

SYNAPSWITCH™



OWNER'S & INSTALLATION MANUAL

MODEL



**California
Proposition 65 Warning**

Certain components in this product and its related accessories contain chemicals known to the state of California to cause cancer, birth defects or other reproductive harm. Wash hands after handling.

DISCLAIMERS:

All information, illustrations and specifications in this manual are based on the latest information available at the time of publishing. The illustrations used in this manual are intended as representative reference views only. Moreover, because of our continuous product improvement policy, we may modify information, illustrations and/or specifications to explain and/or exemplify a product, service or maintenance improvement. We reserve the right to make any change at any time without notice. Some images may vary depending upon which model is shown.

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ORIGINAL INSTRUCTIONS (English):

The English version of this manual controls over any error in or conflicting interpretation of any translation.

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INTRODUCTION

Thank you for your purchase of a Milbank SynapSwitch™ Automatic Transfer Switch. This product is designed for use with standby generators. This SynapSwitch™ may have different installation requirements depending on the generator manufacturer or design. When operated and maintained according to the instructions in this manual, your system will provide many years of standby electrical energy service.

This manual contains important safety instructions for installation and operation of this SynapSwitch™. We have made every effort to provide safe, efficient instructions for installation and operation. However, as every installation is unique, it is impossible to anticipate every possible procedure and method to achieve a properly installed unit. It is important that you read and understand these instructions thoroughly before attempting to install or operate this unit. Your equipment is supplied with this combined Owner's and Installation Manual. **This is an important document and should be retained by the owner after the installation has been completed.** An electronic version can be downloaded at milbankworks.com.

This SynapSwitch™ requires professional installation before use. Refer to the installation section of this manual for instructions on installation procedures. **Only licensed electrical contractors should install the SynapSwitch™.** Installations must comply completely with all federal, state and local codes, standards and regulations. Your installer should follow these instructions completely. Every effort has been made to ensure that the information in this manual is both accurate and current. However, the manufacturer reserves the right to change, alter or otherwise improve the system at any time without prior notice.

NOTICE

Milbank does not guarantee compatibility with any third party products and assumes no responsibility or ease of use with other manufacturers' products used with Milbank SynapSwitch™ transfer switches.

CONTACT INFORMATION

There are several ways to contact us for answers to questions you may have about your product. Contact Technical Services by phone at (816) 410-7346, Monday through Friday, 8 a.m. to 5 p.m, Central Time. Electronic communication can be made through our website milbankworks.com where you can locate an authorized repair technician, or by email at pgts@milbankworks.com.

For your future reference, record the following pertinent information. This information will help to identify product information should you need to contact Milbank's Technical Services department.

SYNAPSWITCH™

Model Number: _____

Description: _____

Serial Number: _____

Installation Date: _____

GENERATOR

Model Number: _____

Description: _____

Serial Number: _____

Installation Date: _____

IMPORTANT SAFETY INSTRUCTIONS



Read Manufacturer's Instructions.
SAVE THESE INSTRUCTIONS.

- This manual contains important information that should be used during installation, maintenance and operation of this unit.
- Read all the instructions and safety symbols thoroughly before attempting to install, operate and/or service this equipment.

Safety Symbol Meanings

Symbol	Description
	Safety Alert Symbol
	Electrical Shock Hazard



This safety alert symbol appears with most safety statements. It means attention, become alert, your safety is involved! Please read and abide by the message that follows the safety alert symbol.

DANGER

Indicates a hazardous situation which, if not avoided, *will* result in death or serious injury.

WARNING

Indicates a hazardous situation which, if not avoided, *could* result in death or serious injury.

CAUTION

Indicates a hazardous situation which, if not avoided, *could* result in minor or moderate injury.

NOTICE

Indicates a situation which can cause damage to the equipment, personal property and/or the environment, or cause the equipment to operate improperly.

NOTE: Indicates a procedure, practice or condition that should be followed in order for the generator to function in the manner intended.

The manufacturer of this product cannot reasonably anticipate every possible circumstance that might involve a hazard. The warnings in this manual and the tags and decals affixed to the unit are, therefore, not all-inclusive. If you use a procedure, work method or operating technique that the manufacturer does not specifically recommend, you must satisfy yourself that it is safe for you and others. You must also make sure that the procedure, work method or operating technique that you choose does not render the equipment unsafe.

SAFETY

SAFETY LABELS



Always replace any illegible or missing labels immediately. All safety labels must be legible to alert personnel to safety hazards.

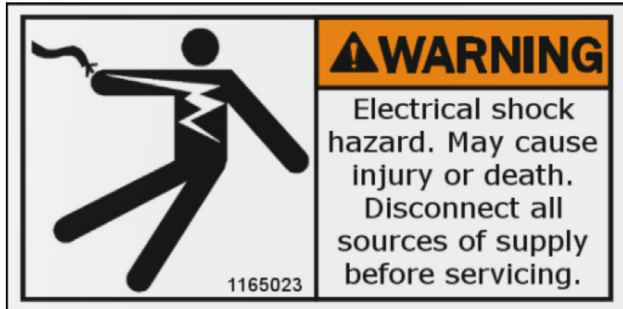


Figure 1 – Milbank PN 1165023

GENERAL SAFETY PRECAUTIONS

DANGER



DANGER! Equipment contains high voltage. Despite the safe design of the system, operating this equipment imprudently, neglecting its maintenance or being careless can result in death or serious injury.

WARNING



The safety messages that follow have WARNING level hazards.

- Unauthorized or improper installation, operation, application or repair of this equipment is extremely dangerous.
- Only qualified electricians should attempt installation of this equipment, which must strictly comply with all applicable codes, standards and regulations.
- When connecting a generator system to an electrical system that is normally supplied by an electric utility company, always comply with regulations of the National Electrical Code (NEC) (Article 701 Legally Required Standby Systems or Article 702 Optional Standby Systems, as applicable), and Occupational Safety and Health Administration (OSHA), as applicable. It is essential to use the latest version of any standard to ensure all current information is applied.

WARNING



The safety messages that follow have WARNING level hazards.

- Failure to properly ground equipment can result in electrocution.
 - Do not touch bare wires.
 - Do not use equipment with worn, frayed, bare or otherwise damaged wiring.
 - Do not handle electrical cords while standing in water, while barefoot, or while hands or feet are wet.
 - If you must work around a unit while it is operating, stand on an insulated dry surface to reduce shock hazard.
 - Do not allow unqualified persons or children to service equipment.
 - In case of an accident caused by electrical shock, immediately shut down all sources of electrical power and contact local authorities. Avoid direct contact with the victim.
- Low-voltage wire cannot be installed in the same conduit as power voltage wiring.
- Dangerous power voltages are present inside a live SynapSwitch™. Never work on the SynapSwitch™ unless all power voltage supplies to the switch have been turned off.
- When a SynapSwitch™ is connected to a standby generator, the generator engine may crank and start at any time without notice to the end user. To avoid injury that may be caused by such start-ups, move the safety disconnect switch on the front panel to the OFF position before working on this equipment.

NOTICE

Improper treatment of equipment can damage it and shorten its life.

- *Use equipment only for intended uses.*
- *If you have questions about intended use, ask a Milbank certified technician or contact Milbank Manufacturing's PowerGen™ division.*
- *Do not expose equipment to excessive moisture, dust, dirt or corrosive vapors.*
- *Remain alert at all times while working on this equipment. Never work on the equipment when you are physically or mentally fatigued.*
- *If connected devices overheat, turn them off and turn off their circuit breaker or fuse.*

INTRODUCTION

This Owner's and Installation Manual describes how to install, configure and use the Milbank SynapSwitch™. This manual describes the configuration and power management features of the system. It is assumed that the reader is familiar with the terminology used in this document.

The Milbank SynapSwitch™ is suitable for use with Auto Mains Failure, or 2- or 3-wire-start generators. Utility-sense generators start and conduct required exercise automatically while 2- or 3-wire generators are controlled by the SynapSwitch™.

OPERATION

Your Milbank SynapSwitch™ system will automatically control your backup generator in the event that utility power is interrupted. Your Milbank switch is capable of managing up to six loads when operating under generator power. While on generator power, it is recommended that you use the nonmanaged (base) loads efficiently; this will reduce fuel consumption and make more power available when the critical managed loads request power to run.

UNPACKING AND HANDLING

After unpacking, inspect the SynapSwitch™ for any damage that may have occurred during shipping. If any missing parts or damage is discovered when unpacking, do not return the unit to the place of purchase; please contact Milbank Technical Services for instructions on how to proceed (see page 4). Never install a SynapSwitch™ that has been damaged.

Shipment contents:

- SynapSwitch™ – Automatic Transfer Switch
- Owner's and Installation Manual
- Warranty card

MOUNTING REQUIREMENTS

The SynapSwitch™ enclosure has a NEMA (National Electrical Manufacturer's Association) type 3R rating and is suitable for indoor/outdoor installations and provides a degree of protection against falling rain and sleet. Guidelines for mounting the unit include:

- Ensure that the mounting surface can support the weight of the SynapSwitch™ and adheres to all local codes.
- The enclosure must be installed with NEMA type 3R hardware and connections.
- Level and plumb the unit enclosure to prevent deformation.
- Never install the SynapSwitch™ where any corrosive substance may come in contact with the enclosure.
- Protect the SynapSwitch™ at all times against excessive moisture, dust, dirt, lint, construction grit and corrosive vapors.
- Mounting dimensions for the SynapSwitch™ enclosure are included in this manual; see *Figure 5*.

A common SynapSwitch™ installation is depicted in *Figure 3*. Layout design and changes to existing electrical service should be finalized before installation begins.

OPERATION AND INSTALLATION

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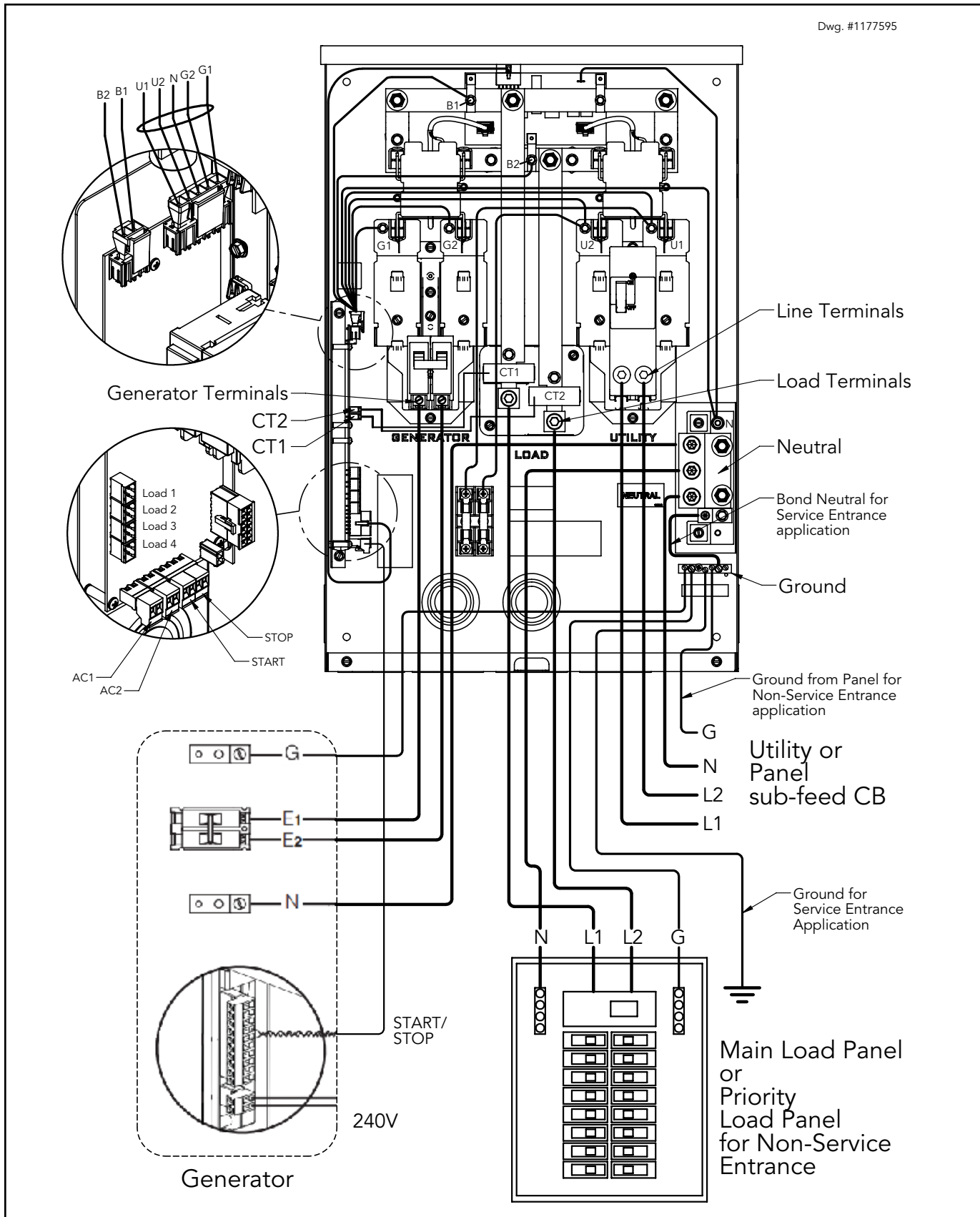


Figure 2 – SynapSwitch™ Schematic/Connection Diagram

INSTALLATION

Each installation is unique and it is impossible for Milbank Manufacturing to understand the circumstances in which installation may be achieved. Neither could we know of possible hazards and/or the result of each method or procedure. See *Figure 3* for a typical basic install; see *Figure 4* for a typical full install.

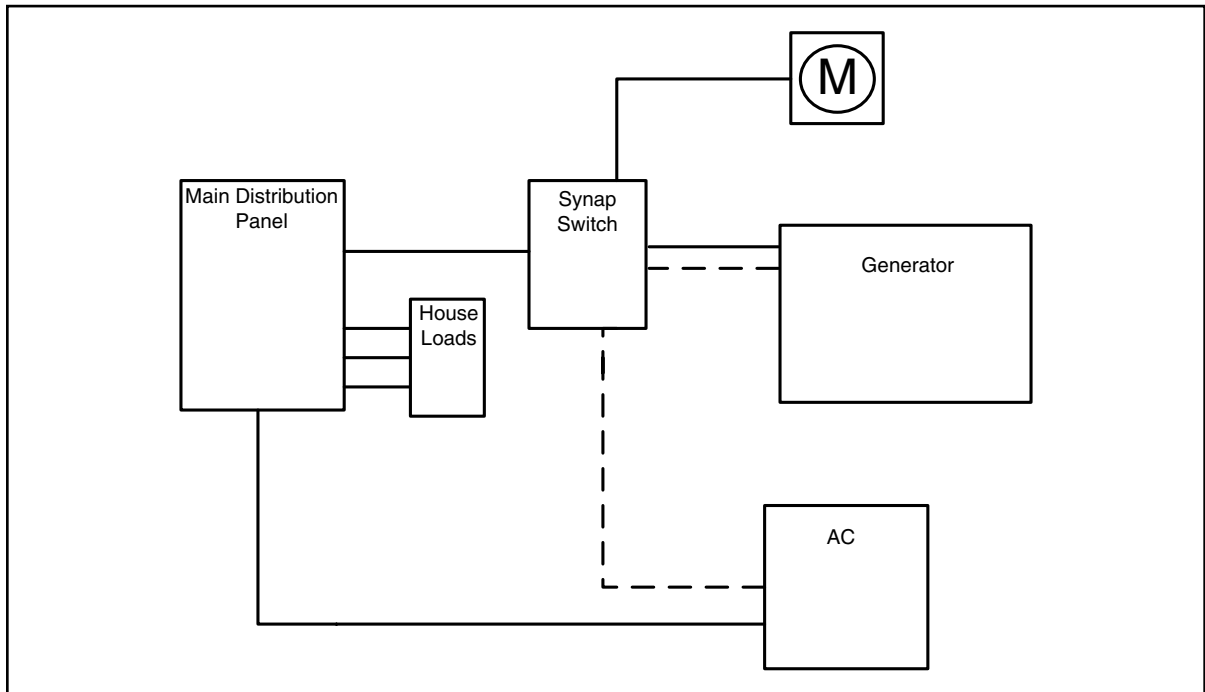


Figure 3 – Basic Install: Dashed line indicates low voltage

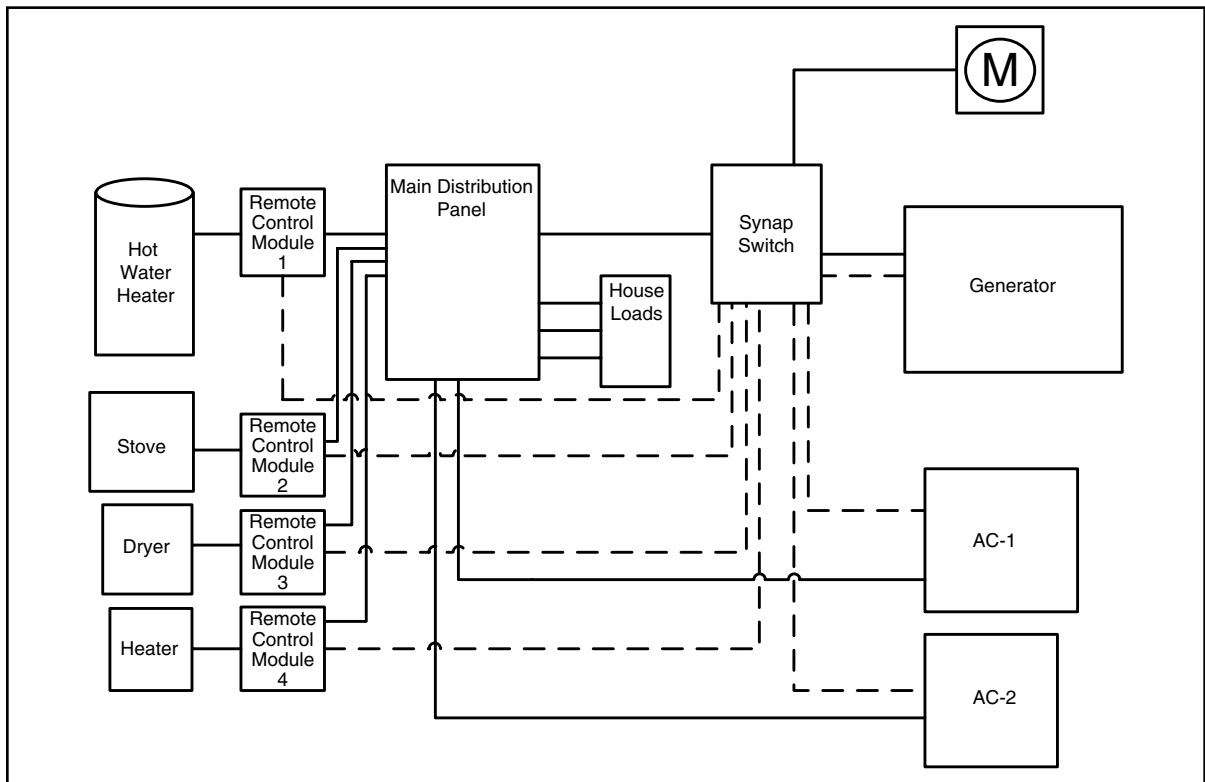


Figure 4 – Full Install: Dashed line indicates low voltage

OPERATION AND INSTALLATION

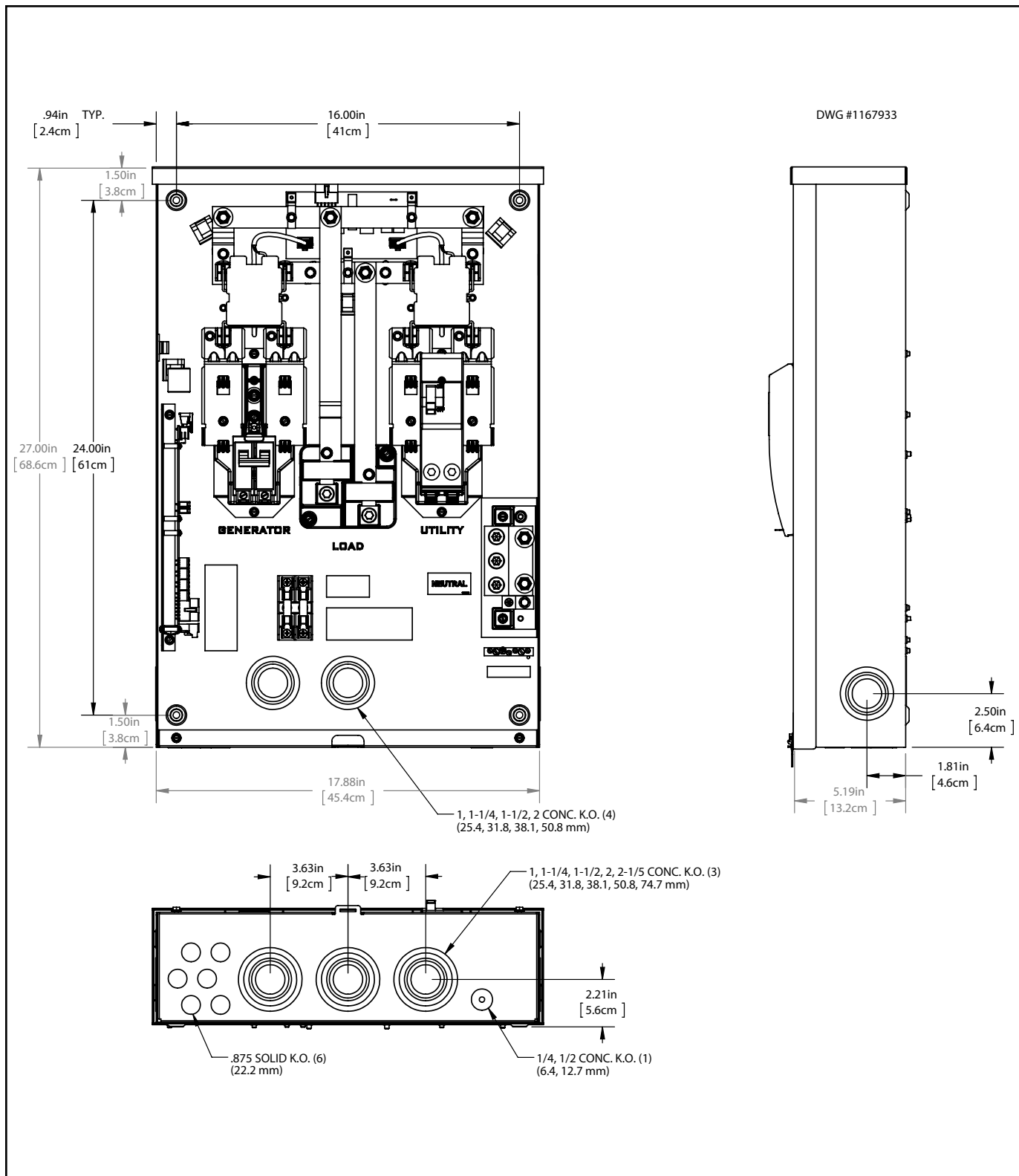


Figure 5 – Mounting Dimensions

OPERATION AND INSTALLATION

End User Responsibilities

To ensure you make informed choices and decisions, communicate effectively with your installation contractor and familiarize yourself with the installation options available. The equipment warranty is void unless the system is installed by a licensed electrical professional. All installations of Milbank systems must comply with all applicable codes, industry standards, and regulations.

NOTE: Your installer must check local codes and obtain permits before installing the system.

Installing Contractor Responsibilities

- Read and observe the safety rules.
- Read and follow instructions given in this manual.
- The installer may need to provide MATS-RM-50 load control modules.
- Check federal, state, and local codes and authority having jurisdiction for questions on installation.
- Ensure the generator is not overloaded with selected loads.
- Perform an installation that will pass the final electrical inspection.

To be supplied by installer:

- Connecting wire and conduit
- Tools and equipment needed to perform the installation

ELECTRICAL

All wiring must be the proper size and supported by appropriate conduit or raceways. All wiring and conduit sizes and types should be in accordance with federal, state and local codes, standards and regulations. Instructions for proper wire type and torque specifications are as follows:

Load terminals 350-6 KCMIL CU7AL:
Torque to 250 in-lb (28.2 N·m)

Neutral terminals 350-6 KCMIL CU7AL:
Torque to 250 in-lb (28.2 N·m)

Ground terminals 1/0-14 AWG CU:
Torque to 50 in-lb (0.6 N·m)

Circuit breaker terminals use wire and torque information listed on circuit breaker.

WARNING



Low-voltage wire cannot be installed in the same conduit as power voltage wiring. It could result in shock due to short circuit as well as cause electromagnetic interference resulting in non-operation of the system.

SYSTEM DESCRIPTION

The SynapSwitch™ monitors utility power, and when the power is outside voltage limits, the SynapSwitch™ automatically starts the generator, monitors the generator power and frequency, and adds or removes loads dependent on the configuration of the SynapSwitch™ to prevent generator overload. The purpose of a SynapSwitch™ is to serve as a means of automatic disconnect from the utility while the location is self-generating power to be used on site, so as to not back-feed to or cogenerate with the utility service. The purpose of power management is to serve as a method of reducing the load demand on a generator, which allows for a smaller generator to be used in many applications thus reducing the fuel consumption and footprint of the generator.

The SynapSwitch™ uses the MATS-RM-50 load control module to control loads. The load control module uses the power management drive signal to control each load.

When on generator power, the homeowner should be mindful not to turn on loads not controlled by the SynapSwitch™, which could cause the generator to overload and stall. *Setup on page 11* describes how to properly configure the SynapSwitch™ to obtain proper operation of your backup power system. Configuration should only be done by a licensed contractor.

SETUP

The SynapSwitch™ uses a computer-controlled Printed Circuit Board (Control PCB) to control the system. On the Control PCB, there are three types of switches and Light Emitting Diodes (LEDs) to configure and monitor the SynapSwitch™ operation. All these controls are internal to the system and are used by the installer to ensure proper setup and operation.

Generator Power Rotary Switches

NOTICE

Factory settings of the power rotary switches are set at "0."

The generator power rotary switches on the SynapSwitch™ control board specify the size of the generator and must be set properly to ensure proper operation.

NOTICE

The SynapSwitch™ controller will automatically adjust load control for existing conditions. Set the generator power rotary switches to the rated generator output.

OPERATION AND INSTALLATION



Figure 6 – Generator Power Rotary Switches

When the user is looking at an upright board, the top rotary switch controls the 10kW (10,000W) setting, and the bottom switch controls the 1kW (1,000W) setting. *Figure 6* shows a board that has been set for a 43kW generator. See *Table 1* for examples of settings.

Table 1

	20kW	12kW	17kW	8kW
Top switch 10kW setting	2	1	1	0
Bottom switch 1kW setting	0	2	7	8

NOTICE

Settings need to be set correctly; press “RESET” after making any changes.

OPERATION AND INSTALLATION

Configuring the Dual In-line (DIP) Switches

Factory settings for the dual in-line (DIP) switches are set at OFF.

The DIP switches on the Milbank SynapSwitch™ Control PCB configure the SynapSwitch™ to operate in different power situations. Each switch has two positions: ON and OFF, as shown in *Figure 7*. See *Table 2* for settings that apply to your installation.



Figure 7 – DIP Switches on the Control Board

NOTICE

The DIP switch settings are only activated after depressing the RESET button on the control board.

Table 2

Feature		Switch Settings							
		Set	Function	Set	Function	Set	Function	Set	Function
1	Time Delay for generator to supply base loads	OFF	20 sec	ON	50 sec	–	–	–	–
2*	SynapSwitch™ controlled weekly exercise (yes/no)	OFF	Yes	ON	No				
3*	Weekly exercise with load/no load	OFF	No load	ON	Load				
4	Generator type – start/stop	OFF	Utility Sense	ON	2-wire start	OFF	3-wire start		
5		OFF		OFF		ON			
6	Power Management (yes/no)	OFF	Yes	ON	No				
7	Power management drive invert (needs to be set to ON to control the MATS-RM-50)	OFF	Invert off: 0 V between load outputs	ON	Invert on: 24 V between load outputs in ON				
8	Frequency sense	OFF	57 Hz	ON	58 Hz				
9	Load 1 Lockout Control	OFF	Manage load during generator operation	ON	Lock out load during generator operation				
10	Load 2 Lockout Control	OFF	Manage load during generator operation	ON	Lock out load during generator operation				
11	Load 3 Lockout Control	OFF	Manage load during generator operation	ON	Lock out load during generator operation				
12	Load 4 Lockout Control	OFF	Manage load during generator operation	ON	Lock out load during generator operation				

* Switches 2 and 3 have no effect if generator is Utility Sense.

OPERATION AND INSTALLATION

Push Button Switches

The push button switches are used to initialize or reset the programmable functions of the Milbank SynapSwitch™ and are located around the DIP switch control.

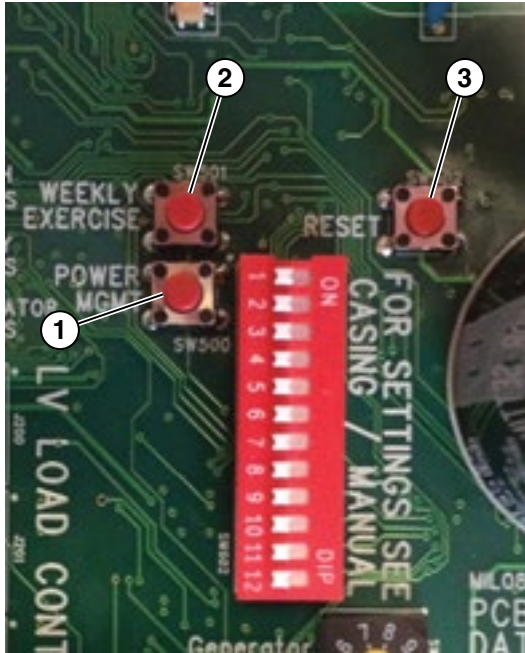


Figure 8 – Push Button Switches

- 1 - Power MGMT (Power Management)
- 2 - Weekly Exercise
- 3 - Reset

WEEKLY EXERCISE (2- or 3-wire-start generators only with weekly exercise selected)

- If held down for greater than 5 seconds: Sets the weekly exercise time as “now” as confirmed by the START and STOP LEDs flashing rapidly green
- If held down for greater than 2 and less than 5 seconds: Initiates a generator exercise immediately

POWER MGMT

- If held down for greater than 5 seconds: Resets the stored average and peak powers used by the power management algorithm to 0 W
- **RESET:** Resets the processor and must be pressed after each change to the setting DIP and rotary switches

LED Activity

The SynapSwitch™ has four LEDs that indicate operation of the SynapSwitch™ controller. Note that all LEDs are bicolor, so if an LED is on, it may be green, red, or both green and red simultaneously, which will appear orange. See Table 3 for descriptions of the LED activities.

Frequency Selection

The SynapSwitch™ monitors generator frequency and will shut off controlled loads when the frequency drops below the selected value. If the generator shuts off above 57 Hz, select 58 Hz to prevent the generator from shutting off before controlled loads can be turned off.

OPERATION AND INSTALLATION

AC Control Interface

There are two AC control interfaces on the SynapSwitch™. To control an air conditioner unit, the SynapSwitch™ provides a contact closure to turn the AC on or off. Connection to the AC thermostat is made through low-voltage signal wires used for thermostat control. Connect the two wires to the green connector and insert it in the AC control plug on the bottom of the control board as shown in *Figure 10*.



Figure 9 – AC Control Interface

⚠ WARNING	
	<p>Low-voltage wire cannot be installed in the same conduit as power voltage wiring. It could result in shock due to short circuit as well as cause electromagnetic interference resulting in non-operation of the system.</p>

The other end of the AC control cable is wired in series with the AC control circuit. *Figure 11* shows a typical thermostat wiring.

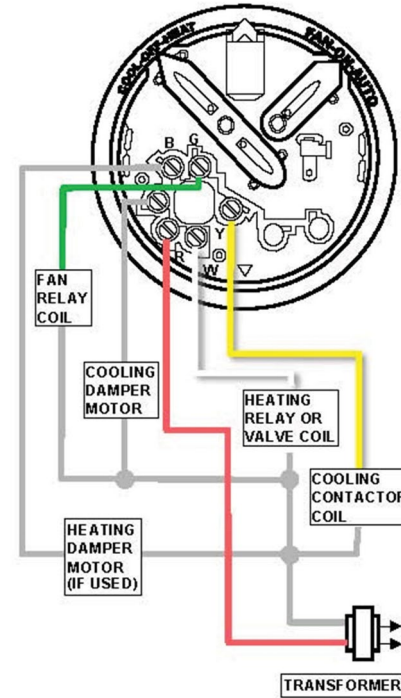


Figure 10 – Typical Thermostat Wiring

Red	Hot lead from transformer on heater/AC
Yellow	Compressor activity (cooling/AC) used for SynapSwitch AC1 and AC2
Green	Furnace blower fan (needed for AC, heat pumps, and some electric furnaces); Note green and yellow are normally connected together with fan in auto mode
White	Heat (gas burner, oil burner, electric heat)

Diagram Courtesy of Honeywell, Inc.

OPERATION AND INSTALLATION

Table 3

LED Name	LED Activity
POWER MGMT	<p>If the power management function is not enabled, this will always be off.</p> <p>If the power management is enabled, it will function as follows:</p> <p>When the SynapSwitch™ enters the utility position, the LED will be green while a 5-minute delay occurs to keep the air conditioning off. The LED will then turn off.</p> <p>When the SynapSwitch™ is in the generator position, the LED will be red for 5 minutes before reconnecting the loads.</p> <p>While the reconnected loads are within the generator capacity, the LED will be green.</p> <p>If a generator overload occurs, the LED will flash rapidly red and green for as long as the overload occurs, with a minimum time of 10 seconds.</p> <p>If the First Run (Learning Function) test is run, the LED will flash slowly red and green for the duration of the test.</p> <p>If the installer tries to run a First Run (Learning Function) test at a time when the test is forbidden, the LED will flash red rapidly for 3 seconds. Installation tests are forbidden while not running on utility, when DIP switch 6 is set to 1, while an installation test is already in progress, or during the first 5 minutes after the system has entered normal operation on utility (since during this time the AC loads are disabled to provide recovery time for the compressors).</p> <p>On the resetting of stored average and peak powers via the power management test button, the LED will flash green rapidly for 3 seconds.</p>
SWITCH STATUS	<p>This is the overall status LED of the SynapSwitch™.</p> <p>When the SynapSwitch™ is in the utility position, the LED is green.</p> <p>When the SynapSwitch™ is in the generator position, the LED is red.</p> <p>When the SynapSwitch™ is in the process of switching over, both red and green will be lit.</p> <p>This is mostly seen during the TDNE period.</p> <p>If the SynapSwitch™ has failed, the LED will be off, while other LEDs will still be on.</p>
UTILITY STATUS	This LED is green for the utility voltage in specification – red otherwise.
GENERATOR STATUS	This LED is green for the generator voltage in specification – red otherwise.
LOAD 1	<p>These LEDs apply only when power management is on (DIP switch 6 on).</p> <p>If the load is enabled, the LED will be green. If the load is disabled, the LED will be red. If load is in lock out position it will always display red under generator power.</p> <p>When on generator power, for the first 30 seconds of the load being connected while it is being qualified, the LED will flash green slowly. Once power management determines that the load is not overloading the generator, the LED will turn green.</p> <p>If the power management determines that the load cannot be on without overloading the generator, the LED will turn red and the load will be disabled.</p>
LOAD 2	
LOAD 3	
LOAD 4	
AC1 (air conditioning)	
AC2 (air conditioning)	
START	<p>For a utility-sense generator, both START and STOP LEDs will be off. For a 2- or 3-wire-start generator, the LEDs will be as follows:</p> <p>If the weekly exercise test is on, the START LED will be green. The STOP LED will typically be off.</p> <p>During a scheduled weekly exercise or during a generator exercise test, the STOP LED will be green.</p> <p>When a weekly exercise time is set, both LEDs will rapidly flash green for 3 seconds.</p> <p>If the installer tries to initiate a generator exercise test or set a weekly exercise time for a utility-sense generator, this is not possible, so the LEDs will flash red rapidly for 3 seconds.</p>
STOP	

FUNCTIONAL TESTING

At the completion of the installation, test for proper operation:

1. Turn off the utility circuit breaker and verify that the backup generator starts and the SynapSwitch™ transfers to generator power in time frame set by DIP switches.
2. Verify load control of the SynapSwitch™ is working properly.
 - a - Turn on a background load that will cause an overload of the generator.
 - b - Verify that controlled loads such as the AC are turned off until the background load is removed during the controlled times (approximately 5 minutes).
3. Restore the utility power by turning on the utility circuit breaker.
4. Verify the SynapSwitch™ transfers power back to the utility after a few seconds. There will be a half-second pause before switching from generator to utility
5. Verify the generator turns off after the cooldown period of the generator. The system is now properly installed.

ENCLOSURE DOOR LATCH

An enclosure door latch is provided to secure the door in the CLOSED position; see *Figure 12*. The enclosure door latch must be engaged in the CLOSED position at all times except for when servicing the system. The enclosure door latch may be secured with a padlock, if desired.

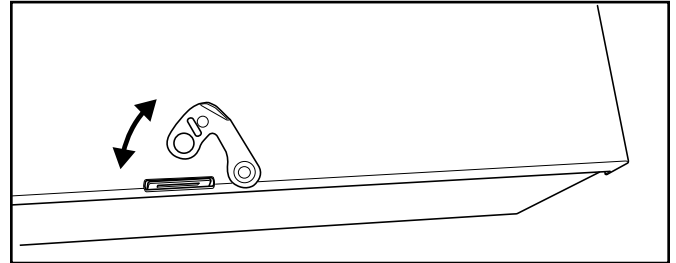


Figure 11 – Door Latch

MAINTENANCE

Always maintain a 3-ft (92 cm) clearance around the SynapSwitch™. Once a month, visually inspect the outside of the SynapSwitch™ for accumulation of dirt, moisture and/or corrosion on the enclosure.

The homeowner or end user is responsible for following all maintenance and periodic testing procedures and guidelines of the generator owner's manual to ensure proper operation.

Once a year, have a licensed electrician clean the inside of the SynapSwitch™ and inspect for:

- Damage or loose parts
- Discoloration of wire insulation or components

TROUBLESHOOTING

TROUBLESHOOTING

Problem	Cause	Correction
Generator does not start	1. Various causes	1. Inspect Generator Fault Code display for error. 2. Consult generator manual for corrective action.
SynapSwitch™ does not transfer power to generator	1. Generator breaker open 2. Generator voltage not acceptable	1. Reset generator circuit breaker. 2. Consult generator manual for corrective action.
SynapSwitch™ does not transfer power to utility	1. Utility breaker open 2. Utility voltage not acceptable	1. Reset utility breaker. 2. Wait for utility voltage to return to normal.
Generator is still running after switch transfers to utility power	1. Generator is operating in engine cool-down period	1. Engine should stop after a few minutes.
Controlled loads (air conditioner, etc.) are not operating when generator is supplying power	1. Air conditioners are disabled for 5 minutes after power transfer 2. Too much load on generator	1. Wait 5 minutes. 2. Decrease load to generator. 3. Contact local service center.
Generator is still running after utility power is restored	1. Minimum engine run time has not elapsed 2. Generator communication line not connected	1. Wait 5 minutes for SynapSwitch™ to retransfer to utility power. 2. Contact local service center.

RADIO AND TELEVISION INTERFERENCE

This equipment has been tested and certified to exceed the performance of FCC part 15 Class B devices. This ensures this SynapSwitch™ provides the highest level of compatibility with other electronic devices. FCC requirements mandate the following statement:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

You may also find helpful the following booklet, prepared by the FCC: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402.

Changes and modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission rules.

In order to maintain compliance with FCC regulations shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio & television reception.

REPLACEMENT PARTS

REPLACEMENT PARTS IDENTIFICATION

For replacement parts, reference the Milbank part number shown.

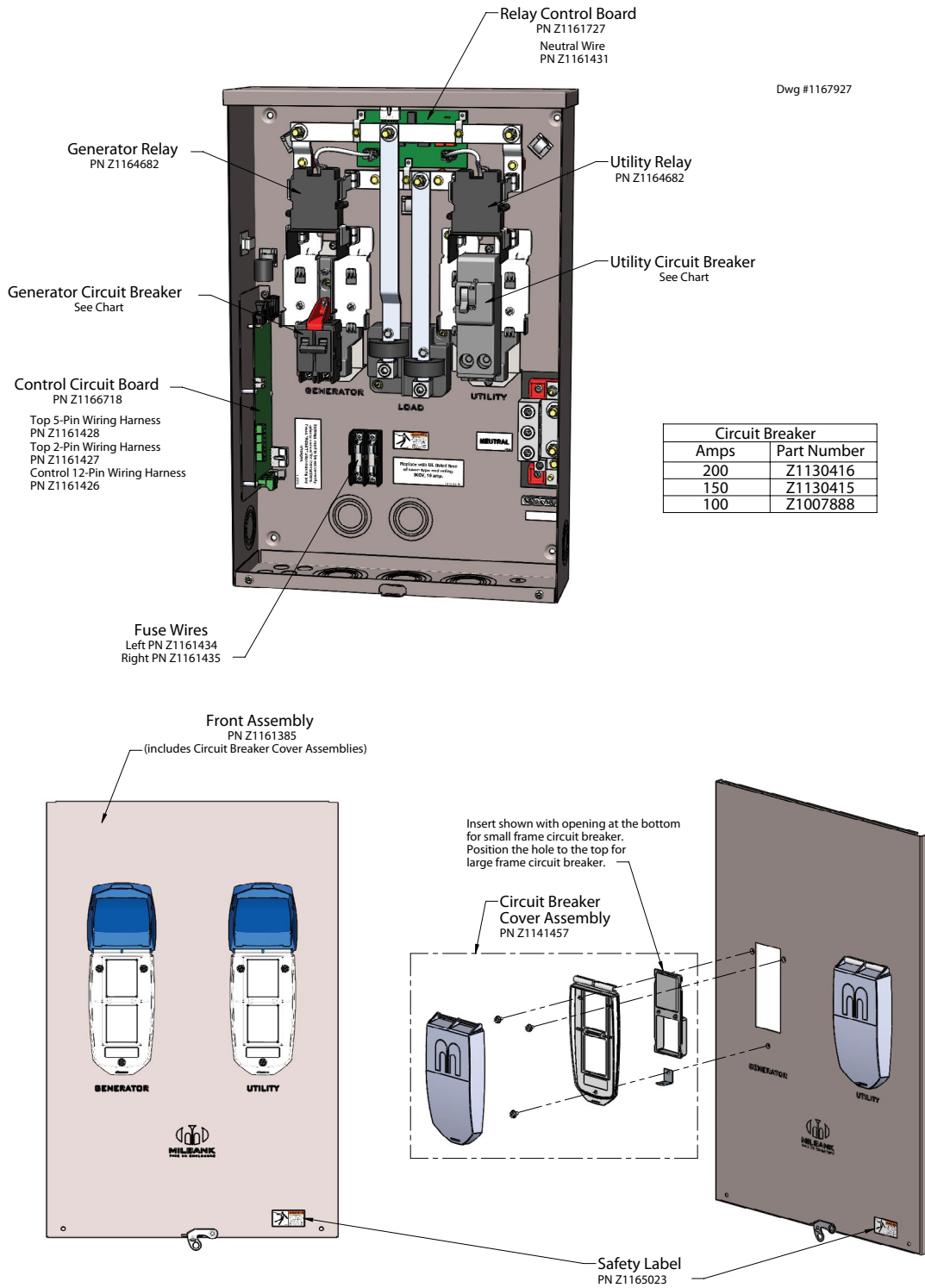


Figure 12 – Replacement Parts

SPECIFICATIONS

SPECIFICATIONS

	MATSO10011	MATSO20011	MATSO15011	MATSO20012
Phase	Single			
Limited warranty	3 years			
Circuits	Whole house			
Utility breaker	100	200	150	200
Service entrance disconnect	Yes			
Generator breaker	100	100	200	200
Rated AC voltage	120/240			
Poles	2			
Frequency	60 Hz			
Short-circuit current/AIC rating	22,000			
Supervisory contacts rating				
<ul style="list-style-type: none"> Air conditioner – for thermostats 	Isolated contacts rated for 5 amps/250V AC, or 5 amps/30V DC			
<ul style="list-style-type: none"> Load control drive – Load 1 through load 4 	These are 24-V, 10-mA DC outputs used to signal Milbank remote switches. Depending on the setting of DIP switch 7, these are used as either noninverted operation (0 V when “on” and 24 V when “off”) or inverted operation (24 V when “on” and 0 V when “off”). These lines are low-voltage Class 2, current limited.			
<ul style="list-style-type: none"> Start/Stop 	Relays used to control nonautomatic generators – isolated contacts rated for 5 amps/250V AC, or 5 amps at 30V DC)			
Common features				
<ul style="list-style-type: none"> Power management 	Yes			
Dimensions (H x W x D)				
<ul style="list-style-type: none"> Unit 	27.15 x 18.25 x 6.54 in. (69.0 x 46.4 x 16.6 cm)			
<ul style="list-style-type: none"> Shipping carton 	29.0 x 19.3 x 8.0 in. (73.7 x 49.0 x 20.3 cm)			
Weight	42 lb (19 kg)			
Shipping weight	48 lb (22 kg)			

* For questions on compatibility with other Milbank generators, please call Milbank sales office at (816) 410-7346.

MILBANK MANUFACTURING SYNAPSWITCH™ OWNER WARRANTY POLICY

LIMITED WARRANTY

Milbank Manufacturing will repair or replace, free of charge, any part(s) of the equipment that is defective in material or workmanship or both providing that installation of the equipment complies with all applicable codes, industry standards, laws, regulations and provided installation manual. Milbank's SynapSwitch™ and associated components shall be installed only by a licensed electrical contractor, and otherwise this warranty is void. This warranty is effective for the time period and subject to the conditions stated below. For warranty service, please call Milbank Manufacturing at 888-483-5314 or Milbank's PowerGen office at (816) 410-7346 (PGTS@milbankworks.com)

THERE ARE NO OTHER EXPRESS WARRANTIES OR IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ABOVE WARRANTY IS LIMITED TO THREE YEARS FROM PURCHASE. ANY AND ALL IMPLIED WARRANTIES ARE EXCLUDED AND LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES ARE EXCLUDED TO THE EXTENT EXCLUSION IS PERMITTED BY LAW. BUYER'S SOLE REMEDY IS THE LIMITED WARRANTY STATED ABOVE.

WARRANTY PERIOD

Consumer Use: 3 years

The warranty period begins on the date of purchase by the first retail consumer and continues for the period of time stated above. Equipment used for primary power in place of utility is not applicable to this warranty.

WARRANTY REGISTRATION PROCESS

Thank you for choosing Milbank's SynapSwitch™ | Automatic Transfer Switch for your home generator system!

1. For the fastest and most efficient way to register your SynapSwitch™ warranty, please complete the online form at milbankworks.com/warranty (preferred method). Otherwise, please complete the postcard and return via mail.
2. Complete the online form or return the postcard within 10 days of installation.
3. Save the proof of purchase. If the SynapSwitch™ is not registered within 10 days, the warranty start date will default to the date of purchase by the first retail consumer.
4. If the warranty registration steps are not completed, the warranty start date will default to the manufacturing date.

ABOUT OUR WARRANTY

Any authorized service dealer may perform warranty repairs. Most warranty repairs are handled routinely, but sometimes requests for warranty service may not be appropriate or applicable. For example, warranty service would not apply if equipment damage occurred because of misuse, lack of routine maintenance, shipping, handling, warehousing, or improper installation. Similarly, the warranty is void if the manufacturing date or the serial number on the equipment has been removed, altered, or modified. During the warranty period defined above, the authorized certified technician, at its option, will repair or replace any part that, upon examination, is found to be defective under normal use and service. No allowances shall be made to the Buyer for any transportation, duties, brokerage fees, labor costs, or parts adjustments or repairs, or any other work, unless said charges have been authorized in writing, in advance, by the Seller. The Seller shall not be liable for determining whether any Article(s) or parts thereof are suitable for the Buyer's or any third-party's intended use or application. The Seller shall in no event be liable for any special or consequential damages or for loss of profit as a result of a breach of this warranty, including without limitation, any damages relating to any direct or indirect damage to property resulting from any use, removal or installation of the article(s) by the Buyer or any third-party.

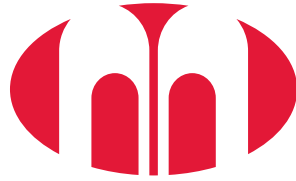
WARRANTY

This warranty will not cover the following repairs and equipment:

- **Normal Wear:** Electrical equipment, like any mechanical device, needs periodic parts and service to perform well. This warranty does not cover repair when normal use has exhausted the life of the part or equipment.
- **Installation and Maintenance:** This warranty does not apply to equipment or parts that have been subjected to improper or unauthorized installation or alteration or modification, misuse, negligence, accident, overloading, improper maintenance, repair or storage so as, in our judgment, to adversely affect its performance and reliability. This warranty also does not cover normal maintenance such as adjustments, cleaning and fuse replacement.

Other exclusions: This warranty excludes wear items or damage or malfunctions resulting from accidents, abuse, modifications, alterations, or improper servicing. Accessory parts are excluded from the product warranty. This warranty excludes failure due to acts of God and other force majeure events beyond the manufacturer's control. Also excluded is used, reconditioned, and demonstration equipment. The warranty shall not apply to any materials or parts thereof furnished by the Buyer, or acquired from others at the Buyer's request and/or the Buyer's specifications or designs.

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