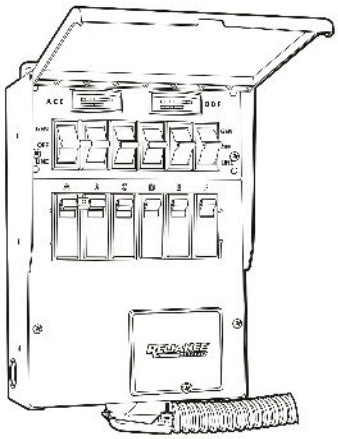
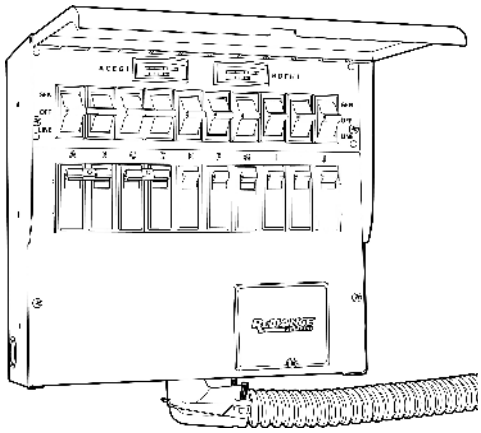
INSTALLATION AND OPERATING INSTRUCTIONS





PRO/TRAN® 2

MANUAL TRANSFER SWITCHES

FROM

RELIANCE® CONTROLS

Residential Wattage Requirements

Appliance	Running Watts	Add watts for starting
Furnace blower, gas or fuel		
1/8 hp	300	500
1/8 hp	500	750
1/6 hp	500	750
1/4 hp	600	1000
1/3 hp	700	1400
1/2 hp	875	2100
Shallow well pump		
1/3 hp	750	1400
1/2 hp	1000	2350
Sump pump		
1/3 hp	800	1300
1/2 hp	1050	2150
Refrigerator or freezer	800	2300
Garage door opener		
1/4 hp	550	1100
1/3 hp	750	1400
Lights	on bulb	0
Radio	50-200	0
Television	100-300	0
Microwave oven	600-1500	0
Coffee maker, typical	1750	0
Toaster/toaster oven	1050-1850	0
Portable heater	1100-1500	0
Dehumidifier	650-800	0
Electric blanket	400	0
Clothes washer	1150	2300
Clothes dryer, gas	700	1800
Dishwasher		
cool dry	700	1400
hot dry	1450	1400
Vacuum cleaner	800-1100	0
Hair dryer	300-1500	0
Iron	1200	0

Warnings • Cautions

Warning: Improper installation of this transfer switch could cause damage or personal injury by electrocution or fire. Installation must be performed by a qualified electrician in compliance with all applicable electrical codes

Warning: When using this product with a portable generator, do not operate the generator indoors or in an enclosed area. Do not operate a generator where the exhaust fumes can accumulate indoors or in an enclosed area like a garage or close to windows or doors.

Caution: Reliance transfer switches covered in this manual should not be used for appliances or systems that may exceed the capacity of the product.

Caution: When the transfer switch is connected to branch circuits with AFCI or GFCI breakers, the AFCI or GFCI protection will be lost when, and only when, the toggle switch in the transfer switch is in the GEN position. To get AFCI or GFCI protection when running on generator power, install the appropriate breakers in the transfer switch.

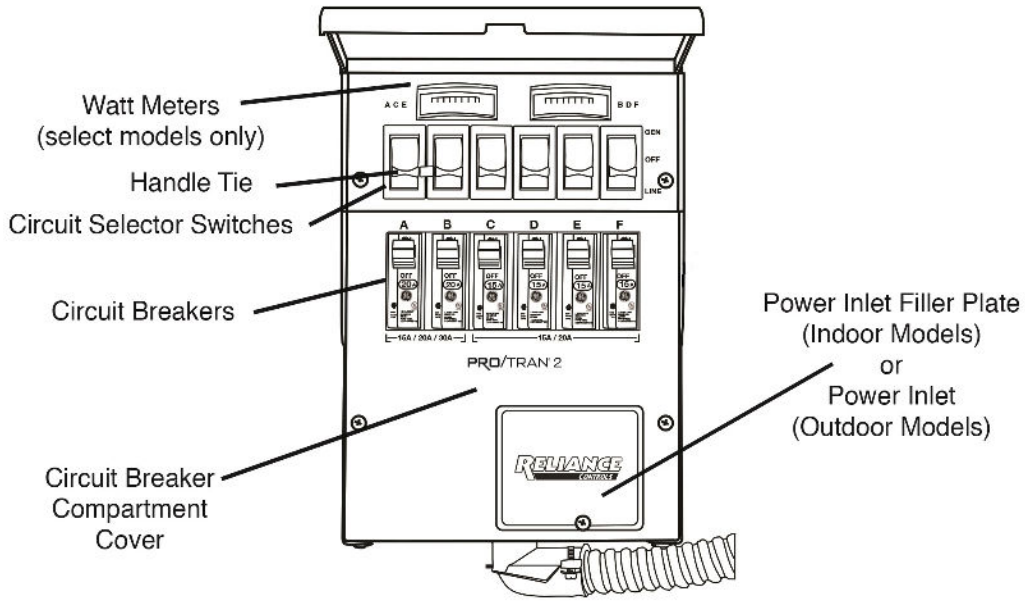
Reliance Controls Corporation is not responsible for damage or injury caused by incorrect installation of this transfer switch.

Member, National Electrical Manufacturers Association

Reliance Installation and Operating Instructions

Key Components of the Reliance Transfer Switch

Figure 1



Circuit breakers. Each transfer switch circuit has a 1-in interchangeable circuit breaker that protects the branch circuit when the circuit selector switch is in the GEN position. In the LINE position, each branch circuit is protected by the breaker in the load center. If you purchased a transfer switch that does not include the circuit breakers, you will need to purchase the appropriate UL 489 Listed breakers. A list of acceptable breakers can be found on the inside of the transfer switch cover.

Circuit selector switches. These switches allow you to select either GEN (generator) or LINE (utility) as the power source for the branch circuits that have been wired through the transfer switch. The OFF position is generally not used, as a switch in the OFF position removes that branch circuit from both utility and generator power.

Handle ties. Handle ties are used for 240-volt circuits or multi-wire branch circuits. They may be removed for 120-volt circuits. See page 6 for instructions on removing and adding handle ties.

Power inlet filler plate. This can be replaced with a power inlet that is included in the suffix A and B models (see page 7 for installation instructions). The power cord from the generator is plugged into this inlet. The inlet is supplied separately for indoor models to encourage the use of a remote connection outdoors reducing the likelihood of running the generator indoors which is extremely dangerous. If this indoor model is installed outdoors, make sure it is installed in a dry location.

Circuit Breaker Compartment Cover. Remove to change circuit breakers. Also includes a wiring space that can be used to hard-wire the unit to a remote power inlet box.

Analog wattmeters (suffix A and C models). These meters indicate the total load, in watts, on each side of the generator when the generator is supplying power as follows:

The left meter measures the load on	
A, C, and E	6-circuit
A,C,E, and G	8-circuit
A, C, E, G and I	10-circuit

The right meter measures the load on	
B, D and F	6-circuit
B,D,F and H	8-circuit
B, D, F, H and J	10-circuit

Note: *The watt meters will register only if power is being used from the generator.*

Installation Instructions

Preparing for Installation

You will need the following items:

- Electric drill
- Screwdriver
- Wire cutters/stripper
- Hammer
- Four anchors and screws
- 6 or 10 yellow wire connectors (depending on the model)
- 4 red wire connectors for the 20A and 30A hard-wire models

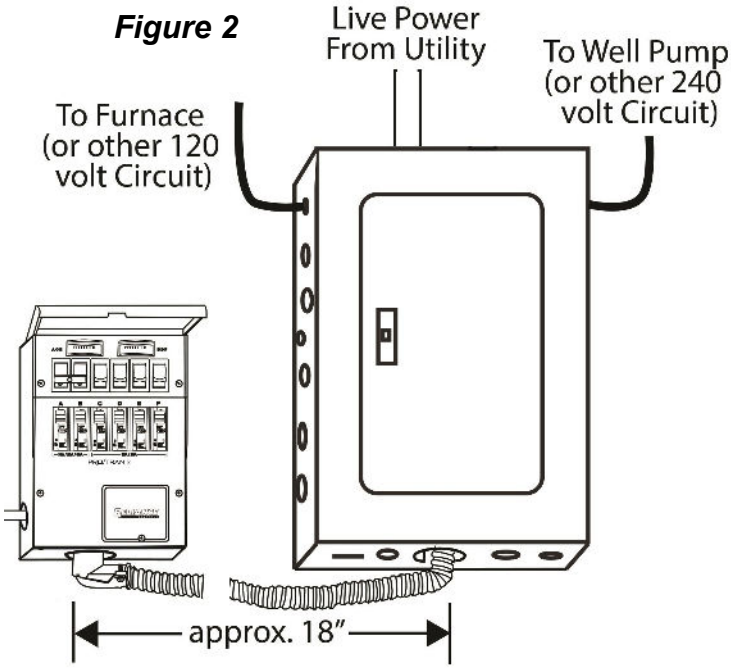
The following five steps generally apply to all transfer switch installations. The transfer switch may be installed on either side of the load center.

1. Turn off the main circuit breaker in the load center to ensure your safety.

Danger: All current-carrying parts on the LINE side of the main are still live

2. Remove the cover of the load center.
3. Locate and remove a knockout (ko) in the bottom of the load center *(Figure* 2). Use a 3/4" ko for 6-circuit models, and a 1" ko for 10-circuit models.
4. Insert the wires extending from the end of the flexible conduit through the ko. Attach the conduit connector securely with the locknut provided.
5. Anchor the transfer switch to the wall using the top bracket and bottom mounting holes located in the cabinet behind the wiring compartment cover. Do not attempt to bend the flexible conduit beyond its structural capabilities.

Figure 2



Wiring the Reliance Transfer Switch to the Load Center

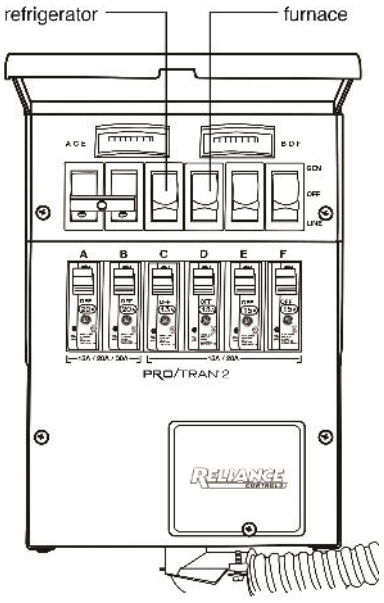
Determine which circuits will be used during an emergency. The residential wattage requirement chart on the inside front cover of this manual may be used as a guide, but actual appliance wattages may vary. If a selected circuit is part of a multi-wire branch circuit, ensure the other branch circuit that shares the neutral is also connected to the transfer switch. The two circuits must be connected to opposing legs (phases) of the generator power and a handle tie must be installed on the switch handles so that both legs are transferred at the same time.

Warning: Failure to properly install a multi-wire branch circuit could result in overloading the neutral wire.

The maximum number of circuits available and those that can be used for multi-wire branch circuits depends on the model of the transfer switch as follows:

Model	Max	Available for multi-wire branch circuits
A304	4	Any two adjacent circuits.
A306, A506	6	Any two adjacent circuits.
A308	8	Any two adjacent circuits.
A310, A510	10	Any two adjacent circuits.

Balancing the Load



To maximize the efficiency of your generator, divide appliance circuits and others requiring higher wattage between adjacent circuit selector switches of the transfer switch so that a usage balance is achieved between the opposing legs of the generator power.

For example, on a 6-circuit transfer switch, consider wiring the refrigerator to Switch C and the furnace to Switch D *(Figure 3)*.

Figure 3

Changing Circuit Breakers

This product is supplied with a combination of 15- and 20-amp circuit breakers. In some cases, a 30 amp double-pole breaker may be supplied in the A and B positions.

All circuit breaker positions will accommodate 15- and 20-amp circuit breakers, and may be easily changed in the field. To remove a circuit breaker, remove the circuit breaker compartment cover, unscrew the terminal screw in the breaker to be removed, removed the wire, tilt the top of the circuit breaker towards you and lift up and out. Reverse the procedure to install another breaker. In addition, positions A and B (but only these positions) will accommodate 30-amp circuit breakers.

This product is UL approved for use with the field-installed breakers listed on the side of the cabinet: Use 30 amps maximum in positions A and B, 20 amps maximum in all other positions.

Rating of a transfer switch circuit breaker should not exceed the rating of the corresponding branch circuit breaker in the load center.

Do not install any breaker larger than 20 amps., except in positions A and B which may be 30 amps.

Installing 120-volt Circuits

Warning: Transfer switch circuits with 20 amp breakers must be installed on only those branch circuits with 20 amp branch circuit breakers. Transfer switch circuits with 15 amp breakers can be installed on 15 or 20 amp branch circuits. **Do not install any transfer switch circuit on branch circuits greater than 20 amps, except in position A and B which maybe 30 amps.**

Wire the most critical circuits first, starting with any circuit position on the transfer switch. Let's assume that Switch C will be designated to supply power to the refrigerator.

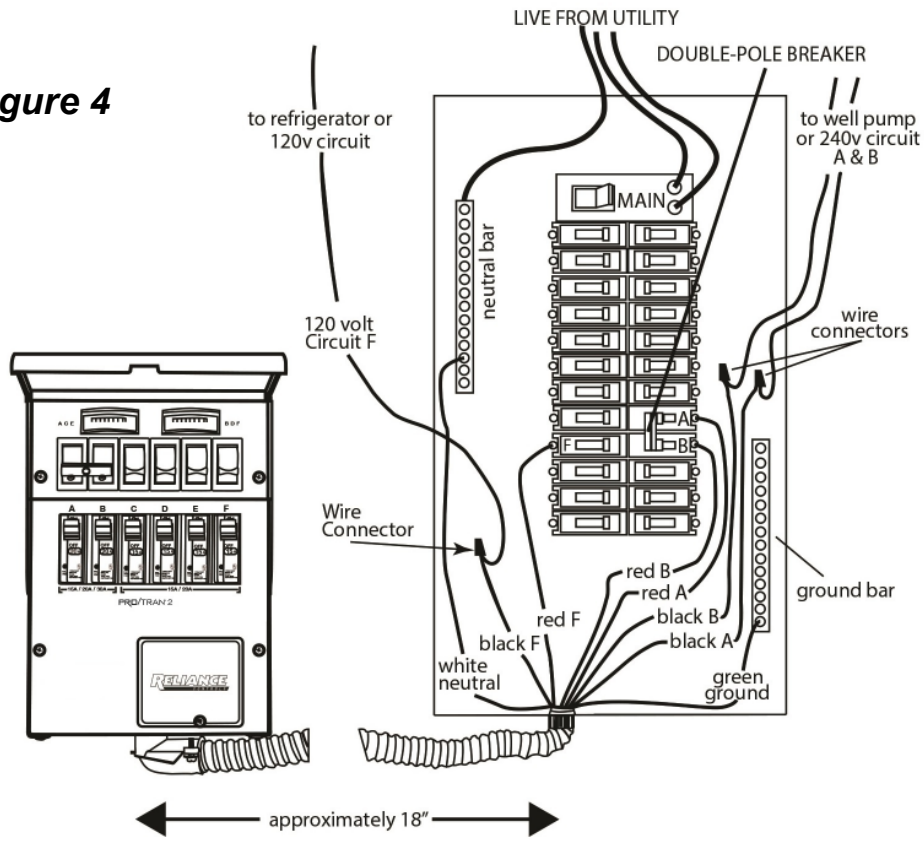
1. Turn off the refrigerator circuit breaker. Loosen the screw that secures the wire to the circuit breaker. Disconnect the wire from the circuit breaker.
2. On the transfer switch, find the black and red wires marked C.
3. Feed the **red wire** to the selected **breaker,** in this case the refrigerator breaker.
4. Cut the red wire C to a convenient length. Strip approximately 5/8" from the end of the wire. Connect the **red wire** to the refrigerator circuit **breaker** and retighten the screw.
5. Cut the black wire C to a convenient length for aligning with the wire removed from the refrigerator circuit breaker in step 1. Strip approximately 5/8" from the end of the wire.
6. Insert both wires (the wire removed from the circuit breaker in step 1 and the black wire) into a yellow wire connector. Twist the connector tightly and push the wires back into the wiring compartment of the load center.

This completes the installation of the transfer switch for your refrigerator.

Repeat steps 1-6 for each of the remaining considering the following:

- See the following section for 240-volt circuits and the removal of handle ties if 240-volt circuits are not required.
- Remember to "balance the load"—dividing the appliances requiring higher wattage between the left and right sides of the transfer switch.

Figure 4



Installing 240-volt Circuits

Any two adjacent circuit selector switches may be used for a double-pole 240-volt circuit. Use a handle tie to connect the two circuit selector switches.

*Note: Circuits used for multi-wire branch circuits are not available for 240-volt circuits

Removing handle tie(s). If there are no 240-volt or multi-wire circuits in the transfer switch installation, handle-ties on the switches are not needed. To remove a handle tie, place the handle-tied switches in a position opposite of the other switches. Rotate the cylindrical spacer between the switches upward repeatedly until the threaded shaft is exposed on the right switch. Grab the threaded shaft and continue to rotate the spacer upward until the spacer is free, being carefully not to drop the spacer when it becomes free. Remove the shaft from the switch. If the shaft is not exposed after several revolution of the spacer, insert a small slot screwdriver in the hole in the right switch and continue rotating the spacer upward while the screw driver prevents the shaft from rotating.

Adding handle ties. If additional ties are needed to accommodate additional 240-volt or multi-wire circuits, they can be added to adjacent pairs of switches.



Warning: Transfer switch circuits with 20 amp breakers must be installed on only those branch circuits with 20 amp branch circuit breakers. Transfer switch circuits with 15 amp breakers can be installed on 15 or 20 amp branch circuits. **Do not install any transfer switch circuit on branch circuits greater than 20 amps, except in position A and B which must be 30 amps.**

Installing 240-volt circuit(s)

1. Locate the two red and two black wires from any adjacent circuit positions.
2. Turn off the double-pole breaker in the load center.
3. Loosen the screws that secure each wire to each circuit breaker. Disconnect the wires from the circuit breakers.
4. Feed the two red wires in Step 1 to the double-pole circuit breaker.
5. Cut the red wires to a convenient length. Strip 5/8" from the end of each wire. Connect the two **red wires** to the double-pole circuit **breaker.**
6. Cut the black wires to a length convenient for aligning with wires removed from the circuit breaker. Strip 5/8" from the end of each wire.
7. Insert one wire removed from the circuit breaker and one black wire into a yellow wire connector. Twist to tighten and push the wires back into the wiring compartment of the load center. Do the same for the other wire removed from the circuit breaker and the other black wire from the transfer switch.
8. Be sure that a handle tie is connected between the two circuit selector switches.

Repeat steps 1-8 for the other double-pole circuits.

30-Ampere Circuits. Only circuits A and B may be used for 30-amp. circuits. Follow the above wiring instructions for installing 240-volt circuits. If 30-amp. single-pole circuits are being used, refer to the previous section regarding installation of 120-volt circuits.

For models with C or D suffix, or to hard wire any cord-connected model, continue to the next section entitled "Hard-wire Installation" to complete the installation.

For models with a A or B suffix skip to "Inlet Installation for Indoor Models Used Outdoors" on page 7.

Hard-wire Installation

"Hard-wire" installation to a power inlet box located remotely from the transfer switch *(Figure 5)* requires additional steps to complete the installation. The wire connections to the wires from power inlet box are made in the circuit breaker compartment of the transfer switch. Access the circuit breaker compartment by removing the two screws located on the sides of the lower circuit breaker compartment cover. Replace when installation is complete.

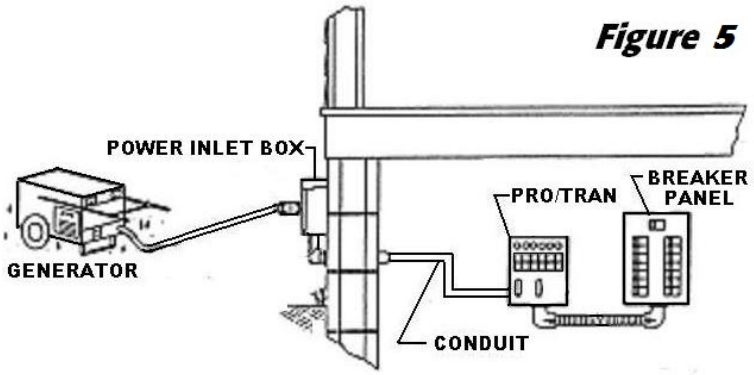


Figure 5

From the transfer switch, connect:

- the black wire lead to the power inlet X or Y terminal
- the white wire lead to the power inlet neutral W terminal
- the red wire lead to the power inlet X or Y terminal
- the green wire lead to the power inlet ground G terminal.

Inlet Installation (For indoor models installed outdoors)

Suffix A and B models have a power inlet included. The inlet can be installed on the unit by removing the circuit breaker compartment cover (described in the proceeding section) and the power inlet filler plate, installing the inlet with the enclosed screws onto the wiring compartment cover, and connecting the wire leads to the inlet as described in the instructions included with the inlet. Make sure the unit is installed in a dry location.

Completing the Installation

When you have wired all the load circuits in the transfer switch, only the white neutral wire and the green ground wire remain.

1. Insert the white neutral wire into an unused opening in the neutral bar in the load center and tighten the screw *(Figure 4).*
2. Insert the green ground (bond) wire into an unused opening in the ground bar in the load center and tighten the screw *(Figure 4).*
3. Replace the cover to the load center.
4 Fill in the chart on the transfer switch to identify your emergency circuits and corresponding circuit numbers in the load center.
5 Return all load center branch circuit and main breakers to the "ON" position.
6 Move all circuit selector switches on the transfer switch to the "LINE" position.

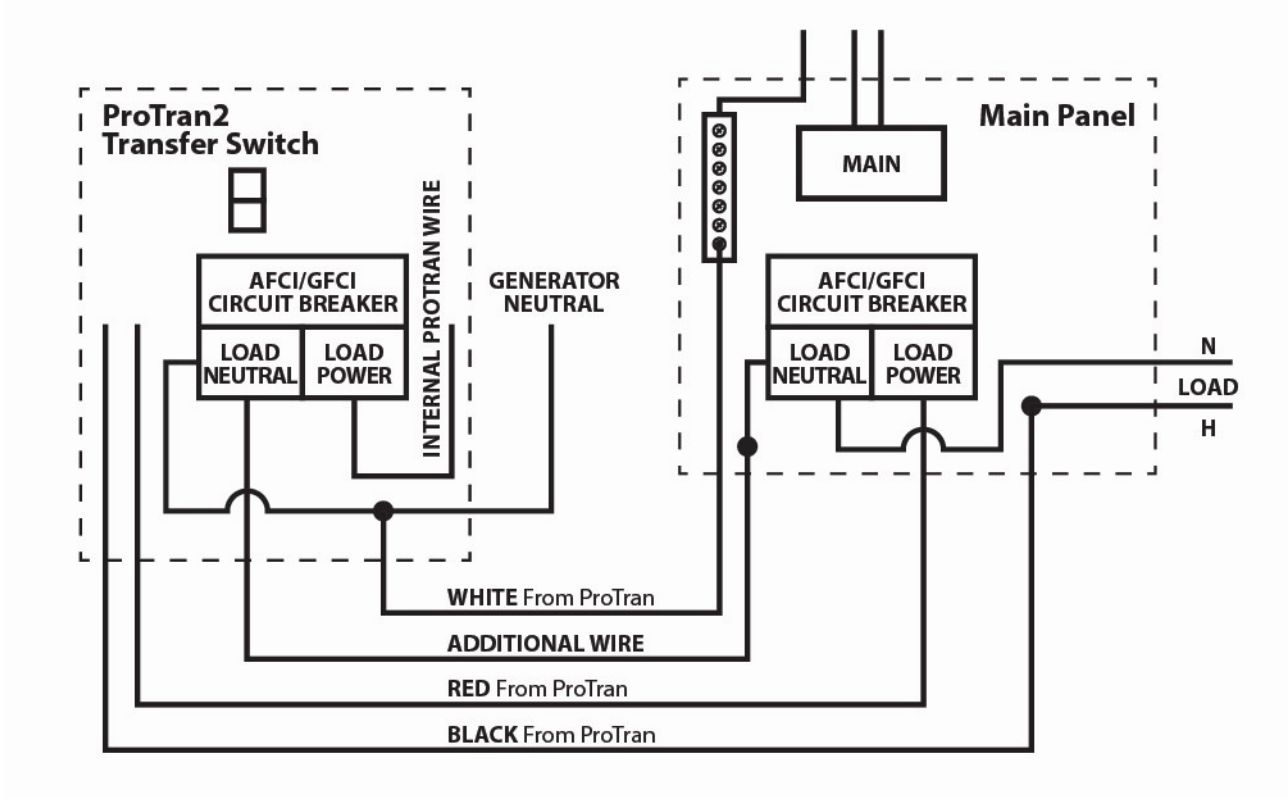
Installation is now complete.

Installing AFCI or GFCI Circuit Breakers

Proper installation of AFCI or GFCI circuit breakers in a Protran2 requires additional steps:

1. Replace the desired circuit breaker in the Protran 2 with an AFCI/GFCI circuit breaker of the same value as the corresponding breaker in your main panel. Connect the internal wire in the Protran to the LOAD or POWER terminal on the AFCI/GFCI circuit breaker. Suitable circuit breakers are listed on the side of the Protran cabinet.
2. Remove the white pigtail wire on the main panel AFCI/GFCI from the neutral bus on the main panel.
3. Connect a white wire of the proper gauge to this pigtail and route it into the Protran cabinet (ADDITIONAL WIRE in Figure 6).
4. Connect this new white wire to the NEUTRAL terminal on the AFCI/GFCI breaker in the Protran (see Figure 6).
5. Connect the white pigtail wire on the Protran AFCI/GFCI breaker to the main neutral wire in the Protran. This is the same white wire that the generator neutral is connected to.
6. Attach the corresponding red wire from the Protran to the LOAD or POWER terminal on the AFCI/GFCI circuit breaker in the main panel, similar to connection of a standard circuit breaker described in previous instructions.
7. Attach the corresponding black wire from the Protran to the load or branch circuit wire that was in the LOAD terminal on the main panel circuit breaker, similar to the connection of a standard circuit breaker in previous instructions.
8. Repeat the above steps for each AFCI/GFCI circuit breaker added to the Protran2.

Figure 6:



Operating Instructions

Using your Reliance Transfer Switch and Your Portable Generator



Warning: ***Do not operate a generator in an enclosed area. Do not operate a generator where the exhaust fumes can accumulate in an enclosed area.***

Important Note About Portable Generators:
The Reliance Protran2 Transfer Switch is a two-pole transfer switch. The Protran2 does not switch the neutral wire. As such, it is intended to be used with a generator that has a floating neutral (ground and neutral not bonded) configuration. Please make sure your system complies with all local electrical codes.

You want your generator to be ready when you need it. Therefore, it is important to perform the following steps at least once a month to keep the generator in peak running condition.

- Start and run your generator under load regularly.
- Keep the fuel tank filled with fresh fuel.

It is not necessary to turn off any circuits in the load center when supplying generator power with the transfer switch, even when the utility power is operating normally. The double-throw action of these switches prevents feeding generator power to the utility and, conversely, prevents feeding utility power to the generator.

Transferring from Utility Power to Generator Power

1. Plug the female connector of the generator power cord into the power inlet box or the power inlet on the transfer switch. All circuit selector switches on the transfer switch should be in the LINE or OFF position.
2. Insert the male plug of the power cord into the outlet on the generator.
3. Start the generator ***outdoors.*** Follow the procedures described in the generator owner's manual furnished by the manufacturer of the generator.
4. Select the circuits to be powered by the generator by moving the corresponding switches on the transfer switch to the GEN position. Use only necessary household items when under generator power.
5. Alternate use of larger loads (furnace motors, well pumps, refrigerators, etc.) to balance the load. See "Balancing the load" on page 4. Do not exceed the maximum wattage of the transfer switch.
6. A 15 amp. transfer switch circuit breaker will limit that circuit to a maximum of 15 amps when in the GEN position. If you have moved a circuit selector switch on such a 15-amp circuit to the GEN position that controls a branch circuit that normally draws more than 15 amps, it may be necessary to turn off some of the appliances on that circuit to avoid exceeding the 15-amp load for that circuit.
7. Determine circuit wattage by using the wattmeters on the transfer switch, or from the nameplate on each appliance or motor. Very small loads may not be sufficient to cause a meter to register.

8. Models with suffix -B and -D do not have watt meters. Determine wattage from the nameplate on each appliance or motor.
9. Make a note of any excessive loads. These loads must be turned off during generator operation.

Transferring from Generator Power to Utility Power

1. Return all circuit selector switches to the LINE position.
2. Follow the procedures in the generator owner's manual to turn off the generator.
3. Unplug the power cord.

Notes on Models Without Watt Meters

Check the nameplate on each appliance or motor and note the load for each. Determine the total running wattage of your generator. During an emergency situation with the generator running, the circuit selector switches should be in the OFF or LINE position when a particular load is not needed. Failure to limit the total load to the total running wattage may cause the generator to stall or create an undervoltage condition that could damage an appliance motor.

Notes on Outdoor Models

Outdoor models have been designed with a reversible front cover. To change the orientation of the cover simply unscrew the hinges, rotate the cover 180 degrees, reattach the hinges, then re-install all screws removed during the process.

Please note: There are 2 additional labels included with your transfer switch. These labels can be used to replace the originals should you decide to change the cover orientation.

Specifications and Parts List

Model #	A304	A306	A506	A308	A310	A510
Max. Watts	7500	7500	12500	7500	7500	12500
Max. single-pole circuits	4	6	6	8	10	10
Max. double-pole and multi-wire circuits	2	3	3	4	5	5
# of handle ties provided	1	1	1	2	2	2
Max. combined loads @ 125 VAC	60A	60A	100A	60A	60A	100A
Max. combined loads @250VAC	30A	30A	50A	30A	30A	50A
Max. load/circuit from generator	2-30A 2-20A	2-30A 4-20A	2-30A 4-20A	2-30A 6-20A	2-30A 8-20A	2-30A 8-20A
Max. load/circuit from load center	2-30A 2-20A	2-30A 4-20A	2-30A 4-20A	2-30A 6-20A	2-30A 8-20A	2-30A 8-20A
Power inlet, NEMA* configuration	L14-30	L14-30	CS6375 non-NEMA	L14-30	L14-30	CS6375 non-NEMA
Minimum cord gauge	AWG 10	AWG 10	AWG 6	AWG10	AWG 10	AWG 6
No. of conductors (wires)	4	4	4	4	4	4
Conduit length	18”	18”	18”	18’	18”	18”
Conduit, trade-size diameter	¾”	¾”	¾”	1”	1”	1”
Optional Power Inlet Catalog #	PB30	PB30	PB50	PB30	PB30	PB50
*National Electrical						

Transfer Switch Parts List

Description	Part#	Description	Part#
Circuit breaker, 15 A S.P.	RCB115	Power inlet, 20 A	L1420F
Circuit breaker, 20 A S.P.	RCB120	Power inlet, 30 A	L1430F
Circuit breaker, 20 A D.P.	RCB220	Power Inlet, 50 A	LL550F
Circuit breaker, 30 A D.P.	RCB230	Handle tie	A7830
Wattmeter, 20 / 30 A	7236	Power Inlet Filler Panel	6271
Wattmeter, 50 / 60 A	7239	Switch, 30A SPDT	7801
Current Transformer (C.T.)	7222		

Warranty

Each Reliance transfer switch or accessory is guaranteed against mechanical or electrical failure due to manufacturing defects for a period of 60 months following shipment from the factory. The manufacturer's responsibility during this warranty period is limited to repair or replacement, free of charge, of products proving defective under normal use or service when returned to the factory, transportation charges prepaid. Guarantee is void on products that have been subjected to improper installation, misuse, alteration, abuse or unauthorized repair. The manufacturer makes no warranty with respect to the fitness of any goods for a user's particular application and assumes no responsibility for proper selection and installation of its products. This warranty is in lieu of all other warranties, expressed or implied, and limits the manufacturer's liability for damages to the cost of the product. This warranty gives you specific legal rights, and you may have other rights, which vary from state to state.

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