Backup Power Transfer Meter Manual

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Installation and connection

The Backup Power Transfer Meter (BPTM) gives the customer a quick and easy connection to a backup power source. Just connect the cable, turn on the generator, and let the BPTM do the switching. With BPTM, using your portable generator is easy and safe.

1. The first thing you will need to do is replace your home's existing electric meter with the BPTM. Installation will take just 45 minutes onsite by a PG&E technician. There is no need to install an Auto-Transfer Switch (ATS) or subpanel.
2. Once you've replaced your electric meter with the BPTM, the next step is to connect it to your generator. Make sure that the generator is placed a minimum of 20 feet from the BPTM enclosure or home window.
3. Plug one end of the supplied cable into the BPTM using the alignment markers on the cable connector and the BPTM connector as a guide. Then twist the knurled metallic end of the connector in the clockwise direction until you hear a click.
4. Plug the other end of the supplied cable into the 240V, 30A, L14-30R connector on your generator and twist the entire connector in the clockwise direction until it stops.
5. The BPTM cable does not have to be permanently installed. However, if the cable is not plugged into the BPTM, cover the connector on the BPTM with the supplied cap to keep it free from debris.

Operation

The BPTM is designed to automatically switch over to generator power if there is a loss of utility power and a generator is properly connected and started. In addition, the BPTM will automatically switch back to the utility power once it has been restored.

1. When there is a power outage, turn off all the circuits on the main breaker panel in the house.
2. If you have solar panels (PV system), make sure that the disconnect between the inverter and the circuit breaker panel is open (OFF).
3. Start your generator, making sure that there is plenty of fuel. Follow all safety guidelines supplied with the generator.
4. The BPTM will automatically disconnect the utility lines and connect the generator lines to the house's main circuit breaker panel in about 14 seconds.
5. Turn on the appropriate circuits (that can be serviced by the generator) on the main breaker panel. The circuits that are turned on should not exceed 7200W (see guidelines later in this document).
6. When utility power is restored, the BPTM will first disconnect the generator power for about 6 seconds, then connect the utility power back to the main circuit breaker panel. You will notice a slight flickering of the lights when this happens.
7. Once the BPTM has connected the utility power back to the house, the generator can be stopped and, if you prefer, disconnected from the BPTM.

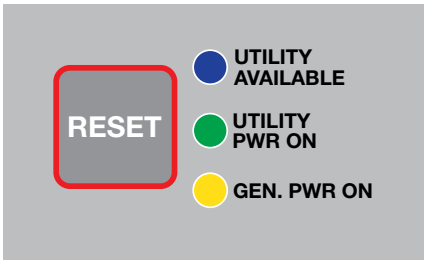
Indicators

The BPTM has three indicator lights on its side that will help in determining the status of the power sources.

UTILITY AVAILABLE: This indictor will illuminate when the Utility power source is available to be switched into the house.

UTILITY PWR ON: This indicator will illuminate when the Utility power source is connected to the house

GEN. PWR ON: This indicator will illuminate when the Generator power source is connected to the house.



Each of these indicators may flash during the transitions from one source to another, as well as when there is a problem with one or both sources (see troubleshooting section).

Loading information

As mentioned earlier, the BPTM is designed to work with maximum 240V, 30A (7200W). When trying to determine which circuits to turn on during an outage, you must consider which circuits are critical to you, and the total watts that each circuit is likely to consume.

Some guidelines for you to use to determine the maximum loading on your generator:

Many appliances in the house have not only **"running watts"** to consider, but an **"inrush"** or **"surge watts"** that can be much higher than the running watts, but only last a few seconds.

To determine the loads you can support with your generator and BPTM, you must consider both the **"running watts"** and the **"surge watts"** requirements of the loads you want to operate.

The following table lists the **running watts**, **surge watts**, and **surge factor**:

ESSENTIAL APPLIANCES	RUNNING WATTS	SURGE WATTS	SURGE FACTOR
Ceiling Fan	60 W	70 W	2
Central AC (10,000 BTU)	1,500 W	4,500 W	4
Central AC (24,000 BTU)	3,800 W	11,400 W	4
Common Light Bulb	75 W	0 W	1
Electric Water Heater	4,000 W	0 W	1
Furnace Fan Blower (1/2 HP)	800 W	2,350 W	4
Furnace Fan Blower (1/3 HP)	700 W	1,400 W	3
Garage Door Opener (1/2 HP)	875 W	2,350 W	3.7
Heat Pump	4,700 W	4,500 W	2
Humidifier (13 Gal.)	175 W	0 W	1
Space Heater	1,800 W	0 W	1
Sump Pump (1/2 HP)	1,050 W	2,150 W	3
Sump Pump (1/3 HP)	800 W	1,300 W	3
Well Water Pump (1/2 HP)	1,000 W	2,100 W	3
Window AC (10,000 BTU)	1,200 W	3,600 W	4
Window AC (12,000 BTU)	3,250 W	9,750 W	4

KITCHEN APPLIANCES	RUNNING WATTS	SURGE WATTS	SURGE FACTOR
Coffee Maker	1,000 W	0 W	1
Deep Freezer	500 W	1,500 W	4
Dishwasher	1,500 W	1,500 W	2
Electric Can Opener	170 W	0 W	1
Electric Kettle	1,200 W	3,000 W	3.5
Electric Stove (8" Element)	2,100 W	0 W	1
Food Dehydrator	800 W	0 W	1
Food Processor	400 W	0 W	1
Fryer	1,000 W	0 W	1
Microwave	1,000 W	0 W	1
Pressure Cooker	700 W	0 W	1
Refrigerator / Freezer	700 W	2,200 W	4
Rice Cooker	200 W	500 W	3.5
Toaster	850 W	0 W	1

ENTERTAINMENT APPLIANCES	RUNNING WATTS	SURGE WATTS	SURGE FACTOR
Clothes Dryer (Electric)	5,400 W	6,750 W	2.25
Clothes Dryer (Gas)	700 W	1,800 W	3.5
Curling Iron	1,500 W	0 W	1
Electric Shaver	15 W	20 W	2
Hair Dryer	1,250 W	0 W	1
Home Internet Router	5 W	15 W	4
Home Phone	3 W	5 W	2
Iron	1,200 W	0 W	1
Laptop	300 W	0 W	1
Monitor	200–250 W	0 W	1
Stereo	450 W	0 W	1
Television	500 W	0 W	1
VCR / DVD Player	100 W	0 W	1
Vacuum Cleaner	200 W	700 W	4.5
Video Game System	40 W	0 W	1
Washing Machine	1,150 W	2,250 W	3

OTHER APPLIANCES	RUNNING WATTS	SURGE WATTS	SURGE FACTOR
Cell Phone Battery Charger	25 W	0 W	1
Clock Radio	50 - 200 W	0 W	1
Copy Machine	1,600 W	0 W	1
Electric Mower	1,500 W	0 W	1
Electric Trimmer	300 W	500 W	2.7
Fax	60 - 80 W	0 W	1
Garage Door Opener (1/2 HP)	875 W	2,350 W	3.7
Outdoor Light String	250 W	0 W	1
Paper Shredder	200 W	220 W	2
Printer	400 - 600 W	0 W	1
Projector	220 W	270 W	2
Scanner	10 W	18 W	3
Security System	500 W	0 W	1
Treadmill	280 W	900 W	4

Notes on Loading Guidelines:

The wattages above are estimates. The estimated wattage required for your appliances can be easily calculated. (NOTE: 1 kW=1000 watts; 2 kW=2000 watts and so on). The formula for finding wattage is: Volts x Amps = Watts (running). Always use surge factor when calculating electrical load requirements for your generator. Select the appliances you want to operate and add the starting wattages together to determine if they can all be operated at the same time without exceeding the capacity of your generator. **NOTE: individual circuit breakers on your breaker panel may control more than one appliance Always determine which appliances/ loads are connected to specific breakers.**

Safety considerations

The BPTM has built-in overload protection, avoids the use of dangerous extension cords and is designed to eliminate dangerous backfeed, lost phases, high voltage surges, and intermittent re-connections.

Overloads

Overloads are mitigated through the overcurrent-protected cable that comes with the BPTM. If you've turned on too many circuits for your generator to handle, the BPTM cable's circuit breakers will keep any damage from happening to your generator. These circuit breakers are UL rated and are pushbutton resettable. No special tooling or training is required to reset them. Each 120V line is protected separately.

Extension Cords

With a BPTM, you eliminate the use of hazardous extension cords. Typical extension cords are not made of the appropriate gauge wire for use in this application. This can lead to an overloaded extension cord that can overheat and cause a fire. Inadequate extension cords can also lead to a loss in voltage that could damage expensive appliances. Appliances such as sump pumps, well pumps, furnaces, ranges, and hot water heaters cannot be connected via an extension cord to a portable generator because they are hard-wired to the circuit breaker panel. BPTM supplies the power to your house through the main circuit breaker panel so that each circuit remains individually protected.

Backfeed

Backfeed is a condition in which electricity from a generator flows back into the utility's electric distribution system through the homes breaker panel. Backfeed can also occur if there is a secondary source already wired into the house, like solar panels. Backfeed can damage equipment or injure utility workers. BPTM automatically disconnects a home from the utility source when you are operating your generator, eliminating that type of backfeed. BPTM also checks for the presence of alternate power sources at the circuit breaker panel before re-connecting the utility source or switching over to the generator source.

Lost phases

If an outage is caused by a storm or other natural phenomena, the possibility exists for a lost phase, due to a downed power line or malfunctioning pole transformer. BPTM constantly analyzes the condition of both lines entering from the utility service and the generator service to ensure that they are not connected to the circuit breaker panel if only one of the two lines is functioning. This adds a second layer of protection to the homeowner during outages.

High voltage surges

If an outage is caused by a storm or other natural phenomena, the possibility exists for a high side to low side short on the pole transformer. The BPTM has a built-in high voltage suppression circuit that will limit the amount of damage caused by this type of catastrophic problem. The BPTM has been tested to protect the equipment from fire or explosion up to 4000VAC across the utility input circuit.

Intermittent re-connections

If an outage is caused by a storm or even high winds on the utility power lines, the possibility exists for utility service to be intermittently re-connected before the service is completely able to provide consistent power. The BPTM will ensure that the switchover between the generator source and the utility source does not happen until the utility source has been connected and at nominal voltage for a number of cycles. This will keep the homeowner's appliances and electronics from being exposed to potentially damaging surges.

Troubleshooting

What should I check if my generator is not being connected after a utility outage?

1. **Make sure that all the circuits on the main breaker panel (or the main circuit breaker) to the house are off (open) before starting the generator.**
2. Make sure that the generator is properly plugged in a both ends, making sure that the twist-lock connector on the generator end is fully rotated and that the connector on the BPTM side is fully engages and the ring has been rotated until it clicks.
3. Make sure that the generator is started, has plenty of fuel, and if it is equipped with a circuit breaker, that it is not tripped.
4. Make sure the neither of the circuit breakers on the BPTM cable are tripped.
5. Make sure that there are no other sources of power coming into the house from extension cords, solar (PV) systems, etc. If so, make sure that they are fully disconnected from the house before attempting to connect the generator again.
6. If you believe that none of the above are causing the problem, call PGE for service.

What should I check if the utility power is not being connected after it has been restored?

1. Typically, this will only happen if the incoming utility power is not completely restored (perhaps there is only one phase active) or if damage has occurred to the meter or the BPTM.
2. Make sure to disconnect the generator from the BPTM to see if there is any issue with backfeeding into the meter from the generator. This shouldn't be required but may help determine the source of the problem. **This can be done by opening the circuit breaker on the generator or unplugging the generator cable from the BPTM.**
3. Make sure that there are no other sources of power coming into the house from extension cords, solar (PV) systems, etc. If so, make sure that they are fully disconnected from the house before attempting to connect the generator again.
4. Observe the LEDs on the side of the BPTM and follow the table below to help determine the source of the problem.
5. **If the utility power has been intermittent, it may be required to press and hold the "Reset" button on the BPTM to clear any temporary fault conditions.**
6. If you believe that none of the above are causing the problem, **call PG&E for service.**

LED light fault indications ("X" indicates flashing light)

Error	LED Indicator ("X" = Flashing light)		
	Generator Power On	Utility Available	Utility Power On
Meter Disconnect Relay did not Open	X	X	
Unexpected Line Voltage Detected	X	X	
Generator Relay Fault	X	X	
Generator Relay did not Close	X	X	
Generator Relay did not Open	X		X
Unexpected Generator Voltage Detected	X		X
Generator Contact Error (stuck open or closed)	X		X
Generator Relay did not Open	X		X
Meter Disconnect Relay Malfunctioned		X	X
Unexpected Load Voltage Detected		X	X

Normal Conditions	LED Indicator ("X" = Flashing light)		
	Generator Power On	Utility Available	Utility Power On
BPTM Booting up after Power Loss	X	X	X
BPTM Checking to Determine if OK to switch to Generator PWR	X		
BPTM Checking to Determine if OK to switch to Utility PWR			X

BPTM specifications and technical information

Physical	Electrical	Operational
Diameter: 6.9 in.	**Utility Source:** 120/240 3W, 200 A	**Transfer Type:** Break Before Make
Depth: 7.5 in.	**Generator Source:** 120/240 3W, 30A, 7200W	**Switch Delay:** 14 Seconds (Utility to Generator), 6 Seconds (Generator to Utility)
Weight: 4.6 lbs.	**Connection:** BPTM Overcurrent Protected Power Cord (included)	**Operation Cycle:** 10,000 Operations (Utility Relays), 5,000,000 (Generator Relays)
Socket Style: Ring, 200 Amp, 4 jaw	**Applicable Standards:** UL1008M, UL414, UL 2735, ANSI C12.20 and PG&E safety high voltage tests (4kV L-L)	**Operating Temperature:** -30°C to 85°C (-22°F – 185°F)

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