and safety bails are in place. Spot check electrical connections for tightness. If any loose connections are found, inspect and tighten all remaining connections.
4. Examine all accessible internal electrical components such as fuses, contactors, and relays. Check lugged wires at these components.
5. Visually inspect the element chamber for foreign objects, broken ceramic insulators, and mechanical damage.

Call Simplex if you have any problems during installation.
24-hour contact at 800-637-8603

IV. INSTALLATION

IV-A. Load Bank Placement

Figure 1: Airflow Diagram



Note: Give 2-foot clearance on all sides.

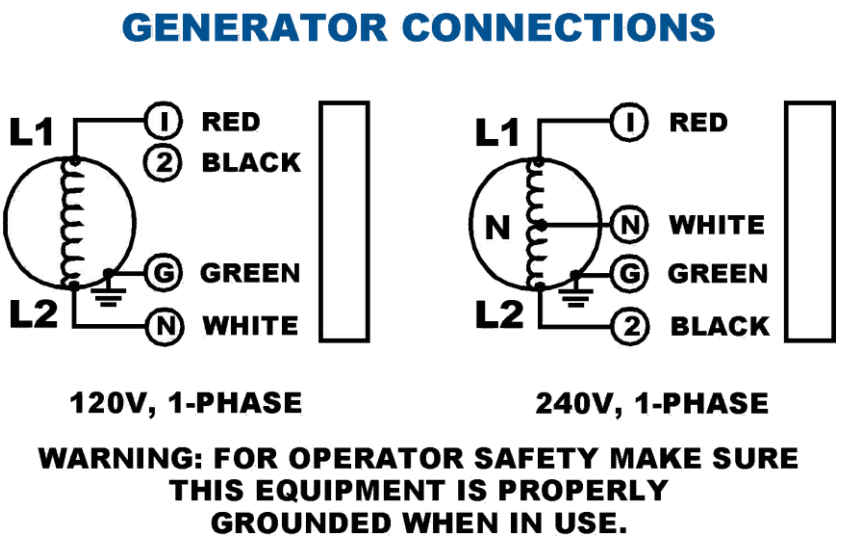
Proper placement of the load bank is essential for the operators' safety and maintaining the integrity of the load bank. The load bank requires 6 inches of clearances on the side and 8 inches on the rear. Avoid blocking the air inlets on the back and the bottom of the load bank (see Figure 1 Airflow diagram) and ensure the area around the load bank is clear of debris.

The load bank elements are cooled by dual 135mm fans, and the unit operator must make allowances for the hot load bank exhaust air.

IV-B. Wiring the Load Bank

Using the connection chart found on the Swift-E load bank's nameplates (see **Figure 2 Wiring directions**), wire the load bank to the desired source for testing.

Figure 2: Wiring Directions



IV-C. Meter Setup Information

Your meter is set up at the factory, but should you need to change the settings, press and hold the (menu) button for three seconds.

IV-D. Current Transformer Ratio

The first setting you can change is the Current Transformer Ratio. To do so, press the (up) and (down) buttons until the desired number is displayed, then press the (menu) button. Note: The ratio is set at the factory (100:5 for the Swift-E and 150:5 for the Swift-E+) and should not need to be changed.

IV-E. Meter Display

Figure 3: Meter

After the Current Transformer Ratio is set, you can change the default display for the bottom display on the meter. There are four options:

Loop, which will cycle through three following measurements:

1. FrQ, which will show the power frequency.
2. ACt, which will display the load generated, measured in kilowatts.
3. COS, which will show the power factor.

Make your selection by pressing the up and down buttons to cycle through the options. Press the MENU button again to set the display. This selection is stored in non-volatile memory and will remain set even after the unit is unplugged.

When the unit is operating, pressing the menu button will cycle the display through the three measurements.

Table 3: Meter Accuracy

Volts, Amps, and Hertz	**0.5% + 1 digit**
Kilowatts	**1.0% + 2 digits**
Power Factor	**0.5% + 2 digits**

V. OPERATING INSTRUCTIONS

V-I. Startup

Before operating the Swift-E load bank, ensure that the unit is wired properly based on the instructions from "Wiring the load bank" on page 10.

1. When wired appropriately, the unit is ready to apply a load to a power source. Set the Meter Range toggle switch to the appropriate input voltage (120V or 240V).
2. Turn on the power source.
3. Flip the toggle switch to "On" for the Fan/Control selection. If the system is operating properly, you will hear the fans start and the meter will turn on.

V-II. Applying a Load

Figure 4: Applying a Load

1. Flip the toggle switch under "Master" to "On." This will allow you to begin applying load to the source as each load step is activated.
2. Activate each load step by switching the desired step on. This step, if done while the "Master" switch is activated, will apply the load instantly. For example, while the "Master" switch is activated, powering 250W then 500W will apply 750W. If you wish to conduct a block load test, turn the load switches on before flipping the "Master" Switch.
3. Using the digital meter (see "Figure 3 Meter" on page 11), you can monitor the voltage, amps, and frequency (Hz) of the load. The meter will not display amperage values at less than 4 amps.

V-III. Shutdown

1. When your operation has completed, switch the "Master" and other load toggle switches to "Off." This will remove the load from the unit. Allow the unit to run for five minutes to cool down.
2. Flip the toggle switch for the "Fan/Control" selection to "Off."
3. Turn off the power source
4. Disconnect the load bank from the power source.
5. The unit is now off and is ready to be moved.

VI. ALARMS AND WARNINGS

VI-A. Overheating

If the load bank's exhaust exceeds a safe temperature, the load deactivates, and the operation cannot proceed. To fix this error, turn the load bank off and disconnect it from the testing source, then check for the cause of the failure. Possibilities include:

- Debris blocking air intake vents
- Load bank being operated too close to power source's exhaust
- Ambient temperature exceeding load bank's capabilities
- Load bank fans failing or becoming disconnected

Unresolved cooling may result in damage to the load bank.

Once the cause has been determined and fixed, the load bank is ready to be reconnected and the operation can resume.

VI-B. Tripped Circuit Breaker

The main breaker will trip, and the unit will shut off if the Meter Range Selector Switch is set for 120 volts and the load bank is connected to 240 volts. If that happens, power down the testing source, disconnect the load bank, and ensure the Meter Range Selector Switch's setting matches the voltage of the test source.

When you are sure the problem is corrected, remove the six (6) faceplate screws on the unit and reset the circuit breaker, which is located near the top of the assembly. You can then reconnect the load bank to the source, power up the source, and resume the operation.

VII. SUPPLEMENTAL EQUIPMENT

If desired, Cam-Lok connectors can be used on the load bank. To purchase these connectors, please contact your sales representative or call the Simplex, Inc. sales department at 800-637-8603 ext. 3.

Male 16-series Cam-Lok connector - Black

Accepts 2/0, 3/0, and 4/0 cables

Up to 600 volts, 405 amps

Product number 25608720

Male 16-series Cam-Lok connector – Green

Accepts 2/0, 3/0, and 4/0 cables

Up to 600 volts, 405 amps

Product number 25608726

Male 16-series Cam-Lok connector – Red

Accepts 2/0, 3/0, and 4/0 cables

Up to 600 volts, 405 amps

Product number 25608721

Male 16-series Cam-Lok connector – White

Accepts 2/0, 3/0, and 4/0 cables

Up to 600 volts, 405 amps

Product number 25608727

Male 15-series Cam-Lok connector - Black

Accepts 8-4 AWG cables Up to 600 volts, 125 amps

Product number 25608814

Male 15-series Cam-Lok connector - Green

Accepts 8-4 AWG cables Up to 600 volts, 125 amps

Product number 25608816

Male 15-series Cam-Lok connector - Red

Accepts 8-4 AWG cables Up to 600 volts, 125 amps

Product number 25608817

Male 15-series Cam-Lok connector - White

Accepts 8-4 AWG cables Up to 600 volts, 125 amps

Product number 25608815

Simplex also offers vinyl and hardshell cases. Please contact your sales representative or call the Simplex, Inc. sales department at 800-637-8603 ext. 3.

Hardshell shipping case

Product Number 31006110

Vinyl cover

Product Number 13104600

VIII. TROUBLESHOOTING

VIII-A. General Maintenance

All electrical connections should be tightened every 3 months. Cooling fan motors are permanently lubricated and do not require maintenance.

Although Swift-E load banks are designed with trouble-free operation in mind, some problems can arise. Please consult the following table for solutions to the most common issues before contacting a Simplex service representative.

VIII-B. Load Bank Wired to Source, but Won't Turn On

- Ensure load bank is wired to source correctly. See page 10 for more information about wiring your load bank to the source.
- Set Meter Range Selector Switch to correct value for source voltage. See page 11 for more information about setting up an operation.
- Remove faceplate and make sure breaker is turned on. See page 13 for more information about resetting the circuit breaker.
- Check control fuses on front of load bank to ensure they aren't blown. See page 17 to see where the fuses are located.
- Remove faceplate and check loose relays, contactors, lugged wires, etc. See page 9 for more information about inspecting the load bank.

VIII-C. Load Bank Overheating

- Clear intake and exhaust vents of any debris. See page 10 for more information about the load bank's airflow needs.
- Move load bank away from generator or other source's exhaust and walls and other obstructions that restrict air flow. See page 10 for more information about the load bank's airflow needs.
- Make sure ambient temperature isn't too high to allow for cool air flow. See page 13 for more information about overheating failures.

VIII-D. Meter Displaying Unexpected Results

- Ensure Current Transformer Ratio is set correctly (100:5 for Swift-E, 150:5 for Swift-E+). See page 11 for more information about setting up your meter.

Remove all power from the load bank and all dan/control power before servicing the load bank. Never operate or service a load bank that is not grounded.

Figure 5: Top of Load Bank

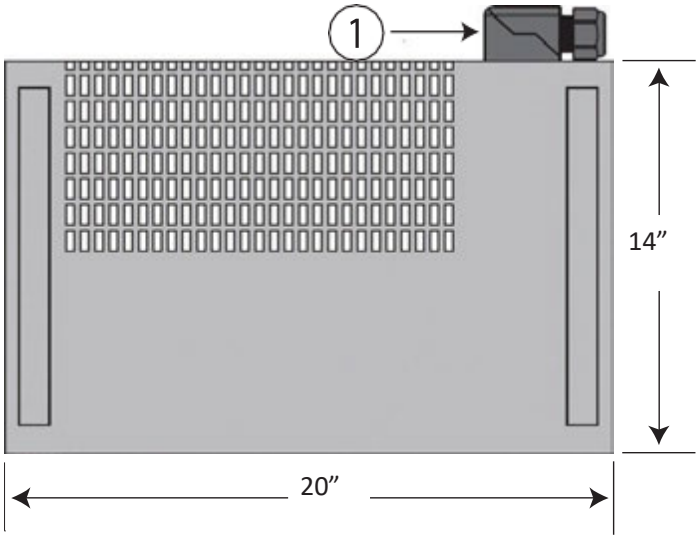


Figure 6: Front of Load Bank

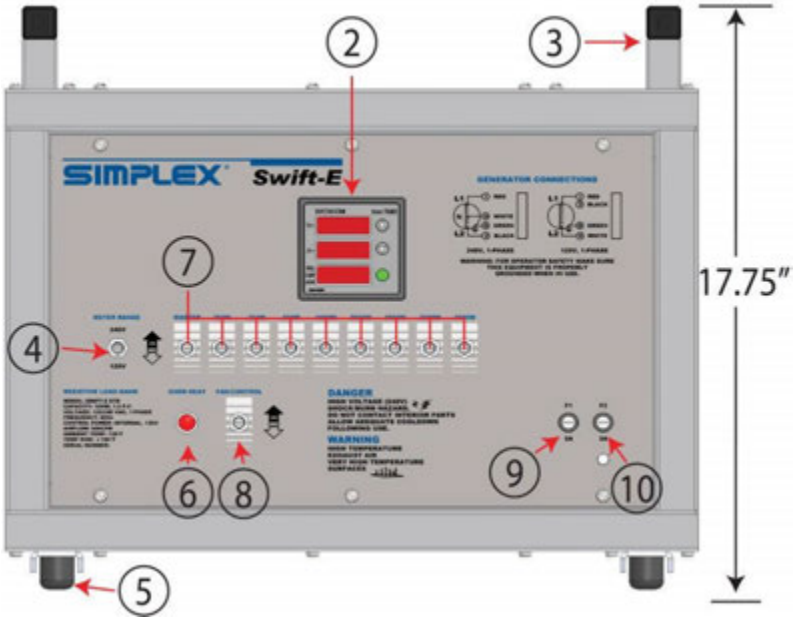


Figure 7: Subpanel

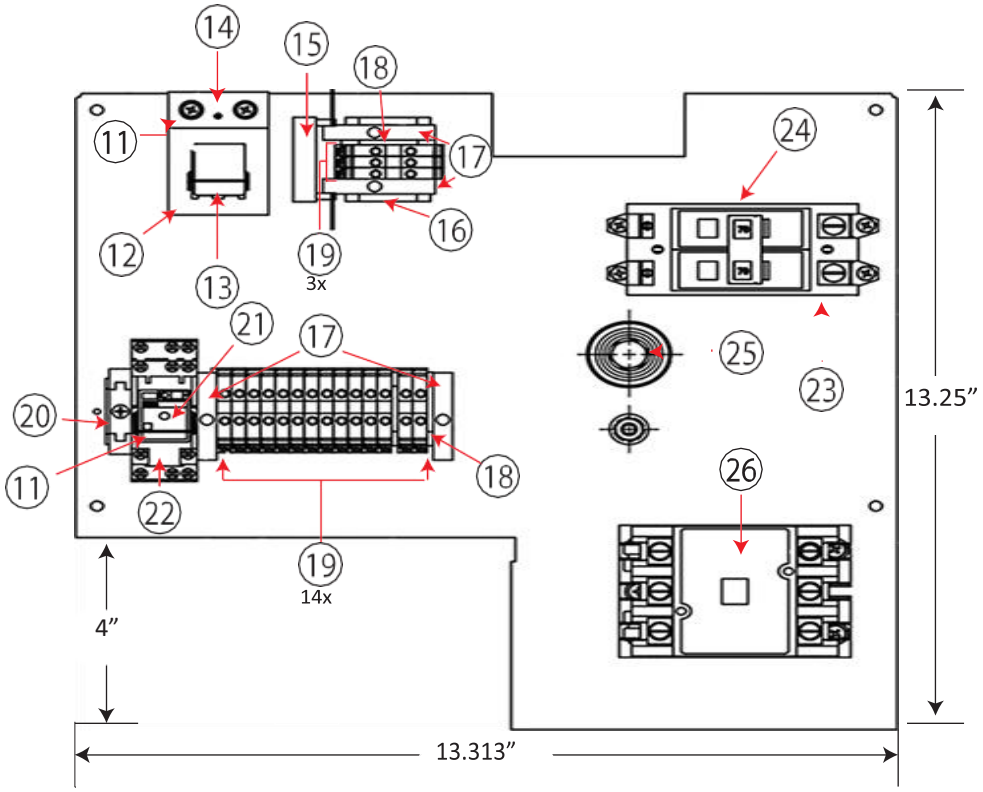


Table 4: Parts of the Load Bank

Number	Part Number	Description
1	15195030	Cable Exit, Strain Relief
2	24341000	Digital Power Meter
3	7BD215514	Handles, Cable Wrap
4	25301000	Meter Range Selector Switch
5	15303000	Rubber Feet
6	24251500	Over Heat Indicator Lamp
7	25303010	Master Load and Load Step Toggle Switches
8	25301000	Fan/Control Power Toggle Switch
9	14031000	Control Fuses 5A, 250V
10	14011000	Control Fuses 2A, 250V
11	54885650	Relay Bale
12	24885000	Relay Base Socket
13	24785300	Relay
14	50020220	Relay Base Bracket
15	25130000	Resistor
16	24892000	Din Rail, 1.75” LG
17	25678501	Terminal Strip End Barrier
18	25678502	Terminal Block End Plate
19	25678500	Terminal Block, 35A, 600V (X17)
20	24892000	Din Rail, 5.62” LG
21	24827035	Relay, General Purpose, 120VAC
22	24882100	Relay Base, 3-Pole, Screw Termination
23	12517000	Plate Mounting
24	12103025	Circuit Breaker
25	15401000	1.375” Isolator
26	13027042	Contactor, 40A

Contact Simplex
for all your Load Bank and Fuel Supply needs.

Simplex, Inc.
5300 Rising Moon Road
Springfield, IL 62711

800-637-8603
www.simplexdirect.com